ECONOMICS OF POULTRY FARMING IN KERALA

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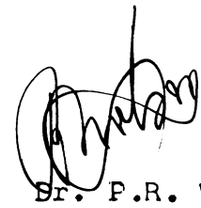
C E R T I F I C A T E

Certified that the thesis "Economics of Poultry Farming in Kerala" is the record of bona fide research carried out by K.X. Joseph under my supervision. The thesis is worth submitting for the degree of Doctor of Philosophy in Management.



Dr. P.R. WILSON.

DECLARATION

I declare that this thesis is the record of bona fide research work carried out by me under the supervision of Dr. P.R. Wilson, Lecturer, School of Management Studies, Cochin University of Science and Technology. I further declare that this thesis has not previously formed the basis for the award of any degree, diploma, associateship, fellowship or other similar title of recognition.

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INTRODUCTION

The population of India increased from 361 million in 1951 to 843.93 million in 1991. The per capita availability of food grains also improved during the period. But the land holdings as well as the per capita availability of agricultural land have been shrinking and these are expected to be around 1.40 and 0.14 hectares respectively by the turn of this century and with competing demands upon land for other sectors of development, it is going to shrink further[1]. Even when the basic resources are declining, food and nutritional security have to be ensured to the future population. The only way to fulfill this obligation is through continuous gain in productivity of various agricultural commodities[2].

About 50 percent of the rural population in India is without both subsistence income and a roof over their heads due to small landholding; there is too much dependence on erratic monsoon for crop production and also there is an inadequacy of agricultural inputs[3]. These conditions have forced a large portion of people to continue to live in poverty. This in fact has affected their productivity as well as their innovative thinking power[4].

The problems faced by rural population can be classified into livelihood, living conditions, education and social upliftment. These problems affect the quality of life led by rural population, which is geared by the generation and distribution of income. The factors that adversely affect the income generation are scarcity of food, fodder, fuel, inadequate housing, lack of irrigation, unemployment and underemployment, lack of buying power, low crop yields, small land holding and poor quality of livestock - the factors that comprise the category of livelihood problems, which are more serious, and which need immediate attention. Once the rural population start earning adequate income they would be able to overcome other problems.[5]

The state of Kerala with 4.887 million individual operational land holdings and a population of 29.01 million, has 2.8 million unemployed and 1.5 million underemployed. Though agriculture production and food grain production have been found to be increasing over the period, the per head availability of land was declining. Besides, soil fertility is decreasing due to over cropping, over grazing and soil erosion. The modern farm practices involving the usage of insecticides and pesticides have also contributed to lesser soil fertility[6].

Human food of animal origin is gaining importance and increasing foothold in the dietary practice of Indian masses, albeit its low share in the overall production of food that mostly come from land-based agriculture, affected Indian poultry growth. Planning in the agricultural sector should be so oriented as to give more emphasis on animal production to avoid drain on soil which is fast becoming bereft of its fertility[7]. One such agro based industry highly suitable for rural areas is poultry farming which by virtue of its employment potential has already been reported to have become the most popular medium of self employment among rural masses[8]. Poultry, being one of the quickest and efficient converter of plant products into food of high biological value, attracts much attention from the nutrition content angle[9].

Poultry farming experiences in other states have proved to be capable of enhancing both the productivity per hectare and the productivity per head in agricultural sector. Among poultry farming, broiler breeds, through the application of modern technology was found to be warmly welcomed by the agriculturists and others[10].

Kerala presents an encouraging picture in the arena of poultry farming. The number of commercial broiler poultry farms has come to 4036 with a capital employment of Rs.1,200 million in

1989-90, with its potential of direct employment to 5,700 and of indirect employment to 60,000 skilled labourers and 12,000 unskilled labourers[11].

Though of recent origin, commercial poultry farming has achieved momentum in Kerala because of its wide and varied potentials capability of employment creation, low investment, quick returns, lesser combination of various factors of production, enhanced productivity per unit of agricultural land, maintenance of soil fertility etc.

Despite all the ancillary attributes characteristic of a thriving venture, the performance of poultry farming in Kerala was not comforting, especially in the case of small and medium size farms. This study has aimed at detailing the various components of cost and revenue in the business of poultry farming, and the adducing of empirical evidences on the nature of relationship of different variables as the gross income, current rate of productivity, extent of capacity utilisation and size of farms in terms of number of birds reared and the farms' overall financial performance. Alongwith this a descriptive approach was made to highlight the challenges and opportunity poultry farming in Kerala, with special emphasis on its economic and financial aspects.

1.1. EVOLUTION OF POULTRY FARMING IN THE WORLD

The original habitat of the ancestor of modern breeds of fowl is South and Central India, the Himalayan Terrain, Assam, Burma, Ceylon, Sumatra and Java. There are four known species of wild fowls, such as Red jungle fowl, Ceylon jungle fowl, Grey jungle fowl and Javan jungle fowl. The Red jungle fowl is widely distributed throughout Eastern India, Burma and Sumatra; the Ceylon jungle fowl in Ceylon; the Grey jungle fowl in South and Western parts of India, the Javan jungle fowl in Java and adjacent islands. All four species will cross with one another and most of the modern breeds have descended from these four wild species. The sport of cock fighting have a tremendous influence in the domestication of wild fowls as well as the distribution of fowls throughout the world[12].

As civilization improved, the use of indigenous fowls progressed from cock fighting to utility purposes[13]. The ever expanding population of the world and consequent high demand for grain food took man to think of substitutes for agricultural crops and grain foods for their subsistence[14]. This led to improving and developing varieties of fowls for utility purposes. Now there are more than 100 breeds of fowls with distinct features but only few of them are reared for the purpose of egg and meat on commercial scale[15].

The transformation of backyard jungle fowl into modern utility fowl was a slow but a significant process in the development of poultry farming in the world[16]. The present day poultry scene is that of specialisation. Scientific poultry farming now stands for rearing either meat type fowls or egg type fowls rather than keeping the meat cum egg varieties.

It was Bennet in 1952 who proved that laying strength vary from flock to flock and paved the way for specialisation in fowls rearing. In 1912 Pearl found that egg production can be increased through genetric line and this was the beginning of line breeding system. Findings of Hay in 1924 about the inheritance and maturity of birds added much to the knowledge of line breeders for selecting the parent stock, which indeed is the nucleus of hatching day old chicks[17].

An organised approach in poultry industry was introduced in the United States of America, by organizing the 'American Poultry Association' in 1873. World level commercial broiler production as it is found today had its beginning in the United States in 1920's although broiler poultry was produced in limited quantities as early as 1880 by keeping up the 'Standards of perfection' approach laid down by American Poultry Association. World's most intensive commercial broiler poultry area had its beginning in 1923 in Delmarra peninsula. By 1927 broilers were produced extensively in many of the states in the United States of America and the major credit goes to American hatcheries[18].

