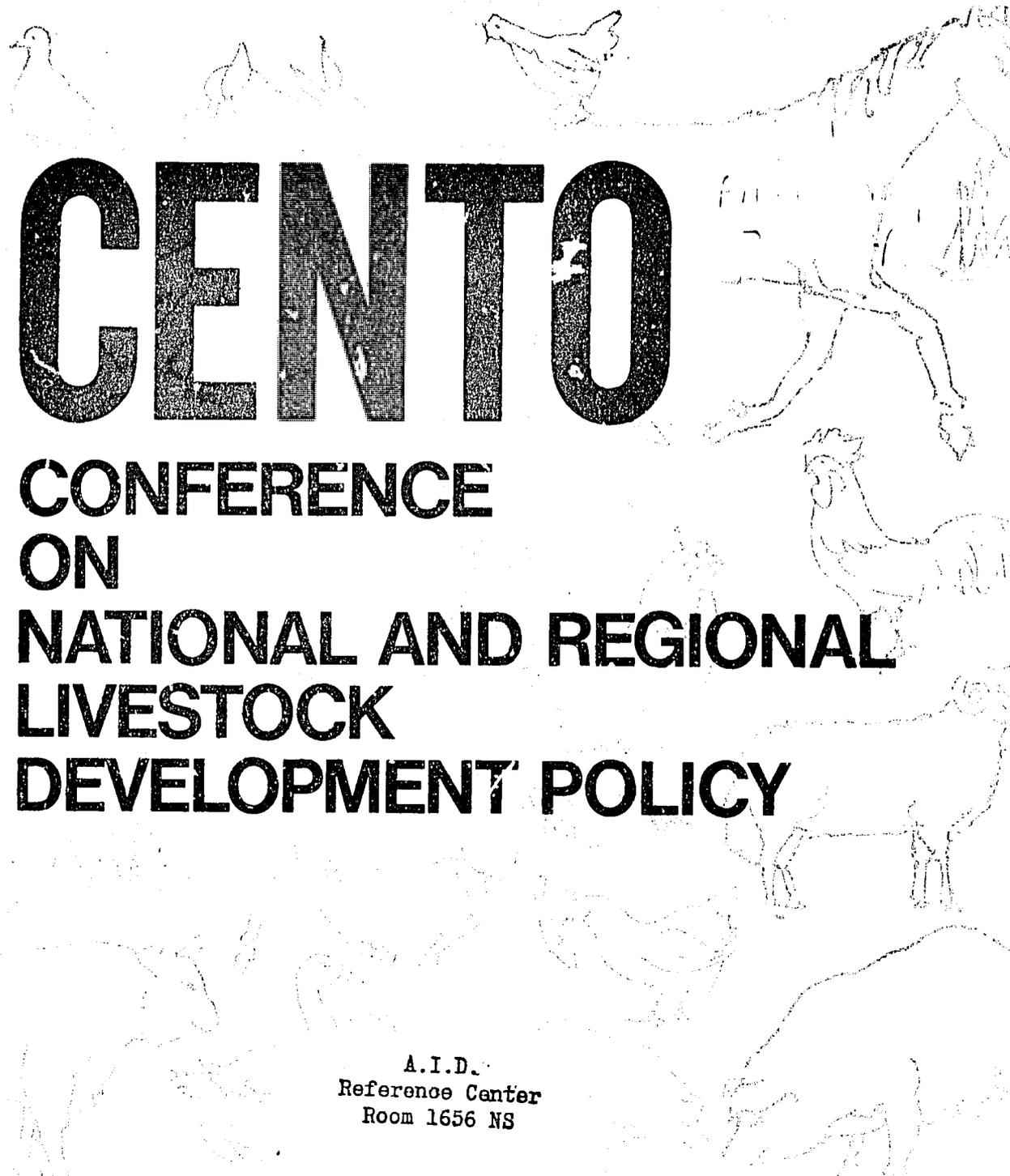


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CENTO

CONFERENCE ON NATIONAL AND REGIONAL LIVESTOCK DEVELOPMENT POLICY

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Delegates



*Turkish delegation.
Mr. Neyzat Uhudağ,
fourth from left,
served as
Head of Delegation.*



*Iranian delegation.
Dr. Mansour
Ferdows, Head of
Delegation, is shown
fourth from the left.*

he Conference



*Pakistani delegation,
Dr. S. M. Ali,
Head of Delegation
and Conference Chairman,
is shown in the back row,
second from the right.*

*Dr. Charles Grey,
Conference Consultant,
is shown
with Mr. Percy Durran,
Head of the U.K. Delegation,
and Mr. Dereck Faulkner of FAO.*



*United States
Head of Delegation,
Dr. Nels M. Kommerup,
is shown
second from left.*

FOREWORD

Conditions in the CENTO countries lend themselves admirably to a regional approach when it comes to the solution of common problems, particularly those agricultural problems of a magnitude too great for the resources of a single country in the area. An example of this is the question of livestock development, and the establishment of a sound development policy.

In order to bring together expertise in the field of animal industry for frank and open discussions on the many problems affecting livestock development in the Middle Eastern countries, a CENTO Conference on National and Regional Livestock Development Policy was held in Islamabad, Pakistan from December 15 to 21, 1969.

The word "policy," which appears in the title of the conference is a word so frequently used these days throughout the world, that it leads one to question just what is meant by policy. According to one definition, it implies a settled or definite course or method, adopted and followed by a government, institution, body or individual. If this be true, how then does one establish policy? It cannot be approached in a dictatorial manner, on a basis of fancy alone, but must be founded on fact — that is, based on a factual conclusion after careful consideration and analysis of all contributing factors.

These approaches, and many others, were considered and debated at the conference in Islamabad, and delegates welcomed the opportunity to determine what factors are involved in the establishment of a livestock development policy for the CENTO countries, and also to determine what disciplines should be involved, and to what extent they must interact for successful implementation of such policy. The real value of the conference arose, not so much from hearing the presentation of these fine papers, but rather from the delegates' frank and uninhibited discussions, and it is hoped that the recommendations that have resulted from these discussions may be accepted as segments of an overall policy for the entire region.

It was the general consensus that this was a most exciting and important meeting, the impact of which will be of great significance to all of the CENTO countries. Yet, unless there is persistent follow-through on conference recommendations, the printed proceedings will merely serve to enhance the archives and gather dust. It is hoped, therefore, that the papers and the recommendations contained in this publication will be carefully studied and remembered, as new policy for livestock development is created.

All the papers presented at the conference are included at least in part, although portions of some of them have been deleted or edited to meet printing requirements.

WELCOME ADDRESS

from H.E.
TURGUT MENEMENCIOĞLU
Secretary General, CENTO

IT IS WITH particular gratification that I send a message of welcome to this very important meeting - the third major CENTO agricultural policy conference.

As you are all aware, emphasis has been increasingly given, for the past several years in the organization's economic development programme, towards improving agricultural production in the region. This problem is one that constantly faces every developing country in the world.

Clearly, agricultural policy is fundamental and, for this reason, in 1963 a CENTO Conference on Agricultural Development Policy was held in Istanbul. The far reaching recommendations stemming from the pooling of the experiences of five nations proved of very great value and led the way towards a second high-level conference in 1967, on national and regional agricultural development policy.

In the past, animal health and husbandry have been the subjects of many specialized CENTO meetings and conferences. In continuation of this, I note with great interest that the present conference has three prime purposes:

- 1) To promote an appraisal of the effectiveness of national livestock policies in each CENTO country
- 2) To disseminate information to participants about the procedure and the results of the most effective policies in each of their countries
- 3) To propose future changes in livestock policies in those countries, including foreign trade.

As these goals are pursued, I hope that inter-regional cooperation in the agricultural field will be intensified.

I would like to pay tribute to Dr. Charles Grey, on loan to CENTO by the United States Agency for International Development. Dr. Grey visited the three regional countries in September and October of this year and discussed the objectives and programme of the conference with the various government agencies and official coordinators nominated by their countries to cooperate on the planning of this conference.

In conclusion, I wish to thank the Government of Pakistan for their kind offer to act as hosts, and the United States Government, through whose efforts this conference has been made possible.

WELCOME ADDRESS

by

*Dr. Syed Mohammad Ali
Animal Husbandry Commissioner
Ministry of Agriculture
Government of Pakistan, Islamabad*

I CONSIDER it a proud privilege to welcome you to Islamabad in connection with the CENTO Conference on National and Regional Livestock Development Policy. The importance of livestock in the national development of the regional countries cannot be over-emphasised. In Pakistan, considerable emphasis was laid during the Third Plan on attaining self-sufficiency in food grains. I am pleased to say that as a result of the concerted efforts on the part of agriculturists, agricultural scientists and administrators, West Pakistan has already become self-sufficient in her principal cereal requirement, viz. wheat. East Pakistan has also been able to considerably increase production of her staple cereal, viz. rice, and is well on the way to achieving self-sufficiency in it.

With the achievement of near self-sufficiency in cereal grains we propose to lay much greater emphasis than ever on increased production of livestock and livestock products during the Fourth Plan commencing from July 1970.

Serious protein deficiency in the regional countries stands to a considerable extent in the way of their national development. It is well appreciated that scientists from the CENTO countries have met to discuss the various problems in the way of livestock development and their possible solution at this juncture, just before we go into our Fourth Plan. I am sure the deliberations in this conference will be of great help as a guideline for us as well as for the other regional countries for bringing about overall improvement in livestock.

In order to highlight the problem of protein deficiency in Pakistan and to find means of overcoming these deficiencies, the Government of Pakistan have, of late, set up the National Protein Committee. Scientists and administrators from various fields of activities have been taken in as members of this committee. The report published by this committee has been found to be extremely helpful, and we are pursuing this serious problem with utmost effort in order to overcome it within a reasonable period of time.

The best source of protein is of animal origin, particularly items like milk, eggs, etc. Your efforts in this direction are, therefore, highly lauded.

West Pakistan has a vast arid zone. We are trying to develop this area and make it suitable for range management. Once this is done, development of livestock in Pakistan will make a big stride. With this object in view, a scheme for the Arid Zone Research Institute has been prepared by the Agricultural Research Council of Pakistan for implementation during the Fourth Plan. The problems and conditions of arid zones in Iran and Turkey, I feel, are also very similar. A joint discussion on this subject would, therefore, be of great benefit to the regional countries.

I hope you will have a pleasant stay in Islamabad and have fruitful discussions and I reiterate that your recommendations will prove to be of great help in solving the deficiency of animal protein in the regional countries.

With best wishes on your efforts, I welcome you again.

STATEMENT

presented by
Dr. Nels M. Konnerup
on behalf of the U.S. Economic Coordinator
for CENTO Affairs

ON BEHALF of the U.S. Delegation I would like to thank the Government of Pakistan, and especially Dr. S.M. Ali, for the kindness in hosting this significant conference, and for the important administrative support. I think it is especially interesting that we are meeting here in Islamabad, a new city which is fast developing into a beautiful capital.

The subject of livestock policy is one of tremendous significance to all of the countries of CENTO. The success of the "green revolution" may present all of the countries involved with problems arising from sufficiency and perhaps surpluses of grains rather than with the long standing problems of insufficiency. Such a condition, of course, is an enjoyable situation in which to be in that it assures that hunger may no longer be a major enemy. However, it does create alternative problems but ones which are far more pleasant to deal with than is the problem of hunger. Although the "green revolution" will ensure full stomachs, it will not necessarily ensure adequate nutrition, nor may it necessarily result in more exports and the generation of more foreign exchange. Protein deficiency in diets will continue to exist unless new practices are followed. The development of a livestock policy can have a large influence on the first, in that increases in livestock production and meat consumption will raise the nutritional level of the

population. Further, it may also affect the second (exports) in that some, if not all, of the CENTO regional countries may be able to develop an export market in livestock and livestock products. The development of livestock policy is not easy since it has a variety of facets, none of which can be solved in isolation. It includes the development of an adequate feed supply with adequate nutritional values. It includes catering to the demands of prospective purchasers. It includes the utilization of economical and effective transportation. It includes disease and pest control. All of these facets and many others taken in total must be considered, and effective methods of dealing with them must be found before we can say that we have developed a productive livestock policy. Nevertheless, as I contemplate the qualifications of the participants in this symposium and the breadth of experience represented here, I am sure that the problems will be faced and that constructive conclusions and recommendations will be reached.

I would also like to make a few remarks at this time on the role of the Office of the U.S. Economic Coordinator for CENTO Affairs, which provides the financial support for this meeting. Unfortunately Mr. Joseph B. Robinson, the Economic Coordinator, is unable to be with us but he has asked me to extend to you his best wishes for a successful symposium. He has also asked

me to indicate to you briefly the role of the Economic Coordinator in supporting CENTO activities. In the past the Office of the Economic Coordinator was active in supporting relatively large-scale capital projects affecting two or more of the regional countries. The most outstanding examples of this support are the CENTO railroad link now being constructed to connect the Iranian and Turkish railway systems which will provide Iran and eastern Turkey with direct railroad facilities to Europe and to the Mediterranean; the CENTO telecommunications system which provides telephonic connections between Ankara, Tehran, Rawalpindi and Lahore; and the CENTO civil airway system which provides a safe, controlled airways communications system between Ankara, Tehran and Karachi. These communications systems form basic essential elements in developing sound livestock production systems.

Since the guidelines for the Office of the Economic

Coordinator provide for support only to activities that affect two or more of the regional countries, and since the fields of transportation and communications have been largely covered by the above projects, the possibility for additional capital projects may be remote. Therefore, principal efforts at the present time are directed at the interchange of information and expertise among the various countries, for the purpose of promoting economic development and regional cooperation. The U.S. Government will continue to support such activities and will also be receptive to special studies of specific problems relating to the CENTO region.

Now I, in closing, look forward to participating with my delegation in your discussions and deliberations and I anticipate a conference report that will identify actions to be taken to speed the future development of animal agriculture which will add to the momentum already in being for regional cooperation.

KEYNOTE ADDRESS:

POTENTIAL PRODUCTION AND PROFITS FROM A LIVESTOCK DEVELOPMENT POLICY

by

Dr. Francis A. Kutish
Staff Economist, Agricultural Economics
U.S. Department of Agriculture, Washington, D.C.

A "KEYNOTE ADDRESS" is intended, according to Webster, to present issues of primary interest to the assembly — but often concentrates on arousing unity and enthusiasm. I don't know how much unity my comments this morning will arouse, but in the next few minutes I do intend to lay out the broad confines of the conference's subject. And I hope to arouse enthusiasm for a coordinated, integrated policy approach to development of the livestock industry in the countries you represent.

I would like to begin by having you take a look with me at a country which, five years ago, was about where your countries are today. That country is Greece. Greece's experience in the past five years may well foretell what lies ahead also for the CENTO countries. For some of you it will be sooner, for others later — but the direction is the same.

From a technological point of view, Greece has made tremendous progress in increasing her grain production. The results have surpassed earlier expectations and reflect primarily increased crop yields. These increased yields have resulted from more use of important, improved techniques such as new higher-yielding varieties, fertilizer and weed killers, and farm machinery. The result is that today with average weather Greece has a

wheat and barley surplus, and the signs point to still further increases in her grain output.

Thus, the basic objective of the Greek agricultural policy of greater wheat production has been achieved. The Greek Government faces the challenge of whether to export its surplus wheat and barley in a world grain market already depressed by glutted conditions — or whether to utilize some of her grain production potential to increase her livestock production to meet the rising consumer demand for livestock and dairy products of its population.

But there is another reason why Greece is interested in developing and expanding her livestock industry, apart from using animal products to meet nutritional needs. We must recognize that animal production may play its most important role through contributions to the economic welfare of an economy. Livestock production offers an opportunity to increase employment and add to national wealth — by processing a raw material (grain and forage) into a higher value product. In the process, the country also can save valuable foreign exchange now being used to import meat and dairy products.

If Greece were to shift some land use to feed grains and forage instead of excess wheat, it could expand output of livestock and dairy products to fulfill the nation's

needs over the next eight to ten years. Furthermore, a recent study indicated that Greece has a good chance of achieving the necessary expansion and improvement in its livestock and dairy production, if the required steps or actions are taken to upgrade the quality of its livestock, raise the level of feeding and management, to improve the quality of its products, and to modernize its marketing system.

Greece has made the decision to go the livestock route. Thus the basic agricultural production objective in Greece today is to raise the general level of technology in livestock and dairy production and to increase the output of livestock and milk products.

There are many obstacles that stand in the way of achieving this goal. The present structure of the livestock industry in Greece — many farmers, each with few animals — does not lend itself to improved livestock technology. There is little new livestock technology in Greece ready to be widely adopted by Greek farmers as was the case when government price incentives were made available to induce production of wheat and barley. Therefore, increasing subsidies on livestock prices now very likely would not produce the same type of production response as when the wheat price subsidies were installed. Lack of reliable livestock statistics further complicates the problem.

Now let's return to the CENIO countries, Mexican wheat has come to Turkey and Pakistan. The results to date have been most successful and both countries visualize sharp increases in grain output. Iran is just getting started on her wheat program. Looking down the road, one can see the same situation ahead for CENIO as Greece now faces.

How did this sharp improvement in wheat production in Turkey and Pakistan come about? The answer is that both countries set up a policy for increased wheat output — and then embarked upon an integrated, coordinated national program of action to achieve this end. And there was a national commitment made to carry the task through to completion.

The same integrated, coordinated type of approach will be needed if Turkey, Pakistan and Iran are to achieve their potential in livestock output. And I might add that while the task of planning and implementing such a program for livestock is more difficult, the results can be just as rewarding to each of these countries.

But there is no point in deluding ourselves. Improving the level of technology in livestock production is much more complex. It requires the combined effort of various sectors of both the government and business, and undoubtedly demands teamwork.

Or to put it another way, increased livestock production requires full consideration of administrative procedures which will help the planning and implementation of the kind of a program which will revolutionize the entire traditional pattern of a nation's agriculture. Following this must come the allocation of the necessary resources to carry the task through to completion — that is, there must be a national commitment to the policy.

The need for such a livestock policy in each country is apparent. I can't overemphasize this point. It is obvious that a broad and coordinated approach must be taken to the problem of livestock development. It does little good to work diligently to overcome one part of the problem if progress continues to be restricted by a bottleneck elsewhere.

It doesn't do any good to eradicate disease if you don't have the feed to feed the animals, and it doesn't do any good to have the feed if you don't manage and handle them properly — and all that too is for naught if you don't have adequate marketing facilities.

But policy is something more than a collection of projects. Policy requires planning and fitting together all the necessary pieces for a unified approach. It involves an inventory of available resources in agencies, both government and private, in terms of what each is doing now and what can be done. Priorities must be established. Interest should be stimulated by a general livestock promotion commission with a coordinating director. Only when all such ingredients are put together does a livestock policy take shape and work.

Let me cite an example from the opposite side of the world — El Salvador in Latin America, where I had the privilege of participating in a most interesting experience.

Recently the government of El Salvador, in cooperation with AID and the USDA, embarked upon an analysis of the agricultural sector of that country. It posed the question that if the economy of that country were to grow and develop for the next two decades at the same rate as for the past decade, what would be the nature of the agricultural production that would be required and what would it take to bring forth and market this production?

It soon became apparent that livestock production in El Salvador would have to be stimulated considerably if that nation were to meet the goals for a three-fold increase in output set forth for the next two decades. Secondly, it became apparent that increased production of meat and milk will have to come primarily *from increased production per unit* — more milk produced per cow and more beef per animal in the breeding herd.

Once this became the goal, the next step was to look at the obstacles which must be removed or the conditions changed to achieve this increased production of milk and beef per unit.

Genetic constitution of the nation's livestock — The native cattle of El Salvador are the result of a long term adaptation to many hostile conditions livestock face in that area. Survival has been the prime consideration; there has been little or no selection or breeding for improved milk or meat production. As a result, milk production per cow was low by all standards of comparisons, even under the best of other conditions. Animals lacked the conformation and rate of maturity needed for optimum beef production. Thus improving the inherent productive ability is necessary to provide the base upon which improved nutrition, management, disease control and prevention, housing and marketing can build.

Nutritional level of livestock feeding The nutritional level of livestock feeding contained shortcomings involving both time and amount of feeding. Generally speaking, in El Salvador, enough forage is available during the rainy season. However, the quality of the forage usually is low and usually is not adequately supplemented with concentrates. And, adequate forage and proper supplemental feeding are lacking in the dry season — affecting both milk production and animal growth for the beef during this part of the year.

Livestock nutrition also involves the development and management of improved pastures. Definite possibilities exist in El Salvador for increasing the carrying capacity of pasture.

The incidence of animal disease This coupled with poor management severely limits the size of the annual calf crop. To obtain more beef per animal in the breeding herd it would be necessary to raise more calves annually per 100 cows. This would require more live calves dropped per 100 cows and lower calf mortality. There are mastitis, tuberculosis, and many other diseases affecting dairy output.

Herdsmanship Much of the difficulty associated with increasing milk and meat production comes from the traditional methods followed by the farmer in caring for his livestock. Bull calves are not castrated, but left to run with the herd. Cows calve at the poorest time of the year for survival and once a calf is born it must fend for itself. Pastures are overgrazed. Poor milking practices are used. Modern science is essential to achieving the livestock production goals. Poor management is part of the cause of lower calving rates and increased calf mortality. It is partly responsible for lower milk output per cow. And poor herdsmanship is partly animals being kept for four or more years to reach optimum slaughter age.

There is also a need for a supplementary livestock feeding industry to bring the animals to slaughter weight which were grown on forages in the parts of the country where the nutrition is basically one of forage.

Housing There is need for development of the type of housing which will provide for adequate shelter for livestock and to permit the production of quality milk given the local climate.

Marketing If higher production is achieved, it must be marketed at a profit. Problems associated with marketing milk and meat have retarded livestock development in many countries. El Salvador found that consumer demand for both meat and milk must be cultivated. The country also faced problems of: a) unnecessary intermediaries or middlemen in marketing livestock, b) little market information (and that poor), c) a meat pricing system which did not give incentives to those producers wishing to produce higher quality meats, d) poor facilities for marketing live animals, and e) adequate and sanitary livestock slaughter facilities.

Too often a nation's livestock policy consists of at-

tacking pieces of these various areas. The net result is a collection of projects — not a livestock policy, not a unified, integrated approach. Rather it is like a jigsaw puzzle in which some pieces are missing. If the effort is successful, the big bottleneck in the whole livestock industry merely is shifted to another problem.

The procedure adopted by El Salvador simply is this: Identify the various obstacles to the end objective — genetics, nutrition, herdsmanship, housing, disease and marketing. Each of these then must be closely appraised and precisely identified. Then all the agencies and organizations, public and private, which can help overcome these obstacles must be identified. Each agency and organization should be assigned the part of the program which it can perform to overcome the obstacles. Thus several of the agencies may be working on various aspects of a single part of the problem.

Some of these necessary advances will require new research. An example is livestock nutritional research to develop methods of using forages and by-products most plentiful in the country to produce a low cost but nutritionally adequate ration. Another example deals with a determination of the best breeds or crossbreeds to meet the different conditions of the areas.

There must be a livestock extension program. There will be a need for demonstrations, perhaps complete livestock demonstration farms as well as demonstrations of specific practices. There is need for programs of promotion — some directed at producers, others at consumers, still others at livestock marketing groups. There is need for importing improved bulls and expansion of artificial insemination, need for additional capital and credit to carry out these production practices as well as for slaughter, processing and distribution facilities. There will be need for changes in livestock marketing practices and perhaps legislation dealing with livestock marketing and slaughter, meat inspection, and meat retailing.

If there are gaps — places where there are no resources available or no activities now going on — then there is need to develop new activities or perhaps new agencies to make sure that the result is a coordinated, complete approach toward the achievement of a goal of increased milk production per cow and more beef produced annually per animal in the breeding herd. Only then will El Salvador have a livestock policy.

I recall during my visit to Turkey in 1966 many of these same types of obstacles to the development of wheat. Turkey is overcoming those obstacles.

There is little question as to the equal potential of the Turkish livestock industry. While some advance has been made since 1966, expanded meat production to meet this potential would require a virtual revolution in the livestock industry of that country. Even a casual study of the publication "Marketing of Livestock and Livestock Products" — a report of the CEN TO Traveling Seminar held in Iran, Pakistan and Turkey, October 1 to November 17, 1967, will convince the reader that potentials exist in all three countries. There are export markets for CEN TO in some of the Middle Eastern

countries. And of course there are large domestic markets to be tapped which will increase with rising consumer incomes.

All three CENTO countries have some program for livestock development. Yet a study of this livestock seminar report also indicates many of the same obstacles to profitable livestock production that were encountered in El Salvador and in Greece. Certainly if there is to be any hope for exporting livestock products to Western European countries, disease eradication becomes a must. The particular nature of the obstacles will vary country-to-country. But the general pattern is the same.

My thoughts go back to that mid-December day back in 1966 in Ankara, Turkey. The Minister of Agriculture,

Bahri Dagdas, had just finished explaining to Prime Minister Demirel the report which Charles Elkington, then Food and Agricultural Officer in AID Pakistan, and I were presenting on behalf of our six-man study team. The Prime Minister turned to Dr. Elkington and me and said, "My Minister of Agriculture tells me that you say that we in Turkey have a treasure chest in our agriculture. You have shown us the key to this treasure chest. But only we can insert the key and turn it."

My message to you today is that you, too, have a treasure chest in your livestock potential. The challenge before your conference this week is to insert the key to this treasure chest and turn it. I am confident that you will be equal to this challenge.

CENTO REPORT OF THE CONFERENCE ON NATIONAL AND REGIONAL LIVESTOCK DEVELOPMENT POLICY

INTRODUCTION

AT THE MEETING of the CENTO Sub-Committee on Agriculture, Animal Production and Animal Health held in Tehran, Iran, November 18 to 21, 1968, it was recommended that a conference be held on National and Regional Livestock Development Policy. The conference was approved by the CENTO Economic Committee in April 1969. The conference was organizationally and financially assisted by the United States Government and the Government of Pakistan acted as host. The conference was held in Block P of the Secretariat in Islamabad from December 15 to 21, 1969. The conference had the following objectives:

- a) To promote an appraisal of the effectiveness of national livestock policies in each CENTO country.
- b) To disseminate information to participants about the procedure and the results of the most effective policies in each of their countries.
- c) To propose future changes in livestock policies in those countries, including foreign trade.

The conference was opened by the Economic Secretary of the Central Treaty Organization who delivered an address of welcome on behalf of His Excellency Mr. Turgut Menemencioglu, the Secretary General of the Central Treaty Organization. A welcoming address was delivered by Dr. S. M. Ali.

The conference unanimously elected Dr. S. M. Ali, Leader of the Delegation of Pakistan as Chairman. The leaders of the delegations of Iran and Turkey, Dr. Mansour Ferdows, and Dr. Nevzat Uludağ, respectively, were unanimously elected as Vice-chairmen.

A Keynote Address, entitled "Potential Production and Profits from a Livestock Development Policy" was delivered by Dr. Francis A. Kutish, Staff Economist, Agricultural Economics, United States Department of Agriculture. A statement on behalf of the United States Economic Coordinator for CENTO Affairs was made by Dr. Nels M. Konnerup, Leader of the Delegation of the United States.

COUNTRY SITUATION PAPERS

Pakistan - A situation paper on livestock development during the Third Plan and proposals for the Fourth Plan was presented.

Iran - A situation paper on livestock improvement programs in Iran was presented.

Turkey - A situation paper on the general aspects of the livestock sector and its development in Turkey was presented.

GENERAL DISCUSSION

During the general discussion which followed the presentation of the three country situation papers, it was apparent that the most significant point to emerge was

the critical deficiency in livestock fodder and feed production. This was especially so in the case of broiler production which is dependent upon balanced concentrate rations. It was clear that there is a general lack of efficient feed-milling facilities in every regional country and that the price ratio between the cost of feed and the return on livestock and poultry products is often too narrow. It was recommended that, with a view to maintaining feed standards, standards of compound feeds should in all cases be controlled by government legislation and supervision.

There was a general consensus that in the establishment and use of improved and extended breeding and artificial insemination services, including the use of frozen semen, there were many problems common to the countries of the CENTO region. There was no agreement on which was the most suitable exotic breed for use under all circumstances, either within or among the countries, and there was little doubt that to meet the varying environmental needs of the different countries it was necessary for the choice to be a national one. Although the discussions mainly centered on the use of exotic breeds, there was general agreement that Pakistan was in the fortunate position of possessing more potentially valuable indigenous breeds than the other two countries. The region was exceptionally fortunate in possessing a large number of cattle and sheep breeds of great potential value.

Emphasis was given to the important place which poultry production would play in meeting the animal protein needs of the human population. Each country should endeavor to make itself independent of imported stock in building up its poultry industry.

Control of livestock diseases was recognized to be of prime importance in furthering animal production, and there was room for regional as well as national efforts in this direction. Diseases mentioned as being particularly important were rinderpest, foot-and-mouth disease, tick-borne diseases and parasitism.

On the general subject of training and extension, the delegate of Iran outlined plans for expanding and strengthening these services by the training of shepherds and flock owners at government stations specially sited in relation to tribal movements.

Arising from the discussions, it was apparent that the methods by which animal production and animal health should be organized within government services, were of crucial importance and might well justify a further conference or working party on this subject alone. There was too much division of responsibilities among various sections, departments or ministries. These should be brought together under a responsible and authoritative head. Subjects involved in such a conference could also include a variety of aspects of the livestock industry, such as marketing of livestock and livestock products, cooperatives, credits and training at all levels.

It was agreed that there was a need for close liaison between CENTO, U.N. and bilateral agencies in order to avoid duplication of effort and overlapping of projects.

PLANNING

Pakistan A paper was presented on the collection of vital animal husbandry statistics needed for development, including information on stock number, mortality, slaughtering, and so forth. In the discussion which followed the paper it was felt that existing arrangements in all three regional countries for collecting livestock statistics were neither adequate nor satisfactory. Accurate statistics on livestock are essential for gauging past performance and planning future national policies. There should be a special section in each regional country statistical organization to collect livestock data on a regular basis.

Turkey A paper was presented on the livestock development program in Turkey. A discussion of the paper brought out that the importance of livestock statistics and data was fully recognized in making development plans for the regional countries. It was considered that the present system of collecting data in the regional countries was unsatisfactory and should be revised. It was felt that the present system could be improved through the introduction of suitable machinery, or that one permanent organization within the existing statistical agency should be fully responsible for livestock statistics.

The conference felt that a separate seminar should be held for the discussion of livestock statistics, in view of the extreme importance of satisfactory data on livestock and livestock products.

Iran A paper was presented on feed production and distribution. A very general discussion followed this paper.

United Kingdom A paper was presented on some aspects of nomadism and transhumance in relation to livestock production. Of interest to the conference was the stress placed on the important part played by nomadic and semi-nomadic communities in the production of meat and livestock products in the regional countries. The breeds of sheep evolved over the centuries were adapted to their environment, and although heavy losses often occurred in winter, the animals were able to withstand the particular rigors of the system of husbandry.

The inaccessibility of many of these people and their flocks for the greater part of the year was the main deterrent to giving them various types of assistance. In combating livestock diseases it was recognized that much had to be left to the flock owners and shepherds. It should be the objective, therefore, to demonstrate the value of treatments and make the necessary medicaments available to the owners.

In areas where hay and forage crops were conserved for winter feed, assistance could be given in simple baling and storage methods, and, if it proved to be economical, concentrated feeds from crop residues could be considered. Depletion of ranges was a problem and could be alleviated to some extent through controlled grazing, by proper marketing facilities and improved transportation to markets.

In view of the inaccessibility of nomads, efforts should

be made to train men from within the tribes as extension workers who would remain with their own people. Government stations should be placed at strategic points for the instruction of flock owners and shepherds.

In the ensuing discussion it was noted that, where defined migration routes existed, much could be done in the way of veterinary treatments and dipping at strategic points on these routes. It was estimated that in Turkey about 15 percent of the sheep and goat population came from nomadic and semi-nomadic people, mainly the latter. In Iran, where 70 percent of the sheep and goats were said to belong to tribal people, 40 percent had a nomadic existence.

The conference agreed that nomadic husbandry methods were specialized and were dictated by the conditions of existence, therefore, government assistance was limited in impact. The people, however, were receptive to veterinary treatment, and these communities which utilized lands which could not otherwise be used deserved serious efforts from their governments to improve their lot, insofar as it was within their power to do so.

United States—A paper was presented on the planning, implementation and results of the livestock fattening program in Turkey. The paper highlighted the urgent need to establish production goals for livestock and their products for domestic consumption and export. The livestock producers should be informed of the export policy concerning kind, amount, quality, and so forth. Requirements of the producers should be established and supported to permit them to achieve the export goals. Research stations should be established to carry out research based on producers' problems, the maximum use of industrial and agricultural by-products as animal feeds and to train livestock technicians.

In the discussion of the paper it was agreed that regional countries should adopt policies to correct the conditions stressed in the paper. Exports of livestock feeds should not be permitted until domestic requirements were fulfilled. Maximum use should be made of all products suitable for livestock feeds. Producers of by-products suitable for livestock feeding should be encouraged to distribute and sell those products in order to prevent the loss of valuable livestock feeds. Loans in kind should be made and credit extended to farmers and livestock breeders to include livestock, machinery, fertilizers and seed, so as to encourage the production, harvesting and storage of alfalfa and other recommended fodder crops.

Food and Agriculture Organization—The Regional Officer of FAO, Cairo, who attended the conference as an observer, presented a paper on livestock improvement in the Near East with special reference to the use of improved, high-producing exotic breeds of cattle. The paper highlighted the importance of environmental conditions characterizing the region such as the limited education and training of the farmers, poor methods of feeding and management, disease prevention, marketing, credit and the organization of cooperatives.

Problems in breeding and artificial insemination arose

from organizational deficiencies, lack of transport, and the low standard of husbandry among the farmers. Few places in the region justified the use of specialized exotic beef breeds. Many indigenous breeds possessed outstanding potentialities for improvement but necessary research was neglected.

In discussing the paper, the conference agreed on the need to study and improve indigenous breeds where justified, but there was also the need to use high yielding exotic breeds to increase production for the growing needs of the population. The conference also agreed on the urgent need to improve management, feeding, disease prevention and control, and veterinary farm practice. This need emphasized the importance of education and training in animal husbandry, production, and health at professional, technical and farmer levels.

Exotic breeds in use are Friesian, Brown Swiss and Red Danish in Iran, and Brown Swiss in Turkish rural areas and Friesian in city milk supply herds. Jerseys are used in both countries in regions of low altitude and high humidity.

For many years a triple-purpose animal, bred for milk, draft and meat, would be needed. A large breed would be needed in areas where draft was important, especially if females were to be used for work in order to allow bullocks to be used for meat production.

In breeding operations, artificial insemination services were mainly concentrated on government farms. Natural breeding was done as a pilot project in Iran by placing bulls under individual ownership in villages and with rural cooperatives. In Turkey bulls were distributed from government bull centers to villages during a short breeding season and returned to the centers on completion. Disadvantages of this system were the shortage of bulls and the use of unproven bulls. It was agreed that improved artificial insemination services were essential for a livestock development program. Modern methods of semen storage and handling, using liquid nitrogen, should be encouraged.

There was general agreement on the need to introduce accelerated programs for forage crop production by the proper use of fertilizers and establishing minimum prices.

In the long discussion of the use of forage and fodder it was stated that Pakistan had found that high quality berseem and alfalfa were adequate for the rearing, growth and health of indigenous cattle and buffalo and for the maintenance and production of up to nine kilograms of milk per day.

Exotic breeds of cattle under difficult environmental conditions were particularly susceptible to a number of diseases of which those commonly occurring in the region were the tick-borne diseases, reproductive disorders, calving diseases, tuberculosis and brucellosis.

There was a desire for advice on rapid means of securing increases in milk production while making intensive efforts to raise standards of husbandry and organize breeding and artificial insemination services. A system of criss-cross breeding using animals from pure herds of indigenous and exotic breeds seemed a possible method

of achieving this aim. In some areas of the region, where environmental conditions are suitable, pure exotic breeds involving purebred female stock, have been used with some success.

GENERAL DISCUSSION

As the result of the general discussion on the subject of planning, the conference made a number of recommendations, which follow.

Animal health and production research As efforts to develop and intensify animal production gather momentum, the need for animal husbandry and production research becomes increasingly evident. The conference recommended that high priorities be given to animal health and animal production research and investigation programs, including the study of potentially valuable indigenous breed types and research into the adaptability of exotic breeds and their crossbreeds to environmental conditions.

Animal production development For the raising of standards of animal husbandry and the increase of production at the village level it was necessary to effect improvements along a broad front. The conference recommended that the attention of governments be drawn to the need for adequate arrangements being made for the provision of credit, marketing facilities, assistance to cooperatives, technical advisory assistance, and leadership, training and other essential government services, as well as assistance in all aspects of animal husbandry activities.

Artificial insemination With the introduction of exotic, high yielding breeds it was necessary to ensure an economical service and the use of semen from proven sires. The conference recommended that particular attention be paid and adequate resources devoted, to the development of A.I. services utilizing modern methods.

Training Because of the steps being taken to increase animal production by the introduction of exotic, high yielding breeds and other development, the need for adequate numbers of well trained personnel was becoming increasingly evident. The conference recommended that governments give the highest priority possible to the development of facilities for the training of animal production and health at all levels, professional, technical, and for farmers, and that such training should include specialist courses for veterinarians in veterinary farm practices. All three regional countries had training and research institutes and the activities of these might be coordinated so as to give maximum benefit to the region.

Forage crop production With the intensification and expansion of animal production, including the increasing use of exotic, high producing breeds, the need to expand the production of forage and feed becomes of paramount importance. The conference recommended that governments should consider the possibilities of devoting the organization and resources to the development of

forage and feed along lines similar to those employed in the promotion of the new high yielding cereal varieties.

PASTURE AND FORAGE CROPS AND RANGE

Iran A paper was presented on the management and improvement of rangelands in Iran.

Pakistan A paper was presented on the management of livestock and poultry on ranges as well as on arable lands.

Turkey A paper was presented on range management and grazing conditions.

GENERAL DISCUSSION

In a general discussion of range management it was agreed that new methods should be applied to range management on the basis of range planning and field analysis. Depleted rangelands should be restricted from grazing for a suitable period of time. To decrease the pressure of overgrazing, the production of forage should be intensively increased. In order to protect eroded soil from further deterioration and to stabilize sand dunes it is necessary to establish vegetative cover. Suitable legislation and regulations should be put into force for the proper utilization of ranges and pastures.

It was recognized that research and extension programs related to range management should be continued. In order to implement range management plans, technical and other trained personnel should be provided in the different categories of range management services.

It was felt that in arid zones, water for proposed range areas should be made available through the strategic spacing of tube wells and troughs. In recognition of the very great contribution which arid and semi-arid areas make to the production of animal products, and the need for the rehabilitation, conservation and development of these areas, the conference felt that the Arid Zone Institute project proposed in the case of Pakistan has considerable merit, and might well serve as a model for the other regional countries.

The conference recognized the opportunity for exchange visits among the regional countries on range and pasture management and livestock production and disease control with assistance from the Multilateral Technical Cooperation Fund (MTCF), and recommended that advantage be taken of this opportunity.

The conference noted that range and pasture management and utilization were the responsibilities of different departments of the government in each of the three regional countries. It strongly recommended that departments concerned with animal health and production should be closely associated with the work of such departments. Furthermore, it recommended that animal husbandry specialists take part in any seminars or workshops on this subject.

ANIMAL DISEASE AND REGULATORY PROGRAMS

Iran A paper was presented on the control of animal diseases and parasites.

Pakistan — A paper was presented on the incidence and control of animal diseases in East Pakistan.

Turkey — A paper was presented on the control of animal diseases and regulation of animal movement as it affects livestock development in Turkey.

GENERAL DISCUSSION

In a general discussion of animal diseases it was agreed that there should be an exchange of reliable information among the regional countries on the incidence of infectious diseases, with special emphasis on exotic diseases.

It was considered desirable for similar biologies used in the regional countries to be standardized, and for the results of field investigations with regard to the use of these biologies to be exchanged among the regional countries.

It was considered desirable for authorities responsible for disease control in each country to meet at least once a year to discuss, among other things, the situation in each country with respect to infectious diseases and methods for their control.

MARKETING OF LIVESTOCK AND LIVESTOCK PRODUCTS

Iran — A paper was presented on the marketing of livestock and livestock products.

Pakistan — A paper was presented on the marketing of livestock and its products in Pakistan.

Turkey — A paper was presented on the marketing organization of livestock and animal products in Turkey for 1969.

GENERAL DISCUSSION

The three papers presented by the regional countries highlighted in detail the production statistics, methods of marketing preparations and marketing of livestock and their products in the respective countries. Production is widely dispersed, resulting in complicated problems of transportation and marketing.

The combined effects of scattered production, long market channels, unregulated markets and marketing charges, transport difficulties, particularly in the remote places, lack of proper knowledge and appreciation of preparation for the market and the poor economic condition of the producers, weigh heavily against the producer.

Marketing and processing cannot be disassociated from production but represent a neglected aspect of the latter. Immediate priority should be given to improvements in livestock marketing, processing, marketing intelligence and the training of staff required for these services.

Slaughter houses are often antiquated, insanitary and inefficient. A reorganization of their labor is required with the provision of facilities for feeding, watering and quarantine of animals as well as for the preservation and distribution of meat. The quality of meat is generally poor due to lack of grading standards.

Organized milk collection is either inadequate or

nonexistent. Milk plants may be too few in number and those existing are often inefficiently and uneconomically operated.

There is an urgent need for national policies covering the development of marketing, processing and distribution of both meat and milk and the provision of necessary funds for investment in the industry.

In some developing countries the statutory board or semiautonomous government type of marketing organization has effectively developed livestock and livestock products marketing, processing and distribution facilities and has established stable, large-scale, integrated animal production and industrial ventures in a field where private enterprise was often hesitant to enter and where governments were not properly equipped to do so.

To be successful, statutory organizations of this type established by governments should be provided with ample initial finance for capital development, and be given adequate operational powers. Such organizations should operate along strictly commercial lines but, over the long term, on a non-profit-making basis. Members appointed to such organizations should have long experience in business and commercial operations and be of the highest integrity, working solely in the national interest.

The conference recommended that:

- 1) When planning the development of marketing systems for livestock and their products, consideration should be given to the system of national statutory boards or semiautonomous organizations of the type in Kenya and other countries involving representation from the private sector.
- 2) Training facilities in livestock marketing, processing and distribution should be provided for national staff, especially at the middle or intermediate level.
- 3) Consideration should be given to the grading of livestock and livestock products, including feeds.

CREDITS AND INCENTIVES

Iran — A paper was presented on the provision of credit for livestock improvement.

Pakistan — A paper was presented on production incentives, including subsidies, credit, etc. in Pakistan.

Turkey — A paper was presented on credit granted by the Agricultural Bank of the Republic of Turkey for animal husbandry and better livestock production.

GENERAL DISCUSSION

In a general discussion of this subject it was stressed that a liberal supply of short, medium and long-term credit was essential to permit farmers to increase their use of fertilizers, improved seeds and high producing livestock, and to make necessary improvements in their farm and marketing facilities.

The development of intensive feeding and fattening enterprises, and an intensive poultry and dairy produc-

tion industry on the scale required could not be undertaken without considerable credit resources. It was necessary to subsidize these inputs in order to encourage the increased production of forage crops and cereal feed grains.

The conference made the following recommendations as a result of the discussion:

- 1) Adequate credit facilities, using simplified procedures, should be extended to livestock producers and farmers.
- 2) Supervised credit and the application of the "project" approach should be applied to credit programs.
- 3) Input subsidies for the purchase of improved seeds, fertilizers and livestock should be granted to encourage the production of animal products.
- 4) Banks and other lending agencies should advance credits to livestock producers and farmers on the recommendation of the technical department concerned.
- 5) Insurance or reduced repayments should be the mechanism to compensate producers for stock lost from disease or other circumstances beyond their control.
- 6) Rates of interest on short and medium-term loans to livestock producers should be consistent with the return on investment which they could expect.
- 7) Where practicable, credit should be granted in kind rather than in cash.
- 8) Processing plants for animals and animal products provide excellent means of granting credit to livestock producers. They should be encouraged to do so.
- 9) In the credit giving organizations a special section should be specifically organized concerning animal credits.
- 10) As tribal livestock producers and nomads play an important role in livestock production in the CENTO regional countries, steps should be taken to provide credit facilities for this group from the public sector.

OTHER BUSINESS

CONFERENCE CONSIDERATION OF CERTAIN MEETINGS SUGGESTED BY THE SEVENTEENTH MEETING OF THE SUB-COMMITTEE ON AGRICULTURE, ANIMAL PRODUCTION AND ANIMAL HEALTH

The conference made a careful study of possible future meetings concerning livestock which were suggested by the Seventeenth Meeting of the Sub-Committee on Agriculture held in Islamabad from November 4 to 7, 1969. It arranged them in a suggested order of priority and gave its views on the relative desirability of holding them.

Animal feeding, feed industries and related problems

There is a wide-spread protein deficiency in human diet in the region. Especially vulnerable groups, such as infants and expectant and nursing mothers, comprise about 40 percent of the population. It may soon be impossible to achieve the minimum standards of mental and physical growth in the region. Such a condition results from the low production of livestock and poultry ascribable mostly to poor feeding. This in turn results from the underdeveloped state of feed production in the region. To embark upon any large-scale program of livestock and poultry development to alleviate human dietary deficiencies, problems related to the scope, extent and feasibility of increasing feed production should be studied and reviewed. The proposed conference is essential to that endeavor.

