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AgEnt

A private sector Agro-Enterprises advice and assistance service
to stimulate the successful development of agro-products, enterprises
and export markets in Sri Lanka.

OCTOBER 1993

Issue No. 8 from AgEnt's business
production, processing and
marketing information center

SRI LANKA POULTRY SECTOR "STRENGTHS/WEAKNESSES/OPPORTUNITIES/THREATS" ASSESSMENT

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This is one of a series of "sector by sector" studies which AgEnt has either completed or has in hand, designed to determine how the project can best assist both a sector and individual companies/entrepreneurs

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AGRICULTURE ENTERPRISE DEVELOPMENT (AgEnt) PROJECT

SRI LANKA POULTRY SECTOR ASSESSMENT

CLIVE DREW
LIVESTOCK ECONOMIST
USAID Funded AgEnt Project
Colombo, Sri Lanka

OCTOBER, 1993

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EXECUTIVE SUMMARY

I. Introduction:

The USAID funded Agro Enterprises (AgEnt) project is to advise and assist in stimulating the successful development of agro-products, enterprises and export markets in Sri Lanka.

The project has received several inquiries for assistance in the poultry sector, and has approved funding for a slaughter plant expansion.

AgEnt deemed it prudent to undertake an assessment of the poultry sector in order to determine potential for assistance.

This assessment includes an analysis of the strengths, weaknesses, opportunities and threats in the poultry sector of Sri Lanka.

II. Macro Economic Factors:

Sri Lanka has a population of 17.4 million. Approximately 75% of the population is Sinhalese. About 69% are Buddhists.

Per capita GNP is around U.S.$467. Income distribution is highly skewed and wages are low. Income and religion constrain meat consumption.

Almost 80% of the population resides in rural areas.

Nutritional poverty affects almost 40% of the population.

The business environment is now more favorable for private sector development, but there are some drawbacks (high tax and import duties, high inflation, high interest rates and a depreciating Rupee).

III. The Agricultural Situation:

GDP in agriculture was Rs.82,359 Mn in 1991. Agriculture contributes about 22% to total GDP.

Over one-half the population is involved in agriculture and contributes less than one-quarter to GDP.

Agriculture is dominated by plantation crops and paddy. Approximately one-third of agricultural holdings have livestock.

Per capita food production in 1991 was 87% of what it was in 1979-81.

The main agricultural export is tea.

Sri Lanka is barely maintaining its status as a net exporter of agricultural products.

The livestock population of Sri Lanka includes 1,477,000 million cattle, 824,000 buffalo, 20,000 sheep, 460,000 goats 84,000 pigs, 8,261,000 poultry and 17,000 ducks.

Livestock account for about 6% of agricultural GDP and 1.25% of total GDP.

Poultry is a minor contributor to the overall economy.

IV. The Poultry Sector

This includes an assessment of input supply, production, processing and marketing of eggs and poultry meat.

There are approximately 65,000 poultry farmers in Sri Lanka producing 870,000 eggs and 20 million kg of poultry meat.

Government and donors provided initial assistance to the poultry industry. Commercialization has largely been undertaken by the private sector in collaboration with government.

The country is essentially self-sufficient in poultry products, given the limited purchasing power of the population. Per capita consumption is approximately 50 eggs and 1.2 kg of poultry meat, which is very low by world standards. Egg production has stagnated whereas broiler production is showing rapid expansion. The commercial poultry belt is in an approximate 30 mile radius of Colombo. Broiler meat production is concentrated amongst the larger producers, with farms in excess of 1,000 birds supplying 65% of broilers. On the other hand, small farmers with less than 1,000 layers are estimated to produce 60% of the eggs. A total of 40 franchised hatcheries supply day-old chicks. There are 19 feed mills, PRIMA and Gold Coin are the main suppliers. There are 8 to 10 commercial poultry processors and 3 main suppliers of veterinary medicines. The broiler industry is fairly well integrated, and this trend is likely to strengthen.

Main policy legislation affecting the poultry industry is the Animal Diseases Act. It is expected that further legislation will evolve relating to feeds and slaughter plants.

Donor support which occurred in the early 1980's included establishment of parent stock farms and hatcheries, animal feed manufacture and area poultry development. Government has focussed too much attention on dairy development.

Markets for poultry products include autonomous consumption, farm gate sales, other informal, formal retail and HRI markets.

Broiler meat is now competitive with the red meats, with a current (October 1993) retail price of approximately Rs.87.00 for whole broilers. Fresh eggs are approximately Rs.2.60 each at the retail level. Both chicken meat and eggs show extreme month-to-month price variability due to supply and demand. Per capita consumption of animal protein is in the following order: dairy, eggs, beef and poultry meat. Farm-to-retail price ratios are approximately 55 to 60% for broilers (live:dressed) and about 77% for eggs.

Eggs are sold in loose form, and size graded by the farmer. There is a preference for brown-shelled eggs. Eggs are not refrigerated. There is a good market (salvage) for spent hens in curry preparations. Broilers are sold as live birds, hot dressed birds and frozen birds. Carcass weight is relatively small, 1.1 to 1.2 kg. There is a small but expanding market for cut-up chicken, sausage and breaded chicken.

Egg and poultry meat consumption is acceptable to over one-half the population. Fish is a close competitor. Broiler meat has been promoted by the industry and is well accepted. Concerns are hygiene and refrigeration.

With the exception of the Maldives, and possibly some of the by-products, there is no export potential for Sri Lankan poultry products.

Sri Lanka has access to all of the major strains of layers and broilers. The 40 franchised parent stock farms/hatcheries import day-old parent and grandparent stock from 19 hatcheries in a total of 9 countries. The DAPH approves/issues import permits, conducts disease surveillance and makes recommendations on vaccination programs. Day-old chick cost is relatively high in Sri Lanka, due to poor performance of breeders as a result of heat stress.

The major poultry diseases are prevalent in Sri Lanka (Marek's, Newcastle, Coccidiosis, Fowl Pox, etc). Virulent strains of Marek's have been a recent concern. IBD is also a threat. Both the DAPH and private sector monitor the disease situation closely. Vaccines and other drugs are readily available.

Government support to the industry is primarily through the Department of Animal Production and Health, the Ministry of Livestock Development and Milk Production and the National Livestock Development Board. There are no specific subsidies for the poultry industry, but concessions are offered on import duties and BTT. Ministry extension personnel primarily assist the small scale producer with larger commercial producers and outgrowers/contract farmers serviced by private sector extension agents. Specific direct government support to the industry includes hatcheries, vaccine production and disease surveillance. Government (and private sector) produce extension publications. There is limited research and academic training in poultry.

Agribusiness in support of the industry includes 40 franchised parent stock farms and hatcheries supplying almost 4 million pullet and 19 million broiler chicks. Most producers raise their own point-of-lay pullets. Total feed requirements for the poultry industry are approximately 300,000 m.t. The main commercial mills are Ceylon Grain Elevators (PRIMA), Moosajees Ltd. (Gold Coin) and New Bernards Animal Feeds. A wide range of poultry feeds is produced in mash, crumble and pelleted form. Bird performance is very good on current commercial feeds. There is a large network of feed dealers and technical support. There are 8 to 10 commercial poultry processors, plus small scale and backyard slaughter. Ceylon Grain Elevators is establishing a 2,000 bird/hour plant. Because of rapid growth, broilers have a short production cycle (38 to 42 days in Sri Lanka). Housing is relatively low cost and simple for birds in Sri Lanka. Environmental heat stress is a limiting factor on production. Non-automated equipment is used, except some of the larger producers using automatic drinkers. Veterinary drugs are readily available from 4 main suppliers. The private sector has a comprehensive network of extension agents.

The commercial broiler industry is fairly well integrated.

Technology in poultry production is reasonably advanced in Sri Lanka. Most birds are located in an area subject to heat stress. Newer houses are of better design, incorporating improved construction materials. Acceptable equipment is used. Feeds are scientifically formulated and bird performance is good. Farmers follow disease prevention guidelines. Many still practice multi age stocking. Day-olds are procured from franchised hatcheries. General management is quite good and farmers do maintain records. The processing industry is in its infancy. Hygiene, product temperature and handling and environmental aspects leave a lot to be desired.

Industry efficiency standards vary. The more advanced commercial egg producers are obtaining 240 to 250 eggs over a 50 to 60 week lay cycle. Broiler farmers are able to produce a 1.5 to 1.6 kg live bird in 38 to 42 days with a feed conversion ratio of 1.8 to 2.2:1, with mortality under 6%. Many of the broiler breeders have low performance on parents due primarily to heat stress.

Industry economic studies are limited. The larger integrators have detailed records and data bases. Economies of scale are a feature of poultry production at each segment. Integration is the only way in which Sri Lanka can benefit fully from economies of scale. Egg and broiler prices show wide fluctuations. Terms of trade appear to be showing a downward trend in egg production and a slight upward trend in broiler production. Current information reveals gross margins to broiler producers of Rs.5.00

to Rs.8.00 per bird. Break-even costs of egg production are close to Rs.2.00 per egg.

On other aspects, there is no active association representing the poultry industry, farmers perceive high production costs as a constraint, there are many women involved in poultry enterprises, credit is difficult to obtain and poultry products are generally accepted.

V. Existing Industry Support From AgEnt

Client requests for AgEnt support were reviewed and over 20 prospective clients interviewed and their operations inspected.

VI. Findings

1. Strengths

1. Poultry is an expanding industry, particularly broiler production that could double in the next 5 years.

2. Broiler meat is an acceptable and competitive meat.

3. There is a short gestation period in setting up broiler production and each batch cycle is short.

4. Deep litter housing allows some flexibility to switch between layers and broilers with some equipment changes.

5. Production is not affected by weather to the same extent as most other agricultural enterprises.

6. Production value per unit area is very high (over Rs.300/ft^2).

7. Technology is understood by those established in the industry.

2. Weaknesses

1. The egg production industry has matured since 1987 and could experience drastic swings in production.

2. Entry into the industry is relatively easy, but a reasonable level of technology is required.

3. There will be further consolidation (concentration) within the industry. The more efficient will expand and benefit from economies of scale.

4. Profit margins are becoming very tight. Only the fittest will survive.

3. Opportunities

Broilers are the growth area. Opportunities exist in input supply, production and processing. The industry has established itself on a viable footing.

1. Those already established in the industry and wishing to use their track record to expand or diversify are the preferred client.

2. Integration is the name of the game in broilers. Strengthening linkages is important. Outgrowers and contract growers can have gainful employment and earn income in the industry.

3. Feed milling will continue to expand to meet the need for scientific feeds. There is competition in this sector.

4. Hatcheries will expand, primarily from existing hatcheries increasing their scale of operations. Farms with grandparent stock may increase.

5. Slaughter plants will need to expand. Larger, more automated plants with proper hygiene, refrigeration, product handling and waste treatment are likely to appear on the scene.

6. Value added processing will include cut-up chicken, institutional cuts and further processed chicken.

7. Point-of-lay pullet rearing has the potential to become a specialized activity.

8. Fast food chicken is likely to expand.

9. Markets for poultry meat by-products will need to be explored. This applies to off-cuts for cut-up chicken (backs, necks and trim) and possibly overseas markets for feet.

10. There are also eccentric opportunities for integrated fish and poultry production, biogas generation, other poultry, etc.

4. Threats

The following threats and mitigation measures should be borne in mind:

1. Disease with higher bird populations and proximity of producers, requiring strict surveillance, vaccination and sanitation programs.

2. Production of a wholesome product, requiring strict hygiene, proper refrigeration and handling and compliance with standards on drug additives and residues.

3. Environmental aspects covering animal welfare, neighbors and effluent.

VII. Potential Intervention in the Poultry Sector (The Role of AgEnt)

The objective is to generate employment and income.

The focus should be on the integrator as the catalyst in reaching outgrowers and contract farmers. This requires a coordinated (synchronized) approach in addressing all segments of the industry.

AgEnt can offer assistance in technology transfer in feed milling, poultry production and processing.

Assistance with trade fairs.

Overall magnitude of growth potential in the short term with the industry expanding by another 20 million broiler placements:

Breeder farms - 20,000,000/130 day-olds hatched = 154,000 parent females.

Feed - 20,000,000*1.6*1.8/1,000 = 57,600 tons broiler feed + parent feed (approximately 12,000 tons).

Outgrowers - 20,000,000/2,000/6 = 1,667 farmers.

Slaughter - 20,000,000*0.94/250 = 75,200 birds/day.

Broiler meat output - 20,000,000*0.94*1.25 = 23,500,000 kg
= 1.27 kg extra meat/capita in 5 years.

Income - 23,500,000*Rs.75.00 = Rs.1.76 Bn.

AgEnt can reach out to the client base through the integrators and larger farmers and agribusiness firms.

Technical assistance will be required in technology transfer and evaluation of proposals. A consultant should visit every 3 to 4 months, depending on client demand.

Environmental aspects concerning animal welfare, neighbors and effluent need to be addressed for each proposal.

Sponsorship to poultry trade fairs is recommended. A very successful Poultry Industry Development Seminar was held on October 19, 1993.

The project should also consider investment cost-sharing on housing involving integral bird comfort features.

The main pitfall to avoid is assisting small scale producers and new entrants on an individual basis.

VIII. Conclusions and Recommendations

The poultry sector, especially broilers, could double output in the next 5 years. AgEnt can facilitate this process, generating employment, income and improving the diet.

This is a rapidly expanding sector that can have immediate payoffs for AgEnt interventions.

IX. Bibliography

A bibliography on books, periodicals, scientific journals and extension bulletins has been prepared. Additional material is being accessed for the AgEnt Business Center.

X. References

A list of key references is attached.

XI. List of Contacts Made

Over 30 industry contacts were made during the consultancy.

XII. Appendices

Supporting documents are attached as an integral part of this report.

I. INTRODUCTION

1. Background on AgEnt

Following is some background information concerning the Project.

The Agro-Enterprise Development (AgEnt) Project is located in Colombo, Sri Lanka. The project was officially launched in early 1993. It is a USAID supported activity whose principal charge is to assist the private sector agro-enterprise industry in Sri Lanka. Advice and assistance services are provided to stimulate the successful development of agro-products, enterprises and export markets in Sri Lanka. The project will address any sector within the industry and is a five year project.

The project is supervised by eight Technical Advisors (TA) including four Sri Lankan associates. Associates are not considered as counterparts in the traditional definition. The following disciplines support the project's activities: Agro-Enterprise Specialists, Production Specialists, Marketing/Agro Processing Specialists, Financial Specialists. The project has no direct government associations but will be cooperating with selected government staff to achieve the goals and purposes of the project. <u>All of the TA Advisors possess a very high level of commercial business experience in their respective disciplines.</u>

The prime contractor for the AgEnt Project is Oregon State University (OSU). It is supported by a consortia of private sector U.S. based companies.

Further background on the project is contained in the brochure attached as Appendix I.

2. Poultry Sector Inquiries

The project is very interested in supporting the poultry activity if potential can be demonstrated.

Currently, the poultry industry in Sri Lanka is domestic market orientated. The larger producers kill maybe 3,000-5,000 birds per day. Many by hand, with some consideration to semi-automatic killing lines. There are possibly some larger operations.

Based on AgEnt field visits, the gamont of quality in the producers is from good to poor. Sanitation problems, leading to death from disease, has been a problem in some of the houses that have been visited.

The AgEnt Project has received numerous requests for assistance from producers/processors in this sector. Initially the project staff felt that it could be a small sector, possibly with limited assistance possibilities. However, as project implementation continues, it is becoming more evident that this could be an area of major assistance activity for the AgEnt Project.

The project has recently assisted a client to negotiate the purchase of a semi-automatic killing line being supplied by a United States company. The equipment is expected in Sri Lanka by November of this year.

Other inquiries include a producer interested in establishing a laboratory for disease diagnosis, a producer requiring feed milling equipment, and a producer needing his operation evaluated.

AgEnt has also recently advertised the in-country presence of the poultry specialist in order to attract further inquiries from the industry. Refer to Appendix II.

3. Scope of Work - With Emphasis on Strengths, Weaknesses, Opportunities and Threats

Following is a brief overview of what will be required under the consultancy.

In broad terms, it will include an evaluation of the poultry sector in Sri Lanka as it exists, that outlines the strengths, weaknesses, opportunities and threats for growth for the producers and processors. The consultant will evaluate both the layer and broiler sub-sectors. This will be the same approach that was utilized for the tropical fish and floriculture sectors. In other words, AgEnt feels it should "get its hands around" the sector before making major commitments.

The AgEnt project would like to proceed with this consultancy as soon as possible. The target date for beginning the consultancy is September 15, 1993. It is anticipated that this will be a four week consultancy, including the preparation of the final draft report. It was recommended and approved that Mr. Clive Drew be contracted to complete this consultancy.

A detailed Scope Of Work (SOW) for the poultry consultancy is attached as Appendix III.

A seminar will be presented to the industry near the end of the consultancy.

II. MACRO-ECONOMIC FACTORS

1. Population

The current population of Sri Lanka is estimated at 17.4 million. Growth rate is approximately 1.5% per annum. The population increases by another 1 million persons every 4 to 5 years. Almost 45% of the population is under 20 years of age.

Based on the 1981 census, population distribution, by religion, was: 69% Buddhists, 16% Hindus, 8% Muslims and 7% Christians.

Ethnic distribution in 1981 was as follows: 74% Sinhalese, 13% Sri Lankan Tamils, 6% Indian Tamils, 7% Moors, and a presence of Burghers, Malays and Others.

Overall population density is 280 persons/km^2 (3,000/km^2 in Colombo District).

The high percentage of Buddhists do not favor the slaughter of animals and consumption of red meat; poultry products are more acceptable.

2. Income

GDP at current prices was Rs.384 Bn. in 1992. In real terms, GDP has been growing at a rate between 4 and 5% in 1991 and 1992.

Per capita GNP was approximately U.S.$467 in 1990. Comparative figures are U.S.$350 in India, U.S.$190 in Bangladesh, U.S.$760 in the Philippines and U.S.$1,420 in Thailand.

Income distribution in Sri Lanka is highly skewed. A 1986/87 survey showed that the highest 10% income group had 41.4% of the income, with 3.5% of the income shared by the lowest 20% income group.

Wages are low. Many agricultural workers only earn Rs.50.00 to Rs.70.00 per day, which constrains purchasing power.

3. Employment

Population distribution is 22% urban, 72% rural and 6% estates.

The most recent survey showed that Sri Lanka had an economically active population of 6.6 million, of which 16.2% were unemployed, the majority being rural women.

4. Poverty

Nutritional poverty is estimated to affect almost 40% of the population. One-half of rural households are nutritionally vulnerable, women and children being worst affected.

5. Trade Balance

Sri Lanka has been running a trade deficit for many years, which is currently about U.S.$720 Mn.

The government is promoting exports. The dominant manufacturing export is textiles and apparel.

6. The Business Environment

The investment climate is affected by the following factors:

1. Whereas Sri Lanka follows the socialist doctrine, the private sector is allowed to function freely. The government has privatized a number of parastatals that has further assisted private sector development.

2. The abundant labor force is an inexpensive resource, with a relatively good work ethic and education.

3. The government does encourage diversification of the economy and export growth.

4. Employment and income generation for the rural poor is high on the development agenda.

5. The BOIC offers attractive investment incentives for qualified firms and industries.

6. There are numerous other incentives offered by donors (e.g. AgEnt, ECIP, etc.), Provincial Councils and various financial institutions.

7. Taxation is very high.

8. Import duties are high.

9. Inflation is high, official rate is 10 - 12%

10. Commercial interest rates are very high, in the order of 24 to 30%, so the effective borrowing rate is high.

11. The current (Sept 24, 1993) exchange rate is Rs.48.93 = U.S.$1.00 which is a 10% depreciation from a year ago.

12. There is civil unrest. Armed conflict has been occurring in the north and northeast for the last decade. The President of Sri Lanka was assassinated in May, 1993.

III. THE AGRICULTURAL SITUATION

Sri Lanka experienced a drought during 1991/92 that had a negative impact on agricultural production.

1. Contribution to GDP

Agriculture accounted for 22 to 23% of GDP in 1991 and 1992.

2. Contribution to Income

GDP in agriculture (at current prices) was Rs.72,452 Mn. in 1990 and Rs.82,359 Mn. in 1991.

3. Agricultural Employment

Approximately 52% of the economically active population is engaged in agriculture.

Agriculture is a dualistic system, with an export oriented plantation sector (tea, rubber and coconut) and a large peasant sector.

Thus, over one-half of the population is engaged in agriculture, which contributes less than one-quarter to GDP.

4. Agricultural Activity

Cropped land comprises approximately 23% of total land area. This equates to 0.11 ha./capita, approximately the same as Indonesia and the Philippines. For the plantation crops, there are 220,000 ha. of tea, 200,000 ha. of rubber and 300,000 ha. of coconut. Paddy is almost 770,000 ha, of which a portion is double cropped. Inter-cropping in plantations is also on the increase.

The 1982 (latest) census showed total agricultural holdings of 1.8 million in the smallholder sector occupying 3.5 million acres. Over one-third of these operators owned a home and garden only. A total of 8,354 estates occupied 1.2 million acres of land.

Approximately one-third of agricultural operators have livestock as part of their enterprise mix. Further information on livestock activity is shown below.

5. Food Self Sufficiency

Food production increased only 7% from 1979-81 (base) to 1991 which is the lowest performance in Asia. With population increase overall per capita food production in 1991 had dropped to 87% of what it was in 1979-81!

6. Export Earnings

Total export earnings for Sri Lanka in 1991 were Rs.84,378 Mn. Agricultural exports of Rs.26,536 Mn. contributed to slightly over 30% of total export earnings (tea being the dominant earner, Rs.18 Mn.). Some industrial product exports are also of agricultural origin (e.g. crustaceans, fish, fruits, vegetables and tobacco) amounting to Rs.1,471 Mn. in 1991.

Private remittances from abroad amounted to Rs.18,120 Mn. in 1991.

7. Imports

Food imports comprise rice, wheat grain, flour, sugar, milk and milk products, fish, etc. The total import bill for these items was approximately Rs.20,000 Mn. in 1991.

Because agricultural productivity has not kept pace with population increase, Sri Lanka is barely maintaining its status as a net exporter of agricultural products.

8. Role of Livestock

The livestock population, 1991

Cattle	1,477,000
Milk	209 million liters
Milk products, Rs	2,504 million import value
Slaughterings	170,988
Buffalo	824,000
Milk	71 million liters
Slaughterings	n.a.
Sheep	20,000
Goats	460,000
Slaughterings	79,277
Pigs	84,000
Slaughterings	30,604
Poultry	8,261,000
Eggs	870 million
Slaughterings	17 million kg broiler meat 3 million kg spent layers, village chicken
Ducks	17,000
Sea Fish	174,000 m.t

Note that the poultry population is a census figure or estimate at the time. As a statistic it is rather meaningless. Annual turnover of broilers can be six-fold.

GDP in the livestock sector was Rs.4.7 Bn. in 1991. Livestock account for about 6% of agricultural GDP and only 1.25% of total GDP.

9. Role of Poultry

Poultry is a minor contributor to the overall economy. Aggregate retail value of poultry products can be estimated:

Eggs, 800 million @ Rs.2.50 ea.	= Rs.2.00 Bn
Broilers, 17 million kg @ Rs.87.00/kg	= Rs.1.48 Bn
Hens, 3 million kg @ Rs.60/kg	= Rs.0.18 Bn
Miscellaneous poultry products (offals, etc.)	= Rs.0.10 Bn
Total	= Rs.3.76 Bn

IV. THE POULTRY SECTOR

1. Definition

This study includes an assessment of Input Supply, Production, Processing and Marketing of Eggs and Poultry Meat.

Macro and policy factors affecting the poultry sector are outlined and their relevance to the private sector business environment are analyzed.

2. Statistical Summary

Following is a statistical summary of the poultry sector in Sri Lanka as of 1992 and 1993:

No. of farmers	65,000
Egg production	870 million eggs
Poultry meat production	17 million kg broiler meat 3 million kg spent hens & village chicken
No. of breeder farms	40
Major poultry processors	8
Feed requirements	300,000 tons
Poultry meat imports	468 m.t., Rs.26 million value

Further statistical analysis and interpretation is included below under the Statistical Analysis section.

