

BANGLADESH AGRICULTURAL RESEARCH PROJECT PHASE-II

**A REPORT
ON THE TRAINING COURSE ON
CATTLE AND BUFFALO DEVELOPMENT AND
AI EXTENSION PROGRAM**

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and
Leopoldo S. Castillo**



**BANGLADESH AGRICULTURAL RESEARCH COUNCIL
INTERNATIONAL AGRICULTURAL DEVELOPMENT SERVICE
May 1985**

A REPORT
ON THE TRAINING COURSE ON

PN-AAU 014

CATTLE AND BUFFALO DEVELOPMENT AND
AI EXTENSION PROGRAM

DURING 11-23 MAY 1985

by

Charan Chantalakhana
and
Leopoldo S. Castillo

AT THE CENTRAL CATTLE BREEDING STATION, SAVAR,
DHAKA, BANGLADESH, JOINTLY SPONSORED BY DLS/BARC/IADS.

Content of Report

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A REPORT OF THE TRAINING COURSE
ON
CATTLE & BUFFALO DEVELOPMENT AND A.I. EXTENSION PROGRAMME,
AT CENTRAL CATTLE BREEDING STATION, SAVAR
ON 11TH MAY TO 23TH MAY 1985.

A. General Background

A training course on Cattle and Buffalo development and artificial insemination (AI) extension program was organized jointly by Department of Livestock Service and Bangladesh Agricultural Research Council, with additional financial support from the International Agricultural Development Service (IADS). The purpose of this training is to improve the capability of the middle-level officers concerning with cattle and buffalo development and AI extension program. The objectives of the course are:

1. To emphasize the importance of AI and fodder production for cattle and buffalo.
2. To improve the knowledge on cattle and buffalo production as influenced by:
 - a. Nutrition
 - b. Breeding and reproduction efficiency
 - c. Management
 - d. Diseases and parasites.
3. To appreciate the role of integrating cattle and buffalo production and crop farming systems in increasing income and employment of farmers, landless laborers, and women.
4. To recognize the role of socio-economic factors on small-farm cattle and buffalo production.
5. To serve as an in-service training course for scientific and livestock extension officers.

The participants attending this training course had been carefully selected on the basis of their capability, efficiency, and seniority. They are the middle-level officers who have achieved good academic records at university level. All of them hold university degree either animal science or veterinary science. The total number of participants were 20, consisting of Assistant Directors (Animal Production) at Zila level, Scientific Officers at Upazila level, and Technical Assistants (AI). (see list of names in ANNEX I).

The course was held during 11th to 23rd May 1985 at the Central Cattle Breeding Station (CCBS), Savar, Dhaka. The training program consisted of lectures, farm visit, as well as practical training (see details of the program in ANNEX II). The training was offered daily except on Friday which is a holiday. The lecturers consisted of 12 local experts invited from various agencies and 2 oversea consultants, one each from the Philippines and Thailand.

B. Recommendations

It has been observed that the preparation and coordination of the training course were excellent. The coordinator of the course (Dr. Ziauddin Ahmed) had given his best efforts in taking care of every business and technical matters, which greatly contributed to the best overall outcome from this training program. Staff and facilities in support of this training were provided at maximum capacity of available resources. The trainees selected to participate in this training program were well-qualified. They were very keen and eager to learn. They appeared to have acquired high degree of village experiences concerning livestock production. Further experiences and knowledges obtained during this training should enable them to carry out their tasks and responsibilities more efficiently, especially that concerning cattle and buffalo development at rural small-farm level.

At this point, for future training courses in livestock development, the following recommendations are proposed for consideration in order to achieve the maximum efficiency from a training course.

I. Recommendations concerning the training course on Cattle and Buffalo development and AI extension program.

1. Course content and recommended improvement. As can be seen from a summary of course content analysis, this training course offered 9 major topics of lecture and discussion, as well as practical training. The total number of lecture and practicals was 91.5 hrs. (see details in ANNEXES II and III). The composition of the lecture hours on 9 major topics and on practical training is shown below.

Summary of Course Content Analysis

- 1. Socio-economic and admin.	12.3%
+ 2. Livestock Management	2.7%
3. Nutrition	12.1%
4. Breeding	9.3%
5. Reproduction	11.2%
6. Diseases	4.9%
- 7. Development and systems	12.3%
8. Biogas	1.1%
9. Research	2.2%
10. Practices	30.6%
	<hr/>
	100%

For future training on the same subject it is recommended that

- a. Some topics on the principles of agricultural extension as well as technology transfer for small farmers should be incorporated in the training program.
- b. More time should be allocated for the topics on cattle and buffalo management practices as well as fodder crop production at small-farm level.

- c. Certain appropriate lecture topics concerning better utilization of farm wastes and by-products, e.g. supplemental feeding of rice straw with leuceana leaf, should be emphasized.
 - d. Additional practical experiences concerning the formulation, analysis, and evaluation of livestock development project, should be given.
 - e. Practical training on reproductive disease prevention and cares and pregnancy diagnosis should be offered.
2. Course objectives. It is highly recommended that prior to the development of a training course program clear course objectives should be formulated. And the course objectives should be well understood by all parties concerned, including training course consultants. Once course objectives have been formulated then a course program can be developed. It is also recommended that in a training course, the course objectives should be formulated to be rather specific, e.g. they should be definite whether they should aim at small farm cattle and buffalo production for draft and meat or smallholder dairy production. Too many goals or targets in a training course could cause confusion among participants, and finally reduce the effectiveness of the training course.
3. Training period. Two-week training period for this training course appeared to be suitable. However, it was observed that the number of hours per day, including lectures and practices, in this training was a little too long (6 a.m. till 5 p.m.). As a consequence, learning efficiency during some later hours of the day cannot be maximized.
4. Selection of trainees. It was clearly observed that all participants were highly selected. All of them held a university degree, either in animal science or veterinary science. They were selected on the basis of capability, efficiency in their works, as well as seniority.

Their general qualification, experiences, and keen interest in the training course were highly satisfied. The results from two course examinations reflected very well of their achievement of knowledges and experiences.