1.1.1. Poultry farming in the world

Poultry farming is carried out to some extent in all countries. In countries like the United States, Canada, Australia and other European countries and China, poultry industry is regarded as an integral part of the agriculture[19]. Though the leading commercial poultry producers are the USA, the USSR and China, with the adaptation of latest scientific developments in the field of hatching, rearing, marketing etc., almost all the developed countries have advanced considerably in this venture.

The contribution of the USA, the USSR, and China to the world output of egg marked 47.03 percent (2,88,635 million) and that of poultry meat touched 41.96 percent (14.766 million tonnes) in 1987. (Table 1.1).

1.1.1.1. Poultry egg production in the world

The world output of egg in 1987 was 6,13,711 million of which 1,37,160 million (22.35 percent) was contributed by China, 81,917 million (13.35 percent) by USSR and 69,558 million (11.33 percent) by USA (Table 1.1). The total output by all Asian countries amounted to 2,48,484 million (40.49 percent) of which 1,37,160 million (55.20 percent) was accounted for by China, 39,567 million by Japan and with an output of 18,750 million (7.54 percent), India stands in the third place in Asia with

Table 1.1

World leaders in Poultry Production

Country	EGG		MEAT	
	Output in Million Nos.	Output as a percentage to World output	Output in Million tonnes	Output as a percentage to world output
U.S.A.	69,558	11.33	9.105	25.87
U.S.S.R.	81,917	13.35	3.125	8.88
China	1,37,160	22.35	2.536	7.21
Total	2,88,635	47.03	14.766	41.96
World Total	6,13,711	100.00	35.189	100.00

Source (1) F.A.O. Poultry Year Book 1987

(2) World Poultry Situation USDA, 1988

regard to egg production. The Indian output of egg compared to world output was only 3.05 percent. The output by all developed countries amounted to 325,261 million (53 percent) and that of all developing countries came to 2,88,450 million (47 percent) (Table 1.2).

Per capita availability of poultry egg per annum in the world was 113 in 1987. It was found that in developed countries the per capita ranged between 276 and 300 while in developing countries it ranged from 54 to 60; whereas the Indians had it to the tune of 26 (Table 1.3). The countries with high per capita egg availability in the world are Japan (319 eggs), USSR (285 eggs), USA (279 eggs), France (274 eggs), UK (213 eggs), Mexico (196 eggs), Germany (165 eggs) and China (124 eggs) (Table 1 4).

1.1.1.2. Poultry meat production in the world

The world output of poultry meat in 1987 reached 35.189 million tonnes. Of this the share of USA alone was 9.105 million tonnes (25.87 percent), the USSR 3.125 million (8.88 percent) and China 2.536 million (7.21 percent) (Table 1.1). The share of output by all developed countries came to 23.197 million tonnes (65.93 percent) and that by all developing countries touched 11.992 million tonnes (34.07 percent). The total output from Asian countries amounted to 7.926 million tonnes (22.52 percent) of which 2.536 million tonnes (32 percent) was accounted for by China, 1.465 million tonnes (18.48 percent) by Japan, 0.546

Table 1.2

Leading Poultry Producers in the World

Country/ Continent	EGG		MEAT	
	Output in Million Nos.	Percentage to total	Output in Million tonnes	Percentage to total
U.S.A.	69,558	11.33	9.105	25.87
U.S.S.R.	81,917	13.35	3.125	8.88
China	1,37,160	22.35	2.536	7.21
Japan	39,567	6.45	1.465	4.16
India	18,750	3.06	0.240	0.68
Brazil	15,400	2.51	1.865	5.30
England	12,070	1.97	0.909	2.58
Asia	2,48,484	40.49	7.926	22.52
Developed countries	3,25,261	53.00	23.197	65.93
Developing countries	2,88,450	47.00	11.992	34.07
World total	6,13,711	100.00	35.189	100.00

Source (1) F.A.O. Poultry year book 1987

(2) World Poultry Situation USDA, 1988.

Table 1.3

Per capita availability of Poultry Products

Country/Region	Per capita availability	
	Egg in Nos.	Meat in Kgs.
World Average	113	6.90
Developed Countries	276-300	15.60
Developing Countries	54-60	2.50
India	26	0.40

Source: Indian Poultry Industry Year Book 1990

Table 1.4

Per capita availability of egg in few leading egg producing countries in the world

Country	Per capita (per Annum) Availability of Egg (Nos.)
Japan	319
U.S.S.R.	285
U.S.A.	279
France	274
U.K.	213
Mexico	196
Germany	165
China	124
India	26

Source: F.A.O. Production Year Book 1988

million tonnes (6.89 percent) by Thailand and 0.240 million tonnes (3.03 percent) by India (Table 1.2). The Indian share of poultry meat production in the world output was only 0.68 percent.

The per capita availability of poultry meat per annum in the world was 6.90 kilograms. The per capita availability in developed countries was 15.60 kilograms and in developing countries, 2.50 kilograms. In India it was 0.04 kilograms (Table 1.3). The leading countries with high per capita poultry meat availability are the USA (36.55 kilograms), Canada (25 kilograms), France (24.31 kilograms), Spain (19.84 kilograms), Italy (18.05 kilograms), Brazil (12.11 kilograms), Japan (11.83 kilograms), USSR (10.9 kilograms) and Thailand (9.75 kilograms) (Table 1.5).

1.2. EVOLUTION OF POULTRY FARMING IN INDIA

History witnesses the dominance of India in poultry keeping even during 1000 B.C. There are evidences in history to believe that fowls and eggs were exported to Persia, Palestine, Greece etc. during 500 B.C. In the beginning of the Christian Era India was a dominant supplier of fowls to South Africa, Australia, Japan and Russia and it continued for centuries together. The fowls supplied during these periods were desi in nature and were reared under very primitive methods without any scientific touch[20]. For centuries together the rural population

Table 1.5

Per capita availability of poultry meat in few leading poultry meat producing countries in the world

Country	Per capita availability of poultry meat in kilograms (per Annum)
U.S.A.	36.55
Canada	25.00
France	24.31
Spain	19.84
Italy	18.05
Brazil	12.11
Japan	11.83
U.S.S.R.	10.90
Thailand	9.75
India	0.40

Source: F.A.O. Production Year Book 1988.

of India, mainly the women folk, had been rearing the indigenous fowls under primitive methods, for domestic consumption with little business motive[21].

The first missionary poultry farm was set up at UTAH in Uttar Pradesh in 1907. The next farm was set up by the British under the name 'SPARRIN' in 1912 but it was closed in the year 1923 because of poor turnover[22]. It was Mr. A.E. Slater who first introduced exotic breeds in this country at Mission Poultry Farm at Eath in Uttar Pradesh in 1930[23]. With the starting of Imperial Veterinary Research Institute at Izatnagar in Uttar Pradesh in 1939 and the starting of a few large layer poultry farms with improved varieties of fowls, by the military authorities during World War II, poultry farming began to get popularised in India[24]. Poultry farming with its scientific touch began to spread over to many of the states in India when the Ministry of Defence, Government of India started poultry farms with highly improved varieties of fowls[25] The poultry sector witnessed spectacular progress during the 1960s, especially when private sector farms were allowed to import pure line breeds[26].