Regional Workshop on Range Management There is a wide gap between the demand and supply of foods of animal origin in the region. The gap could be closed either by increasing the number of livestock, or improving their performance, or both. Since it is not possible to withdraw arable land from cereal crops, the only remaining source is rangeland. Means should be devised to rehabilitate the vegetative cover of drought-resistant grasses to develop water points, to control bush encroachment and to increase the numbers of well-adapted and productive cattle, sheep and goats. Since socio-economic conditions, financial resources, technical know-how, and the exact nature of the problems faced by each country are quite different, it is necessary that these be first identified and then ways and means be explored to find solutions. This workshop is essential to that effort.

Workshop on Marketing of Livestock and Livestock Products In 1967 a Traveling Seminar on Marketing of Livestock and Livestock Products was held. Marketing problems were identified and solutions sought. Desirable improvements in the existing marketing system were highlighted. A follow-up is essential to involve representatives from all marketing levels, especially the producers, since production is so widely dispersed as to create problems of transportation and marketing. The importance of this proposed workshop is evident from the fact that the regional countries have basically agricultural economies which contribute about 25 percent to GNP. The livestock share of this contribution is about half the total agricultural contribution.

Seminar on Veterinary Investigational and Diagnostic Methods The loss of livestock from disease is staggering. Disease control depends upon the organization and availability of adequate diagnostic facilities. Any plans for improvement of indigenous livestock by the use of exotic or improved high producing stock will be thwarted unless diseases can be diagnosed. Outbreak of disease in one country can quickly threaten the livestock of neighboring countries. Often the need is for rapid, accurate diagnosis and alerting of neighboring countries to adopt suitable control measures. Any delay or error in diagnosis can cause enormous losses to the

livestock industry. To eliminate delay and improve diagnostic methods there is an urgent need for this proposed seminar.

Seminar on Newcastle Disease in Poultry To meet the existing acute shortage of animal protein, the quickest and easiest solution is increased poultry production. The three regional countries have made a good start on this activity, but progress is handicapped by disease problems confronting poultry farmers. There are conflicting views and ideas on the control of this disease. The best way to solve the problem is to have an exchange of views among experts and specialists in the field of disease control. For this purpose a seminar on this subject is needed.

RECOMMENDATIONS OF THE NEAR EAST ANIMAL PRODUCTION AND HEALTH COMMISSION

The conference heard with interest an account of the first meeting of the Near East Animal Production and Health Commission given by the FAO Regional Animal Production and Health Officer as secretary to the commission.

A number of subjects on which recommendations had been made by the commission were of considerable importance and had also been discussed by the conference. The commission's recommendations covered a wide range of subjects in the animal husbandry, production and health fields and included proposals for regional projects in connection with training, nomadic and tribal animal husbandry and regional trade in livestock and meat.

The conference agreed that all the recommendations made by the commission should receive close attention and consideration by the regional governments and technical departments concerned when the report of the first meeting of the commission was received by them from FAO.

RECOMMENDATION ON OUTBREAKS OF RINDERPEST AND RINDERPEST-LIKE DISEASES

Since in outbreaks of rinderpest it was of the utmost importance that immediate steps be taken to control the disease, and since a close clinical and pathological similarity exists between rinderpest and rinderpest-like diseases, the conference recommended that all outbreaks of disease which simulated rinderpest should be regarded as rinderpest until proven otherwise, and that the country concerned should at once notify neighboring countries of any such outbreaks. The importance of taking advantage of existing facilities for confirmatory laboratory diagnosis both inside and outside the region, was fully recognized.

EXCHANGES AMONG RESEARCH INSTITUTIONS

The conference suggested that the regional countries exchange personnel and trainees on a short-term basis (up to one year) among national research institutions dealing with livestock matters. It was considered feasible to request MTCF assistance for such exchanges.

FOLLOW-UP OF RECOMMENDATIONS PROPOSED BY THE CONFERENCE

The conference proposed that each member country assign the responsibility to a coordinator to follow up on the recommendations of the conference on a continuing basis in cooperation with the coordinators of the other member countries.

SUMMARY OF RECOMMENDATIONS OF THE CONFERENCE

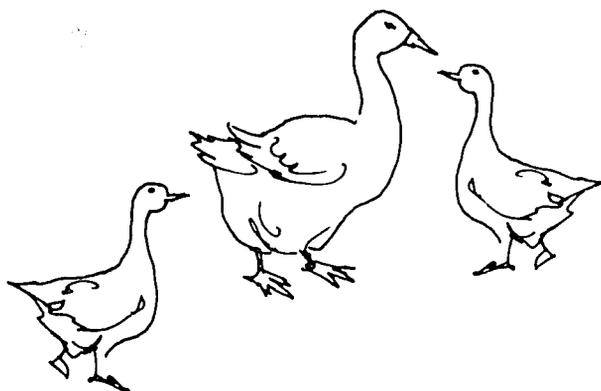
The recommendations made by the conference are listed below:

- 1) High priorities should be given to animal health and animal production research and investigation programs.
- 2) Adequate arrangements should be made for the provision of credit, marketing facilities, assistance to cooperatives, technical advisory assistance and assistance in all aspects of animal husbandry activities.
- 3) Adequate resources should be devoted to the development of artificial insemination services utilizing modern methods.
- 4) Facilities should be developed for the training of animal production and health at all levels for technical staff and lay farmers.
- 5) Consideration should be given to providing organization and resources to the development of forage and feed along the lines employed in the promotion of new high yielding cereal varieties.
- 6) The MTCF should be used to assist in the exchange of visits among the regional countries on range and pasture management, livestock production and disease control.
- 7) Departments concerned with animal health and production should be closely associated with the departments concerned in each regional country with range and pasture management. Animal husbandry specialists should take part in any seminars or workshops on the subject.
- 8) Consideration should be given to the grading of livestock and livestock products, including feeds.
- 9) When planning the development of marketing systems for livestock and their products, consideration should be given to the system of national statutory boards or semiautonomous organizations of the type in Kenya and other countries involving representation from the private sector.
- 10) Training in livestock marketing, processing and distribution should be provided for national staff, especially at the middle or intermediate level.
- 11) Adequate credit facilities, using simplified procedures, should be extended to livestock producers and farmers.

- 12) Supervised credit and the application of the "project" approach should be applied to credit programs.
- 13) Animal production should be encouraged by granting input subsidies for the purchase of improved seeds, fertilizers and livestock.
- 14) Banks and other lending agencies should advance credits to livestock producers and farmers on the recommendation of the technical department concerned.
- 15) Insurance or reduced repayments should be used to compensate producers for stock lost from disease or other circumstances beyond their control.
- 16) Rates of interest on short and medium-term loans to livestock producers should be consistent with the return on investment which they could expect.
- 17) Credit should be granted in kind rather than in cash when practicable.
- 18) Processing plants concerning animal and animal products should be encouraged to provide credit to livestock producers.
- 19) Standards of compound feeds should in all cases be maintained by government legislation and supervision.
- 20) The regional countries should favorably consider the relaxing of customs duties and taxes on the importation of livestock and poultry for breeding purposes, livestock machinery and implements required for developing farming, livestock feeds and feed supplements.
- 21) In the credit-giving organizations a special section should be specifically organized concerning animal credits.
- 22) As tribal livestock producers and nomads play an important role in livestock production in the CENTO regional countries, steps should be taken to provide credit facilities for this group from the public sector.
- 23) All outbreaks of disease which simulate rinderpest should be regarded as rinderpest until proven otherwise, and the country concerned should at once notify neighboring countries of any such outbreaks.

The conference adopted the Report to the Sub-Committee on Agriculture. Brief closing statements were made by the leaders of each delegation in which deep appreciation was expressed to the Government of Pakistan for acting as host and for its generous hospitality to the delegates, and to the Secretariat for its servicing of the meeting. Thanks were expressed to the Government of the United States for its arrangement of and assistance to the conference, and to the Office of the United States Economic Coordinator for CENTO Affairs for its valuable assistance.

COUNTRY SITUATION PAPERS



LIVESTOCK DEVELOPMENT IN PAKISTAN DURING THE THIRD PLAN AND PROPOSALS FOR THE FOURTH PLAN

by
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BELOW IS furnished a brief résumé of the various important development programmes undertaken during the Third Plan (1965-1970) with a view to bringing about overall improvement in livestock in Pakistan.

CATTLE AND DAIRY DEVELOPMENT

In East Pakistan, cattle breeding farms for cross-breeding local cows with bulls of proven breeds from West Pakistan as well as foreign bulls, have been established and are being expanded. These farms are also carrying out research work in order to raise strains that may be suitable under local conditions in order to improve the production of milk, meat and draught power. Three such farms are now located in East Pakistan:

- 1) Dairy and Cattle Improvement Farm at Savar (near Dacca), over an area of 2,000 acres of land, with about 1,000 cows and 1,000 young stock.
- 2) Cattle Breeding Section at Tejgaon (Dacca), which is proposed to be shifted to Rajshahi in the northern part of the province and established in a bigger way during the current Plan period.
- 3) Cattle Breeding-cum-Dairy Farm at Sylhet, in the eastern part of the province, which is being reorganised and expanded under an approved Third Plan scheme.

The Dairy and Cattle Improvement Farm at Savar is being reorganised and its activities greatly improved under a bilateral programme with the West German Government. Under this programme services of as many as 14 German experts in the various fields of livestock farming will be made available for a period of two years to start with. Most of these experts have already arrived. Also equipment and machinery worth Rs. 3.50 million will be received from West Germany. These have already started to come.

Improvement of stock is also being done through artificial insemination at centres located in different parts of the province. By the end of the Second Plan, there were only five A.I. centres in East Pakistan. Under an approved Third Plan scheme, A.I. centres are being established in each of the 18 districts of the province with three to four sub-centres under each main centre.

About 400 stud bulls of improved breeds are being maintained with selected caretakers throughout the province. The bulls have been distributed free by the Government and a sum of Rs. 15-30 per month is being contributed by the Government towards maintenance of each bull.

In West Pakistan, the ordinary village stud bulls are being replaced with quality stud stock from six government and several land reform, land grant and other farms that exist for the production and distribution of

such superior germ plasm of different breeds species.

Two thousand one hundred and seventeen breeding bulls and 639 breeding cows are being maintained on cash subsidy and Lambardari grants.

Dhani breeds in Pothwar tract, Dajal and Rojhan breeds in D.G. Khan District and Lohani and Bhagnari breeds in Quetta, Sahiwal in Multan Division and Red Sindhi in Hyderabad Region are being developed on the lines of herd-book schemes.

Eighteen artificial insemination centres are in operation in the province.

Pilot experiments are being started at Quetta to develop a beef breed simultaneously with the development of range management.

The Landi Buffalo colony at Karachi, housing 40,000 buffaloes, supply dry animals at the rate of 120 per day, which are being sold to butchers and replaced by fresh animals. A scheme to preserve such superior animals and their progeny was formulated in 1967 and has been approved by the World Food Programme of the United Nations. Under this project, coarse cereals worth Rs. 10 million are being supplied as grants to the West Pakistan Government.

SHEEP AND GOAT DEVELOPMENT

Goat breeding is done by individuals in the rural areas. There is as yet no organised farm for goat breeding in East Pakistan, either in the private or public sector. A scheme establishing a goat breeding-cum-research farm near Dacca, for development of local goats, is in process.

A sheep breeding-cum-research farm is under execution at Noakhali, in the southern part of the province. Another such scheme, to be operated in the northern part of the province, is under process.

In West Pakistan, farms for the production of various types of sheep and stud rams for issue are being reorganised and their activities expanded.

POULTRY DEVELOPMENT

There are 12 poultry farms under government and semi-government bodies. Improved breeds of fowl and ducks are maintained in these farms and supplied throughout the province for genetic improvement of local birds. The improved breeds of birds are bigger in size, put on weight more rapidly and lay more eggs of bigger size than the local birds. Even larger farms of this type are contemplated.

In West Pakistan, development of the poultry industry is being quickened for increasing the production of animal proteins through introduction of a broiler industry. Parental and grandparental breeds of hybrid broilers and layers have thus been established. Sizeable stocks of these now exist around the principal cities for the production of eggs and meat. Large hatcheries have been established by two well-known foreign concerns in collaboration with Pakistani capital. Today a production capacity of 2 million birds exists in West Pakistan. In Karachi alone, the broiler production increased

from 30,000 in 1964 to 200,000 in 1966. Similar progress has been made in Lahore and Islamabad.

The United Nations has agreed to establish a Poultry Production Research and Training Institute at Karachi at an estimated cost of Rs. 10 million. The existing poultry farms at Quetta, Lahore and Peshawar are being modernised to meet the entire demand for cockerels of exotic breeds needed for cross-breeding in rural areas. Simultaneously, six broiler training centres have been set up in West Pakistan.

FEEDS

As private enterprise was shy in East Pakistan, Government have, in the recent past, started a provender mill at Dacca for the preparation of balanced feeds for cattle and poultry. Importance of such an enterprise in the development of livestock cannot be overemphasised.

The main stumbling block in the development of a livestock industry has, in fact, been the shortage of coarse cereals for livestock feeding. The only remedy was to start livestock feed mills which could utilise industrial wastes and by-products like molasses, gluten meals, oilcake and urea to produce premixes available at reasonable prices within easy reach of farmers, particularly poultry breeds. Intensive research in this connection was thus undertaken at the Animal Husbandry Research Section of the College of Animal Husbandry at Lahore, with the result that today three big feed mills are operating with an annual capacity of 72,000 tons. Now that the country is on the threshold of self-sufficiency in cereals, these mills will play a vital role in the utilisation of hybrid maize, sorghum, millet, rice screening, wheat middlings, etc. for preparation of balanced wholesome ration for livestock.

RESEARCH

There are three biological production and research centres in East Pakistan. Of these, the Research Institute at Mohakhali (near Dacca) is the biggest. It has a number of sections concerned with production of biologicals like foot-and-mouth vaccine, Newcastle vaccine, rabies vaccine, etc., besides research sections. Bacterial sera and vaccines like anthrax, black quarter, fowl cholera, and so forth, are produced at the Institute at Comilla. Rinderpest vaccine is produced in the third institute at Dacca.

In West Pakistan, a Livestock Production Research Institute has been set up at Bahadurnagar near Okara in Sahiwal District at a cost of over Rs. 5 million. This institute is undertaking research on various problems facing the livestock industry. Work for finding the potential of existing indigenous breeds with their crosses with exotic breeds is already in hand. The work at the institute is being further strengthened by collaboration with the Danish Government who are providing proven sires of Red Dane and Jersey breeds, equipment and training facilities as a grant exceeding Rs. 5 million.

The biological production activities and research works on disease control are carried out mainly at the

Veterinary Research Institute at Lahore and also at Peshawar.

DISEASE CONTROL

Epidemics of livestock diseases that used to take a heavy toll of animal lives every year have been greatly reduced. This has been possible because of better vaccines, sera and diagnostic agents produced entirely within the country and their timely application in the field through a systematic mass vaccination programme.

Regional diagnostic laboratories have been established and their activities are being expanded in both wings of the country for tackling local disease problems and for effective control measures against epidemic diseases. With this object in view not only quality and quantity in biological production activities are being improved, but also services of larger numbers of field staff are being provided for streamlining disease control and mass vaccination activities.

STEPS PROPOSED TO BE TAKEN DURING THE FOURTH PLAN ON LIVESTOCK IMPROVEMENT

CATTLE AND DAIRY DEVELOPMENT

In East Pakistan additional facilities will be provided at the Dairy and Cattle Improvement Farm at Savar (Dacca) under the bilateral programme with West Germany.

A fourth cattle breeding farm on about 1,500 acres of land, will be established in Khulna Division for supplying improved types of cattle in the area and improving the local cattle.

Cows and bulls of superior genetic quality will be imported for cross-breeding purposes at the various cattle farms of the province. Efforts will thereby be made to evolve multi-purpose and single-purpose breeds suited to the climatic conditions prevailing in East Pakistan.

Artificial insemination activities will be expanded up to the thana (police station) level by establishing a centre in each of the 57 sub-divisions with sub-centres in all the 415 thanas. By the end of the Fourth Plan, there will thus be sufficient number of centres and sub-centres to provide an opportunity to the farmers to vastly improve the quality of their cattle.

Schemes for the development of dairies through registered breeders will also be taken up. These will provide for the distribution of quality bulls, supply of special feeds on loan, subsidy, etc., and concentrated disease control facilities.

In West Pakistan exotic breeds will be introduced for upgrading hill cattle and breeding them pure in green-belt areas.

Key village and herd book societies will be established and organised, and there will be registration of pedigree stock which can serve as a reservoir for exporting pedigree milch animals.

New A.I. centres will be established and the existing ones strengthened, utilising proven sires produced at

government livestock farms. Existing livestock facilities will be streamlined and modernised. Cross-breeding will be introduced for beef and dairy potential.

Range management will be introduced in a big way in the arid zones for beef production under the scheme of the Arid Zone Research Institute of the Agriculture Research Council of Pakistan.

SHEEP AND GOAT DEVELOPMENT

Attention will also be paid to improving the quality of sheep and goats, principally for increasing meat production. In East Pakistan two schemes will be taken up to evolve new and better breeds of sheep and goats.

In West Pakistan triple-purpose sheep, producing mutton, wool and milk, will be propagated in each region of the province. Fine wool in restricted areas on key village basis will be developed. Sheep in irrigated areas on the line of feed-lot system will be developed.

Goats for the production of mohair, milk and meat on key village basis will be propagated in non-restricted areas.

POULTRY DEVELOPMENT

Two new fowl and duck breeding farms will be set up and the existing nine poultry farms of the East Pakistan Agricultural Development Corporation will be strengthened.

A scheme for poultry development through registered breeders will also be taken up in East Pakistan and the new methods of poultry rearing will be popularised through demonstration. A poultry research and extension farm will also be established at Savar near Dacca.

In West Pakistan at least one government poultry farm in each region will be developed to meet the requirement for cockerels for distribution in the rural areas. Each poultry farm will have an adult flock of 5,000-10,000 birds and facilities for rearing an adequate number of cockerels pullets up to three months.

Peking Ducks will be developed for meat and Khaki Campbell for egg production. These duck farms will be established at the existing A.I. centres, and each farm will have 5,000-10,000 ducks.

A government hatchery and parental and grand-parental stock farm will be established to stabilise prices of day-old chicks for broilers layers issued by the private hatcheries.

Poultry demonstration farms will be established at district level for layers broilers. Each district poultry farm will have at least 1,000 layers to produce hatching eggs in the rural areas.

Fair price shops will be established for selling poultry meat and eggs, and cooperatives of poultry breeders will be set up.

Credit facilities will be provided to poultry breeders through the Agriculture Development Bank.

DISEASE CONTROL AND TREATMENT

Facilities at the thana veterinary dispensaries in East Pakistan will be extended under programmes initiated during the Third Plan. Furthermore, 16 district

council veterinary hospitals will be provincialised and provided with better facilities.

One hundred veterinary aid centres will be set up in important unions in order to strengthen the treatment and disease control activities.

Mass vaccination programmes and other disease control activities will be further strengthened through production of adequate quantities of all biological products. For this, additional facilities will be provided to the existing laboratories, while another unit of the Biological Production Centre with research facilities will be established in the proposed Bureau of Veterinary Research and Biological Products. Furthermore, preliminary diagnostic facilities will be provided to the district veterinary hospitals.

In West Pakistan quarantine outposts will be established and veterinary medical stores will be revived. Existing veterinary hospitals will be provincialised and veterinary aid centres will be set up at union level.

RESEARCH, EDUCATION AND TRAINING

Research on fodder crops will be given higher priority and undertaken at the Savar Dairy Farm in East Pakistan and at the proposed Humid Zone Research Institute under the auspices of the Agriculture Research Council of Pakistan.

In order to overcome the acute shortage of technical personnel for the animal husbandry sub-sector, an attempt will be made for instituting special emergency courses at the East Pakistan Agricultural University as well as by increasing the enrollment.

More veterinary training institutes will be set up to train over 1,000 additional stock assistants, so that by the end of the Fourth Plan period each of the 4,000 unions will have one stock assistant.

In West Pakistan the existing Veterinary Research Institute at Lahore will be strengthened with more accommodation, staff and equipment. Veterinary research laboratories will be established at district level.

Better educational facilities will be provided at the

College of Animal Husbandry, Lahore, and the Agricultural University, Lyallpur, so that the number of graduates turned out is adequate to overcome the shortage of qualified graduate staff. Institutes will also be established for in-service training and for imparting training for the course of stock assistants and compounders in each region.

PUBLIC SECTOR AND EXTENSION PROGRAMME

The Public Sector Programme in the Fourth Plan aims at establishing commercial schemes to act as demonstration units in order to induce the private sector to invest and to meet some of the essential needs of the public. With this object in view, the milk plant at the Savar Dairy Farm in East Pakistan will be reactivated and operated in full capacity through collection of milk from private producers in the surrounding milk-pocket areas.

Seven out of the nine EPADC poultry farms will be expanded and run on commercial lines. The two farms at Chittagong and Khulna will be converted into broiler farms. Two more broiler farms will be established by EPADC at Dacca and Rajshahi. A parent stock farm-cum-hatchery will also be established to feed the broiler farms at the four divisional headquarters.

Two large feed mills will be set up by the EPADC to cater to the needs of poultry and cattle farms in the province. Production from the existing Government Provender Mill will also be increased.

In West Pakistan private enterprise will be aided through supply of subsidised feeds and loans in kind in package deals. Further encouragement to the private sector will be provided in the form of tax holidays, lease of state lands and provision of foreign exchange for importation of poultry and dairy equipment on OGL, free of duty, as in the case of agricultural machinery. Liquid nitrogen plants will be set up in both wings of the country for storage of semen. Publicity vans will be provided at district level.

LIVESTOCK IMPROVEMENT PROGRAMS IN IRAN

by

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BACKGROUND INFORMATION

IRAN is an agricultural country covering an area of about 1,648,146 square kilometers with a population of approximately 28 million. The rural and tribal population is about 67 percent and the urban population 33 percent according to the 1966 census. The climate is diversified and the country is divided into three different regions: 1) the Caspian area with a subtropical climate with high rainfall and abundant forests, where rice, jute, tea, tobacco and citrus fruits are grown; 2) the Central Plateau, located between the Zagros and Elburz ranges, which is covered with range and pasture lands where livestock, wheat, barley, alfalfa, sugar beets, etc. are grown. Azerbaijan (East and West) Kurdistan and Loristan are included in this region; 3) the semi-desert and desert of Baluchistan, Khorasan and Fars Provinces, where the natural range plays an important role in the livestock economy of the area but mismanagement has

depleted this resource to the point that it is an acute problem in the development of satisfactory livestock industries.

In 1966 the number of livestock in Iran were estimated to be as follows:

Sheep	28,000,000
Goats	14,000,000
Cattle	5,200,000
Buffalo	330,000
Camels	234,000
Pigs	70,000
Poultry	43,000,000

The agricultural sector of the economy contributed 107.4 billion rials to the gross national product which was 450 billion rials in 1966-67. Animal products accounted for 49 billion rials or 46 percent of the agricultural sector.

Livestock production takes second place when compared with oil exports. Even so, it is Iran's highest agricultural commodity exported.

INCOME FROM LIVESTOCK PRODUCTION IN 1965 (in million rials)

Meat, 285,000 tons	18,900
Milk, 1,600,000 tons	12,846
Animal manure	7,633
Animal power	4,125
Wool, hair, etc.	3,166
Eggs	2,328
	48,998

The value of exports from animal products was about 3,000,000,000 rials (U.S. \$ 37,500,000).

PROGRAM AND ACTIVITIES OF THE NATIONAL LIVESTOCK ORGANIZATION

SHEEP AND GOAT HUSBANDRY PROGRAM

The sheep and goat production in Iran is not only the main and major livestock industry in the country but it is also the main occupation of large numbers of people in the country.

The sheep and goat industry produces 75 percent of the red meat and 40 percent of the milk and milk products as well as the wool for the world famous Iranian carpet industry.

Forty million of the estimated 46 million range animals is made up of sheep and goats which are the backbone of the national animal production industry.

Unfortunately the development of the sheep production industry is not keeping pace with the increasing demands for more mutton in the country and consequently greater numbers of sheep for slaughter as well as chilled mutton have been imported during the last four years in order to meet the mutton needs of the country.

In order to meet the present and the future demands of the country for mutton important changes and improvements must be made in the sheep husbandry methods and systems as well as in the production and use of animal feeds.

One of the responsibilities of the National Livestock Organization of the Ministry of Agriculture is the production and distribution of improved high quality rams and bucks and the establishment of an efficient field service in sheep and goat husbandry in order to help improve the production of mutton, milk and animal fiber in the country.

This program will increase the production of high quality rams for distribution to commercial flocks as well as improve the existing sheep husbandry field services. It will greatly increase the assistance given to the sheep industry by the National Livestock Organization thus helping in the solution of the mutton shortage problem of the country.

There are two main types of sheep in the country,

pelt type sheep (Karakul) and wool type sheep.

The pelt-producing breed are rather limited in numbers and are mainly concentrated around Shiraz, Qum and in Meshed. Karakul pelts were once Iran's most important export. The market has decreased due to:

- The poor quality of pelts that have been produced
- The change from Karakul to native meat and wool type sheep
- Several years of severe weather and feed shortages
- Competition provided by high quality Afghani and southwest African Persian lamb pelts.

The National Livestock Organization has a new program to develop Karakul breeding in order to increase the number of sheep and to improve the quality of pelts.

The wool type sheep make up an estimated 90 percent of the sheep population in the country. The dominant breed in the eastern half of the country is Baluchi. The distribution of this breed and its lines covers a very large area from Meshed to Kerman Ostans. The Baluchi breed and its lines usually have better types of carpet wool than most of the other breeds in the country. The breeding policy in the Baluchi dominated regions is for the production of wool and mutton.

In the western part of the country which at the present time supplies most of the mutton to the Tehran market, the breeding policy is mainly for the production of mutton. However this does not mean that no attention is paid to milk and wool production. A systematic evaluation of the Iranian sheep and goat breeds is being carried out at the National Animal Husbandry Research Center. If some of the breeds evaluated show special efficiency for milk or for the production of better carpet wool and if this breed happens to come from the western part of the country then this policy may be modified accordingly.

ESTABLISHMENT OF NEW SHEEP STATIONS AND IMPROVEMENT OF OLD STATIONS

In order to implement an effective nationwide sheep and goat improvement program it is necessary to increase the present number of field stations from 6 to 12 and improve the performance of the field staff.

IMPROVEMENTS IN OLD STATIONS

Station	Ostan
Abbasabad	Meshed
Saraks	Meshed
Baft	Kerman
Moghan	Azerbaijan
Kermanshah	Kermanshah
Shiraz	Ali aba Kemin

Breed Ewes	Flock Size Started
Baluchi	2,000
Black Karakul	1,000
Cashmere does	500
Moghani	2,000
Sanjabi	500
Karakul Grey	1,000

NEW STATIONS TO BE ESTABLISHED

Station	Ostan
Shahrikurd	Isfahan
Sanandadj	Kurdistan
Around Maku	West Azerbaijan
Miandoab	Azerbaijan
Shahrud	Semnan
Baft	Kerman

Breed Ewes	Flock Size Started
Bakhtiyari	500
Kurdi	500
Makui	1,000
Kizil	2,000
Senghisari	1,000
Baluchi	1,000

THE PLACE OF TRIBES IN SHEEP AND GOAT PRODUCTION

A sample survey made in 1966 indicated that about 70 percent of the sheep and goat population in the country is owned by the tribal communities in the country. In terms of red meat production the tribes produce over 50 percent of the red meat supplies and 28 percent of the milk and milk products.

The demand in the country for mutton is increasing faster than the production and for this reason greater numbers of sheep for slaughter and chilled mutton are imported every year.

In order to meet the present and future mutton needs of the country it is necessary to improve the production methods of the sheep industry. Since the tribal communities control the major part of the sheep and goat industry it is natural that the government field services in sheep and goat husbandry be strengthened in this area.

This program is designed with the objective of integrating the government field services in sheep and goat husbandry into the tribal structure by establishing field stations in the tribal summer and winter grazing areas; recruiting the tribal people and training them to run these stations whenever possible; and establishing sheep flocks for demonstration and high quality ram production. This program will serve:

- To demonstrate and introduce improved sheep husbandry methods in the tribal area in order to increase the mutton and sheep, milk and milk products
- To produce and distribute high quality rams
- To demonstrate the production and economic benefits and use of animal feeds and fodder
- To determine the specific production problems that are hindering the speedy development of sheep production in the tribal areas and to assist the tribes in the solution of these production problems.

This project will be implemented in the summer and winter grazing areas of the Bakhtiyari tribe, which lies in the Ostans of Isfahan Khuzistan specifically in the Loris-tan and Chaharmahal area of the Zagros Mountains.

POULTRY HUSBANDRY

Iran's modern poultry industry began in 1952 under the National Livestock Organization which provided technical assistance to encourage poultry raisers near urban areas to establish large-scale specialized poultry farms.

By taking note of the 15,000,000 hatching eggs imported every year, and noting the population growth of 2.9 percent, the increase in consumption of white meat in Iran, particularly in urban areas, the task of the Ministry of Agriculture in helping the poultry industry can be realized.

THE CHICKEN MEAT PRODUCTION IN IRAN

Because of the rapid growth and development of commercial production of broilers in Iran in past years the term "production of poultry meat" must be divided into two parts: 1) domestic poultry production and 2) commercial production of broilers.

The domestic poultry production has still an important role in the production of poultry meat, but its growth is very slow or even stagnating so that its future role in the production of poultry meat in the country will be negligible. The present domestic production has been estimated to be about 14,600 tons.

The production of broilers that began 16 years ago with 200 tons of meat produced, has now reached the figure of about 20,000 tons. This type of production is well organized so that leading poultry farms in respect to their consumption of feed, organization level and economics could be matched with similar farms in countries with a much more developed agricultural production.

The leading poultry farms, located in Tehran, have achieved a production of one kilogram of meat on 2.30 to 2.40 kilograms of feed. Results achieved by small farms are not so profitable, but these farms secure their economical production based on a different structure of other costs.

In 1967 total consumption of white meat in Iran was 1.8 kilograms per capita, out of which quantity poultry meat made 1.3 kilograms. It is expected that the 1972 per capita white meat consumption will reach a figure of 2.5 kilograms out of which quantity poultry meat will make 1.8 kilograms.

All factors required for future rapid development of commercial production of poultry meat already exist in Iran. The country has a strong production of hatching eggs necessary for raising one-day-old chicks. There are several large-scale, well equipped plants producing about 20 million one-day-old chicks. Finally, there are several hundred small poultry farmers that produce their broilers from one-day-old chicks purchased from hatching plants.

It is estimated that about 70 percent of the broiler producers raise 1,000 to 10,000 broilers in one turn. Another 20 percent of them raise about 10,000 to 50,000 broilers in one turn, and 20 big broiler farms have more than 50,000 broilers in one turn. One broiler producer has about 250,000 chickens in one turn. At present 40 percent

of the hatching eggs required for the production of broilers is imported, but by next year this percentage will decrease considerably.

There are plans for the establishment of dressing plants of 20,000 broilers-per-day capacity near Tehran. Also there will be smaller plants in Rasht Province.

During the past 15 years the National Livestock Organization has established a number of poultry farms in the provinces on a small scale. There is one big hatchery of 10,000,000-egg capacity.

The plans are for establishing 10 mother stock poultry farms and 7 hatcheries and 6 demonstration and extension stocks in the provinces. This is designed to encourage the private sector to get into commercial operations. These set ups will be run on a commercial basis, thus eliminating a lot of red tape normally found in government operations.

IMPROVEMENT OF BEEKEEPING IN IRAN

From old days the beekeeping has been widely distributed in Iran, and in the regions covered with wild flowers, forests, mountain ranges and orchards the villagers are keeping a number of beehives according to their financial situation. For them it is a part-time profession.

The hives kept in villages are generally located in hollow tree trunks, logs, clay pots and baskets. There are approximately one million of these, each yielding about 3-4 kilos of honey per year.

A number of commercial apiaries have been established around big towns recently due to the activities and help of the National Livestock Organization of the Ministry of Agriculture. Each consists of about 400-500 beehives, and their honey yield does not exceed 20 kilos per year.

The National Livestock Organization in the past years has imported a number of selected and best quality bee queens from the U.S. and has distributed them among the beekeepers of the country in order to improve the species of local bees. The NLO has also offered them long-term loans, technical help and training. The beekeepers now are very much interested in establishing commercial apiaries, not only because of financial benefits resulting from the apiaries, but also because of the important part played by bees in the pollination of many agricultural plants.

The National Livestock Organization has prepared a plan to increase the honey yield of the country. The resulting increase in income will provide better living. The main parts of the project will include the following steps:

Twenty commercial apiaries will be established over the country, each apiary consisting of 200 to 500 hives. These will be utilized to train farmers in the new and exact methods of beekeeping.

The quality of the local bees will be improved by importation of selected bee queens from abroad. After a few years the Haydarabad beekeeping stations will be well equipped to produce the selected bee queens for the country.

- Haydarabad will prepare new hives of a standard design and will sell them to the beekeepers for a reasonable price.
- Short-term training courses will be held for beekeepers in order to increase their knowledge, to control the present bee diseases, and to prepare graded honey for market.
- Trained technicians will be produced for beekeeping stations.
- Technical brochures will be issued and distributed to the beekeepers.

CATTLE BREEDING PROGRAM IN IRAN

The increasing demand for milk and beef in the cities has caused a considerable number of cattle producing establishments to be located near cities, and beef and dairy farming has developed into a sizeable industry.

Iranian cattle breeds are not consistently good milk producers. The majority of the native cows produce only about 600 to 900 kilograms of milk per lactation period so that the present cattle and buffalo population of 5,530,000 head does not supply enough milk.

With the establishment of the artificial insemination center of Mehr-Abad (near Tehran), research work is being carried out, the aim of which is to demonstrate sound cattle raising through cross-breeding of local cattle with Brown Swiss, Holstein and Jersey semen.

A herd testing program began 12 years ago. At present there are more than 60 large dairy farms around Tehran which are cooperating with the National Livestock Organization in this program. The technicians visit each farm once a month and record the day's milk production of each cow, collect samples for butter fat content and other information.

In conjunction with the dairy plant of Tehran a milk purchasing scheme was worked out to compensate for expenses incurred in getting milk to market in a sanitary condition. The milk plant of Tehran contracts for milk on the basis of inspection reports. In this scheme each dairy farm (mostly purebred cows of Holstein, Red Danish and Brown Swiss breeds) is inspected four times per year by the NLO herd testing program team and local veterinarians for the condition of farms, milk handling, milk plant conditions, health of animals (T.B. & Br. tested) and cleanliness. This program proved to be a 100 percent success and is now being extended to other parts of Iran. There are ten pasteurization plants in Iran which have been developed since the Tehran milk plant started in 1956.

In 1968, 30,000 artificial inseminations were done at livestock stations. The milk production of the improved cows is reported to have increased up to 1,000 liters on an average in the first generation.

The NLO initiated the importation of 1,000 selected Holstein, Red Danish and Brown Swiss sires from abroad for private dairy producers and assisted these producers in management practices. Later many private people started dairy farms by importing purebred cows from Israel, England, Denmark, the U.S. and Germany.

Since 1962 frozen semen from high producing bulls

has been imported from the U.S. and used in and around the Tehran area to increase both the quality and the quantity of milk produced.

Today there are 185 dairy herds of from 15 to 1,000 purebred, crossbred and native cows which produce 100 to 6,000 kilos of milk which is delivered daily to the Tehran milk plant. There are also another 80 tons of milk produced near Tehran which is delivered to private shops and sold unpasteurized in the form of cheese, yoghurt, butter or raw milk.

In connection with this activity the National Livestock Organization has arranged a program for progeny testing of the young sires.

To launch such a program necessary steps have been taken to set up a cooperative system among dairymen and A.I. centers of the country.

This cooperation will insure coordination of the different programs of A.I., registration, record keeping and progeny testing.

The activity of NLO for cattle improvement in the 14 government stations is as follows:

In two stations (Meshed and Shiraz) Brown Swiss

breed will be used for milk production and production of purebred females to be distributed among dairy farms.

- In three stations (Kermanshah, Bam and Nowshahr) Holstein and Jersey cows will be kept.

In two stations (Gorgan and Tabriz) crossbred male calves for meat production will be bred in order to investigate possibilities for beef production.

In three other stations (Rezaieh, Golpayegan and Isfahan) purebred dairy calves will be bred and produced, then distributed among dairy farms. In Ramsar Station, Brown Swiss and Holstein purebred cows will be kept for demonstration purposes.

- In Ahwaz Station investigations on three breeds (Holstein, Brown Swiss and Jersey) will be continued in order to find the best suited breed to the area.

In Sarab Station native Sarabi breed will be kept.

- In Guilan (Rasht) Red Danish breed will be kept for demonstration and extension programs.

GENERAL ASPECTS OF LIVESTOCK SECTOR AND ITS DEVELOPMENT IN TURKEY

by

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PRESENT SITUATION

INTRODUCTION

CONDITIONS for agricultural production differ widely from one region to another, depending on rainfall, altitude and soils. The semi-arid Central Plateau is the main area for grain growing and cattle and sheep raising. The mountainous eastern parts rely more on livestock than the other areas. In general, the existing topographic and climatic conditions in Turkey are suitable for animal production. Especially in the eastern regions with rather extensive pastures, animal production is the dominant type of agriculture. Due to the economic, cultural and various other factors, animal production also has an important place in other regions.

The importance of the agricultural sector to the Turkish economy is illustrated by the 29 percent contribution to the gross national product in 1967-68. While

the greater proportion (58 percent) of this was plant crops, livestock industries contributed 33 percent.

The contribution of livestock to agriculture and the economy as a whole is considerable and takes the form of milk, meat and poultry production for local consumption, and export of livestock and by-products including hides and skins. Almost all farm families in our country have horses, donkeys, a few cattle, sheep, goats and laying hens. In addition to these, there are large commercial herds and poultry farms which are supplying the animal production needs of the local citizens especially around the big cities such as Ankara, Istanbul, Izmir and Adana.

LIVESTOCK POPULATION

Important livestock numbers were tabulated below as low producer natives and improved high producers for each species.

TABLE*

Species	Low Producers (Natives)		High Producers (Improved)		Total	
	Number	%	Number	%	Number	%
Cattle	12,600,000	96.9	620,000	3.1	13,220,000	100
Sheep	32,054,000	98.5	600,000	1.5	32,654,000	100
Ordinary goat	13,138,928	100	-	-	13,138,928	100
Angora goat	5,563,000	100	-	-	5,563,000	100
Poultry	30,000,000	90	3,000,000	10	33,000,000	100

* Source: General Directorate of Veterinary Service Records, 1968

ANIMAL PRODUCTION AND CONSUMPTION

Yield per animal unit in all species is very low due to factors which will be discussed later in this paper. Namely, cattle carcass weight is 92 kg, milk yield was estimated at 600 kg available for human consumption or a total of 713 kg including that fed to calves by cattle. Milk yield and carcass weight of sheep are 47 and 18 kg per head respectively. Wool and mohair production per head are 1.3 and 1.6 kg in natives. Egg number produced yearly per chicken is 52. Total cattle and sheep slaughter amounts yearly to about 2.0 and 13.0 million head respectively. Sheep and goat meat retain a predominant position in the supply of meat, contributing 61 percent of the total, compared with 39 percent from cattle and buffalo.

Per capita meat consumption (including poultry) is estimated as 15.7 kg in 1967 and will be 18.0 kg in 1972, milk consumption as 98.0 kg in 1967 and 108 kg in 1972, and egg consumption as 2.7 kg in 1967 and 3.3 kg in 1972.

Up to about ten years ago or so most of the increased effective demand for livestock and livestock products

was met through an increase in livestock numbers and a very modest increase in yields.

FEEDS AND FEEDING

The most important obstacle in all aspects of animal husbandry is feed production and feeding because this either eliminates or greatly reduces the potential for both genetic improvement and improved control of diseases and parasites. Poor nutrition is also a heavy contributor to retarded maturity, a low birth rate and a high mortality rate.

Meadow and pasture lands of both the villages and state-owned areas are overgrazed. Large numbers of cattle, sheep and goats roam the grasslands and mountain slopes. In eastern Turkey the animals are often driven in a nomadic fashion. In the western part the pastures are better, but even there good management of herds and flocks does not prevail. Due to serious overgrazing livestock is generally in a poor condition, especially in dry seasons.

Present feed supply consists of a comparatively small

proportion of concentrates and a very high proportion of low quality roughages. The greater part of the supplied concentrates is utilized for providing only the absolute minimum winter feed supplementation necessary for survival of animals and minimum energy allowances for draft animals. Roughages supplied consist almost wholly of cereal straws and low quality open pastures. Total roughage utilization is about 51 million tons.

Owing to the low and spasmodic rainfall on the Anatolian Plateau, natural grasslands comprise 34 percent of the total feed. Moreover, the continental climate of the plateau with its long cold winters and hot dry summers limits the grazing to only three to four months per year, and stock has to be kept under shelter for four to six months each winter. The ration therefore is deficient in calories, protein and vitamins and too high in fibre content, and is especially poor for milking cows and young animals in general. Present total available concentrate feeds amount to about 6.2 million tons of which about 4.4 million tons go to livestock other than poultry. The utilization of by-product feeds is also limited. Twenty percent of oil-seed cakes and bran are now being exported or used for less productive purposes.

In 1958 feed plants were established by the Government. The habit of using industrial feed is not yet widespread. This, coupled with the generally low purchasing power of the animal breeders, has resulted in the plant not working at full capacity. In an effort to increase sales, feed is provided to producers as a credit in kind. Thus total feed is at present about ten percent below that normally required even for the present low growth rates of animals, low milk production levels and poor animal conditions.

Because of inadequate feed, most native cows that produce 5 to 6 kilos of milk daily at the beginning of their lactation periods, decline quickly to half of this amount or less. They discontinue producing milk within five or six months after freshening, whereas adequate rations generally could extend the lactation period to six to eight months resulting in an increase of more than 100 percent in the amount of milk produced in each lactation period.

MARKETING AND PROCESSING

Apart from the feed supply, other economic bottlenecks of livestock are marketing structures and pricing mechanisms. At present almost all animals are sold on a per-head basis. Much of the milk is sold directly by producers or by peddlers, especially in the smaller cities. A limited number of terminal markets are operated by commodity exchange boards. Six city and town livestock markets are operated by local chambers of commerce. Moreover the Ministry of Agriculture has begun to establish new stock markets in the producing areas. Fifteen markets are planned to be in operation by 1970. The Meat and Fish Organization is an autonomous government agency established mainly to encourage fattening and to regulate the meat market. The organization has its own slaughter houses and cold storage facilities.

In order to encourage the fattening, credit is extended to producers and producers' cooperatives that are financially assisted.

In 1963 the National Milk Industry Organization was established. Producers are encouraged to form cooperatives, which will act as joint marketing and credit organizations on this side of production too. The bulk of the dairy products entering the commercial trade are manufactured in small privately owned plants situated near the high consumption centers in the case of yoghurt, and in the case of cheese where the milk is produced.

LIVESTOCK ENTERPRISES AND MANAGEMENT

As observed from the animal population table most of the number are low producer natives. The limited genetic capabilities of the native breeds makes it uneconomical to use high quality feedstuffs including improved pastures for increased meat and milk production. Native breeds are multi-purpose and have a low production potential for both milk and meat. Livestock enterprises in the country are characteristically very small and numerous. Some 60 percent of the three million farm families keep livestock which are usually pastured as village flocks on common pastures.

MAIN PROBLEMS AND MEASURES TO BE TAKEN BY THE STATE

In recent years cattle and sheep numbers have been increasing at between 1 and 2 percent per year whereas goats have remained constant. Turkey has large numbers of livestock with respect to total land area and particularly in relation to the human population. As indicated above in spite of high population, livestock production per unit is at a very low level, compared with that of developed countries.

Factors impeding development of animal production in Turkey are summarized as follows:

- Insufficiency of livestock genetic structure for high production
- The lack of necessary quality and quantity roughages and concentrated feeds, plus inadequate knowledge of appropriate feeding technique
- Inadequate credit
- The lack of a producers' organization
- The lack of sufficient marketing facilities and organization
- Imbalance between the prices of animal products and feeding stuffs.

ORGANIZATION

Governments have been continuously persevering toward the improvement of animal husbandry since the foundation of the Republic of Turkey. Below are the basic measures that have already been taken:

- The establishment of a number of institutions and special organizations striving for genetic improvement of high production farm animals and control of contagious diseases in the country

- The establishment of many institutions concerning soil conservation, plant breeding, and development of different quality feedstuffs
- The establishment of other supporting institutions such as credit, marketing and processing animal products which have been organized with their special laws through the Ministry of Agriculture.

The first and second items result directly from the Ministry of Agriculture law number 3203.

Under the authority of the Minister, the General Directorate of Veterinary Services, the following activities are the main duties according to the mentioned law item 9:

- 1) Controlling the contagious animal diseases throughout the country. As a part of this duty, Veterinary Services must control all domestic animal movements as well as exports and imports. In order to prevent zoonotic diseases, this department also must supervise any kind of animal products, animal housing, feeds and all slaughter houses.
- 2) Improving livestock population for increased per unit production. Towards this effort there have been established a central livestock research institution, 7 state farms (Hara) 8 cattle and sheep breeding stations, 11 stallion depots as seed stock, and other necessary supporting facilities such as extension services, organizing proper courses for in-service training, and the training of farmers engaged in animal husbandry. Thus Turkey possesses a number of assets and some advantages rarely found in other countries. These include:
 - a) Quite well organized animal health, husbandry and production services which are coordinating with each other and other supporting assets; and extending well down from the Capital into the rural areas by the link of province directorate and district veterinary services. These services include a relatively large number of veterinarians, veterinary helpers and other technical personnel who are trained in various aspects of animal husbandry and production.
 - b) Extensive and well organized laboratory facilities for diagnosis of animal diseases, investigations and biological production, such as vaccines, sera and like substances.