5. Evaluation of the course. It is recommended that for future training courses a systematic evaluation of the success of the training course should be prepared and implemented in order to obtain information for further course improvement, as well as to measure impacts of the course on trainee's performance improvement.
6. Trips and visits. Mid-training field trip or visits are very useful both for gaining wider experiences and to break from classroom lecture routine. A field report should be required after the field trip.
7. Practical training. Practical training forms a major part of the training program. A well-prepared practical training program with well-defined objectives is very essential for good success of a training program. It is recommended that necessary facilities for good practical training should be provided sufficiently with respect to the total number of participants. A small group of trainees is taken care by a trainer of good practical experience.
8. Overseas consultants and local experts. All lecturers invited to give lecture should be informed ahead of time of the course objectives, background and qualifications of participants, and details and scope of assigned lecture topics). The rate of lecture fee for local experts should be increased to a more attractive rate, if possible, in order to insure high-quality service. Transportation should also be provided for lecturers who have to travel from distant location. Lecture notes should be prepared for student's use during and after the training course.

9. Manuals or proceedings. If possible, a training manual or proceedings should be prepared for use during the training and for future use. Preparation of a manual is a time-consuming task, sufficient staff and facilities are required to produce a good quality manual.
 10. Teaching aids. Various necessary teaching aids such as video equipment, dummy cow for AI training, relevant laboratory tools and kits, etc should be provided in sufficient amount in order to insure training effectiveness and efficiency. Copying and mimeographed machines are necessary for reproduction of teaching materials. Efficient typist is also important to facilitate the preparation of lecture notes and teaching manual.
 11. Lecture room. If possible, it is advisable that a lecture hall should have air-conditioning facilities during hot season, or at least should be well-ventilated. Seating arrangement should be physically comfortable for long-hour lecture.
 12. Other aspects. Training during fasting season (Ramzan) should be definitely avoided. Physical examination of participants can be useful to ensure maximum success of a training course. Books and library should be available for trainee use. Recreations for trainees should be provided for relaxation. Movies or other social evening programs can be very useful. Psychological and social motivation for the trainees can be incorporated in to the evening program.
- II. Recommendations for future training courses.
1. Future training courses. It is very clear that livestock, especially cattle and buffalo for draft, meat, milk, and manure, plays a major role in Bangladesh agriculture. Smallholder livestock production

integrated with crop farming systems will remain a significant part of the total agricultural sector, while landless livestock producers are also very common. With special reference to ruminant production, i.e. cattle, buffalo, goats and sheep, low productivity appears to be the top limitation. One of the major constraints of livestock productivity in Bangladesh is limited feed resources for ruminant animals, which contribute significantly to low breeding efficiency, high calf mortality, and slow body weight gain. Other major constraints are lack of culling of inferior stocks, lack of better feeding and management practices, lack of necessary health cares, and socio-economic constraints.

It is very clear that the solution to the problem of livestock low productivity has to be achieved through integrated or interdisciplinary approach. The more urgent problems should receive first attention. Therefore, future trainings for livestock personnel, both research and extension workers, should be focused on feeds and feeding, management and health cares, fodder production, selection and culling of breeding animals, selection of cattle and buffalo for draft, reproduction and artificial insemination, smallholder livestock production systems, economic and marketing of livestock, extension services and technology transfer for small farms.

Some training courses for livestock research and extension personnel are recommended as the followings.

Recommended future training courses

1. Livestock Research Methodology. (2 weeks).
2. Cattle and buffalo production with special reference to feeding, management, breeding, and health cares. (2-3 weeks).
3. Fodder crops production for village ruminant production. (2 weeks).

4. Better utilization of farm wastes and by-products as animal feeds. (10 days).
5. Small ruminants production in integrated farming systems. (2 weeks).
6. Integrated livestock/crop/fishery farming systems (2 weeks).
7. Leuceana production for animal feeds on small farms. (1 week).
8. Non-conventional feeds and their utilization under smallholder livestock production systems. (10 days).
9. Smallholder dairy development. (2-3 weeks).
10. Small-scale poultry production and disease prevention. (2 weeks).
11. Commercial poultry production. (2-3 weeks).
12. Livestock economics and marketing. (1 week).

Some examples of training course program

1. Training program on Livestock Research Methodology.

Period: 2 weeks

Topics and time allocation:

- | | |
|--|-----|
| A. Research methods | 15% |
| B. Livestock research priorities,
planning and project proposal | 15% |
| C. Livestock research techniques in
nutrition, breeding, physiology, and others | 30% |
| D. Statistical techniques:
Experimental design, data collection and
analysis | 30% |
| E. Report writing | 10% |

(Practices in term of assignments).

2. Training Program on Cattle and Buffalo Production

Period: 2 to 3 weeks

Topics and time allocation:

A. Production systems in Bangladesh	5%
B. Major problems and constraints	5%
C. Nutrition and Feeding and Fodder Production	20%
D. Management and health cares	15%
E. Breeding and reproduction	10%
F. Integrated livestock/crop farming systems	5%
G. Utilization of farm wastes and by-products	5%
H. Techniques in agricultural extension	5%
I. Practices on C, D, E, F, G	30%.

3. Training Program on Fodder Crop Production for Village Ruminant Production.

Period: 2 weeks

Topics and time allocation:

A. Systems of village ruminant production	5%
B. Introduction to suitable fodder crops in warm climates	10%
C. Techniques of fodder production	20%
D. Farmer participation in seed production and multiplication	5%
E. Collection and conservation of fodders	10%
F. Fodder nutrition and utilization	20%

- | | |
|--|------|
| G. Integration of fodder production into crop farming system | 5% |
| H. Extension techniques | 5% |
| I. Practices | 20%. |
4. Training Program on Better Utilization of Farm Wastes and By-products as Animal Feeds.
- Period: 10 days
- Topics and time allocation:
- | | |
|--|-----|
| A. Crop farming system and crop production in Bangladesh | 10% |
| B. Crop products and by-products | 10% |
| C. Nutritional value of crop wastes and by-products | 10% |
| D. Use of crop residues as animal feeds | 10% |
| E. Improvement of crop residues for animal feeds | 10% |
| F. Other uses of crop residues | 5% |
| G. Socio-economic aspects of animal production at village level in relation to crop residues feeding | 5% |
| H. Practices | 30% |
5. Training Program on Small Ruminants Production in Integrated Farming Systems.
- Period: 2 weeks
- Topics and time allocation:
- | | |
|--|----|
| A. Introduction of village farming systems and role of small ruminants | 5% |
|--|----|