1.2.1. Poultry Development in India in various decades

A modest beginning towards commercial poultry farming was by launching a pilot project in Orissa in the beginning of 1950. During this period, 33 extension centres were started in different parts of the country to supply improved breeds of layer fowls to interested farmers[27].

During the middle of 1950s the Orissa pilot project was developed into an all India Poultry Development Project to encourage backyard rearing in rural areas with improved varieties of fowls and to popularise layer poultry farming on commercial scale in urban areas. This was the first large scale organised effort towards modern poultry farming in the country. Five regional poultry breeding farms were established in various parts of the country, during this period, to have genetically superior varieties of fowls from the parent stocks imported from USA, under the Technical Co-operation Mission. But the programme did not turn up well due to the lack of marketing facilities and other infrastructural disabilities.

Through the adaptation of scientific rearing systems and practices like deep litter housing, balanced feeding, preventive vaccination, etc., poultry farming emerged as a commercially viable enterprise in the 1960s. It was during this period that the intensive egg and poultry 'production-cum-marketing programme with an area development and package approach' was introduced.

This was considered a landmark in poultry development in India[28]. The entry of National and International agencies like the United States Agency for International Development, Applied Nutrition Programme, Freedom from Hunger Campaign, the United Nation's Development Programme etc., gave added momentum to the growth of commercial layer poultry farming in the country. This period witnessed the dramatic growth in the number of layer poultry farms with improved breeds of fowl and the beginning of broiler poultry farms in a few centres in the country. The setting up of franchise hatcheries in private sector, import of pure line breeds from Australia, functioning of two large scale poultry processing plants etc. were basically behind the successful implementation of the programmes during this period.

In the beginning of 1970s (1969-74) the thrust was given to the expansion of poultry marketing facilities. The permission to breed layer and broiler chicks in private hatcheries and the launching of modern poultry complex at Hessargetta, attracted many challenging entrepreneurs into the field.

By the middle of 1970s efforts were made to improve the quality of basic inputs needed for successful poultry farming and to establish proper poultry marketing network in the country.

Late seventies and early eighties gave special emphasis for broiler poultry farming and its development. The beginning and the functioning of National Poultry Development Board and

many State Poultry Development Corporations were made during this period.

It was during the middle of eighties that the government made sufficient provision for the research and development in poultry sector, with special emphasis on poultry meat processing. The developments in poultry sector as seen today is the outcome of active involvement of private entrepreneurs and government agencies in the country. The government investment in poultry sector during the plan periods amounted to Rs.1572.00 million against the total expenditure of Rs.26,609.40 million in livestock sector (Table 1.6).

The country has at present a strong poultry network of 491 hatcheries with ISI specifications including those having tie-up and franchise agreements with foreign poultry breeders of international repute, 299 leading commercial poultry feed manufacturing companies, 27 Veterinary and Biological institutes, 67 disease diagnostic centres and large number of Veterinary pharmaceuticals and equipment manufacturing companies. The total capital employed in poultry sector in 1988 amounted to 12,700 million and it gives direct employment to 60,000 and indirect employment to 0.5 million people per annum. The additional investment made during 1989 amounted to Rs.560 million and in 1990 Rs.621 million. Additional employment to skilled workers in 1989 was 4050 and in 1990 it was 9450[29].

Table 1.6

Five Year plan expenditure on livestock and Poultry

(in Million Rs.)

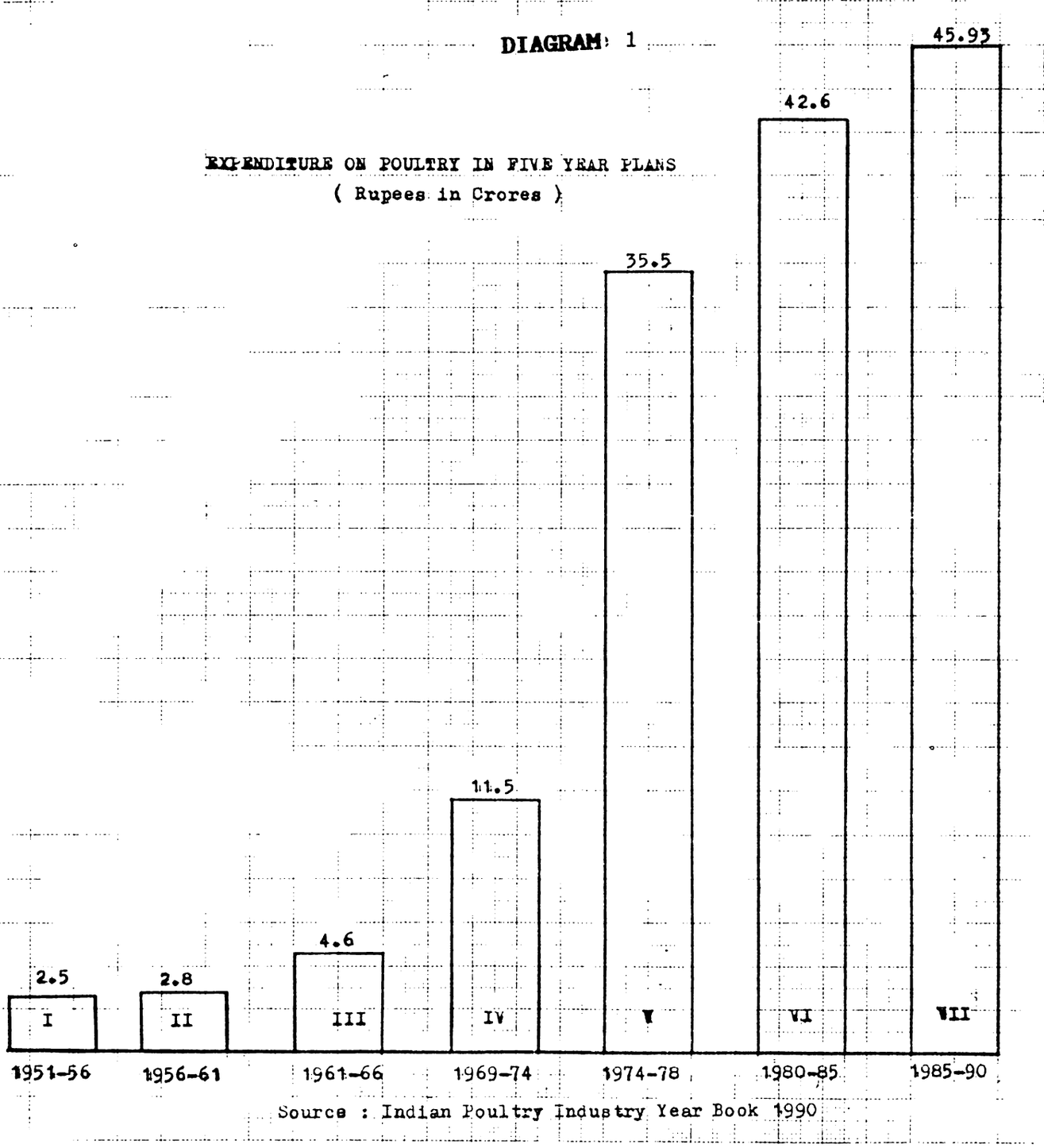
Plan Period	Expenditure on Livestock	Expenditure on poultry	Expenditure on poultry as a percentage of Livestock expenditure
First Plan (1951-52 to 1955-56)	160.00	25.0	15.62
Second Plan (1956-57 to 1960-61)	334.70	28.0	8.37
Third Plan (1961-62 to 1965-66)	770.00	46.0	5.97
Annual Plan (1966-67 to 1968-69)	597.00	-	-
Fourth Plan (1969-70 to 1973-74)	1542.60	115.0	7.45
Fifth Plan (1974-75 to 1977-78)	2324.60	355.0	15.27
Annual Plan (1978-79 to 1979-80)	2087.70	-	-
Sixth Plan (1980-81 to 1984-85)	8025.10	426.0	5.31
Seventh Plan (1985-86 to 1989-90)	10767.70	577.0	5.36
Total	26609.40	1572.0	5.91