3. Government Agricultural Policy Affecting Poultry

3.1 Political Objectives, Strategic Plans, Work Plans and Tasks

The broad political objectives of government are to provide a nutritional source of food at reasonable prices to the population, generate employment, income and exports (or import substitution). The poultry sector satisfies all of these criteria and is therefore an industry that has been targeted for attention.

Government recognized the contribution poultry products could make to alleviating malnutrition. Poultry production could also be undertaken by peasants.

Initial impetus to develop commercial poultry production involved government programs with donor assistance in development of parent stock hatcheries, egg collection centers and disease surveillance. Extension services were also provided to the poultry producer.

Commercialization of the egg and broiler industry has largely been undertaken by the private sector. Significant growth has occurred since the mid 1980's.

A reasonable balance has been struck where private sector activity in such areas as day-old chick supply is geared towards the commercial producer, whereas government hatcheries are able to meet the needs of the small scale producer.

4. Statistical Analysis

4.1 Local Production and Imports

The following statistics on egg and poultry meat production have been extracted from official sources.

The data appears to underestimate poultry meat consumption. Apart from slaughter at processing plants, a large percentage of birds are slaughtered in small scale facilities, by backyard contractors and for direct household consumption. Supply sources include broilers, spent layers and village chicken.

4.2 Level of Self-Sufficiency

The country is largely self-sufficient in poultry products, given the limited purchasing power of the population. National statistics reveal imports of 468 m.t. of poultry meat in 1991, valued at Rs.26.00 million. This represents less than 2% of consumption requirements. Exact composition is unknown, but most likely applies to specialized poultry meats. There is a 50% import duty imposed on poultry meat imports. Sri Lanka also imports day-old parent stock, vaccines, equipment and some feed materials.

4.3 Per Capita Consumption

Per capita consumption is estimated at approximately 50 eggs per year. This compares to approximately 250 eggs per capita in the U.S.A. Broiler meat consumption is approximately 1 kg per capita. In addition, there is consumption of hens (spent layers) from commercial flocks and village slaughter in the rural areas, which is probably in the order of 0.17 kg per capita. By comparison, U.S.A. per capita consumption of poultry meat is approximately 34 kg. The following graph illustrates the increase in U.S.A. per capita consumption of broiler meat, which is now the leading meat consumed.

USA PER CAPITA MEAT DISAPPEARANCE

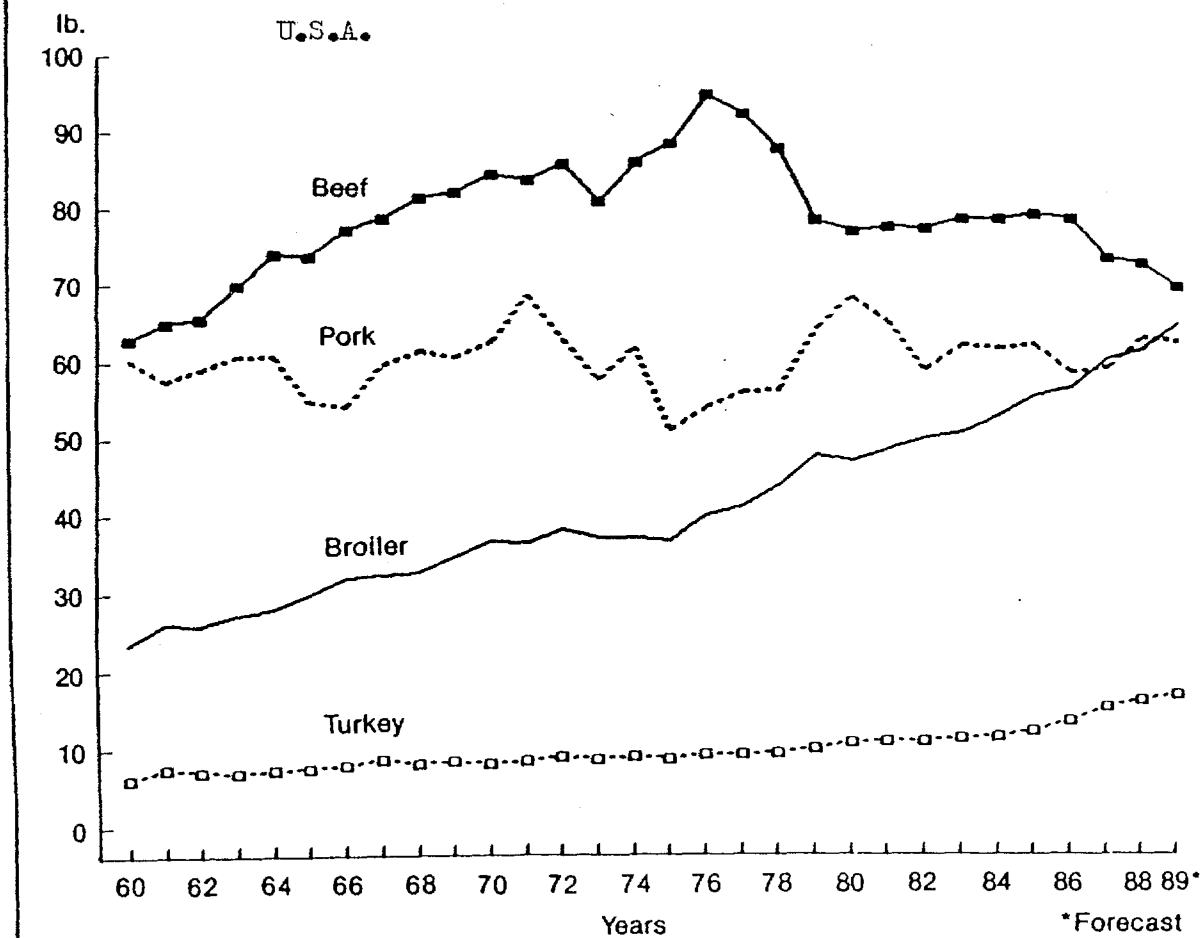


FIGURE 1. Per capita meat disappearance: Beef, pork, broilers and turkeys

Egg and Broiler Meat Production, Sri Lanka, 1981-1992

YEAR	POPULATION	EGGS		POULTRY MEAT	
		Production	Per capita	Production	Per capita
	Millions	Millions	No.	Million kg	kg
1981	14.9	466	31.3		0.10
1982	15.2	521	34.3		n.a.
1983	15.4	567	36.9		n.a.
1984	15.6	561	36.0		n.a.
1985	15.8	617	39.0		n.a.
1986	16.1	667	41.4		n.a.
1987	16.4	815	50.0		0.59
1988	16.6	778	46.9		0.65
1989	16.8	834	49.6		0.90
1990	17.0	817	48.1		0.83
1991	17.2	850	49.4		0.89
1992	17.4	870	50.0	17.0	1.00

Source: Department of Census and Statistics.

4.4 Growth Trends

The egg and broiler industries have developed over the past decade from backyard and semi-intensive production to commercial intensive systems of production.

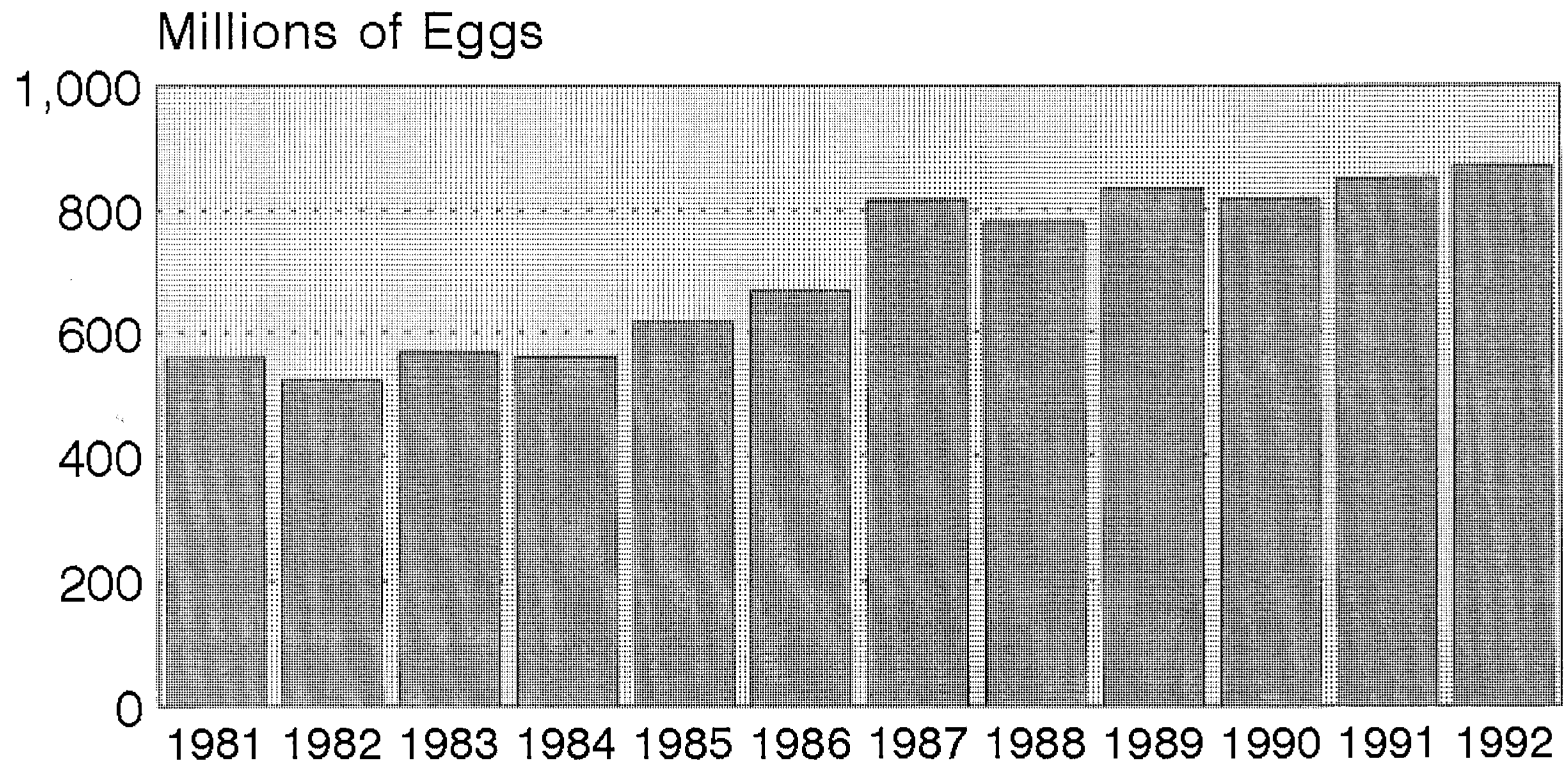
The private sector has played a dominant role in achieving this growth, after initial assistance from public sector initiatives. Commercialization has only occurred in the last decade. During this period, egg output has increased 50% and the broiler industry has grown from infant status to an output of over 17 million kg/year.

Egg production has stagnated since 1987 at approximately 50 eggs per capita. This is somewhat consistent with the family budget constraints of achieving consumption of 1 egg per family member per week. Trends in egg production are shown in the following graph.

Poultry meat production (all sources) is more difficult to estimate and data collection, analysis and reporting is lagging growth in the broiler sub-sector. The following graph (which excludes consideration of spent layers, village chicken and cockerels) shows issue of day-old broilers by franchise

SRI LANKA EGG PRODUCTION

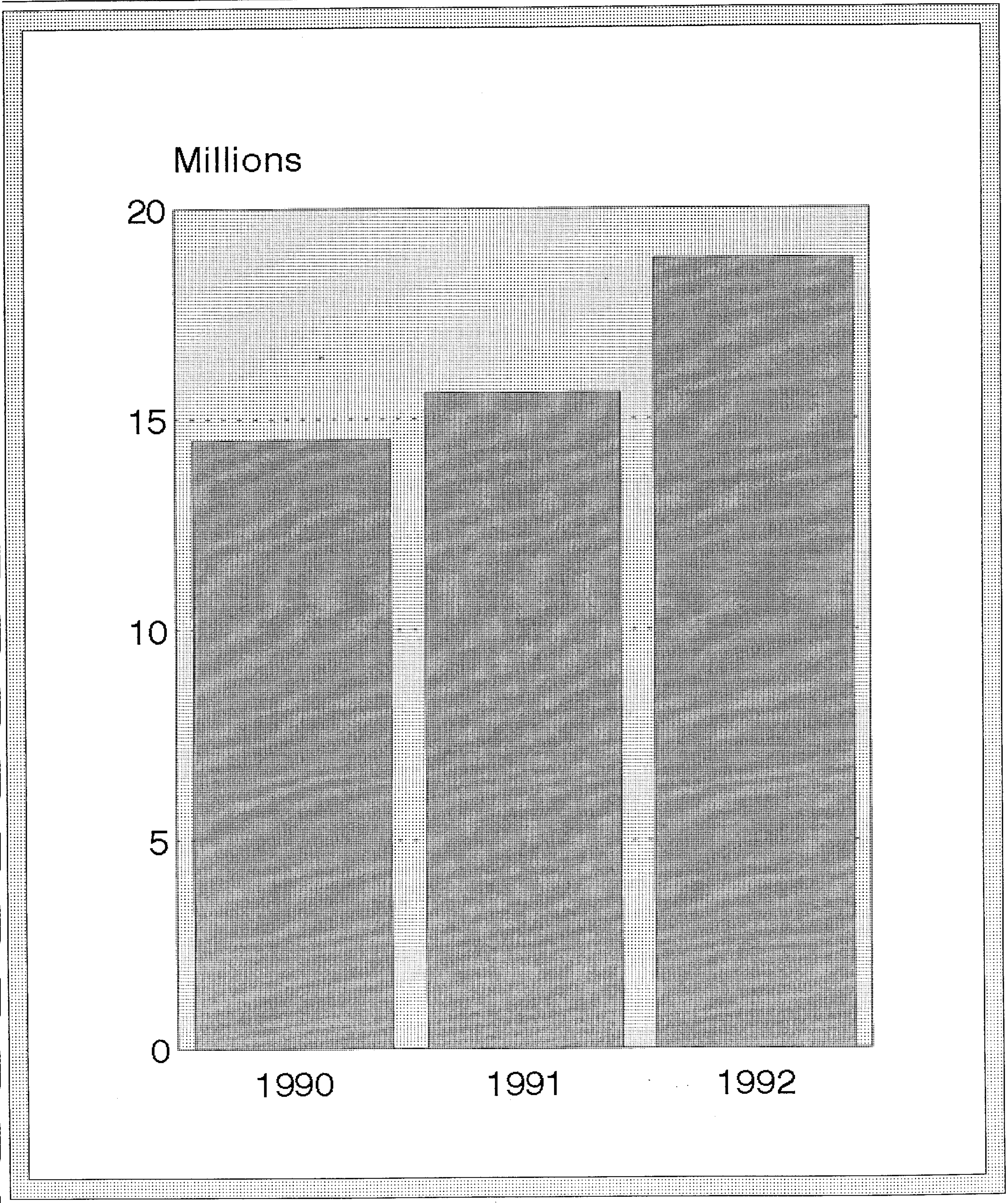
1981 - 1992



Source: Sri Lanka Department of Census and Statistics
Chart: AgEnt/cd/10.93

SRI LANKA DAY-OLD BROILER ISSUES

1990 - 1992



Source: Sri Lanka Department of Census and Statistics
Chart: AgEnt/cd/10.93

hatcheries in recent years. This is a reasonable proxy of growth trends in the broiler industry. If we assume an overall mortality rate of 8% throughout the broiler industry and an average dressed weight of 1.2 kg/bird then output of broiler meat should be about 1.1 kg for each day-old broiler chick issued.

Broiler production increased by 30% between 1990 and 1992. This demonstrates the phenomenal growth that can be achieved in this sub-sector. It has been further reported that issue of day-old broilers for the first 9 months of 1993 exceeded entire issues in 1992.

4.5 Location of Production

Backyard production is undertaken throughout the island. The commercial poultry belt is in the western part of the country, extending approximately 20 miles south, 30 miles north and 20 miles inland from Colombo. Leading Districts are Kurunegala, Gampaha, Puttlam and Colombo[1]. The agro-climatic zone is intermediate, concentration of Christians and Muslims is higher, feed mills are nearby, plus the major urban market of Colombo.

Figure 1 shows the main area of poultry production.

4.6 Number of Industry Participants

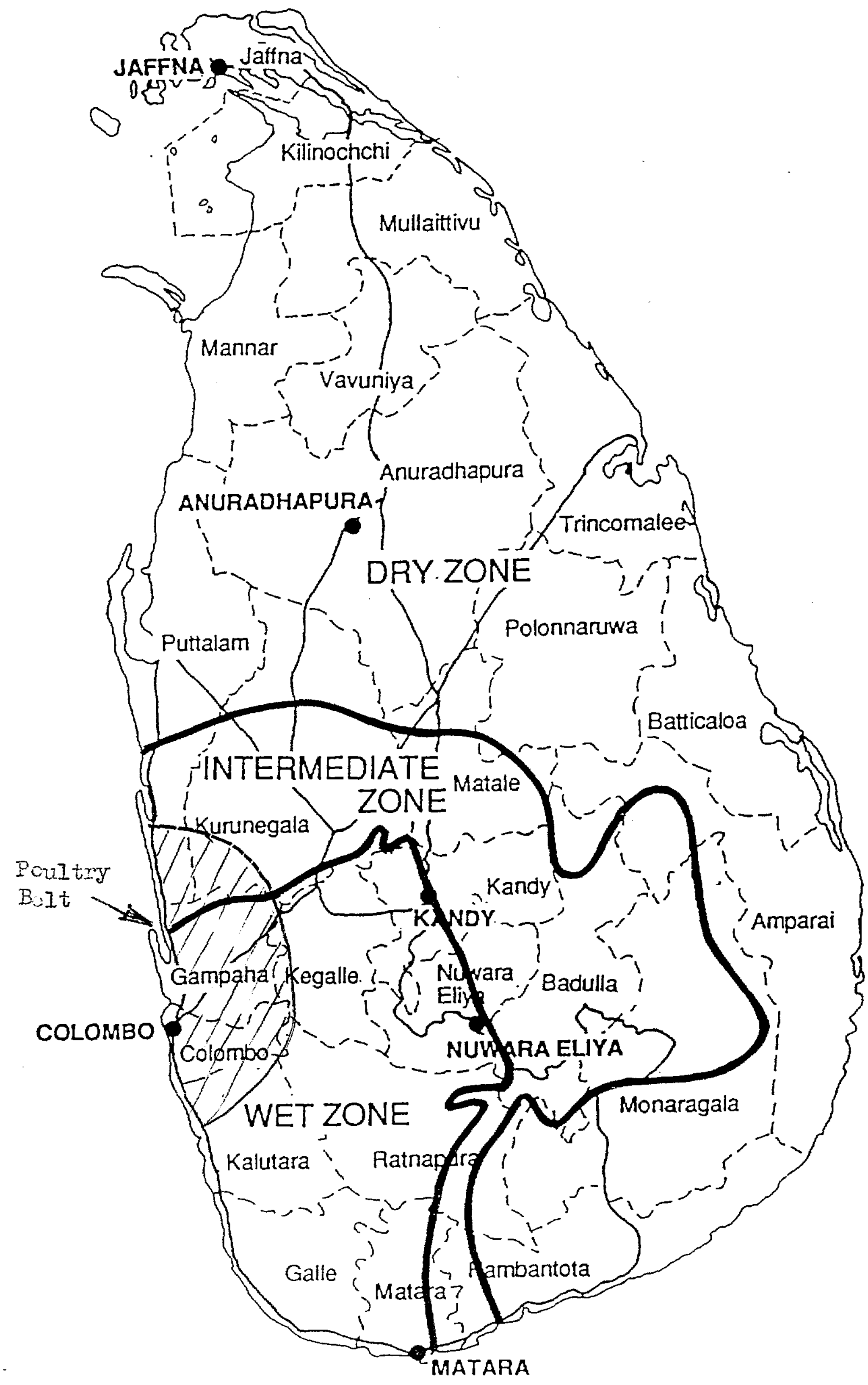
The number of industry participants provides an indication of the level of industry concentration/integration,

At the producer level, there are approximately 65,000 poultry farmers in Sri Lanka. The following table shows distribution of flocks.

Broiler meat production is concentrated amongst the larger producers, with farms in excess of 1,000 birds estimated to supply 65% of broilers. Maximum size of broiler farms is 10 - 12 thousand birds. On the other hand, small farms with less than 1,000 layers are estimated to produce a total of 60% of the eggs. One layer farm has 25 thousand birds.

[1]The northern area around Jaffna, with a predominant Tamil population is also reported to be a significant poultry producing area. Civil disturbances have no doubt affected the industry and have precluded the collection of statistics in this area.

FIGURE 1
AGRO-CLIMATIC ZONES



Distribution of Poultry Flocks in Sri Lanka

Farming System	Flock Size	% of Farmers	% Market Share	
			Meat	Eggs
Intensive	>10,000	5	65	40
Intensive	1,000 - 10,000	10		
Intensive	100 - 1,000	35	30	60
Semi-Intensive	50 - 100	35		
Backyard	<50	15	5	

Source: Bandara, B H W M U S. *Present Extension Approaches for Entrepreneurship Development in the Livestock Sector of Sri Lanka.* The Sri Lanka Agricultural Extension Association (SLAEA), 1993.

A total of 40 franchised parent stock hatcheries supply day-old pullets and broilers to farmers. It is estimated that the 5 leading hatcheries supply over 60% of requirements.

One large feedmill, Ceylon Grain Elevators (PRIMA) supplies an estimated 80% of poultry feed requirements. There is a total of 19 feed mills, plus a number of small scale manufacturers and farm mixers.

There are 8 to 10 commercial poultry processors, plus a number of small scale processors and backyard slaughter operations. PRIMA is currently undertaking a project to establish a 2,000 bird/hr poultry processing plant, which will make it the largest in Sri Lanka. All of the major processors are integrated.

There are 3 main suppliers of veterinary medicines in support of the poultry industry.

A large number of dealers and retail outlets supply poultry equipment.

The broiler sector is fairly well integrated, and this trend in integration is likely to strengthen.

5. Policy Legislation and Regulations

Policy legislation and regulations are reviewed in the context of legal freedom for private sector development (a facilitator or impediment?)

Specific policy directed at the poultry industry is limited at this stage.

Mention should be made of the Animal Diseases Act (1992). Under this Act, it is a requirement to obtain an import permit to import poultry and poultry products into Sri Lanka. This primarily affects live bird (including day-old) and hatching egg imports for grand-parent and parent stock. Also, local breeding farms must be registered. The administrating authority is the Department of Animal Production and Health of the Department of Agriculture. Further reference to this is contained in Appendix IV.

Animal feeds legislation has been drafted but not yet enacted. It primarily contains stipulations on preparation of wholesome feeds, guaranteed analyses of feeds, additives and feeding instructions. Various commercial animal feeds will have to be registered and labeled.

To date, there is no specific legislation on egg or broiler processing facilities or procedures. This may change, particularly in the case of broiler slaughter which is not conducted under strict hygiene by small scale processors.

On a more general note, commercial sale of poultry products is subject to weights, measures and pricing regulations administered by the Food Administration Unit (Food and Drug Inspection) of the Department of Health.

Poultry production and processing facilities are also subject to environmental regulations under the Ministry of Environment.

The various government ministries are also aware of the constraints in implementing legislation. For example, it is compulsory to vaccinate commercial birds against various diseases. Whereas it is a wise measure for a producer to follow these guidelines, it is difficult to enforce.

To summarize, it can be stated that there does not appear to be any legislation or overregulation that would pose itself as a barrier to private sector activity in poultry or restricting free entry. In fact, it is quite the contrary. It is conceivable that more legislation will evolve in time to protect the sector and the reputation of poultry products from actions of the unscrupulous. Examples of such wrongdoing would include sale of feeds not meeting acceptable nutrient status, excess moisture in chicken, etc.

A list of ordinances, acts and laws related to the livestock sector in Sri Lanka is shown in Appendix VI.

6. Donor Support and Projects for the Poultry Sector

Some donor support commencing in the early 1980's included:

The Canadian International Development Agency (CIDA) which helped strengthen the Central Poultry Research Station and supplying hatchery and parent stock facilities at the Marawila Livestock Farm.

The Netherlands project was planned to establish 5 regional parent stock farms and hatchery and rearing facilities to supply day-old and month-old chicks to small farmers.