B. Small ruminants production	6%
C. Nutrition, feeds, and feeding	15%
D. Management and health cares	10%
E. Breeds and breeding	8%
F. Reproduction and freeding efficiency	8%
G. Major production problems and constraints	5%
H. Techniques in agricultural extension	8%
I. Socio-economic consideration	5%
J. Practices	30%

With particular reference to dairy production, relatively large amount of milk (800 thousand metric tons) has been produced annually, which constitutes about 22 percent of the total value of livestock products. Almost all milk production comes from smallholder dairy operation. In order to improve milk production, breeding of local dairy animals to Holstein Freisian (HF) breed using artificial insemination appears to yield very satisfactory results so far. The half-breed HF crossbreds are well adapted under smallholder conditions. At present, AI of fresh semen from HF bulls appears to yield relatively satisfactory results in term of first service calving rates (40-50%). However, in the not-too-far future, say five to ten years time, the use of frozen semen in dairy production will offer higher benefit under Bangladesh dairy production conditions, since maintenance of bulls, limited number of personnel and labors, scattering nature of rural dairy farmers, etc. will limit the usefulness of fresh semen. Therefore, frozen semen technology should also be incorporatated into a future training program in smallholder dairy production development.

2. Recommendation for visits to observe training and extension activities.

It is recommended that the training coordinators and top officers responsible for these activities be given the opportunities to observe the activities along these line in Thailand and the Philippines. The activities to be visited include (a) livestock training programs being conducted in respective countries, (b) smallholder cattle and buffalo development activities, (c) integrated livestock/crops/fish farming operations, (d) smallholder dairy development, (e) improvement of animal drawn farm implements as well as harness systems.

A group of two to four top officers should be given a chance to spend two weeks in each country in order to be able to observe closely on various training/extension activities. In Thailand, the sites of visit should include Kasetsart University (Bangkok), Buffalo Breeding and Research Center (Surin), Farming System Research at Khon Kaen University (Khon Kaen), Dairy Promotion Organization of Thailand (Saraburi), and National Dairy Training Centre (Chiang Mai). In the Philippines, the sites of visit should include the University of the Philippines at Los Banos, Central Luzon State University, PCARR, the National Buffalo Research Center, SEARCA, and others for broader outlook on training/extension developments. A most suitable period of visit should be the last two weeks of January (Thailand) and the first two weeks of February (the Philippines). However, if this period would not be possible then the months of November or December could be considered as the next alternative. These recommended periods of visit are preferable since intense cropping and livestock activities commonly take place during these periods of time in the respective countries.

III. Strengthening of Livestock Training Activities

It is clear that in-service training in livestock production, especially that for the middle-level personnel involved in livestock research and extension, will continue to be one of the most important and useful activities in livestock development in Bangladesh for a long time to come. It is well known that transfer of appropriate technologies to reach rural farms remains an unsolved problem in most developing

countries. Training of extension workers to understand and master the available appropriate technologies for the improvement of livestock production is a very essential and primary step. Therefore, more resource inputs should be given to the strengthening of training activities in livestock.

It is recommended that sufficient equipment, facilities, and personnel as well as operating budgets should be allocated for regularly scheduled training programs. Various training courses should be organized in a systematic and well-designed fashion. It is also considered to be useful if a few, say one in each region (division), focal livestock training sites could be developed. And at each focal training site, such as Savar Central Cattle Breeding Station, all necessary training facilities should be sufficiently provided. A focal or central training site in each region should be selected on the basis of the already available training resources including technical personnels, training facilities, as well as other facilitating equipment.

If such training centers or network could be developed, then the quality and effectiveness of training courses can be ensured, and the benefits of these training courses to livestock development in Bangladesh can be ascertained.

ANNEX II

Course Content Analysis

<u>Topics</u>	<u>No. of hours.</u>
1. <u>Socio-economic and administrative aspects</u>	
1.1 Cattle and buffalo production	2:45
1.2 Role of BARC	2
1.3 Planning of resources	1:45
1.4 Credits	3:45
1.5 Cooperation and coordination	1
<u>Sub-total</u>	<u>11:15 (12.3%)</u>
2. <u>Livestock Management</u>	
2.1 Animal identification	1:00
2.2 Calf rearing	1:45
<u>Sub-total</u>	<u>2:45 (2.7%)</u>
3. <u>Nutrition and feeding</u>	
3.1 Role	1:45
3.2 Feeding and reproduction	1
3.3 Feed and fodder situation	2
3.4 Feed quality improvement	1:45
3.5 Fodder cultivation	3:45
3.6 Straw treatment	1:45
<u>Sub-total</u>	<u>12:00 (13.1%)</u>
4. <u>Breeding and genetic improvement</u>	
4.1 National breeding policy	1:45
4.2 Breeding and genetics	4:45
4.3 Selection of quality stocks	2
<u>Sub-total</u>	<u>8:30 (9.3%)</u>

Annex II

<u>Topics</u>	<u>No. of hours.</u>
5. <u>Reproduction</u>	
5.1 AI	2
5.2 Film on AI and discussion	2:45
5.3 Discussion of AI problems	2:45
5.4 Production of breeding bulls	1
5.5 Reproductive problems and ways to improve	1:45
<u>Sub-total</u>	<u>10:15 (11.2%)</u>
6. <u>Reproductive diseases</u>	
6.1 Diseases	1:45
6.2 Film and discussion	2:45
<u>Sub-total</u>	<u>4:30 (4.9%)</u>
7. <u>Cattle and buffalo development systems</u>	
7.1 In Asia	1:45
7.2 Small-dairy project	2:45
7.3 Dairy/Crop	3
7.4 Smallfarm agriculture systems	3:45
<u>Sub-total</u>	<u>11:15 (12.3%)</u>
8. <u>Use of wastes</u>	
8.1 Biogas	1 (1.1%)
9. <u>Research priorities and proposal</u>	
9.1 Priorities, planning, and proposal	2 (2.2%)
10. <u>Practices</u>	
10.1 Practical class on AI and fodder	18
10.2 Village visit and discussion on problems	10
<u>Sub-Total</u>	<u>28 (30.6%)</u>
Total:	<u>91.5</u>

PROGRAM OF
Training Course on Cattle and Buffalo Development
and A.I. Extension Programme.

Venue: Central Cattle Breeding Station, Savar.

10.5.85 Friday : 4 pm to 6 pm Registration.

11.5.85 Saturday

9:00 am. to 10:00 a.m. : Opening session.
10:00 am. to 11:00 am. : Importance of Cattle and Buffalo in
Bangladesh and its contribution towards
the Socio-Economic condition.