RESEARCH AND EXTENSION

It is realized that livestock development depends largely on the availability of a sufficient number of research and extension workers. It is the policy of the Government to encourage and support research and training of farmers. The General Directorate of Veterinary Services established the Lalahan Central Zootechnical Research Institution whose principal function is applied research. They also established a number of state livestock farms, breeding stations and province or district level organizations devoted to various aspects of animal production, research and training. These facilities have been in operation for a number of years and work

in close coordination with the Veterinary Faculty of Ankara. Similar groups have been organized by the General Directorate of Agriculture on many aspects of grassland and feed plant production.

Research, training and publication facilities are directed towards increasing livestock productivity.

TARGETS OF DEVELOPMENT PLANS

During the First Plan period the increase in livestock products was projected as 31 percent. Of this only 13 percent was realized. Most of the measures designed to promote the development of animal husbandry have not been put into effect. Among these measures, the increase in concentrated fodders and in forage crops to be brought about by implementation of special feed production programs during the Second Plan period, will lead to an average increase in the carcass weight of 15.9 percent in cattle and 12 percent in sheep. It is projected that the increase in carcass weight will amount to 60,289 tons in 1972 valued at 361 million T.L.

The feed production programs to be implemented during the Second Plan period, as well as previous stock improvements, will affect milk production. With 1967 production taken as a base, the percentage increases expected in 1972 are 22 percent in cattle and 10 percent in sheep. To get these results measures will be taken to ensure the optimum utilization of pastures through improved maintenance and organization of the property rights for pastures. Development of improved breeds and increase in their production within the total livestock population, together constitute one of the main approaches to the advancement of animal husbandry. At present the ratio of improved breeds to total cattle population is only 3 percent. Efforts in artificial insemination will be directed towards increasing the ratio of the improved breeds in regions where the conditions are suitable. Research, training and publication services will also be directed towards increasing livestock productivity. In the meantime the Ministry of Agriculture has been working on a special development program for the livestock sector. Within this program priority has been given to set up a series of nucleus enterprises in private sectors for animal production development.

The aim of the program has been to: 1) produce animals with high breeding ability, 2) develop the livestock fattening and feed stuff programs, according to the targets of state development plans and projects which are in conformity with technical and economic basis of animal production under the long-term projections and yearly programs in Turkey. Thus the improvement of animal production and its quality will be realized as the appropriate human nutrition and export targets of the country.

FOREIGN SUPPORT

For the efficient implementation of the livestock development program, support is needed in a number of fields, particularly those of feed production, animal breeding and artificial insemination, marketing animal products, processing and disease control projects.

The technical assistance program of the United States was started in 1949, but most of the projects were for subjects other than animal husbandry. However one of the most effective programs of the AID organization is the cattle fattening project. This has resulted in increased income for Turkish feeders in addition to extra meat production. In this project feeders have been supported by credits given by the Agricultural Bank, through the funds provided from domestic and AID sources.

CENTO projects have also been effective in animal production, particularly in parasite disease control in the eastern regions, in addition to the provision of technical experts and equipment and the training of Turkish technicians.

A United Nations special fund project named Sheep and Goat Diseases Project has been established at Pendik Laboratory of the Veterinary Directorate General. One other special fund project is in operation to produce necessary vaccine and other measures against foot-and-mouth disease by a special institution established in Ankara.

The Turkish Government has prepared a livestock development program and has requested credit from the International Bank for Reconstruction and Development concerning the projects listed below:

- Intensive dairy production
- Livestock fattening
- Beet pulp drying
- Dairy breed improvement.

These projects are interrelated, and together will lead to an improvement in foreign exchange earning through increasing the supply of meat for export. The aim is also to increase the supply of milk and meat for domestic consumption. Implementation of all projects can be expected to commence in 1970 and will extend over a period of three to four years.

RESULTS RECEIVED FROM THE WORKS THAT HAVE BEEN CARRIED OUT CONCERNING ANIMAL HUSBANDRY

Breeding and improvement works were started initially in 1924 at Karacabey State Breeding Institution in Hara, which is located in Bursa Province. In the beginning selected native horses, cattle and sheep were collected in different sections of Hara. With the continuous implementation of pure-breeding and cross-breeding methods between natives and imported high producing breeds of each species, such as Arabian horse, Brown Swiss cow, and Merino sheep, new Turkish types have been produced. These well known new breeds were named Karacabey horse, Karacabey cow, Karacabey Merino, and the latest one, Karacabey Haflinger horse. All these new species are well adapted to our environment with more productivity than their ancestors. As figures illustrating these studies, the milk production of Karacabey cow average is 3,900 kg, in Lalahan Zootechnical Research Institute. The wool production of Karacabey Merino is 3.0 kg yearly.

In conjunction with the animal improvement services provided by the state breeding institutions, province veterinary organizations have started the implementation of artificial insemination programs where there is a demand. At the beginning, the demand was limited but as farmers bred much more productive animals than the native species, other farmers started to put pressure on the Government to extend the program. For the time being a total of 358 artificial insemination centers (fixed or movable) are functioning. Two hundred of these are engaged in cattle insemination. Cattle artificial insemination projects were directed to an upgrading program using Brown Swiss bulls in the Eastern, Central and Thrace regions of the country, Holstein bulls in the Aegean and Marmara regions, Jersey bulls in the Black Sea coast area, depending on regional ecologic conditions. In the sheep artificial insemination program only Merino rams are being used for higher wool production. Another desirable project aims for higher qualified mohair production through the enlarging of the Angora goat population in Central Anatolia where it originated. Besides the above-mentioned projects, natural insemination centers consisting of 50 bulls each have been functioning during the breeding season in other parts of Turkey, depending on transportation and geographical conditions. The purpose of these centers is to upgrade native cattle into Brown Swiss and Jersey breeds in the mentioned areas.

SOME FIGURES CONCERNING LIVESTOCK IMPROVEMENT ACTIVITIES IN 1968

Artificial Insemination

Cow numbers inseminated	167,220
Sheep numbers inseminated	271,222
Calf production percent	66.1
Lamb production percent	78.4

Natural Insemination

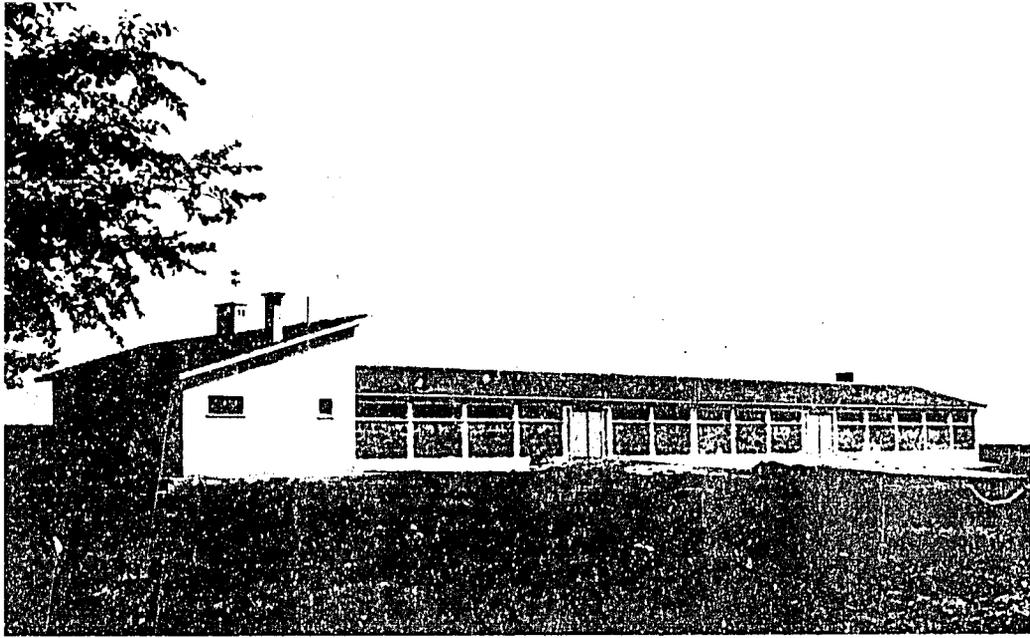
Bull numbers used	558
Cow numbers inseminated	27,414
Calf production percent	57

Animals Distributed from State Breeding Seed Stock Farms and Stations to the Farmers

Stallion numbers	85
Mare numbers	101
Foal numbers	203
Bull numbers	337
Cow and heifer numbers	1,050
Sheep and yearling numbers	3,077
Chick numbers	977,906

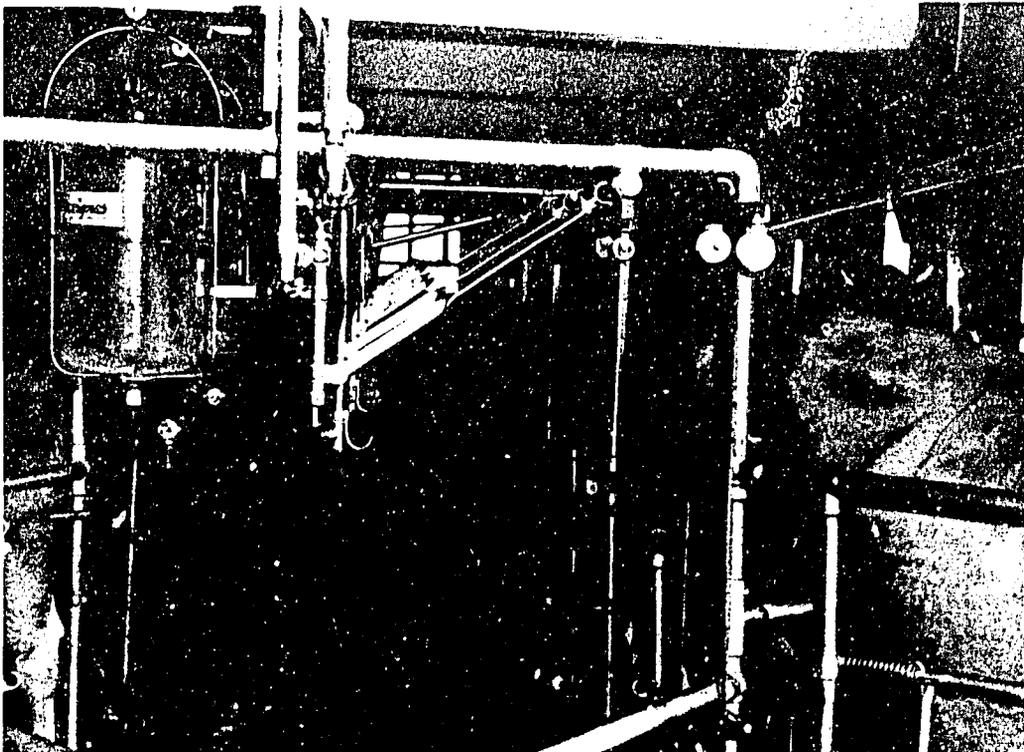
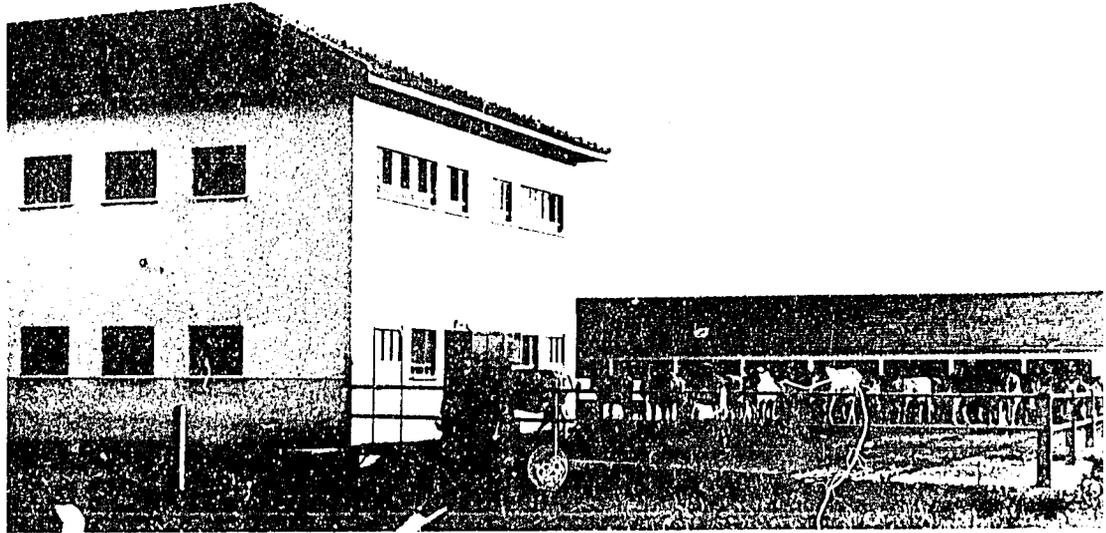
Fattening and Meat Production

Credit distributed	54,125,901 TL
Feeders number supported by credits	4,838
Number of cows fattened	89,940
Number of sheep fattened	148,579



Improved breeds of horses, cattle and sheep have resulted from animal improvement projects conducted at state breeding institutions. Shown here is a cowbarn at the Karacabey State Breeding Farm in Bursa Province.

The new breeds are well adapted to their environment, and are far more productive than their ancestors.

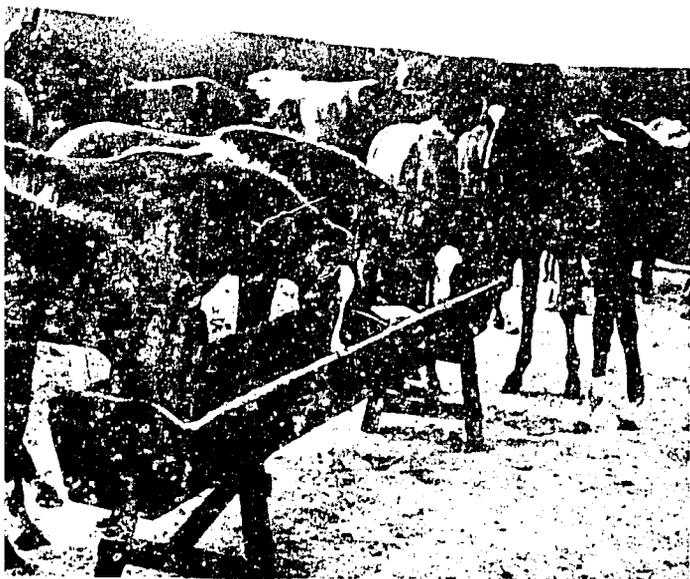
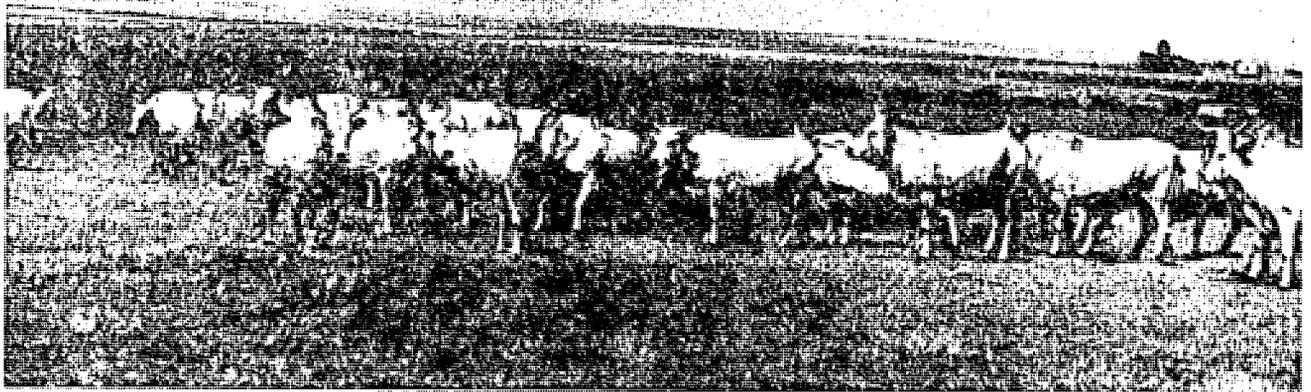


Modern milking machines at Karacabey.

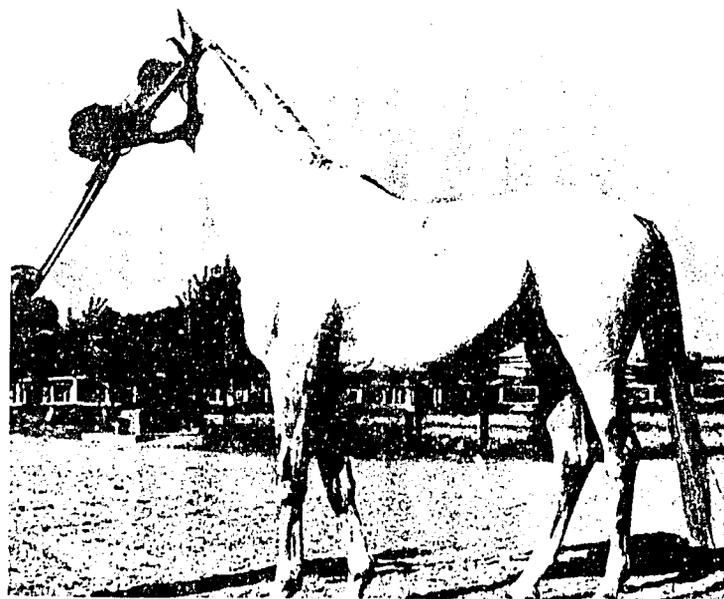


Karacabey Brown Swiss cows.

Shown here are native Turkish gray cattle herds at the Çifteler State Breeding Farm at Eskişehir.



Concentrates are fed to horses at Karacabey.



Selected native horses have been bred with imported breeds of each species, thus producing fine animals such as this Karacabey Arabian horse.

Live Weight Gains per Head

Cattle	60 Kg
Sheep	35 Kg

Additional Meat Production Received by the Implementation of This Project

Live weight produced by cattle	5,396,400 Kg
Live weight produced by sheep.....	5,200,300 Kg
TOTAL.....	10,596,700 Kg

Besides the above activities carried out in the Ministry of Agriculture a number of economic state enterprises such as the Meat and Fish Organization, Wool and Mohair Corporation, National Dairy Industry Organization and Animal Feed Industry Organization already possess considerable facilities in support of animal production in Turkey.

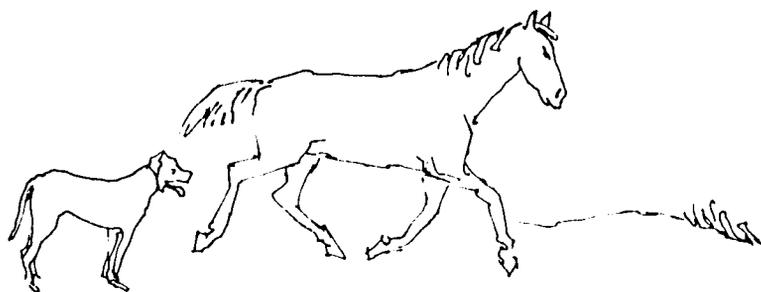
In spite of facilities and activities already mentioned the figures in this section clearly indicate the fact that the livestock industry is in need of further assistance at this critical stage of its development program.

SUMMARY AND CONCLUSIONS

Affairs within the livestock industry sector must be directed simultaneously to the increase of productivity. The channeling of investment and credit is necessary in order to speed up the improvement of the livestock sector in Turkey. The improvement of the animal industry is essential to the improvement of the entire national economy in Turkey. The foregoing programs although massive in character still cover only a comparatively small part of the entire livestock population. Many other measures for development must also be undertaken. For instance as a beginning: 1) It is necessary to train technicians for more efficient research and extension activities provided to farmers; 2) We must carry out extensive applied research that will provide the necessary basic data to solve development problems and extend the knowledge that is received, to the farmers through more extensive extension activities.

I hope at the end of this conference all of us will be in agreement on some important measures that will benefit member countries in the field of livestock development.

PLANNING



FEED PRODUCTION AND DISTRIBUTION

by

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CROP PRODUCTION

IRAN'S LATITUDE gives it generally cold winters and hot summers. Precipitation occurs principally in winters except in the Caspian region, where the annual precipitation is 400 to 2000 mm. In other parts of the country the precipitation is generally less than 400 mm. per year, thus irrigation is required for most crops outside of the Caspian area.

The cultivated lands in Iran are largely fine textured alluvial soils which are composed of relatively recent sediments. These soils usually have a PH content between 7.5 and 8.0 and generally have a low content of available P, N and organic matter. The area under

cultivation at the end of the Third Five-Year Plan was 6.1 million hectares. This increase will cover 400,000 hectares under the dam irrigation and the remainder will be in other parts of the country.

The population in Iran was nearly 26 million in 1966, thus allowing only about one-fourth hectare of crop area per person — also the population is growing at the rate of about 2.6 percent per year. The areas planted for production and numbers of farms are shown in Table 1. Crop yields are much improved by irrigation. The wheat yields in 1960 averaged 1024 kilos per hectare on irrigated land, compared to only 469 kilos without irrigation. Oil seed crops yield three to five times as much on irrigated land as on dry land.

TABLE 1
AREA PLANTED, PRODUCTION AND NUMBERS OF FARMS
 By Crops, 1960 and 1968
(Area in 1000 hectares: Production in 1000 tons)

C r o p	Area 1960	Planted 1968	Production		Yield/ha	No. Farms 1000	Area has. each
			1960	1966			
Wheat-Irrigated	1183	1400	1425	4200	1204	905	1.3
Rainfed	2480	2600	1163		469	1029	2.4
Barley-Irrigated	280	330	317	1035	1132	397	0.7
Rainfed	798	870	367		460	660	1.2
Rice-Irrigated	313	355	651	700	2080	257	1.2
Pulses-Irrigated	68	90	39	130	574	123	0.6
Rainfed	55	20	24		350	119	0.5
Potatoes-Irrigated	16	20	39	N.A.	2438	N.A.	—
Cotton-Irrigated	147	200	135	160	918	134	1.1
(w.seed) Rainfed	137	155	101		737	68	2.0
Sugarbeets-Irrigated	335	115	648	2830	19343	41	0.8
Sugarcane-Irrigated	1.2	5	41	500	34166	1.2	1.0
Tobacco-Irrigated	20.6	10	7.6	15	369	39	0.5
Rainfed	7.4	10	4.6		622	12.3	0.6
Oilseeds-Irrigated	22.4	25	6.2	31.5	273	35.6	0.6
Rainfed	23.5	20	1.2		51	18.8	1.2
Vegetables-Irrigated	22.4	25	194.5	N.A.	8683	121.3	0.2
Rainfed	6.0	7	14.8		2467	37.5	0.2
Melons-Irrigated	37.3	40	237	N.A.	6353	93.0	0.4
Rainfed	55.9	60	115		2057	50.0	1.1
Forage-Irrigated	48.0	142	208	500	4333	234	0.2
Rainfed	6.0	35	1.2		2000	4.0	0.2
Tea-Rainfed	15.0	26	6.6		440	N.A.	—
Other-Irrigated	87.0	100	97.3		1183	143.4	0.6
Rainfed	81.0	85	76.1		—	142.6	0.6
TOTAL-Irrigated	2280	2857	—	—	—	2525	0.9
Rainfed	3845	3888	—	—	—	4668	0.8
ALL CROPS	6125	6745	—	—	—	7193	0.9

Since wheat, rice and sugar are the principal food products, they are also the major items of food consumed in Iran. The average consumption is estimated in 1964-1966 at 152.5 kilos of wheat, 29.0 kilos of rice and 21.3 kilos of sugar.

ANIMAL PROTEIN FOR HUMAN CONSUMPTION

Meat, eggs and milk are the important sources of animal fat and protein. Animal protein is necessary for

the growth and healthy maintenance of the human body and also for resistance against the diseases caused by microbes.

The daily animal protein consumption per capita in Iran is not more than 15 gms while it should not be less than 30 gms per day. The annual meat consumption per capita is 12.5 kilos. The requirement for the population of Iran is 350,000 to 360,000 tons (12.5 kilos per capita per year). The percentage of meat production by species are as follows:

Sheep and goats	50-60	percent
Cattle	21	"
Poultry and fish	13-14	"
Miscellaneous	6	"

The annual milk production in Iran is 1,600,000 tons (65 to 75 litres per capita) while the average consumption in some countries is between 380 to 430 litres.

The egg production from industrial poultry farms and rural areas is 1,056,000,000 and the average consumption per capita is 45.5 per year.

Assuming a 2.6 percent population increase per year, the number of people in Iran will exceed 30 million at the end of the Fourth Plan (1972). It is obvious that with this increase in population more animal protein will be needed.

Animal products are one of the important sources of national income (24 percent from agriculture products, 57 percent of that from animal sources).

According to the latest census the numbers of animals in Iran are:

Sheep	28	million
Goats	13.5	"
Cattle	5.2	"
Buffalo	330,000	
Pigs	70,000	
Poultry - rural area	20	"
industrial area	24	"

FEED SOURCES IN IRAN

Feeds that are used for animal nutrition in Iran can be divided into three categories: a) range feed, b) farm feed and c) industrial feed.

Range feed Most of the animals in Iran, depending on the weather and climatic conditions, are on the ranges the year round and virtually all are grazed some parts of the year.

Farm feed Farm feed consists of the foods which are grown and prepared at the farms and villages. Village animals are still grazed on the ranges in the summer months.

The types of feed that are given to the village animals are mostly related to the area and the season of the year. For example in the southern part of Iran, where dates are grown the animals are fed the leaves, fruit and seed of the date tree. In the Caspian area, which is primarily a rice growing area, the animals might be given by-products of this cereal. There are some feeds which are common in the different parts of the country such as wheat and barley straw, alfalfa and so forth. In general the feeds which are produced in the rural areas are forages, wheat and rice bran, leaves of trees, the green parts of fruits such as almonds, melon peelings, seeds of fruits such as date seeds and corn stover.

Industrial feed Feeds which are produced as the by-products of industrial factories are such things as beet pulp, molasses, bone meal, fish meal, feed yeast, brewers grains, and also wheat and rice bran (produced by

large mills), and meat meal produced as a by-product of the slaughter industry.

GRAZING AREAS OF THE COUNTRY

Since more than half of the country's animals are fed the year round and the others more than seven months of the year on the rangeland, the pastures are the most important source of animal feed and also the main factor in producing animal products. Forage and other sources of animal nutrition are fed only to limited numbers of animals.

Sheep and goats are the main grazing animals on the ranges. Winter and autumn are the critical feeding periods for the Iranian shepherds. Death losses may reach 20 percent of the total number due to the lack of available feed.

The situation of the range depends on the rain. If there is an abundance of feed available one can observe this from the tail of the sheep where the sheep stores the fat. If the condition is the opposite the tail becomes more and more flacid and empty.

The feed on the rangeland is generally composed of grasses, fescue, bromes, sage and in some areas orchard grass, trefoil and wild alfalfa.

According to the range specialist the pasture in Iran is overgrazed and the number of animals is two times more than it should be.

The area of the rangeland in Iran is not exactly measured but estimations are as follows:

Gilan	3.8	million hectares
Mazendaran	4.2	" "
Khozestan	4.5	" "
Fars	9.5	" "
Tehran and Semnan	4.1	" "
Isfahan and Zardkooh	4.2	" "
Khorasan	9.8	" "
Baluchistan	1.2	" "
East Azerbaijan	4.1	" "
West Azerbaijan	2.3	" "
Kordestan	1.8	" "
Kermanshah	3.0	" "
TOTAL	52.5	" "

A sheep unit of 1.57 can be kept on one hectare on the ranges of Gilan and Mazendaran. A sheep unit of 1-1.3 can be fed on the ranges of Khozestan, Fars, Tehran, Semnan, Isfahan, Zardkooh, Khorasan, and Baluchistan. A 2-sheep unit can be maintained on one hectare on the other rangelands.

In order to evaluate the value of rangeland according to the feed unit (FU) in the sheep and goat industry it would be interesting to look at the following calculations:

Total number of sheep and goats	41.5 million
Approximate conversion of feed to meat	6 to 1 (FU)
Meat production	200,000 tons per year
Thus 200,000 x 6	1,200,000 tons barley
Milk production	634,000 tons with 5% fat from sheep and goats

634,000,000 x 0.5 = 317,000 tons barley (each litre of milk needs 0.5 FU)
 Maintenance ration for 40 million sheep and goats with average weight 30 kgs.
 .47 FU each day
 40,000,000 x .47 = 18,800 tons barley each day
 18,800 tons x 365 = 6,862,000 tons barley each year
 1,200,000 x 317,000 = 6,862,000
 8,379,000 tons of barley
 8,379,000 x 5,000 = 41,395,000,000 rials
 Assuming barley at 5 rials per kg.

These figures are related only to the sheep and goats, but the other kinds of livestock such as dairy cows, cattle and horses are also grazing.

FARM FEED

Forage The common forages in Iran are alfalfa, clover, sanfoin, corn and sudan grass. Alfalfa is grown in most of the country and there are excellent conditions in the Khozestan area where it is harvested 13-14 times per year with an average production of almost 12 tons. The area planted to forage for all of Iran at the end of the Third Plan was 173,000 hectares and the total production 516,000 tons per annum.

In some parts of the country ghasil or kasil is produced and is given to the animal in green form.

Wheat and barley straw It is not known exactly how much wheat is used for animal feeding but 60 to 70 percent of the barley produced is fed to animals.

Fruits and their by-products In the date producing area of the southern part of the country the season for producing green forage is short, approximately 20 February to 20 March. Since grains are very expensive the animals are usually fed dates and date by-products. Date seeds are fed in two forms: a) soaked seed and b) powdered form.

To prepare the first type the seeds of the fresh date are separated and allowed to soak in large vats for 24 to 48 hours. The seeds are then more easily chewed by the animals. Sheep and goats are given 800 to 1,000 grams and cattle are given 1,000 to 1,200 grams per day. To this is added two parts straw and one-fourth part barley. The chemical analysis of date seed is given as:

Protein	5.22	Ash	1.12
Fat	8.4	Carbohydrate	62.0
Cellulose	16.2		

To prepare the powdered form date seeds are ground in special mills and mixed with fish meal, straw, wheat bran, barley and in some parts with alfalfa and beet pulp.

Leaves of trees During periods when there is a shortage of forage, animals are fed the leaves of trees. In the northern part of the country the leaves of the apricot, berries and grape are fed to animals and in some cases are dried and stored for winter use. In the south large amounts of leaves and branches of trees

are fed to the animals. The usual amount of feed is 1.2 to 1.5 kgs for large animals and .8 to .9 kgs for small animals. In Azerbaijan a common practice is to rent the gardens for animal feed.

Kashk Kashk or whey, one of the milk by-products which is produced in the village is used for animal and human feed as well. Kashk is produced from yoghurt and is also used 2-5 percent in poultry rations. The high percentage of salt in kashk sometimes causes toxicity in pullets. Although most protein supplements are now produced by feed factories some kashk is still being used in poultry rations.

INTENSIFICATION OF LIVESTOCK PRODUCTION DEPENDS PRIMARILY ON ADEQUATE FEEDING PRACTICES

Modern production of meat and eggs is closely related to balanced rations. Animal feed industries were started in Iran in 1953 although some beet pulp, molasses and cotton seed cake had been used before. In 1953 Pars Company, the first feed factory, started producing animal feeds in Iran. Later on in 1962 the second animal feed factory (Provimi) was established through the cooperation of Iran and Holland. The establishment of animal feed factories in Iran was undertaken for the following reasons: a) there is a general shortage of fodder and b) the program for increasing the production of meat, milk and eggs cannot be accomplished with the old system of feeding and management.

The annual feed supply by three feed factories is about 300,000 tons but was utilized only 27 percent in 1968. According to the animal protein requirements for human consumption it will be necessary to produce a quantity of about 650,000 tons concentrate by 1972 and to be increased to 1,400,000 tons by 1977. The quantities listed above will be used for:

- fattening sheep and kids
- fattening beef cattle
- supplementary rations for feeding pure and cross-bred dairy cows for maximum production
- producing broilers
- feeding laying hens.

The greater part of the raw materials required for the production of concentrate feed such as wheat and rice bran, oil cakes, dried beet pulp, molasses, blood and meat meal is produced or can be produced in the country. The production of alfalfa should particularly be increased since there are excellent conditions in the country for doing so.

As the country is short in some grains, it will be necessary to import additional quantities of corn (about 25,000 tons in 1972 and about 100,000 tons by 1977). It will also be necessary to import the deficient part of protein compounds (fish meal, blood and meat meal, milk powder), while the requirements of feed yeast and urea will be covered by the country's own future production. It might be suggested that five new factories with a total capacity of 480,000 tons be constructed in

Meshed, Tabriz, Shiraz, Rasht, and Dezful by 1972. Seven additional new factories with a total capacity of 450,000 tons are suggested by 1977 in Isfahan, Ghazvin, Kermanshah, Ardabil, Gorgan, Rezaieh and Moghan. Locations of these factories are in areas where strong development of livestock production is planned for feed lots, dairy farms, broiler and egg farms.

INDUSTRIAL FEED SOURCES

Beet pulp Beet pulp is one of the most important feed by-products in the country but still only about half the production is used. The reasons for incomplete usage of beet pulp are: a) some farmers are still not familiar with this product and b) transportation is expensive. The following figures are given for the 1967-68 crop:

Area under cultivation	148,200 hectares
Sugar beets produced	3,411,586 tons
Molasses production	70,297 "
Dried beet pulp	81,817 "
Wet beet pulp	822,638 "

According to the above figures the beet pulp production is not comparable to beet production. If all the delivered sugar beet is converted to pressed wet beet pulp (70 percent water and 30 percent DM) the production would be about 1,020,000 tons. If all the delivered sugar beet is converted to dry beet pulp the production would be about 221,000 tons.

Sugar beet production will increase to 4.5 million tons by 1972 and 6.0 million tons by 1977. The conversion of this production to dried beet pulp with 15 to 20 percent molasses will be 292,500 tons in 1972 and 390,000 in 1977.

The Dezful Irrigation Project in Khuzestan has 120,000 hectares under its program. If the average barley production is maximum 2.0 tons per hectare, the total production will be 240,000 of barley. The total beet production in the country will prepare the same amount of feed units (FU) without using enormous capital for producing this by-product. The top of the sugar beet which includes the crown and leaves, the weight of which is equal to 45 to 75 percent of the sugar beet per hectare, should be considered as a big source of animal feed.

Sugar Cane The amount of molasses produced by the sugar cane factory in Ahwaz is 17,640 tons per year.

Seed by-products The cultivation of seed oil crops is increasing throughout the country. The Government will also help the farmers by giving them credit. The following are the reasons for increasing the production of oil seeds: 1) vegetable oils are the main source of energy in the different rations and each gram of oil contains 9 calories (protein and carbohydrate 4 calories). 2) by-products of the seeds are used for protein sources of animal and poultry rations.

Each year oil cake valued at about 100 million rials is exported from Iran, but recently it has been limited

due to internal requirements. Seed oil production was 10,000 tons in 1965-66 but it has been anticipated that the production will increase to 150,000 by 1972.

Cotton seed meal The cotton seed meal production was 204,000 tons in 1968-69. The oil cake consumption is increasing 15-20 percent per year. With the increase of soybean and sunflower meal they might be replaced with cotton seed meal for poultry and animal rations. There are two kinds of CSM in Iran: 1) cotton seed meal which is produced by the expeller process and has 90 percent dry matter and consists of 30 percent d.p. and 8.0 percent fat. Each kilogram of this type CSM has 1,300 units Vitamin A, 4,000 units Vitamin B² and 660 units Vitamin B¹; 2) CSM which is produced by the solvent process and has the same amount of protein but only 3 percent fat and no vitamins.

Soybean meal The importation of SBOM has been as follows:

1964-65	100 tons
1965-66	400 "
1966-67	2,000 "
1967-68	4,000 "

Soybean oil meal production was 1,600 tons in 1968-69.

Sunflower cake The production of sunflower cake was 7,500 tons in 1968-69. The production of other oil seed is still low.

Wheat bran Wheat bran is one of the common feeds for livestock and poultry. Wheat bran is used for one-fourth to one-third of the concentrate of dairy cows. The wheat bran production from wheat is related to the whiteness of the flour and it ranges between 5-24 percent of the wheat. The quantity of wheat bran according to the wheat delivered to the city mills is as follows:

Year	Wheat Delivered (tons)	Wheat Bran (tons)
1959-60	392,000	47,040
1960-61	423,860	50,863
1961-62	457,963	54,955
1962-63	495,454	59,454
1963-64	532,727	63,921
1964-65	788,478	94,617
1965-66	1,992,701	239,124
1966-67	2,301,102	276,132

Fish meal Fish meal is one of the important animal protein sources for animals and poultry. Bandar Abbas plant is the only factory in Iran which is producing 1,080 tons of fish meal per year, but it is not enough for the country's requirements. The percentage conversion of fish to fish meal in Iran is between 15-20 percent. According to FAO reports 30,000 tons of fish are caught in Iran. With the establishment of one or two factories around the Oman Sea or Persian Gulf more fish meal could be produced. In Iran especially, the type of fish is mostly industrial and can be used for this purpose. The amount of fish meal imported in 1968-69 was 4,465 tons.

Bone meal Bone meal is produced by one fertilizer plant under the Ministry of Agriculture. The production of this plant is 1,200 tons per year. Chemical analysis of this bone meal is calcium 22-23 percent, phosphorus 9 percent, protein 22 percent, fat 2 percent. In addition to this factory some private companies are making bone meal through the burning of bones. The percentage of calcium is 35 percent and phosphorus 15 percent.

Brewers grains Recently brewers grains are being used by dairies around the Tehran area. This by-product is mixed with beet pulp, straw, wheat bran, cottonseed meal and so forth.

Date meal About 200 tons of dates are being used for alcohol in Shiraz but to date by-products are not being used.

Meat meal Meat meal is being produced by the Tehran slaughter house at the rate of 500 tons per year. Primary use is for poultry feed. So far there has been no production of blood meal.

FEED DISTRIBUTION

There is no particular organization for the distribution of feed throughout the country. Private haulers are usually contracted on an individual basis.

The fact that transportation charges are somewhat expensive may be due to roads. Roads from the provincial towns to villages are usually rough dirt roads accessible by truck only in good weather. Transportation charges for wet beet pulp are 100 rials for one ton kilometer and nine rials per ton kilometer for dry beet pulp.

Recently there has been a reduction in hauling charges by rail for fertilizer and this practice should be adopted for feed stuffs. Rail rates per ton kilometer are significantly lower than truck rates. The common methods of transporting feeds are rail, truck, small pickups and in the rural areas, draft animals.

Feed mills around Tehran distribute their feed either in bulk or in paper bags, however only 20 percent of the feed processed in Tehran is distributed to the provinces due to high transportation charges.

CONCLUSIONS

Surplus feeds are available in different parts of Iran. Sugar beet pulp is being produced at the rate of 1,020,000

tons annually. Of this amount less than half is actually being used as livestock feed. Cottonseed hulls, particularly in the Caspian area, are not being completely used. Wheat and rice bran are available in quantities and are not being completely used as livestock feeds.

It seems that Iran is not poor in feed sources but policies and methods should be corrected to obtain maximum efficiency from feeds available. To improve this condition the following suggestions are given.

Increase forage production The farmers should be encouraged to produce more forage. Some varieties of clover produce well in the Caspian area. Berseem can be rotated very well with rice. Cultivation of alfalfa and sanfoin can be increased in areas where precipitation is over 250 mm per year, rotated with wheat or grown independently. Corn production which is centered mostly around Tehran and in the Gorgan area should be increased throughout the country especially for silage.

Feed factories Construction of new feed mills should be completed by the end of the Fourth and Fifth Plans in areas where there is a strong tendency to increase livestock production through feed lots, dairies or broiler and egg farms. Production of concentrate feeds should be kept at a minimum so as to be fitted to the prices of animal products i.e. meat, milk, eggs.

Regional cold storage plants The construction of regional storage plants in the livestock producing areas will prevent the loss of animals and weight of animals incurred on the way to market.

Fattening program Since the numbers of animals are greater than the carrying capacity of the ranges fattening of animals in the feed lot should be increased. There is no question that the increase in meat production in Iran must come from the expanded use of feed lots.

Correct use of industrial feeds It was mentioned that by-products should be completely utilized for livestock. Beet pulp may be used wet or dry depending on the distance from the factory. Demonstrations for farmers on the better methods of use of rice bran, rice hulls, oil cake and brewers grains should be undertaken.

Customs and taxes Materials imported for livestock feed should be free of customs and taxes.

Reduction of transportation charges Transportation charges should be reduced for rail shipment of feeds.

COLLECTION OF VITAL ANIMAL HUSBANDRY STATISTICS

by

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INTRODUCTION

ANIMAL HUSBANDRY statistics, like any other statistics, become the basis on which means of development (policies and programmes) are formulated for achieving the goal (increased production income) to which the nation aspires. Statistics also provide an index or metre to gauge various stages of growth and development. The animal husbandry statistics needed for making development policies and programmes may be divided into four steps:

- 1) Need for statistics as the basis
- 2) Objective for animal husbandry planning (achieving higher production income)
- 3) The means (programmes to be drawn up within the available resources to maximize the production of desired items of livestock and poultry and their products)

- 4) Execution and evaluation (to execute and measure in terms of statistics, the stages of planned growth and development from time to time).

The present paper will aim at the collection of animal husbandry statistics needed for development and hence will cover other aspects in general as involved with that.

Vital animal husbandry statistics have a direct bearing on the estimates of the availability of milk, meat, eggs, hides skins and other livestock products and by-products; if the statistics are crude it is difficult to make policy decisions to effect any development of desired level especially in those fields of animal husbandry where need for development is more pressing within available scarce resources. Unreliable statistics may mislead to conclusions which would give undue priority to the area where need is less and thus eliminate those items which deserve pressing priority. This paper will aim at the following aspects:

- a) Organization dealing with livestock statistics in Pakistan
- b) Collection of vital statistics in this field their adequacy or inadequacy for development
- c) Efforts made for refinement of livestock statistics as needed for development and planning
- d) Bench mark statistics, plan and development
- e) Livestock statistics in Asian countries, non-Asian countries
- f) Methods of collection of statistics
- g) Lack of statistics and development
- h) Fertility, mortality and slaughtering
- i) Conclusions.

ORGANIZATION DEALING WITH LIVESTOCK STATISTICS IN PAKISTAN

There is no proper organization which deals exclusively with livestock statistics. However, many organizations are associated with such work:

- a) Central Statistical Office, Economic Affairs Division
- b) Central National Income Commission
- c) Agricultural Marketing Advisor, Central Ministry of Agriculture and Works
- d) Planning Unit, Central Ministry of Agriculture and Works
- e) Agricultural Census Organization, Government of Pakistan, Lahore
- f) Directorate of Land Records, West Pakistan
- g) Bureau of Statistics, Planning and Development Department, Government of West Pakistan, Lahore
- h) East Pakistan Bureau of Statistics, Government of East Pakistan
- i) Water and Power Development Authority, East Pakistan
- j) Water and Power Development Authority, West Pakistan
- k) Bureau of Agricultural Statistics, East Pakistan
- l) Department of Agriculture, West Pakistan (Animal Husbandry Wing)
- m) Directorate of Livestock Services, Government of East Pakistan
- n) West Pakistan Agricultural University, Lyallpur
- o) East Pakistan Agricultural University, Mymensingh.

A proposal was put forward by the Government of West Pakistan for setting up planning and statistical cells with the Regional Directorates of Animal Husbandry, West Pakistan, the Directorate of Livestock Farms and the Directorate of Veterinary Research but only one such cell has been set up in Lahore Region, West Pakistan. Other regions have not as yet set up such cells. In East Pakistan there was no such proposal during the Third Plan period, hence it would be desirable to have such a cell during the Fourth Plan. Directorate of Livestock Farms, Lahore have been issuing detailed livestock data on livestock farms in its annual reports. There was a scheme concerning livestock economics and statistics in East Pakistan during the Second Plan; data

available from government livestock poultry farms and artificial insemination centers have been analyzed under this scheme. There was a proposal for setting up a veterinary research institute in East Pakistan including a section for production of biological products, but this scheme has not as yet been implemented during the Third Plan. All types of important research sections needed (including the livestock statistics section) would be provided under this institute if duly proposed by the Government of East Pakistan. The Agricultural Research Council, Government of Pakistan, sanctions schemes which also cover livestock statistics and research on fertility, mortality and diseases.

COLLECTION OF VITAL STATISTICS

The need for the collection of livestock statistics was accepted by the Indian Famine Commission as early as 1880. Before 1920 livestock data were collected in the Indo-Pak sub-continent on a different basis. Uniformity of methods and the time schedule for conducting the census were not maintained and were different in different areas states provinces. In 1916 the Government decided to hold a quinquennial livestock census. The first such census was held in 1919-20; the second was scheduled to be held after five years in 1924-25, but was carried out in former Punjab in 1922-23 while in undivided Bengal it was conducted in 1926.

According to observations made by the Royal Commission on Agriculture in India in 1928, this census was not conducted regularly every five years; hence the commission stresses the need in its report. The censuses of 1930, 1935, and 1945 were conducted almost according to schedule.