Source: Planning Commission Reports

DIAGRAM: 1

EXPENDITURE ON POULTRY IN FIVE YEAR PLANS

(Rupees in Crores)



Source : Indian Poultry Industry Year Book 1990

1.2.2. Growth of Poultry farming in India

The beginning of 1980s witnessed a transition in poultry farming. The phenomenal expansion in broiler production compelled many of the layer poultry farmers and private layer hatcheries to shift from layer fowls to broiler fowls, because of its relative financial advantage. This gestation period has shown visible variations in the movement of layer parent stock, layer feed production and egg production whereas the broiler poultry business in the same period was growing up gradually.

Growth of hatcheries indicate the expansion and growth of poultry business in the country. While looking at the number of hatcheries in India between 1980 and 1988 it was found that the number of poultry hatcheries in private sector declined in the beginning of 1980s (Table 1.7). This was due to the decline of layer poultry farming in many other states and the time lag for converting the layer poultry farms into broiler poultry farms. However, the timely intervention of government by starting new public sector layer hatcheries did give a balanced movement in layer poultry sector. It also helped to reduce the hardships of private layer poultry farmers in India.

Growth rate in parent stock is another indicator of development in poultry sector. In the beginning of 1980s there was sizeable decline in the strength of parent stock of layer fowls which was partly due to the rebound of shifting from layers

Table 1.7

Number of hatcheries and breeding farms (poultry) in private and public sector in India 1980-'88

Year	Number of Hatcheries and Breeding Farms		
	Private sector	Public sector	Total
1980	155	127	282
1983	99	131	230
1985	173	158	331
1988	197	294	491

Source: Indian Poultry Industry Year Book 1990

to broilers (Table 1.8). By the middle of 1980s this declining tendency subsided and alongwith the growth in broiler poultry sector, the layer sector also ushered in considerably.

Growth of feed output is one of partial indices of growth in poultry sector. While looking at the poultry feed production it shows normal growth till 1985 and since then the rate of growth was very high (Table 1.9). The development of broiler farms at the expense of the layer farms did not make much variation in the feed output, whereas the sudden growth of feed output since 1985 was mainly because of the broiler boom in the country.

Growth in the value of pharmaceuticals (veterinary-poultry) is regarded as another index of growth in poultry sector as a whole. Growth in value of poultry pharmaceuticals is partly due to the increase in the value of veterinary medicines in general and also due to the enhanced consumption. Enhancement in consumption may be attributed to the shifting from desi layer fowls to improved layer fowls. It could also be due to the increase in the intensity of rearing of fowls. The value of pharmaceuticals continuously showed an upward trend since 1975. When compared to 1980 and 1985 the growth rate is rather slow (Table 1.10). This is because of the lesser expenditure on medicines and preventives for broiler fowls when compared to layer fowls, as the rearing period of broiler is rather short.

Table 1.8

Growth of Poultry Parent Stock (layers and broilers) in India 1980-'89

(in thousands)

Year	Poultry Parent Stock	
	Layers	Broilers
1980	960	330
1981	920	390
1982	890	440
1983	960	570
1985	970	830
1986	1040	1050
1987	1070	1650
1988	1180	1762
1989	1240	2200

Source: Indian Poultry Industry Year Book 1990

Table 1.9

Annual Production of Poultry feed in India

Year	Output in Million tonnes	Growth rate in Percentage
1980	2.5	-
1983	2.8	+ 12.00
1985	3.0	+ 7.14
1988	4.7	+ 56.67

Source: Indian Poultry Industry Year Book 1990

Table 1.10

Annual Production of Veterinary (Poultry) Pharmaceuticals in India 1975-'90

Year	Value of output (in Million Rupees)	Growth rate in percentage
1975	170	-
1980	350	+ 105.88
1985	860	+ 145.71
1988	1350	+ 56.98
1990	2000	+ 48.15

Source: Indian Poultry Industry Year Book 1990

Thus the developments in late 1980s clearly show the superiority of broiler poultry farming in India. This broiler boom made chances for setting up integrated broiler poultry projects for growing of parent stock and custom hatching of eggs resulted in the availability of wide range of poultry stock of international repute alongwith the transfer of modern techniques of poultry farming into the country[30].

Egg production in the country is organised at two levels - intensive level and extensive level. The intensive sector contributes bulk of the egg production in the country, while the extensive sector, contributes only less to the output of egg. The extensive sector is predominantly depending on desi fowls, reared under backyard system. India stands in the fifth place in the world and third place in Asia, in poultry egg production. This remarkable achievement was made mainly through the tie-up agreements with leading poultry breeders of the USA, the UK, Netherlands and Germany[31].

In India, poultry keeping is done in almost all states and union territories, under intensive as well as extensive methods. The output of egg increased from 2000 million in 1961 to 24,600 million in 1990, making a growth of 11.3 times (Table 1.11). Regarding egg production in various states (during 1988-89), Andhra Pradesh accounted for 20.04 percent of the country's output and stood first in the country. West Bengal, by claiming 10.82 percent of National output, came next. This was followed

Table 1.11

Poultry Egg Production in India (in Millions)

from 1961-90

EGGS		
No.of eggs from Desi Fowls	No.of eggs from Improved Fowls	Total
1980 (99.00)	20 (1.00)	2000
2100 (42.00)	2900 (58.00)	5000
1800 (15.00)	10200 (85.00)	12000
1200 (7.69)	14400 (92.31)	15600
1200 (7.14)	15600 (92.86)	16800
1020 (5.51)	17480 (94.49)	18500
1020 (5.05)	18180 (94.95)	20200
1020 (4.55)	21380 (95.45)	22400
1020 (4.15)	23580 (95.85)	24600

Source: Annual reports of Department of Agriculture and Cooperation, Ministry of Agriculture, Govt.of India.

by Tamil Nadu (10.74 percent), Maharashtra (8.48 percent), Punjab (7.69 percent), Kerala (6.9 percent) and Karnataka (6.54 percent). The output from the above 8 states, where 89.71 percent of the country's improved layer fowls are reared, amounted to 74.96 percent of national output. It is also found that the contribution of egg from the remaining 17 states and 6 union territories together amounted to 25.04 percent of national output. These regions were concentrating mainly on extensive farming and they accounted for only 10.29 percent of the country's improved layer fowls (Table 1.12).