Dr. James Dickey & Ziauddin Ahmed.

11:00 am. to 11:15 am. : Tea break
11:15 to 1:00 pm. : -do-
1:00 pm to 2:00 pm : Lunch break.
2:00 pm. to 3:00 pm. : National Cattle breeding policy and its
operational problems in the country.

Ziauddin Ahmed.

3:00 pm. to 3:15 pm. : Tea break
3:15 pm. to 4:00 pm. : -do-
4:00 pm. to 5:00 pm. : Identification of Cattle and Buffaloes
through accurate record keeping.

Dr. L.S. Castillo.

12.5.85 Sunday

6:00 am. to 8:00 am. : Practical class on A.I. & Fodder
Cultivation.
8:00 am. to 9:00 am. : Breakfast.
9:00 am. to 10:00 am. : Present practices of collection, dilution
preservation, transportation and use of
semen in Bangladesh.

Talukder Saiful Islam.

10:00 am. to 11:00 am. : -do-
11:00 am. to 11:15 am. : Tea break.
11:15 am. to 1:00 pm. : The role of nutrition in the reproduction
of Cattle and Buffalo.

Dr. L.S. Castillo.

- 1:00 pm. to 2:00 pm. : Lunch break.
2:00 pm. to 3:45 pm. : Present development in Cattle and Buffalo
production in South Asian Countries.
Dr. L.S. Castillo.
3:45 pm. to 4:00 pm. : Tea break.
4:00 pm. to 5:00 pm. : Impact of existing feeding on the
reproductive performance of both male and
female cattle and Buffalo.
Dr. L.S. Castillo.

13.5.85 Monday

- 6:00 am. to 8:00 am. : Practical class on A.I. & Fodder
Cultivation.
8:00 am. to 9:00 am. : Breakfast.
9:00 am. to 10:00 am. : Integrated dairy production system
combined with mixed cropping system.
Dr. L.S. Castillo.
10:00 am. to 11:00 am. : Tea break.
11:00 am. to 12:00 noon : -do-
12:00 noon to 1:00 pm. -do-
1:00 pm. to 2:00 pm. : Lunch break..
2:00 pm. to 3:00 pm. : Filmshow on semen production, insemination
etc.
Debobrata Chowdhury.
3:00 pm to 3:45 pm. -do-
3:45 pm. to 4:00 pm. : Tea break.
4:00 pm. to 5:00 p.m. : Discussion on the film show.
Ziauddin Ahmed.

14.5.85 Tuesday

- 6:00 am. to 8:00 am. : Practical class on A.I. and Fodder
Cultivation.
8:00 am. to 9:00 am. : Breakfast.
9:00 am. to 10:00 am. : Situation of feeds and fodder in the
country including the supply and demand.
M.A. Haye
10:00 am. to 11:00 am. : -do-
11:00 am. to 11:15 am. : Tea break.

11:15 am. to 12:00 noon : Importance of quality feeds and fodder for milch animals and improvement of feeding practices and proposed solution of shortage.

Dr. L.S. Castillo.

12:00 to 1:00 pm. : -do-

1:00 pm. to 2:00 pm : Lunch break.

2:00 pm. to 3:00 pm. : Economy of cultivation, harvest and storage of Napier, Para, Guinea, Maize, Matikalai, Ksheshari, Cowpea for year round utilization.

Dr. Castillo & Ziauddin Ahmed.

3:00 pm. to 3:45 pm. : -do-

3:45 pm. to 4:00 pm. : Tea break.

4:00 pm. to 5:00 pm. : Discussion. -do-

15.5.85 Wednesday

6:00 am. to 8:00 am. : Practical class on A.I. & Fodder Cultivation.

8:00 am. to 9:00 am. : Breakfast.

9:00 am. to 1:00 pm. : Visit to nearby villages in different groups and identification of problems on the improvement of quality cattle (preparation of questionnaire by each group).

Ziauddin Ahmed & M.A. Haye

1:00 pm. to 2:00 pm. : Lunch break.

2:00 pm. to 3:00 pm. : Discussion.

3:00 pm. to 3-45 pm. : -do-

3:45 pm. to 4:00 pm. : Tea break.

4:00 pm. to 5:00 pm. -do-

16.5.85 Thursday

6:00 am. to 8:00 am. : Practical class on A.I. & Fodder Cultivation

8:00 am. to 9:00 am. : Breakfast.

9:00 am. to 10:30 am. : Discussion on the experience of the participants on visiting the villages.

Ziauddin Ahmed.

10:30 am. to 11:00 am. : -do-

11:00 am to 11:15 am. : Tea break.

- 11:15 am. to 12:00 noon : Situation of genital diseases of cattle and Buffalo under rural condition & its control measures.
- 12:00 to 1:00 pm. : -do-
Dr. Fazlul Haque.
- 2:00 pm. to 3:00 pm. : Film show on various reproductive diseases of cattle.
Debobrata Chowdhury.
- 3:00 pm. to 3:45 pm. : -do-
- 3:45 pm. to 4:00 pm. : Tea break.
- 4:00 pm. to 5:00 pm. : Discussion on the Film show.
Ziauddin Ahmed.
- 17.5.85 Friday : Weekly Holiday.
- 18.5.85 Saturday
- 6:00 am. to 8:00 am. : Practical class on A.I. & Fodder Cultivation.
- 8:00 am. to 9:00 am. : Breakfast
- 9:00 am. to 10:00 am. : Breeding and improvement of cattle and Buffalo.
Dr. Charan.
- 10:00 am. to 11:00 am. : -do-
- 11:00 am. to 11:15 am. : Tea break.
- 11:15 am. to 12 noon. : -do-
- 12 noon to 1:00 pm. : Breeding improvement of Cattle and Buffalo.
Dr. Charan.
- 1:00 pm. to 2:00 pm. : Lunch break.
- 2:00 pm. to 3:00 pm. : Problems in rearing of calves under village condition.
Dr. L.S. Castillo & Ziauddin Ahmed.
- 3:00 pm. to 3:45 pm. : -do-
- 3:45 pm. to 4:00 pm. : Tea break.
- 4:00 pm. to 5:00 pm. : Hormonal influence on the reproductive cycle of cattle and buffalo
Dr. Charan.