The 1950 census was not held at all, due to post-Independence problems. The data for the 1945 census for East and West Pakistan geographical areas were compiled in 1948 and published by the Cooperation and Marketing Advisor, Central Ministry of Food and Agriculture, under the title "Livestock Wealth of Pakistan, 1949." The data as published in this report in 1949 are the same as those in the 1945 census as stated above; these were adopted with the assumption that there was no change in livestock population on account of migration of livestock and other factors. This was the first set of livestock data available in Pakistan.

The livestock census of 1955 was not held in East Pakistan. A census was, however, carried out in West Pakistan. The results of this census were compiled under the title "Livestock Statistics of West Pakistan" and published by the Ministry of Food and Agriculture in 1960.

The quinquennial livestock census scheduled for the year 1960 was not conducted due to an agricultural census (including some aspects of livestock) which was conducted in both wings of the country in 1960.

Other surveys studies were also conducted by various organizations which also provide some useful livestock statistics. Some of them are named below:

"Report on Marketing of Milk in East Pakistan, 1962," by the Directorate of Agricultural Marketing, East Pakistan

"Report on the Survey of Livestock and Their Products in East Pakistan, 1965," Bureau of Agricultural Statistics, East Pakistan

"Agricultural and Animal Resources of East Pakistan, 1961," Agricultural Marketing Directorate, East Pakistan

"National Income Commission Report, 1965," Government of Pakistan

"Livestock Production in West Pakistan" by S.M. Ishaq, Director Livestock Farms, West Pakistan, Lahore.

During 1965 there was no livestock census held in East Pakistan but a census was conducted in West Pakistan. The census was held from November 1965 to February 1966 in the Northern Zone and the report was published in February 1966. No such census report was published in respect to the Southern Zone. Data collected on various types of animals were, however, compiled by district. Attempts were made to refine these data for use at the time of preparation of plans.

EFFORTS MADE FOR REFINEMENT OF LIVESTOCK STATISTICS AS NEEDED FOR DEVELOPMENT AND PLANNING

Pre-Plan The need for livestock statistics was felt in the pre-plan period. "Livestock Wealth of Pakistan, 1949," which provides the estimated livestock number of East and West Pakistan, formed the basis for estimating the priority needed on programmes for development; pragmatic efforts were made from time to time for preparing and implementing development schemes. The Six-Year Development Plan 1951-56 was, however, not a proper plan like the First, Second and Third Plans.

First Plan Collection of statistics on livestock and their products did not improve when the First Plan was prepared. Attempts were made to explore the scope of production in the livestock sub-sector and to implement programmes drawn up from general considerations through additional disease control units, breeding and other activities.

Second Plan During the Second Five-Year Plan efforts were made to decide bench marks for livestock number and livestock products. From the deliberations held with the provincial government some pragmatic estimates could be made about livestock number and their products as could be derived and projected from quinquennial livestock census 1955 (published in 1960). Information on such estimates is available in the "Paper Pertaining to Preparation of the Second Five-Year Plan in the Agriculture Sector," Volume No. IV Animal Husbandry (AGR-77), Planning Commission. Such estimates were not, however, made in respect to East Pakistan as there was no livestock census in 1955 or even prior to 1960. No bench marks production targets were, therefore, incorporated in the Second Plan document on livestock and livestock products. The Second Five-Year Plan was, therefore, similar to the First Five-Year Plan, prepared on the basis of trial and error method of estimating the

needs in the field of animal husbandry and meeting those needs through various programmes on disease control, breeding, education research, dairying and others.

Third Plan The author made serious efforts to compile data on livestock number and also livestock products so that a bench mark production target on these items could be decided for preparation of the Third Plan. The Provincial Governments of East and West Pakistan could not find reliable statistics to recommend bench mark target numbers of livestock and production of livestock products in the livestock sector for preparation of the Third Plan. The Third Plan documents were issued without such bench marks.

In 1965 Messrs. Carl Gotsch and Walter Falcon made an effort to work out bench mark livestock number and livestock products in East and West Pakistan for the Third Plan, under their papers, entitled "Growth Rate of Livestock Products in East Pakistan During the Second Plan Period and Suggested Bench Marks for the Third Plan and Growth Rate of Livestock Products in West Pakistan During the Second Plan Period and Suggested Bench Marks for the Third Plan." These estimates were, however, further examined by the author in view of the overestimation in respect to cattle, goats and sheep in East Pakistan livestock data. Efforts were also made by the Indicative World Plan unit of the FAO Rome in 1968 to make certain estimates on livestock and its products but they also needed similar refinements.

Dr. Israrul Haque and Col. M. Masud of West Pakistan Agricultural University, Lyallpur, in their publication entitled "Livestock, Poultry and Their Products" made an excellent effort to make projection of livestock and livestock product statistics for the year 1965 for the country and the two provinces of East and West Pakistan. This was issued in 1966. The yield coefficients of livestock products seem to have been used primarily from government farms; hence the data worked out are found somewhat overestimated.

Fourth Plan The Fourth Plan Study No. 3 entitled "Estimates of Livestock and Poultry Population and Their Products and Suggested Bench Marks for the Fourth Plan in East Pakistan" by Dr. Ghulam Rabbani and Mr. Mutahar Hussain of the Planning Department, Government of East Pakistan, covered various aspects of livestock and poultry and their products, and estimated the number of livestock and their products for 1965-70, as well as bench mark livestock population and its products for the year 1969-70 to be used in the Fourth Plan. On examination the author observed that the ratio between cows and young stock was not biologically sound. As such, in spite of other soundness, certain aspects of this study had to be revised in consultation with the East Pakistan Government so that it could be used as bench mark in the Fourth Plan. Bench mark number of livestock and livestock products for the Fourth Plan, worked out by the author, has been in line with the thinking of the Government of West Pakistan.

BENCH MARK STATISTICS PLAN AND DEVELOPMENT

Since the quinquennial census was not conducted at

all in East Pakistan after Independence and it was conducted very much off the time schedule in West Pakistan, difficulties have been experienced in formulating animal husbandry development plans without proper data at the appropriate time of preparation of each plan. In fact, quinquennial livestock census, which is scheduled to be held every five years could provide bench mark statistics on livestock for the next Five-Year Plan and stage of achievement as the result of execution of development schemes programmes during the previous Five-Year Plan period. Problems of statistics have been faced in the preparation of the Fourth Five-Year Plan, in previous plan periods.

Several efforts have so far been made by different experts and authors to make projections estimations of vital statistics in the livestock sector on the basis of growth rate observed during the past period. Some livestock statistics have, therefore, been available through such projections and estimations as discussed already. While an effort is made for making projection on livestock statistics, growth rates on different classes of animals for various periods in respect of all Pakistan as well as the provinces are worked out with a view to finding out the growth rates which are statistically sound and biologically acceptable.

The Planning Commission arranged a meeting of the working group of the livestock sub-sector of the Indicative World Plan in August, 1968 under the chairmanship of Mr. M. Shafi Niaz, S.K., T.Pk., Chief, Agriculture

and Food Section, Planning Commission. The group discussed various connected problems on livestock statistics and came to conclusions on certain aspects. Conclusions on growth rate and projection on statistics on the basis of growth rate were generally agreed upon. On some items of statistics there was no convergence of opinion. Agreed conclusions were used by the author for the refinement growth rate and projection of the required data and were made with other supplementary materials as considered appropriate for the purpose. Accordingly tentative bench mark number of livestock and production of livestock products have been worked out for the Fourth Plan.

The 1955 livestock census in West Pakistan and the 1960 final census data relating to livestock number are found to have overestimation in respect to cattle buffalo in West Pakistan. The 1948 statistics in the "Livestock Wealth of Pakistan, 1949" and the data in the 1960 preliminary census were found more suitable for obtaining the growth rates and are used for all types of livestock as shown in Table 1.

On the basis of 1948-1960 (preliminary census) and other facts available in various papers discussed above, estimated production data in 1959-60 and 1964-65 as bench mark for the Second and Third Plan respectively and 1969-70 production data as tentative bench mark for the Fourth Plan in respect to livestock products have been worked out with the growth rates as shown in Table 2.

TABLE 1
LIVESTOCK POPULATION EAST AND WEST PAKISTAN
POPULATION

Unit		1959-60	1964-65	1969-70	Average Annual Growth Rate %	
		In 000				
Cattle	East Pakistan	Number	18,721 ¹	20,670	22,821	2.0
	West Pakistan	-do-	9,800	9,898	9,998	0.2
Buffalo	East Pakistan	-do-	455	412	373 (-)	2.0
	West Pakistan	-do-	6,500	7,247	8,080	2.2
Sheep	East Pakistan	-do-	422 ²	546	707	5.3
	West Pakistan	-do-	9,786	11,072	12,527	2.5 ⁶
Goats	East Pakistan	-do-	6,034 ³	7,029	8,188	3.1
	West Pakistan	-do-	7,261	8,017	8,851	2.0
Poultry	East Pakistan ⁴	-do-	20,096	19,594	19,111 (-)	0.5
	West Pakistan ⁵	-do-	10,015	12,600	15,853	4.7
Fowls	East Pakistan	-do-	15,474	15,087	14,715	---
	West Pakistan	-do-	9,714	12,222	15,377	---
Ducks	East Pakistan	-do-	4,622	4,507	4,396	---
	West Pakistan	-do-	301	378	476	---

1. 1960 census figures adjusted for 3.6 percent overestimation of bullocks.

2. 1960 census figures adjusted for 11.6 percent overestimation of sheep.

3. 1960 census figures adjusted for 6.6 percent underestimation of goats.

4. Total poultry population has been split up in the ratio of 77:23 of fowls and ducks respectively on the basis of the ratio obtainable in 1945 census.

5. Total poultry population has been split up in the ratio of 97:3 of fowls and ducks respectively on the basis of the study made by Dr. Israrul Haque and Col. M. Masud. *Livestock Poultry and Their Products*, West Pakistan Agricultural University, Lyallpur, 1966

6. Captain Mohammad Ashtaq, Joint Secretary, Animal Husbandry, Department of Agriculture, Government of West Pakistan, Lahore (estimates dated 2nd November, 1968).

TABLE 2

ESTIMATED PRODUCTION OF MILK, MEAT, EGGS, HIDES/SKINS AND
WOOL DURING 1959-60, 1964-65 AND BENCH MARK PRODUCTION
FOR THE FOURTH PLAN 1969-70

	Unit	1959-60	PERIOD 1964-65	1969-70	Percentage of Increase in 5 Years Ending 1969-70
Milk	000 Tons				
East Pakistan	-do-	499.7	550.6	607.9	10.4
West Pakistan	-do-	4061.3	4440.0	4862.7	9.5
All Pakistan	-do-	4561.0	4990.6	5470.6	9.6
Meat					
East Pakistan	-do-	161.1	176.6	194.0	9.9
West Pakistan	-do-	181.7	196.2	213.3	8.7
All Pakistan	-do-	342.8	372.8	407.3	9.3
Eggs	Million Nos.				
East Pakistan	-do-	396.0	386.0	377.0 (-)	22.3
West Pakistan	-do-	360.0	453.0	570.0	25.8
All Pakistan	-do-	756.0	839.0	947.0	12.9
Hides Skins	000 Number				
East Pakistan	-do-	5889.0	6725.0	7688.0	14.5
West Pakistan	-do-	11382.0	12533.0	13819.0	10.3
All Pakistan	-do-	17271.0	19258.0	21507.0	11.7
Wool	000 Tons				
East Pakistan	-do-	(n)	(n)	(n)	(n)
West Pakistan	-do-	3.7	4.2	4.7	11.9
All Pakistan	-do-	3.7	4.2	4.7	11.9

(n) Negligible

(-) Decrease in percentage

Once statistics are available on bench mark livestock number and its products these can be examined to determine how present supply position compares with present requirements demand for each of the items of livestock and its products. For instance the requirements for milk, meat, eggs and other livestock products are known from consumption surveys or other sources. It would be possible to identify the degree and extent of deficiency or sufficiency in respect to each item. The deficiency of each item, in terms of aspiration of the nation and what selected items are required in higher or lower quantity can be spelled out. If the present level of supply is sufficient for internal consumption it may be maintained at the same level. Strategy for policy decisions will primarily depend on such a basis. A decision is to be taken as to whether increased production of the commodity is for internal consumption as raw material or industrial consumption for secondary products. If export would be possible or its production would save the foreign exchange needed for imports the item would get priority.

If a higher priority is given to a particular item, the objective of planning would be to allocate a comparatively higher amount to such an item.

Since resources are scarce even in the richest country of the world, it is not surprising that the allocation to the livestock subsector is very limited. It is not the total amount allocated to livestock development that would boost up production in this sector, it is rather the priority and importance given to comparatively more productive programmes schemes within this sector which would speed up production of livestock commodities. For instance if it is observed that better nutrition is of highest importance for increasing livestock and livestock products, it would be essential to lay more emphasis on the production of fodder feeds in preference to the allocation of funds to disease control or breeding or other programmes. Under such circumstances the feed and fodder programme would receive highest priority. In other circumstances highest priority might be given to some other programme.

LIVESTOCK STATISTICS IN OTHER COUNTRIES

The livestock statistics situation as reported in FAO publication, 1955 on "Methods of Collecting Current Agricultural Statistics and Asian Agricultural Survey" by the Asian Development Bank, 1969 and other sources have been used for a review of the situation in Asian and non-Asian countries as follows:

Asian countries In the developing countries like the Philippines, Malaysia, Korea, China and Thailand the collection of livestock statistics is covered along with agricultural statistics. Statistics of these countries are not satisfactory, however, as data on food balance sheets are somewhat underestimated. A census of crops and livestock is conducted in the Philippines on an annual basis. There is no organized collection of livestock statistics in Singapore.

Personnel dealing with livestock statistics in these developing countries are not properly trained for the purpose of collection, analysis and issue of statistical data. In general persons are normally trained in statistics but they lack knowledge of the biology of livestock. High quality statistics, like accuracy, concept coverage, standardization and competence are lacking in most countries. Statistical programmes in Asian countries with a few exceptions generally lack in continuity. The collection of statistics has to be designed for presentation of the data in a manner that is convenient for the consumers to use. Data issued very often lack in meeting the requirements of the users. In some of these countries statistics are collected from cooperative societies organizations, in other countries these are collected through censuses, surveys, estimation and judgement. In Iran and Turkey livestock censuses are conducted through questionnaires and supplemented by local enquiry and personal judgement by agriculture livestock personnel and other enumerators. India collects livestock statistics every five years except in some states where it is done annually. In Japan livestock and livestock product statistics are collected from censuses conducted every five years and supplemented by intercensus surveys. Data on livestock number, milk, eggs, etc. are collected from sample enumeration but in case of dairy factory products these are collected through complete enumeration of the dairy factories. The Philippines, Taiwan and other countries where cooperative organization is developed, livestock statistics are collected from this organization and supplemented by estimation and sample enumeration.

Non-Asian countries Collection of livestock statistics is not uniform all over the world. The scope, definition, accuracy and coverage vary from country to country. Some countries collect livestock statistics annually while some countries collect them only every five years in other countries they are not collected at all. In the United Kingdom collection of livestock statistics is compulsory. Forms questionnaires are distributed to farmers who fill them in and return them in all possible accuracy and completeness. The method followed in the USA is identical but submission of returns is on a volun-

tary basis. Not more than 50 percent of the questionnaires are received completely filled in. Some are received with incomplete information also. In some developing countries in Africa and South America, the question of compulsory or voluntary collection of statistics by the questionnaire method does not arise, as farmers are not sufficiently educated to fill in the forms themselves and to make complete answers to meet the requirements of enumeration. According to the first issue of a summary review made by the FAO of the United Nations in its publication entitled "Methods of Collecting Current Agricultural Statistics," there were 89 countries (17 Asian and 72 non-Asian countries) analyzed on the basis of unit of enumeration, 77 countries had some sort of enumeration but 12 countries had no enumeration.

In the field of livestock product statistics there is general deficiency in data collected all over the world. Meat production statistics are generally collected from slaughter houses in the European countries, as well as countries like Argentina and Brazil. Individual farm data is collected in Belgium, Finland, Canada, the United States, Australia and New Zealand, and supplemented with slaughter house and processing plant information. In Norway data are derived from marketing cooperatives.

Statistics on the production of milk are more difficult to obtain than the statistics on the production of meat. There are estimates only on a judgement basis in most countries of the world. In Germany and Australia milk production is estimated at district level. In the United Kingdom this is collected on reports received from milk marketing centers. The United States, Canada and Australia collect data from farms.

Estimates for production of eggs are more difficult to obtain than those of meat. Indirect estimates are made for collecting data on eggs. In Denmark the major share of eggs produced in the country is marketed; the Government controls the sales and export of these, hence data collection becomes easy. Farms are enumerated and marketing data are used for estimating egg production in Australia. In the United States and Canada these estimates are based on sample enumeration of farms. In many countries egg production data are altogether non-existent.

METHODS OF COLLECTION OF STATISTICS

Livestock statistics, similar to other agricultural statistics are collected in the following ways:

- a) Estimation/judgement
- b) Complete enumeration
- c) Sample survey (random, stratified, purposive)
- d) Projection (Use of past census/survey data and projection of the subsequent period on the basis of growth rate.)

Complete enumeration is the most expensive of all methods and has become out-of-date. It is time and labor consuming. If enumerators are not properly trained, this method may lead to major errors in the data compiled in spite of the high cost of collection of data.

In recent days sample survey is conducted keeping in mind the purpose for which data are being gathered and the sample drawn on a random basis within the purpose and stratification made to achieve the desired objective in collection of data. Livestock census conducted in Pakistan is on sample enumeration. Trained staff are required in sample surveys similar to other surveys. Any error in this survey is multiplied hence a high degree of precaution is needed when this method is used.

LACK OF STATISTICS AND DEVELOPMENT

Development plans may be formulated under two extreme circumstances: a) with adequate statistics, as in the USA, the UK, Japan, and so forth, and b) without basic statistics, as in Pakistan and other developing countries. The first one is done with knowledge of what is available and to what degree each item of information is needed for planning and development, the second is done without knowledge of the present position, where a decision to do something must be made without that knowledge. Statistics are the foundation on which superstructure of plan (policy, strategy, priority and programme) is built. In case statistics are lacking this is a structure without foundation and may be broken down by any internal or external cause. For a developing country like Pakistan where resources for development are limited, it would be desirable to invest a minimum amount on the development of certain programmes in the animal husbandry sector which are less productive. In the absence of statistics the programmes would, therefore, have impact in an undesired direction.

Statistics, even when lacking, are not very expensive to collect as they form a very small part of the total development and revenue expenditure. It is desirable that allocation be made for conducting surveys and experiments in various fields of livestock production to discover results so that these are available to make a choice between various alternatives in livestock development programmes schemes. Investment of an optimum amount should be made in cases in which it is learnt that production income would be maximized by the minimum optimum amount of investment.

FERTILITY, MORTALITY AND SLAUGHTERING

Statistics regarding fertility, mortality and slaughtering are generally considered less important than the vital statistics on livestock number. Studies and surveys published in Pakistan exclusively on fertility, mortality and slaughtering are not many. Data can, however, be made available from many sources.

Fertility in animals varies according to the livestock, their types, species, nutrition, resistance to diseases, climate and so forth. From a biological feasibility point of view, reproduction in cattle and buffalo in Pakistan is on the order of 15 to 20 percent, in sheep and goats this is on the order of 40 to 60 percent, in case of poultry it is 185 to 196 percent. These fertility rates may, however, vary under various conditions localities.

Mortality in animals is related to nutrition, resistance to disease, natural calamities, extreme climatic condi-

tions, care as well as management under which livestock is raised. If the animals and birds are subject to extreme circumstances and temperature, there may be a very high mortality. Mortality rates, are, however, going down with the improved conservation facilities through curative and preventive measures against diseases. Most generally acceptable mortality rates in Pakistan at present are about 10 percent in buffalo, about 7 percent in goats sheep and about 60 percent in poultry birds (out of this 60 percent, 50 percent may be attributed to diseases). Mortality in fowls is higher than it is in ducks. Young animals birds have a comparatively higher mortality rate than adult animals birds. Mortality of livestock on government farms would be lower than the same in disorganized private farms, whereas mortality in privately owned well managed farms is generally lower than the same in government farms. Mortality data may be collected by sample survey farm management survey.

There is no fixed rate for slaughtering but data are collected from the slaughter of animals in cities and urban areas (recognized and unrecognized slaughter houses). The estimated number of animals slaughtered in rural areas added to the number slaughtered in urban areas provides some basis for working out the rate of slaughter in animals. It is also possible to estimate the slaughter rate or number of animals slaughtered from number of hides and skins.

The total number of hides skins equals the number of the same used for local consumption plus export. The total number may be ascertained from: a) number of hides and skins from recognized and unrecognized slaughter houses in urban areas, b) hides and skins obtained from rural areas, c) hides and skins from fallen animals and d) skins from aborted kids and lambs. A counter check is necessary on two sets of data on number of hides and skins and the estimated number of animals slaughtered, so that number of hides skins is within reasonable limits, and acceptable.

Animals slaughtered in case of cattle and buffalo are taken in West Pakistan as about 7 and 3 percent respectively, in the case of goats and sheep these are taken as 50 and 30 percent respectively. Slaughter rates for cattle and buffalo in East Pakistan are taken as 10 percent and 5 percent respectively. The slaughter rate in sheep and goats in East Pakistan is on the order of 25 percent and 50 percent respectively.

The estimated slaughter rate of 134 percent in poultry birds in East Pakistan is higher than the 120 percent rate in West Pakistan. The rate of slaughter in poultry cannot be properly estimated from actual slaughter or from number of skins which are nonexistent, hence indirect methods are used. Consumption survey provides data on poultry meat consumed. Once meat per bird is known it is possible to work out the slaughter rate in poultry birds. The existing system of data collection has to be streamlined and data published on an annual basis.

Collection of statistics on fertility, mortality and slaughtering is a prerequisite for ascertaining some aspects of animal husbandry programmes which need

the attention of the planners development departments authorities. If the data is not available, some sort of projection estimation has to be made for allocating the available funds for development of livestock and their products.

CONCLUSION

In Pakistan we may collect data on livestock number, fertility, mortality, etc. on annual basis as is being done in the Philippines. Unlike the Philippines where cooperatives are the main source of livestock data, we have to depend on sample enumeration and farm management surveys. While sample survey would provide almost all types of data, farm management survey would be needed for collection of data on births and deaths besides many other facts which have a bearing on annual or periodical performance.

Estimated number of animals slaughtered either through recognized slaughter houses and through other channels, and estimated production of milk and eggs

through sample survey method should also be collected on an annual basis instead of quinquennial basis.

The time schedule has not so far been maintained and coverage is inadequate but more frequent collection of data through survey should cover the deficiency to a great extent. Our farmers are not educated, hence enumerators and technical staff handling data on livestock statistics need to have some training and education on statistics. Biological problems of statistics could only be properly understood if personnel associated in the collection and processing of livestock data are technically qualified in animal husbandry agriculture.

The Central Agricultural Census Organization Central Planning Unit in the Agriculture Ministry may organize statistical cells on livestock and initiate collection of livestock statistics on an annual basis similar to crop statistics. Similar statistical cells would have to be set up at the provincial level also. The main responsibility should, however, be with the Ministry of Agriculture and Works, Government of Pakistan.

THE LIVESTOCK DEVELOPMENT PROGRAM IN TURKEY

by

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GENERAL SETTING

BASIC CHARACTERISTICS OF THE LIVESTOCK POTENTIAL

TURKEY has large numbers of livestock with respect to total land area and particularly in relation to the human population. According to the estimates in the Second Five-Year Plan, there were 13.4 million cattle, 1.2 million buffalo, 34.1 million sheep, 20.8 million ordinary and mohair goats, 1.4 million horses and mules and 1.9 million donkeys. Most of these are native breeds. In recent years, cattle and sheep numbers have been increasing at between 1 and 2 percent per year whereas the number of goats has remained constant or declined very slightly.

At present the gross mortality rate in cattle is about 8 percent of the inventory on January 1 with mortality in calves to 10 percent. Since oxen constitute a fairly high proportion of the total herd (about 22 percent), the proportion of breeding females is fairly low at about 38 percent. The calving rate is very low at perhaps 62 percent. This, combined with the comparatively high mortality rates for both young and older animals, requires that almost all young females must be raised as replacements. These estimates indicate that about 23 to 24 percent of the inventory lactate and that the total annual animal slaughter amounts to 14 to 15 percent of the entire inventory.

Total cattle slaughter amounts to about 2.0 million head with an average carcass weight to about 90 kgs. The total slaughter of sheep in 1967 was about 13 million head amounting to about 38 percent of the January 1 inventory. Total lamb and mutton production was about 195.0 thousand tons with an average carcass weight of 14.73 kgs per head. Milk production per cow lactating in 1967 was estimated at 606 kgs available for human consumption or a total of 713 kgs including that fed to calves.

The aggregate feed supply at present consists of a comparatively small proportion of concentrates and a very high proportion of low quality roughage, as shown in Table I. By far the greater part of the present supply of concentrates is utilized for providing the absolute minimum winter feed supplementation necessary for survival of animals and for the provision of near minimum energy allowances for work animals. Roughages consist almost wholly of cereal straws and low quality open pastures. Controlled grazing and pasture improvement are practically nonexistent. Whereas the potential for pasture improvement is substantial, the potential for providing lush pastures for the full grazing season is ecologically and economically extremely limited. The potential for providing improved forage production under present prices (either hay or pasture) from

irrigated land is also limited because of the competition of other crops for such land. Because of the vast dryland area required, the potential for replacing most of the present straw consumption with high quality forage is also very limited.

REVIEW OF PERFORMANCE IN RECENT YEARS

Up to about ten years ago or so most of the increased effective demand for livestock and livestock products was met through an increase in livestock numbers and a very modest increase in yields. With the recently accelerated rate increase of population and in disposable

income per capita, the expansion of production has been falling increasingly behind the expansion in demand. The possibility for continued expansion in animal numbers is extremely limited and, indeed, pastures are at present heavily overgrazed. With the accelerating divergence between demand and supply in recent years, price relationships are now moving in a direction more favorable to the expansion of livestock production. The relief from this obstacle has been most marked in the past three years or so. The removal of price ceilings in municipal markets has permitted the pressure on prices to become felt.

TABLE I
FEED AVAILABILITY, 1967 PLAN ESTIMATES (000 tons)

	Feed Materials Dry Feed Equipment	Total Digestible Nutrients	Percentage of Total Digestible Nutrients
Concentrates			
Cereals.....	3764	2905	10.34
Pulses.....	98	63	.22
Brans, oilcakes and other by-products.....	1434	972	3.46
Salvaged by poultry ¹	903	681	2.42
TOTAL.....	6199	4621	16.44
Stored Roughages			
Wheat straw.....	11903	4832	17.19
Other cereal and pulse straw including corn stalks.....	9423	4148	14.76
Cultivated hay.....	857	436	1.55
Wild hay.....	3000	1473	5.24
TOTAL.....	25183	10889	38.74
Open pasture including forest.....	18606	9053	32.21
Other Pasture			
Cereal and pulse stubble.....	3423	1506	5.36
Pasture of fallow land.....	2341	1171	4.17
Pasture of other cropland and all other crop by-products.....	1756	866	3.08
TOTAL.....	7520	3543	12.61
TOTAL OF ALL FEEDS.....	57508	28106	100.00

1. Waste grains, household waste, etc. salvaged by village poultry.

The current level of export of meat is about 23 thousand tons annually, mostly as live animals. This amounts to some 4 to 5 percent of total production. In addition large numbers of animals are smuggled across the southern and eastern borders.

Not more than a few percent of the total slaughter passes through plants with facilities for utilization of by-products. As a result, almost all by-products are wasted or seriously underutilized. The concentration of slaughter from a large number of very small slaughter places to a limited number of modern slaughter houses is necessary to enable full utilization of the by-product potential.

At present, total available concentrate feeds amount to about 6.2 million tons of which about 4.4 million tons go to livestock other than poultry. Total straw utilized as feed amounts to about 21 million tons. Other stored forages amount to 3.9 million tons of hay of which less than 900,000 tons are cultivated hay. Production from all open pasture land amounts to about 18.6 million tons. Cultivated land generates about 7.5 million tons of additional (dry) feed derived from stubble and fallow grazing and the salvage of other crop residues. Total roughage utilization is, therefore, about 51 million tons. These feeds supply about 26.7 million tons of total digestible nutrients for livestock other than poultry, only 12.4 percent of which is concentrates.

The total feed supply is at present about 10 percent below that normally required even for the present low growth rates of animals, low milk production levels and poor condition of animals.

LONG-TERM NATIONAL REQUIREMENTS AND EXPORT PROSPECTS

At present the income elasticity for milk appears to be about 0.6 percent whereas that for meat is about 1.3 percent. These levels, combined with an increase in per capita income of 2.8 or 3.0 percent per year and an annual population increase of 2.5 or 2.6 percent, indicate a need to increase milk output at about 24 to 25 percent in a five-year period but to increase meat production by about 38 percent in the same period. The longer-term outlook indicates a continued high rate for meat and a continuation of the same more moderate rate of increase for milk. For the next ten years or so, the increase in milk requirement can be met through improved feeding of existing native animals, although this will require strenuous efforts to implement improved feeding projects. The potential for expanding milk production in this way is likely to be used up rather abruptly by about 1978 or 1980, leaving the entire increase in milk requirement after that date to be met through improved genetic stock with continued improvement in feed supplies to support the better animals.

At present there is a very urgent need to expand meat production whereas the urgency with respect to milk is not quite so high. Because of the long lead time required with respect to genetic improvement, however, it is most urgent that steps be taken immediately to generate the capability of a rapid increase in milk from

dairy animals in about ten years from now.

At present there is a large unsatisfied demand for meat in Middle Eastern countries where prices are above domestic prices. The longer-term outlook in these areas at present is for an even greater divergence between supply and demand. This, combined with the longer-term prospects for the opening up of European markets, makes the potential for export very favorable. On the other hand, with constant relative prices, domestic demand will increase extremely rapidly. The prospects for export, therefore, are dependent to some extent on limits set on domestic consumption through domestic price increases, on the one hand, and the special effort made to increase the livestock output over and above the level set in the Second Five-Year Plan and to divert smuggling to legal export on the other. The limit on such price increases which can be tolerated is an integral part of policy with respect to domestic human nutrition.

Long-term considerations dictate that domestic prices must be allowed to overtake world price levels. This should not, however, be so rapid as to grossly interfere with increases in domestic per capita consumption. Although a large export market exists, the capability of taking advantage of this is dominated by domestic consumption requirements, by the capability of supporting an efficient poultry meat industry and the rate of increase in livestock production that can be generated. Considering this situation, after the adoption of the Second Five-Year Plan, a special study was launched to explore the possibility of increasing livestock output and export over and above the targets set in the plan. The study out of which this program emerged has shown that Turkey has the potential of exporting 70,000 tons of meat annually by 1972 as compared with 35,000 tons estimated in the plan. When this program is in full operation export will exceed 85,000 tons. The immediate introduction of intensive efforts to expand production and to recapture many of the animals now smuggled is, therefore, mandatory.

FACTORS IMPEDING GROWTH

For the past two decades or more, the prices for livestock and animal products in Turkey have been unfavorable relative to the prices for quality feeding stuffs (both concentrates and forages). The production of livestock or livestock products based primarily on cultivated land resources has been impossible. Although Turkey has a large livestock population, a very large part of the livestock industry has been basically a massive salvage operation based on a large volume of open pasture and cereal straws relative to the human population. As indicated above, recent developments have removed much of the problem with respect to basic price pressures.

Apart from the feed supply, the main economic bottlenecks at present appear to be the marketing structures and pricing mechanisms. This implies the need for adequate development of slaughter facilities and milk processing capacity and ensuring their efficient operation. A great deal of attention must be given to

developing an orderly flow of feeder animals, through feedlots to slaughter and from slaughter to the ultimate consumer. At present, almost all animals are sold on a per-head basis up to the point of slaughter. The market for fluid milk and its products is also disorganized. Much of the milk is sold directly by producers or by peddlers especially in the smaller cities. There are no systematic differentials in price for fat or non-fat solids and no systematic seasonal price differentials are employed. The larger cities normally have winter milk shortages. Most cheese is sold according to the reputation of the geographic region of its origin. This is dependent to a large extent upon the particular proportions of sheep, cow, goat and buffalo milk used in its manufacture. Dealers normally sort cheese into types or qualities and sell them as high up the "geographic" scale as they can.

Adaptations are also required in the communal pattern of pasture ownership. Adaptation must also be made to the inverse relationship which exists between livestock and land ownership.

Even with some improvement in the price situation, the remaining obstacles constitute a formidable list covering almost all aspects of animal husbandry. The most important of these is feed production and feeding since this either eliminates the need for or improves control of diseases and parasites. Poor nutrition is also a heavy contributor to retarded maturity, a low birth rate and a high mortality rate.

BASIC ELEMENTS IN IMPROVEMENTS

Because of the basic nature of the existing feed supply, the critical role that feed improvement must play in the development of overall livestock production and the adverse ecological and economic conditions under which feeding improvement must be stimulated, it is essential that those improved feed supplies and qualities which can be generated economically must be strategically utilized. It is, however, this very aspect of the overall problem that makes it imperative to focus improvement programs on the specific classes of animals that are likely to yield the most favorable returns.

First priority should be given to cattle and sheep since these species will generate the largest response relative to effort expended. Concentration in both species should be specifically on improvement in meat and milk production.

It is crucial, therefore, to concentrate first on the animals themselves and secondly on the provision of feeds in the general approach. The associated and integrated feed programs are derived from the nutritional needs and the feeding prospects for the animals. The total program may be developed by expanding toward the provision of feed supplies (or movement of animals to feed supplies) with extension to pasture management on the one hand and the development of outlets and the solution of other disposition problems for products on the other. Since there are substantial differences in the potential for improving feed supplies in different localities and since livestock are generally

more mobile (economically) than all but the most concentrated of feeds, than vice versa.

The main objective in improving livestock production is to increase the total volume and quality of livestock output available at the consumer level, particularly meat and milk. If national requirements in terms of both domestic consumption and exports are to be met, this must be done on a massive scale. Because of the urgent need for increased livestock production and the relative efficiency of fully integrated activities, it is clear that improvements should be sought through integrated projects. These must be organized on a geographic basis with adequate linkages between the regions in all aspects of the projects. An adequate balance between meat and milk objectives also must be assured. The activities of all executing agencies must be tied to the needs of the individual projects and adequate coordination provided at both the national and project levels.

THE PROGRAM FOR THE DEVELOPMENT OF THE TURKISH LIVESTOCK SECTOR

SCOPE AND OBJECTIVES OF THE PROGRAM

As indicated above, the central objective of the program is to develop meat and milk production to meet domestic requirements and to provide some surplus to take advantage of potential export opportunities. In order to accomplish this overall goal, it is essential to stimulate feed production which will also generate an improved general agricultural pattern, to improve the marketing structure for slaughter animals, feeder animals and for milk. The latter implies rapid expansion of slaughter plants, dairy processing facilities and livestock markets. The encouragement of adequate markets for feed surplus is essential to mobilize the widest possible land use for the generation of feeds. This will also induce improvement in income distribution in that it opens broader opportunities for livestock owners.

The Livestock Development Program, as presently envisaged, is composed of groups of interrelated projects centering on four major areas of activity. These are:

- 1) Livestock finishing
- 2) Livestock breeding
- 3) Feed production and improved feeding
- 4) Product processing and distribution.

Livestock finishing The comparative improvement in meat prices which has occurred in the last several years now permits the profitable finishing of certain classes of livestock. Priority has been given to well-grown, male cattle since this category offers the best opportunity for profitability and will produce a substantial increase in total meat output. Finishing is required also to meet the demands of the rapidly growing domestic market for improved quality beef and to permit export of meat. In addition, because of the general low quality of the base feed supply, beef has traditionally come to market in a poorer condition than sheep.

The second priority is being given to the feeding of

young male sheep. Although a large national gain can be obtained by encouraging the improved finishing of sheep, this subsector is probably more capable of developing adequately and rapidly without large-scale assistance than is beef finishing especially if special assistance is given to beef.

The finishing operations are divided into three sets of sub-projects. The first set of special projects is being undertaken by the sugar factories. Within three years, it is expected that these projects (one for each of eight factories) will finish about 180,000 cattle per year. Assistance will be given only to sugar beet growers wishing to initiate or improve their feeding operations and is restricted to those willing to feed between 12 and 40 animals per lot. This project is made possible since the sugar company constitutes a ready-made administrative organization capable of handling a project of this magnitude and its personnel already have excellent rapport and working relations with sugar beet growers.

The second set of special projects will be undertaken by the Ministry of Agriculture and will concentrate in a limited number of areas (also closely associated with the sugar beet factories) and work with larger-scale and more specialized feeders. This project, involving groups of feedlots on single sites, will finish some 120,000 animals per year within three years. These projects are in addition to existing programs of the Ministry of Agriculture which, at present, are providing assistance in the finishing of some 90,000 animals per year.

These combined projects, together with private (unassisted) finishing, are expected to produce about 500,000 finished animals per year in three years. This will utilize a high proportion of the animals most suitable for finishing at that time.

Associated with these finishing projects is a set of projects for the construction of slaughter plants to handle the output including efficient utilization of by-products near the sites of the feeding operations. Marketing and meat transport facilities are included within these projects. A program for the mobilization of the feeder stock supply and its delivery to the feedlots is also an integral part of the feedlot projects. These combined projects, then, constitute the focal points for the improvement of the entire system of livestock and meat marketing.

Dairy improvement At the center of a second major thrust in livestock development is a group of dairy projects. The very rapid growth of the major cities together with increasing demand per capita has generated a situation approaching the critical stage in the supply of fresh milk and fresh milk products for Istanbul, Ankara, Izmir and Adana. Projects have been developed to supply imported dairy animals to dairy producers in each of these areas. The milk will assist in supplying the milk factory in each region (three of them recently completed) with the supply which they require. At the same time the females will be utilized to provide most of the bulls required for the breeding program. The

projects also provide for credit and technical assistance in generating an adequate feed supply for the animals. Animals will be supplied for modest sized herds. It is required that the roughage supply be produced from the land operated by the herd owner. In these projects, assistance, both financial and technical, will be supplied from feed supply through animals, milk collection, processing and distribution.

It is intended that these projects serve as a focal point for improved fresh milk supply and as a beginning in a national program for the improved handling, processing, and marketing of dairy products. They also serve as one of the two main sets of focal points for genetic improvement. Since they involve feed production on a fully integrated basis, they cut across three of the four main areas of emphasis in the livestock development program.

Livestock breeding As indicated under the dairy projects centering on the milk plants of the main cities, the purebred dairy herds placed under those projects will generate a supply of purebred bulls to be used in upgrading of indigenous animals. These animals, together with those from government breeding stations, state farms and certain other public institutions together with animals owned by certain qualifying private breeders will be mobilized under the livestock breeding project. By far the greatest emphasis in cattle will be placed on supplying Holstein bulls or semen in the coastal areas and areas of low elevation where natural feed conditions are better and on supplying Brown Swiss bulls in almost all of the upland areas. Possibilities of cross-breeding with beef breeds have at present a low priority since the long-term price outlook for animal products appears to dictate the need for substantial income from milk (as opposed to meat) if cattle are to be economically competitive. At a later stage, when feeding conditions have been improved and the birth rate is raised, there is expected to be a place for systematic production of cross-bred beef for direct slaughter.

Adequate outlets for milk and an adequate feed base for improved animals constitute the two major preconditions (or at least simultaneous conditions) for the expansion of this program. The program for dairy processing plants including cheese manufacture and marketing will be pushed ahead or at least simultaneously with this program. The program will also eventually produce an increasing supply of larger framed animals as feeders in the feedlots.

Expanded programs for the supply of superior genetic material for sheep and mohair goats are also to be undertaken. However, the dependence on cattle almost exclusively for expanded national milk requirements dictates that highest priority be given the cattle breeding projects.

Feed production and improved feeding projects - Because of the dependence of improved animals upon improved feeding, highest priority for the projects in this area must be given to those geographic areas best suited to

the early expansion of the breeding programs and must expand at least as fast as the improved breeding material. Because of the project interdependencies, these projects must give priority to the milkshed and to a lesser extent, the feedlot areas. A crucial element in the program is the provision of credit for roughage production and for feed purchase of both roughage and concentrates, with repayment scheduled to correspond with realization of cash for the ultimate product. Priority is to be given first to animal feeding education and, in areas not already included in the dairy improvement project: to projects to improve animal nutrition in critical periods of the lactation and growth cycles of the animals. At present, it is clear that it is not economic to feed indigenous animals at full theoretical nutritional levels throughout the year. It is expected that this type of improvement project with some improved forage production from private lands must precede any large-scale effort to improve public pastures if the latter are to be successful. Associated supporting projects include the production of adequate quantities of seed, etc.

A major impediment to progress in the area of increased production of improved forage (other than inadequately developed market outlets) rests in inadequate present knowledge of adapted species and varieties of forages and lack of adequate knowledge of how these fit in rotation with wheat and industrial cash crops under both irrigated and dryland conditions. Until such time as increased wheat production can be obtained from less land or the villager can be absolutely assured that wheat is available from national stocks at reasonable prices, he will not heed inducements to improve forage or other feed production.

PROJECT IMPLEMENTATION AND COORDINATION

At present there is already a host of public agencies with considerable experience in dealing with the problems of livestock technical services, production, product processing and distribution. The central problem in evolving an organizational framework for an efficient implementation of the proposed program is one of reorienting and adapting the existing administrative units and technical personnel to a series of new concepts and policies and not one of creating wholly new agencies supplanting the existing ones.

The main components of the envisaged organizational structure for the proposed program are summarized in the following section.

Coordination Board This body will be the highest policymaking unit in the implementation of the program. The board will be headed by the SPO Undersecretary, and have as its members the Program Director, the heads of related departments in the Ministry of Agriculture, the President of the Sugar Corporation, the head of the Agricultural Bank, the Director of the Meat Company and the head of the Feeders' and Breeders' Association.

The Coordination Board will be advised and assisted by a small team of highly qualified technical staff,

which might be attached to the SPO. This team will ensure that the whole program is effectively integrated within the annual state programs. It may also advise on and coordinate a series of research projects carried out in various research units and universities.

Office of the Program Director The chief executive officer of the program is the Program Director located in the Ministry of Agriculture who has been appointed by the Government. The Program Director will be assisted by several project supervisors (two have been appointed to date) who will be directly responsible for the projects. The Program Director's office will also be staffed with a number of essential technical specialists who will assist in project development and coordination at both the national and regional level. Where appropriate, there will also be regional project managers as extensions of the Program Director's office. The Program Director's office is charged with the execution and control of the entire program. It will be adequately staffed by technical personnel, capable of carrying out the required promotional and coordination activities. The office should also be equipped so as to evaluate the technical and economic feasibilities of investment and credit applications exceeding a certain minimum size.

Special department in the Agricultural Bank A new development branch has been instituted within the Agricultural Bank, especially designed to serve as a channel to distribute credits and funds to be made available from external and domestic sources for the various special development projects. The accounts of this department will be kept separate and will not be integrated with the rest of the financial operations of the Bank. This department will undertake financial evaluation of investment and credit applications under the projects.

Livestock committees (or bureaus) in related agencies

In agencies related to the program, special committees (or bureaus) will be set up directly under the chief executives of these agencies. The committees will work very closely with the office of the Program Director and will follow up the implementation of measures assigned to their respective agencies within the framework of the whole program.

Provincial committees Provincial committees will be instituted in those provinces with maximum potential for livestock development, headed by the governors with the local representatives of the Ministry of Agriculture and the head of the local branch of the Agricultural Bank. The major functions of these committees will be the promotion and coordination of activities at the provincial level.

The proposed implementation program should be viewed as a tentative system. As project preparations proceed, it will be possible to define the functions and responsibilities of various agencies and units involved in the program. It is quite possible that more innovations might be introduced into the entire planning and implementation process.

The feedlots will provide the major outlet through which feeder animals are funneled through slaughter facilities. The dairy breeding project provides for the eventual supply of milk through the milk processing facilities and generates as a by-product an important source of male animals for the feedlots. The beef breeding project will provide for the greatly improved quality of some of the animals going to slaughter. The various elements included in the feed production and improve-

ment project are mandatory for the support of the first two. The objectives for feed improvement are derived directly from the nutritional needs of the animals involved in the first two projects. The product processing facilities not only provide the focal points for the improvement in production performance but constitute the center of all activities involved in improvement in market structure for livestock and livestock products.

SOME ASPECTS OF NOMADISM AND TRANSHUMANCE IN RELATION TO LIVESTOCK PRODUCTION

by

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THE PART PLAYED by nomadic and semi-nomadic or transhumance systems is of immense importance when considering either national or regional livestock development policies in the CEN TO regional countries. The sheep population alone of the three countries is estimated at an approximate total of seventy-five million head (according to the FAO-WHO-OIE Animal Health Yearbook) and a high proportion of these is in the hands of flock owners dependent mainly upon utilization of ranges. Goats are of much less economic importance and are less in number than sheep on the ranges and I hesitate to venture into the controversial subject of a policy for this much maligned species.

Neither do I intend to discuss the socio-economic and political aspects of nomadism and semi-nomadism. Many of the merits of settlement of nomads are obvious but suffice it to say that disappearance or great reduction of the system would leave enormous tracts of country unused which cannot be used in any other way, with consequent loss of meat, milk products, wool, hair and skins. Voluntary settlement or partial settlement does

occur to some extent for a variety of reasons but for the foreseeable future nomadic and semi-nomadic use of ranges will continue to be of primary importance in the livestock economies of these countries.