An Asian Development Bank (ADB) Livestock Development Project was also designed to assist poultry development in 9 districts. There was also an integrated rural development program to integrate crop and livestock development.

The Government of Switzerland provided a loan to Ceylon Oils and Fats Corporation in the early 1980's to expand plant capacity in the manufacture of animal feeds.

The Netherlands government provided 4 chicken incubators to support backyard poultry development.

Mahaweli Livestock Enterprises Ltd (MLEL) was formed in 1988 between Mahaweli Authority, Dutch Bank, National Development Bank and farmer suppliers and is located at Tambuttegama. The objective is to have 360 outgrowers producing 6 x 500 bird batches of broilers per year. Day-old chicks are supplied from the hatchery to outgrowers whose inputs are financed during the growing cycle, and finished broilers delivered to the slaughter plant which has a planned capacity of 3,000 birds/day.

Mahaweli Agriculture and Rural Development (MARD) Project (U.S.$13.8 million) is being assisted by USAID to provide investors with technical and marketing support, training, business advisory services and credit.

The poultry sector has also benefitted from other donor supported projects in the general areas of planning and analysis, training and area based development schemes.

The majority of donor and government effort in livestock has focused on dairy development. However, milk production has remained relatively static for the past 15 years, and imports of milk and milk products (direct purchases and food aid) have remained high. Greater allocation of public and donor resources to the poultry sector would generate greater social payoffs.

7. Review of Studies, Plans and Reports

Several studies, plans and reports were reviewed in preparing this assessment. The list is contained in the References Section of this report.

8. The Market Situation

8.1 Autonomous Consumption

In terms of population distribution and income, Sri Lanka has a high proportion of low income rural households. This segment of the population is isolated, does not have refrigeration and cannot afford to purchase eggs or meat at the retail level. These households typically have small backyard and free ranging flocks of traditional (village) chicken that supply some eggs, and meat to a lesser extent.

8.2 Farm Gate Sales

This is also common place in the rural areas where the small scale entrepreneur sells eggs and live or dressed birds to village households in the vicinity and also to wholesalers. Since many Buddhists are reluctant to slaughter a chicken, they will purchase a dressed chicken from this source.

8.3 Other Informal

This sector includes roadside stalls and butchers. The outlet normally has an arrangement with a supplier and also uses brokers (itinerant traders) to procure the product. Some farmers also set up stalls to market their poultry produce.

8.4 Formal Retail

The formal market is primarily supplied by medium to large scale poultry producers who supply finished broilers under an outgrower arrangement to medium scale processors, who in turn supply outlets with a packaged product. There are also opportunists who collect birds from a number of small to medium scale producers, have them slaughtered and then supply the formal market. Brand names and value-added product are offered for sale. The product is refrigerated (mostly frozen).

8.5 HRI Markets

The hotel, restaurant and institutional (HRI) market is also supplied by medium to larger scale processors. Chicken pieces (cuts), including skinless and boneless product is supplied.

9. Market Prices

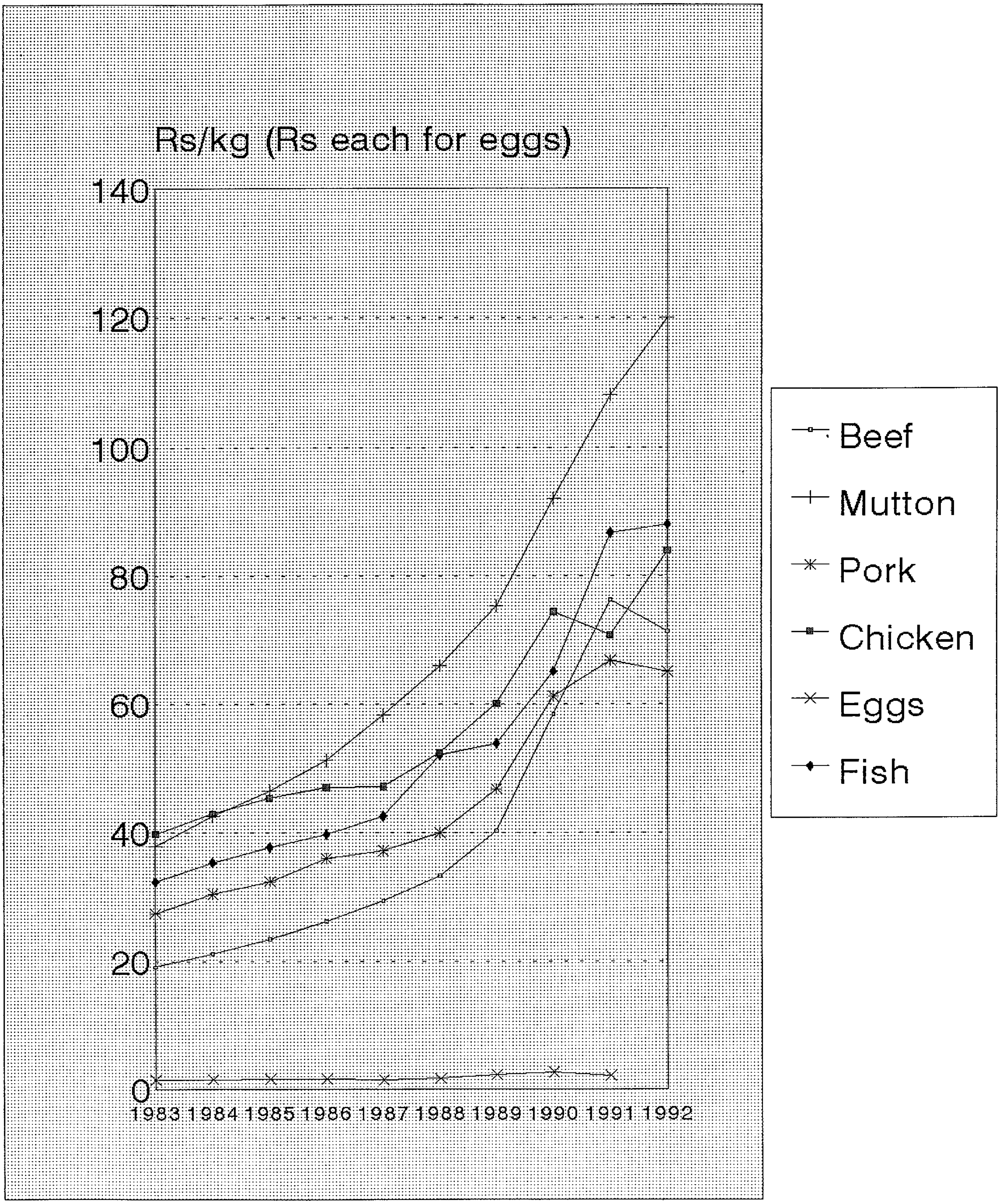
9.1 Retail Price Trends

Market (retail) price trends are shown in the following graph for different meats and eggs. All commodities have increased in price over the period 1983-1992, a period of relatively high inflation. Chicken was a luxury item in the early 1980's. From 1985, mutton (primarily goat meat) became relatively expensive. Chicken showed a more modest increase with increased supply brought about by rapid expansion in the broiler industry. As the graph depicts, it is now competitive with fish, beef and pork. Eggs remain an economic source of animal protein.

Comparative retail prices for meats in the U.S.A. are shown in the following graph. Broiler meat is the cheapest, which is the main factor contributing to increased demand.

SRI LANKA AVERAGE RETAIL PRICES

1983 -1992



Source: Central Bank of Sri Lanka

Chart: AgEnt/cd/10.93

U.S.A. RETAIL MEAT PRICES

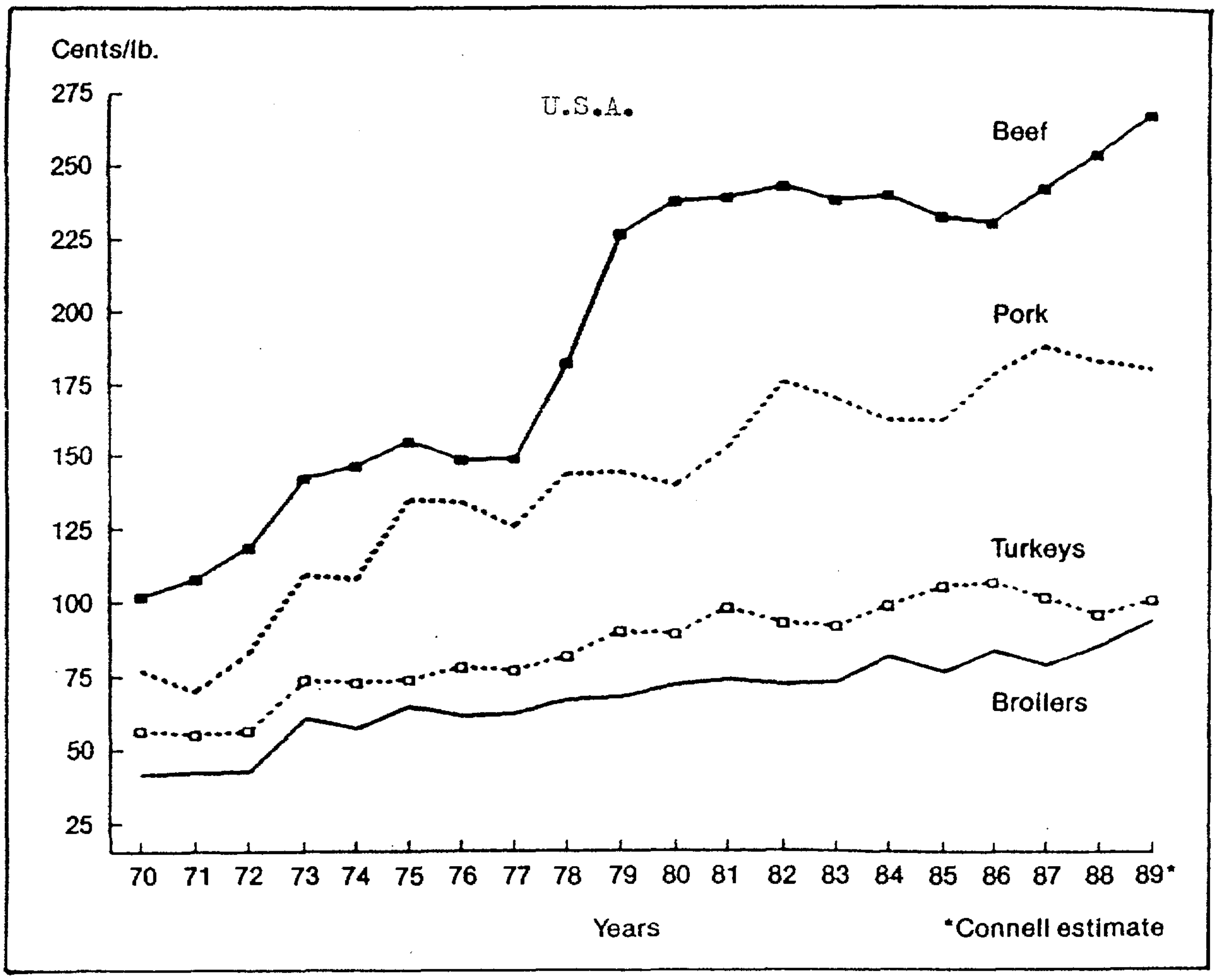


FIGURE 2. Retail meat prices, current dollars

9.2 Current Retail Prices

Keells, Food City and Elephant House supermarkets in Colombo were visited in September 1993 to obtain current retail prices for meats in the upscale market. Following are the results of the survey.

Colombo Supermarket Prices For Meat Products, September, 1993

Meat Cut	Price Rs/kg
Fresh Pork Chops	175
Fresh Mutton Leg (Local, incl. shank)	190
Fresh Beef, Topside	124
Whole Broiler (Excl. giblets)	87
Fresh Cut-Up Chicken (Ave. of Cuts)	150

Colombo supermarket prices for fresh eggs (September 1993) = Rs.2.574 each.

As the price information reveals, broiler meat is now competitive with red meats. With a retail price of Rs.87.00/kg, it is possible for the consumer to purchase a whole chicken, representing a family meal (plus leftovers) for approximately Rs.100.00. Cut-up chicken provides considerable added value.

9.3 Seasonal Price Variability

Both chicken and eggs show extreme oscillation in prices from month-to-month. This is shown in the respective graphs under Section 23.2, below. This certainly has an effect on profit margins, with short-term losses experienced during periods of depressed prices. There are several factors that contribute to price variability:

- Supply of broilers and eggs is erratic. Low prices discourage farmers from placing day-old chicks in new production cycles, which in turn causes shortages in supply followed by higher prices. Other factors affecting supply are availability of day-old chicks, heat stress and diseases.

- On the demand side, there are peak periods of poultry consumption coinciding with Christmas and also the Sri Lankan New Year in April. Poultry products are also a close substitute with fish, so seasonal peaks in fish catch and lower prices depress the demand for poultry products.

9.4 Per Capita Availability of Animal Products

Per Capita Availability of Animal Products in Sri Lanka, 1991

Item	grams/day	calories/day	Protein/day	Fat/day
Tinned meat	0.00	0.00	0.00	0.00
Beef	3.69	4.20	0.83	0.10
Pork	0.35	1.30	0.05	0.12
Mutton[1]	0.30	0.36	0.06	0.01
Poultry	2.43	2.64	0.63	0.01
Eggs	7.12	12.32	0.95	0.95
Milk Prod.[2]	40.53	65.32	3.10	3.94
Total	54.42	87.21	5.62	5.13

1. Meat from goats and sheep
2. Includes cow and buffalo fluid milk, whole dried milk, condensed milk, milk foods, butter and cheese.

Source: Department of Census and Statistics.

In terms of animal product consumption, dairy products are the main product, accounting for 55% of protein availability, followed by eggs, beef and poultry meat. Animal sources account for approximately 25% of total protein intake.

9.5 Farm-To-Retail Price Spreads

The following table shows trends in farm-to-retail price spreads for broilers and eggs over the period 1985 to 1992.

The producer price per kg for live broilers has remained fairly constant at between 55 and 60% of the retail price per kg for dressed broilers. Part of this can be explained by the high level of integration where processors supply major retail outlets and also procure live birds under buy-back or contract grower arrangements.

In the case of eggs, the producer's share of the retail price has shown a decline over the period, from approximately 85% down to approximately 77%. Marketing and distribution of eggs is not well organized.

10. Methods of Selling, Packaging and Grading Standards

10.1 Eggs

The larger producers deliver eggs to retail outlets in returnable plastic flats and in bulk loose boxes. Eggs are then sold in

FARM-TO-RETAIL PRICE SPREADS FOR BROILERS AND EGGS

	1985	1986	1987	1988	1989	1990	1991	1992
BROILERS:								
Retail Price/kg dressed broiler	45.00	46.54	47.10	52.48	65.20	75.48	75.10	83.95
Producer Price/kg live broiler	n.a.	n.a.	27.00	28.94	37.00	44.08	45.25	48.90
Price Spread/kg			20.10	23.54	28.20	31.40	29.85	35.05
Producer/Retail, %			57.3	55.1	56.7	58.4	60.3	58.2
EGGS:								
Retail Price each	1.62	1.67	1.47	1.72	2.32	2.69	2.55	2.67
Producer Price each	1.35	1.43	1.36	1.52	1.80	2.05	2.00	2.04
Price Spread, e	0.27	0.24	0.11	0.20	0.52	0.64	0.55	0.63
Producer/Retail	83.3	85.6	92.5	88.4	77.6	76.2	78.4	76.4

Source: Data from Department of Census & Statistics.

loose form in plastic sacks, in units of 10 of 5 eggs per sack. Seldom are eggs maintained in refrigerated compartments in retail stores. Given high ambient temperatures, shelf life is limited to approximately 2 weeks.

Flow of eggs from farm to retail is not organized. Previous attempts by government to establish a federation and producer organizations failed. The weak distribution system for eggs is often cited as the reason for price fluctuations, which constrains output.

There are no official grading standards for eggs, although producers do separate pullet and small eggs and jumbos. Standard egg size varies from approximately 45 to 55 gms. Eggs are not candled.

Preference is for brown shelled eggs which sell for a premium of Rs.0.10 each over white shelled eggs.

10.2 Spent Hens

There is a good market for spent hens, which sell at a price per kg slightly less than broilers. This high salvage value enhances overall profitability of egg production. Heavier weight brown hens sell at a higher price than white hens.

Hens are primarily used in curry preparations.

The larger layer farms do have difficulty in disposing of spent hens in a short period.

10.3 Broilers

The small scale producer sells some live birds, but the majority are processed. Small scale processors, traders and open air butchers often sell hot dressed birds, whereas the larger processors offer frozen birds.

The majority of broiler meat is marketed as whole frozen carcasses, with the giblets sold separately. Carcass weight is relatively small, 1.1 to 1.3 kg.

Broilers are packaged in plastic bags, usually with a brand name. Halal chicken is also readily available.

Value-added chicken includes ready-to-cook chicken portions (breasts, thighs, drumsticks and wings) usually in fresh form from refrigerated counters. There is also skinless chicken, frozen chicken sausage, and upscale packages of breaded chicken parts and chicken balls.

There are no official grading standards for broilers. Retailers are sensitive to weight, fatness, free water content and overall presentation (color and conformation). Whole frozen broilers are rarely blast frozen and packages become misshapen due to compaction during the slow freezing process.

10.4 Other By-Products

Poultry manure has a ready market. Most of it is from deep litter systems. Many of the poultry farms are situated on estates with crops such as coconuts and other minor crops. Manure is therefore used on the estate as an organic fertilizer, and must be credited as an overall benefit for the poultry enterprise because of its soil conditioning and nutrient properties.

In many instances, processing plant wastes (blood, heads, feet, intestines, etc.) are fed in raw form to a piggery enterprise as a means of disposal. In one enterprising situation visited, pig manure in turn was used to generate methane, which could then be used as a source of energy for the brooders and scalders.

Feathers are usually buried, which pose an environmental concern because of slow decomposition.

11. Value Added Products

Value added chicken includes cut-up chicken, skinless and deboned pieces and processed chicken products. These items are for the limited upscale market. As the following table indicates there is considerable value added at the retail level, compared to whole birds. Legs, drumsticks and thighs are popular cuts in Sri Lanka, whereas breasts are slow movers. Off-cuts (backs, necks, trim, etc. are discounted).

Retail Prices of Chicken Portions (Rs./kg) Colombo Town

Portion	1990	1991
Whole frozen broiler	75.48	75.10
Drumsticks	97.00	120.00
Thighs	97.00	115.00
Breasts	99.00	115.00
Wings	56.00	55.00
Necks	44.00	47.50
Liver	81.50	75.00
Gizzard	99.00	99.00
Chicken sausage	153.33	170.00
Chicken meat balls	155.00	160.00

Source: Ministry of Livestock Development and Milk Production.

As the industry matures and incomes rise, it is likely that more chicken will be sold as value-added product. In the U.S.A., for example, whole bird sales decreased from about 70% of production in 1970 to about 15% of production in 1990. Cut-up chicken constituted about 55% of the U.S.A. market in 1990 and further processed chicken about 20%. Also in the U.S.A., retail grocery sales now represent about 55% of market share, with the foodservice industry occupying 45% of market share (of which an estimated 80% is fastfood). The trends are shown in the following graphs.

Because of low incomes and low per capita consumption, the Sri Lankan market for sophisticated value-added chicken is very narrow. Therefore, producers should concentrate on supplying an economical source of poultry meat that will reach a broader segment of the population and also allow the consumer to increase frequency of purchase.

12. Religious and Cultural Aspects/ Preferences

As stated above, Sri Lanka is a Buddhist nation. However, egg and poultry meat consumption is acceptable in the diet by the majority of the population. There is also a Moslem population, and the exclusion of pork from this segment of the population's diet can be made up by chicken. The majority of chicken is sold as Halal.

The broiler industry has done an excellent job of promoting broiler meat as being tender and succulent white meat from the young bird. This has changed consumer attitudes towards poultry meat as being a stewing product, reminiscent of the days of the 'jungle' or village chicken or the spent layer. Preference is for a white carcass, not yellow.

Carcass size is relatively small, between 1.0 and 1.2 kg. Cost of producing a carcass of this size is quite high, compared to heavier weight birds, particularly in Sri Lanka where cost of day-old chicks is high. Part of the explanation for producing a light weight bird is to have a retail full carcass that is still within the reach of the consumer's pocket. This will be less of a concern once the industry progresses into value-added cut-up chicken (chicken portions). As a result, a greater volume of chicken meat can then be produced at a lower cost per kg.

Both male and female broilers are produced as straight-run batches. Females require approximately 5 extra days to reach equivalent market weight as their male counterparts, or are approximately 300 gms lighter at marketing under all-out production.

Concerns about cholesterol, etc. in red meat, which has received worldwide publicity in recent years will also improve demand for poultry (white) meat. The beef industry has limited expansion potential relative to broiler meat.