19.5.85 Sunday

- 6:00 am. to 8:00 am. : Practical class on A.I. and Fodder Cultivation
- 8:00 am. to 9:00 am. : Breakfast.
- 9:00 am. to 10:00 am. : Cattle & Buffalo & Small farmers.
Dr. Charan.
- 10:00 am. to 11:00 am. : -do-
- 11:00 am. to 11:15 am. : Tea break.
- 11:15 am. to 1:00 pm. : -do-
- 1:00 pm. to 2:00 pm. : Lunch break.
- 2:00 pm. to 3:00 pm. : Discussion on problems identified by participants in their place of works.
Dr. Castillo & Ziauddin Ahmed.
- 3:00 pm. to 3:45 pm. : -do-
- 3:45 pm. to 4:00 pm. : Tea break.
- 4:00 pm. to 5:00 pm. : -do-

20.5.85 Monday

- 6:00 am. to 8:00 am. : Practical class on A.I. & Fodder Cultivation.
- 8:00 am. to 9:00 am. : Breakfast.
- 9:00 am. to 10:00 am. : Characteristics of superior quality cattle and Buffalo for milk, meat and draught power.
Dr. Charan.
- 10:00 am. to 11:00 am. : -do-
- 11:00 am. to 11:15 am. : Tea break.
- 11:15 am. to 12 noon : Administration Co-operation and Co-ordination of various agencies concerned with the development of cattle and buffalo.
Mirza M.A. Jalil.
- 1:00 p.m. to 2:00 pm. : Lunch break.
- 2:00 pm. to 3:00 pm. : Planning requirements in terms of infrastructure, manpower, equipment training etc. for the development of cattle and buffalo.
T.K. Chakma.

3:00 pm. to 3:45 pm. : Planning requirements in terms of infrastructure, manpower, equipment training etc. for the development of cattle and buffalo.

Y.K. Chakma.

3:45 pm. to 4:00 pm. : Tea break.

4:00 pm. to 5:00 pm. : Lecture on Gobur gas and use of high urea, mollasses and minerals block lick as supplementing to rice straw for cattle and buffalo.

Dr. Castillo.

21.5.85 Tuesday

6:00 am. to 8:00 am. : Practical demonstration on ammonia treated straw and its operation.

M.A. Haye.

8:00 am to 9:00 am. : Breakfast.

9:00 am. to 10:00 am. : Economic utilization of ammoniac treated straw as cattle feed and farmer acceptance.

Dr. Sadullah.

10:00 am. to 11:00 am. : -do-

11:00 am. to 11:15 am. : Tea break.

11:15 am. to 12 noon : -do-

12 noon to 1:00 pm. : Fodder Maize Cultivation in Bangladesh.

M.A. Haye.

1:00 pm. to 2:00 pm. : Lunch break.

2:00 pm. to 3:00 pm. : Reproductive problems and some measure for improving reproductive efficiency.

Dr. Charan.

3:00 pm. to 3:45 pm. : -do-

3:45 pm. to 4:00 pm. : Tea break.

4:00 pm. to 5:00 pm. : The role of BARC on Cattle and Buffalo production & A.I. research & extension.

Dr. Altaf Hossain

M.A. Haye.

22.5.85 Wednesday.

- 8:00 am. to 9:00 am. : Breakfast.
- 9:00 am. to 10:00 am. : Role of credit for the development of cattle and Buffalo in rural area and experience of Grameen Bank.
Dr. Younus, Grameen Bank/ Dr. Kaiser Hossain.
- 10:00 am. to 11:00 am : -do-
- 11:00 am to 12 noon : Right approach for the bank financing in cattle development programme on the basis of social economic situation in the country.
Kamal Uddin Ahmed, Bangladesh Bank.
- 12 noon to 1:00 pm. : -do-
- 1:00 pm. to 2:00 pm. : Lunch break.
- 2:00 pm. to 3:00 pm. : Technical feasibility and financial viability of small Dairy Project in Rural Area.
Dr. Castillo & Ziauddin Ahmed.
- 3:00 pm. to 3:45 pm. : -do-
- 3:45 pm. to 4:00 pm. : Tea break.
- 4:00 pm. to 5:00 pm. : Linkage between research and Extension for development of Cattle & Buffalo.
Dr. Altaf Hossain & Dr. Dickey.

23.5.85 Thursday.

- 8:00 am. to 9:00 am. : Breakfast.
- 9:00 am. to 10:00 am. : Research priorities/Planning and Project preparation.
Dr. Charan.
- 10:00 am. to 11:00 am. : -do-
- 11:00 am. to 11:15 am. : Tea break.
- 11:15 am. to 12 noon : Production of breeding bulls.
T.S. Islam.
- 12 noon to 1:00 pm. : -do-
- 1:00 pm. to 2:00 pm. : Lunch break.
- 2:00 pm. to 3:00 pm. : Approach and methodology of training for the officers and field staff concerned with the implementation of programme to increase Livestock production.
Dr. Castillo & Dr. Charan.

- 3:00 pm. to 3:45 pm. : Approach and methodology of training for the officers and field staff concerned with the implementation of programme to increase Livestock production.
- Dr. Castillo & Dr. Charan.
- 3:45 pm. to 4:00 pm. : Tea Break.
- 4:00 pm. to 5:00 pm. : Valediction.
- 5:00 pm. to 8:00 pm. : Certificate distribution and closing.

ANNEX III

Outlines of Lectures Presented by Professor Charan Chanlatakhana
Professor L.S. Castillo and Local Lecturers (to be provided by
Dr. Ziauddin Ahmed).

(1) Breeding Improvement of Cattle and Buffalo

1. Improvement of Livestock

- Breeding
- Feeding
- Management
- Health.

2. Difference among animals

$$P = G + E$$
$$= \text{Nature} + \text{Nurture.}$$

3. Breeding tools

- Breeding Plans
- Selection
- Record keeping.

4. Improvement of Trait(s)

- Traits

Production: Meat, Milk, Draft

Reproduction:

Physiological:

5. Genetic control

$$P = G + E$$

$$\begin{array}{l} 100 = 10 + 90 \\ 100 = 75 + 25 \end{array} \quad ? \quad h^2$$

Annex III

6. Improvement through breeding
 - Trait ?
 - h^2

- * 7. Selection of animals
 - Pedigree
 - Relatives
 - x - Mass (performance Testing)
 - Progeny.