Broiler, today has emerged as the fastest growing segment of the poultry industry[32]. Broiler poultry production in India is not scattered across the country; rather it is concentrated in certain 'pockets' in each region. The mode of rearing, though intensive in nature, varies from region to region. In the early eighties the commercial broiler production was mainly confined to the northern and western regions which together accounted for over 70 percent of the total output[33]. Since then, broiler production has spread widely with new centres of growth in South India which alone now accounts for 37.50 percent of the country's output of 168 million birds (Table 1.12). As a peculiarity the western region, which is in the forefront of broiler development, is concentrating on contract growing whereas the northern region is focussing on integrated broiler projects. The southern region, where expansion of broilers is very fast, follows intensive rearing methods in the major poultry pockets. The

Table 1.12

Overview of Commercial Poultry Production in various states in 1988-'89

State	Improved layer Fowls in Million Nos.	Egg Production in Million Nos.	Broiler Production in Million (Nos)	Number of Hatcheries				Parent Stock	
				Day old Layers	Day old Broilers	In Private Sector	Total	Layers (in Million Nos.)	Broilers (in Million Nos.)
Andra Pradesh	103.65 (25.17)	4170(20.04)	29(17.26)	31(25.40)	51(19.17)	60(20.40)	61(12.42)	230(19.48)	262.50(14.90)
Haryana	17.11 (4.15)	780(3.75)	10(5.95)	10(8.20)	33(12.40)	36(12.24)	42(8.55)	225(19.05)	273.00(15.49)
Mahara-shtra	34.28 (8.33)	1765(8.48)	28(16.67)	8(6.56)	26(9.77)	28(9.52)	34(6.92)	175(14.81)	315.00(17.88)
Tamil Nadu	79.54 (19.33)	2235(10.74)	12(7.14)	15(12.30)	24(9.02)	26(8.84)	34(6.92)	125(10.58)	199.50(11.32)
Karnataka	23.58 (5.74)	1360(6.54)	17(10.12)	11(9.02)	25(9.40)	29(9.86)	42(8.55)	100(8.46)	189.00(10.72)
West Bengal	31.77 (7.72)	2250(10.82)	19(11.31)	12(9.84)	15(5.64)	18(6.12)	32(6.52)	50(4.23)	126.00(7.15)
Punjab	27.74 (6.74)	1600(7.69)	16(9.52)	4(3.28)	19(7.14)	19(6.46)	24(4.88)	120(10.16)	147.00(8.34)
Kerala	51.66 (12.53)	1435(6.90)	5(2.98)	10(8.20)	5(1.88)	5(1.70)	15(3.05)	4(0.34)	11.60(0.67)
Other States & Union Territories	42.35 (10.29)	5205(25.04)	32(19.05)	21(17.20)	68(25.55)	73(24.86)	207(42.19)	152(12.86)	238.30(13.53)
South India	25.84 (62.77)	9200(44.22)	63(37.50)	67(54.92)	105(39.47)	120(40.80)	152(30.94)	459(38.87)	662.60(37.60)
All India	411.68 (100.00)	20800(100.00)	168(100.00)	122(100.00)	266(100.00)	294(100.00)	491(100.00)	1181(100.00)	1761.90(100.00)

Source: Report of All India Census of Livestock, Reports of State Departments of Animal Husbandry and Planning Commission of India Reports.

eastern region with a slow growth in the past is coming up well by adopting intensive rearing practices in the major poultry pockets[34].

The growth rate of broiler sector in India is much higher than that in the layer sector. During the sixties, broilers were totally alien to Indian farmers. During the early seventies the output was 4 million fowls. Within a decade it went upto 30 million fowls showing a growth rate of 6.5 times. By 1990 the output level reached 240 million fowls, showing a growth of 7 times, a better growth rate than that of the previous decade. Thus the growth of broilers within two decades was really good, marking an overall growth of 59 times (Table 1.13). While comparing the Indian output with international and Asian output, it was found to be only 0.68 percent and 3.03 percent respectively, which on any account is not at all impressive. (Table 1.2).

Like egg production, broiler meat production is also under the firm grip of Andhra Pradesh with 29 million birds and accounting for 17.26 percent of national output in 1988-89. The other states leading in broiler poultry production are Maharashtra 28 million birds (16.67 percent), West Bengal 19 million birds (11.31 percent), Karnataka 17 million birds (10.12 percent), Punjab 16 million birds (9.52 percent), Tamil Nadu 12 million birds (7.12 percent), Haryana 10 million birds (5.95 percent) and Kerala 5 million birds (2.98 percent), in its order

Table 1.13

Annual Production of broiler poultry meat in India from 1961-90

Year	Broiler Production in Million Nos.	Growth rate in percentage
1961	-	-
1971	4	-
1981	30	+ 650
1985	75	+ 150
1986	100	+ 33.33
1987	130	+ 30.00
1988	168	+ 29.23
1989	200	+ 19.05
1990	240	+ 20.00

Source: Annual Reports of Department of Agriculture and Cooperation, Ministry of Agriculture, Govt. of India.

of importance. The output from the above 8 states amounted to 80.95 percent of the country's broiler poultry production, whereas the remaining states and Union territories together produced only 19.05 percent (Table 1.12).

1.2.3 Layer Poultry Farming in India

Egg production in the country is organised at two levels - the intensive sector comprising of about 60,000 farmers with large flock size concentrated in certain states and extensive sector comprising of about 1,00,000 rural farmers, scattered across the country with small flock size varying from 25 to 250 birds reared in their backyard[35]. Both the sectors are needed for the development of poultry farming in India.

The egg production in the country in 1989 amounted to 20,800 million and 71.22 percent of it was produced in seven states which in order of importance are Andhra Pradesh (20.04 percent), West Bengal (10.82 percent), Tamil Nadu (10.74 percent) Maharashtra (8.48 percent), Punjab (7.69 percent), Kerala (6.9 percent) and Karnataka (6.54 percent). The contribution from South India came to 44.22 percent of national output (Table 1.2)

While analysing the performance of leading egg producing states in India it was found that Andhra Pradesh accounts for 103.65 million improved layer fowls, 31 percent of layer hatcheries and 230 million layer parent stock.