U.S. WHOLE BIRD, CUT-UP & FURTHER PROCESSED CHICKEN

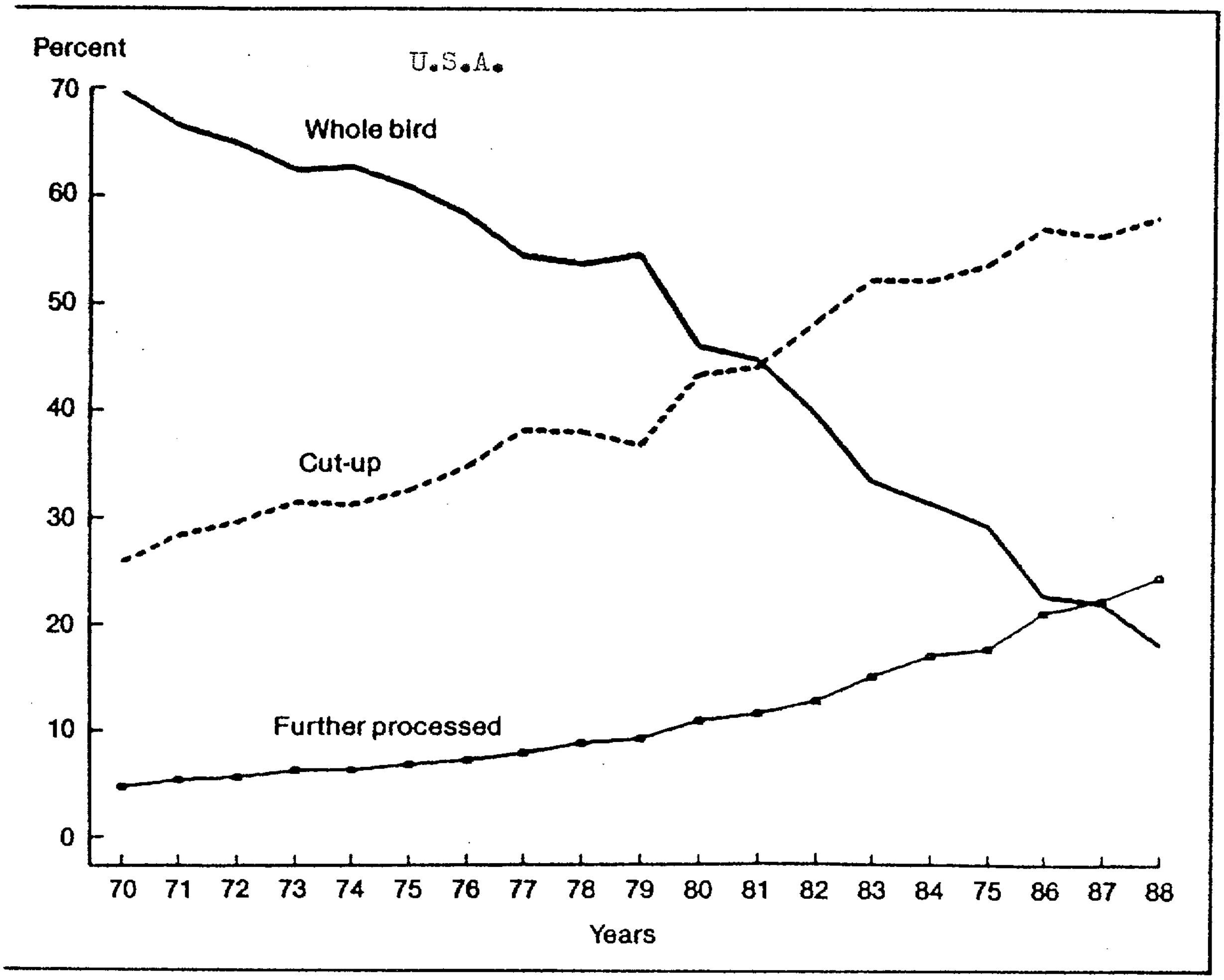


FIGURE 5. Whole bird, cut-up and further processed production as a percentage of total production

U.S. GROCERY & FOODSERVICE MARKET SHARE

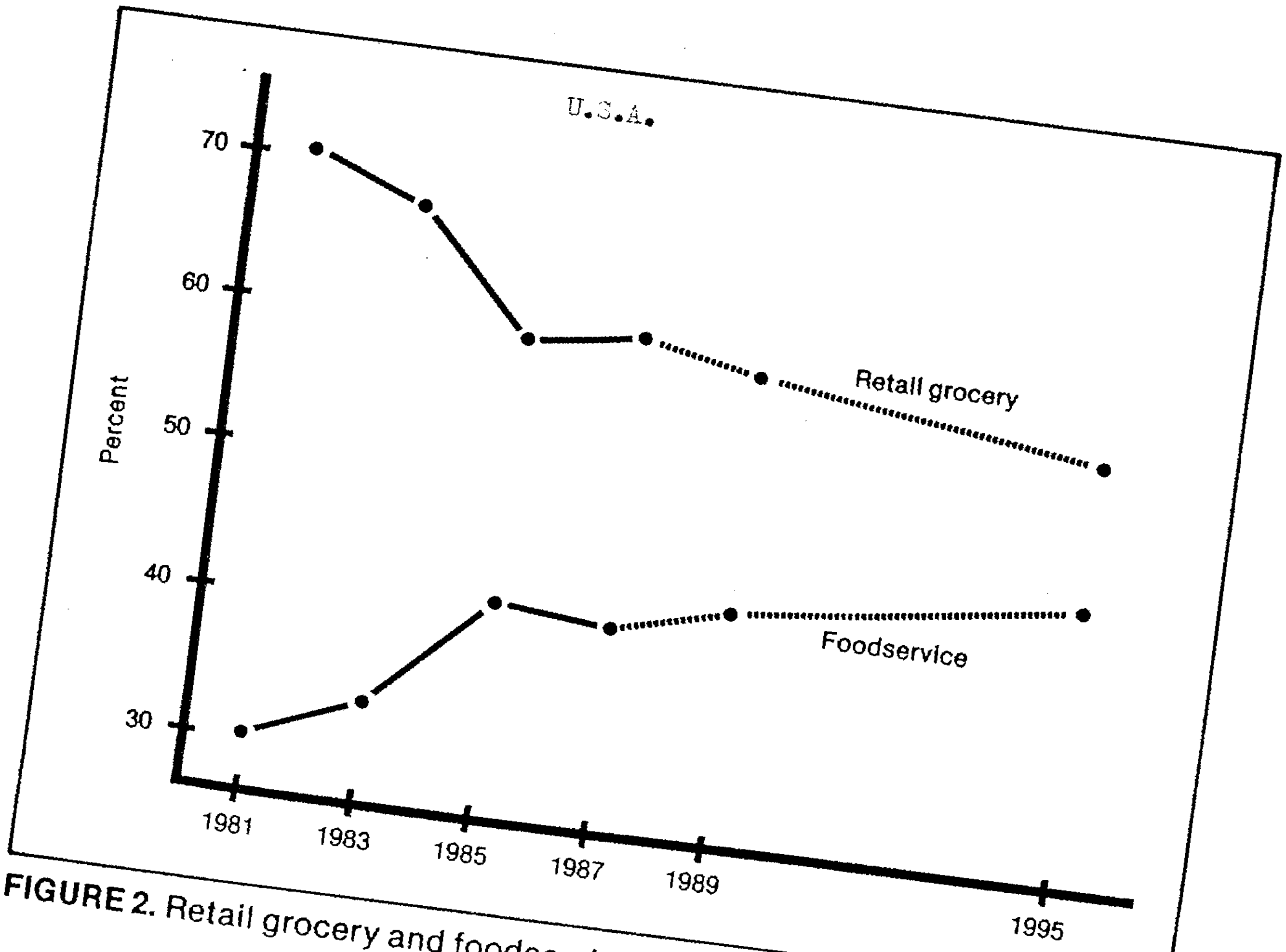


FIGURE 2. Retail grocery and foodservice market share for broilers.

Consumers in Sri Lanka find fat to be objectionable.

With eggs, the preference is for brown shelled eggs, which sell for a premium of Rs.0.10 each over white shelled eggs.

Poultry products compete directly with fish.

There is considerable potential for expansion in broiler meat consumption in Sri Lanka. There is such a multitude of value added products and dishes that can be prepared with broiler meat.

A couple of concerns should be mentioned that can have a negative impact on consumer confidence and demand for broiler meat. One of the biggest concerns, even in the developed world, is salmonella and E. coli contamination. Strict hygiene is required in slaughter and processing of poultry and post-slaughter refrigeration, particularly in hot climates such as Sri Lanka. Many small scale broiler slaughter plants do not have the capability to rapidly remove carcass heat and maintain low storage temperatures. Another concern can be drug residues in poultry products.

13. Export Potential

There is very little export potential for poultry products from Sri Lanka, except perhaps to the Maldives.

Most countries produce poultry. World poultry meat production is approximately 40 million m.t. (ready-to-cook equivalent). Of this, only approximately 7.5% enters world trade.

Since feed represents over 60% of production costs for this intensive agricultural enterprise, it is those countries with large production of feed grains, often at subsidized prices, who have a competitive advantage. The U.S.A. is the world's largest exporter (exporting over half a million m.t./year), followed by France, the Netherlands and Brazil. Thailand and China are the leading exporters in the Asian region. Most countries in the Middle East have shown substantial gains in poultry production under heavy subsidy schemes.

Potential may exist to explore Asian markets for poultry meat by-products (necks, backs, feet and offals).

World poultry meat production and trade data is shown in Appendix VII.

14. Breeds, Strains and Access to Genetic Material

Considerable genetic progress has been made in poultry over the last few decades. A question often raised is whether a country with a relatively new commercial poultry industry has access to improved genetic material?

Investigation has determined that Sri Lanka has a wide diversity of layer and broiler strains. There are approximately 16 modern strains of layers and 14 modern strains of broilers available. This represents the majority of genetic material available in the world.

There are approximately 19 hatcheries in a total of 9 countries approved by the Department of Animal Production and Health as sources of supply for importation of parent birds into Sri Lanka. This further diversifies Sri Lanka's ability to acquire genetic material with desirable traits for the local egg and broiler market.

The current list of strains, franchise agent and country of origin and names of approved hatcheries is contained in Appendix V.

The 40 franchised Sri Lankan breeder farms/hatcheries import day-old parent stock and grandparent stock replacements on a regular basis. As such, the industry is able to keep abreast with the latest genetic improvements in poultry.

The Department of Animal Production and Health desires to undertake random sample tests of the various strains. It should be pointed out, however, that hatcheries and producers have individual preference for particular strains of birds and this freedom of choice must not be denied without strong justification.

As stated under the Diseases section, below, the Department of Animal Production and Health under the authority of the Animal Diseases Act (1992) does register breeding farms and also approves international hatcheries and approves/issues import permits and maintains quarantine surveillance on imported birds.

As the industry further expands, some of the larger breeders will most likely consider grandparent stock operations. One company has already been doing this for about 2 years. Also, specialist producers may enter the business of raising point-of-lay pullets.

Due to rapid expansion and integration in the broiler industry, availability of day-old chicks for the small independent producer has been difficult. The Ministry of Agriculture mostly supplies the small scale producers. In 1991 the Department of Animal Production and Health issued 787,425 pullets, 393,043 cockerels (male egg-type chicks) and 621 unsexed chicks. The National Livestock Development Board issued 367,092 broiler chicks in 1991 and is now also supplying pullets.

Cost of day-old chicks is relatively high in Sri Lanka. Broiler chicks reached a peak of Rs.21.00 each in 1992. Retail price to out-growers is currently in the order of Rs.16.00 each, ex-hatchery. Figuring Rs.2.00 transport cost and a 95% survival rate gives a day-old cost per finished broiler of approximately Rs.19.00 each. Under current buy-back agreements, a 1.5 kg liveweight broiler is worth Rs.44.00/kg or Rs.66.00/bird. Day-old cost therefore represents almost 30% of the value of the finished bird! This is very high because in most of the leading broiler producing countries the cost of day-old chicks is less than 10% the value of the finished bird. The main reason advanced for this is poor performance of breeders due primarily to heat stress. Day-olds hatched per broiler breeder housed is probably around 110 in Sri Lanka, compared to over 140 in more temperate climates. The light weight at slaughter also increases the relative (fixed) cost of the day-old chick to the total cost of production.

Likewise, day-old pullets are also relatively expensive. Retail cost peaked at Rs.25.00/chick and is currently in the region of Rs.20.00/chick.

To summarize, it can be stated that Sri Lanka has access to the popular egg and broiler strains used throughout the world. There are legal requirements being enforced so that parent stock is only imported from reputable hatcheries with a certified history of freedom from specific diseases. Day-old chicks are expensive.

15. Diseases, Parasites and Veterinary Treatments Available

A major concern with any intensive livestock enterprise such as poultry, where a large number of birds are concentrated in a small area, oftentimes in sub-optimal housing, is disease. Another factor that can compound the problem in a country such as Sri Lanka is the large number of backyard, or free ranging poultry that are not necessarily subject to proper disease prevention and control measures. Also, constantly high temperatures do not cause any seasonal dormancy in disease prevalence.

The veterinary experts in the Department of Animal Production and Health were contacted to provide an account of disease incidence in Sri Lanka's poultry industry. It is encouraging to report that there are no major disease threats to successful poultry production in the country.

Common diseases are prevalent. These include:

- Marek's Disease - virulent strains and variant sero types
- Newcastle Disease (Ranikhet) - endemic
- Coccidiosis
- Fowl Pox
- Infectious Bronchitis
- Avian Encephalomyelitis
- Egg Drop Syndrome
- Fowl Cholera
- Infectious Bursal Disease (Gumboro) - suspected

Most birds are housed on deep litter. Tapeworm is a common parasite. Lice are also a problem.

The government of Sri Lanka is cognizant of the problems disease could impose on the expanding poultry industry. To mitigate against this possible threat, there is a poultry disease expert at the Veterinary Research Institute (Dr. Ranjith Wickremasinghe). Dr. Pushpa Wijewantha of the Department of Animal Production and Health has also been assigned full duties in support of the poultry industry, and is planning to attend a 1 year overseas training course on diagnostic techniques shortly. There are also 4 provincial veterinary investigation officers and several DVM surgeons experienced in poultry post-mortem diagnosis. There are also extension generalists that have recently received in-service training in poultry diseases. The Department of Animal Production and Health is also planning to establish a laboratory for serological testing (Austrian funding) on a cost-recovery basis. A British expert conducted an island-wide survey of poultry diseases.

Some of the private sector agribusiness firms serving the poultry industry (e.g. PRIMA) have independent laboratory facilities to serve their farmer clients. They also have their own veterinarians and extension personnel serving their farms and growers.

Because there are approximately 40 approved (franchised) hatcheries that can import parent birds to Sri Lanka from a variety of approved countries, the issue of also importing disease is a factor that must be monitored under strict quarantine conditions. For example, some of the hatcheries imported cheaper parent stock from India that carried a variant serotype Marek's Disease.

Vaccination guidelines have been developed by the Department of Animal Production and Health for parent birds (both layers and broilers). These are outlined in Appendix V.

Prevention for most diseases is the only 'cure'. Therefore, vaccination, feed additives, isolation of breeding farms and general sanitation is the only effective solution, which applies to any country with a poultry industry.

A wide range of poultry vaccines are available in Sri Lanka and widely distributed. The Veterinary Research Institute vaccine laboratory also produces vaccines for Fowl Pox and Newcastle Disease. Feed grade antibiotics and various coccidiostats are also added to commercial feeds.

The incidence of low mortality and satisfactory productivity in commercial poultry flocks is testament that farmers have adopted effective health programs.

To summarize, it can be stated that the common diseases of poultry are prevalent in Sri Lanka and remedies are readily available. Diagnosis also appears to be adequate. Sound vaccination guidelines for diseases have been developed and are implemented by hatcheries and commercial producers. There are no unique problem areas. The low reported incidence of

Infectious Bursal Disease (Gumboro) is encouraging but also of possible future concern. The breeders will need to strengthen their capabilities in monitoring titer levels.

16. Government Support

16.1 Institutions

The primary institution involved in support of the poultry industry is the Department of Animal Production and Health at both headquarters and provincial level in the Ministry of Agricultural Development and Research. Other institutions include the Ministry of Livestock Development and Milk Production and the National Livestock Development Board. Organograms of the respective institutions are shown in Appendix VIII.

16.2 Subsidies

There are no direct subsidies to the poultry sector. Following are some support measures that assist the poultry industry:

- BOI status for some agri-business firms
- Duty free import of poultry feed ingredients
- Duty free import of day-old parent stock
- Concessional duties on imports of poultry equipment
- Concessional BTT
- Government supply of vaccines at below cost-recovery
- Concessional credit under various government and donor programs

16.3 Extension Services

The Ministry has a network of extension generalists advising on livestock husbandry and veterinary surgeons and regional disease investigation centers that support the poultry industry. These extension agents primarily deal with the small scale producer, with the larger commercial producers being serviced by private sector extension agents.

16.4 Specific Support

Specific facilities provided by government in support of the poultry industry are egg and layer parent stock farms and hatcheries, manufacture of Newcastle Disease and Fowl Pox vaccines and poultry disease surveillance.

16.5 Publications

The Ministry has produced several practical extension publications on egg and broiler production, and publications on nutrition and recipes for poultry products.

16.6 Research and Academic Support

Poultry research is very limited. There is one poultry expert in the Veterinary Research Institute. Poultry Science is only a part of the general agriculture curriculum at Peradeniya.

16.7 Government-Private Sector Cooperation/Conflicts

Overall, government and the private sector are cooperating closely in promoting the poultry industry in Sri Lanka. The Ministry of Agriculture extension efforts and supply of day-old chicks is primarily assisting the small scale producer. There is close interaction on disease surveillance and diagnosis.

Agribusiness in the private sector, especially the integrators, has established its own extension service, newsletters and laboratories. The private sector is able to attract high caliber, motivated professionals.

17. General Status/Prestige of the Industry

Overall, the egg and broiler industry is an attractive environment for the entrepreneur. Many farmers started small and their operations have grown into Rs. multi million turnover.

18. Agribusiness in Support of the Industry:

18.1 Day-old Chicks

In modern egg production, a layer will commence egg production (point-of-lay) at around 20 weeks of age. Economic life is approximately 52 to 60 weeks, after which the bird is culled at an approximate age of 72 to 80 weeks as a spent hen and replaced. A day-old broiler will reach maturity and be slaughtered at about 6 weeks of age, allowing several batches to be produced from the same house within a year. Therefore, hatcheries perform an important function in supplying replacement stock.

In the case of both layers and broilers, commercial stock comprises synthetic (hybrid) strains.

As stated above, a total of 40 franchised parent stock farms (hatcheries) supply day-old chicks. Parent stock chicks are imported from 9 countries, and comprise 15 commercial broiler strains and 20 commercial layer strains. One company also imports grandparent stock. These parent stock chicks are raised by the hatcheries and used for breeding hatching eggs that are incubated to produce day-old commercial chicks for distribution to farmers.

Number of Franchise Hatcheries, Sri Lanka

Year	Broiler	Layer	Broiler & Layer	Total
1990	9	3	9	21
1991	11	3	11	25
1992	18	3	14	35
1993 (Apr)	19	3	14	36
1993 (Jun)	19	2	16	37
1993 (Sep)				40

Source: Department of Animal Production and Health.

The number of franchised hatcheries has shown rapid expansion in recent times, doubling since 1990. It is highly improbable that this growth in number of franchised breeders (hatcheries) can continue. Day-old pullet prices have declined from around Rs.25.00 to Rs.20.00 each during 1993. Day-old broiler prices have also declined from around Rs.20.00 to Rs.16.00 for the larger outgrowers. Since breeder farms are too small to benefit fully from economies of scale, this price is more than double the cost of day-olds in leading poultry producing countries. The more efficient, larger scale and integrated hatcheries are likely to survive and expand operations, whereas small units will cease to operate.

Breeder farms in Sri Lanka demonstrate relatively poor performance, which obviously increases the cost of producing day-old chicks. This is primarily the result of heat stress on birds due to unsatisfactory housing environments. The outcome is high mortality, low egg production, small eggs, weak shells and low hatchability. Many farms are not even achieving 120 day-olds hatched per breeder. Breeder farms would have better performance if they were located in the hill country or if housing was environmentally controlled. Breeder farms/hatcheries are quite sophisticated to operate, and expertise is lacking in Sri Lanka.

Further details on flock dynamics are not readily available. Output (issues) of day-old chicks appears quite low in relation to breeding flock sizes, particularly in the case of broilers where straight-run (both sexes) are issued.

Distribution of day-old chicks

Sub-sector	1990	1991	1992	% Change 1990-92
LAYER:				
Parent Bird Imports	41,920	39,196	44,831	+ 6.9
Flocks Maintained		97,157	51,859	
Pullet Issues, million	3.7	4.2	3.8	+ 2.7
BROILER:				
Parent Bird Imports	165,677	193,384	263,963	+59.3
Flocks Maintained		291,133	430,714	
St.Run Issues, million	14.5	15.6	18.8	+29.7

Source: Department of Animal Production and Health.

18.2 Point-Of-Lay Pullets

In most cases, egg producers buy day-old pullets from the hatcheries and raise them. It takes approximately 20 weeks to raise the bird to point-of-lay (P.O.L.), and is quite technical (e.g. lighting and restricted feeding regimes). In the course of time it is most likely that specialized producers will raise pullets.

The concern over virulent strains of Marek's disease now prevalent in Sri Lanka has also forced some commercial layer operations to raise P.O.L. pullets offsite, to separate birds of different age and specialize in either layers or broilers.

18.3 Feed

Feed is supplied by large commercial mills, localized mills and farm batching.

Total poultry feed requirements in Sri Lanka exceed 300,000 m.t. per year. At present, about 25% of the feed is required for broilers and 75% for layers and parent stock. However, a significant number of 'layers' in the national flock are scavengers and/or supplemented with farm by-products (rice bran and polishings, etc).

The main supplier of feed is Ceylon Grain Elevators (PRIMA brand) and its market share is estimated at 80% for broiler feed and 90% for layers. Other main suppliers are New Bernards Animal Feeds and Moosajees Ltd. Gold Coin (a Swiss company) from Singapore has recently entered the feed market (with Moosajees).

Commercial feeds include:

Layer Feeds	Broiler Feeds
Chick Booster Crumbles	Broiler Booster Crumbles
Layer Starter Crumbles	Broiler Starter Crumbles
Layer Grower Crumbles	Broiler Grower Pellets
Layer Grower Mash	Broiler Grower Mash
Layer Crumbles	Broiler Finisher Pellets
Layer Mash	Broiler Finisher Mash
	Broiler Withdrawal
Layer Premix	Broiler Premix

Broiler feeds are high in energy and protein. The fact that broilers are able to attain market weight at 38 to 42 days with feed efficiencies of 1.8 - 2.2:1 verifies that the feeds are scientifically formulated. Super feeds with higher nutrient density can produce a tender bird that will mature 5 to 7 days earlier, but fat deposition (particularly in the abdomen) is higher and is resisted by consumers. Skin is also very soft and poses a problem during processing.

It is the general opinion of farmers that entry of Gold Coin into the commercial feed supply business has caused an overall improvement in feed quality, as measured by bird performance. In fact, feed quality has improved, cost is higher but it is more economical.

Feeds include coccidiostats, growth promoter and mold inhibitor and furazolidone, where appropriate.

Local feed ingredients include rice bran and polishings, broken rice, kakulukudu, wheat bran and screenings, coconut oil and meal (poonac). Imports include broken rice, maize grain, soybean meal and fish meal. Imports of animal feed ingredients in 1991 were:

Fish meal	5,559 m.t.
Bran	458 m.t.
Oil cakes	34,333 m.t.
Forage, residues	35 m.t.
Broken rice	47,274 m.t.
Other grains	18 m.t
Maize, concess.	20,750 m.t.
Maize, other	32,581 m.t.

Minerals, amino acids, vitamins and other feed additives also have to be imported.

Local production of maize and soybeans as livestock feed sources is being attempted.

A total of 19 feed mills, plus a number of small scale manufacturers supply poultry feeds. The list is included in Appendix V.

Feed is typically sold in 25 kg and 50 kg paper sacks.

Current indicative feed costs are:

Layer Mash	Rs. 8.28/kg
Broiler Finisher	Rs. 10.72/kg

There is a large network of dealers who distribute feed to the farmers. For example, PRIMA has approximately 250 dealers. These dealers receive discounts from the millers and typically extend credit to the farmers.

The larger feed mills have nutritionists, veterinarians, technical coordinators and also sales coordinators to backup the larger dealers.

18.4 Slaughter

There are 8 to 10 commercial poultry processors, plus a number of small scale poultry processors, including backyard slaughter.

Major processors are:
- Bairaha Farm - approx. 14,000 birds/day
- Maxie House - approx. 3,000 birds/day, doubling capacity under AgEnt shared investment
- Crystal Springs - 3,000 birds/day
- Pussalla Farm - 2,000 birds/day

Ceylon Grain Elevators is currently undertaking a project to establish a 2,000 bird/hr processing plant at an industrial site near the Colombo airport. This will be a modern plant using Stork (Netherlands) equipment. It will have a complete rendering plant and full refrigeration.

All of the larger processors are backward and forward integrated, do some custom slaughtering and pack brand name birds.

To date, the operations largely entail the output of whole birds, either fresh or frozen. Bairaha Farm also produces value added products such as chicken nuggets, meatballs, cutlets (breaded pieces) and sausage (franks) through an associate company, Bairaha Norfolk Foods (Pvt) Ltd. Keells also produce value-added chicken.

The list of poultry processors is included in Appendix V.

18.5. Marketing

18.5.1 Poultry Meat Marketing

The 2 distinct types of poultry meat are broiler meat and spent hens. Broilers have a short production cycle and profit margins are quickly eroded if birds are not slaughtered and marketed at optimal stage of maturity. Therefore, major producers are under an arrangement to supply finished birds under a contract or buy-back agreement to the processors. The processors usually pay the producer on a price/kg liveweight. Processors supply their own retail outlets, HRIs, wholesalers and other retailers (sometimes with brand names). There is also a network of smaller operators that supply shops, small hotels and butcher stalls with dressed birds. These birds are often procured from independent producers, home slaughtered then collected for delivery to market outlets. Hygiene and storage temperatures are not satisfactory. Live birds and hot dressed birds are also offered for sale at the village level. Spent hens are usually sold as 'hen' in the lower income markets, either dressed or live.

18.5.2 Eggs

The larger producers of fresh eggs have direct sales to retail and HRI markets. There is also a network of wholesalers who visit farms on a regular (often weekly) basis and procure eggs.

18.6 Housing and Equipment

The climate of Sri Lanka can be considered too hot and wet for optimal performance of poultry. The majority of poultry are located in North-Western Province, which is a relatively drier area, but still hot, wet and humid.

Compared to cold climates, brooding is less critical and of shorter duration during the production cycle. This lowers the cost of production. Warm temperatures also favor efficient feed conversion, if there is adequate floor space, roof insulation and ventilation to minimize heat stress.

Structures are relatively simple, convection - open sided deep litter houses. The roof providing shade/shelter and the open netted sides providing ventilation. Poultry houses are often constructed by the farmer. Cadjan (woven palm frond) roofs are common. Since the majority of poultry are raised in the Coconut Triangle, poultry houses are often located between the rows in coconut plantations, providing good shade and shelter. Due to high temperatures, floor space requirements for birds are larger than that recommended for cooler climates. Recommended floor space requirements for layers are 2 ft^2 for deep litter, 1.5 ft^2 for slatted floor and 0.5 ft^2 for cages. For broilers the minimum requirement is 1.2 ft^2 per bird. Conventional houses currently cost between Rs.60.00 and Rs.80.00/ft^2 to construct. A few of the larger producers and the breeder farms use ventilation fans and roof sprinklers.

Litter material is readily available, primarily rice hulls (paddy husks), wood shavings and sawdust and some coir dust.