Actual improvement of ranges is constantly under discussion and proposals for the approach to improved grazing may be through regeneration of natural plant growth or introduction of new plants, regulation of movement of flocks and improved facilities for marketing and offtake of animals. The practical application of such suggestions is far from easy.

It is obvious that the subject of ranges and the people who utilize them is very complex and interests a number of ministries and departments in each of the three CEN TO countries. Although the terms of reference of this conference are confined to livestock, the wider spheres of nomadism and semi-nomadism embrace a variety of inescapably related interests such as land tenure, local government, hydrology, range management, social affairs, education, human health, animal health and production, marketing of livestock and live-

stock products and even industry as far as it is dependent upon livestock products. I am aware that other papers are being submitted to this conference giving detailed information on a number of matters on which I am commenting briefly and also that regional participants are more qualified than I am to describe conditions within their countries and to discuss possible solutions to their problems. This short paper is therefore offered in the hope that the variety of topics mentioned briefly, may stimulate discussion and mutual exchange of ideas.

True nomads have no permanent settlement or base whereas semi-nomads or transhuman flock owners have permanent seasonal homes. The inaccessibility of both types is the major deterrent to development. Disappearance of flocks to distant areas and often to high mountains for a part of the year tends to isolate them from government contact, while the villages of those with permanent winter quarters are frequently cut off for several months by deep snow or flooded country. Ability to exist with livestock in this manner utilizes tracts of country unusable to a large extent for other purposes and the national contribution of such people in meat and livestock products entitles them to earnest consideration. It may be possible to give them such attention only for short periods of the year. Furthermore it must be admitted that in developing countries, the majority of animal husbandry experts, veterinarians and agriculturalists are inevitably of urban background and even with the best will in the world, they are unable to keep in close contact with the flock owners for much of the time and in any case lack the means of transport to do so. Because of this inaccessibility, consideration of development policy should be limited to measures which are really practicable.

First in importance is the subject of feeding livestock as this is the whole object in the way of life which has been evolved over the centuries. In general it may be said that there is an annual period of good or at least fairly good feeding, varying from season to season according to climate, and a period of low nutrition or even semi-starvation. Creeds have been naturally adapted to such conditions, in spite of which there may be heavy losses in a bad season. Some nomadic tribes provide no supplementary feeding during the low nutrition period and flocks may even have to struggle for meagre grazing under the snow. Others house their animals in winter and feed them mainly on stored forage at that time. In some areas which I have seen in eastern Turkey and northwestern Iran, the storage of natural hay and even to some extent of alfalfa hay is most impressive. I suggest there is room in these and no doubt other areas for assistance by extension and demonstration of better storage by, for example, simple hand-baling machines. Where forage crops are cultivated there is a wide field for assistance with better seed and its distribution and control of crop pests and diseases. In some areas there are by-products and crop residues suitable for concentrated animal feed. These might well be acceptable to village flock owners who manage their stock on a transhumance system and house them in winter. They are of particular

interest to owners of feed lots. In certain pastoral areas there is an increasing encroachment on grazing lands by mechanized agriculture and irrigation schemes which will force people to provide more supplementary feed if they are going to maintain the numbers and quality of livestock. Range management will be discussed in detail on other papers at this conference. Controlling movement of nomadic flocks on the range is extremely difficult but in arid areas there is often opportunity to do this to some extent by more careful siting and capacity of artificially constructed watering points.

Turning to the subject of breeding, it is clear that over the centuries particular breeds have been evolved which are undoubtedly well adapted to their environment. The opportunity for breed improvement by genetic means through cross-breeding with exotic stock is limited and dependent upon a concomitant improvement in the plane of nutrition and management. It is important first to investigate the effect of improved nutrition on indigenous breeds, that is to say the effect upon meat, milk and wool production and lambing percentages. Indiscriminate cross-breeding programmes endanger the natural resistance of indigenous stock to diseases and stress, but work over a number of years in the region countries has shown that there is a place for introduction of fine wool sheep under certain conditions.

Nomadic and semi-nomadic livestock are constantly threatened by a variety of diseases. Some, but not all, may reasonably be prevented by prophylactic inoculations and good management and some may be cured by specific treatments. Expanded veterinary services and diligent application of available control measures could do much to alleviate the considerable livestock losses which are experienced. Inaccessibility of nomadic flocks during part of the year adds to the problem and as in any large sheep husbandry country, much is inevitably dependent upon the flock owners. Their education in disease control measures and treatment of parasitic disease requires good extension services besides readily available curative drugs. Experience in the present CENTO Joint Project for the Control of Parasitic Diseases of Livestock in Iran and Turkey has amply demonstrated the demand for treatment and ready co-operation of flock owners when it is made available. An attempt is being made to assess the economic effect of the campaign.

Marketing of livestock and livestock products is being discussed at the conference. Much remains to be done to ensure fair prices for the actual producers. The use of new road and rail communications merits serious study by governments, not only for internal trade but also for the considerable export of sheep from Turkey and Iran. The importance of carpet wool to the regional countries goes without saying. The grading of export wools in Pakistan has been of great benefit to the trade and is a model of its kind but it is difficult to get the financial benefits back to the actual producers. There are ways and means for this which merit further study, such as bulk classing of wool at country markets, breeding programmes to eliminate or reduce the proportion of

coloured wools and possibly mobile shearing units. Here again the inaccessibility of flocks at the crucial time creates difficulties.

I have repeatedly stressed the difficulties which arise through inaccessibility of nomadic and semi-nomadic livestock over long periods of the year. There is in fact little that government officials can teach flock owners about management under their very specialized system of husbandry but great opportunities do exist in respect of disease control and marketing of livestock and livestock products. It seems to me that efforts should be made to select and train a body of young men from within

the tribes as junior extension officers who will remain with their own people.

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THE PLANNING, IMPLEMENTATION AND RESULTS OF THE LIVESTOCK FATTENING PROGRAM IN TURKEY

by

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TURKEY is considered a livestock surplus country, having 70,000,000 head of livestock. The total available feed is not of sufficient quality or quantity to meet the requirements of this livestock population for maximum profitable productive purposes. Geographically, Turkey is surrounded by livestock importing countries. These are Russia, Iran, Iraq, Syria, Kuwait, Jordan, Lebanon, Libya, and the Sheikdoms in the Persian Gulf area. The European countries would be a potential market for Turkish livestock and livestock products if and when Turkey can be declared free of foot-and-mouth disease.

A need was recognized many years ago by some Turkish officials and AID personnel for Turkey to explore the export market in order to increase its foreign exchange earning through the production and marketing of quality livestock. The livestock feeders were not feeding the quality of live-stock demanded by the importing countries at the time of the initial livestock fattening program.

AID made 15,000,000 counterpart T.L. available to the Government of Turkey to be loaned to qualified feeders to purchase livestock and or feed under the original agreement. The Agricultural Bank was delegated as the lending agency by the host government to make and service all loans made to qualified livestock feeders under this program. The scope of this loan program was increased in 1967 when an additional

10,000,000 counterpart T.L. was made available to the host government by AID under an additional agreement.

Various portions of the original program, which was written and agreed upon in 1960, have been changed as the situation, conditions and problems of the feeders demanded revision.

The following excerpts taken from the Pro Ag will give you a general idea of the planning and implementation of this program:

COUNTERPART PROJECT AGREEMENT AND FINANCIAL PLAN

Project title Loan Fund for the Promotion of Sound Livestock Feed and Marketing.

Project description The loan fund will be provided for the purpose of furnishing credit to private livestock feeders for the feeding of cattle and sheep under technical supervision. The credit will be made available to approved individual feeders, or cooperative groups for the purchase of livestock and for feed. Feeders will be encouraged to produce the type and quality of product desired in the export market.

In addition, loans may be made to 4-K members for the purpose of purchasing livestock and feed. It is mutually understood that the loans to 4-K members will be made and serviced by the Agricultural Bank,

and that personnel of the Extension Service responsible for 4-K activities will supervise such loans in accordance with recommendations of the Provincial Director of Veterinary Service. The purpose of this type of loan is to encourage and train young 4-K members in the selection, feeding, care and marketing of livestock.

This project will be limited to seven provinces as follows: Kayseri, Konya, Adana, Eskişehir, Adapazarı, Afyon, and Balıkesir. The number of provinces under this project may be increased or decreased by mutual agreement, in writing, of the Ministry of Agriculture, the Agricultural Bank and the Food and Agriculture Division of AID. In each of these provinces the Director of Veterinary Service will place a veterinarian supervisor-technician to work exclusively with borrowers of this fund in the promotion and supervision of sound feeding and marketing practices. It will be desirable that these men speak English. U.S.-trained participants will be given preference in making the placements.

The fund will be deposited in and administered by the Agricultural Bank. The Bank will have the full authority for making and servicing all loans.

Loan terms and conditions Loans from this fund may be made for the purchase of feeder livestock and feed and may not exceed six months in duration. Regardless of the duration of the loan, repayment will be made when the livestock are marketed. The Agricultural Bank will charge 7 percent interest annually on the principal amount borrowed. Three-sevenths of the earned interest will be retained by the Bank for administration of the loan fund. An amount equal to two-sevenths of the interest to be earned will be given from the fund to the General Directorate of Veterinarian Service for supervision, demonstrations and educational activities. Advances may be made from the fund, based on estimates, prepared by the Advisory Committee, of loans to be made. The remaining earned interest will accumulate to the Revolving Fund for future loans.

The Agricultural Bank will take as security for the loan the livestock to be fed, the feed and supplies purchased with the loan fund, and in addition, the Bank may take other items of security up to 50 percent of the value of the loan. Since this is a departure from the present security policy of the Bank, any losses occurring as a result of this policy will be borne by the fund. It will be one of the purposes of this policy to demonstrate the value of supervision of loans as it relates to soundness and security requirements.

Procedure for obtaining credit Feeders will apply to the nearest branch of the Agricultural Bank of the Republic of Turkey.

Administration of the loans and supervision of the borrowers will be in accordance with such terms and procedures as agreed upon by the Ministry of Agriculture and the Agricultural Bank with the concurrence of the Food and Agriculture Division of AID.

Estimated time required to complete the project Loans may be made under this agreement until April 1, 1965.

Each year the project will be reviewed thirty days prior to the end of the Turkish fiscal year by representatives of the Agricultural Bank, the Ministry of Agriculture and AID, and a report made to OIEC with respect to the progress of the project and their recommendations for continuation.

Reporting A report showing the amount of credit, the purpose for which loans were extended, collections made, amount outstanding and balance remaining in the fund will be prepared quarterly by the Bank and transmitted to the Ministry of Agriculture with eight copies.

Liquidation of counterpart loan fund Disposition of funds remaining in this project loan fund, including those provided for in the initial allocation and subsequent repayments, interest payment, as well as disposition of outstanding loans, will be by mutual agreement of the Government of Turkey and AID not later than April 1, 1965, or at such earlier date as may be mutually agreed upon.

Upon a decision to liquidate this fund (or until action is taken as stated above by April 1, 1965) the funds remaining in this loan fund will automatically be transferred to the special counterpart account of the Central Bank of Turkey.

PROCEDURES FOR EXTENDING LOANS FOR THE PURCHASE AND FEEDING OF LIVESTOCK OPERATING RESPONSIBILITIES

Agricultural Bank The Agricultural Bank will have the full authority for making and servicing all loans. The Bank will develop criteria for making loans and will furnish same to the designated veterinary representative in each province responsible for certification and supervision of the feeding operations.

The Bank will designate a representative to serve on the Advisory Committee for the development of demonstrations and educational materials for borrowers under this project.

Ministry of Agriculture The Ministry of Agriculture will appoint one man from the General Directorate of Veterinary Services to coordinate the field activities of the veterinarians in the designated provinces. He will also serve as a member and chairman of the Advisory Committee. He will be the coordinator of the educational, demonstration and supervision responsibilities of the Ministry of Agriculture as it relates to this project. It will also be his responsibility to prepare and distribute export market information to the feeders through the veterinary supervisors.

The duties and responsibilities of the Veterinary Supervisor designated in each province will be as follows:

- 1) Investigate all applicants applying for loans under the feeding project and make all surveys required by the Bank for each applicant.
- 2) Issue a certificate or recommendation to the Bank on feeders who qualify for loans.
- 3) Assist feeders in purchasing animals and feed.

- 4) Be responsible for carrying out an approved educational program with the feeders under this program.
- 5) Arrange educational meetings with the provincial employees of other Directorates of the Ministry in order to keep all agriculturists informed of this activity and to popularize the program by cooperation from those employees.
- 6) Assist the feeders in locating markets for their animals at the conclusion of the feeding period.
- 7) Notify the Bank when animals are to be marketed by the feeders.
- 8) Keep a comprehensive report on all feeding operations of each feeder.
- 9) Make reports and attend meetings called by the Coordinator.
- 10) Advise feeders on rations to be fed.
- 11) Inform feeders on quality and kind of animals desired by importers. Notify Ministry Coordinator when animals being fed by feeders in his province will be ready for marketing.

AID Livestock Adviser -- It will be the duty of the AID Livestock Adviser to:

- 1) Assist in preparing training programs for veterinary supervisors
- 2) Assist in training veterinary supervisors
- 3) Serve as an adviser to the Ministry Coordinator
- 4) Attend regularly scheduled meetings of the Advisory Group
- 5) Assist in planning demonstrations
- 6) Assist in planning exhibits and shows.

Advisory Committee -- The Advisory Committee will consist of the Coordinator, the Agriculture Bank official and the AID Credit and Livestock Advisers.

This Committee is to plan in advance expenditures to be allowed from interest earned in this project for supervision, demonstration and education. AID advisers will recommend and advise only; the final decision must be a joint written agreement between the Coordinator and the Bank official.

The Advisory Committee may make decisions concerning matters not covered in this protocol, and they may also make recommendations for changes needed to improve the operations of this project.

PROCEDURE FOR OBTAINING CREDIT

T.L. 15 million now deposited in a special account in the Agricultural Bank of the Republic of Turkey will be made available for livestock feeding loans.

Adequate funds will be allocated to each branch bank in the designated provinces to assure prompt service on loans. The branch banks will have authority to approve loans up to T.L. 50,000 in accordance with the instructions issued by the General Directorate, Agricultural Bank in Ankara.

Loans may be made for the purchase of livestock and/or livestock feed. The loans will be made to livestock feeders who will be recommended by the Provincial

Supervisor. Loans may be made to 4-K members for the purchasing of livestock and/or livestock feed. Approval for 4-K members shall be the same as for adult feeders. The Agricultural Bank will supply the Veterinary Supervisors with requirements under which loans can be made to minors. The Extension Services, Ministry of Agriculture, shall be responsible for supervising the feeding operations of 4-K members' livestock. The Veterinary Supervisor will be available for assistance in training and supervising 4-K projects if their services are requested by the Extension Service.

The credit shall only be made available to certified feeders and cooperatives. The individuals who apply for credit must be actual feeders, who have adequate feeding facilities and experience. They must obtain a certification from the Veterinary Supervisor based on information from the application and his personal investigation.

The cattle and sheep to be fed under this program must be of the age and sex to meet the requirements of the export market.

All animals fed under this program shall be treated for external and internal parasites. The cost of the medication may be included in the loan. No personal fees shall be allowed from the principal or interest of this fund for application of medication or castration, as this is to be borne by the borrower.

Duration of the feeding period shall be approximately 120 days for cattle and 90 days for sheep.

The project shall be reviewed by the advisory group at the conclusion of three months of operation after this Protocol (Revised) is accepted and at three-month intervals as long as the project is in effect.

After three years of operation, the parties to this agreement shall review the program under the project and determine by mutual agreement the future course of action including final disposition of any balance remaining of the funds advanced by AID and the balance in the revolving fund.

The Ministry of Agriculture will have the responsibility for the preparation of educational material, but will consult with the Agricultural Bank and AID in carrying out this responsibility.

It is recognized that all points relating to the operation of this project may not be included in the present document. Any matters not covered in this document may be resolved by written agreement of the Advisory Committee.

PURPOSE OF PROGRAM

PRIMARY OBJECTIVES

- 1) To provide credit at a reasonable rate of interest to livestock feeders
- 2) To promote the fattening of younger animals
- 3) To train technicians and livestock feeders in improved feeding and management techniques
- 4) To encourage the cooperation of various government agencies in an approved multiple responsibility program

- 5) To produce an animal that is acceptable for export and to increase and improve meat for local consumption.

PROGRAM EVALUATION

WEAKNESSES OF INITIAL PROGRAM

- 1) The program was developed without first consulting the livestock feeders as to their needs for such a program.
- 2) Areas without livestock fattening possibilities were included in the initial program. Loans made in these areas were not used to purchase livestock and or feed, but were used for non-agricultural purposes in some instances.
- 3) Agency responsibilities were overlapping. This was particularly true of the veterinarians and Et ve Balik Kurumu. Et ve Balik was removed from the program when it was rewritten in 1962.
- 4) The technicians were not properly trained or oriented prior to the initial implementation.
- 5) Repayment of loans made in the eastern provinces were not made when they became due.
- 6) The Extension Service did not, and has not to this date, taken advantage of this opportunity to develop a 4-K livestock feeding program from this loan program.

CHANGES MADE IN PROGRAM

- 1) Length of loans: This was changed from four months to six months because a four-month period was not sufficient time for a producer to purchase feed and or livestock, fatten, market the animals and repay the loan on the due date.
- 2) Availability of funds: Funds are not available 365 days of the year. There was a two-month dormant period during the summer when no loans were permitted to be made, although this was the harvest period for the feed grain crops. This change was made in 1968.

FACTORS CONTRIBUTING TO WEAKNESS OF FATTENING PROGRAM AND OVERALL LIVESTOCK DEVELOPMENT PROGRAM

- 1) Void of applied research: The livestock development will never move forward until a sound applied research program is developed on the prob-

lems of the producers. This type of research is a must in order to train technicians in recognizing and assisting livestock producers with their production and management problems.

- 2) Marketing: This is one of the primary keys to livestock development. Quality livestock will not be produced on a large scale until a sound grading and pricing system is developed. The present policy of purchasing on a dressing percentage basis is not a sound basis for grading and paying for quality. The high degree of the "Middle Man" involvement is detrimental to livestock development in Turkey and other Middle Eastern countries.
- 3) Trained technicians: The productivity of any man is controlled by the degree of training which he has received in his assigned field of responsibility. Too much of the resources is for facility development and an inadequate amount for development of personnel.
- 4) Support for technicians: Most of the technicians working in livestock development are inadequately supported.
- 5) Continuity of employment: Continuity of employment of a technician in an assigned field of responsibility is essential. To change a technician from one area of responsibility to another unrelated area of responsibility periodically does not afford an individual the needed incentive and desire to be more productive.
- 6) Use of research results from foreign countries: There is an abundance of basic research information available which could be applied in Turkey if only it were translated into the Turkish language and technicians trained in its usage. This should not be substituted for a research program in Turkey, but it could be effective to a degree until a needed research program is developed in Turkey.
- 7) Security requirements for loans: There are many questions which should be considered about the present security policy and its effect upon livestock development.
- 8) Government evaluation: It would seem advisable for OIEC and SPO to make a thorough study of the present livestock development program. Special emphasis should focus on the present policies and their effectiveness on livestock development.

LIVESTOCK IMPROVEMENT IN THE NEAR EAST WITH SPECIAL REFERENCE TO THE USE OF IMPROVED, HIGH-PRODUCING EXOTIC BREEDS OF CATTLE

by

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INTRODUCTION

INCREASING shortages of foods of animal origin and the success which, during recent years, has been achieved from the introduction of new high-yielding cereal varieties has led to increasing pressures being brought to bear on governments and their technical departments, to achieve expanded production of the former by the introduction of high-yielding, improved, exotic breeds of livestock. Many of these introductions have proved disappointing under the environmental conditions commonly encountered in the region.

ENVIRONMENTAL CONDITIONS

Environmental conditions in most countries of the Near East are characterized by low standards of husbandry and hygiene due to the low level of education of the farmer (the human factor) and to inadequate incentives; the inadequacies of the government services available to the farmer, and especially of reliable veterinary farm practitioners and of breeding services, including A.I. services, and to the almost universal inadequacies of and deficiencies in methods of livestock feeding.

If rainfall, as the component exerting an indirect ef-

fect on the amount of feed available is excluded, climate is of much less significance in the Near East than feeding, disease and management. Where standards of husbandry are reasonably high and where irrigation, or high rainfall, permit the production of ample feed and fodder, there are few areas of the Near East where exotic, improved breeds cannot be satisfactorily and economically maintained. Very high levels of production are, for example, being obtained below sea level, in the Jordan Valley.

Other vitally important factors in livestock improvement to be considered in the Near East include the need for organized marketing facilities, the absence of which, as, for example, in eastern Turkey, may make the farmer reluctant to use exotic breeds because of the lack of facilities to enable him to dispose of his surplus milk at remunerative prices. The lack of cheap credit, combined with inadequate incentives, are also often important constraints on improved husbandry and increased production.

INDIGENOUS BREED TYPES, EXOTIC INTRODUCTIONS AND BREEDING POLICIES

Throughout the region there are a number of indigenous breed types which, even under the adverse condi-

tions described above, and with no systematic selection, have demonstrated excellent potentialities for milk and meat production and of course in the case of sheep, for wool production. Introductions of exotic breeds have, in a few instances, where husbandry conditions have been good, proved successful. More commonly, however, such introductions have failed to lead to the implementation of systematic breeding programmes, to effective A.I. services or to increased efforts to raise the standards of husbandry and the efficiency and scope of the government services provided to the farmers, with the result they have often proved disappointing.

High-producing grades and crossbreds of the exotic breeds require skilled, veterinary farm practitioners, very few of whom, at present, are to be found while advisory services for fodder production and conservation, feeding and management, are still inadequate or lacking.

Grading up to exotic breeds requires efficient breeding services. Most A.I. services in the region are severely handicapped by poor communications, lack of transport and poor organization. Semen from untested bulls is commonly used and services have been known to be the vehicle for the spread of infertility disease conditions rather than the means of eliminating them and of raising levels of production.

There is also the simple, but vital problem of ensuring the detection of oestrus and then of impregnating the cow. This requires a high standard of husbandry on the part of the farmer and an efficient, well-organized breeding and/or A.I. service. Regular reproduction is essential and improved exotic breeds often suffer in this respect under adverse conditions.

There is also the question of the policy to be followed in ensuring a reliable supply of semen. When grading up indigenous breed types to an exotic breed, to the limit of prevailing feeding and management conditions, or when purebred bulls are produced locally, a systematic program of genetic selection becomes necessary. This is impossible without the adequate progeny testing of bulls and this is only possible if sufficient numbers are available. The organization of such a programme is beyond the resources of many countries. Alternatively, with modern methods of semen storage and handling, semen from progeny tested bulls can be flown in and stored.

Whatever the policy adopted, it has to be appreciated that in almost all the countries of the Near East the initiative in such matters can only come from the government departments concerned. The ability of private enterprise to enter into such operations is exceedingly limited. This emphasizes the importance of Ministries of Agriculture and Animal Resources possessing adequate numbers of properly trained animal husbandry and veterinary professional and technical personnel.

Specialized training in animal husbandry and production, both at the professional and technical level, is generally inadequate throughout the region and especially insofar as the latter is concerned.

There is also a grave deficiency in animal husbandry and production research. Very few countries are properly

ly aware even of the qualities, characteristics and potentialities of their indigenous livestock, but many are prepared to embark on large-scale, grading up programmes with exotic breeds before the various environmental deficiencies mentioned, have been put right.

Purebred exotic cattle successfully maintained on government farms, where high standards of feeding and management might be expected, give little, if any, indication of their adaptability under the altogether different conditions of the farming areas. If careful records are maintained of all the animals born, including those which die, those which are infertile and those which give no milk, together with the records of growth rate and milk yields, many indigenous breed types would compare favourably with the Freisian, and other exotic breeds, under the husbandry conditions at present found in most areas of the region. In studying productivity, individual lactation records alone are insufficient, and more emphasis needs to be put on lifetime performance which takes into account non-productive dry periods.

BREEDING POLICIES

Very few countries have the resources to embark on breeding programmes involving the production of new crossbred breeds. Where husbandry conditions and the government services provided the farmer are adequate, the grading up of indigenous breed types to a selected, improved, exotic breed by the continuous use of purebred bulls, or semen from progeny-tested bulls imported for the purpose, could be undertaken. This has the merit of simplicity.

On the other hand, it might be decided, where husbandry conditions are less satisfactory, to grade up indigenous breed types to an exotic breed up to the optimum genetic combination permitted by the prevailing feeding and management conditions, efforts then be made simultaneously to improve environmental conditions. The danger here is that such a policy can easily degenerate into a state of indiscriminate crossbreeding without the application of a systematic livestock improvement policy; diseases can be introduced to which the indigenous livestock are susceptible and, in a short time, the indigenous breed types are lost. An alternative policy, so far rarely adopted, but suitable under certain conditions, is the maintenance of two purebred herds, one of the indigenous breed type and the other of the exotic breed so that systematic criss-cross-breeding can be maintained in the farmer's herds on a continuing basis until such time as environmental conditions have improved and can successfully support the pure exotic breed.

On the question of the actual exotic breed to be selected for use this seems to be of less importance than the other factors referred to here. If maximum yield of milk per animal is the chief criterion, the Freisian appears to be the most suitable choice, since, as has been demonstrated in many European countries, this breed makes excellent beef if it is well fed because of its rapid growth and low percentage of fat in the carcass.

In most areas of the region, there seems little justification for the importation and breeding of the specialized, exotic beef breeds.

In the case of sheep the grading up of the excellent indigenous carpet wool sheep of the region to fine-wool breeds such as the Merino, poses a number of difficult problems. The experience of Turkey, which has some excellent flocks of this latter breed, would no doubt be of interest and guidance to other countries of the region.

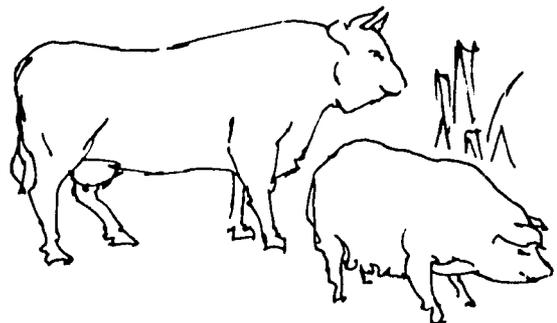
GENERAL CONCLUSIONS

The conclusion is reached here that there is a need for caution in grading up and cross-breeding programmes under Near Eastern conditions unless measures have been taken to improve the various environmental factors referred to in this paper.

The fact remains, however, that it seems more than likely that exotic breed types will continue to be imported on an increasing scale even in the absence of such improvements. Suggestions for the kind of approach which might be adopted by countries faced with this problem are summarized below:

- a) There can be no doubt of the soundness of recommending all-out efforts to improve standards of animal husbandry in all countries by intensive programmes of training, both of national staff and of farmers, particularly in improved methods of disease prevention, feeding, management, forage production and conservation, milk recording and milk handling, processing, marketing, breeding and reproduction. Training of personnel for services connected with A.I. and reproduction and of veterinarians for veterinary practice on the farms are of vital importance in this context.
- b) While pressures to import and utilize high-producing, exotic stock may be difficult to resist (even if it were considered sound to do so) it can be recommended that the use of such stock should be restricted, in the first instance, to large dairy herds situated in areas adjacent to towns and cities. Under these circumstances, the necessary technical services required and the incentives for improved husbandry conditions are more likely to be available.
- c) Where a country possesses a population of livestock having outstanding potentialities for production (e.g. Shami cattle and goats as in Syria) that facilities should be provided to ensure that the breed type is maintained pure in adequate numbers, that it is thoroughly tested and steps are taken to improve it by selective breeding.
- d) That where technical services are adequate, forage and feed in adequate supply and remunerative markets available, consideration be given to a systematic, but cautious policy of grading up the indigenous breed types to tested bulls of suitable exotic breeds. Alternatively, a simple policy of systematic criss-cross-breeding, involving a pure indigenous breed type and a pure exotic breed, might be considered.
- e) In those areas where indigenous breed types are maintained under conditions where survival, adaptation and reproduction of livestock is almost a miracle, grading up or cross-breeding with improved exotic breeds would not be recommended. However, careful assessment, under improved conditions, of the indigenous breed types concerned for their economic potentialities (e.g. for meat production) would be strongly recommended.

PASTURE AND FORAGE CROPS AND RANGE



MANAGEMENT AND IMPROVEMENT OF RANGELANDS IN IRAN

by

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AREA

THE TOTAL AREA of Iran's rangeland is estimated to be 52 million hectares of which 40 million hectares are non-forested and 12 million hectares are forested rangelands.

To be more specific in this regard, I refer to the information contributed by one of the FAO experts, Mr. Henry Pabot, who studied and investigated Iran's rangeland during seven years of his mission in this country.

According to his estimation the total area of Iran's rangelands should be 106 million hectares including very poor ranges and also fallow lands grazed during certain periods of the year

Grazed forests	14	million	hectares
Fallow lands	12	..	..
Good and fair pastures	8	..	..
Depleted pastures	32	..	..
Semi deserts, extremely poor rangeland	40	..	..
Total	106	..	..

PRESENT CONDITION OF RANGELANDS IN IRAN

Iran is an old country with at least 2,500 years of history. Animal husbandry is one of the oldest industries

in this part of the world. Ever since the Arians invaded the plateau of Iran the natural grazing lands have been heavily utilized to the extent of present condition. Except for the very narrow strip of the Caspian Zone which enjoys a high rate of annual rainfall (from 600 to 2,000 millimeters) the country is divided into arid and semi-arid regions in which the precipitation is not well distributed, ranging from 150-350 millimeters in the plains, and not exceeding 500 millimeters in higher areas.

With the combination of such climatic conditions and the severe utilization, one would expect to see that ranges have deteriorated and erosion has taken place almost everywhere.

Our best ranges are summer ranges in higher altitudes in the Elburz Mountains, extending from the northwest to the northeast and in the Zagros Mountains, extending from northwest to the west and southwest of the country. Better conditions and higher productivity of these rangelands is mainly due to more precipitation and limitation of use (only in summer). Nevertheless the effect of overgrazing and erosion can be seen in these areas as well.

In lower areas there exist what we call winter ranges which have been severely overgrazed and most of it has been converted to agricultural lands.

Spring and fall ranges are located between the other two and these types of range areas are considered to

be the poorest and most depleted of all others in our country since there has not remained any degree of productivity on them and retrogression is taking place very rapidly.

MAIN CAUSES OF DETERIORATION OF RANGELANDS

The following factors have contributed to range deterioration in Iran:

Excessive numbers of livestock which graze the rangelands much beyond their carrying capacity
Land conversion by mechanical devices such as tractors

Ignorance of livestock men and tribes concerning scientific and new technical methods of range management.

In addition to the above factors which are mainly caused by human interference, other natural factors contribute more unfavourable conditions to the problem. Factors such as low amount of precipitation and its maldistribution, especially lack of rainfall during summer months in semi-arid regions and successive dry periods all happen to be the most effective causes accelerating such deterioration.

RANGE PRODUCTIVITY

The carrying capacity varies from one point to another, but generally speaking the average capacity of the total rangelands of Iran is less than half of the existing number of livestock.

FORAGE PRODUCTION AS THE KEY SOLUTION TO THE RANGE PROBLEMS

In order to protect and improve the remaining rangelands we think that some part of the rangelands should be withheld from grazing, but to do this and also apply new methods of range management, it would be necessary to find other sources of feed for at least one-half to three-fourths of the livestock, and this is the most difficult problem to solve.

Although there are some measures to increase the productivity of natural rangelands, forage production seems to be the key solution to the problem.

The rate of forage production has been increased up to 10 percent during the last 10 years in the country.

Many other developing projects are being undertaken for the production of more forage crops through agricultural rotation. In some cases this is rather expensive and difficult, but as I mentioned it is absolutely the only way possible and has greatly aroused the interest of the government.

A few varieties of high-produce crops such as corn, Sudan grass, berseem clover and others have been introduced during recent years and seem very promising; farmers and producers have become so interested that we cannot meet the increasing demand for seeds. These are planted in different parts of the country according to their soil and climatic requirements.

PRESENT OWNERSHIP OF RANGELANDS IN IRAN

According to the Forest and Range Nationalization Law all natural rangelands belong to the Government with the exception of the rangelands surrounding villages, amounting to twice the total cultivated lands in the village.

Grazing in natural rangelands should be allowed upon issue of permits by the Ministry of Natural Resources. In these permits the number and kind of animals, season of use and duration of grazing are registered.

According to the new legislation first priority for grazing will be given to those livestockmen who have organized animal husbandry cooperatives.

SUMMARY OF ACTIVITIES ON RANGE MANAGEMENT IN IRAN

The results of five years of research in the different fields of plant introduction, range improvement, etc., will be published in the very near future and will be available to interested experts. Listed below are some of the activities on range management that have taken place.

Establishment of exclosures in order to study the variations in plant composition, productivity, and range trend

Establishment of a complete herbarium of the most important range plants that have been collected from all over the country and taxonomically classified

Introduction of grass seeds from other countries to study their adaptation to the ecological conditions in different parts of the country, a program that has shown positive results in many parts of the country
Collection of some very important ecotypes of remnant native plants for seed multiplication for reseeding in depleted areas

Establishment of seed multiplication stations in order to produce more seeds of adapted plants

Establishment of some demonstration allotments in order to show the effect of reseeding, grazing intensity and other methods of range conservation programs

Organizing international range training courses in Iran with the help of AID and FAO experts, for the purpose of increasing the level of knowledge of both the local and invited technicians and also of exchanging ideas on different aspects of range management activities

Training of several technicians in foreign countries including the USA to provide the range technical section with well trained technicians in the field of range management

Organizing the pasture and fodder crops investigation unit as a joint project between the Government of Iran and the FAO of the United Nations, a project started in 1964 and terminated in 1969.

PROGRAMS UNDERTAKEN

RANGE MANAGEMENT ACTIVITIES

The Ministry of Natural Resources was established in Iran more than two years ago. Among the many responsibilities of this Ministry are the protection and correct exploitation of natural resources such as forests, soils, watersheds, rangelands and wildlife.

According to the new legislation approved by both parliaments, exploitation of natural resources should be based on well organized and scientific range plans provided or approved by the Ministry of Natural Resources. Development of a sound exploitation plan will be based on inventories and aerial photographs already being undertaken by the experts and technicians of the Ministry of Natural Resources.

Range planning has been started recently by using aerial photographs and field analyses of plant associations and types.

Along with range planning, which eventually reduces the pressure of grazing by reducing the excess number of livestock, the Ministry of Agriculture is responsible for production of more forage crops all over the country.

Every year more depleted rangelands are being improved and rehabilitated through different methods such as grazing control, reseeding, pitting, and water conservation programs.

In some parts only prohibition from grazing or a few years of rest will result in significant improvements in such areas.

TRAINING

We have a two-year School of Forestry and Range Management in which 200 students receive training and

graduate to work for the Ministry of Natural Resources.

Out of these 200 graduates 60 students will be working under range management and soil conservation programs, and the rest will go into forestry.

There exists a College of Forestry and Range Management (in Karadj) in which 50 students are trained and graduate every year.

According to new legislation this college will be converted into a College of Natural Resources and students can graduate in several fields such as Forestry, Range Management, Soil Conservation or Game and Fisheries.

SUMMARY OF RECOMMENDATIONS

- 1) Management of rangelands on the basis of range planning and field analysis
- 2) Temporary, short and long-term prohibition from grazing in some areas according to their need of rest
- 3) Improvement through reseeding in areas having a rather higher rate of precipitation and favourable soil and climatic conditions, with economic evaluations and other factors taken into consideration
- 4) Forage production both directly and through rotation with other crops in order to decrease grazing pressure from rangelands
- 5) Provision of well trained personnel educated in different aspects of range management for the range technical service
- 6) Establishment of improved demonstration ranges in order to familiarize interested livestockmen and tribes with principles and new methods of range utilization and animal husbandry
- 7) Continuation of the range research programs already started.

MANAGEMENT OF LIVESTOCK AND POULTRY ON RANGES AS WELL AS ON ARABLE LANDS

by

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MAINTENANCE of livestock by grazing on ranges is the oldest practice of livestock farming. From the very beginning of civilization livestock was considered as wealth and livestock owners have led nomadic lives in search of more extensive ranges or grazing areas, rich in herbage. When man became more civilized he started living in limited areas and his livestock was also maintained in limited areas. With the gradual increase of population all over the world the available grazing areas have become narrower and narrower and now in many countries grazing areas are too limited. The interesting point is that although in the earlier days grazing areas were more extensive, the standard of livestock was too poor. Since the beginning of the present century the livestock industry as a whole has been developing and following the development of science. In the primitive days, for instance, a cow used to produce barely 5 lbs. of milk a day but at the present time many herds of the western world yield on an average more than 40 lbs. per cow per day. There are examples of some cows producing even 100 lbs. a day. Good cows breed almost regularly every year which was not so in earlier days. Similarly the productive capacities of beef animals, draft horses, wool producing sheep, broilers, laying hens, etc., i.e. practically all kinds of livestock, have tremendously increased. This has been made possible by the application of knowledge about the

science of nutrition, breeding and other branches of animal science. The population of the world and particularly of our country is progressing too rapidly. The lands at our disposal are more or less limited. A great majority of the population of our country is suffering from malnutrition. The seriousness of the nutrition problem demands full utilization of our knowledge of agronomy and animal science for the best utilization of land, so that, from an acre of land, maximum nutrients are available. An attempt has been made in this paper to focus on the most important points that may help in raising livestock by full utilization of arable rangelands.

FACTORS AFFECTING THE KIND OF STOCK TO BE RAISED

There are many factors which influence the type and degree of success of livestock farming in a particular area. These relate to the character of the land, climate of the area and also to local conditions. The most important ones are discussed briefly in the following paragraphs.

Topographical features of the land This is the most important factor which influences the type of farming. It is comparatively easy to successfully grow livestock in an area which is quite level and fertile. It is very dif-

difficult to spare such arable and superior quality lands for growing livestock because there is a much greater demand for such lands for growing grain food crops. Lands which are hilly in topography or full of waste jungles can be first utilized for large-scale livestock farming. However, such areas are not suitable for dairy farming until the lands are first developed to such an extent that superior quality forages are grown. Lands adjacent to lakes as are found in Hill Chittagong are of this category. Sheep farming is also possible in these areas. In the lakes ducks may be maintained very nicely in addition to fish.

In East Pakistan there are some "Haor" areas which remain submerged under deep water for more than six months in a year. In the dry season these areas are quite suitable for maintaining dairy, beef and other kinds of livestock. The annual siltation replenishes the deficiency of nutrients removed by cropping or grazing in the previous year. The efficiency of these areas may be increased by a supply of regular water for irrigation for about six months during which these areas remain completely dry. The surplus feeds can be preserved for the next rainy season during which the fodder problem is too acute. The vast grazing areas of West Pakistan similarly can produce huge amounts of forages if irrigation facilities can be provided.

Character of forages and grasses The nutritive values of all the grasses are not the same. Again all grasses cannot be grown successfully on the same type of land. In general grasses that grow on the marshy areas are less nutritious. Dairy cows are to be maintained in areas where the best quality forages may be grown. Buffalo can be maintained in marshy areas quite successfully. Where grasses are too thin only sheep farming or goat farming should be practiced, because these species are expert in nibbling on small grasses. There are some grasses or bushes which are preferred only by goats. So selection of the stock to be raised depends on the kind of grass that may be grown successfully. In the "Haor" areas legume seeds are broadcast on the lands as soon as the water dries up. Legume grasses grow profusely. These are rich in nutritive value and also enrich the soil by nitrogen fixation with the help of their root nodule bacteria. The yield of the grasses may be accelerated by providing irrigation facilities, better seeds and by making timely harvests.

Availability of water Undoubtedly water is the most limiting factor in making a success of any type of farming. A farming plan has to be made according to the availability of water. This, if solved, will eliminate many of our problems. If water is readily available from neighbouring canals or streams a lift pump will solve the irrigation problem. In the case of hilly areas or lands having an undulating surface, sprinkle irrigation is probably the best answer. If no source of water is available within a reasonable distance a deep tube well should be set up.

Control of wildlife Wild animals are sometimes obstacles in livestock farming, at least in the forest areas.

These have to be controlled before livestock can be maintained in such areas.

Market facilities A readily available market is a requisite for disposal of farm products. For a dairy farm there must be a good market for milk and milk products within a reasonable distance. Big cities are no doubt the best markets for milk, milk products and poultry. Egg producing poultry farms should be within a reasonable distance from the cities.

Other problems Some other conditions pertaining to the locality may also affect the maintenance of animals or type of farming on ranges or arable lands.

- a) A thoroughfare through the pasture land or grazing area can create many inconveniences of which the most serious is the spread of diseases in the herd through the medium of passing animals. If this is not checked the entire herd may be seriously affected. If a thoroughfare through the grazing area is unavoidable both sides of the passage should be fenced.
- b) The visit of unwanted scrub male animals from outside may disturb the normal breeding programme of the herd. The best check in such a case is to castrate the surrounding scrub males.
- c) Recurrence of floods is a serious problem in many areas in East Pakistan. It is not possible for any particular farmer to control the flood by his individual effort. It has to be done collectively through the sponsorship of government or local organizations, e.g. Cooperative Society, Multi-purpose Society, Farmers' Club, Union Councils, and so forth. However, an individual farmer can at least protect his own animals by adopting some means which, of course, are fairly expensive. In southern areas of East Pakistan particularly in the offshore islands of the district of Noakhali where a very large number of sheep are maintained raised platforms made of bamboo are used. Just before the onrush of flood water the sheep owners raise their individual flocks of sheep to the platform and get them down after the flood or tidal water recedes. Through cooperative organizations this practice may be strengthened. For heavy animals such as cattle or buffalo an artificial hillock having a well-built shed on the top may be the solution.
- d) Cyclones, storms and tornadoes, which generally originate in the Bay of Bengal in East Pakistan, play a devastating role almost every year in the southern part of East Pakistan. The devastation of these natural calamities may be minimized by planting timber trees or by developing a forest belt round the coastal areas and the offshore islands.
- e) In the vast and extensive grazing areas unavailability of any shade trees is often a problem during an extremely hot summer. Either trees have to be planted or some temporary arrangements should be made for allowing shade from the scorching sun and rest for the animals.

MANAGEMENT OF LIVESTOCK

The key points of successful livestock farming are a sound breeding programme, well balanced rations, proper care and disease control. Needless to say the same points are to be considered most important under range conditions as well as under arable land farming of livestock. The success of any type of livestock farming depends upon the extent of coordination of the breeding programme with feeding and other management programmes.

The type of farming that is to be practiced will decide the type of animals. If a dairy farm is to be started a pure dairy breed suitable for the area must be selected. For high lands having a leveled surface, irrigation and market facilities, dairy breeds like Sindhi or Shahiwal should be maintained. If the land is marshy, dairy buffalo may be maintained. Nilli, Ravi or Murrah are good dairy buffalo breeds. The general rule is that a breed which has been tried in an area and found successful should be maintained. The same is the rule for sheep and goat farming. People of poorer means may start sheep and goat farming.

The system of breeding that is to be followed depends on the farmer's objectives. If the standard of a particular breed is to be raised, inbreeding of the females with the best bull of the herd or with an imported bull of the same breed should be practiced. If the good characteristics of two breeds are to be combined, cross-breeding amongst males and females of those breeds should be practiced. For a farmer of limited means the cheapest method of gradually raising the herd standard is to practice 'grading.' In this system a very superior type bull, i.e. one having a superior pedigree should be allowed to cover the superior indigenous females having no breed characteristics. The first generation female offspring having 50 percent of the blood of the superior breed may be bred with a purebred bull and the second generation will have 75 percent purebred blood. In this way after four to five generations, a crop of a high percent pure blood of a superior heredity may be established in the herd. The only difficulty of this system of breeding is that the grade male cannot be used for breeding purposes.

Whatever might be the system of breeding to be adopted only superior males should be used for breeding purposes. Artificial insemination techniques should be adopted to maximize the use of the superior male.

The artificial insemination technique has revolutionized the livestock breeding programme in many countries. According to the natural method of breeding, a male can produce barely one hundred new offspring each year. If this technique is adopted a male can produce thousands of offspring every year. However, before adopting this technique one has to be quite sure about the quality of the sire, otherwise more harm than good will be done. For lack of space, other advantages of the artificial insemination technique are not discussed here.

The ratio of males to females in a herd is to be controlled carefully. If the adoption of the artificial insemination technique is not possible, one selected bull, buck

or ram should be maintained for every 50 to 100 females. The undesirable males should be castrated within two to three weeks after birth. Castrated animals quickly gain in weight and their meat quality is better.

If feeding is not the greatest problem the males should be maintained up to an age when they fetch the maximum price. For beef and mutton animals one should take advantage of the highest market value which is normally available during Ramadan and Idd-ul-Azha. In East Pakistan cattle owners prefer young females of a superior breed. A breeder should take advantage of the liking of the local cattle growers.

Special care of pregnant animals - In general pregnant animals, particularly those in the advanced stages of pregnancy need special care. They should not be allowed to move freely in the herd lest they may be seriously hurt by herd mates. About two months before the due date of parturition they should be housed in a comfortable box stall. The animal should have free movement in this maternity shed. Good quality forage and highly nutritious concentrates should be made available during this period. The concentrates as well as the forage should be palatable and laxative in nature. The ration should have about 15 percent digestible protein and an adequate amount of calcium and phosphorus for the proper growth of the fetus.