With respect to the strength of improved layer fowls it was found that the states of Andhra Pradesh, Tamil Nadu, Kerala and Karnataka accounted for 25.17 percent, 19.33 percent, 12.53 percent and 5.74 percent respectively, of the national strength. As regards the number of hatcheries, the above states occupied the following position - Andhra Pradesh 25.4 percent, Tamil Nadu 12.3 percent, Karnataka 9.02 percent and Kerala 8.2 percent. With reference to the number of layer parent stock, the states of Andhra Pradesh, Tamil Nadu, Karnataka and Kerala contributed 19.48 percent, 10.58 percent, 8.46 percent and 0.34 percent respectively (Table 1.12).

Review about the per capita availability of egg in India revealed that it was only 11 eggs in 1971. It increased to 18 in 1981, 26 in 1988 and 30 in 1990. The per capita availability of egg per annum in Kerala was 49 in 1988-89 (Table 1.14).

Since 1970, it was found that the production of egg per fowl per annum increased from 165 to 240 showing a growth of 45.45 percent. Feed conversion ratio showed a decrease by 32.2 percent. The increase in egg weight was by 14 grams within the period of 20 years. (Table 1.15). Shifting from desi fowls to improved ones, provision of balanced feed and additives and other technological transitions are behind this success.

Table 1.14

Per capita availability of poultry products in India from 1971-'90

Year	Per capita Availability of egg (in Nos.)	Per capita availability of Broiler Meat (In grams)
1971	11	0.10
1981	18	0.64
1985	22	0.153
1986	23	0.200
1987	24	0.250
1988	26	0.320
1989	28	0.367
1990	30	0.430

Source: Annual reports of the Department of Agriculture and Cooperation Ministry of Agriculture, Govt.of India.

Table 1.15

Indices of Performance of layer and Broiler Poultry farms in India from 1970-'90

	1970	'75	'80	'85	'90
LAYERS:					
Egg prodution per bird	165	178	207	225	240
Feed Conversion Ratio	2.95	2.85	2.72	2.54	2.00
Average Egg weight(in grams)	41	47	50	52	55
BROILERS:					
Market Age (in days)	72	65	54	49	45
Live weight (in kgs.)	1.36	1.48	1.56	1.70	1.82
Feed Conversion Ratio	3.52	3.25	3.10	2.75	2.30

Source: Indian Poultry Industry Year Books

Table 1.16

Per capita availability of Broiler meat in various states in India 1988-'89

State	Per capita availability of Broiler meat (in grams)
Goa	3931
Punjab	1245
Jammu & Kashmir	1083
Haryana	1019
Andra Pradesh	698
Karnataka	600
Maharashtra	571
West Bengal	456
Tamil Nadu	322
Kerala	256
All India	315

Source: Annual reports of Department of Agriculture and Cooperation, Ministry of Agriculture, Govt. of India.

Thus it was seen that at the national level Kerala had 8th place with regard to broiler fowl strength, 10th place regarding number of broiler hatcheries and 13th place with respect to broiler parent stock.

Study about per capita availability of broiler meat per annum in India revealed that it was as low as 10 grams in 1971, 64 grams in 1981, 320 grams in 1988 and 430 grams in 1990 (Table 1.14). The analysis of per capita broiler meat availability in various states in 1988-89 disclosed that Goa has 3931 grams, Punjab 1245 grams, Jammu and Kashmir 1083 grams, Arunachal Pradesh 1019 grams, Andhra Pradesh 698 grams, Karnataka 600 grams, Maharashtra 571 grams, West Bengal 456 grams, Tamil Nadu 322 grams and Kerala 256 grams Table (1.16).

The review of the performance of broiler poultry farming in India from 1971 to 1991 revealed that live weight per fowl has increased from 1.36 kilograms to 1.82 kilograms, recording an increase of 33.82 percent. The F.C.R. declined from 3.52 to 2.30 recording a growth of 34.65 percent. The market age came down from 72 days to 45 days recording a growth rate of 37.50 percent (Table 1.15).

Thus the analysis revealed that poultry sector in India is developing fast. The existence of hatcheries and breeding units under private sector as well as under public sector, availability of exotic breeds of layer and broiler parent stock, sufficiently adequate infrastructural facilities, increased output of egg and poultry meat, reasonable price and inexhaustive demand for poultry products etc. are the motivators to the present farmers.

1.3. REVIEW OF LITERATURE

This section is to provide an overview of the available literature on the subject. A number of studies were conducted on various technical aspects of poultry farming. Some of them which are closely related to the present work are being reviewed here.

1.3.1. Studies on Poultry Farming

Hawthorne and Miller (1949), Burlingam and Hertal (1949) conducted studies on poultry reared under backyard system. Their study disclosed that earnings per fowl is very much dependent on the flock size. But Cagle (1956) who made an evaluation about the fowls reared under the backyard system opined that income per fowl is not dependent on flock size but is influenced, to a great extent, by rate of mortality and feed efficiency. Davis and Mann (1963) extended the enquiry about desi fowls reared under backyard system to other directions and concluded that earnings per fowl is dependent on flock size, labour utilisation and asset management.

Pandey N.K. and Tewari S.K. (1985) made an evaluation about poultry units maintained under deep litter system where White Leghorn layer fowls and Rani Shaver broiler fowls were reared. The study was about minimum economic size of poultry units.

The studies regarding the performance efficiency of different sizes of poultry farms were conducted by Taluk Dev J.R., Reddy C.V., and Tej Bahadur (1985), Aboobecker (1988), Jadhav M.S. and Kasav D.V. (1989), Pothuluru C.H. (1991) and Krishnakumar (1992). Aboobecker evaluated the capital productivity and profitability of selected breeds of fowls in farms of different sizes in and around Thrissur. It was concluded that while profitability was more characteristic of the large sized farms, productivity was more among the small sized farms. Jadhav and Kasav attempted at a break-even analysis approach on different sizes of broiler poultry farms in Maharashtra. to conclude that optimum results were recorded by large size farms. Pothuluru, in his study about the economics of layer and broiler poultry farms in Andhra Pradesh, came to the conclusion that small size poultry farms do have optimum viability and economy. Krishnakumar, in an attempt to evaluate the commercial viability of egg and meat type poultry enterprise in Andhra Pradesh suggested for large size poultry farms with inbuilt feed compounding units. Taluk Dev et. al. made evaluation about different flock sizes. According to them, flock size influences investment and input-output ratio in broiler poultry farms.