Equipment such as brooders, self-feeders and water founts are readily available in Sri Lanka. These are usually stocked by feed dealers and hatcheries to broaden the service offered to farmer clients. Practically every village has an outlet offering poultry equipment. Some of the larger farms are using automatic drinking systems.

There are over 14 suppliers of poultry equipment in Sri Lanka, using an extensive network of dealers. The list is included in Appendix V.

18.7 Vet Supplies and Diagnostic Lab Services

The spectrum of common diseases affecting poultry is fairly well understood in Sri Lanka.

Vaccines, including various types/strains from internationally recognized manufacturers are readily available for:

- Egg drop syndrome (EDS)
- Fowl cholera
- Fowl pox
- Infectious bronchitis (IB)
- Infectious bursal disease (IBD, Gumboro)
- Newcastle disease (NCD)
- Marek's disease (MD)
- etc.

There is also a wide range of feed grade and water soluble coccidiostats, antibiotics and growth promoters available.

The Veterinary Research Institute Vaccine Laboratory produces live F and Komorov strains of NCD (Raniket) vaccine and Beaudette strain of Fowl pox vaccine. It produced over 17 million NCD doses and 4.4 million Fowl Pox doses in 1991.

Major local agents for vaccines include:

- Brown & Co. Ltd.
- Moosajees Ltd.
- Ceylon Grain Elevators Ltd.
- Dept. of AP&H

A more detailed list of poultry vaccines available in Sri Lanka and local distribution agents is included in Appendix V.

A vaccination guideline for commercial layers and broilers prepared by the Department of Animal Production and Health is also contained in Appendix V.

Diagnostic laboratories are operated by the Veterinary Research Institute, Ceylon Grain Elevators (CGE) and Bairaha.

Veterinary services for the poultry sector are provided by the Veterinary Research Institute, the Department of Animal Production and Health, Provincial veterinarians, and veterinary surgeons. Private sector veterinary surgeons and integrated producers such as CGE (PRIMA) have their own complement of veterinarians.

Most of the breeding farms practice disease surveillance. General extension personnel in the public and private sectors also provide guidance on bird health and sanitation.

To summarize, the industry has access to professional advice and diagnosis and also access to vaccines and drugs.

18.8 Private Sector Extension Services

Several of the larger integrated firms in the poultry sector offer a relatively complete package of extension services.

Some of the activities include a technical services department servicing sales coordinators for feed, technical coordinators and veterinarians. Extension bulletins and newsletters are distributed and there are also diagnostic laboratories and feed analyses provided. One major integrator (PRIMA) also has a computer data base on almost 6,000 commercial producers. Integrators using contract farmers have detailed physical and financial data on each batch close-out.

Farmers must recognize when they are buying feed that the bag also comes with a package of services. Integrators aim for their customers receiving at least 1 visit from a technical representative per month.

The private sector also collaborates closely with the public sector in fostering the poultry industry.

The private sector can provide a better compensation and benefits package plus better working conditions to attract competent professionals.

19. Forward and Backward Integration in the Poultry Sector

Development of the broiler industry has largely been in the hands of the private sector. The pattern of development has followed that of practically all countries with a broiler industry - integration is a key aspect of the industry. There are 3 main reasons for integration:

1. To benefit from economies of scale and to coordinate efficient utilization of plant capacity.

2. The production cycle is very short (approximately 38 - 42 days) and profit margins are quickly eroded once the birds attain maturity, therefore slaughter and marketing has to be scheduled before a batch of chicks is started.

3. Quality control.

There are basically 4 systems of broiler production in Sri Lanka: nucleus farms; contract growers who are supplied all the inputs;

outgrowers with a guaranteed buy-back arrangement; and, independent producers.

Integration typically takes the form of supplying a particular strain of day-old chicks from a designated hatchery, supply of feed and vaccines, equipment supply, technical advice and scheduled collection and processing of finished birds.

This level of integration has resulted in concentration within the broiler industry: hatcheries; feed mills; processing plants; and producers with relatively large flock sizes supplying the majority of finished birds.

The egg industry is integrated to a lesser extent. Farmers do order replacement chicks from hatcheries of choice.

20. Technology Assessment and its Relevance

Overall, the commercial poultry industry is well advanced in Sri Lanka. The more successful producers started with a few hundred birds and have expanded their operations to 5 - 10 thousand birds. Following are some general observations.

20.1 Location of Production

The commercial poultry belt is convenient in relation to its proximity to the greater Colombo market. This is a hot environment, which is stressful to birds, particularly during March-May. Houses placed in coconut groves receive some shading effect. Breeders are particularly stressed. Location of these farms would be better up country.

20.2 Housing

Many farmers entered the industry by constructing 'cheap' housing with a short productive life. They are now paying the price through lower bird performance and high annual maintenance costs that are escalating. Expansion of facilities and replacement housing is of improved design (higher roof line, lower side walls, open mesh sides, lower stocking density, oriented in an E-W axis direction, etc.) incorporating better construction materials (cadjan or other insulated roofing compared to corrugated iron, etc).

20.3 Equipment

Equipment used is standard for poultry operations. Most of the brooders operate by an electric element or infra red bulbs. Feed hoppers and water founts are plastic. Feed is typically distributed manually from 25 to 50 kg sacks. Larger operations have gravity water lines supplying automatic drinking founts. Water supplied from small header tanks exposed to sunlight is extremely hot for birds.

20.4 Feeds and Feeding

Scientifically formulated and milled feeds are available, and farmers are of the opinion that quality has improved after Gold Coin entered the market. Farmers consider feed to be 'expensive' but fewer now contemplate the false economy of home mixing or dilution. Farmers do understand the various ration steps to be followed and how to monitor feed intake and bird performance. The larger egg producers are able to carry out restricted feeding during the growing and lay cycle according to weight and egg production. Because of the short feeding cycle for broilers, there may be a need to revise diets/feeding regimes.

20.5 Diseases

Farmers recognize the significance of disease prevention. They practice all-in, all-out production systems in individual houses, thorough clean-out, disinfection and spelling of houses between batches, and follow recommended vaccination and anti-stress programs. They also seek technical advice. Many farmers still practice multi-age production and mixed broiler/egg production in close proximity.

20.6 Source of Birds

Commercial farmers only restock their farms with birds from franchised hatcheries. Some farmers have conducted their own on-farm trials with different strains of birds and have their own preferences.

20.7 General Management

The commercial farmers understand and practice proper stocking densities, brooder capacities and temperature regulation, have an acceptable number of feeders and waterers, maintain good litter management, lighting control, proper feeding regimes, etc. Practically all commercial farmers maintain meticulous records and are able to interpret performance criteria.

20.8 Processing

The processing industry is in its infancy. Hygiene, product temperature and environmental aspects leave a lot to be desired. The PRIMA processing plant will be the only facility in Sri Lanka with proper consideration given to a complete system utilizing technology that will result in a wholesome product.

21. Industry Efficiency Standards

As is the case with any industry, there are wide variations in technical performance between individual farmers. Industry-wide surveys have not been conducted and it was beyond the scope of this assessment to undertake such a task. Some of the larger agribusiness firms, e.g. PRIMA, have comprehensive data bases on their client farmers.

The main interest for AgEnt is the commercial producer. It is in this segment of the industry that performance standards must be reasonably high for the farmer to survive.

Following are some estimates of commercial industry 'norms' derived from personal interviews with local poultry experts and farmers, and review of data:

21.1 Layers

Issue of day-old pullets by franchise hatcheries:

1990	3.7 million
1991	4.2 million
1992	3.8 million

Egg production, Hen Housed Average (HHA) 240 to 250 over a 50 week lay cycle.

Feed consumption:

0 - 8 weeks	1.8 kg
9 - 20 weeks	4.5 to 5.0 kg
20 - 72 weeks	42.0 to 46.0 kg

Mortality during lay cycle 10 - 12%

21.2 Broilers

Issue of straight-run day-old broilers by franchise hatcheries:

1990	14.5 million
1991	15.6 million
1992	18.8 million

Days to slaughter 38 - 42 days, straight-run

Slaughter weight 1.5 to 1.6 kg live bird

Feed conversion efficiency 1.8 to 2.2:1

Mortality 3 - 6%

21.3 Broiler Breeders

Age of hatching egg production 26 to 28 weeks

Completion of lay cycle 65 to 70 weeks

Chicks hatched per breeder housed 80 to 120

21.4 Interpretation

The Sri Lankan poultry industry has internationally recognized strains of layers and broilers. Birds have the genetic potential.

Heat stress is a problem.

The commercial farmers do take an interest in the welfare of their birds, which represents a sizeable investment.

Larger producers are owner-operators. 'Remote control' farming does not work with poultry.

22. Overall Economics of the Industry

Economic data is somewhat limited on industry economics. The Planning section of the Ministry of Livestock Development and Milk Production maintains budget templates and statistical data on input costs and poultry product prices. There does not appear to be any industry-wide surveys. Some private sector agribusiness firms have useful data bases on customers.

22.1 Economies of Scale

Economies of scale are evident throughout poultry enterprises, including feed milling, breeder and hatchery farms, broiler and egg producing farms and processing plants.

The poultry industry in Sri Lanka is relatively small by world standards, and not in a position to fully benefit from economies of scale. The broiler industry is expected to continue expanding, which will allow some economies of scale to be realized.

Integration is the best option for Sri Lanka to achieve low cost production.

A disadvantage in Sri Lanka is the long time required for travel between 2 points.

22.2 Cost-Price Trends

The following graphs show cost-price trends in the poultry industry.

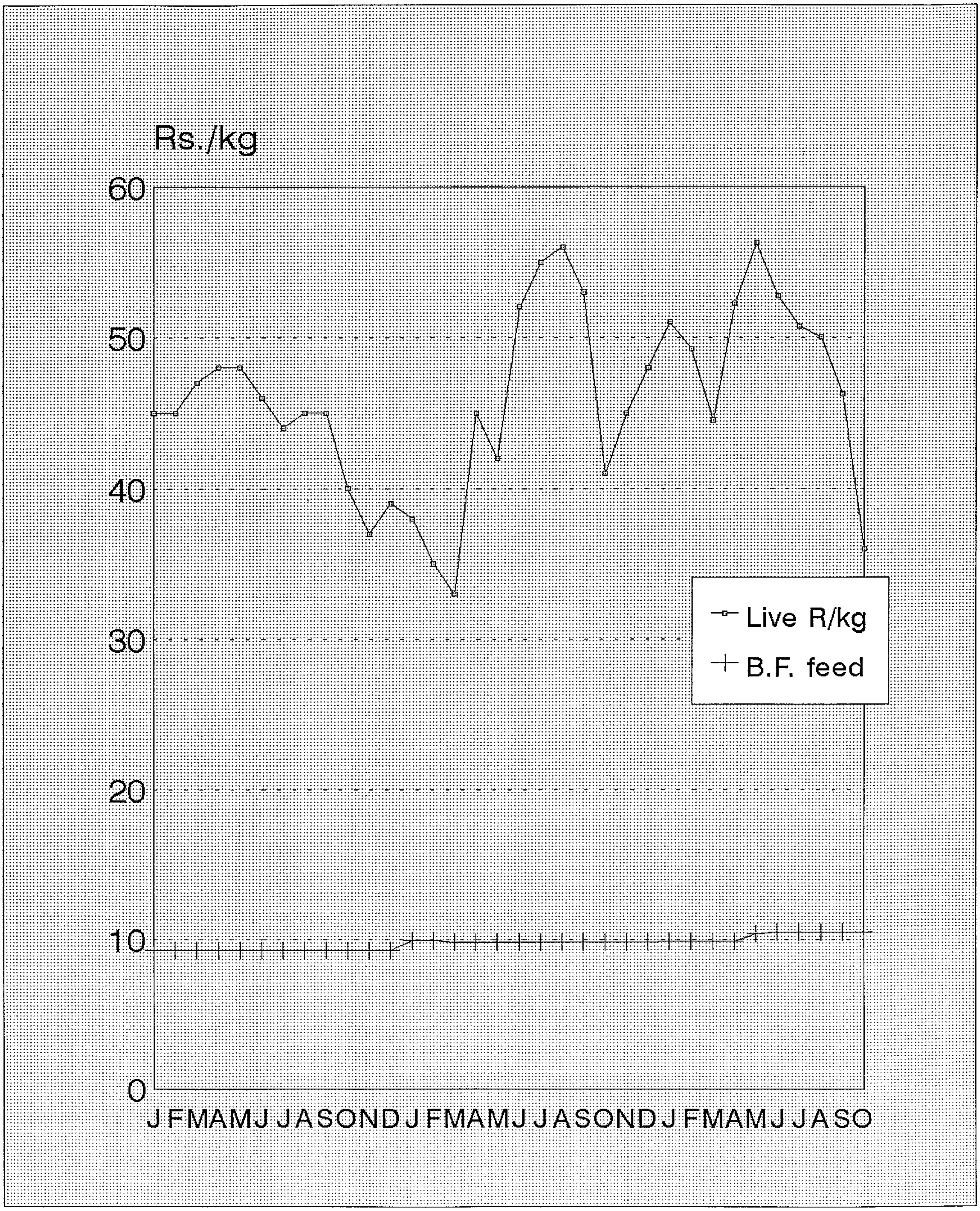
Feed is the most significant input in intensive poultry production. Feed costs have shown steady increases over time. This is to be expected considering there is:

- double digit inflation
- high interest rates
- depreciating Rupee making imported feed ingredients and machinery, spare parts and vehicles more expensive
- improvement in feed quality by manufacturers using more expensive ingredients
- the package of services included in feed (extension advice, laboratory, etc.)

Egg and broiler meat prices at the producer level have shown wide fluctuations over time due to seasonal supply/demand relations.

COST-PRICE RELATIONSHIPS IN BROILER PRODUCTION

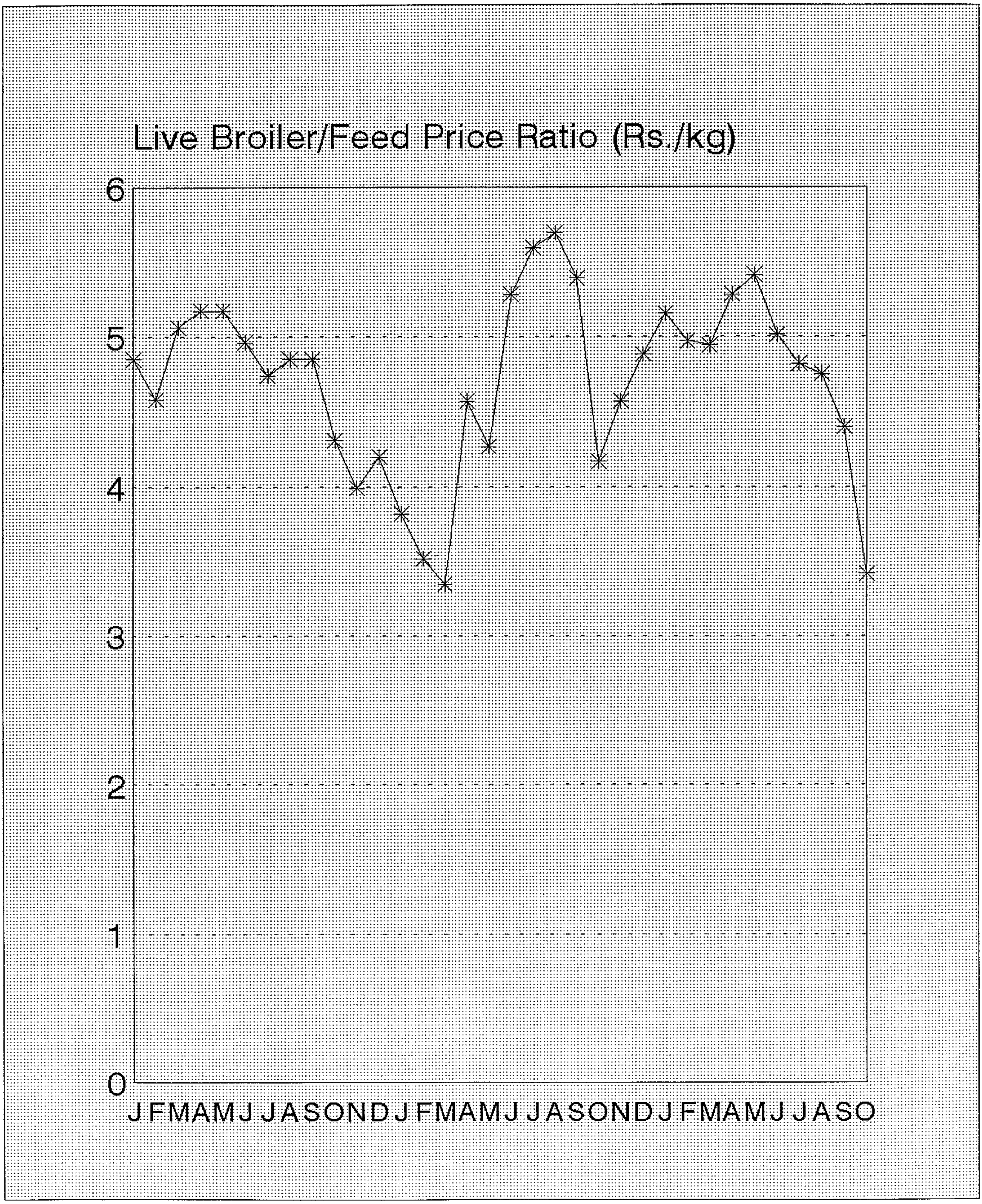
Sri Lanka, January 1990 - October 1992



Source: Ministry of Agricultural Development & Research
Chart: AgEnt/cd/10.93

TERMS OF TRADE IN BROILER PRODUCTION

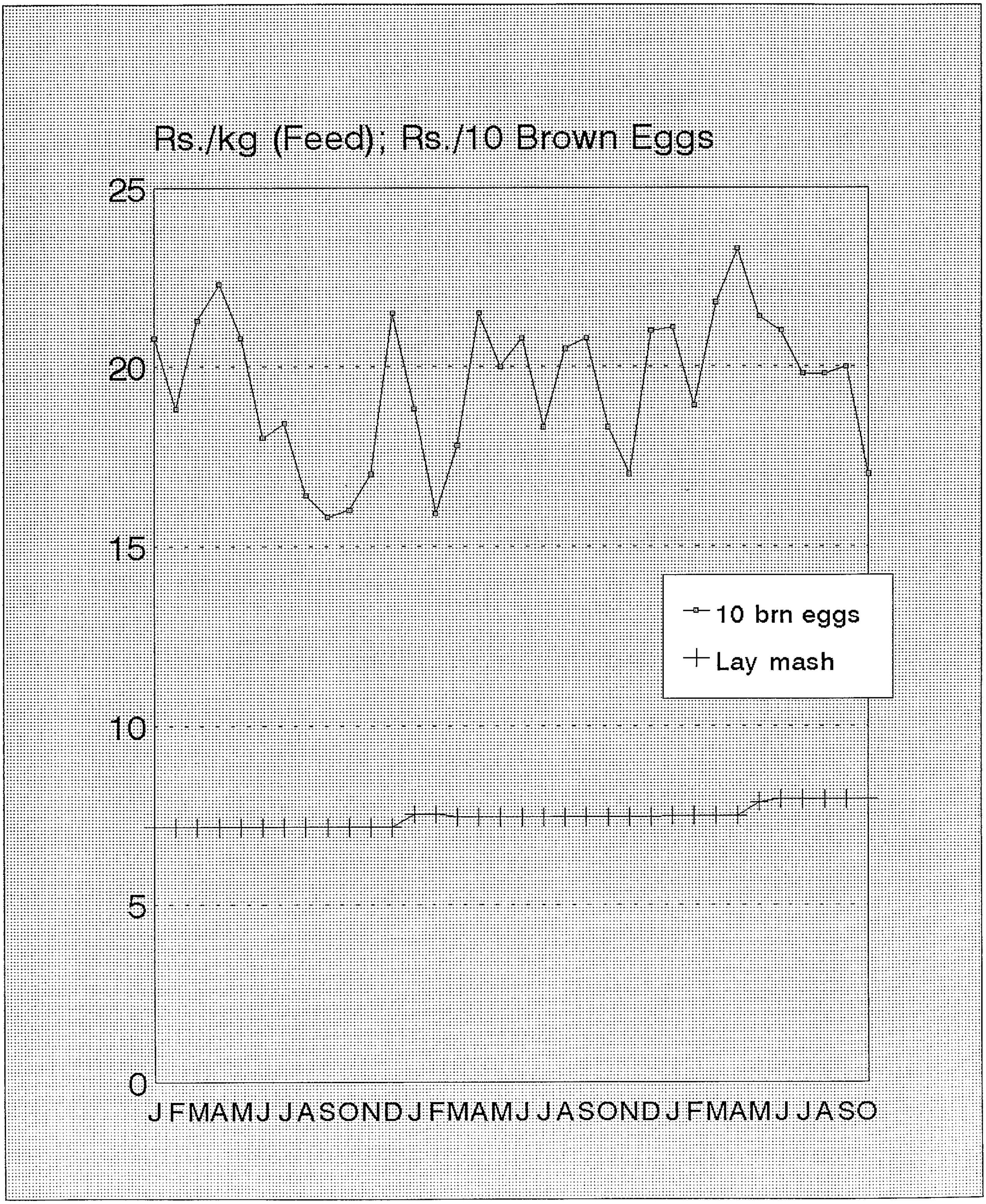
Sri Lanka, January 1990 - October 1992



Source: Ministry of Agricultural Development & Research
Chart: AgEnt/cd/10.93

COST-PRICE RELATIONSHIPS IN EGG PRODUCTION

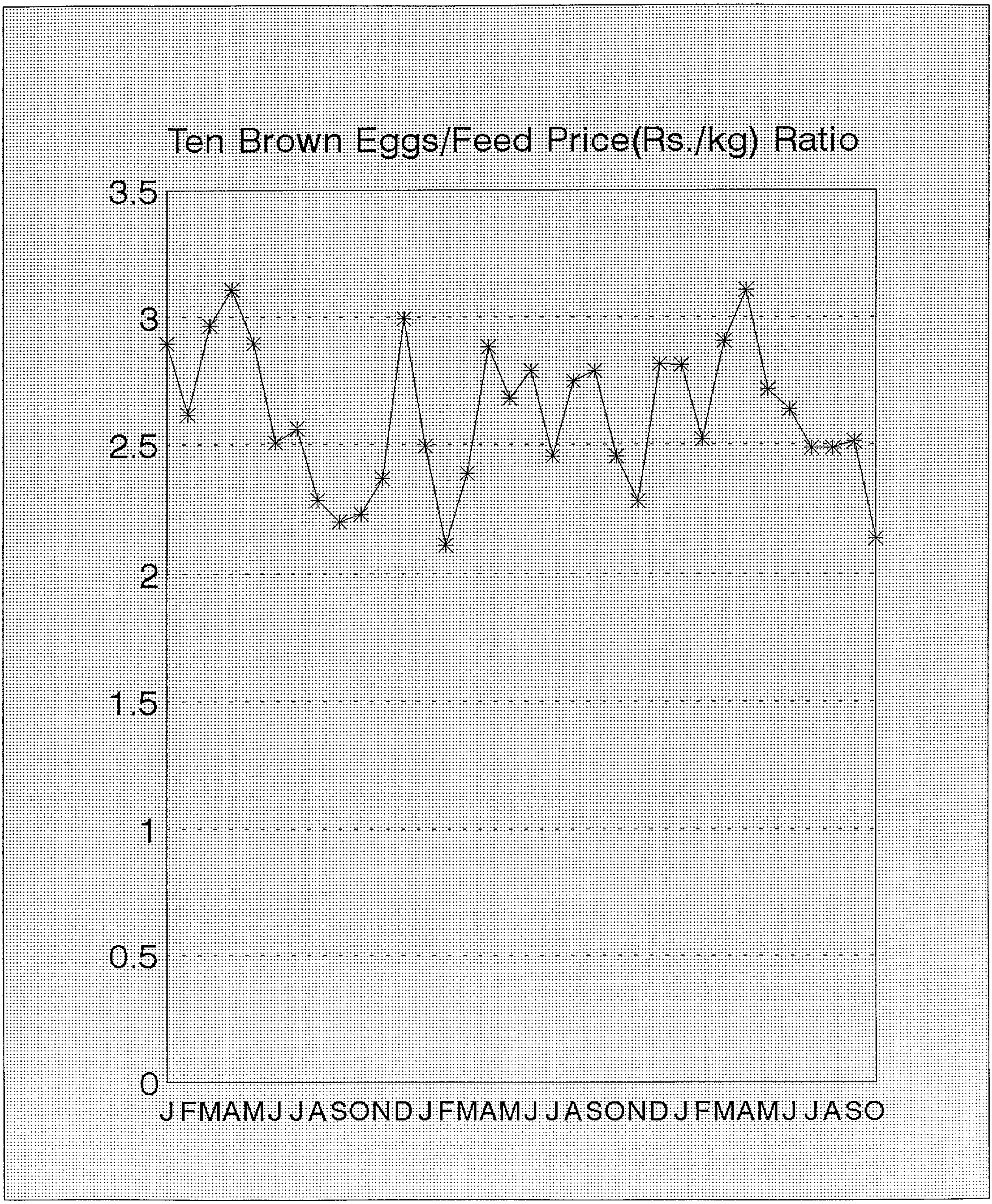
Sri Lanka, January 1990 - October 1992



Source: Ministry of Agricultural Development & Research
Chart: AgEnt/cd/10.93

TERMS OF TRADE IN EGG PRODUCTION

Sri Lanka, January 1990 - October 1992



Source: Ministry of Agricultural Development & Research
Chart: AgEnt/cd/10.93

The overall terms of trade (the relationship between feed and egg prices) has shown wide fluctuations and appears to be declining slightly. Broilers production has also shown wide fluctuations in its terms of trade, but there appears to be an upward trend.