8. Performance Testing
(Village or small farm).

- * 9. Breeding plans
 - Within breed
 - Between breeds
 - Cross breeding
 - upgrading
 - Heterosis

10. Some breeding problems
 - Macro
 - Lack of breeding
 - Lack of improvement program
 - Lack of understanding & interest.
 - Micro
 - Inbreeding
 - Low calf crop
 - Lack of identification & recording
 - Castration of larger
 - Reproductive diseases.

Annex III

11. Specific remarks

Cattle

Buffalo

Dairy

Breed

Dual-purpose animal

Gene Pool

AI/ET.

(2) Integrate Farming Systems and Role of Cattle and Buffalo.

- I. Small farming systems in Asia
- II. Role of Cattle and buffalo.
- III. Significant features of integrated farming systems.
- IV. Major constraints to livestock production at small farm level
- V. Problems in technology transfer to village farms.
- VI. Role of science and technology appropriate technology.
- VII. Examples and cases of technology transfer to small farms.
- VIII. Role of socio-economic factors.
- IX. Farming system research.

(3) Selection of Suitable Cattle and Buffalo for Warm Climates.

- I. Adaptability and heat tolerance.
 1. some measurements.
 2. difference among breeds
 3. performance as an indicator.
- II. Body conformation

Hump, horn, dewlap, ears, etc.

Annex III.

III. Resistance to diseases and parasites

Foot-and-mouth diseases
Hemorrhagic septisemia (HS)
Internal parasites
Anaplasmosis/pyroplamaxis
etc.

IV. Indigenous cattle and buffaloes

Adaptability.

V. Performance of animals in warm climates

Draft, meat, milk.

VI. Adjustments of traits due to environmental differences

$P = G + E.$

(4) Reproductive Problems and Ways for Improving Reproductive Efficiency

I. Reproductive efficiency .

Measures:

1. Service/conception
2. Length of service period
3. Days open
4. Calving interval
5. Non-return rate (60/90d)
6. Calvine rate/calf crop.

II. Causes of repord. problems

A. Genetic influences

- Anatomical & Physiological
- Breeds & Breeding

B. Environmental influences

- Nutrition
- Diseases
- Postpartum Estrus.
- Season
- Others

Annex III.

III. Ways of improving breeding effic.

1. Role of manager
2. Detecting estrus
3. Synchronization of estrus
4. Determination of pregnancy
5. Culling of sterility.

IV. The male in reprod. efficiency

Libido, musculinity, fertility
Shy-breeder.

V. Some aspects of AI in tropics

Advantage

Disadvantage

Frozen semen: Straw, pellet.

VI. Problems in AI service for small farmers

Technical problems

Administrative problems

Farmer's problems.

(5) Research Priorities/Planning and Project Proposal

I. Research Priorities

1. Research

Scientific method of finding solution to problems.

Solution to problems

Lots of problems.

2. Priority

Limited resources & manpower

Most important problems first

Most important problems

Need solution = research.

Annex III.

3. Research priorities!!!

* Most important problems which need research solution.

4. What are the serious problems here?

Cattle and buffalo:

- Low animal productivity?
- Need to increase no. of animals?

Why low productivity?

G: Breeds, breeding,...

E: Nutrition & feeding

Management & health cares

Diseases & parasites

Reprod. Efficiency

Lack of Econ. Incentives

Traditions, beliefs,...

Nutrition: What technology?

Fodder: Leuceana,...

Straw: Improved Util.

Technically possible?

Would small farmers accept it?

Socially feasible?

Would it be beneficial?

Economically viable?

Appropriate technology

Affordable technology

5. Appropriate technology

For whom shall technology be produced?

Small farmer

Learn to understand existing system

1. Simple
2. Low cost
3. Use locally-available resources

Annex III.

4. Not conflict with social a trad. beliefs

? ? ?

Farming system research

Priorities

To improve

- | | | |
|---------------------------|--|---------------------|
| - Meat (P.) | | <u>Productivity</u> |
| - Draft (P ₂) | | |
| - Milk (P ₃) | | |

How?