At the time of parturition an attendant must be present. In case of a difficult parturition he should render manual help. He should be very careful in removing the placenta as soon as it drops, so that the mother cannot eat it. A mixture of warm water, wheat bran, molasses and salt with rice gruel, should be fed to the animal immediately after parturition if possible. This will act as a stimulating feed and will help in the easy expulsion of the placenta.

The newly born calf should be properly received in a clean bed. Colostrum should invariably be fed to a newly born calf or kid as this is highly nutritious and thus serves to protect the young animal against diseases.

CONTROL OF ANIMALS ON RANGE OR ARABLE LAND

Herd control - The strength of animals to be maintained in a herd depends on many factors, e.g. the size of the animal, breed, type of farming, nature and yield of forages. It is evident that if animals are to depend only on naturally grown grasses a very small number can be maintained on the land. On one acre of land about 800 to 900 maunds of forages may be grown under optimum conditions. If favourable conditions exist three large-size or four to five medium-size cattle may be maintained throughout the year on one acre of land. The daily maintenance requirement of a thousand-pound cow is about 6.5 lbs. T.D.N. including about .65 lbs. of digestible protein. In the western countries where the population is very thin and plenty of grazing areas are available two to three acres of land are allowed for each adult cow. On arable lands only one cow per acre is maintained. So the number of animals that are to be maintained in an area

depends upon the intensity of growing forages. If only younger animals are to be maintained, two to three times the number of adults may be maintained. Regarding sheep or goats about 20 to 25 herd of adults may be maintained on one acre under optimum conditions.

For a milk producing farm only females and breeding males should be maintained. It should be remembered that in ruminant livestock farming, feed is best utilized in milk production, i.e. the feed cost for a pound of milk solids is much less than per pound of meat solids. So it should be clearly remembered that if a ready market is available dairy farming fetches a higher income than beef farming.

Rotational grazing or rotational harvest should be practiced for the best yield as well as for best utilization of the pasture grass. The area under command for forage growing should be segmented conveniently and sown in such a way that harvesting at the proper stage of growth may be spread over the whole year in a continuous manner. If there is an arrangement for silage making or hay making, rotational harvest is not so essential. It should be remembered that the nutritive value of forages goes up to a certain stage of growth after which it deteriorates gradually. Therefore forages should be harvested at the proper stage of growth. Usually the blooming stage is best for maize or corn or sorghum.

Maintenance of fences is an important step to be taken to guard the forage against stray animals or unauthorized animals. Fencing is no doubt expensive but essential for farming. If electricity is available at a cheaper cost, electric fence once installed saves a lot of labour cost. Once the animals are accustomed to the electric fence they will always keep away from it. Sometimes fencing costs may be reduced if quick growing trees are planted round the border and barbed wire is fixed to the trunks of the trees.

NUTRITIONAL NEEDS OF LIVESTOCK

Livestock requires nutrients such as protein, fat, carbohydrates, minerals and vitamins. These are agents for converting nutrients generally derived from plant sources into body tissue and milk, or transforming them into motive power. The ultimate source of all the nutrients is the soil. Unless the soil is rich in nutrients plants cannot grow properly and ultimately the animals will suffer. Human beings can also live on plant products but the quality of these nutrients is insufficient to meet the full body requirements of human beings. Accordingly for best nutrition of human beings livestock are to be engaged for converting poorer quality plant foods into superior quality nutrients.

Unlike human beings our ruminant livestock can digest some plant products quite easily. These are straws, brans, seed coats, i.e. products rich in cellulose and hemicellulose. The rumen micro-organisms which are enormous in number secrete some enzymes which break down the complex carbohydrates into simpler carbohydrates assimilable by the digestive system. They can also transform poor quality protein into superior

quality protein. Another capacity of the rumen micro-organisms is that they can synthesize the 'B' vitamins. On account of these outstanding abilities, a major part of their nutrients may be available from human food by-products, weeds, straw, and so forth.

Protein is the most important of all the nutrients. Its main function in the body is to repair worn out tissues and to build new tissues, muscles, wool, hair, and bone marrow. Surplus protein is utilized for production of energy or for disposition as fat.

The main function of carbohydrates is to produce energy. This single nutrient provides 60 to 70 percent of the total energy needed by an animal. Fat is another nutrient which is of high caloric value. Its main function is also to produce energy. Surplus fat is deposited in the body as fat.

About thirteen minerals are essential for proper nutrition. Minerals other than calcium, phosphorus, sodium chlorine and magnesium are generally available in normal diets. Besides many other functions, minerals are responsible for bone formation, maintenance of acid base balance in the system and activation of enzymes for metabolism.

Vitamins are micro-nutrients synthesized generally by plants. Animals however can convert pre-vitamins of plant origin into the vitamin proper after assimilation. Although vitamins are needed in small quantities they are also equally essential as other nutrients. Minerals and vitamins are essential nutrients, unlike fat, protein and carbohydrates. These are not direct sources of energy, but their role in the body is no less important. Without 'B' vitamins food energy present in protein, carbohydrates and fat cannot be utilized by the animal. Vitamin 'A' is essential for maintaining normal eyesight and prevention of many diseases. Vitamin 'D' is essential for utilization of calcium and phosphorus in bone formation.

As already mentioned, the nutrient requirements of animals vary according to breed, size, extent of production, etc. A cow of average size (900-1,000 lbs.) requires about 6.5 lbs. of total digestible nutrients for daily maintenance including about .65 lbs. digestible protein. This requirement is met if the ration includes plenty of green grasses with some supplementation of concentrates. The general rule is to provide 2 to 2.5 lbs. of dry matter per 100 lbs. of body weight and the concentrate should contain about 14 to 15 percent of digestible protein. If the animals graze on luxuriant legume grasses throughout the day no supplementation of concentrate feed is needed. For milch animals concentrate feed mixture should be supplemented with grass or forage ration. A good concentrate mixture may be made by mixing wheat bran or fine rice polish, oil cake, broken pulse in equal proportion. About two chhataks of salt per head of cattle should be mixed with the concentrate mixture. To meet the calcium and phosphorus requirement one chhatak of sterilized bone meal per cow should also be mixed with the concentrate mixture. The requirement of this mixture per cow or milch animal depends on the capacity of milk production. Usually 1 lb. of

mixture for every 2 lbs. of milk produced is adequate. Many feed manufacturers supply a well-balanced mineral mixture. If available this may be mixed with the ration instead of bone meal. Livestock grazing on green grasses or forages does not require vitamin supplementation. Ruminants cannot synthesize vitamin 'A' and 'D,' but they can easily meet their requirement from green grasses. They have the capacity of storing these vitamins within their body to tide over a scarce period of about two to three months duration. To safeguard the animals from nutrient deficiency an adequate quantity of green grasses supplemented with concentrate mixture should be fed regularly. Protein is the costliest nutrient. The feed cost may be considerably reduced if a part of the protein is replaced by 'Urea' which is quite cheap. About one third of the total protein may be in the form of urea.

POULTRY KEEPING

Of all the livestock, poultry birds are the most efficient in respect to utilization of nutrients or feed for broiler or egg production. If the livestock are arranged in order of merit of feed utilization the first is poultry, second is the dairy cow in milk production and the third, beef or mutton animals. The only disadvantage of the poultry birds in comparison with the ruminants is that they are principally grain eaters whereas the ruminants are principally forage or roughage eaters. However poultry birds can thrive successfully on a feed mixture consisting of purely human food by-products, such as wheat bran, rice polish, oil cake, slaughter house wastes, fish industry wastes, and so forth.

The main problems of the poultry industry in our country are:

Feed problems — As there is no feed industry, the poultry industry is in a deplorable condition.

Incidence of diseases and epidemics — This single problem alone is responsible for the loss of thousands and thousands of birds in a short time.

Unavailability of some essential equipment, e.g. incubators, feed mixture, etc.

Unavailability of improved breeds like New Hampshire, Rhode Island Red, White Leghorn which are found to stand the climate of East Pakistan.

The most important points of poultry management or poultry keeping include: 1) provision of well balanced ration, 2) improved breed, 3) preventive and curative measures against diseases and epidemics, and 4) use of modern equipment for better utilization of birds.

Well balanced rations are essential for raising healthy birds. The feed should contain as usual protein, fat, carbohydrates, vitamins and minerals. Unlike ruminants poultry cannot synthesize the 'B' Complex vitamins. So, the poultry ration should have all the vitamins. Absence of vitamin 'C' will not do any harm as they can synthesize it. The ration should contain very little fibre (not more than 5 percent), as their digestive systems cannot pro-

duce enzymes to break down complex carbohydrates.

Quality of protein is an important consideration in poultry rations. Unlike ruminants poultry birds must have an adequate amount of essential amino acid. This is not so in the case of ruminants. For this reason, in the case of poultry rations, the incorporation of protein of animal origin is needed. The sources of such animal protein suitable for poultry are fish meal, blood meal, meat offals, sterilized meat or beef of dead animals. The ration should contain 16 to 20 percent of total protein. The supplement of animal protein should be about 5 to 10 percent.

There are mainly two systems of feeding, one being the wet mash system the other a dry mash system. In the wet mash system all the feeds are mixed together with some water and the feed is supplied in specially designed hoppers. The modern tendency is to feed a well-balanced dry ration to the birds with free access to water.

The quantity of feed needed for birds varies tremendously on account of their varying degree of accessibility to ranges. If there is an extensive range the total feed requirement may even be half. In the ranges birds pick up tender grasses, insects, earthworms and thus they partially meet their requirements.

The amount of feed required by birds depends on the rate of egg production, size of the birds, weather, etc. Younger birds require comparatively more feed. About 25 to 30 lbs. of feed mixture are needed daily by 100 adult heavy birds. The lighter birds require about 20 to 25 lbs. If the birds are accessible to extensive ranges having tender grasses the requirement of grain will be much less.

In poultry feeding careful attention must be given to the minerals, particularly to calcium, phosphorus, manganese, zinc and iodine. For want of calcium and phosphorus, the bone formation will be hampered and the egg shells will lose strength. Similarly manganese prevents perosis or slipped tendon and iodine is essential to prevent goitre. To be safe from a mineral deficiency a standard mineral mixture should be used.

The question of vitamins is still more important in poultry rations. Vitamin 'A' is essential for normal growth, egg production and prevention of diseases. Vitamin 'D' is essential for proper utilization of calcium and phosphorus. Riboflavin is the most important of the 'B' Complex vitamins. For want of this poor hatchability of eggs and curled toe paralysis will result.

The best method of vitamin supplementation is to add cod liver oil or shark liver oil and alfalfa or beer-seem meal with the feed mixture. An example of a good feed mixer for poultry as suggested by Morrison, "Feeds and Feeding," p. 1032, 21st Edition, is given below.

The general principles of breeding in poultry are almost the same as in large animals. However since poultry birds are quick growing and immediate results are obtained, it is better to start with a pure breed like White Leghorn, New Hampshire or Rhode Island Red. There should be one male for each 8 to 10 females. If the feed contains all of the essential nutrients like amino acids, minerals and vitamins and has adequate calorie value

the performance of the birds will be satisfactory. If the management is sound, each of the above-mentioned breeds will produce about 250 eggs per bird per year. In the case of broilers a good ration with proper management should be able to produce about 2.5 lbs. of meat for every 4 lbs. of dry feed consumed. Good incubators are essential for efficient hatchability. The egg capacity of the incubators may range from 50 to several thousands. Only experienced men should be entrusted to handle eggs in incubators otherwise there will be unnecessary loss or poor hatchability.

Greatest care must be taken on a poultry farm in respect to sanitation and preventive measures against disease. Birds should be vaccinated against diseases. No outsider should have access to the birds unless he first dips his shoes in phenyle. Great care should be taken so that no disease may be carried to the farm from outside through the workmen, employees, wild birds, or equipment. It must be remembered that in our country disease and epidemic control is the greatest problem in the poultry industry and as such every conceivable step should be taken in this regard.

SUGGESTED FORMULAS FOR POULTRY MASHES (In pounds)

	Chick starting mash	Chick growing mash (to be fed with grain) *	Hen laying mash (to be fed with grain) *	Hen breeding mash (to be fed with grain) *
Ground yellow corn, wheat, barley or grain sorghum	49.5	34	30	35
Ground oat or wheat by-products	10	20	30	20
Alfalfa leaf meal (75,000 I.U.) Vitamin A or more per lb.	5	5	5	5
Soybean oil meal	10	10	15	10
Cottonseed meal, peanut meal, corn gluten meal or soybean oil meal	10	10	5	5
Fish meal	4			5
Meat scraps	4	10	5	5
Steamed bone meal, deflourinated phosphate or dicalcium phosphate	1	2	2 ¹	2 ¹
Ground limestone or oyster shell	1	2	2	2
Salt	0.5	1	1	1
Riboflavin supplement (20 micrograms riboflavin per gram or equivalent)	5	6	5	10
TOTAL POUNDS	100	100	100	100
Manganese sulfate, anhydrous, oz. per ton or equivalent in feed grade	4			
Vitamin D product (A.O.A.C. units per 100 lbs.)	18,000	36,000	90,000	90,000
Vitamin A ²				

* To be fed free choice with grain. The grain mixture may be any combination of corn, wheat, oats or barley. For breeding birds the grain and mash intake should be approximately equal.

1. Oyster shell or high calcium limestone grit is also to be fed free choice.
2. The quantity of vitamin A feeding oil required will vary depending on the vitamin A activity of the alfalfa product used. It is important to remember that the vitamin rich feeds are in the mash. Thus when the mash-grain system of feeding is followed, the vitamin rich mash is diluted with feedstuffs carrying less vitamins.

RANGE MANAGEMENT AND GRAZING CONDITIONS

by

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RANGE CONDITION

FEEDING livestock on a large scale in Turkey depends on the forage produced from the range. The amount produced from the rangelands, by-products from the industry and the coarse materials grown by the farmers is 39,737,649 metric tons per year. When the poor quality, coarse, hay-type material which amounts to 16,745,000 metric tons, is deducted from the figure above, it is understood that we end up with 22,992,649 metric tons of relatively good quality feeds and forage. This shows that our main forage production comes from the range and pasture.

RANGE VEGETATION

CLIMATE

We have very few types of climatic conditions in Turkey. Except for a very narrow strip in the north, summers are dry and warm. Winters are mild on the coast and somewhat severe inland, but in general, Turkey can be classified in the subtropic climate zone. Precipitation occurs during the winter months.

CHARACTERISTICS OF THE PRINCIPAL VEGETATION TYPES

Species composition -- Species composition in Turkey is very closely related to the different types of climatic districts. When these districts are coordinated with each other, we will have only three differentiated types, namely: 1) Mediterranean, 2) Black Sea and 3) Central and Eastern Anatolia. When these regions are further divided, it is somewhat hard to distinguish the characteristic species of each region. We know that although certain shrubs and phrygana are characteristic of the Mediterranean, steppe types of Central Anatolia, and broad-leaf forest trees and evergreens are the characteristic vegetation types of the Black Sea, still there is not a clear-cut line between them. That is, the transition zone between them is very wide.

Southern Anatolia The south part of the Taurus Mountains facing the Mediterranean to a certain elevation is covered mainly by a xerophil type of plants. Special formations throughout the region are the evergreen shrubs and phrygana plants. In the mountains we find mesophyl forests. Among the characteristic evergreen shrubs the following can be named.

Species Composition of Southern Anatolia

Aegilops ovata
Aegilops triuncialis
Alopecurus anthoxanthoides
Alopecurus myosuroides
Avena fatua
Briza spicata
Bromus commutatus
Bromus scoparius
Hordeum bystrix
Hordeum spontaneum
Hordeum murinum
Imperata cylindrica var. *europa*
Festuca octoflora
Eragrostis poeoides
Melica uniflora
Phalaris canariensis
Poterium spinosum
Genista acanthoclada
Onobrychis sativa

Northern Anatolia The mountain line in Northern Anatolia is parallel to the Black Sea coast. In the eastern part they are very close to the sea, thus vapor-loaded winds cannot penetrate very far inland, and they leave the vapor as precipitation on a very narrow strip of land. As we go to the west, the mountains get farther and farther away from the coast. Since the winds from the Black Sea are able to travel across this area, the forest area is much wider here. Thus, some species in the western part are mixed with mediterranean types.

The main forest trees are: *Alnus Barbata*, *Carpinus betus*, *Fagus orientalis*, *Acer laetum* and *Diopyros lotus*. In some parts of the region shrubby formations are well established.

Species Composition of Northern Anatolia

Aegilops ligustica
Agropyron elongatum
Agropyron junceum
Bromus sp.
Hordeum murinum
Festuca elatior
Lolium preenne
Poa pratensis
Trifolium aureum
Trifolium ambigum
Trifolium armenium
Trifolium subterraneum
Cynodon dactylon
Dactylis glomerata
Cornucopieae cucutatum
Cynosurus cristatum
Festuca sp.
Lotus sp.
Paspalum dilalatum
Poa trivialis
Trifolium menighinianum
Trifolium polyphllum
Trifolium repens

Central Anatolia Most of the plant species found in Central Anatolia are found in groups of their own in different localities. Some species are branch grass with none or some leaves and have hard needles on the branches. Plants with hard and long needles are very common. These are mainly *Astragalus* and *Acontholimon* types.

In Central Anatolia grasses (gramineae) plants are dominant as a group. This also proves that this part of Turkey is a steppe region. Dominant plants of the region are *Festuca ovina*, *Poa bulbosa* and *Thymus squarrosus*. These are the important vegetation complex of the ranges.

Species Composition of Central Anatolia

Agropyron intermedium
Andropogon gryllus
Andropogon ischaemum
Bromus erectus
Elymus caput-medusae
Agropyron cristatum
Agropyron orientalis
Festuca ovina
Medicago noea
Medicago turbinata
Medicago rigidula
Medicago sativa
Onobrychis armena
Hedysarum calliehroum
Phleum gracuum
Poa bulbosa
Poterium sanguisorba
Koeleria cristata
Pennisetum orientalis
Stipa legascea
Stipa pennata
Globularia orientalis
Teucrium polium
Thymus squarrosus
Astragalus angustifolius
Astragalus eriocephalus
Astragalus hamosus
Astragalus pandokatus

Eastern Anatolia This part of Turkey is covered with mountain-type steppe flora, native range and pasture. In short, it resembles the steppes of Central Anatolia and the Alp vegetation of Sweden.

Eastern Anatolia is the richest part of Turkey as far the different species of gramineae and legumes are concerned. The ranges look as if they are pastures seeded with the mixture of the two. Most of them stay green the whole year. So this is the most important part of Turkey with regard to livestock production.

Species Composition of Eastern Anatolia

Aegilops cylindrica
Andropogon caucasicum
Alopecurus pratensis
Bromus inermis

Dactylis glomerata
Lolium prennne
Lotus corniculatus
Medicago papillosa
Medicago noea
Medicago turbinata
Medicago falcata
Melilotus alba
Melilotus officinalis
Onobrychis sativa
Pisum formosum
Phleum pratense
Trifolium pratense
Trifolium rytidesemium

Southeastern Anatolia The lower parts of the region are covered with steppe vegetation. Forests are found at 1,000-meter elevation or higher. At 400 to 600 meters, shrubs are found. Shrubs are not dense and some are grassy looking ones. The characteristic type is *Triticum thaouidar*.

Species Composition of Southeastern Anatolia

Aegilops ligustica
Aegilops speltoides
Bromus tectum
Bromus scoparius
Cicer judacium
Hordeum bulbosum
Lotus sulphureus
Pisum humile
Pisum fulvum
Phalaris tuberosa

Aegean Region The type climate in the region is mediterranean, so the species found are likely to be the same. Since the fall and winter seasons are rainy and mild the vegetation period is long in the region. Consequently the region is green the year round.

Mountain skirts are covered with *Aegilops triuncialis*, *A. ovata*, *Hordeum murinum* and *Avena sterilis*. *Secale montanum* is very common above 500-meter line.

Species Composition of Aegean Region

Aegilops triuncialis
Aegilops ovata
Avena sterilis
Avena barbata
Avena bulbosa
Hordeum murinum
Hordeum bulbosum
Hordeum spontaneum
Hordeum maritimum
Andropogon gryllus
Briza maxima
Bromus hordeaceus
Bromus scoparius
Cynodon dactylon
Dactylis hispanica
Lolium rigidum

Thrace and Marmara Region --- Since this region is under the influence of both mediterranean and Black Sea types of climate, it is impossible to state special species. *Deschampsia caespitosa* found on the Ergene plain differentiates the region. In addition, in the western part of Thrace, Central Anatolia types such as *Festuca*, *Thymus* and *Astragalus* are found.

Species Composition of Thrace and Marmara Region

Aegilops apeltoides
Agropyron elongatum
Agropyron prostratum
Agropyron repens
Alopecurus lanatus
Aire cappilaris
Agrostis alba
Andropogon ischaemum
Ammophilla arenaria
Anthoxanthum amarum
Anthoxanthum aristatum
Briza maxima
Briza media
Deschampsia caespitosa
Festuca ovina
Holcus lanatus
Dactylis glomerata

RANGELAND

Range management is often regarded as concerning itself solely with the production of animals on natural pastures. This view, however, does not go deep enough. The basic wealth of any people is the land. To meet the enlarged demands of increasing human population, some of the land is cultivated in order to increase the products from the more productive and limited areas. Other lands, unsuitable for cultivation, yield products under natural conditions. In the lower rainfall areas, these products are usually the forage plants and in the high rainfall sections, the forests. The range manager, then, becomes a land manager where the small vegetation the grasses and forbs and shrubs predominates. As such, his first concern and responsibility is not the production of livestock but the control of land-use so that this part of his nation's land can contribute maximum benefits to the people. The grazing of livestock on some or most of the area may be involved. The grazing of livestock on some of the area may also be necessary in order to protect the land and reduce wind or water erosion and flood runoff. Other areas may need to be reserved for use by important wildlife species.

Wherever land areas are small in proportion to population, there will be a demand to cultivate marginal lands where rainfall is low or where slopes are steep. All of these uses need to be reconciled in the interest of good land-use in order to make all the lands most valuable to the people. The range will then consist of those lands which the combinations of soils, climate, and topography dictate should remain under a cover of permanent vegetation, much of which may be grazed by livestock.

NATIVE RANGE FORAGE PLANTS

Although the ecological conditions between the different regions are very different, the range conditions can be studied within three large regions.

Condition of ranges in Central Anatolia (including Southeastern Anatolia) - The size of the rangeland is 11 billion hectares. Because of the limiting climate and soil conditions, the ranges here are the poorest class found in Turkey. They are steppe-type and in some locations are so poor that they cannot even conserve the soil against erosion.

Festuca ovina, *Bromus erectus*, *Agropyrons*, *Andropogon ischaemum*, *Phalaris tuberosa*, *Onobrychis armena* and *Genista* sp. are the species left from climax vegetation. These are hidden by the coarse, tough plants that have needles on them. Their rate within the botanical composition is 20 to 30 percent. Dominant ones are *Arthemisia fragrans* and *Thymus squarrosus*. Within the range 10 to 12 percent of the area is covered by only the lower stem parts of the plants.

Condition of ranges on the coasts - Climatic and soils conditions of ranges on Mediterranean, Aegean and Marmara coasts are much more favorable than Central Anatolia.

On these ranges, better value gramineas such as *D. glomerata*, *F. elatior*, *L. prene*, *Ph. tuberosa* and legumes of the type *Tri. meneghinum*, *Tri. fragiferum*, and *Tri. pratense* are found.

Condition of ranges in Eastern Anatolia - Range covers a large area in this region. Because of the fact that heavy grazing is not practiced here, it is much easier to find the original vegetation on the ranges. Consequently their botanical composition is much better than the ranges in the other regions. Plant types such as *Agrostis alba*, *Dactylis glomerata*, *Bromus inermis*, *Festuca elatior*, *Trifolium repens*, *Medicago sativa* and *Lotus corniculatus* are abundant.

INTRODUCED FORAGE SPECIES AND THEIR SPECIAL CHARACTERISTICS

There have been 2,270 ecotype plants obtained from several sources and seeded.

GRAZING PRACTICES AND PROBLEMS OF THE COUNTRIES

RANGE UTILIZATION

Present utilization - After the Second World War, because of some economic, social and political reasons, ranges were plowed on a large scale. In the table below, the amount of decrease in the rangeland is shown. We see that it amounts to 30 percent.

TABLE 1
Changes in Rangeland and Livestock Between 1948-1962

Years	Range Area (hectares)	Livestock Number (unit 250 kg.)	Range Area (unit livestock)
1948	38,900	22,295,055	1,745
1949	36,240	21,446,048	1,690
1950	35,500	21,680,147	1,637
1951	34,978	22,797,019	1,534
1952	32,889	23,524,544	1,398
1953	31,547	23,740,792	1,328
1954	30,941	23,797,234	1,300
1955	29,509	23,833,670	1,238
1956	27,989	24,854,034	1,126
1957	28,248	25,900,800	1,090
1958	27,624	27,016,915	1,022
1959	27,514	28,440,626	967
1960	27,158	27,670,288	981
1961	27,315	27,051,271	1,010
1962	27,166	26,947,110	1,008

Grazing capacity and yields on the heavily grazed ranges are as follows:

- In Central Anatolia, 3.1 hectares should be given for a cattle (250 kg) unit.
- On the coasts, 2.3 hectares should be given for a cattle (250 kg) unit.
- In Eastern Anatolia, 1.1 hectares will be enough size for a cattle (250 kg) unit.

What is the best management on the range? - In Turkey, controlled grazing can be done if the following conditions are provided:

- They should be privately owned.
- There is need of legislation to regulate utilization.
- The farmers should be educated in pasture and forage crop growing and management.

Grazing methods - In general, uncontrolled grazing is practiced in Turkey. In some parts, livestock is grazed on the plains during the winter months and in the summer they are taken to the mountains. This we consider "natural grazing rotation."

Range improvement - The Ministry of Agriculture is doing some "demonstration" type work on some of the community pasture ranges.

Artificial reseeding - Good results are obtained from the artificial reseeding studies made in East and Central Anatolia ranges.

Establishment pastures - Pasture establishment work is being done at the state farms. Farmers have not yet begun.

Selection of livestock according to range characteristics

Selection of livestock according to the range characteristics is not practiced.

Range inventories and management planning - For the last few years inventory work has been done in Eastern and Central Anatolia.

The importance of forage crops in rotations -- Yoneca, Korunga and Fiğ, in general are used in crop rotations.

ADMINISTRATION OF PUBLIC GRAZING LANDS

STATE AND COMMUNITY GRAZING

In Turkey, range and pasture ownership is separated into three categories: 1) that owned by the state, 2) that owned by the village and 3) privately owned.

Uncontrolled grazing is practiced on the ranges that are owned by the state and by the village.

CONFLICT IN GRAZING USE OF PUBLIC LANDS

Community ranges have to be controlled under the conditions which have been cited below:

- a) Range boundaries of the village should be determined precisely.
- b) Every family chief has to have grazing rights in accordance with the members of his family.
- c) According to the grazing rights every family should pay a certain amount of money to the fund separated from the budget of the village for taking care of and improving range.
- d) Seeds and machinery should be provided to the villages for range improvement by the government organization.
- e) Publications should be made available for education of the farmers.

RANGE RESEARCH

DRYLAND CONDITIONS

Grassland research has been conducted in our country since 1959. Research has been carried out particularly under dryland conditions.

Adaptation experiments have been conducted to determine drought-resistant varieties by using forage crops from various sources. These experiments have indicated adaptable varieties of *Agropyron cristatum*, *Agropyron intermedium*, *Agropyron desertorum*, *Agropyron elongatum*, *Bromus inermis*, *Phalaris arundinacea*, *Elymus junceus*, *Festuca ovina*, *Medicago sativa* (Kayseri), *Onobrychis sativa*, *Vicia sativa*, *Poterium sanguisorba* and *Kochia prostrata* for dryland conditions. Besides, the trials have been carried out for the purpose of testing the same varieties with regard to sowing time, row distance, hay yield and seed yield. In addition, natural range conditions, plant composition of the range and way of improving the range have been determined.

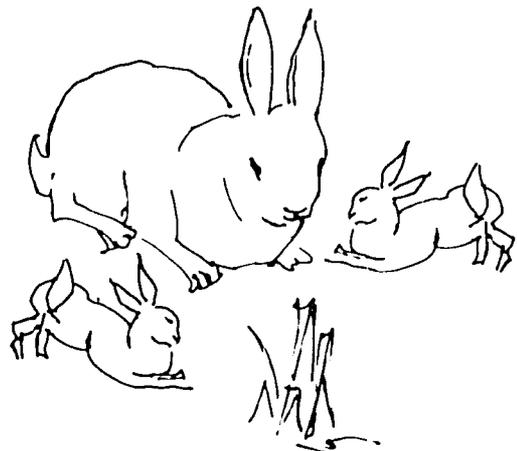
IRRIGATED CONDITIONS

Alfalfa and corn variety trials are being carried out under irrigated conditions.

PROPOSALS

At least five to six research men should be sent to well-developed foreign countries for training in different branches of grassland research.

ANIMAL DISEASE AND REGULATORY PROGRAMS



CONTROL OF ANIMAL DISEASES AND PARASITES

by

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Head of Virus Department

Razi Institute, Ministry of Agriculture, Tehran

THE QUESTION of soundness of livestock is more important than is commonly realized. Healthy and disease-free animals yield sound products. It is quite obvious that food produced from animals affected with diseases, especially those of an infectious nature, can be a serious danger to the public health and national economy.

In livestock improvement success cannot be attained as long as effective control measures against diseases have not been applied.

A campaign against contagious diseases faces many difficulties in countries where the number of field veterinarians is limited, good roads and suitable transportation means are not fully developed, and skilled management of animals is not yet available.

To overcome these difficulties and obtain the greatest possible success in the eradication, or at least the control of outbreaks one should look for the simplest and most economical procedures.

Systematic vaccination should be carried out using safe and potent prophylactics with good keeping qualities under unfavourable conditions.

For many years much attention has been given to the campaign against infectious diseases in animals and great steps forward have been taken in the development of effective biologics.

In the last two decades, Iran has made valuable efforts to encourage livestock improvement and to control animal diseases.

This brief report provides basic information relating to the status of animal diseases and control measures in Iran.

INFECTIOUS DISEASES

SHEEP AND GOAT POX

Pox among sheep and goats is one of the serious diseases causing heavy mortality and great economic loss in Iran where the majority of farmers depend on these animals for their livelihood. Their economy suffers from pox infection which, in some instances, kills 90 percent of the lambs, reduces production, causes abortion and mastitis and frequently leaves considerable skin defects.

Mass vaccination is the method of choice in checking the spread of the disease. Live-modified strain of causative agents, attenuated on primary cell cultures (ovine kidney) is now used to control the infection.

During the last two years, large amounts of the combined sheep pox-anthrax and recently goat pox-anthrax vaccines have been produced and used in the field with satisfactory results.

Combined vaccines are of potential economic importance since a single injection confers solid and long lasting immunity against two major diseases of sheep and goats.

FOOT-AND-MOUTH DISEASE (FMD)

For a long time FMD has been widespread in Iran. It is not a serious problem from the mortality point of view, but the economic importance due to wastage and loss of production is considerable.

In indigenous adult animals the disease is not so severe. However, high mortality has been reported among new-born and those of imported cattle from disease-free countries.

Two types of the virus (A & O) are actually present in the country. Type Asia I has been isolated on two occasions, once in 1957 and again in 1964.

Heavy outbreaks of SAT 1 type appeared in 1962 and caused high mortality in young calves and affected sheep flocks. Thanks to the potent type-specific vaccine produced at the State Razi Institute and mass vaccination the outbreak was brought under control very quickly. At present, there are neither Asia I nor SAT 1 types in Iran.

In 1966 subtype A (A22) was isolated from infectious material received from the field for typing.

Type C has never been detected in Iran, but considering the existing conditions the danger of introduction of this type is always present.

Typing is carried out at the State Razi Serum and Vaccine Institute. In case of suspicious specimens, samples are also sent to the World Reference Laboratory, Pirbright, U.K. for confirmation of our findings.

Hyperimmune sera against different types of FMDV are locally prepared. Inactivated F₁ antigen vaccine is now in use to immunize susceptible animals.

RINDERPEST

Since 1950 Iran has been one of the rinderpest-free countries in the Middle East. Towards the end of June 1969 the infection occurred in the vicinity of Tehran and in a few days it spread among bovine and buffalo of other provinces, mainly through the local movement of cattle.

Twenty thousand deaths of cattle and buffalo have officially been reported and it is believed that a still larger number of deaths due to this disease went unrecorded.

After prompt diagnosis, movement of animals within provinces was subjected to drastic quarantine measures. Cattle markets were closed. Transportation of animals and animal products to clean zones was not permitted. Mass vaccination of apparently healthy animals and destruction of the infected ones were immediately carried out.

The outbreak has been brought under control within two months due to the above-mentioned procedures.

Susceptible animals have been immunized with both inactivated and live-modified tissue culture vaccines.

In spite of many efforts, the disease still appears from time to time in a few farms because of negligence of the

owners who have failed to vaccinate their animals.

The amount of vaccine produced by the Razi Institute and injected by the field veterinarians is as follows:

- a) Inactivated tissue vaccine 5,000,000 doses
- b) Live-modified tissue culture vaccine (Plowright strain) 8,000,000 doses

NEWCASTLE DISEASE

Poultry raising is now a relatively important animal industry and its products rank high in Iranian farm communities. As the poultry population increases, the disease problem is apt to increase. Thus success or failure in the poultry industry is greatly influenced by hygienic conditions and freedom from diseases.

Systematic immunization of baby chicks and older birds is carried out by BI and Komarov strains respectively.

ANTHRAX

Some years ago, anthrax was a serious problem among sheep and goats in Iran. The drastic threat of the disease has gradually diminished during the last ten years due to the application of mass vaccination. The Veterinary Services is trying to wipe out the disease, and at present, it occurs only sporadically.

The incidence of anthrax among bovine and equine population is comparatively less. Equine animals are immunized against the disease by injections of a combined anthrax and tetanus vaccine.

SOME OTHER INFECTIOUS DISEASES

For other diseases against which effective biological products are available, mass vaccination for both prophylactic purposes and for the control of outbreaks is regularly carried out.

African horse sickness No single case of this disease has been reported in Iran since 1965. However, large amounts of monovalent tissue culture vaccine have been produced for some foreign countries where outbreaks of African horse sickness occurs.

Parasitic diseases There are a number of parasitic diseases that are prevalent among farm animals and poultry flocks. Due to the fact that some of our livestock owners and the nomadic tribesmen in particular, have not yet become fully familiar with the effective role of anti-parasitic drugs, the campaign against parasite infestation has not come up to expectations.

Recently, a long-term plan has been outlined, which would provide for the free treatment of the internal and external parasitic diseases of animals.

A joint Van-Rezaieh project has been drawn up to control helminthic diseases in livestock in Turkey and Iran. All necessary equipment, chemicals and vehicles have been provided by the United Kingdom.

INCIDENCE AND CONTROL OF ANIMAL DISEASES IN EAST PAKISTAN

by

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THE DIRECTORATE of Livestock Services in East Pakistan is charged with the responsibility of looking after the animal wealth of the province and with providing the public with technical advice and service in respect to their domestic animals. The activities of the Directorate come under two main categories, namely: a) Animal Health and b) Animal Production.

Activities under the Animal Health category include both curative treatment and prophylactic measures. Emphasis is however more on prevention and control of epizootic, enzootic and parasitic diseases of domestic animals. Veterinary hospitals and dispensaries are maintained at different levels, namely district, subdivision and thana. There are at present 52 hospitals and 245 dispensaries in the province. These are used for the treatment of domestic animals. The Directorate maintains a staff of 576 technical personnel. At present there are two technically qualified officers, one in charge of disease control and extension work and another in charge of the thana veterinary dispensary in each thana. Steps have been taken to post veterinary vaccinators to each union of the province. In addition, one thana livestock assistant and two field assistants have been posted recently to each thana to strengthen the mass vaccination campaign against cattle and poultry diseases. Poultry protection weeks are observed from time to time to intensify the vaccination drive.

There are three research institutes under the Directorate where research is conducted and vaccines and

sera are produced against various prevalent diseases of domestic animals. Two of these institutes are situated at Dacca and one at Comilla.

Diseases of domestic animals and birds which appear in epidemic form in East Pakistan include anthrax, haemorrhagic septicaemia, black quarter, foot-and-mouth disease, rabies, Ranikhet disease, fowl pox and fowl cholera.

Rinderpest, which used to occur in epidemic form in the past, does not occur now. It appeared last in epidemic form in 1957-58 when it took a heavy toll. There has not been any incidence of this disease since 1959.

A mass vaccination drive against rinderpest in cattle has been greatly intensified with the production of freeze-dried goat tissue vaccine. The vaccine has proved very effective in controlling the disease.

A systematic vaccination drive against anthrax, a fatal disease of cattle, was launched in 1960. The result has been satisfactory. This vaccination drive has been continued and the incidence of the disease has been greatly minimised. A few cases of viral diarrhoea disease complex have been reported. They appeared to be different from rinderpest.

Vaccine and/or sera against the diseases mentioned above are prepared in the research institutes under the Directorate by specialists and technicians. FAO provided equipment and other facilities and the expert advisory services of Dr. Sabhan, Col. G. Hinds, Dr. Fredericks and others who trained some of the local officers. A

good number of the staff engaged in the production of vaccines and biologics have received higher training abroad. Freeze-dried vaccines are being produced against rinderpest, Ranikhet disease, fowl pox and rabies. These freeze-dried vaccines and other vaccines produced against anthrax, haemorrhagic septicaemia, black quarter, foot-and-mouth disease, and fowl cholera have proved very successful in the prevention and control of disease of domestic animals of East Pakistan. There is a tremendous demand by the public for these vaccines which are of international standard. The institutes and facilities for preparation of vaccines and sera being expanded to meet this increased demand.

The mortality rate among the cattle and buffalo from contagious diseases and other causes was estimated at 10.6 percent by Haq and Masud in 1966. They also estimated total loss of milk, meat and eggs as a result of mortality and impaired production from diseases in cattle, buffalo, sheep and poultry at approximately Rs. 1,116.5 million annually in West Pakistan. These figures are likely to be higher in East Pakistan. A very conservative estimate places the loss from foot-and-mouth disease alone in East Pakistan at Rs. 4.2 million annually.

The data on incidence and control of contagious and infectious diseases and on production of biologics are given in Tables 1 and 2.

In addition to the loss from major epizootic and enzootic diseases prevalent in the country considerable

losses also occur from internal and external parasites resulting in debilitation, depreciation and death.

Parasitic diseases of livestock constitute a major problem in East Pakistan. The humid tropical climate of this low lying deltaic region is very favourable for parasites and parasitic infestation of the domestic animals. Investigation is in progress on the parasites of domestic animals, their identification, pathogenesis and loss caused by them. As many as 80 different species have been identified in the research institutes of this Directorate. Four research schemes are in operation on parasites and parasitic diseases. "Humpsore" is widely prevalent in the bovine population. It has so far resisted attempts to completely cure and eradicate the condition.

Due attention must be paid to the control of livestock movement, and a regulatory programme enforced for the successful prevention and control of diseases in domestic animals.

Livestock movement in the province is controlled through various government acts like the Provincial East Pakistan Diseases of Animals Act, Central Glanders and Farcy Act and the Dacca Municipal Administration Ordinance of 1960, and the Livestock Importation Act. The provisions of these acts notify the public to restrict the movement of animals for checking the spread of infection of contagious diseases. Quarantine measures have been recommended. It is expected that quarantine centres for imported animals will be established at suitable places.

TABLE 1
INCIDENCE AND CONTROL

Name of Disease	No. of outbreaks			No. of serum inoculations (in presence of outbreak)			No. of vaccinations (in absence of outbreak)		
	1966-67	1967-68	1968-69	1966-67	1967-68	1968-69	1966-67	1967-68	1968-69
Rinderpest							5,322,116	6,163,083	4,844,208
Anthrax	277	295	298	136,363	5,552	30,688	298,302	1,362,947	405,602
Haemorrhagic septicaemia	203	381	310	48,787	1,192	33,704	126,989	199,250	186,163
Black quarter	68	98	51	12,344	562	3,625	36,428	87,785	48,876
Foot-and-mouth disease	964	65	520	34,454	4,713	2,312	15,092	3,236	47,789
Newcastle disease (Ranikhet)	571	350	461	439,425	303,747	192,041	9,059,164	10,989,999	13,283,179
Fowl pox	27	33	35	14,335	11,399		120,278	70,471	131,911
Fowl cholera			1						3,428

TABLE 2
PRODUCTION OF VACCINE AND SERA AND ANNUAL REQUIREMENT

Name of biologics	Vaccine production in doses			Vaccine requirements per year		
	1966-67	1967-68	1968-69			
Foot-and-mouth disease vaccine	64,800	17,400	26,700	19.42	million	doses
Ranikhet disease vaccine	10,279,000	13,391,300	22,252,600	40.00	"	"
Baby chick Ranikhet disease vaccine	378,150	699,750	672,250			
Fowl pox vaccine	307,500	376,000	672,250	40.00	"	"
Single-dose rabies vaccine	5,145	5,583	1,375	20.00	"	"
Goat tissue vaccine	6,829,700	7,216,200	6,208,700	19.42	"	"
Anthrax vaccine	378,000	528,000	505,300	19.42	"	"
Haemorrhagic septicaemia vaccine	211,680	187,770	247,560	19.42	"	"
Black quarter vaccine	52,520	57,060	63,180	19.42	"	"
Fowl cholera vaccine	6,305	15,100	16,500	40.00	"	"
Anthrax serum	15,835	9,700				
Haemorrhagic septicaemia serum	11,940		14,820			
Black quarter serum	8,380		31,980			

CONTROL OF ANIMAL DISEASES AND REGULATION OF ANIMAL MOVEMENT AS IT AFFECTS LIVESTOCK DEVELOPMENT IN TURKEY

by
Dr. Namik Buharalilar
Section Chief, Animal Diseases
Ministry of Agriculture, Ankara

ONE OF THE MAIN functions of the Veterinary Directorate in the Ministry of Agriculture is disease control by prophylaxis and treatment, with the implementation of sanitary measures when required.

The Ministry of Agriculture employs 1,143 veterinarians and 829 veterinary helpers. The veterinary helpers are trained staff who have qualified after three years' training at a special school where they receive instruction in animal husbandry and the practical side of veterinary medicine. When employed in the field they work under the close supervision of a qualified veterinarian.

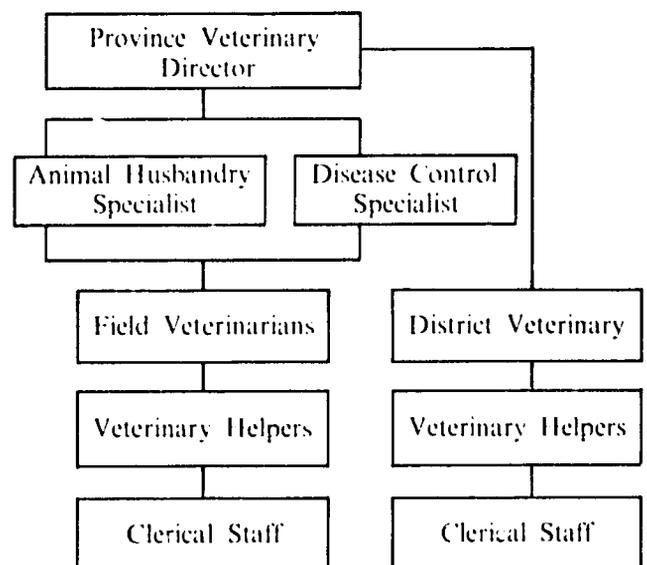
The Organization of Veterinary Services in Turkey is divided into four parts:

- 1) Central Organization
- 2) Field Service
- 3) Laboratory Service
- 4) State Farms.

FIELD SERVICE

Turkey is divided into 67 administrative provinces each of which is divided into "Kaza" or districts, totalling 570. The number of villages in the country is 36,558. The veterinary service of a province is con-

trolled by the provincial veterinary director and his staff in the provincial capital.



Where it is practicable, with the limited number of staff, districts are staffed with veterinarians and veterinary helpers.

LABORATORY SERVICE

The laboratory service provides biological products, operates a diagnostic service and carries out research.

The requirements for vaccines and sera are met by the production units at the three main veterinary institutes—Pendik (Istanbul), Etlik (Ankara), and Elazığ with a Biological Control Laboratory, Bornova (Izmir). In addition to the three main institutes, diagnostic and investigation laboratories exist at Samsun, Bursa, Denizli, Konya, Diyarbakir, Adana, Afyon, Kars, Erzurum. Each of these contains a food control laboratory.

The Sheep Diseases Institute at Pendik has been completed and is commencing work in conjunction with foreign experts through FAO.

The new Foot-and-Mouth Disease Institute at Ankara has been functioning since March 1967.

IMPORT

For livestock improvement, pedigreed animals are imported but on a limited scale amounting to no more than four or five hundred each year. Small amounts of animal products are imported by Turkey.

The following regulations are in force when animals are imported:

A certificate from the country of origin is required stating that no communicable disease exists on the premises of origin.

The animals are subjected to examination by a government veterinarian in the country of origin and a certificate of health is issued.

If required, diagnostic tests are carried out on the animals.

If considered necessary, prophylactic vaccination with specified vaccine is undertaken.

Animals enter Turkey through a controlled port of entry.

Animals are quarantined on arrival in Turkey for two months during which time prescribed diagnostic tests are applied.

At the end of the quarantine period and prior to releasing the animals to farms further examinations are made.