Current information reveals gross margins to broiler producers of Rs.5.00 to Rs.8.00 per bird. Break-even costs of egg production are close to Rs.2.00 per egg.

Only the efficient producer can survive in commercial poultry production.

Farmers must undertake careful budget projections to determine profitability before placing orders for batches of birds.

22.3 Sample Enterprise Budgets

The following sample enterprise budget has been prepared to reflect current (October 1993) costs and returns associated with a 1,000 bird broiler operation placing a batch of 500 day-olds every month.

Capital investment is in the order of Rs.121,200.

Fixed costs per 1,000 birds are estimated at Rs.3,335

Variable costs of production for 1,000 birds are Rs.61,175, of which day-old cost represents 27% and feed 60%.

Total cost of production is Rs.64,510, or Rs.67.90 per 1.60 kg live bird.

Estimated profit is Rs.6.37 per bird placement.

Overall profit for the enterprise is in the order of Rs.38,220 per year for an operation of this scale (6,000 birds per year).

INVESTMENT PROFILE FOR A BROILER OUTGROWER

1. Production Assumptions:

2 x 500 broiler batches

Placements of 1 batch every month

42 days to slaughter

Turnover 6,000 birds/year

Mortality 5%

Feed Consumption/500 bird batch

- Booster,	0 - 14	days	250 kg
- Starter,	14 - 28	days	450 kg
- Finisher	28 - 42	days	750 kg
- Total			1,450 kg

Market weight 1.6 kg live

Overall FCR = $\{1,450/[(500*0.95)*1.6]\} = 1.91:1$

2. Capital Investment:	Rs.
2.1 Infrastructure	
Site preparation & grading	2,000
Supply of water	10,000
Sub-total, Infrastructure	12,000
2.2 Facilities	
Brooder facility 300 ft^2 @ Rs.80.00/ft^2	24,000
Finisher facility 600 ft^2 @ Rs.80.00/ft^2	48,000
Feed & eqt store 100 ft^2 @ Rs.120.00/ft^2	12,000
Sub-total, Facilities	84,000

2.3 Equipment

	Rs.
500 bird gas (or 8 bulb electric) brooder	6,500
5 chick feeder trays @ Rs.100.00 ea.	500
10 tubular chick feeders @ Rs.100.00 ea.	1,000
10 chick water founts @ Rs.110.00 ea.	1,100
2 x 4 auto waterers @ Rs.600.00 ea.	4,800
28 tubular feeders @ Rs.175.00 ea.	4,900
4 hurricane lanterns @ Rs.600.00 ea.	2,400
1 header tank and water lines	3,000
Miscellaneous (thermometer, clean-up, etc.)	1,000
Sub-total Equipment	25,200
Total Capital Investment (1+2+3)	121,200

3. Revenue Per 1,000 Birds (2 batches)

Live bird sales 1,000 birds*0.95 survival rate *1.6 kg liveweight @ Rs.44.00/kg ex-farm	66,880
Manure credit, 2,000 kg @ Rs.2.00/kg	4,000
Total Revenue	70,880

4. Annual Fixed Costs of Production

Depreciation, facilities Rs.84,000 @ 7%	5,880
Depreciation, equipment Rs.25,200 @ 20%	5,040
Interest, 50% loan, 1/2 investment @ 22%	6,666
Repairs & Maintenance, Rs.121,200 @ 2%	2,424
Total Annual Fixed Costs	20,010
Fixed Costs Per 1,000 Birds (2 batches, 2 months), 20,010/6	3,335

5. Variable Costs Per 1,000 Birds (2 batches)	Rs.
Day-old chicks 1,000 @ Rs.16.50 delivered	16,500
Litter, 10 trailers rice husks @ Rs.40.00	400
Feed, 2,900 kg @ Rs.12.75/kg	36,975
Vet., disinfectants, baits @ Rs.0.20/bird	200
Electricity (brooding, water & lights)	1,000
Labor 2 months @ Rs.2,000.00/month	4,000
Miscellaneous (transport, records, etc.)	1,000
Interest on working capital Rs.60,000 @ 22% for 1 month	1,100
	61,175
6. Total Cost of Producing a Batch (1000 birds)	
(4+5)	64,510
Cost/finished bird, Rs.64,510/(1,000*0.95)	67.91
Cost/kg liveweight, Rs.67.91/1.6	42.44
7. Profit	
(3-6)	6,370
Profit/bird, Rs.6,370/1,000	6.37

23. Other Aspects

23.1 Associations and Societies in the Poultry Industry

The poultry industry does not have an organized functioning membership. There was an earlier poultry federation and societies, established primarily for the effective marketing of eggs. These institutions failed due to mismanagement and lack of participation.

The integrators have a close network of feed dealers and outgrowers.

The professional veterinary association and interested parties from both the private sector and government convene frequently and discuss issues and challenges facing the poultry industry.

23.2 Perceived and Actual Technical and Management Constraints

The main concerns expressed by the industry were:

1. Fluctuations in prices received by farmers.

2. Availability of day-old chicks in a timely manner and quality of chicks issued.

3. Rising costs of production.

4. Lack of frequent professional extension advice.

23.3 Gender Issues

Poultry production is gender positive. The whole family can participate in caring for the birds and marketing. Many females in the household are responsible or actively participate in the poultry enterprise. The labor force in poultry processing plants also includes females.

23.4 Credit Access and Terms

Farmers complained about the high cost of credit and limited availability. There are various donor supported schemes that provide more favorable credit. Some of the integrators have opted for using small scale contract growers where the production inputs are supplied.

23.5 Attitudes Towards Poultry and Poultry Products

Historically, poultry production is considered an acceptable enterprise. Many of the larger producers started with small scale enterprises and expanded.

General understanding on poultry production as a business enterprise and an important source of income is quite good.

There are many new entrants in the industry and fallout has been relatively low, however periodic contraction in production in response to market prices is common.

Poultry products are accepted by a wide segment of the population.

V. EXISTING INDUSTRY SUPPORT FROM AgEnt

1. Review of Studies and Plans

AgEnt has received several inquiries from the poultry sector. Each of these agro-enterprise profiles was reviewed.

2. Inspect a Sample of Existing Operations, Expansion, Diversification and New Entrants

Over 30 contacts were made during the tour of duty. Prospective clients are interested in the following:

Broiler slaughter
Meat processing
Refrigeration
Feed milling
Breeder farms & hatcheries
Laboratories
Broiler production
Egg production

Emphasis was placed on expansion or diversification plans for entrepreneurs established in the industry.

Because of confidentiality between client and AgEnt, specifics are not disclosed in this report.

VI. FINDINGS

1. Strengths

1. Poultry is an expanding industry. This applies particularly to broilers. It is not unreasonable to expect broiler production to double in Sri Lanka in the next 5 years. The layer (egg) industry appears to have matured. There were difficulties in disposing of eggs in early 1993.

2. Broilers are still expanding. Per capita consumption of broiler meat is approximately 1 kg. The consumer is aware of the quality difference between broiler meat and village chickens or spent layers. Prices for broiler meat are coming in line with other meats. Broilers are consumed by all religious segments of the population.

3. There are 2 significant advantages with broiler production, especially in the business environment of Sri Lanka where interest rates are high: there is a short project gestation period in setting up production; and, the production cycles are short (approximately 38 to 42 days = <60 days placement-to-placement) allowing high turnover with at least 6 batches of birds produced per year.

4. With deep litter housing, the producer has the flexibility to switch between layers and broilers with only slight equipment changes.

5. Since commercial poultry are raised under confined conditions with dispensed inputs, bird performance is not greatly affected by weather patterns, etc., except in extreme circumstances. Production can be uniform throughout the year, although demand has seasonal peaks and troughs.

6. Production and value per unit area is very high. With broilers stocked at a density of 1.25 ft^2/bird producing a 1.50 kg live bird every 2 months with a farm value of Rs.44.00/kg, annual output per ft^2 is 7.2 kg of live bird with a value of Rs.317.00. In layers stocked at 2.00 ft^2/bird on deep litter with 80% HHA egg production over 50 weeks with a farm value of Rs1.80/egg and a salvage value of Rs.80.00 on a 2.00 kg spent hen, annual output per ft^2 in the layer house is 140 eggs and 1 kg of live bird with a value of Rs.292.00.

7. Technology is understood, to varying degree, by those already established in the industry. Unlike a new enterprise, those in the industry have advanced along the learning curve. Inputs are readily available.

8. The industry is organized, particularly in the case of broilers, with agribusiness support in place and integrated production.

9. Poultry products are accepted in the market place.

2. Weaknesses

Every industry is not without its weaknesses. The following are considered relevant in the poultry sector.

1. For layers (eggs) it appears the industry has matured since about 1987, with per capita consumption reaching a plateau of around 50 eggs. What is likely to happen over the short-medium term is cyclical gyrations: egg gluts will be followed by retractions of producers, fewer day-old pullet placements, followed by egg shortages. There is a lagged effect, because hatcheries will also react to the situation and it also requires 20 to 22 weeks for day-old layers to reach point-of-lay. The layer pipeline is 18 to 24 months in length. The bottomline is egg producer profits experiencing wider fluctuations, including negative results in certain periods. AgEnt should adopt a conservative posture in offering assistance to egg producers.

2. Poultry input supply, production, processing and marketing does require a reasonable level of technology and is most suited to the entrepreneur who is owner/operator. Because of the ease of entering the business and start-up of operations, investors can be under the illusion that the enterprise will take care of itself. AgEnt should focus its efforts on those entrepreneurs already established in the industry who wish to expand, adopt a specific technology or diversify/integrate.

3. There will be further consolidation (concentration) within the poultry industry. Even with expansion, this will be taken up by the more successful firms becoming larger and more competitive as they can benefit from economies of scale. With broilers, the independent producer will become diluted. There will continue to be a large number of outgrowers and contract growers, with the more efficient growers increasing the scale of their operations. It is likely that the number of feed mills, hatcheries and slaughter plants serving the industry will shrink with the surviving firms expanding their capacity and overall market share. AgEnt should be cautious about assisting start-up operations or the small firm, unless these firms can demonstrate they have a unique competitive edge in the industry.

4. Profit margins are very tight in poultry production. Only the technically efficient, larger producers who can benefit from economies of scale will survive.

3. Opportunities

The main opportunities in the poultry sector are in support of the expanding broiler sub-sector. Opportunities exist in input supply, production and processing.

Of importance to AgEnt is the fact that the industry has already established itself - it is not a pioneering effort requiring trials, R&D, research, market development, etc. and the inherent risks associated with start-up ventures.

1. The safest bet is to assist those entrepreneurs who are already in the industry and wish to undertake expansion or diversification. One can evaluate their operation to determine if they are successful. They also have experience and do not require a lot of hand holding. AgEnt does not have the resources to provide ongoing technical assistance to individual investors.

2. Integration is the name of the game in the broiler industry. This has occurred worldwide so everyone can benefit from economies of scale and modern technology. There is no reason why Sri Lanka's broiler industry will not evolve into full integration - in fact the majority of the industry is already at this stage. AgEnt can therefore assist in strengthening these linkages. Support to the industry that would directly or indirectly assist outgrowers and contract growers would satisfy the project's objectives of generating employment and income.

3. Feed milling will continue to expand as a result of growth in the industry and the dependence on complete rations of scientifically formulated feeds. PRIMA is the giant in the industry. Gold Coin is poised to become a strong competitor. There are a couple of other multi-national firms researching the feed industry. Some smaller feed mills can survive because of their own integration and certain competitive advantages (e.g. transport factor, access to local feeds, dissatisfied customers, etc). Layer feeds will remain the dominant poultry feed in Sri Lanka for many years to come. Some feed mills may require specific technology, such as pelleting/crumbling equipment, etc.

4. Hatchery expansion will continue in order to keep pace with growth in the industry. However, it is likely to come from increase in the scale of existing hatcheries rather than additional entrants. The majority of layer and broiler strains are represented in Sri Lanka. One area with likely growth potential is grand-parent stock breeding farms. PRIMA is already in this business. It is also quite a small, specialized undertaking.

5. Slaughter plant expansion is necessary in order to keep pace with industry growth. In this respect, we are looking

at full processing plants with a minimum capacity of 3,000 to 4,000 birds per day. Ability to produce a hygienic product is key.

6. Value-added processing must be approached with caution. Half-chicken and chicken portions allow the Rs.100.00 retail barrier on whole birds to be segmented. Further value-added chicken (sophisticated high priced products) has a very narrow upscale market niche. Given the low per capita consumption of poultry meat and low incomes, greater volume sales can be generated by supplying low cost chicken to a broader segment of the population and increasing frequency of purchase of chicken that is competitive with other sources of animal protein. Processing opportunities exist for spent layers and off-cuts.

7. Point-of-lay pullet rearing has the potential to become a specialized undertaking.

8. Fast food chicken is likely to expand.

9. Markets for poultry meat by-products need to be explored by the larger processors. Some of these products may have higher value as consumer items versus being fed to pigs or rendered.

10. Eccentric opportunities include integrated fish and poultry production, biogas, other poultry (ducks, game birds, etc.) but should only receive subsidiary attention by AgEnt.

4. Threats

Although not an immediate problem, there are some potential threats that should be borne in mind.

1. Disease is a problem in intensive poultry production. As the industry expands bird numbers become even more geographically concentrated so disease can spread more easily and rapidly between farms. Strict vaccination and sanitation programs must be adhered to, plus disease surveillance.

2. The industry must continue to supply consumers with a wholesome product. Chicken products are easily contaminated and are highly perishable. This requires proper hygiene during processing and handling the product and adequate refrigeration and compliance with use of feed additives. Otherwise, loss in consumer confidence translates into reduced demand and industry losses.

3. Environmental aspects covering animal welfare, neighbors and effluent must be addressed, especially as scale of operations expands.

VII. POTENTIAL INTERVENTIONS IN THE POULTRY SECTOR

1. Identification of Areas/Specific Clients Requiring Support

The objectives are to generate employment and income within the timeframe of the project. As mentioned above, establishing a poultry enterprise has a short gestation period and output (cash flow generation) is realized in a short time frame, producing early payoffs for AgEnt interventions.

The egg industry has matured, however there may be opportunities to assist individual clients on a case-by-case basis. Broilers are the growth industry and should receive the most attention.

The focus should be on the integrator as the catalyst in reaching outgrowers and contract farmers. This requires a coordinated (synchronized) approach in addressing all segments of the industry.

The following chart provides a logical framework on how the integrator functions and how the various segments of the industry come into play. AgEnt does not have the resources to deal with small outgrowers on an individual basis.

AgEnt can offer assistance in technology transfer in feed milling, hatcheries, poultry production and processing. Minimum scale units to be considered are:

Individual farmers	- 5,000 birds
Processors	- 3,000 birds/day
Feed milling	- 10 m.t./day
Hatcheries	- 50,000 day-olds/month

AgEnt should also assist industry representatives to attend trade fairs offering technology and equipment in the poultry industry.

2. Addressing Institutional Impediments

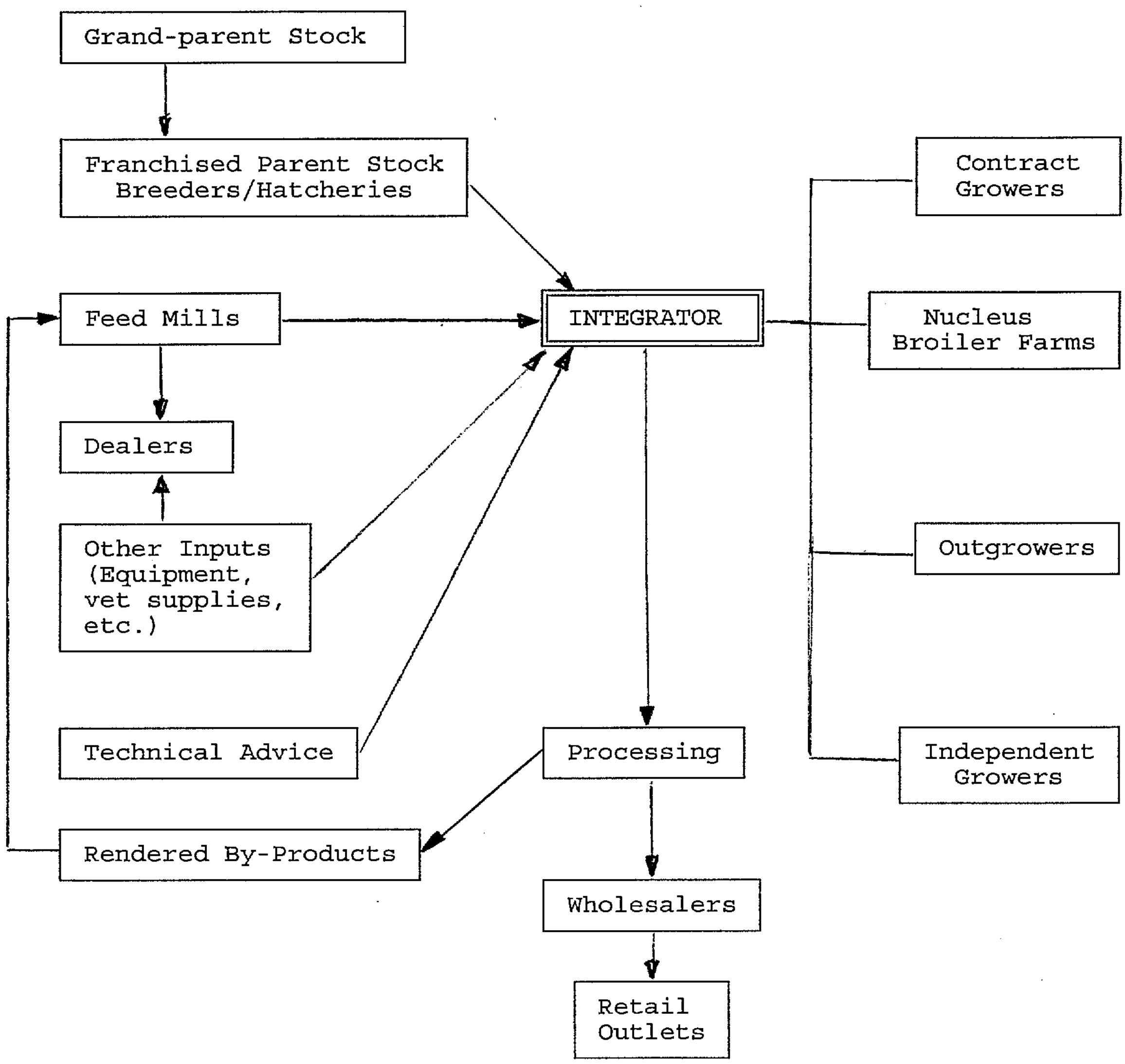
There are no major institutional impediments affecting the poultry industry.

When government realizes the potential of the industry, it will then need to position itself in providing policy guidelines, further extension, training, research and academic support to the industry.

Marketing of eggs needs to be further addressed. Alternatives must be carefully reviewed so that the private sector and market forces are allowed to function.

The veterinary society shows keen interest in the poultry sector.

INTEGRATION POSSIBILITIES IN THE BROILER INDUSTRY



3. Overall Potential

3.1 Growth Potential

The overall growth potential of the broiler industry in the short term is expansion by another 20 million day-old placements per year within the next 5 years. This is based on current growth trends. This will largely come from integrators.

Coordinated development of all the segments serving the broiler industry is illustrated by the following order-of-magnitude projections.

3.2 Breeder Farms

Breeder farms - 20,000,000/130 day-olds hatched = 154,000 parent females.

3.3 Feed

Feed - 20,000,000*1.6*1.8/1,000 = 57,600 tons broiler feed + parent feed (approximately 12,000 tons) = 70,000 tons.

3.4 Outgrowers

Outgrowers - 20,000,000/2,000/6 = 1,667 farmers.

3.5 Slaughter

Slaughter - 20,000,000*0.94/250 = 75,200 birds/day.

3.6 Meat Output

Broiler meat output - 20,000,000*0.94*1.25 = 23,500,000 kg = 1.27 kg extra meat/capita in 5 years. Plus extra spent layers, approximately 135,000 birds/year.

3.7 Income

Annual Income - 23,500,000*Rs.75.00 = Rs.1.76 Bn. (equivalent to U.S.$35.25 million/year.

3.8 Time Frame

The time frame for achieving this projected increase in production is 5 years.

3.9 Impact on the Industry

This would cause poultry meat consumption to double in Sri Lanka, and employing approximately 3,000 extra people.

4. How Can the AgEnt Project Reach Out to the Client Base?

The effort should be client driven.

The industry needs to be aware of the assistance AgEnt can provide. Advertizing and press coverage are effective mediums.

AgEnt can reach out to the client base through the integrators and larger farmers and agribusiness firms. This is the necessary conduit to service outgrowers.

Appropriate support that AgEnt can provide to Sri Lanka's poultry industry involves intensive forms of production dealing with integrators to reach the small outgrower indirectly, direct farmer contact with flock sizes >5,000 birds, semi automatic slaughter facilities with capacity >500 birds per hour and hatcheries with capacity >50,000 day-olds/month.

5. Technical Assistance Support Requirements

5.1 Future Consultancies

Technical assistance will be required in technology transfer and technical evaluation of proposals. A consultant should visit every 3 to 4 months, depending on client demand.

5.2 Local Support Institutions

AgEnt should support local institutions such as the veterinary. Farmer conferences should also be supported.

6. Environmental Aspects

Since commercial poultry production is under confined conditions, the bird is entirely dependent on the farmer.

There are environmental factors that must be considered when supporting the poultry industry. The listing represents a checklist. These are identified under 3 categories:

6.1 Animal Welfare

Some factors to take into account are:

- Proper siting of houses and house construction so there is adequate shade, good natural ventilation and good drainage so litter stays dry.

- Adequate stocking densities, brooder area, waterer and feeder space.

- Access to fresh water and feed at all times.
- Proper sanitation and disease control.
- Transport of day-old chicks and slaughter birds during the cool of the day and in proper containers.
- Humane slaughter.

6.2 Neighbors

- Proper siting of houses so neighbors are not affected by odor, flies and runoff.
- Room for expansion.
- Sufficient space between houses to allow good ventilation and minimize spread of disease.
- Isolation from other poultry farms, especially for breeding farms.

6.3 Effluent

- Producers must have adequate provision to handle manure, runoff and dead bird disposal.
- Processing plants have to deal with waste water treatment, condemned birds and carcasses, blood and other carcass residues and feathers.

7. Training Needs Assessment, Including Familiarization Tours

Sponsorship to poultry trade fairs is recommended. Thailand has a livestock trade fair and a feed milling trade fair. The main poultry trade fair for the larger producers is the International Poultry Exposition.

AgEnt held a very successful Poultry Industry Development Seminar at the Lanka Oberoi on 19 October, 1993. Details are included in Appendix IX.

8. Any Modifications to the Project Paper and Project Implementation Plan

There is a need to consider funding for bird housing and U.S. procurement waivers.