Clayton E.S. (1967) made a detailed study about cost and revenue of layer poultry farms maintained under backyard system. The study revealed that rate of mortality and morbidity decides the input cost and output prices, to a great extent. Saxena V.P. and Gupta S.C. (1971) enquired about cost, revenue and productivity aspects of layer and broiler poultry farms. It was concluded that the involvement of own labour accelerated the productivity. The input costs like feed, day old chick, preventives and medicines showed a more than proportionate increase than that of revenue. But the enhanced output of fowls due to the accelerated demand for the product, made the total cost per unit to come down. Panda J.N. (1973) looked into the employment potential, income generation and cost structure of layer poultry farms. The study remarked that layer poultry farming is very much capable of generating additional income and employment opportunity. Keith J. Rosario (1987) made a comparative study about layer and broiler poultry farms. The study revealed that high capital turnover, accelerated demand for the product, improvement in weight gaining and reduction of market age made broiler poultry farming more attractive.

Nagabhushana Rao (1979) and Singh H. (1980) made studies about rearing and marketing aspects of layer poultry. Nagabhushana Rao came to the conclusion that size of layer poultry farms and the structure of marketing determines the aggregate cost. Patel R.K. (1981) made out the research

conclusion that economies in procurement, processing and marketing decides the success or failure in poultry farming. Prabhakaran R. and Sivaselvam S.N. (1981) identified that economies of scale of operation is behind the success of large size poultry farms and degree of personal involvement of the farmer is the key to success in small size farms. Kothandaraman and Narahari N. (1982) made the conclusion that size of farm, methods of rearing fowls and market structure decided the survival or otherwise of poultry farms. Sathish Chandra (1982) had the strong view that superior quality of day old chicks alongwith the scientific touch in the sphere of farm management decided the success of layer and broiler poultry farms. Lobo J. David (1985) regarded financing and marketing aspects as the central point of success or failure in poultry farming. Taneja B.S. and Gupta A.K. (1986) in their study, pointed out that economical rearing and timely marketing are the strong marks for achievement in poultry farming. Ramappa (1987) disclosed that efficient rearing is the basis for success in layer and broiler poultry farming. Maruthiram B. (1968), Marimuthu (1984), Gnaanamani M.R. (1986), Sadagopan V.R. and Srivastava H.P. (1987) and Thomas M.O. (1990) focussed on feed management. Maruthiram concluded that feed accounted for the highest segment of cost. Marimuthu made it a point to concentrate on low cost self compounded feed for minimizing the rate of mortality and optimizing the return from layer poultry farming. Gnaanamani came to the conclusion that feed management is the decisive element in the success of layer and broiler poultry farming.

Sadagopan and Srivastava concluded that balanced feed when provided at definite intervals with minimum feed wastage could make the poultry enterprise a successful venture. Thomas proposed to rear the fowls under backyard system with locally available feed made into a properly balanced diet, for thriving poultry farming. Atkara S.S. and Srikant Joshy (1987) had the opinion that reduction of feed wastage is the key of success in layer and broiler poultry farming.

Ramaswamy (1986) reported that type of poultry shed, its ventilation and the direction in which it is built etc. influences the heat stress. He suggested internal air filtration and reduction of temperature inside the farms for better liveability and weight gain. He also suggested 'All in All out' system for optimum return from broiler fowls.

In the opinion of Wilson J.D. and Weaver W.D. (1986) lack of sufficient feeder space and lighting give chances for leg abnormalities leading to the culling stage. They also revealed that the relation between marketability and market age, market age and live weight of fowls, live weight and feed conversion ratio, feed conversion ratio and market age etc. are the crucial variables which gear the profitability or otherwise of broiler poultry farms. Lobo J. David (1985), Ramaswamy (1986) and Taneja B.S. and Gupta A.K. (1986) clearly suggested proper record keeping for scientific and successful poultry farming.

Reddy B.V. (1987) and Sunitha Anand (1987) compared the advantages of rearing layer and broiler fowls in deep litter backyard and cages. Reddy contends that under cage system feed conversion ratio and rate of mortality is very low and the system is highly suited for poultry farms in coastal regions. But Sunitha concluded that cage system needs more capital investment and it leads to cage fatigue which develops cannibalism among fowls. But the labour productivity is found high in cage system.

Thus the foregoing discussion revealed that though much literature is available on several aspects of poultry farming, the number of studies about poultry farming in Kerala is totally inadequate. Moreover, the available studies are mainly about the technical aspects of layer poultry farming, and they are made from different independent angles and only little literature is available covering different aspects of commercial poultry farming. Hence an effort is made to analyse the different aspects of poultry farming in the context of data available with respect to the broiler poultry farming in Kerala.

1.4. RESEARCH DESIGN

1.4.1. Title

This study entitled 'Economics of Poultry Farming in Kerala' is a search into the growth and development of broiler poultry farms in the State of Kerala, specifically in the private sector. The title is justified by the detailed analysis and it encompasses on factors as trends in cost and revenue, productivity, extent of capacity utilisation, dimensions that reflect the overall efficiency of the poultry farms. The study also has attempted to make an appraisal of functional problems currently being faced by the farms and to delineate the possible reasons for the failure of layer farms within layer sector of poultry farms as far as the state is concerned.

1.4.2. Significance of the Study

Kerala was a leading producer and exporter of poultry and egg even when farming was done under backyard rearing, with indigenous breeds of fowls. With the advent of commercial layer poultry farming in other states, this position is reversed. Now Kerala has to import at the rate of 4 lakh eggs a day for internal requirements from neighbouring states like Tamil Nadu, Karnataka and Andhra Pradesh[36]. Though the situation is worth exploring, there is hardly any study about this decline. In the

present study, an attempt is made to highlight the factors which dragged the state to this deplorable situation when neighbouring states like Tamil Nadu, Karnataka and Andhra Pradesh have progressed substantially.

Considering the industrial backwardness and the mounting rate of unemployment and underemployment, commercial poultry farming can effectively help in the economic development of Kerala. Therefore, it is imperative to study the economics of the growth and development of commercial broiler poultry farms in the state. The series of studies that have been conducted by the technical veterinarians and others regarding flock size, system of rearing, liveability, broiler housing, feeding efficiency, processing and marketing etc., have hardly touched the economic and financial aspects of commercial broiler poultry farming in Kerala. Hence, an attempt is made here to analyse different aspects of commercial broiler poultry farming in Kerala, with special emphasis on private sector farms.

1.4.3. Research Problem

The present study is to evaluate and bring into picture various aspects of poultry farming in Kerala. The major problems posed are :

1. What is the extent of growth and development of commercial broiler poultry farming in Kerala ?

2. Why has Kerala declined in layer poultry farming ?

3. Whether the individual broiler poultry farms in the state are functioning efficiently ?

4. Whether the trends in input cost are in proportion with output prices ?

5. To see if the current levels of profitability of broiler poultry farms are are being supported by feed convertibility, capital and labour productivity, capacity utilisation and capital intensity?

6. How far the size of commercial broiler poultry farms influence the financial performance ?

1.4.4. Objectives of the study

The concern of the study is to trace the growth and development of commercial broiler poultry farming in Kerala and to identify the financially efficient size of broiler farms. More specifically the objectives are:

1. To evaluate the key factors for the growth and development of broiler poultry farming and the causes for the decline of layer poultry farming in Kerala.