The importation of animals and animal products is dependent on the absence of contagious diseases in the exporting country. Importation and the passage of animals and animal products may be prohibited, or allowed with certain reservations, according to the nature of the existing disease.

EXPORT

The following regulations are in force when animals are exported:

A certificate from the country of origin must

be provided stating that no communicable disease exists.

A health certificate must be issued by the government veterinarian after examination.

Diagnostic tests should be given if required.

Prophylactic vaccination should be given if considered necessary.

Animals are assembled at a quarantine station near the point of departure for final examination and release.

Live animals are kept under veterinary observation for at least 24 hours before shipment. Animals resident within a 30-kilometer radius of air, sea and border ports used for the exportation of livestock receive prophylactic vaccination and are kept under constant surveillance.

IN TRANSIT

In compliance with the Geneva International Agreement, animals being shipped through Turkey must be transported in closed containers and receive veterinary examination at each rest station.

INTER-PROVINCIAL ANIMAL MOVEMENT

Inter-provincial seasonal movements of flocks and herds occur in Turkey. For disease control purposes all animals moved from their district of residence must have a certificate of origin and a health certificate from the district veterinarian, indicating the route to be taken and designating rest stations. Further examinations are made at the resting places and a final examination is carried out at the place of destination. At the time of the first examination on the premises of origin, prophylactic vaccination may be undertaken at the discretion of the veterinarian. This applies to all animal traffic. Nomadic movements between Turkey and adjacent countries are prohibited.

NATIONAL AND INTERNATIONAL DISEASE CONTROL

Vehicles used for the transportation of animals in international commerce must be cleaned, disinfected and treated to destroy insects with approved disinfectant and insecticides after unloading and before loading other animals.

The following list gives the diseases that are notifiable in Turkey and for which the Veterinary Services is responsible for control by diagnosis, treatment and instituting sanitary measures.

1. Rinderpest
2. Foot-and-mouth disease
3. Anthrax
4. Black leg
5. Contagious pleuropneumonia
6. Tuberculosis
7. Bovine haemorrhagic septicaemia
8. Contagious pleuropneumonia of goats
9. Pox (Sheep and goats)

10. Glanders
11. Lymphangitis epizootica
12. Dourine
13. Scabies
14. Rabies
15. Newcastle-fowl pest
16. Fowl cholera
17. Pullorum
18. Fowl pox and avian diphtheria
19. Bovine brucellosis
20. Contagious agalactia
21. Strangle
22. Bovine contagious mastitis
23. Piroplasmosis
24. Distomatosis
25. Strongylosis
26. Hypodermosis
27. Echinococcosis
28. Entero-toxaemia
29. B. Ichtero-haemoglobinuria
30. African horse sickness
31. Hog cholera
32. Swine cont. pneumonia
33. Swine erysipelas
34. Black disease of sheep

Besides the above diseases, any diseases causing significant economic loss must be reported to the provincial veterinary services so that any necessary control measures can be adopted.

A veterinarian has a statutory obligation to investigate any suspected disease within 24 hours of notification. The following is an outline of the prescribed procedure for conducting an investigation.

History of disease

Examination of affected animals

Autopsy

Collection of material for laboratory examination

If the aetiology is not apparent, assistance from a laboratory specialist should be requested.

After establishing the existence of a contagious disease the veterinarian is responsible for notifying the Ministry of Agriculture, the local authority and, with the assistance of the local authority, notifying the surrounding area. Isolation of affected and suspect animals is enforced with the prohibition of movement of susceptible animals and quarantine. Animal fairs and markets are suspended, and disinfection is carried out on the premises, vehicles and persons. All dead killed animals are disposed of by burying or burning. Depending upon the nature of the contagious disease, vaccination, treatment, or slaughter with indemnity, is prescribed.

Provision is made for slaughter with indemnity for the following diseases:

Glanders

African horse sickness

Rinderpest

Brucellosis

Tuberculosis

Pleuro-pneumonia of goats.

Arrangements are made for notifying all neighboring countries as soon as a highly contagious disease is identified. Reports detailing existing contagious diseases are sent at fifteen-day intervals to bordering countries and member countries of the O.I.E.

The control of foot-and-mouth disease was a major part of the sanitary action against contagious disease in Turkey in 1968 and 1969 and foci and extension of the infection were much less compared to the previous years. At the present time there are active 338 foci of 01 type of F.M.R. in our country.

There has not been a case of SAT₁ in Turkey since June 1965. In 1969 only three cases of A₂₂ type have been recorded. The last case reported in June 1969, C type of FMD has never been seen in Turkey except for one single case in an imported cow in 1959.

Control measures follow those previously outlined and involve the quarantine of affected villages, restrictions on animal movements and the prohibition of fairs and markets. Ring vaccination is widely practiced, and typing is carried out at the Ankara Şap Institute.

Rinderpest was eradicated in 1932 and since that year no cases have been identified.

Sheep pox is one of the most prevalent diseases in Turkey and is subject to the previously mentioned control measures with extensive vaccination. Vaccination is carried out in known infected areas and areas that have a history of disease during the past few years.

Entero-toxaemia has shown an increase over the past six years, judging by the number of reported cases. To combat this rise in incidence there has been a marked increase in vaccination. It is hoped that the vaccine produced at Pendik (CI, Welchii C and D) will be improved by enhancing its immunizing properties and its annual output.

The poultry industry in Turkey is, in the main, composed of small free-range units and consequently respiratory diseases other than Newcastle disease are not a problem today.

EMERGING DISEASES

Bluetongue was identified in 1944 near the Syrian border but after appropriate measures were taken no further cases were recorded.

African horse sickness was first identified in 1960 and that year caused the slaughter of 26,569 horses and mules. Compulsory vaccination of all horses and mules commenced in 1961 and continues. During 1961, 73 animals were affected with this disease but with the present slaughter policy and mass vaccination, this disease has been eradicated with no case reported since October 1961. Vaccination in 1965 was completed and confined to animals in the provinces on Turkey's southern and eastern borders.

Equine encephalomyelitis has not been recorded in Turkey.

PARASITIC DISEASES

The efforts of the veterinary staff are directed to the demonstration of control measures and treatments

of parasitic diseases so that owners can take necessary action. Field veterinarians are responsible for treatment of reported cases.

We are fortunate in having close cooperation with pharmaceutical firms operating in Turkey. These firms provide an invaluable service by dispensing the required drugs to animal owners.

Parasitic diseases are responsible for much wastage of Turkey's livestock and are, to a great extent, attributable to the following factors of husbandry associated with village farming methods:

- Communal grazing with no arrangements to rotate the grazing areas

- Village herd and flocks mixing freely with no age segregation

- Overcrowding and overgrazing

- Malnutrition

- Animal housing which is often unsanitary

- Ignorance on the part of the owners as regards the adoption of modern prophylactic methods and medicine.

Under the Five-Year Development Plan it is our intention to give the people information on parasitic

diseases and to enlist their help in the fight against these diseases so as to secure increased yields.

Parasitic gastro-enteritis and parasitic bronchitis, particularly in sheep and goats, and liver-flukes (*Fasciola hepatica*, *F. gigantica* and *Dicrocoelium dendriticum*) are the main parasitic diseases.

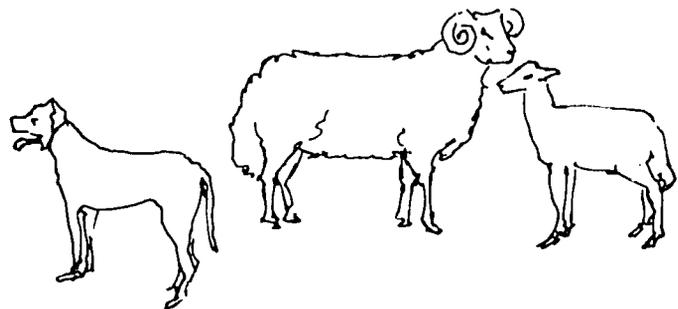
Cestodes, particularly those belonging to the genus *Moniezia*, are very prevalent in some areas, causing deaths in young lambs and loss of condition.

Ectoparasites are a problem, with many species of tick, lice and mites and hypodermatitis infesting our animals. With the advent of B.H.C., the incidence of mange was brought to a low level.

Piroplasmiasis and theileriosis are enzootic and to reduce the incidence, efforts are made to educate the animal owners in the way of treatment and many are now adept at recognizing and treating these diseases in the early stages. Acaprin and Babesin are the drugs at present in use in Turkey.

We are very thankful to the U.K. for their close interest and fruitful help in provision of needed medicine, vehicles and equipment to the joint project of Van-Agre Parasitic Disease Control Program which has been fully operated since September 1968.

MARKETING OF LIVESTOCK AND LIVESTOCK PRODUCTS



MARKETING OF LIVESTOCK AND LIVESTOCK PRODUCTS

by

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REVIEW OF THE POPULATION DURING THE FIVE-YEAR PERIOD OF THE FOURTH PLAN (1967-72)

THE ANNUAL RATE of increase in the population of Iran during the Fourth National Plan is expected to be about 2.6 percent, and the rate of increase in urban areas is about 4.4 percent. This is greater than that of rural areas, which is only about 1.4 percent.

The population of Iran with the above-mentioned rate will be doubled by the end of this century and is estimated to be around 50 million.

The rural population constitutes 61 percent of the total population and the ratio of employed population in the agricultural sector to the total employed population is 48 percent. With the growth in population and the increase in purchasing power of various groups, the consumption of food products which come primarily from livestock and livestock products will also rise.

If the major parts of needed food supplies are not produced in the country, and if we depend on imports

then this will create numerous obstacles to our economic development.

PURPOSE OF THE FOURTH NATIONAL DEVELOPMENT PLAN

The Ministry of Agricultural Products and Consumer Goods was created in 1966 to intensify efforts and hasten progress in the field of supply, marketing, processing and distribution of foodstuffs. Article One of the law creating this Ministry declares that for the purpose of forecasting the requirements and supplying major foodstuffs and consumer goods; for studying and regulating markets; for processing and changing the form of agricultural products; for developing markets and improving channels of distribution; for provision of equipment necessary for protection of produce, and finally for preliminary steps towards the insurance of crops and for continuous supervision of the price of goods consumed by the public, the above-mentioned Ministry was established. Upon its formation responsibility for the milk industry, meat organization, cold stores and slaughterhouses was given to the said Ministry.

LIVESTOCK POPULATION

In 1966 the number of livestock in Iran was estimated to be as follows:

<u>Livestock</u>	<u>No. of Head</u>
Sheep	28,000,000
Goats	14,000,000
Cattle	5,200,000
Buffalo	330,000
Camels	234,000
Pigs	70,000
Poultry	43,000,000

THE VALUE OF LIVESTOCK PRODUCTS TO THE ECONOMY

In the year 1967-68 the GNP of Iran was Rls. 564 billion at market price. The value added in the agricultural sector was Rls. 127 billion and livestock contributed Rls. 49 billion. In other words the contribution of agriculture and animal husbandry to Iran's GNP is about 23 percent. The value added in this sector will be the highest of all sectors of production excluding petroleum during the Fourth Plan period (1968-72). Therefore, under the present and future economic conditions of Iran, agriculture and animal husbandry are of special significance.

LIVESTOCK IMPORTS AND EXPORTS

The importation of livestock for slaughtering was 21,081 head in 1965, valued at Rls. 68 million, and in 1966, 34,996 head, valued at Rls. 149 million. Imports of meat, including dressed poultry were 1,433 tons valued at Rls. 90 million in 1965-66 and 153 tons, valued at Rls. 18 million in 1966-67.

The total value of exports of animal products including live animals, meat, casings, hides, skins, wool, hair, dairy products, eggs and honey was approximately Rls. 1,830 million.

Iran imports meat either in the form of live animals, frozen or chilled carcasses to cover the periodic shortages particularly in Tehran. The countries of origin of those imports are principally Australia, Argentina, Turkey and Bulgaria.

INDEX OF LIVING AND WHOLESALE PRICE

Statistics obtained from the Central Bank of Iran indicate the way in which most prices have led the country-wide index upwards. The cost of meat, poultry and fish has risen by 60 percent since 1959, compared with the general cost of living which has risen only 17.9 percent.

PROGRESSIVE DETERIORATION OF THE MEAT SUPPLY SITUATION IN IRAN

In the year 1962, the High Council of Economics stated that "Every year the population of Iran increases and the increase of population is much more than the increase of production level of animal products. In other words the livestock production of Iran plus its importation at the present time is not able to supply

the nutritional needs of Iran's people and its 2.6 percent annual increase. Therefore in the winter and spring, when the demand for animal products increases a meat shortage exists. In view of the increase in townspeople in the future it is quite obvious that the food situation will be worse than at the present time."

CALCULATION OF MEAT CONSUMPTION

According to the figures obtained by various surveys made in the country it is believed that per capita consumption of meat in Tehran, urban and rural areas is 21, 17 and 14 kilograms per person per year respectively.

The supply of about 340,000-350,000 tons of red meat in Iran would give us an average consumption of 12.5 kilos of red meat per person per year, if including white meat (poultry and fish) the per capita consumption is about 15 kilos per year.

The percentage of different kinds of meat consumed in Iran each year is as follows:

	<u>Percent</u>
Sheep and goat meat	55
Cattle and buffalo	30
Poultry and fish	15
Total	100

The local taste calls more for lamb, mutton and lean meat rather than for beef. The main sources of beef are generally working oxen, culled cows and dairy bulls.

MEAT MARKETING PROBLEMS

Livestock is purchased from the tribal areas and the village by middlemen who truck the animals to the cities either for fattening or slaughter. (Only 5-7 percent of the total animals slaughtered in Iran are fattened.) Sometimes the animals pass through several middlemen before they are slaughtered. The average daily slaughter in Tehran in 1966-67 was 4,800 head of sheep and goats and 600 head of cattle and buffalo.

The principal buyers of animals in Tehran are the Tehran Syndicate and the Tehran Beef Syndicate. These are associations of prominent butchers who are engaged in the purchase of livestock, in slaughtering and retailing. They have the exclusive right to slaughter and distribute meat in Tehran.

The system of purchase on the basis of carcass weight makes it more profitable for the syndicate to purchase two lean animals producing a total carcass weight of 40 kg than to buy a fat animal producing an identical carcass weight, because of the receipt of two skins and two sets of offals (sold on contract by the price and not by the weight). For this reason preference is given to lean, range-fed animals over fat ones.

The Tehran Municipality has had fixed prices for red meat for many years. During the summer months the price for mutton and goat meat is Rls. 10 per kg lower than that in force during the winter months. Prices for beef have been approximately two-thirds of those for mutton. Retail prices per kg in the year 196 were as follows:

	S u m m e r		W i n t e r	
	with bone	boneless	with bone	boneless
Mutton and goat meat				
Mixed sheep and goat meat	72 Rls.	96 Rls.	82 Rls.	109 Rls.
Shoulder and fore end	75 "	100 "	85 "	113 "
Breast, neck, loin	70 "	93 "	65 "	86 "
Leg and hind end	80 "	107 "	90 "	120 "
Belly	55 "	73 "		
Beef				
Mixed beef and veal	54 "	72 "	56 "	76 "
Breast, neck, loin	44 "	58 "	51 "	61 "
Shoulder and fore end	54 "	72 "	61 "	81 "
Leg, hind end and back muscle	55 "	73 "	61 "	81 "

The main limiting factors in the meat marketing in Tehran (as well as most parts of Iran) could be summarized as follows:

- 1) A monopolistic organization controls the purchase and slaughter of livestock as well as the retail sales of meat. Lack of competition excludes any possibility of improvement in the marketing system.
- 2) There is no possibility for the sellers to check all the details of the transaction
- 3) The traditional system of marketing encourages the production of lean unfinished animals and constitutes a serious disincentive to fattening. There is no discrimination for quality: good lambs bring the same price as old ewes and rams.

THE PROGRAM AND ACTIVITIES OF THE MINISTRY OF AGRICULTURAL PRODUCTS AND CONSUMER GOODS IN IRAN

ORGANIZATION OF HIGH COUNCIL AND EXECUTIVE COMMITTEE OF LIVESTOCK AND MEAT AFFAIRS

According to the proposal of the Ministry of Agricultural Products and Consumer Goods to the government body the organization of a high council and an executive committee of a livestock and meat organization was formed to increase the livestock and livestock products. Since this program has many angles such as animal husbandry, fodder increase, protection and improvement of pastures, distribution, etc., there will be close cooperation between the ministries involved. These include Agricultural Products and Consumer Goods, Water and Power, Agriculture, Economics, Natural Resources, Land Reform and Rural Cooperatives. Besides these ministries representatives of the Plan Organization and Meat Organization are the members in the high council headed by the Prime Minister.

MILK INDUSTRY

The milk industry in Iran is developing at a rapid rate, and modern dairy plants have been installed in different parts of the country. The Tehran Pasteurized Milk plant was erected in 1957 with a capacity of 45 tons per day. The output of the plant was about four tons per

day, but now it operates with 160 tons of milk daily. Besides the present plant a new section called Tetra Pack has been annexed to it with a capacity of 40 tons. The sterilized milk in special containers would have a long shelf life, and the plant is due to begin operations within a few months. Therefore, the total output of these two plants would be about 200 tons daily.

COLD STORES

In recent years some units of cold stores have been erected by the private sector in Tehran and other cities. The purpose of cold stores is to prevent the spoilage of livestock products, estimated at about 30 percent. In the Third and Fourth National Development Plans the establishment of cold stores gathered considerable attention, therefore, credits for their establishment were allocated.

In the operation of the cold stores in Iran in the next year or two we would meet the demand of the consumer during the seasons when the meat shortage occurs, and the problem of the black market and price fluctuations could be solved. The Ministry of Agricultural Products and Consumer Goods has taken action to construct the following cold stores in Iran:

City	Capacity in tons	Can be extended in tons
Tehran	10,000	16,000
Abadan	1,500	3,000
Ahwaz	500	1,500
Tabriz	2,500-2,700	
Meshed	1,500-1,700	
Isfahan	1,500-1,700	

REGIONAL AND INDUSTRIAL SLAUGHTERHOUSES

Project plans for 67 modern and mechanized slaughterhouses have been prepared and submitted to the Plan Organization by the respective ministry for control, hygiene and sanitation and standardization of the country's slaughterhouses. On this basis 36 units will be built in two phases (10 units and 20 units) during the Fourth

Plan. The remaining 31 units are scheduled to be constructed in the Fifth National Development Plan.

All industrial slaughterhouses (10 units) are equipped with cold stores and freezing tunnels to keep the meat for a long period of time. Furthermore, there is a project to install a poultry slaughterhouse with a freezing tunnel with capacity of 600 chicks per hour, adjacent to a 3,000-ton prefabricated cold store. The aim is to overcome the meat shortage and control the price fluctuations due to the black market.

ESTABLISHMENT OF OFFICIAL AUCTIONS FOR LIVESTOCK

The absence of official auction yards has caused the producers to sell their livestock at a cheap price to the middleman. Therefore, the Ministry of Agricultural Products and Consumer Goods has taken steps to establish such auction yards in different parts of the country to confront the price fluctuation and also to transport the excess meat to the regions where the meat shortage exists. Of course, these auction yards are equipped with

modern facilities such as slaughterhouses, cold stores and feeding equipment. We also import live animals from foreign countries. When they arrive the animals are tired and restless, so they have lost weight during the shipment and it is not the proper time to slaughter them. In order to overcome this difficulty the Ministry of Agricultural Products and Consumer Goods has constructed holding pens to take care of and feed 30,000 head at the port of Bandar Shahpoor, where the animals are kept and fed properly to gain their lost weight. Then they are shipped by train to Tehran or other parts of the country for slaughtering.

ANIMAL FEED PLANTS

In order to produce balanced and formulated animal and poultry feed in Tehran, and to cope with the private competitors for price stabilization, the said Ministry recently erected an animal feed plant in Tehran. This plant has the capacity to produce 80 tons of animal and poultry feed per day.

MARKETING OF LIVESTOCK AND THEIR PRODUCTS IN PAKISTAN

by
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THE PAKISTAN Government is making all-out efforts to make structural changes in the economic pattern of the country thereby minimising the dependence on uncertain factors which play an important role in an agricultural economy. As a result of different measures taken by the Government the industrial sector witnessed the highest growth rate of about 8.6 percent (compound) during the Second Five-Year Plan period (1960-65). The growth rate in agriculture during the same period was 3.5 percent. In spite of the lower growth in agriculture, it remains the largest sector of the country's economy and contributed in 1968-69 a total of 44.8 percent to the GNP. Even in the perspective plan ending 1985, which envisages an annual compound rate of growth of 5.6 percent in agriculture against 10.2 percent in industry, agriculture is projected to retain its character of the biggest contributor to the output of the country. This contribution stood at 60 percent in 1950 and went down to 49 percent in 1965 and is projected at 45 percent in 1970 and 36 percent in 1985. Compared to this, industry contributed 6 percent in 1950 and 12 percent in 1965. This is expected to further increase to 14 percent in 1970 and 21 percent in 1985. Consequently, agriculture will be the leading sector even in 1985, providing employment to 49 percent

of the labour force.

The gross national product through agriculture was Rs. 2,320.1 million in 1968-69, out of the total of Rs. 5,104.8 million. In the estimates under agriculture, only partial contribution of the livestock sub-sector has been shown. The value added by livestock and their products has been estimated at Rs. 4,420 million.

The cattle of the country constitute the main source of motive power for agricultural operations, annually covering about 71 million acres of the cultivated area. In addition, the cattle provide large quantities of milk, meat, fat, hides and skins, wool, hair, bones, and guts, which are essential for human nutrition and for the industry. It is, however, unfortunate that the livestock sector has no separate identity and is treated as only ancillary to agriculture.

POPULATION AND PRODUCTION STATISTICS

According to the Agricultural Census 1960, the population of all types of livestock was 65 million head excluding 30 million head of fowl. More recent estimates published in 1966 by the West Pakistan Agricultural University, Lyallpur place this number at 81 million head excluding 41 million head of fowl. The population of different kinds of livestock is given below:

Kind	1960	1966
	(in million)	
Oxen	33.53	39.01
Buffalo	8.40	10.32
Sheep	10.26	12.90
Goats	12.92	16.07
Horses	N.A.	0.56
Donkeys	N.A.	1.09
Mules	N.A.	0.03
Camels	N.A.	0.76
Fowls	(	34.90
Ducks	(30.10	5.80
Other birds	(	0.15

The livestock provide a large number of products like meat, milk and eggs which supplement the human diet with animal proteins, and raw materials for the industry like wool, hair, hides, skins, bones and casings, thereby feeding the local industry as well as earning foreign exchange for the country through their export. The quantities of livestock products available in the country, as per estimates of the West Pakistan Agricultural University, Lyallpur are given below:

	Production (1966)	
	(in millions)	
Milk	236.3	Maunds
Ghee	4.3	"
Meat including edible offal and head and trotter	11.5	"
Animal fat	1.1	"
Guts	16.6	Pieces
Eggs	789.7	Nos.
Hides	7.9	Pieces
Skins	12.2	"
Bones	6.9	Maunds
Wool	0.5	"
Hair	0.1	"

It may be appreciated that although the marketing operations start after the produce has been obtained the factors of production have a direct bearing on the efficiency or inefficiency of the marketing operations. Therefore, to understand the marketing practices, a clear understanding of the production methods is also necessary. Similarly the quantity, place and credit for production directly affect the marketing structure. The problems facing the livestock products are discussed below.

POPULATION OF LIVESTOCK AND THEIR PERFORMANCE

At present, the livestock get their strength from agriculture and have no separate identity as a livestock sub-sector. Rearing of livestock like cattle is primarily done to meet the draught requirements of agriculture. As a result the population of livestock is scattered throughout the country and there is an absence of centralised livestock industry. Similarly, sheep and goats are primarily reared on the farms for obtaining additional income. They are also reared on arid and semi-arid zones where they constitute main source of income. This situation makes it difficult to have better management of the stock. The diseases and parasites

also take a heavy toll and result in low efficiency performance. For example, the average yield of milk per animal is very low compared with yields in other developed countries. This average yield is also much lower than that obtained on the small number of dairy farms established in the country. Similar is the position in respect to industrial raw materials of livestock origin like hides and skins. A large number of these pieces show different degrees of damage due to warble fly, ticks, smallpox, mange, and so forth, and result in colossal loss in value. Better management facilities can minimise this loss to a great extent if not altogether eliminate it.

A country which is short in nutritional supplies and has to increase its foreign exchange earnings through export of industrial raw materials can hardly afford to bear this loss. It is, therefore, suggested that:

- 1) An industrial bias should be given to the livestock industry. Efforts should be made to centralise this industry so that it may have a separate identity as distinct from agricultural pursuit. This is all the more necessary because mechanised agricultural operations have already started replacing cattle on the agricultural farms.
- 2) Selective breeding should be introduced in the country to evolve specific strains of meat and milch cattle. This will result, on the one hand, in avoiding losses incurred in rearing uneconomic animals and, on the other hand, will increase the quantity of animal proteins in the country.
- 3) Extension services should play a more dynamic role in educating the people in better management practices. At the same time the veterinary services should be expanded.

LOSSES

LIVESTOCK

Animal losses occur through diseases, accidents and senile decay. The heaviest loss is sustained from diseases, the number of animals lost through other causes being small. On the basis of availability of hides and skins from fallen animals it is estimated that 3.5 million head of oxen, one million head of buffalo, 0.8 million head of goats are lost annually, a considerable proportion of them being premature thereby resulting in heavy losses in terms of meat and milk.

The losses among poultry are also heavy due to mismanagement and diseases. It has been estimated that nearly 20 million birds are lost every year. Of them 50 percent are lost through diseases like Newcastle, fowl pox and tick fever. The remaining mortality is attributable to carelessness in management and attacks of predatory birds and animals.

LIVESTOCK PRODUCTS

Milk The losses in milk production occur through careless handling and uncontrolled weaning of calves. It is estimated that one percent of the milk is lost through careless handling and 4 percent through feeding of

calves. The total annual losses are estimated at 9.2 million maunds (5 percent) valued at Rs. 184 million. If efforts are made to prevent or minimise losses through careful handling of milk the present supply can be raised appreciably.

Meat Meat is lost in two ways, first through faulty flaying and dressing and secondly through improper storage. Improper flaying and dressing leave small portions of muscles and fat on the skins, while improper storage causes spoilage of meat in the summer season. It is estimated that 370 thousand maunds (4 percent) of meat valued at Rs. 15.4 million are lost every year.

Hides and skins Losses in hides and skins occur on account of the following reasons:

- 1) Losses due to non-collection It has been estimated that 5 percent of fallen hides and 2 percent of fallen skins valued at Rs. 4.0 million are lost yearly because animals dying of disease are not flayed or some of the dead animals are thrown away for want of flayers.
- 2) Losses due to faulty flaying and curing It has been estimated that 15 percent of the hides and 10 percent of the skins produced are damaged through defective flaying and cuts resulting from carelessness in flaying. They depreciate in value to the extent of 20 percent, thereby causing an annual loss of Rs. 6.1 million. Similarly 10 percent of hides and skins are spoiled as a result of improper curing and they depreciate in value to the extent of Rs. 4.2 million.
- 3) Losses sustained through damages by skin diseases Trade inquiries reveal that about 80,000 pieces of hides and 122,000 pieces of skins are damaged through parasitic diseases of skins resulting in a loss of about Rs. 1.0 million. The aggregate figure of loss of Rs. 15.3 million per year not only reflects losses to the production but also loss of supplies of vital raw material needed by industry.

Wool It is estimated that 2.5 percent of the wool is left unshorn on the body of the sheep as a result of imperfect shearing and clipping in West Pakistan and wool left unshorn on three-fourths of the sheep as conventional practice in East Pakistan. Approximately 0.9 million lbs. of wool valued at Rs. 13.5 million, goes to waste every year.

Hair Nearly half of the potential production of hair is lost every year because a large number of animals remain unclipped. Such loss is estimated at about Rs. 7 million.

Eggs It is estimated that 16 million eggs, accounting for about 2.5 percent of the total production, are lost every year. The value of the loss comes to about Rs. 2.08 million. The losses occur through breakages in long distance transportation, faulty storage and through loss in collection. If effective and cheap methods of

collection, transport and storage are introduced, a considerable proportion of this waste can be prevented.

Guts Losses in guts occur owing to: a) non-collection, b) damage during the process of removal from the carcass and c) putrefaction following imperfect preservation. Such losses particularly occur in the case of dead animals and animals slaughtered on Idulzuba. Intestines from dead animals can be utilised for the manufacture of "gut" used in sports industry. Approximately 4.4 million pieces of guts valued at Rs. 4.7 million are lost every year.

Bones It has been estimated ¹¹ at 1.7 million maunds of bones valued at Rs. 15 million remain uncollected and go to waste every year.

Body fats The body fats from dead animals are usually not collected. If body fats from all carcasses are collected, the present supply can be increased substantially. Body fats collected from dead animals can be utilised for the manufacture of soaps, glycerin, nitro-glycerin, etc.

DISPOSAL AND STORAGE

Meat Meat obtained after slaughtering of animals in slaughter houses is brought to the market by butchers in carts and covered trucks. Meat is not stored in cold storage. At present as many animals are slaughtered each day as is the daily requirement.

Milk Milk is taken to consumers directly, in cans or other kinds of utensils. The milk processing plants established by the Government at Karachi, Lahore and Dacca and a few modern dairies supply milk in polyethylene bags and sterilised bottles. As Pakistan is short of milk and meat for home consumption there is no export of milk (fluid or condensed) or meat.

Hides and skins Raw hides and skins are cured in tanneries both by hand and by modern equipment. Almost all production of hides is consumed locally for production of leather. Almost 300,000 pieces of skins including fur and fancy skins are exported annually.

Wool and hair The wool and hair are sold by the producers either direct to the manufacturers or through the commission agents who sell to wholesale dealers or exporters. About four-fifths of the wool produced is exported and the remainder is consumed locally.

Eggs Eggs are collected by collectors from village producers and packed in crates and baskets. These crates baskets are transported by either hand load, boats, rail or trucks to urban consuming areas. Cold storage vans have been provided by the railways and cold storage facilities are also available in big cities like Karachi, Lahore, Dacca and Chittagong. With the establishment of several modern poultry farms, egg production is steadily increasing and small quantities of these eggs are also exported.

Bones Bones are collected and brought to primary markets in trucks, bullock carts or in railway wagons.

Bones are crushed before being put on the market as feed or manure. Bones are also exported in the crushed form.

MARKETING PROBLEMS

The scattered, and resulting small, production all over the country raises special and complicated problems of movement and marketing. This has resulted in the creation of a chain of intermediaries and increased intermediaries' costs. This is notwithstanding the exorbitant charges recovered by the middlemen and the malpractices which are adopted by them. Due to small production, the producer is not in a bargaining position. It has been estimated that the producers' share in the consumers' price on an average comes to 65 percent. The balance is shared between the transport and handling costs (15 percent) and middlemen's profits (20 percent).

The scattered and small production per unit producer has also decreased the marketable surplus, since the marginal surpluses are not disposed of by the producers due to complicated channels of marketing and high marketing costs.

The transport problems are also aggravated due to dispersed production. This adversely affects the movement particularly in case of perishables and the producer is compelled to convert them into products less perishable in nature. An example can be given of conversion of milk into cream, butter or ghee in which process the producer undergoes a progressive loss. To illustrate it, whereas the producer in Karachi gets Rs. 1.25 for one seer of milk, his returns from cream are Rs. 7.50 per seer (obtained through conversion of about 6.5 seers of milk costing Rs. 8.30); from butter Rs. 8.00 per seer (obtained through conversion of about 16.5 seers of milk costing Rs. 20.75); and from ghee Rs. 9.00 per seer (obtained through conversion of about 22 seers of milk costing Rs. 27.75).

Efficient handling and transport not being possible due to dispersed production, the producer and the country have to undergo substantial losses due to impairment in quality caused by delays in disposal. Lack of knowledge of correct methods of preservation as well as absence of facilities of preservation also affect the quality thereby reducing its value. The scattered production makes the task of the extension services more difficult.

It shall thus be seen that the combined effects of dispersed production, long marketing channels, unregulated markets and market charges, transport difficulties and lack of knowledge, appreciation and facilities of preparation for market, weigh heavily against the producer. Very little incentive is thus left to him to make efforts of producing more and as such even the available potential is not fully exploited. With a view to improving these conditions, therefore, it is necessary that actions are taken on the following lines:

- 1) Markets should be regulated so as to eliminate malpractices by the middlemen. Both the pro-

vincial governments have already in operation market regulation acts—Agricultural Produce Market Regulation Act in West Pakistan and the East Pakistan Agricultural Produce Markets Regulation Act in the Eastern Province. The West Pakistan Act has been in operation since 1940 and the East Pakistan Act was introduced in 1964. About 146 markets have so far been regulated in West Pakistan and in East Pakistan the number of such regulated markets is about 57. The operation of these acts should be expanded at least to all the important markets of the country.

- 2) Centralised production, even at the present level, will increase the marketable surplus.
- 3) Better transport facilities should be provided. Concessional rates of transport also must be introduced.
- 4) Provision and expansion of the ice-cool vans and refrigerated wagons by the railways will not only help in regulated marketing but will also increase the available supplies due to reduction in losses of perishables. This will result in better returns to the producers and will induce them to make more efforts in increasing their production activities.
- 5) Extension services can play a commendable role in educating the producers in correct preparation methods. Such activities can be in line with similar measures adopted in West Pakistan, for example, in shearing of wool in East Pakistan by demonstrating correct methods of flaying, curing and grading of hides and skins through their Scheme of Peripatetic Hides and Skin Flaying, Curing and Grading Demonstration Parties. An ordinance was once proposed by the West Pakistan Animal Husbandry Department, for controlling the flaying and curing of hides and skins in the recognised slaughter houses of the province. No progress seems to have been made in this direction and it is well advised that the case may be pursued to its ultimate objective.

COLD STORAGE

Provision of proper and adequate storage facilities is essential for better marketing arrangement of live-stock produce especially for improving the sustaining power of the grower. Provision of cold storage facilities is essential for orderly marketing of perishable farm produce, especially eggs, fish and meat. Absence of cold storage facilities accounts for wide seasonal fluctuations in the prices of perishable farm produce. The present cold storage capacity in the country is 4.7 million cubic feet. It is proposed to increase the present cold storage capacity to 13 million cubic feet by the end of 1970.

GRADING AND STANDARDISATION

At present, there are no uniform and scientific methods of selection and sale in the country. Selections are based on the personal concept of quality and, therefore, differ in basis from one merchant to another. It results in lack

of confidence about the quality among the consumers, both local and in the foreign markets, and adversely affects the trade and returns to the producers. A number of malpractices have also crept into the trade which have affected the country's export trade.

Evaluation of national quality standards and introduction of grading of the agricultural commodities are of primary importance for obtaining maximum results of the different agricultural development plans. An exhaustive research work, both economic and scientific, is a prerequisite to the formulation of grade standards and grading schemes.

The Department of Agricultural Marketing and Grading of the Government of Pakistan was made responsible for the formulation of these standards and their introduction. That department prepared specifications for a large number of agricultural commodities and livestock products, and introduced grading schemes on a voluntary basis for local consumption of ghee, butter and eggs. Similar grading schemes, but on a compulsory basis, have been introduced in respect to wool in 1954, animal hair in 1963, and pickled skins in 1965, raw hides and skins and eggs in 1968. Action has also been taken to introduce grading of animal casings, crushed bones, fur and fancy skins. Their compulsory grading will be introduced shortly.

The experience of these compulsory grading schemes has shown that the introduction of a system of compulsory grading and testing proves immensely helpful. It regulates the trade on standard lines and expands the export trade, increases the foreign exchange earnings considerably and enhances the reputation of the national products in the international markets by putting an end to disputes on quality and prices among the sellers and buyers.

Voluntary grading schemes for local consumption have, however, been abandoned since the work has been transferred by the Central Government to the provinces. Except for the Egg Grading Scheme, in

operation in East Pakistan, all other voluntary schemes have been discontinued since this work has not yet been taken up by the Government of West Pakistan, where ghee and butter were being graded.

MARKETING INTELLIGENCE

An efficient market news service is also essential for the orderly marketing of agricultural commodities. It not only assists the farmer in disposing of his produce at better prices but also provides a basis for formulation and determination of trade policies. The Department of Agricultural Marketing and Grading collects the daily wholesale prices of 27 and retail prices of 13 livestock products in respect to the Karachi market. These are regularly disseminated through the issue of daily price bulletins. Daily wholesale prices of about 23 items are broadcast over Radio Pakistan for the benefit of producers, traders and consumers. In addition to this, the department also collects and maintains a record of weekly wholesale prices of about 29 livestock commodities from 23 centres both in East and West Pakistan. These are published in a monthly journal "Markets and Prices."

The Directorate of Agricultural Marketing in East Pakistan collects wholesale prices of 31 livestock products from 58 important markets of the province and issues them in the form of a weekly price bulletin. Prices of the Dacca market are also disseminated through the radio and local dailies.

In West Pakistan, the staff of the Directorate of Agriculture Economics and Marketing and Market Committees collects rates of important livestock commodities and disseminates them daily through newspapers. Prices of important commodities are also broadcast over Radio Pakistan from various centres. Some other central and provincial departments also collect prices of various livestock products but these are mostly for their individual use.

MARKETING ORGANIZATION OF LIVESTOCK AND ANIMAL PRODUCTS IN TURKEY, 1969

by
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INTRODUCTION

THE AREA of marketing includes all the functions that take place between producer and consumer, embracing all the services which have to be performed in order to make raw products salable.

Marketing of livestock has also several services such as handling, transportation, slaughtering, processing, distribution and selling.

These marketing functions are the same for Turkey. In our paper, we will pay attention to livestock marketing in Turkey in the same way, but it is also important to know something about market information. For this reason, this paper will include two main parts. The first one will be about *market information* such as government policy, future projects, sales, etc. In the second part, we will discuss the *marketing functions*. We will also glance briefly at dairy facilities, poultry and the egg situation in Turkey.

GOVERNMENT POLICIES

The main government policy is to develop the livestock and increase the amount of animal products. This improvement will depend on breeding of high grade productive animals and feeding activities under better conditions. The following objectives are stated in the Second Five-Year Development Plan:

- 1) The basic objective will be the organization of animal husbandry according to the economic and ecologic conditions of the country. In this context, in the eastern regions where pastures are available and where the marketing conditions are favorable, although the dominant mode of farming is now field farming, intensive animal husbandry supported by forage crops will be encouraged and developed.
 - 2) Productivity per animal and per herd will be increased and thereby the best utilization of resources will be possible.
 - 3) The objective will be to meet the demand for livestock products through domestic production.
 - 4) Due consideration will be given to increasing the proportion of livestock products in the diet.
 - 5) Necessary measures will be taken to enable producers to organize themselves at all stages of their activities, from production to consumption.
- In order to achieve these objectives, some policy measures will be taken into account by the Government as follows:
- a) Measures will be taken to ensure the optimum utilization of pastures through the improvement, maintenance and organization of the property rights for pastures. The latter will be given high priority.

- b) Development of improved breeds and increase of their proportion within the total livestock population, together constitute one of the main approaches to the advancement of animal husbandry. At present, the ratio of improved breeds to total cattle population is only 3 percent. Efforts in research and artificial insemination will be directed towards increasing the ratio of the improved breeds in regions where suitable.
 - c) The efforts of selective stock breeding will be related to infrastructural investments, and fodder production will be tied to animal husbandry development projects. Stud breeding efforts will be supported within the framework of a selective stock breeding program. Along with studs of foreign origin, suitable domestic breeds will also be stressed in selective stock breeding.
 - d) Eighteen percent of the estimated increase in livestock population will result from better methods of husbandry and from a decline in death rate due to disease control. Therefore, the disease control measures will be geared to meet at least this target. The public establishments will be responsible for the control and eradication of epidemics. In fighting common diseases and parasites they will provide training, expert advice and help. The limitations required by disease control measures will be enforced in the movements of herds. The suitable regions will be rendered disease-free.
 - e) Specific feeding programs will be devised to optimize the use of existing fodder sources. Quality beef raising will be supported.
 - f) In the coming 10 years, the target will be to meet the fine-wool demand domestically. To realize this target the required research, production and establishment of marketing facilities will be supported.
 - g) Research, training and publication services will be aimed at increasing livestock productivity. Priorities will be given in this context to meat, fine-wool and milk production.
 - h) Publications will be aimed at educating producers on the technological aspects of feeding, disease control and animal husbandry. They will be incorporated in projects with specific purposes in different regions.
 - i) The marketing facilities and systems for livestock products will be organized and consumer preferences will be conveyed to producers.
 - j) To ensure rapid development of poultry farming, private ventures will be encouraged. Selective breeding efforts of the public establishments will be accelerated and private ventures in selective breeding will be supported. The wider use of selective breeding will also be supported.
 - k) Application of new techniques, such as keeping livestock in open fields, will be popularized.
 - l) The price policy will be actively utilized in encouraging the development of livestock production.
- Also, special attention was given to livestock development by the Government in 1969; a team from the

State Planning Organization and the Ministry of Agriculture has been preparing special projects. They will most probably be financed by the IBRD program.

PROJECTIONS FOR LIVESTOCK AND LIVESTOCK PRODUCTS

In general, the existing topographical and climatic conditions in Turkey are favorable for animal husbandry.

Specifically, animal husbandry is the dominant type of farming in the eastern regions with extensive, good quality pastures. Due to economic, cultural and various other factors, animal husbandry also has an important place in other regions.

Although the number of livestock is rather high, animal husbandry has not been developed due to the following reasons: insufficient forage crops; grazing on common pastures with hay as fodder; limited means of marketing, stock breeding and disease control; and the lack of balance between livestock products and fodder prices.

During the First Plan period, the total number of the different types of livestock was envisaged to remain constant. Nevertheless, sheep increased by 10.3 percent and cattle and water buffalo by 7.1 percent, while goats decreased by 6.8 percent and Angora goats by 1.3 percent. Trends in the past years and the experience gained indicate that the present structure of animal husbandry makes it difficult to check the increase in the number of livestock.

It is estimated that on the average the different kinds of animals, except goats, will increase 1-2.2 percent annually during the Second Plan period.

DEMAND AND EXPORT SITUATION

DOMESTIC DEMAND

During the First Plan period there was a one percent increase in per capita meat consumption and no increase in milk consumption.

It is estimated that during the Second Plan period the per capita meat consumption will increase by 14.0 percent and per capita milk consumption will increase by 10 percent. Due to the trend to consume high quality meat, the value of per capita meat consumption will increase by 15.5 percent.

Per capita meat consumption (including poultry) is estimated to be 15.7 kilograms in 1967 and 18.0 kilograms in 1972, milk consumption as 98.04 kilograms in 1967 and 107.99 kilograms in 1972, and egg consumption as 2.7 kilograms in 1967 and 3.3 kilograms in 1972. The production levels believed to be realizable will only meet the increase stated above. These increases will have no significant effect on the proportion of livestock products in the diet.

A 19 percent increase is expected in the consumption of fleece, mohair and hair during the Second Plan period.

EXPORTS

A 33.2 percent increase in the export of livestock products is envisaged during the Second Plan period.

Live animals constitute 64.3 percent of the entire livestock product exports. Meat has the additional advantage of excellent export prospects. At present, there is a large unsatisfied demand in Middle Eastern countries and there is every reason to believe that prices there will remain well in excess of domestic prices for some time to come. As foot-and-mouth disease problems are solved through inoculation and the imposition of strategically situated buffer zones, additional markets should become available in some European countries.

The trend in fleece exports will continue during the Second Plan period. A decline in mohair exports is expected due to the increase in the domestic demand of the textile industries.

PRODUCTION AND IMPORT SITUATION

PRODUCTION

The production estimates of this sub-sector are based on age distribution, increase in productivity and in reproduction rates.

During this period, it is assumed that there will be no change in the fertility rate, but through the increased efficiency of disease control measures and development of veterinary services, the death rate will decline by one percent. The 8.4 million kilograms of meat loss which was prevented by disease control measures in 1967 will be increased to 24.3 million kilograms by 1972.

The increase in concentrated fodders and in forage crops to be brought about by implementation of special fodder and feeding programs during the Second Plan period, will lead to an average increase in the carcass weight of the various kinds of livestock as follows: 15.9 percent in cattle, 1.2 percent in water buffalo, 12 percent in sheep, 1.8 percent in goats and 2.9 percent in Angora goats. But, if priority is given to cattle, lambs and milk cows during the application of the fortified feeding programs, the increases shown above may be expected to be greater. It is projected that the increases in carcass weights will amount to 60,289 tons in 1972, valued at T.L. 361,047,000.

Increases envisaged in poultry and egg production are based on the assumption that the ratio of the select breeds to total breeds will increase along with productivity.

The feeding programs to be implemented during the Second Plan period, as well as previous stock improvement, will affect milk production. With 1967 production taken as a base, the following percentage increases are expected in 1972: 22 percent in cattle, 10 percent in sheep, and 8 percent in water buffalo.

Meeting the textile industry merino fleece requirements domestically is the long-term target, and production projections are made accordingly. Nevertheless, at the end of the Second Plan period only 13.7 percent of demand will be met by domestic production.

To realize the envisaged increase in livestock production the increase in fodder production should be carefully utilized through special feeding programs. However, under present price conditions, it is difficult for

animal husbandry dependent on fodder to be economical.

IMPORTS

Livestock and livestock product imports are confined to studs, hair and merino fleece.

Only 9.3 percent of the demand of the textile industry for clean merino fleece was met domestically in 1967 and this figure is expected to increase to 13.7 percent by 1972. The remaining demand will be met by imports.

Improved breed studs raised in the state breeding centers are not sufficient to meet requirements. During the Second Plan period the state establishments and private breeders will continue to import improved breed studs.