$$P = G + E.$$

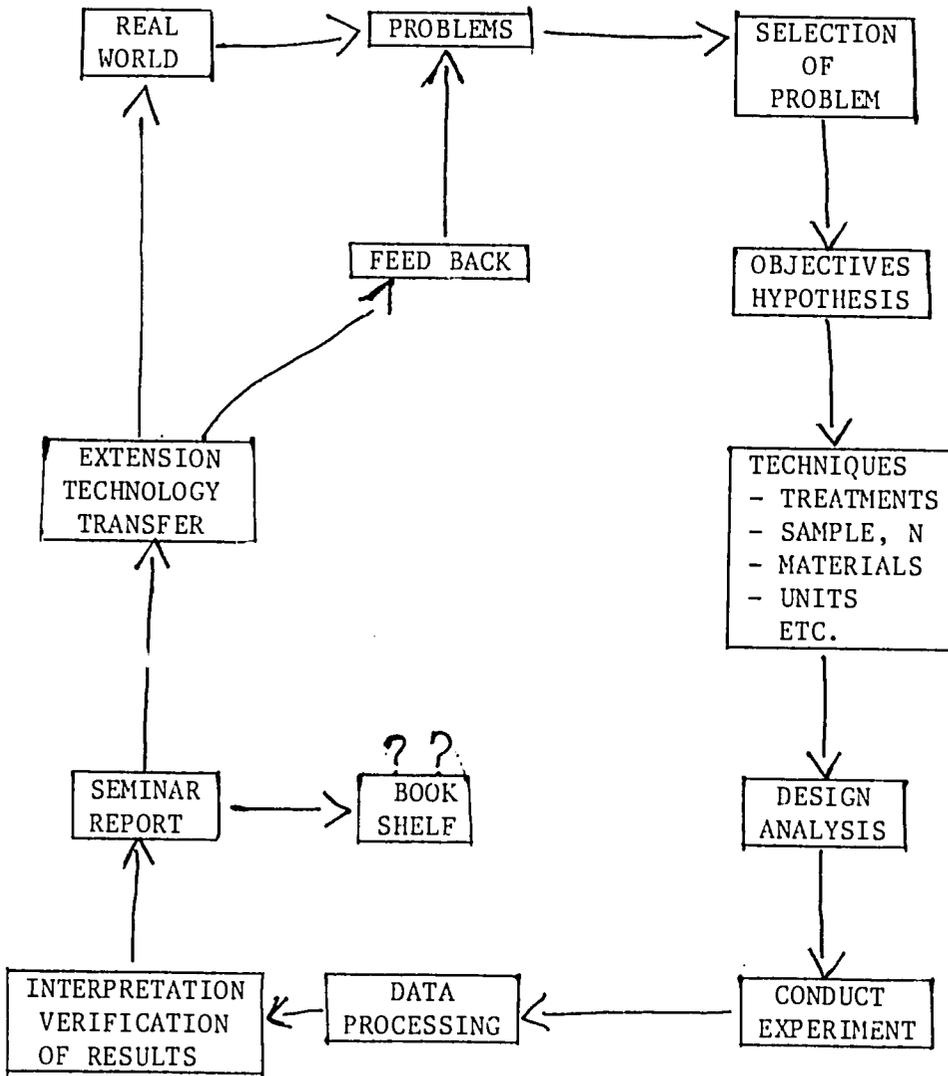
II. Research process*

1. Formulation of the problem-Hypothesis
2. Review of related literature.
3. Construction of a research design
-selection of technique, etc.
4. Determination of the universe, size and
selection of the sample.
5. Data collection & processing.
6. Interpretation of the data
7. Conclusion (vs. other results)
8. Report.

* (Lastruccl, C.L. 1963).

Annex III.

III. STEPS IN EXPERIMENT



Annex III.

IV. Research Objectives

1. Estimation: \bar{X} , \bar{O} , C.L. Etc.
2. Variation of characteristics & causes
 $P = G + E$.
3. Comparison: Best breed
4. Relationship: Draft/Height, Wt.
5. Changes: \uparrow Milk - \downarrow Fat, Δ
6. To predict: Weigh by heartgirth
7. Adjusting factors: Age, sex,...
8. Trend: Production by year
9. To develop index or score
 $I = a x + b y$
10. Survey
11. Basic information: Biolog, Physiol.
case studies.

Background*

Statistics & experimental design

V. Project preparation

1. Objectives or aims
2. Justification
 - 1) What is the problem?
 - 2) How important is it?
 - 3) How will the result contribute to solving the problem?
 - 4) Is the solution of the problem practical and could it be implemented in the existing system?
3. Materials
 - 1) Description of animals. Age, weight, sex, physiological (reproductive) status, previous history (relevance to problem).
 - 2) Description of feed. Type, fertilizer, harvesting and threshing treatment, chemical composition.

Annex III.

4. Experimental plan
 - 1) How many animals? What health control?
 - 2) How many treatment? How much to feed?
 - 3) What measurements, at what intervals?
 - 4) What experimental design?
 - 5) What labor requirement? What equipment?
 - 6) How will the data be statistically analyzed?
 5. Methods & Techniques
 - 1) Biological, chemical and biochemical methods - accuracy, repeatability.
 - 2) Instrumentation - standardization & accuracy.
 - 3) Sampling procedures - feed, feces, urine, blood, rumen, etc.
 6. Experimental schedule
 - 1) Pre-treatment and preliminary feeding.
 - 2) Collection and measurement period & timetable.
 - 3) Analytical timetable - chemical & statistical
 - 4) Writing up for publication.
 7. Budget
 - 1) Three-year project? By year.
 - 2) What have? What have not?
 8. Expected results.
- VI. Project proposal format
1. Project title
 2. Project personnel
 3. Objective
 4. Justification
 5. Project site & period
 6. Experimental plan
 - Materials & methods
 - Experimental design & analysis
 - Activity timetable.

Annex III.

7. Budget.
8. Expected result
9. Approval of concerned authority.

IDENTIFICATION OF CATTLE AND BUFFALOES FOR ACCURATE RECORD KEEPING

Professor L.S. Castillo

Identification of each animal is important for accurate record keeping. It is useless to keep records if the animals are not properly identified. The methods of marking animals are as follows:

1. Ear notching. This requires an ear notcher. In its absence a sharp knife or blade may be used to ear notch the animal. A code is necessary to prevent confusion in reading the number of each animal. (Illustrate how this code is made with both ears).
2. Ear tattooing. An indellible ink during the process of marking the ears is used. Again a code is needed.
3. Ear tagging. Code is important for proper identification. Aluminum and tin tags are common. Ear tags that are not easily tern off are to be used.
4. Branding. There are two types of branding methods, namely by the use of hot iron brands and by the use of the cold brands. The latter requires the use of dry ice or liquid nitrogen. Both of these substances are expensive, hence they are not commonly used. The brand should be placed on the forearm of the animal to minimize the destruction of the hide especially if it will processed into leather. The hind quarter compared to the other parts of the animal is the source of good hides. In the Philippines, the brand on the right forearm is for the owner of the animal while that of left forearm is for the municipality or town. Fresh hide is about 9 -10% of the liveweight of an animal.
5. Neck chains and bells. The chain may carry a tag. A disadvantage is that chains easily gets tangled with fence lines.
6. Whorls or cowlicks and their direction as located in the animal body are located on the fascimile of the animal, cattle or buffalo. In addition color markings are also recorded.

7. Muzzle prints. These are taken similar to fingerprints. No two muzzle prints are identical, hence they are useful.
8. Cutting of parts of the horn. This is done if there few animals in the herd.
9. Giving names to animals. Could not be done if there are many animals in the herd. Confision is likely to occur.

1st Evaluation - May 13, 1985

Mention the important or salient points from each of the topics presented:

- 20% 1. The socio-economic importance of cattle and buffalo in Bangladesh.
- 15% 2. What have you learned from the practicum in artificial insemination and fodder production?
- 15% 3. Name or enumerate some important points in the theoretical basis discussed in artificial insemination.
- 40% 4. Mention some additional information you got from the discussion on:
 - 10% a. The role of nutrition in reproduction
 - 10% b. Recent developments in cattle and buffalo production in South Asia.
 - 10% c. What could be the impact of the feeding practices in the reproductive performance of cattle and buffaloes? How could you improve it in your district and or in Bangladesh as a country?
 - 10% d. What could be the role of integrated dairy production and crop farming systems? Are you convinced about this new approach and why?
- 10% 5. Identification of animals for accurate record keeping.

EXAMINATION ON MAY 23, 1985

- I. Matching type. Match items of column A with the correct answer in column B Write the letter of the correct answer on the blank before column A.