9. Pitfalls to Avoid

The project does not have the resources to directly assist all.

VIII. CONCLUSIONS AND RECOMMENDATIONS

Broiler production is the fastest growing agricultural industry in Sri Lanka and could double in the next 5 years. AgEnt can position itself, primarily through the integrators, to make a contribution to this growth thereby generating employment in rural areas, income and improving the diet.

This is a rapidly expanding sector that can have immediate payoffs for AgEnt interventions.

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XI. LIST OF CONTACTS MADE

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USAID/Sri Lanka,

Dr. Chin How Cheong, Ceylon Grain Elevators Limited (PRIMA).

Dr. S.L.A. Daniel, Director (Planning) Ministry of Agricultural Development and Research.

Mr. & Mrs. Srigenee Fernando, Mirrigama Poultry.

Mr. D.R. & Ms. A.P. Weragoda and Mr. T.M. Fonseka (consultant), Ravi Farm Complex.

Mr. P. Fernando & Dr. U. Perera,

John Silva, Chairman, Regional Rural Development Bank, Gampaha.

A. Upali Wijesekera, Ceylon Oxygen, Ltd.

Sam Pieris, Kegalle

Mr. & Mrs. A.H.N. Welikala, "Silverdale Farm", Dodangoda.

Mr. Priyan de Silva, "Kemps Estate", Dandeniya.

K.D.M. Perera & L. Wickramasinghe, DFCC.

Mr. M.N.M. Yakooth & Dr. Aldo Abeysena, Bairaha Farms.

Leyaquath Ali-Khaan & Miilaffar-Mohamed, Puttalam.

Mrs. Swinitha Fernando, S.R.S Farms (Private) Ltd., Padukka.

Mr. Philip D.J. Wewita, Pussalla Farm, Kosgama.

Mr. M. Imtiaz & M.H.M. Hibatullah, Crystal Springs, Gampola.

Mr. Damitha Rajapaksa, Gampala.

Mr. E.L. Lokubalauriya, Kadawala.

Mr. Remenzie Fernando, John Keells Holdings.

Hon. P.S.L. Galappathy, Misnister of State for Fisheries & Aquatic Resources.

Mr. Gunawardena, Unawatuna Poultry Farm, Unawatuna

XII. APPENDICES

I. AgEnt Brochure

II. Poultry Sector Advertisement

III. Scope of Work

IV. Guidelines to Import Poultry Parent Stock to Sri Lanka

V. Selected Information on Poultry Industry of Sri Lanka

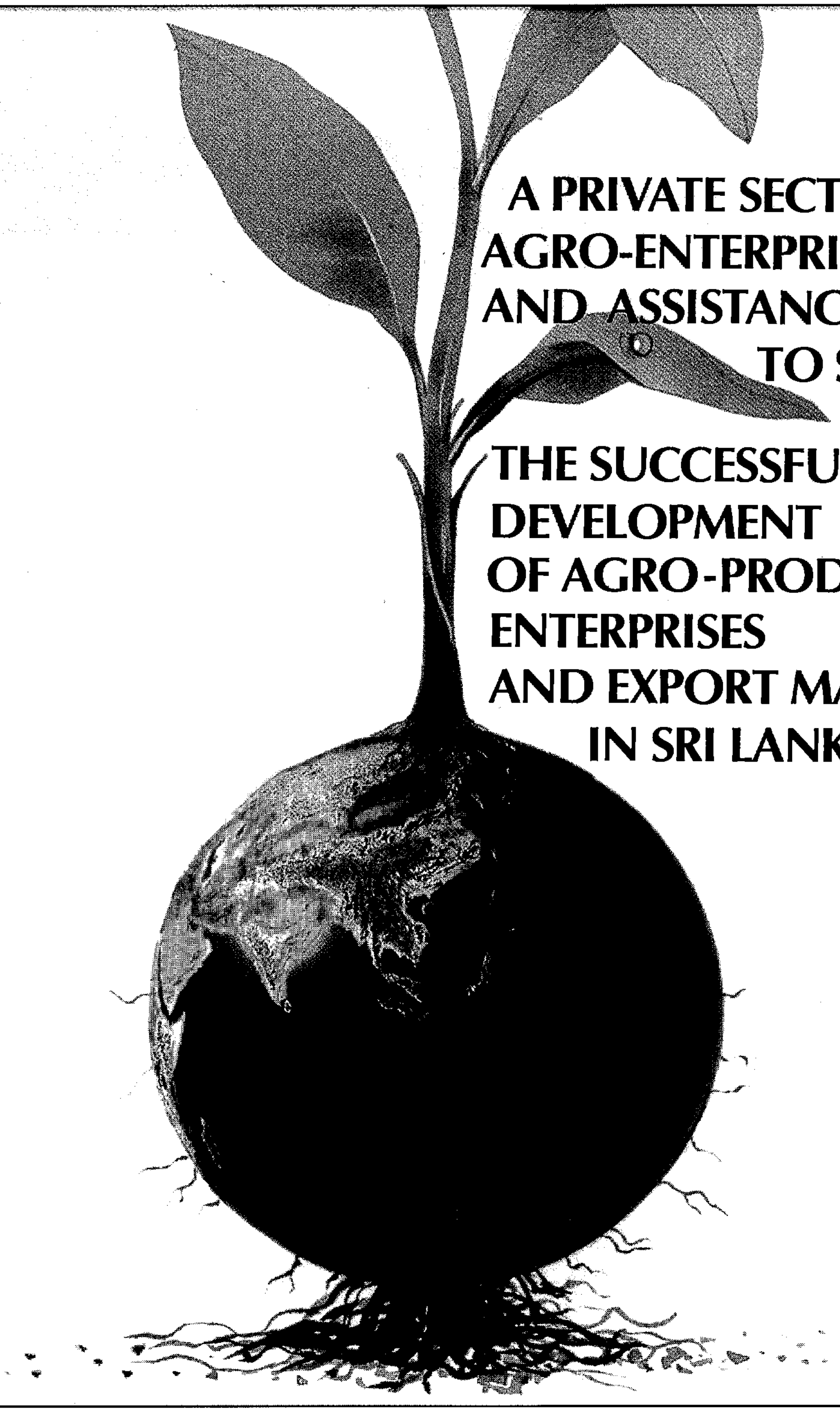
VI. Ordinance, Acts and Laws Related to the Livestock Sector in Sri Lanka

VII. World Poultry Meat Production

VIII. Ministry of Agriculture Organograms

IX. Poultry Seminar

AgEnt



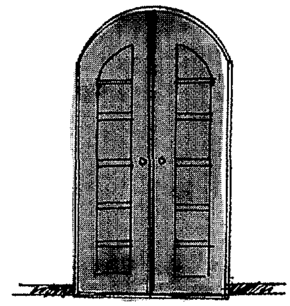
A PRIVATE SECTOR
AGRO-ENTERPRISES ADVICE
AND ASSISTANCE SERVICE
TO STIMULATE

THE SUCCESSFUL
DEVELOPMENT
OF AGRO-PRODUCTS,
ENTERPRISES
AND EXPORT MARKETS
IN SRI LANKA

AgEnt is funded by the United States Agency for International Development (USAID) in Sri Lanka.

USAID

* AGRO-PRODUCTION, PROCESSING AND MARKETING INFORMATION CENTRE

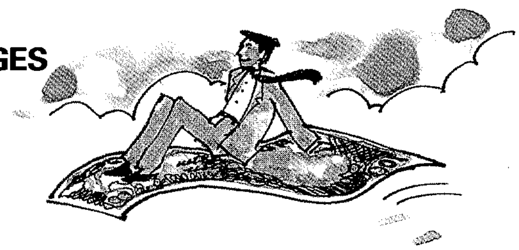


AgEnt will develop an information centre to enable agro-enterprises/entrepreneurs to access up-to-the-minute data in each of the above sectors.

* AGRO-ENTERPRISES DEVELOPMENT GRANTS

AgEnt will award grants (Shared Investment Awards) to businesses and commercial farmers with the potential to become viable enterprises through the introduction of new production and processing technologies designed to develop new products and markets.

* AGRO-ENTERPRISES FINANCIAL/INVESTMENT PACKAGES

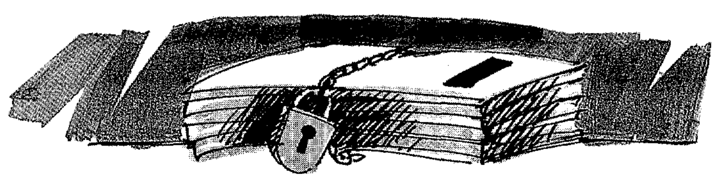


AgEnt may advise on financing for agro-enterprises including assisting clients to put together "bankable project investment packages".

* SPECIAL POLICY AND FEASIBILITY STUDIES

AgEnt will - as the need arises - conduct a number of agro-industry sector studies to assist in the identification of issues which must be addressed to improve the domestic/export production, processing distribution and marketing of Sri Lankan products

* CLIENT CONFIDENTIALITY



AgEnt will maintain strict confidentiality in their dealings with all clients.

* THE AgEnt ADVISORY AND ASSISTANCE TEAM

The AgEnt team which will advise/assist Sri Lankan private sector agro-enterprises/entrepreneurs have considerable, proven international and domestic experience in the highly competitive private sector covering the business, joint venture development, marketing, production, processing and financial disciplines.

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Fax: 94 - 1 - 446428

AgEnt

AgEnt, USAID's major private sector agro-enterprise initiative designed to stimulate the successful development of private sector agro-enterprises and export markets in Sri Lanka, has just brought in two international specialists to help the project determine how best we can offer assistance to the two sectors below.

AYURVEDIC MEDICINES.

IS THERE A MAJOR SRI LANKAN EXPORT MARKETING OPPORTUNITY, IF SO, HOW CAN AgEnt ASSIST POTENTIAL EXPORTERS?

AgEnt has already conducted a Phase 1, selected export markets overview. We are now interested in talking to Ayurvedic manufacturers, growers etc. to establish whether the project can help them develop export markets utilising a number of marketing strategy approaches, and supported by AgEnt advice/assistance packages on behalf of identities who meet the necessary criteria.

For further information contact -

Anton Wijeratne
Gamini Kumarage
Anthony Dalgleish

POULTRY SECTOR.

HOW CAN AgEnt HELP THE INDUSTRY, PROCESSORS AND OUTGROWERS TO DYNAMICALLY/PROFITABLY GROW ?

AgEnt is already making a significant contribution to this fast growing sector through a number of "shared investment grants" designed to upgrade and/or introduce new technology. AgEnt now intends to widen its advice/assistance service across the entire production/processing/marketing sectors, and would welcome enquiries from identities interested in exploring how the project may be able to assist their particular sector.

For further information contact -

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Tel: 94-1-446447, 446420
Fax: 94-1-446428

CSL/4874/A

APPENDIX III

TERMS OF REFERENCE FOR THE POULTRY SECTOR ASSESSMENT

SHORT-TERM CONSULTANT

GENERAL COMMENTS:

The selected individual must possess commercial production, management, and marketing experience with a suitable profit orientated background appropriate to Sri Lanka; be knowledgeable in all aspects pertaining to the production, management and marketing techniques for both the layer and broiler sub-sectors. Previous professional Sri Lanka, or other similar developing country experience is advantageous.

The selected consultant will be required to evaluate both the production and marketing sub-sectors of the poultry industry for the layer and broiler sub-sectors. The output requirements of the consultancy will include strengths, weaknesses and opportunities for the domestic industry. This will provide to the project management the how, where and with whom they should assist to maximize the results of the assistance provided by the project to specific clients and the poultry industry.

The selected consultant will be required to conduct client field visits, consultations with individual producers and industry members as requested by the poultry industry.

The AgEnt Project will provide the necessary office and other in country support requirements to the consultant as is necessary and reasonable.

This initial consultancy is expected to be 4 weeks in duration, including the preparation of the required report. The project anticipates beginning the activity in late September 1993; with completion estimated for late October 1993.

SPECIFIC CONSULTANCY REQUIREMENTS:

1. Address the production, management and marketing issues of small, medium, and large-scale poultry producers in Sri Lanka; including disease diagnosis and control, house sanitation, poultry nutrition, breed selection and improvement, brooding facilities, poultry rearing methodology, identify new breeding stock that would improve Sri Lanka's ability to satisfy existing domestic market demands; and improved labor utilization technologies. By completing this activity determine the economic viability if the industry, both layer and broiler sub-sectors.

2. Advise the poultry industry or a specific client to introduce and grow improved breeds (both layers and broilers) which lend themselves to production in the tropics and provide Sri Lankan producers higher margins.

3. Advise the poultry industry or specific client on better methods of necessary infrastructure improvement/development and utilization, including multiple level production methods, possible use of fans and other improved technologies.

4. Identify appropriate issues pertaining to production, packaging and post-harvest handling techniques. This should include specifically, improved work flow methods in the production, killing, handling and packaging sequence, to improve the product and minimize damage.

5. Assist the poultry industry to update their knowledge of the most effective nutritional, health and general/handling technologies through the provision of a current information bibliography to be provided as part of the consultancy.

6. Provide the AgEnt Project with a list of specific recommendations that can be used to assist the project to <u>provide the most effective support to the poultry industry and sub-sectors, both at the sectoral and individual producer levels.</u> This list should contain specific clients and the type of assistance that is appropriate to the individual.

7. The consultant will be required to produce the final draft copy of the consultancy report that <u>must contain a list of specific recommendations</u> that can be utilized by project management to assist the poultry sector prior to departing Sri Lanka. <u>This is a primary requirement of the consultancy.</u>

8. Provide to the AgEnt Project an index of the imperative training endeavors required to update the producers and industry to be more competitive in the domestic market.

9. Assist the AgEnt Project to identify specific policy issues that may be impacting the poultry sector at a macro level; and make appropriate recommendations as to their priority and develop the necessary terms of reference for the potential consultancy (ies).

10. The consultant must be prepared for a <u>maximum work load, a minimum of six days per week. Contractual arrangements will be made accordingly.</u>

L/92/2

GUIDELINES TO

IMPORT

POULTRY PARENT STOCK

TO

SHRI LANKA

DEPARTMENT OF ANIMAL PRODUCTION AND HEALTH
PERADENIYA
SHRI LANKA

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CONTENTS

1. Introduction

Requests are made by private entrepreneurs to import live poultry from time to time to Shri Lanka. This leaflet will provide importers with guidelines and information for such imports.

2. Legal Requirements

Under the Animal Diseases Act (1992) of Shri Lanka, an import permit from the Director of Animal Production and Health has to be obtained BEFORE an L.C. is opened and the birds shipped from abroad. At present, importation of grand-parent and parent stock is allowed to establish breeder farms in Shri Lanka.

2.1 Country of Origin

The policy of Shri Lanka for importation is as follows:

- The poultry disease situation of the country of origin of the birds should be BETTER than that of Shri Lanka.
- It will also NOT be permitted to import parent poultry birds from countries where the disease situation is unknown.

Import of breeder stock is permitted ONLY from the following countries:

- United Kingdom
- Holland
- Denmark
- France
- Germany
- Australia
- U.S.A.
- Canada

2.2 Farm of Origin

Import of birds is permitted ONLY from the farms which have been proven to be free from the following diseases for at least two years immediately prior to the shipment of birds:

* Newcastle disease
* Fowl pox
* Mycoplasmosis
* Avian leucosis
* Avian Tuberculosis
* Gumboro disease
* Infectious coryza
* Avian encephalomyelitis

General health status and disease monitoring activities in the exporting farm should be certified by the veterinary authority of the exporting country and has to be submitted to the Director of A. P. & H. at least annually.

3. Information required by the Director of Animal Production and Health

In order to consider the request for importation of breeder poultry stocks to Shri Lanka following information is required:

- Country of origin of birds.
- Breed of the birds and details of the farm.
- Performance data of poultry.
- Vaccination information of the original stocks.
- Quantity to be imported.
- Purpose of importation.
- Location/place where the imported birds will be maintained in Shri Lanka.

If importing for the first time, information on facilities to rear and quarantine the imported birds and hatching should be conveyed and made available for inspection.

4. Registration of the farm as a breeding farm with the Department of Animal Production & Health

If importation is done for the first time, an authorised officer from the Dept. of A. P. & H. will visit the farm with prior notice for the above purpose.

Following details regarding the farm should be submitted:

- Location
- Environmental conditions
- Existence of nearby poultry farms
- Size of the farm
- Infrastructure including incubator
- Input availability
- Knowledge on poultry farming
- Marketing facilities

5. Application for the Permit

Once the necessary requirements by the Department are met by the farm, applications may be made to obtain an import permit using GVS 31 form in quadruplicate. Forms are available with D./A. P. & H.

6. Certificate of Health

Health of birds should be certified in English by the respective Government Chief Veterinary Surgeon of the country of origin or by a Veterinarian authorized by him that:

- The diseases listed below have either been eradicated from the exporting farm/and been tested serologically within a period of three months immediately prior to the shipment of birds; seronegative and found to be free in the farm.
    * Fowl plague
    * Avian infectious bronchitis
    * Avian infectious laryngotracheitis
    * Fowl cholera
    * Fowl typhoid
    * Pullorum disease
    * Egg drop syndrome
    * Viral arthritis
- There were no outbreaks of any infectious or contagious diseases in the farm and the surrounding area within a radius of 3 km. for three months prior to the date of export.
- The exporting farm should be free from Marek's disease. The day old birds should be vaccinated against Marek's disease.

7. Issue of Permit

Once all these requirements are fulfilled a permit will be issued for the import of poultry. This permit is valid for 3 months from the date of issue and can be extended on request. The Director/A. P. & H. has the authority to cancel a permit whenever necessary.

8. Importation and clearance of birds, from the Airport

Animal Quarantine Officer should be informed regarding the date of arrival of birds at least one week ahead.

Following documents should be produced on arrival:

- Import permit in GVS 31
- Health Certificate

9. Illegal import of birds

All birds imported to the country without a permit will be destroyed without paying any compensation. Destruction and incineration costs will have to be paid by the importer.

10. After importation of birds

Imported birds are released only under quarantine surveillance agreement where an authorised officer from the Department of Animal Production and Health should be allowed to visit and examine the birds as and when necessary.

Any disease/deaths among imported birds should immediately be conveyed to the Animal Quarantine Officer. (Telephone: 01/20504)

Further Information can be obtained from:

* Director/Veterinary Surgeon (Epidemiology)
  Department of Animal Production and Health,
  P.O. Box 13,
  Peradeniya. Telephone: 08/88195
  88462 : 88463

* Deputy Director, (Animal Health and Human Resource Development),
  Department of Animal Production and Health,
  P.O. Box 13,
  Peradeniya. Telephone: 08/88178.

* Animal Quarantine Officer,
  41, Morgan Road,
  Colombo 2. Telephone: 01/20504
  Telegram: "Veterinary"
  Fax : 08 – 88195

Printed at the Department of Government Printing, Sri Lanka.

Draft copy

SELECTED INFORMATION ON POULTRY INDUSTRY OF SRI LANKA

Published by: Department of Animal Production & Health
Getambe, Peradeniya,
Sri Lanka.

June 1992.

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FORWARD

Poultry industry of Sri Lanka has shown a marked growth during the last decade. As a result, the dietary habits of Sri Lankans have shifted from that of beef to chicken. With this growth, those interested in the industry seek information pertaining to the sector. Thus it was thought appropriate to publish a booklet containing useful information about poultry sector.

This booklet provides information on breeder farms, types of commercial chicks available, poultry feed manufacturers, poultry vaccines available in Sri Lanka, vaccination guidelines for poultry, poultry processors and equipment manufacturers in Sri Lanka. I trust that this booklet will in a long way assist in accelerating the present growth rate of the industry.

I am thankful to Dr. Pushpa Wijewantha, Veterinary surgeon (Poultry Development) for collecting data and developing the booklet to its final form.

Dr. A.S. Abeyratne,
Director
Department of Animal Production & Health,
Peradeniya.

April, 1993.

SELECTED INFORMATION

ON

POULTRY INDUSTRY OF SRI LANKA

CONTENTS

ADDRESSES OF FRANCHISE HATCHERIES IN SRI LANKA

	Name of Farm/Agent	Contact Address	Tel:Telex & Fax No.
√1.	Bairaha Farm	Managing Director, Bairaha Farm, 407, Galle Road, Colombo 3.	Tel: 01 - 573055/ - 575255/ - 575375 Tlx: 21398 MIMNAC"CE Fax: 94-1-575256
2.	Central Poultry Research Station	The Manager, Central Poultry Research Station, N.L.D.B, Karandagolla, Kundasale.	Tel: 08 - 25545
√3.	Christombu Farm	Managing Director, Christombu Farm, 27, Hospital Street, Colombo 01.	Tel: 01 - 433142 - 328909 Fax: 94-1-446650
4.	Crest Farms	Managing Director, Crest Farms, No. 229, Highlevel Road, Nugegoda.	Tel: 01 - 552694
5.	Dalugama Hatcheries	Managing Director, Dalugama Hatcheries, 145, Kandy Road, Dalugama, Kelaniya	Tel: 01 - 521761
6.	Dikkanda Farms	Managing Director, Dikkanda Farms, 24, Guildford Crescent, Colombo 7.	
7.	Dumfries Stock Breeders	Managing Director, Dumfries Stock Breeders, [illegible] Road, [illegible]	Tel. 01 - 520192
8.	[illegible] Farms	Managing Director, [illegible] [illegible] [illegible] [illegible]	Tel: 022 - [illegible]

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9.	H.R.T. Farms	Managing Director, H.R.T. Farms, "Saliya" Kadurunda Road, Kumbuka West, Gonapola Junction, Bandaragama.	Tel: 01 - 713098
10.	Kawatayagoda Farm	Managing Director Kawatayagoda Farm, & Hatchery, No. 100, Morontuduwa Road, Wadduwa.	Tel: 034 - 33265
11.	Kekanadura Farm	Manager, Regional Poultry Farm & Hatchery, Dept. of AP&H, Kekanadura, Matara.	
12.	Lalitha Rajapakse	Managing Director, 74, Grand Street, Negombo.	
13.	Lan-lib Breeder Farm & Hatchery	Chairman, Sri Lanka Libiya Agricultural & Livestock Dev.Co.Ltd. 3rd Floor, Lanlib Building, No. 46/56, Nawam Mawata, Colombo 2.	Tel: 01 - 436135 Tlx: 23161 Fax: 94 -1-423769
14.	Mahaweli Livestock Enterprises Ltd.	Chairman, Mahaweli Livestock Enterprises Ltd, 187, Ward Place, Colombo 7.	Tel: 01 - 694594 - 694416 Tlx: 22049 CECB CE Fax" 94 -1-694594
15.	Maples Hatcheries.	Managing Director, Maples Hatcheries, Maples Road, Wennappuwa.	Tel: 031-5506

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16.	Marawila Farm of N.L.D.B	The Manager, Marawila Farm of NLDB, Marawila.	Tel: 031 - 8285
17.	Marist Brothers Farm	Managing Director, Marist Brothers Farm, Tudella, Ja-Ela.	Tel: 01-536360
18.	Mikchris Co. Ltd.	Managing Director, Mikchris Co. Ltd. 81, Ward Place, Colombo 7.	Tel: 01 - 698633 Tlx: 21230 MIKECRIS CE Fax: 94-1-693822
19.	Miriswatta Farm of NLDB	The Manager, Miriswatta Farm of NLDB Millewa, Horana.	-
20.	Negombo Farms (Pvt.) Ltd.	Managing Director, Negombo Farms (Pvt.) Ltd. Palm Gardens Estate, Demanhandiya.	Tel: 01-443629 Fax: 94-1-443629
√ 21.	Nel Farm & Hatchery	Managing Director, Noorani Estates Ltd. 481 A, Prince of Wales Avenue, Colombo 14.	Tel: 01 - 436763/ - 448417 Tlx: 21352 A/B NURBHIA CE Fax: 94-1-448223
22.	Pilimatalawa Hatchery	Managing Director, Pilimatalawa Hatchery, Embilmeegama, Pilimatalawa.	
23. 34	Prima Breeder Farm	The General Manager, Ceylon Grain Elevators Ltd. 15, Rock House Lane, Colombo 15.	Tel: 01 - 522556/ 522558 Tlx: 22076 [illegible] CE Fax: 94 - 1 - [illegible]