PRICE SITUATION

The relatively rapid increase in livestock and livestock product prices is the result of pressure on supplies induced by a fast-growing demand influenced by a high rate of population growth and an increasing level of disposable income.

In fact, there is no major commodity group for which Turkey has a greater price advantage despite the fact that at present the marketing margin for livestock between farmer and processor is extremely high.

Dr. T. Günes of the Ankara Faculty of Agriculture accounted for marketing margins for beef as 62 percent of the final selling price.

There is every indication that demand for meat and dairy products will continue to increase strongly in the foreseeable future. Population is growing at a rate of 2.6 percent per annum and incomes are improving.

The income elasticity of demand for red meat in Turkey is about 1.3 percent, for poultry about 2.5 percent, and for milk about 0.6 percent.

Planned target for red meat is 5.4 percent and it is 4.5 percent per annum over the Second Five-Year period (1968-1972). Even a better increase may take place for red meat in the future.

SALES SITUATION

The marketing channel is generally longer. The goods are often handled by a middleman before going to the wholesaler. When the farm is at some distance from market and transportation facilities are lacking, the farmer sells his animals to a dealer who brings them to the market. Another type of middleman pays the farmer himself, buying the animals when prices are low and selling them two or three months later at a profit. Some agents also operate on a commission basis, selling the cattle for the farmer or for another middleman. The animals are purchased and slaughtered by wholesale butchers who supply the retailers.

The producer is generally in a weak position vis-à-vis buyer and cannot therefore obtain a fair price for his animals.

In Turkey, there are two ways of selling livestock. The first one can be called head sales. These can be carried out as follows:

- a) as pairs
- b) individually
- c) as herds.

The second kind of sales, based on weight, is made in one of the following ways:

- a) by live weight
- b) by carcass weight
- c) by 50 percent yield per carcass weight. (This is used by Et ve Balik Kurumu only, and this organization pays a premium for each percentage increase in yield.)

Animal products such as wool, carvings, hides and skins are sold through the commerce board. In small towns, there is no special market place for milk, butter and yogurt. In some of the high consumption centers, some of the dairy products are sold through the government directly and some by private milk plants. In big cities, however, drinking milk and yogurt are mostly sold by street peddlers.

MARKET PLACE

Turkey has three kinds of livestock markets: a) Livestock Board's terminal markets, operated by the livestock section of the Commodities Exchange Board; b) city and town livestock markets, operated by municipal authorities; and c) unsupervised village markets.

There are livestock boards in nine provinces, namely, Ankara, Aydın, Erzurum, Denizli, Mersin, İstanbul, İzmir, Kars, Konya and Osmaniye county.

Most of these are inadequate for marketing. Only Ankara, İstanbul and Erzurum livestock boards have enough marketing facilities for the buyers and sellers, such as loading, unloading and holding pens, buyers' and sellers' pens, feeding, and watering and weighing. The daily capacity of the Ankara terminal market is 3,000 sheep and 4,000 goats, and 300 cattle. This market is equipped with good scales. The İstanbul terminal market is one of the best equipped stockyards in the country with a daily capacity of 5,000 to 10,000 sheep, and 500 to 2,000 cattle. Sales are carried on six days a week in all of the ten market places.

City markets have been organized by municipalities, but in some instances they are nothing more than an open space or a simple fencyard alongside a railroad or main road. The main purpose of these market places is to provide a definite space for merchants to meet and discuss buying and selling. There is only one definite sales day each week at this type of market. Not all producers sell their livestock in the organized market places, but use any place where buyers and sellers can get together.

The Ministry of Agriculture has begun to establish new stock markets in the producing areas. Fifteen markets are planned to be in operation in 1970.

ASSEMBLING OF LIVESTOCK AND LIVESTOCK PRODUCTS

Livestock and livestock products are generally collected from the villages by the intermediaries in Turkey. The livestock breeder sells livestock and livestock products at the farms or in the villages, or in the local

markets. The shipping of livestock and livestock products to the central markets by the farmers themselves has not yet been developed. The selling and assembling of products by producers and intermediaries are individually, not cooperatively operated.

The small production capacity of farms is a significant barrier to achieving an efficient assembling function. One of the most important problems of marketing milk is collecting a sufficient quantity of milk from the villages to be transported to the cities in an economic way.

There are many different kinds of assemblers in marketing of livestock and they have a high bargaining power, due to the fact that they are very well-off financially.

The assembling centers and quarters are generally not satisfactory for proper keeping of livestock and livestock products, and the pre-cooling system has not yet been developed in assembling.

TRANSPORTATION

In Turkey, livestock is transported either by foot, by truck, by railroad, by wagon or by boat.

The simplest method of moving livestock to market is to drive them on foot. Driving animals to market is still the most common method used in many areas in Turkey, especially in the eastern regions. Livestock is driven as much as several hundred kilometers to slaughtering centers or to railroad and transport terminals.

The development of the roads is gradually changing this situation, and where roads are available more of the livestock is hauled by truck.

Railroad transportation is the most common method of transportation for long distance hauling between production and consumption areas. However, loading and unloading, feeding and watering facilities are still inadequate in these establishments.

From 1955 to 1965, railway transportation of livestock increased in the following pattern:

Year	Thousand head
1955	2,261
1960	3,589
1961	4,203
1962	4,584
1963	4,197
1964	3,787
1965	4,142

Instead of railway and truck transportation, the movement of livestock by boat is decreasing in the following pattern:

Year	Thousand head
1955	244
1960	173
1961	173
1962	147
1963	230
1964	156
1965	122

According to the Fish and Meat Organization's calculation, a saving of 44.5 percent can be attained when carcass meat is transported instead of live animals. In the case of frozen meat, the saving is 68.2 percent.

Therefore, refrigerated transporting facilities would further reduce the cost of slaughtering in the processing regions.

Consequently, the proposal contained in the Second Five-Year Plan to import 61 refrigerated wagons of 20 tons' capacity each, with semi-mechanical cooling units must be supported. At present, there are 84 insulated railroad wagons, 14 refrigerated trucks, 50 insulated trucks and nine refrigerated ships all individually owned by the Et ve Balik Kurumu.

SLAUGHTERING FACILITIES

There are 628 slaughter houses distributed all over the country. These are operated by municipal organizations. Usually, the municipalities maintain their own administrative personnel and employ laborers for killing and dressing and maintaining cleaning facilities. In the smaller towns, retail butchers use these installments to slaughter the few number of animals they need for their own trade. The use of these facilities and services are made available on a fixed fee per animal or on a kilo per dressed weight basis.

The numbers of animals killed outside of the slaughtering houses are: cattle 39.6 percent, sheep 57.51 percent, goats 79.0 percent, buffalo 43.6 percent. Most of this outside slaughtering is done in villages and small towns where there are no slaughtering facilities. Thus, there is an urgent need to encourage the slaughter of animals in the slaughter houses. Only government-owned slaughter houses have proper processing facilities.

The General Directorate of Fish and Meat Organization has four slaughter houses which are called meat combines. They are charged not only with slaughter, but also with carving of meat, production of sausages, processing of by-products and the like.

These big slaughter houses are located in Ankara, Erzurum, Konya and Istanbul. The total daily capacity of these four slaughter houses on a one-shift-a-day basis is 10,185 head of sheep and 1,080 head of cattle, or a total of 364 tons of edible meat. This organization also provides loans to the producers for livestock feeding. They also buy animals from producers, collectors and feeders on a dressed weight basis.

PROCESSING

Processing and cold storage are important marketing functions. In meat marketing, processing includes slaughtering, cutting and preparing for market. In milk marketing, it covers the technological stages which have to be applied for milk.

Milk is processed at the farm in the processing quarters of the assembler or in the private and public milk plants.

A large proportion of milk is processed at the farms. For example, 72 percent of the milk is being processed on the farm in six different regions of Kars Province.¹

During the last few years, there has been a considerable improvement in the milk processing plants. With additional milk plants that will be established according to the First and Second Five-Year Development Plans, more and more marketing channels will be provided for milk.

Another marketing channel is the street peddler. The peddlers buy their milk from the producer and sell it directly to the consumer. This milk is not pasteurized, however, and has to be boiled with care.

Of the total milk produced in Turkey, it is estimated that 0.31 percent is manufactured into pasteurized milk, 0.15 percent into powdered milk, 28.5 percent into yogurt, 10.3 percent into white cheese, 2.7 percent into Kaşar cheese, 3.5 percent into other kinds of special cheeses, 2.4 percent into butter, and 52.65 percent of the remainder is sold as unpasteurized milk to be used for various purposes.

GRADING AND STANDARDIZATION

The basic livestock products, such as meat, milk and eggs are not yet standardized in Turkey. Therefore, producers and consumers are both deprived of the advantages of standardization. The Turkish Standards Institute is busily working on these subjects.

COLD STORAGE

There are 24 cold storage plants, 11 owned by the Meat and Fish Organization and the rest are municipal or privately owned. The cold storage capacity of the Meat and Fish Organization plants is as follows:

Kind	Capacity (Tons)
Meat	1,800
Other products	25,000
Frozen meat	13,000
Frozen products	17,000

The total daily frozen capacity is 264 tons. It is proposed to expand this capacity considerably during the Second Five-Year Development Plan period.

DAIRY FACILITIES

The National Milk Industry Organization (controlled by the Ministry of Agriculture), was established in 1964 to set up and operate large-scale milk factories designed to produce a full range of dairy products with emphasis on pasteurized milk, and to develop market outlets. The organization now operates milk factories in Izmir, Adana, Istanbul and Kars Provinces and has a 25 percent interest in a plant in Konya.

In Ankara, there is also a milk factory which is operated by Atatürk State Farm which is under the control of the Ministry of Agriculture. Besides this, a modern factory is in the course of construction in Ankara. The factory at Kars is expected to commence operation this year.

1. Avas, Ali *Economic Structure of Milk Manufacturing in Kars*, Ankara, 1954.

There are also some small private milk plants in some big cities like Istanbul, Ankara, Bursa, etc. Pasteurized milk, however, is only a recent product on the market in Turkey.

Most of the milk in towns is sold by door-to-door vendors who buy their milk from producers in the cities or in the suburbs.

Presently, dairy products sold commercially are mainly manufactured in the small private sector plants situated near the big consumption centers for yogurt and butter products, or in the areas where milk is produced for cheese production.

According to a study made in 1963 by the Ministry of Agriculture, there are 14 milk plants, 669 small manufacturers, and 1186 cheese manufacturing plants. Totally, 1869 milk and milk products dairy establishments are in operation at present.

In these establishments 715,582 tons of milk have been processed into milk products during the year of 1963. In the same year, in addition to these establishments, it has

been estimated that some private producers have processed butter, yogurt and cheese in their own plants, amounting to 1,131,993 tons.

POULTRY AND EGGS

Turkey shows a great potential for improving poultry. However, at present, the statistics indicate that per person consumption in 1967 was 45 eggs and 1.3 kg of poultry meat.

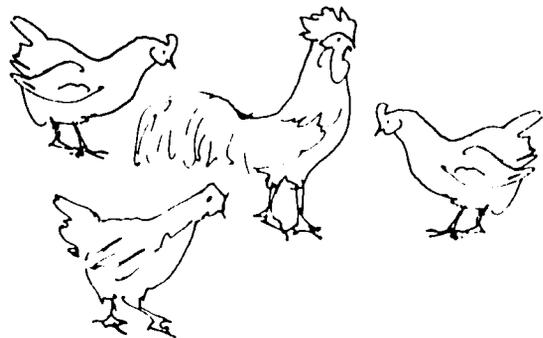
Poultry farm establishments are increasing in number. So are prices along with them. The prices however will tend to increase more rapidly in the future. Marketing has become an important factor in meeting the increasing demand for poultry.

Government also pays attention to the poultry improvement so as to produce more meat and eggs for the people. In the Second Five-Year Plan the target for production of poultry meat is 78.3 and for eggs 123 tons for the year of 1972.



An annual animal show is not only a matter of business, but a social occasion as well.

CREDITS AND INCENTIVES



PROVISION OF CREDIT FOR LIVESTOCK IMPROVEMENT

by

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PREFACE

Provision of credit for agriculture and livestock improvement is of national and regional importance and it is very difficult to cover all aspects of the subject in a short report. In the present report effort has been made to look at the subject from special points of view which have not been discussed before.

The following subjects have been particularly in mind in preparation of this report:

- 1) Sources of credit
- 2) Type of credit recipients
- 3) Economic and social interactions between items one and two
- 4) Flow of funds through credit channels, and distribution of credit among different groups of producers.

Conclusions and recommendations are also made within the above-mentioned framework. It is hoped that the information submitted in this report, to be regarded as a supplement to the reports and discussions of the honourable delegates participating in this conference, will guide the conference in formulating desirable proposals for the common goal, "Improvement of Animal Industry in the Region."

INTRODUCTION

Agricultural and livestock credit has always been a problem complicating agricultural improvement in the developing countries. The approach to the problem can be made from two different directions, one being the sources of credit, and the other, credit recipients.

Sources of credit The problems encountered within sources of credit are as follows:

- Amount of credit available to livestock raisers
- Methods of payment and control practices.

Credit recipients The difficulties confronted by the recipients when applying for loans are as follows:

- Credit for the livestock industry involves a long-term investment, and creditors are reluctant to supply loans.

The ever-influencing and unforeseen natural factors endanger the repayment of loans.

The low capital return in agricultural and livestock investment compares unfavourably with other sectors of economical activities.

A low level of literacy, and lack of technical ability prevail in the rural sector.

Complexity of the above-mentioned problems and in particular the last item, which is predominant in the

developing countries have caused restriction in the livestock credit sources. Therefore, activities of most of the credit organizations are directed towards short-term loans. This phenomenon has created an unhealthy condition causing more investment in the final stages of production, rather than the infra-structural stages of the activity — namely, the activities which begin from the time that livestock leaves production centers. The more essential parts of the production stages such as forage production, development of water resources, livestock breeding, feeding and management, have been overlooked.

Sources of credit in most of the developing countries are as follows:

Government	Private money lenders
Direct government loans	Rural traders ¹
Rural coops	Itinerant dealers. ²
Private banks	

SOURCES OF CREDIT IN IRAN

The history of agricultural and livestock credit in Iran is obviously divided into two periods.

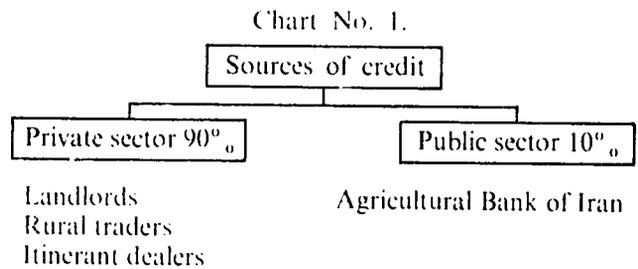
The period terminating in 1961³ Until 1961 and during a period of 28 years previous to that time, the Agricultural Bank of Iran was the main government source of credit in the country. However, the regulations influencing the extension of loans were of such difficult terms that it was almost impossible for the average farmer to obtain credit. Consequently the majority of loans were used by landlords. Furthermore, in the case of unforeseen circumstances like famine, drought or floods, when the Government extended float loans to the farmers, almost 90 percent of the credit went into the hands of landlords indirectly, due to the repayment guarantee formalities.

In many cases it was noted that big landowners used groups of farmers for collecting loans from various government agencies for their own purposes. In the meantime the landlord was the real source of credit for the farmer who was deprived of his social and economic rights. In compensation for loans, the landlord received the bulk of products at harvest time. Due to the absence of acceptable repayment guarantees, private banks did not extend any direct loans to the farmers. Thus the loaning field of rural areas was wide open to the itinerant dealers, rural traders and private money lenders. Figures in hand show that up to 1961 only 10 percent of the rural credits were supplied by government sources, and the rest were covered by above-mentioned private sources charging high rates of interest.

To repay the loans, villagers had to sell their products and lamb crops before they reached a profitable market size. For example many livestock raisers sold their unborn lamb crop for a price of 400-500 Rials (US \$6-7) during the pregnancy of the ewe, while the lamb actually delivered six months later, was worth at least U.S. \$13-16.¹ In the meantime the interest rate on the money that private lenders had extended to the farmers, exceeded 50 to 100 percent.

In such unhealthy conditions most of the agricultural and livestock products were delivered to private money lenders before passing through the usual marketing channels. Thus it was very difficult to undertake sound credit policies and new marketing development programs.

The situation of credit sources before 1961 is presented in Chart No. 1.



The period after 1961 — After the land reform law was put into effect "landlord" who was the main source of credit in the rural society was eliminated in a short time. In order to fill this economic vacuum, the Government stepped in promptly by establishing and operating new loaning organizations. At the present time the agricultural and livestock credits in Iran are divided into three groups as follows:

- Short-term credits
- Medium-term credits
- Long-term credits

Short-term credits Main characteristics of these loans are as follows:

Repayment period	: Up to 2 years
Interest rate	: 4 percent average
Repayment guarantee	: Chain guarantee
Coop guarantee	: Government treasury documents, promissory notes, and unmovable mortgage.

Medium-term credits Main characteristics of medium-term credits are as follows:

Repayment period	: 2-5 years (sometimes 7 years)
Rate of interest	: 6 percent
Repayment guarantee	: Unmovable mortgage. In special conditions the Agricultural Bank may extend loans up to 200,000 Rials (U.S. \$2,670) without unmovable mortgages

1. The man who runs a village store and exchanges commercial goods with agricultural and livestock products.
2. A retail dealer who travels through several villages and supplies utilities as well as loans to villagers in exchange for agricultural and livestock products.
3. Land reform law was undertaken in 1961.

1. U.S. Dollar 75 Rials.

Long-term credits Main characteristics of long-term credits are as follows:

- Repayment period : Up to 15 years
- Rate of interest : 7.5 percent
- Repayment guarantee : Unmovable mortgages. In some cases creditors may take part in joint investments in cooperation with private loan recipients. The situation of credit sources in Iran at the present time is shown in Chart No. 2.

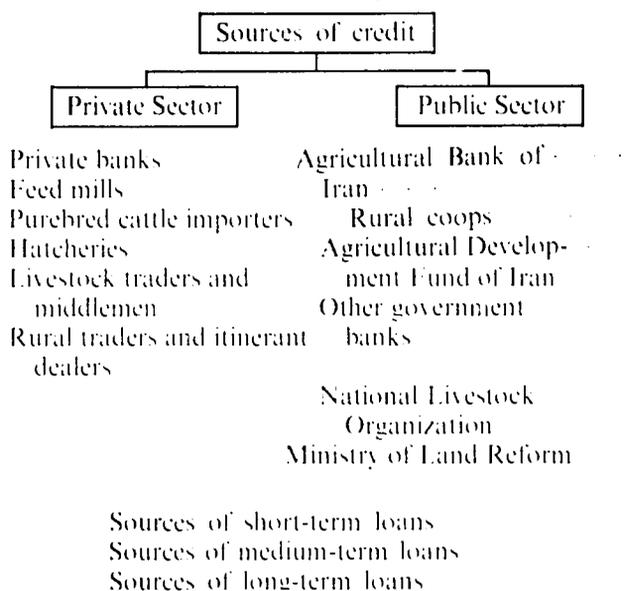
society. It is interesting to note that in parallel with government organizations' activities, the private sources of loans have also expanded widely, with the consideration that the nature of these private money lenders has greatly changed as well. At the present time most private creditors are industrial firms or modern commercial companies which have an active role in the agricultural economy of the country. Efforts have been made to explain the role of the foregoing credit sources in the rural life of the country by individual representations in the following pages.

PUBLIC SOURCES OF CREDIT

Agricultural Bank of Iran The Agricultural Bank of Iran (The Agricultural Coop Bank) was established in 1933. The Bank at the present time is the largest source of agricultural and livestock credit in the country, with a registered capital investment of 10,000,000,000 Rials (US \$134,000,000). As mentioned before, the Bank, which was the only government source of credit, did not play an active role in the years before 1961. Activities of the Bank during three decades (1933-1961) included 380,000 individual loans. In the same period the total payments of the Bank did not exceed 8,000,000,000 Rials (US \$107,000,000) while during the seven-year period of 1961 to 1968 the total number of individual loans increased sharply reaching 2,800,000 individual loans. The total payments during the same seven-year period equalled 35,000,000,000 Rials (US \$467,000,000). In other words, the lending activities of the Bank increased by seven times from the view point of number of loans, and four and a half times from the view point of total payments during the last seven years in comparison with the whole life of the institution before 1961.

The Agricultural Bank of Iran has credited 3,111,454,765 Rials (US \$41,500,000) for animal husbandry during its existence, from which 95 percent has been paid off in the last seven years. The trend of credit flow in the field of animal husbandry in the last seven years is shown in Table 1.

Chart No. 2



As is seen in Chart No. 2, the government sources of credit have widely expanded during the period 1961-1969, although these newly established organizations still are not in a position to fulfill all needs of the rural

TABLE 1

Years Iranian Gregorian	Total payment for the purpose of Animal Hus- bandry (Rials)	Total payment for the purpose of Animal Hus- bandry (US Dollars)	Percent of Livestock loans to the total
1341 (1962-1963)	5,368,150	71,575	0.4% "
1342 (1963-1964)	8,549,000	113,987	0.3% "
1343 (1964-1965)	178,601,674	2,381,355	4.3% "
1344 (1965-1966)	290,473,977	3,872,986	5.4% "
1345 (1966-1967)	139,184,824	1,855,797	2.7% "
1346 (1967-1968)	830,519,572	11,073,594	16.0% "
1347 (1968-1969)	946,384,016	12,618,453	17.9% "

Although the figures in Table 1 indicate that the livestock raisers are gradually occupying their real place in the agricultural economy of the country, according to 1968 figures published by the Central Bank of Iran, livestock activity accounts for approximately 10 percent of the gross national product (GNP) in the country. The livestock field still has a long way to go before it receives its share from credit allocations of the country.

Central Organization of Rural Coops At the present time, the Central Organization of Rural Coops is

supervising 8,000 rural coops throughout the country. The capital investment of the organization exceeded 4,800,000,000 Rials (US \$64,000,000) by September 1, 1969. The organization extends small short-term loans with the interest rate of 3 to 4 percent to villagers through rural coops and coop federations, although this organization on special occasions may extend loans to coop federations with the exceptionally low interest rate of one percent. The total amount of credit extended by the Central Organization of Rural Coops during six years of activity is displayed in Table 2.

TABLE 2

Years Iranian Gregorian	Total credit extended (Rials)	Total credit extended (US Dollars)
1342 (1963-1964)	396,803,105	5,290,000
1343 (1964-1965)	1,434,000,313	19,120,000
1344 (1965-1966)	1,882,951,734	25,106,000
1345 (1966-1967)	3,023,907,108	40,319,000
1346 (1967-1968)	4,076,608,590	54,355,000
1347 (1968-1969)	5,041,337,381	67,218,000
TOTAL	15,855,608,231	211,408,000

It should be considered that the above-mentioned loans have mostly been dual purpose loans and used inseparably for both agriculture and livestock activities.

Furthermore, in the years 1347-1348 (1967-1969) the Central Organization of Rural Coops has extended a credit of 20,000,000 Rials (US \$267,000) for animal feeding.

Agricultural Development Fund of Iran The Agricultural Development Fund of Iran was established in 1347 (1968) for providing long-term supervised loans to agricultural and livestock institutions. The initial capital investment of this organization was 1,000,000,000 Rials (US \$13,000,000) which have been paid out of National Development Funds of the country. In addition, the organization has obtained the legal right to lend up to \$250,000,000 from foreign sources, and in the case of need it can also issue 5,000,000,000 Rials (US \$67,000,000) of government bonds.

The fund has already extended 13 individual loans for joint agricultural and livestock projects. The total credit payments of the organization have reached 197,000,000 Rials (US \$2,627,000) up to October 1969, and 23 new projects amounting to 1,156,910,000 Rials (US \$14,992,000) are under study at the present time.

The interest rate of these long-term loans is 7.5 percent plus 0.5 percent supervisory expenses.

Other government banks In some cases other govern-

ment banks, namely the Bank of Omran, Distribution Coops' Credit Bank, and others extend special loans for livestock production or marketing, to their regular customers. As these loans are not paid at the national level, the concerned figures are not mentioned herein in this report.

Animal Husbandry Organization Other than the foregoing sources of credit, the Government recently has been extending some direct loans to the farmers through its ministries.

In 1347 (1968) a sum of 400,000,000 Rials (US \$5,300,000) out of National Development Funds was put at the disposal of sheep feeders as supervised credit through the Animal Husbandry Organization (Ministry of Agriculture) to produce more meat for Tehran. This organization had credited 200,000,000 Rials (US \$2,650,000) to 59 individual livestock feeders by the end of September 1969. The interest rate of the above-mentioned loans is six percent.

Ministry of Land Reform and Rural Cooperatives When agricultural corporations¹ were formed in 1347 (1968), the Ministry of Land Reform launched a new easy term credit scheme especially for the benefit of these corporations. The volume of credit depends on

1. Agricultural corporations were formed with the goal of preventing agricultural lands from being cut into small pieces due to family inheritance changes, as well as preparing suitable ground for farm mechanization and rural industrialization.

the soundness of the projects submitted to the Ministry by corporations, as well as the amount of funds allocated for the purpose each year. Approved loans are put at the disposal of the Ministry of Land Reform with an interest rate of one percent by the Plan Organization. The Ministry transfers the funds to different corporations in installments.

The interest rate on the loans extended to the agricultural corporations is 4 percent, one percent of which is paid to the Plan Organization and 3 percent is spent in launching new projects in the same corporations.

Each corporation is run by a college educated general manager who is a government employee and who will ensure the repayment of loans.

AGRICULTURAL AND LIVESTOCK CREDIT IN THE FOURTH NATIONAL DEVELOPMENT PLAN

In consideration of the foregoing public sources of credit it is comprehensible that the Plan Organization itself is the country's main source of credit indirectly.

In the Fourth National Development Plan (1968-1972) a sum of 14,000,000,000 Rials (US \$186,700,000) has been set aside for the purpose of agriculture and livestock loans, from which 6,000,000,000 Rials (US \$80,000,000) would be livestock credit only.

Private sources of credit Although parallel to the new changes in the agricultural sector of the country in recent years, the nature of private money lenders has been changed, and private bankers as well as feed mills, hatcheries, and importers of purebred animals have

appeared on the scene of rural credit. However the interest rates offered by these sources, being 12 to 20 percent, are too high when considering the capital return of agricultural and livestock activities. So government institutions are so far the only suitable source of credit to serve the rural sector of the country.

Credit recipients in Iran In order to have an idea about the different categories of credit recipients in Iran, some data which have been acquired from the report "CENTO Traveling Seminar on Marketing of Livestock and Livestock Products 1967" are mentioned in the following lines:

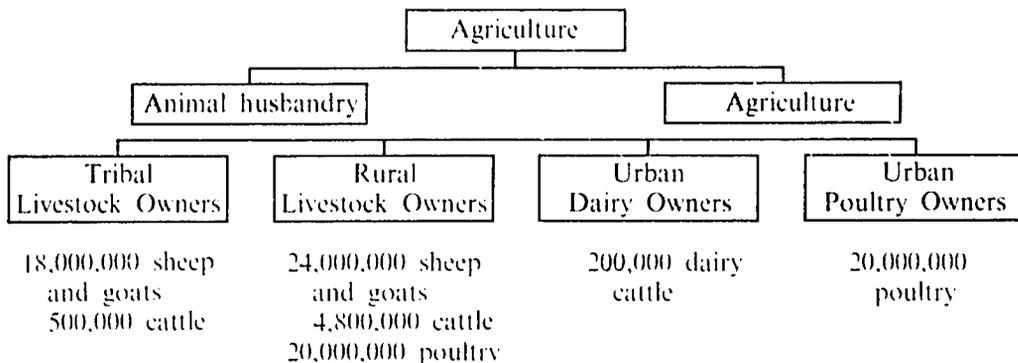
"The agricultural sector of the economy contributed 107.4 billion rials to the gross national product which was 450 billion rials in 1966-1967. Animal products accounted for 49 billion rials or 46 percent.

"It has been estimated that 22 percent of the working population or 17 percent of the total population in Iran are directly involved with livestock production.

"The sheep and goat husbandry practices in Iran are divided into two parts: the village sheep and goat owners, and the tribal sheep and goat owners. About 18,000,000 sheep and goats (out of 42,000,000 total sheep and goat population of the country) are kept by tribal herdsmen."

For better understanding, the various categories of livestock raisers within the animal husbandry field of the country are displayed in Chart No. 3.

Chart No. 3



Considering the number of animal units which are kept by each group, the order of economic importance of different groups is as follows:

- 1) Rural livestock owners
- 2) Tribal livestock owners
- 3) Urban dairy owners
- 4) Urban poultry owners.

The flow of credit among these groups, however, is not in accordance with the above order, so that the tribal livestock owners who have the second position in the above categories, receive the lowest amount of credit from public sources, due to the lack of social organizational factors and repayment guarantees. Accessibility of groups of livestock raisers to various

sources of credit is shown in Chart No. 4.

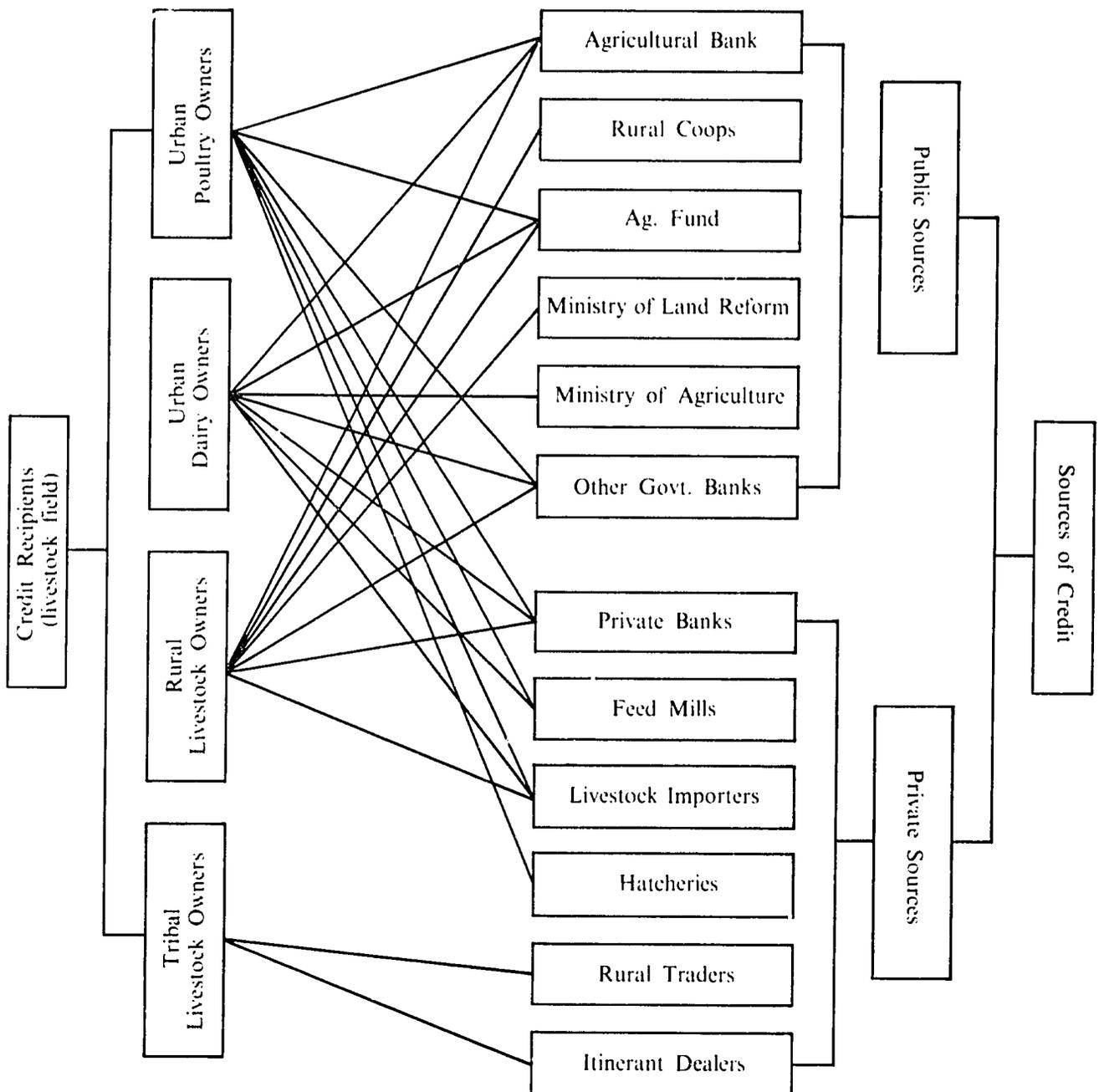
As is seen in Chart No. 4, each group of loan recipients may receive loans from six or seven public or private sources, except tribal livestock owners who are still continuing to get credit on difficult terms from rural traders, peddlers, and intermediaries.

CONCLUSIONS AND RECOMMENDATIONS

The above discussions direct us to the following conclusions which may be of some value in solving the credit problems in Iran and the other countries which are in a similar stage of development.

1. The Government should take firm steps to build up a sound credit policy to ensure proportional flow of credit to different groups in the livestock field.
2. It is urgent to find desirable solutions for tribal credit, especially in the countries where tribal flocks make up an integral part of the livestock population. The following means and solutions are considered to be useful:
 - a) Establish tribal coops or similar organizations that among other benefits would ensure repayment of loans extended.
 - b) Make government tribal credit policies conform with its economic policies in matters such as tribal settling projects, tribal feed lots, etc.
 - c) Find some solution towards acceptance of stocks as repayment guarantees.
 - d) Find some new methods of extending loans to tribal livestock owners in kind rather than in cash.
3. Encourage payment of supervised credit through specialized government agencies, similar to the loans which have been extended to sheep feeders in Iran through the Animal Husbandry Organization.

Chart No. 4



PRODUCTION INCENTIVES, INCLUDING SUBSIDIES AND CREDIT IN PAKISTAN

by

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AGRICULTURAL CREDIT

Most of the farmers in Pakistan have a limited income. They have little or no marginal savings for reinvestment. Additional capital has, therefore, to be pumped into the agricultural sector to induce investment for higher production.

Credit is being provided to the farmers by the Government, the Agricultural Development Bank of Pakistan and the cooperatives.

The Government provides credit in the form of Taqqavi loans. A sum of over Rs. 30 million was advanced during 1966-67 and 1967-68. Taqqavi loans are not popular because of rigid methods of recovery and cumbersome procedures involved in securing such loans. Besides they are inadequate and casual.

The most important source of credit is the Agricultural Development Bank of Pakistan. It caters to short-term, medium-term and long-term needs both in cash and kind. Its average annual lending capacity is about 80 to 200 million rupees. It advanced Rs. 158 million in loans during 1968-69 and has the capacity to disburse about Rs. 200 million during 1969-70.

The Agricultural Development Bank enjoys exemption from Stamp Duty, Registration Fee and from the operation of restrictive acts. Its loans are recoverable as arrears of land revenues.

In 1967 there were about 120 cooperative banks in both wings of the country. They advanced loans amounting to Rs. 322 million to individuals and Rs. 576 million to societies. There are about 20,000 agricultural credit societies (14,500 in West Pakistan and 5,000 in East Pakistan), with a total membership of two million. They advanced loans of about Rs. 60 million during 1967-68.

The State Bank of Pakistan established a Rural Credit Fund in 1960 with Rs. 10 million to provide medium-term loans and advances to rural credit agencies. In 1967 this fund stood at Rs. 75 million.

CREDIT REQUIREMENTS

The producers of livestock and livestock products are by and large of poor economic means. Their requirements generally run faster than their earnings and this induces them to obtain loans from whatever source is handy. As a result, the producer is generally indebted to the merchants and middlemen. As a guarantee for repayment of loans the producer is bound by these merchants to dispose of his produce to or through them. The producer is thus handicapped in disposing of his produce at competitive rates. Realising this problem, the Government has now decided to revitalise the co-operative movement in the country and through them to link credit with marketing. It is necessary that:

- 1) Early action may be taken to reorganise and establish cooperative marketing societies to link credit with marketing. The provision of credit will be the biggest single factor in increasing the returns to the producers and will thus help in development and expansion of production activities.
- 2) The livestock industry may be accepted as an industry and provided with financial help and other incentives such as are being given to other industries of the country.

PRODUCTION INCENTIVES AND SUBSIDIES

- A. Dairy and poultry farming have been placed in the private sector. Under the provincial government's milk supply schemes of Karachi, Lahore and Dacca, milk is being supplied at subsidised rates of 87 paise per seer to the public. Licences for setting up dairy plants have been issued to Cow and Gate and Horlicks. Glaxo is already preparing baby milk food.
- B. Poultry farming is growing fast after the establishment of modern hatcheries by P.I.A. and Arbor

- Aeres. One-day-old chicks and broilers are supplied to enterprising poultry raisers at cheap rates.
- C. The Government of West Pakistan has through the World Food Programme received free of cost 24,000 tons of cereals — maize and sorghum, in the ratio of 3:1. This cattle feed is being sold at subsidised rates to owners of superior breeds of cattle to tide them over dry periods when it is very expensive to feed the cattle.
 - D. The manufacturers of poultry and cattle feed have been exempted from the payment of income tax for a period of six years in the present budget. This will greatly help in the development of the poultry and livestock industry by making poultry and cattle feeds cheaper.
 - E. The Agricultural Development Bank of Pakistan and the Industrial Bank of Pakistan advance loans at 7 percent interest on short-term loans and 6 percent interest on long-term loans to dairy, poultry and animal husbandry industries. A statement showing loans sanctioned for the development of these industries during the last three years is given below:

LOANS SANCTIONED (Rupees)

Agricultural Development Bank of Pakistan

Industry	1966-67			1967-68			1968-69		
	E.P.	W.P.	Total	E.P.	W.P.	Total	E.P.	W.P.	Total
Poultry Farming	11,300	54,120	65,420	9,745	236,120	245,865		215,570	215,570
Dairy Farming	99,100	1,708,798	1,807,898	70,800	1,065,492	1,136,292	2,000	941,645	943,645
Animal Husbandry	—	799,041	799,041	7,750	406,238	413,988	16,850	338,500	355,350

Industrial Bank of Pakistan

Industry	1965-66			1966-67			1967-68		
	E.P.	W.P.	Total	E.P.	W.P.	Total	E.P.	W.P.	Total
Poultry Farming	—	183,130	183,130				146,500	151,050	297,550
Dairy	—	315,790	315,790	—	185,000	185,000			

CREDITS GRANTED BY THE AGRICULTURAL BANK OF THE REPUBLIC OF TURKEY FOR ANIMAL HUSBANDRY AND BETTER LIVESTOCK PRODUCTION

by
Yalçın Poyraz
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INTRODUCTION

BRIEF INFORMATION ON THE AGRICULTURAL BANK OF THE REPUBLIC OF TURKEY

THE FOUNDATIONS of institutional agricultural credit in Turkey were laid as early as 1863 in the form of local and simple organizations formed to provide agricultural credit for needy farmers to save them from the usurious interest charged by private money lenders. In 1888 a decree to establish an Agricultural Bank was promulgated and these organizations were taken over as the branches of the Bank. Since then, the status of the Bank was amended from time to time before it acquired its present situation.

In the course of over a hundred years of its existence, the Bank has developed into the most powerful credit institution in Turkey covering all kinds of banking transactions with a network of 737 branches, 16,000 employees, and its deposits exceeding 8 billion T.L. The Bank has a distinctive position as a singular institution disbursing 99 percent of the total agricultural credit in the country.

AGRICULTURAL CREDITS

Agricultural credits extended by the Bank may be separated into three categories:

- 1) Loans granted to the farmers directly by the Bank
- 2) Loans to agricultural credit cooperatives
- 3) Loans to agricultural sales cooperatives and their unions.

Direct loans Direct loans are granted to meet short, intermediate, and long-term credit requirements. The Bank has allocated about 4 billion T.L. for direct loans in 1969.

Loans to agricultural credit cooperatives Agricultural credit cooperatives are under the administrative authority and supervision of the Agricultural Bank. Generally speaking, short and some intermediate-term credit requirements of the cooperatives are to be met by the cooperatives from both their own resources and the credit funds made available from the Bank. The Bank may respond to the long and intermediate-term requirements of the cooperators which the cooperatives

are not allowed to deal with. In 1969 the Bank allocated 1,950,000,000 T.L. to the credit cooperatives.

Loans to agricultural sales cooperatives and their unions

The Bank is also authorized to grant credits to agricultural sales cooperatives and their unions incorporated under law No. 2834.

In fact, the Bank provides for them monetary advances to be paid back after the sale of their products. The sales cooperatives and their unions export a considerable portion of the cotton, hazel nuts, raisins, olives, olive oil and ground nuts which they receive from their members. In 1969 the Bank allocated 2,100,000,000 T.L. to sales coops and their unions.

SUPERVISION OF THE BANK AND METHODS OF LENDING

Intermediate and long-term direct loans are always subject to supervision of the Bank until they are fully repaid. Such inputs as chemical fertilizer, certified seed and feed which are of great importance for agricultural production are granted in kind, and in the form of seasonal loans. In fact, since the promulgation of the law No. 3202 in 1937, the Bank has been practicing a credit system based upon project and supervision (and a supervised credit system since 1964) to prevent any misuse of loans in particular for fresh fruits and vegetables, marketing of agricultural production, and livestock. In compliance with the principles and targets of the First and Second Five-Year Development Plans, the Bank takes great care to make project type and supervised loans.

The supervised credit system is completely based upon project. The supervised credit program was put in operation for the first time in 1964 in two provinces. Upon achieving satisfactory results of the implementation of the program, 20 provinces were brought under this program, and in the near future, supervised credit is expected to be available all over Turkey.

Under this new method of lending, the overall requirements of a farming unit are studied and a project is prepared under which credit and advice is extended to the farmer by the credit engineers and technicians (technical staff) of the Bank. The implementation of the project is also duly supervised by the said technical staff.

Since 1968 the Bank has been implementing a new program based on the project (Encouragement and Development Loans Program) and financed by the Government. The credit funds made available from the Government for the implementation of this program through the Agricultural Bank may be summarized as:

Agricultural Development Funds To finance: a) livestock breeding and fattening projects as well as poultry projects, b) alfalfa establishment projects, c) projects designed to set up orchards, vegetable gardens, green houses and d) fishery projects.

Loans for animal husbandry from Agricultural Development Funds are granted at 3 to 5 percent interest for a maximum of 10 years.

Industrial Development Funds To finance: a) food processing projects, b) chemical industry projects and c) transportation and storage projects.

Export Promotion Funds To finance: a) cold storage of agricultural products to be exported, b) refrigerated trucks to transport agricultural products to be exported and c) grading of agricultural products to be exported.

LOANS FOR ANIMAL HUSBANDRY

For animal husbandry short, intermediate and long-term loans are granted by the Agricultural Bank.

Short-term loans for a maximum of one year for purchase of food are granted at 9 percent interest.

Intermediate-term loans are given for a period of from one to five years at 7 percent and one-half percent service charge, and long-term loans (only for establishment and construction purposes) for up to 20 years at 7 percent and one-half percent service charge.

Depending upon the circumstances and particularly the nature of the loan, the following securities are taken by the Bank:

- Joint guarantee of borrowers
- Mortgage of immovables
- Pledge of movables.

Besides, where the execution of the project is to take place on the land secured by the Bank as collateral, any building equipment or fixtures installed on such land form part of the collateral as they are installed.

CREDIT FUNDS ALLOCATED FOR ANIMAL HUSBANDRY LOANS BY THE BANK'S ANNUAL LOAN AND INVESTMENT PROGRAMS

In 1968 Million T.L.	In 1969 Million T.L.
890	1103
	<u>Loan Purposes</u>
	Purchase of cattle, dairy cows, sheep, goats, bulls, feed, construction of stables, sheep folds, straw lofts, feed-lot buildings, poultry houses, alfalfa establishment, purchase of poultry, bee-hives and so forth.

DEVELOPMENT PROGRAM FOR LIVESTOCK SECTOR IN TURKEY

Livestock resources of Turkey are considerable, but need to be imported and developed.

(Million) Livestock Number	Type of Livestock
35,9	Sheep
20,9	Goats
14,2	Cattle
3,3	Mules-donkeys
1,2	Buffalo
1,2	Horses

Value of livestock products was 14.456 million T.L. in 1968 (33.2 percent of the total value of agricultural production in Turkey).

The Turkish Government has already requested financial assistance from the International Bank for reconstruction and development to finance four nationwide projects designed to develop the livestock sector in Turkey.

The intensive dairy production project To establish dairy units on mainly irrigated farms in the vicinity of the milk factories at Adana, Izmir, Istanbul and Ankara which are short of milk.

The livestock fattening project To fatten both cattle and sheep.

The national dairy breed improvement project To

initiate a genetic upgrading of native cattle.

The beet pulp drying project To supplement the feed supply for the livestock production project.

Total cost of the four projects is estimated at US \$90.2 million. The Agricultural Bank of the Republic of Turkey shall be the relending authority.

The Ministry of Agriculture shall be responsible for the execution of the four projects. The Agricultural Bank shall evaluate the projects of farmers requiring credits in accordance with the rules and regulations to be established by the Ministry of Agriculture.

The credit requirements of the projects shall be financed through Encouragement funds (already available), funds to be allocated to the Agricultural Bank from foreign sources, and funds to be set aside from the resources of the Bank itself.

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64. Geology and Ore Deposits of Lakan Lead-Zinc District, Iran, 1968
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