<u>COLUMN 'A'</u>	<u>COLUMN 'B'</u>
1. According to Ziauddin about 17,000 children are getting blind every year because of	a. 6.5%
2. Extender of semen	b. Haye
3. Location of National Semen Bank	c. Iodins deficiency.
4. Lecturer on requirement and availability of cattle feed fodder	d. 2-4%
5. Dickey suggests the non-conventional GDP from livestock is	e. Coconut milk
6. HUNME use urea at what levels?	f. Dr. Chakma
7. Explained BARC organizational set-up	g. Heterosis
8. Gobar gas or biogas has	h. Size and weight
9. Brahman Desai produces calves with	i. 10½15%
10. Draft power associated with.	j. Methane
	k. Dr. Altaf Hossain
	l. 11.5%
	m. Central Breeding Station Savar.
	n. Prot. and Vit. A deficiency.

- II. True or False. Write the word "TRUE" on the balk before the number if the statement is ture. Otherwise write "FALSE".
1. Sterility and infertility mean the same thing.
 2. Persistent corpora lutea could be removed from the ovary.
 3. Silage making requires anarobic condition.
 4. Freeze tranding requires dry is or liquid nitrogen, hence it is expensive.
 5. Fodder varieties including legumes and maize could be produced the year round to supply the feed requirements.
 6. There are about 10% of Bangladesh householder that are landless.
 7. Holotensis are affected by the hot humid tropical clitrate.

8. HUMMB lick improve rice straw utilization.
9. The use of barbed wire fencing is recommended for dairy cows.
10. Swamp buffaloes have 50 chromosomes.
11. In a gober gas plant, the scum formed on the top of the digester will allow the methane gas to be collected at the gas holder.
12. Cattle and buffaloes have one functional ovary.
13. The use of frozen semen will minimize or eliminate the raising of breeding bulls in your district.
14. Whorls or cowlicks are found in cattle and buffaloes.
15. It seems Brahman breed is adapted to many southeast Asian countries.

III. Multiple Choice

1. If P(phenotypic value) equals to 60, (Genotypic value) 40, and E (Environmental value) 20, h^2 equals to
 - a. 33%
 - b. 67%
 - c. 50%
 - d. 60%
2. Performance testing is a method for an evaluation of animals genotype in order to carry out.
 - a. Progency selection
 - b. Pedigree selection.
 - c. Mass selection.
 - d. Index selection.
3. Castration of animals for work, in a long run, could create:
 - a. Low calving rate.
 - b. Reduction in average body weight.
 - c. Inbreeding.
 - d. Increase in average body weight.
4. What is the most important reason why the farmers in Bangladesh raise cattle and buffaloes.
 - a. To produce meat.
 - b. For work and manure
 - c. To use as long-term saving.
 - d. To increase income.

IV. Completion or enumeration

1. Crop yield gap between that of experimental station and that of farmers field can be divided into three, they are due to.
 - a.
 - b.
 - c.
2. Name two uses of maize.
 - a.
 - b.
3. What is the best season for maize?
 - a.
4. Name two activities you did in fodder production
 - a.
 - b.
5. Name two activities you did in artificial insemination
 - a.
 - b.
6. Mention one extension activity you are doing in your district.
 - a.

The objectives of this training course could be:

1. To emphasize the importance of artificial insemination and fodder production for cattle and buffaloes.
2. To improve the knowledge on cattle and buffalo production as influenced by:
 - a. Nutrition.
 - b. Breeding and reproductive physiology
 - c. Management.
 - d. Health.

3. To appreciate the role of integrating cattle and buffalo production and crop farming systems in increasing income and employment of farmers, landless labour, and women.
4. To recognize the role of socio-economic factors on progressive cattle and buffalo production.
5. To serve as an in-service training course for scientific and livestock production officers.

Considering these objectives and your actual experience during the course, May 11-23, 1985 do you honestly feel that the knowledge you got will be of help to you (according to the categories listed):-

Please check what you feel.

Very much useful _____

Much useful _____

Fairly useful _____

Less useful _____

Not useful at all _____

Have learned them before, therefore the two weeks is waste of Government funds and my time _____

OUTLINES OF LECTURES PRESENTED
BY LOCAL EXPERTS

ANNEX IV

List of Literatures Provided for the training course.

1. Chantalakhana, C. 1979. Performance of swamp, riverine, and crossbred buffaloes in SE Asia. FAO Animal Production and Health Paper 13, FAO, Rome, Italy. p.143-151.
2. Chantalakhana, C. 1981. A scope on buffalo breeding for draft. In "Recent advances in buffalo research and development", published by the FFTC/ASPAC, Taiwan, ROC. p.131-151.
3. 1981. Comparative evaluation of swamp buffaloes in the SABRAO region. Proceedings of the second SABRAO Workshop on Animal Genetic Resources, held in Kuala Lumpur, 5-6 May, 1981. p. 91-110.
4. The village farmer and his livestock. Paper presented at the International Brahman Congress, during 18-22 April 1983, Rockhampton, Queensland, Australia.
5. Chantalakhana C. 1977. Swine production in Thailand and some major constraints. Paper presented at FFTC/ASPAC Seminar, Taiwan, ROC.
6. 1980. Some problems in the development of integrated farming in Thailand. Paper presented at the APHCA International Workshop, Chiang Mai, Thailand.
7. 1978. Influence of government animal seedstock programs on genetic improvement for small farms. Paper presented at the RF seminar, Bellagio, Lake Como, Italy.
8. Potential and limitation of livestock production in Thailand.

Annex IV

9. 1977. Some important steps in the research process in agriculture. Agricultural Research Management Vol. II. SEARCA, Philippines.
10. Proceedings of the Second Coordination Meeting of the Regional Cooperative Agreement on the use of Nuclear Techniques to Improve Domestic Buffalo Production in Asia, 1981. Chulalongkorn University Bangkok, Thailand.
11. Liu Cheng Huw, 1978. The preliminary results of crossbreeding of buffaloes in China. Mimeographed publication.

ANNEX V

Terms of Reference

1. Assist in conducting a two-week training course on cattle and buffalo production;
2. Lecture on recent developments in tropical countries, with particular reference to South Asia;
3. Lecture on production problems and constraints of cattle and buffalo production in Bangladesh and discuss possible solutions to those problems;
4. Encourage participants to develop research proposals on the various problems.

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Assoc. Production Agronomist, Jamalpur
Livestock Specialist