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24.	Ravi Farms Complex	Managing Director Ravi Farms Complex, Weligampitiya (Ja-Ela) Ganemulla Road, Bollata.	Tel:01 - 536657 Tlx: 22048 MAHROF CE Fax: 94-1-536657
25.	Regional Hatchery, Vavuniya	Officer in-Charge, Regional Hatchery, Dept. of AP&H, Vavuniya.	Tel: 024-2219/ 2119
26.	Rishana Farm	The General Manager, Rishana Farm (Pvt.) Ltd. 62/11,Rassagala Rd, Balangoda.	Tel: 045-7103
27.	River Valley Farm	Managing Partner, River Valley Farm, Ellatota, Bandarawela.	Tel: 057-2339/ 2631
28.	Samira Poultry Farm	Managing Director Samira Poultry Farm, 117/1, Kahanthota Rd, Malabe.	Tlx: 22894 SAGCO CE Fax: 94-1-446518
29.	Shetna Poultry Farm	Managing Director, Shetna Poultry Farm, Gampola.	Tel: 08-52457 Tlx: 22767 SOORYA CE Fax: 94-8-32435
30.	S.R. Farm	Managing Director, S.R. Farm, No. 15, N.H. Mawata, China Fort, Beruwela.	Tel: 034 - 76083
31.	Sun Farm Hatchery	Mr. S.D. Unantenna Agriculture Engineer 21, Hill Street Gampola.	Tel: 08 - 52235 Fax: 94-8-32765 (Attn: SALIKA)
32.	Superbreed Farms (Pvt.) Ltd.	Managing Director Superbreed Farms (Pvt) Ltd. 272, Jayamalapura Gampola.	Tel: 08-52631 Tlx: 22707 [illegible] CE Fax: 94-8-[illegible]

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33.	Super Chick Hatcheries	Managing Director Super chick Hatcheries Kandahena Estate, Panaluwa Migoda.	
34.	Three Acre Farm	The General Manager, Ceylon Grain Elevators Ltd. 15, Rock House Colombo 15.	Tel: 01 - 522556/ 522558 Tlx: 22076 CGE CE Fax: 08 - 524163
35.	Trinity College Farm,	The Director, Trinity College Farm Pallekelle, Kundasale.	
36.	Uplands Farm	Managing Partner Uplands Farm Galaha Road, Peradeniya.	Tel: 08 - 88050
37.	Wariyapola Farm	Secretary, Ministry of Agric: Food & Co-operaties 170, Negombo Road, Kurunegala.	Tel: 037 - 22836 - 23683 Fax: 94-37-23683

Turkey Farms

1.	Kurundugolla Farm	K.D. William, Kurundugolla Farm, Gurugalle, Avissawela Pilimatalwa.

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STRAINS OF COMMERCIAL LAYERS & BROILERS AVAILABLE FOR SALE IN SRI LANKA

a) Layer Strains

		Franchise Agent / [illegible]	
1.	Babcock - BV 300	Samira Poultry Farm	India
2.	Babcock - BV 380	Dalugama Hatcheries Samira Poultry Farm	India India
3.	Bovans - Brown	Shetna Farm	Holland
4.	Bovans - WL	Dikkanda Farms Marist Brothers Farm Shetna Farm	Holland Holland Holland
5.	CEPO Starline	Central Poultry Research Station - Karandagolla. Regional Hatchery, Vavuniya	Sri Lanka Sri Lanka
6.	Dekalb	Uplands Farm	U.S.A
7.	Gold Line - 54	Marist Brothers Farm Shetna Farm	Holland Holland
8.	Hisex Brown	Bairaha Farm	Holland
9.	Hubbard Golden Comet	Christombu Farm	Holland
10.	Hyline Black/Brown/White	Three Acre Farm	U.S.A
[illegible]	Lohman - Brown	Lan-Lib Breeder Farm Prima Breeder Farm	Holland/ W. Germany W. Germany
[illegible]	[illegible]n - LSL	Christombu Farm Dalugama Hatcheries Lan-Lib Breeder Farm Prima Breeder Farm Marist Brothers Farm [illegible] Hatchery	Holland Holland Holland/ W. Germany W. Germany Holland Holland

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14.	Shaver - 288	Marawila Farm	Canada
		Negombo Farms (Pvt) Ltd.	Canada
		Regional Hatchery, Vavuniya	Canada
15.	Shaver - 579	Marawila Farm	Canada
		River Valley Farm	Canada
16.	Tetra - SL	Nel Farm & Hatchery	U.K

b)	Broiler Strains	Franchise Agent/Farm	Country of Origin
1.	Arbo Acres	Kawatayagoda Farm & Hatchery	Holland
		Superbreed (Pvt) Ltd.	Holland
2.	ASA	Pilimatalawa Hatchery	Denmark
3.	Cobb	Pilimatalawa Hatchery	India
		Uplands Farm	U.K.
4.	Hubbard	Christombu Farm	Holland
5.	Hybro	Bairaha Farm	Holland
6.	Hypeco	Maples Hatcheries	Holland
		Super Chick Hatcheries	Holland
7.	Indian River	H.R.T. Farms	Sri Lanka
		Lan-Lib breeder Farm	India
		Negombo Farms (Pvt.) Ltd	Sri Lanka
		Three Acre Farm	U.S.A
8.	Isa-Vedette	Nel Farm & Hatchery	France
		Shetna Farm	France
9.	Lohman	Dalugama Hatcheries	W. Germany
		Kekanadura Farm	W. Germany
		Lan-Lib Breeder Farm	W. Germany /Holland
		Marist Brothers Farm	W. Germany
		Miriswatta Farm	W. Germany
		Prima Breeder Farm.	W. Germany
		Regional Hatchery, Vavuniya	Holland

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10.	Ross	Dumfries Stock Breeders	U.K
		Lalitha Rajapaksa	India
		S.R. Farm	India
		Ravi Farms Complex	India
		Rishana Farm	U.K
11.	Shaver-Starbro	Central Poultry Research Station, Karandagolla	Canada
		Crest Farms	Canada
		Mahaweli Livestock Farm	Canada
		River Valley Farm	Canada
		Sun Farm Hatchery	Canada
		Trinity College Farm	France/Holland
		Wariyapola Farm	Canada
12.	Teegal	Mikchris Co. Ltd	Australia
		Negombo Farms (Pvt.) Ltd	Australia
13.	Tetra - DB	Kawatayagoda Farm	Holland
		Nel Farm & Hatchery	U.K.
14.	Vencob	Kawatayagoda Farm	India
		Lan-Lib Breeder Farm	India
		Samira Poultry Farm	India
		Hijra Farms	

Turkey

B.U.T. 8	Kurundugolla Farm	U.K
Medium Broze	Kurundugolla Farm	Sri Lanka
Medium White	Kurundugolla Farm	Sri Lanka

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LIST OF APPROVED HATCHERIES FOR IMPORTATION
OF PARENT BIRDS TO SRI LANKA

1. **Australia**

A.A. Teegal Pvt. Limited,
Richardson Rd,
Camden,
NSW - 2570
Australia.
Tlx: AA 20791 (Tegel)
Fax: 046 46 2230

2. **Canada**

Shaver Poultry Breeding Farms Ltd.
Box 400,
Cambridge, Ontario,
Canada. NIR 5 V9
Tlx: 069 - 59337
Fax: 59 621-9407

3. **Denmark**

A. S.A. Chick Export Ltd.
Frederikshab,
E.K. 7183 Randbol.
Denmark.
Tlx: 60227 abroed dk
Fax: 45 7588 5266

4 **France**

Instiut de Selection Animale
Societe Anonyme au capital de 10057450OF
119, Avenue Marechal de Saxe - 69427 Lyon Cedex 03
France
Tlx: ISA 31069
Fax: 33 72619255

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5. India

Deejay Hatcheries,
Deejay Enterprises,
Bangalore 560025
India.
Tlx: 0845 - 2604 DEEJAY
Fax: 91-912 213609

The India Poultry Farm,
101, 5th Main Road,
Jayamahal Extension,
P.O. Box 4633, Bangalore,
India.
Tlx: 0845 8611 VIBS IN
Fax: 91 812 334424

Venkateshwara Hatcheries Ltd.
Venkateshwara House,
S.No. 114/2, Sinhaged Road,
Pune - 411030,
India.
Tlx: 0145-7319
Fax: 0212-422277

6. The Netherlands

Arbor Acres Farm B.V.
Kleine Gracht 32,
P.O. Box 21,
8050 AA, Hattem,
The Netherlands.
Tlx: 42350 arbor
Fax: 05206 - 41307

Euribrid B.V.,
P.O. Box 30,
5830 AA, Boxmeer,
The Netherlands.
Tlx: 37288
Fax: 0 8855 75201.

Cobb - Vantress International.
P.O. Box 249.
Siloma Springs, Arkansas 72761
United States of America.
Tlx: 928456 COBBSO Litnud
Fax: 524-3043

Dekalb Poultry Research Inc
International Division 3100
Sycamore Road, Dekalb Illinois 60115,
United States of America.
Tlx: 08185-2604 Deejay
Fax: 91-812-213609

Hyline International
2929 Westown Parkway,
West Des Moines
Lowa 50265
United States of America
Fax: 515 225 6425

Indian River international,
P.O. Box 828,
Nacogdoches, Texas 75963
United States of America.
Fax: 409 569-0145

9. **West Germany**

Lohamann Tierzucht Gmbh.
P.O. Box 460
D - 2190 Cuxhaven
West Germany
Tlx: 2-32-234 LTZ D
Fax: 4721 38852

LIST OF ESTABLISHED POULTRY FEED MANUFACTURERS IN SRI LANKA

* This list is not comprehensive, specially with regard to Small scale manufacturers.

1. B.C.C Lanka Ltd.
   P.O. Box 281
   Colombo 12.
   Tel: 01-422111/5

2. B.G. Jayaweera
   Siyambalagasruppa,
   Dummalasooriya.

3. B.M.S. Balasooriya
   (B.M.S. Feed)
   No. - 231
   Kurunegala Road,
   Bingiriya.

4. Ceylon Grain Elevators Ltd.
   (Prima Feed)
   15, Rock House Lane,
   Colombo 15.
   Tel: 01-522558/
   522558
   Tlx: 22076 CGE CE
   Fax: 94-1-524163

5. Gamini Hettiarachchi
   (New Sampath Feed)
   Talagahapitiya
   Bingiriya.

6. Gold Coin Feed Mills (Lanka) Ltd.
   (Gold Coin Feed)
   205, Vystwyke Road.
   Colombo 15.
   Tel: 01-522624/
   523038
   Tlx: 22611 TRUST CE
   Fax: 94-1-522682

7. Kasagahawatta Farm,
Divulapitiya.

8. K.M. Gunathilaka
(K.M.G. Feed)
Pallegama,
Hettipola.

9. Kumari Poultry Feeds
(Kumari)
Pansal Handiya,
Dematawela,
Udubaddawa.

10. L.U.A. Wijewardana
(Chuti Kumari Feed)
Kahadenigama,
Udubaddawa.

11. Master Feeds
(Vet House Feed)
14/2, Tower building,
25, Station Road,
Colombo 4.
Tel: 01-580245/
501249
Tlx: 21300 EASTAG CE
Fax: 94 -1-588492

12. M. Samaranayaka
(M.P.F. Poultry Feed)
Mabopitiya Trade Centre
Allawwa.

13. S.P.S. Seeniwasagam Chetti (Private) Ltd.
(Golden Star Animal Feed)
41, Wolfendhal St.
Colombo 13.
Tel: 01 - 434443/
4370[illegible]
Telex: [illegible]
Fax: 94 1-4409[illegible]

14. Tisara Trade Centre
(Tisara Poultry Feed)
Kanubichchiya,
Dummalasooriya.

15. Titus Fernando
St. Anthony Poultry Farm
Newakade Road,
Udubaddawa.

16. Trico Oils & Fats Co. (Pvt) Ltd.
(Trico Feed)
414/17, K Cyril C. Perera Mawatha
Colombo 13.
Tel: 01-440118/9
Telex: 22369 TRICO CE
Fax: 94-1-432000

17. Wilbert Mayadunne
(Niluka Poultry Feed)
Elathalawa,
Deegalla.

18. W.L.J Perera
(New Bernards Feed)
Newakade Road,
Udubaddawa.
Tel: 037 - 41139

19. W.P.P. Samarasinghe
(Super Feed)
Meepitiya,
Kegalle.
Tel: 035 - 2824

LIST OF POULTRY EQUIPMENT SUPPLIERS & MANUFACTURERS

Name & Address

1. Aceland Livestock Services,
   No. 288, Kandy Road,
   Kahawatta.
   Tel: 01-525262
   Fax: 94-1-520635

2. Asian Trading House
   115, Messenger Street,
   Colombo 12.
   Tel: 01-434666
   Fax: 94-1 434666

3. Bairaha Farms,
   407, Galle Road,
   Colombo 3
   Tel: 01-573055/
   575255
   Tlx: 21398 "MIMNAC" CE
   Fax: 94 1 575256

4. Ceylon Grain elevators Limited
   15, Rock House Lane,
   Colombo 15.
   Tel: 01 - 522556, 522558.
   Tlx: 22076 CGE CE
   Fax: 94 1 524163

5. Eastern Traders,
   200, Central Road,
   Colombo 12.

6. Maccons Mech Industries,
   140, Messenger St.,
   Colombo 12.
   Tel: 01 437140

7. Marshal Exports & Imports
   542/12, Colombo Road,
   [illegible]
   [illegible]

8. Master Feeds Limited,
14/2, Tower Building,
25, Station Road,
Ciolombo 14.
Tel: 01 - 580245/501249
Tlx: 21300 EASTAG CE,
Fax:94-1-588492

9. Moosajees Merchanting Ltd,
206, Vystwyke Road,
Colombo 15.
Tel: 01 - 522624/523038
Tlx: 22611 TRUST CE
Fax: 94-1-522682

10. Noorani Estates Limited,
481 A, Prince of Wales Avenue,
Colombo 14.
Tel: 01 - 436763/448717
Tlx: 21352 A/B NURBHIA CE
Fax: 94-1-448223

11. Nutricare Farms,
50 Swarna Road 6,
Colombo 6.
Tel: 01-580012

12. Promotor Engineering Company Ltd.
267, Vauxhall Street,
P.O. Box 612,
Colombo 2.
Tel: 01-25399/25411

13. S.P.S. Seeniwasagam Chetti (Private) Ltd.
(Golden Star Animal Feed)
41, Wolfendhal St,
Colombo 13.
Tel: 01 - 434443/
437019
Telex: 22939 SEGER CE
Fax: 94-1-440971

14 Walker Sons Engineers (Pvt) Ltd.
5, Dalada Veediya,
Kandy,.
Tel: 08-22153/22052
Fax: 94 8 22052

LIST OF POULTRY PROCESSORS

* This provicional list does not include small scale poultry processors.

1. Bairaha Farm,
   407, Galle Road,
   Colombo 3.
   Tel: 01-573055,575255,575375
   Tlx: 21398 "MIMNAC"CE
   Fax: 94-1-575256

2. Ceylon Cold Stores
   "Elephant House",
   P.O. Box 220,
   Colombo.
   Tel: 01 - 328221
   Tlx: 21180 (ZERO)

3. Christombo Farm
   27, Hospital Street,
   Colombo 1.
   Tel: 01 - 433142, 328909
   Fax: 94 1 446650

4. Crystal Springs (Pvt) Ltd,
   272, Jayamalapura,
   Gampola.
   Tel: 08 - 52631
   Tlx: 22787 MATSUI CE,
   Fax: 94 8 32343

5. Mahaweli Livestock Enterprises Ltd.
   187 Ward Place.
   Colombo 7.
   Tel: 01-694594, 694416
   Tlx: 22049 CECB CE
   Fax 94 1 694594

6. Maxi House
   Wennappuwa.
   Tel 031-5325

7. National Livestock Development Board,
P.O. Box 1748,
No. 40, Nawala Road,
Narahanpita,
Colombo. 5.
Tel: 01 - 501701, 501702

8. Nel Farm & Hatchery,
Attn: Noorani Estates Ltd.
481 A, Prince of Wales Avenue,
Colombo 14.
Tel: 01-436763/448417
Fax: 94 1 448223
Tlx: 21352 A/B NURBHIA CE

LIST OF POULTRY VACCINES AVAILABLE IN SRI LANKA AND THEIR LOCAL AGENTS

Disease & Name of the Vaccine	Type/ Strain	Manufacturer	Local Agent
a) **Single Vaccines**			
1. Egg drop syndrome			
Poul Vac. I.EDS	EDS	Duphar B.V.	Brown & Co. Ltd.
Poul Vac. I.EDS	EDS 76	Salsbury	Moosajees Ltd.
2. Fowl Cholera			
Pabac	F. Chol.	Salsbury	Moosajees Ltd.
3. Fowl Pox			
Chick-N-Pox	Chick-N -Pox	Salsbury	Moosajees Ltd.
Diftosec	Chicken strain	Rhone Merieux	Ceylon Grain Elevators Ltd.
Fowl Pox	Beaudette strain (Live)	Vaccine Labor- atory, V.R.I Gannoruwa, Sri Lanka.	Dept. of AP&H
Ovo-Diphtherin	Chicken strain	Intervet	Brown & Co.Ltd.
Poxine	Chicken Strain	Salsbury	Moosajees Ltd.
4 Infectious bronchitis			
Bioral H 52	H52	Rhone Merieux	Ceylon Grain Elevators Ltd

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Bioral H 120	H120	Rhone Merieux	Ceylon Grain Elevators Ltd.
IB Vaccine	H52	Smithkline RIT	Unical(Ceylon) Ltd.
IB Vaccine	H 120	Smithkline RIT	Unical Ceylon Ltd.
IB Vaccine Nob	H51	Intervet	Brown & Co. Ltd.
I.B Vaccine Nob	H120	Intervet	Brown & Co. Ltd.

5. **Infectious bursal disease**

Gumbopest	D78	Rhone Merieux	Ceylon Grain Elevators Ltd.
Gumboriffa	D78	Rhone Merieux	Ceylon Grain Elevators Ltd.

6. **NewCastle disease**

Imopest	NCD	Rhone Merieux	Ceylon Grain Elevators Ltd.
NCD Vaccine	B1-B1	Sterwin	C.I.C Ltd.
NCD Vaccine	F Strain (Live)	Vaccine Labor-atory,V.R.I Gannoruwa, Sri Lanka.	Dept. of AP&H.
NCD Vaccine	Komorov (Live)	Vaccine Labor-atory, V.R.I Gannoruwa, Sri Lanka.	Dept. of AP&H.
NCD Vaccine	NCD-K Kimber	Salsbury	Moosajees Ltd
NCD Vaccine	B1-B1	Salsbury	Moosajees Ltd.
NCD Vaccine	B1-La Sota	Salsbury	Moosajees Ltd

NCD Vaccine	Clone 30	Intervet	Brown & Co. Ltd.
NCD Vaccine	Hitchner B1	Intervet	Brown & Co. Ltd.
NCD Vaccine	La Sota	Intervet	Brown & Co. Ltd.
Newcavac	NCD	Intervet	Brown & Co. Ltd.
Pestos	Hitchner B1	Rhone Merieux	Ceylon Grain Elevators Ltd.
Sotasec	La Sota	Rhone Merieux	Ceylon Grain Elevators Ltd.

7. **Marek's disease**

Cryomarex	Rispens	Rhone Merieux	Ceylon Grain Elevators Ltd.
Lyomarex	HVT-FC126	Rhone Merieux	Ceylon Grain Elevators Ltd.
Mareks	HVT	Salsbury	Moosajees Ltd.
Mareks	HVT/SB1		C.I.C Ltd.
Mareks HVT	HVT 1	Intervet	Brown & Co. Ltd.
Marexine CA& SB1	FC 126 & SB1	Intervet	Brown & Co. Ltd.
Marexine SB1	SB1	Intervet	Brown & Co Ltd.
Rismavac Nobilis	CV 1988	Intervet	Brown & Co. Ltd

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b) **Combined Vaccines**

Binewgodrop	NCD, IB, IBD, EDS	Rhone Merieux	Ceylon Grain Elevators Ltd.
Binewvax	NCD, IB	Rhone Merieux	Ceylon Grain Elevators Ltd.
IB & ND Vaccine	IB (MA5) NCD (clone 30)	Intervet	Brown & Co. Ltd.

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PART II

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VACCINATION GUIDELINES FOR COMMERCIAL LAYERS AND BROILERS

1. Layers

a) Compulsory Vaccinations

It is most important that following vaccinations must be given at the respective ages as indicated below.

Disease	Age of Vaccination	Type of Vaccine Recommended	Route of Vaccination
Marek's Disease	Day 01	Sero type 1 or Sero types 2+3 Strains. (Should be given at the Hatchery)	Intramuscular or Subcutaneous
Newcastle disease (ND,Ranikhet)	**Either Programme 1**		
	3-4 weeks	Hitchner B1 (live) or similar strains	Drinking water
	8-10 weeks	Hitchner B1 or B1 type La Sota (Live)	Drinking water
	14-16 weeks	ND (Killed)	Intramuscular or Subcutaneous
	Or Programme 11		
	3-4 weeks	F strain (Live)	Intramuscular
	12-14 weeks	Komarov strain (Live)	Intramuscular
Fowl pox (FP)	5-6 weeks	FP modified (Live)	Scarification (wing web)
	14-16 weeks	FP modified (Live)	Scarification (wing web)

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Note: For Newcastle (Ranikhet) vaccination, if Programme 1 is followed, an additional vaccination (Hithner B1 live or similar strains given by Eyedrop or Intranasal) at day 1 is recommended as an option.

b) **Optional Vaccinations**

In addition to the compulsory vaccinations, it may be necessary to provide additional protection against following diseases depending on the area, location of the farm, breed/strain, biosecurity measures undertaken etc. Suitable additional vaccinations will have to be picked up from any of the following.

Disease	Age of Vaccination	Type of Vaccine Recommended	Route of Vaccination
Infectious bronchitis (IB)	day 01 (Optional)	H 120 (Live)	Eye drop or Intranasal
	3-4 weeks	H 120 (Live)	Drinking water
	8-10 weeks	H 120 (Live)	Drinking water
	14-16 weeks	IB, Mass(Killed)	Intramuscular or Subcutaneous
Avian ence-phalomyelitis (AE): (Epi-demic tremor)	10-12 weeks	AE, (Live)	Drinking water
Egg drop syndrome (EDS)	14 weeks	EDS (Killed)	Intramuscular
Fowl cholera	12 weeks	Pasteurella multocida Serotype 1,3 & 4 (Killed)	Intramuscular or Subcutaneous
	16 weeks	Pasteurella multocida serotype 1,3 & 4 (Killed)	Intramuscular or Subcutaneous

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2. Broilers

a) Compulsory Vaccinations

It is most important that Newcastle (Ranikhet) vaccination is given at 2-3 weeks of age as indicated below.

Newcastle disease (ND, Ranikhet)	2-3 weeks	Hitchner B1 (Live)	Drinking water

b) Optional Vaccinations

Depending on the area, location of the farm, breed/strain, biosecurity measures taken etc.it may become necessary to carry-out additional vaccinations inorder to provide adequate protection to the flock. Following are these optional vaccinations.Suitable additional vaccinations will have to be picked up from these.

Newcastle disease (ND, Ranikhet)	day 01	Hitchner B1(Live)	Eye drop or Intranasal
Infectious bronchitis (IB)	Day 01	H 120 (Live)	Eye drop or Intranasal
	2-3 weeks	H 120 (Live)	Drinking water

Note: When live vaccines are given in drinking water, make sure no chlorine or any other disinfectants are present in the water. It is recommended to add 25 grams of skimmed milk powder to 10 litres of water before dissolving the vaccine in water.

Infectious bronchitis (IB)	1-10 day	H 120 (Live)	Intraocular, Intranasal, Oral
	8-10 weeks	H 120 or similar broad spectrum(live)	Oral
	14-16 weeks	IB (Killed)	Intramuscular or Subcutaneous
Avian Ence-phalomyelitis (AE,Epidemic-tremor)	12 weeks	AE vaccine(Live)	Oral
Fowl cholera	12 weeks	Killed bacterin (serotypes 1,3 & 4)	Intramuscular or Subcutaneous
	16 weeks	- do -	- do -

Reovirus Infection)
Egg drop syndrome)
Infectious laryngo-)
tracheitis)

Vaccination has to be carried out according to the farm health status and epidemiological situation of the disease.