2. To investigate the functional problems of broiler poultry farms in Kerala.

3. To study the trends in the cost and revenue items and its impact on the financial performance of commercial broiler poultry farms in Kerala.

4. To ascertain the achieved productivity, capacity utilisation and capital intensity as indices of income generation in broiler poultry farms in Kerala.

5. To assess and evaluate the impact of farm size on the profitability and financial position and to identify an appropriate size suitable to Kerala situations.

1.4.5. Hypotheses

The first objective is concerned with the factors behind the failure of layer poultry farming and that of the success of broiler poultry farming. The second objective deals with the functional problems faced by commercial broiler poultry farms. As these objectives are descriptive in nature, no hypothesis have been formed. However, the following hypotheses have been formed under the rest of the objectives.

1. The upward trend in output price of broiler poultry meat is being brought about largely by increasing input costs.

2. Productivity of poultry farms, other things being comparable, is directly proportional to the size of farm measured in terms of the number of birds reared.

3. Feed conversion ratio vary significantly with varying size of the farm.

4. Higher the capacity utilisation of poultry farms, more is the profit margin realised.

5. Profitability of the poultry farms, other things being comparable, is a function of the size of farms.

6. High capital turnover is a major determinant of the profitability of broiler poultry farms, irrespective of their size.

1.4.6. Definition of concepts

The important indices and terms used to express the performance level of poultry farms are briefly given in this part.

[i] Capacity utilisation : It stands for the ratio of floor area occupied to the floor area available. Symbolically-

$$\text{Capacity utilisation} = \frac{\text{Occupied floor area in square foot}}{\text{Actual floor area in square foot}} \times 100$$

[ii] Capital employed : This refers to gross capital employed (i.e. current assets + fixed assets).

[iii] Capital intensity : It relates the investment in fixed assets with the input of labour hours. Symbolically -

$$\text{Capital intensity} = \frac{\text{Input of fixed capital in rupees}}{\text{Input of labour hours}}$$

[iv] Capital productivity : It relates the output of meat with the investment in fixed assets. Symbolically -

$$\text{Capital productivity} = \frac{\text{Output of meat in Kilograms}}{\text{Fixed capital investment in Rupees}}$$

[v] Feed conversion ratio (F.C.R.) : It is an index of efficiency expressed in terms of kilograms of feed consumed per dozen of eggs laid or per kilogram of weight gain in broiler fowls. Symbolically -

$$\text{F.C.R.} = \frac{\text{Total Kilograms of feed used}}{\text{Total weight of live birds / number of eggs laid}}$$

[vi] Feed price ratio : It measures the amount of revenue generated from every rupee spent on feed. Symbolically -

$$\text{Feed price ratio} = \frac{\text{Total value of meat / eggs}}{\text{Total cost of feed provided}}$$

[vii] Gross margin per unit of floor area : This indicates the efficiency with which capacity utilisation is made. Symbolically -

$$\text{Gross margin per unit of floor area} = \frac{\text{Gross income - Feed cost}}{\text{Total area of poultry sheds in square feet}}$$

[viii] Labour productivity : It is the relation between the quantity of meat produced and the total input of labour hours. Symbolically -

$$\text{Labour productivity} = \frac{\text{Total live weight of fowls}}{\text{Labour input in hours}}$$

[ix] Return on Investment: This shows the relationship between net profit and capital employed. Symbolically -

$$\text{Return on Investment} = \text{Capital turnover ratio} \times \text{Net profit ratio}$$

[x] Performance Efficiency Factor (P.E.F.): It is an index to compare the performance of each flock or each size with others. Symbolically -

$$\text{P.E.F.} = \frac{\text{Average live weight of fowls}}{\text{F.C.R.}} \times 100$$

1.4.7. Pilot Study

The basis of the present study is the M.Phil. dissertation of the investigator entitled "Finance Management in Broiler Poultry Farms in Ernakulam District". For a broader framework and as a definite step of present study eight private broiler poultry farms from various districts in Kerala were taken for pilot study. Farms were selected from Thiruvananthapuram, Kollam, Kottayam, Ernakulam and Kannur districts as commercialised poultry farming in the state is concentrated in these districts.

Before starting the pilot study the investigator discussed the major aspects of poultry farming with many experts at Centre for Advanced Studies in Poultry Science, Mannuthy; Directorate of Animal Husbandry, Thiruvananthapuram; Central Hatchery, Chengannur and the field staff of some of the leading hatcheries, feed manufacturers and pharmaceutical dealers. Apart from this, the information gathered from the veterans in the field of poultry farming has given more insight to the investigator. This was followed by a detailed literature survey and direct farm exposure at Kerala Agricultural University Poultry Farm, Mannuthy. All these helped the investigator to have a clear and sharp framework for the study.

The pilot study gave valid insights into the extensiveness and nature of universe, suggesting the need of adopting a sampling approach. The information regarding the educational qualification and other personal backgrounds of the farmers, collected during pilot study, was of immense help in designing the tools of data collection.

1.4.8. Universe and Sample

The initial exploration revealed that Kerala Poultry Development Corporation with its headquarters at Thiruvananthapuram being in the infantile stage is unable to provide information like number of broiler poultry farms functioning in the state, number of successful and unsuccessful farms etc. Hence the data relating to the number of commercial broiler poultry farms were collected from the district-level broiler poultry farmer's associations, records of the leading hatcheries, feed suppliers and pharmaceutical dealers, and from the Directorate of Animal Husbandry, Thiruvananthapuram.

Some of the poultry farmers used to dispose off the fowls at a particular age to some other units to avoid the marketing problems. Some of the units are rearing the fowls for pullet supply, and some others are functioning only for the marketing of fowls. Some of the farms undertakes farming operations irregularly while many others are regular but no trace of accounting information are available, even in some crude form. All these farms are excluded from the universe of the study.

This study thus encompasses as its universe only those private broiler poultry farms in the state having continuous operations for not less than five years, which could provide some accounting information and where the average weekly purchase of day old chicks are not less than 100 birds.

In order to keep off the widely scattered broiler poultry farms certain districts, where density of fowls and number of farms are reasonably low were excluded from the study. Thus, the study covers only organised private sector broiler poultry farms in Ernakulam, Thiruvananthapuram, Kottayam, Kollam and Kannur (Table 1.17). The total number of such farms came to 759 and from this a twenty percent sample was drawn at random using random number tables. The number of sample units so selected came to 152 poultry farms.

1.4.9. Tools of data collection

Most of the respondents from the private poultry farms being reluctant to disclose information regarding poultry farming, unless they are very much convinced about the purpose and use. Personal interview was found to be more appropriate than any other method of data collection. As the interview schedule of data collection tool contained a number of technical questions, any substitute arrangement other than personal interview was found found to be unsuitable.

Table - 1.17

Universe and Sample of the Study

Particulars	Weekly Purchase of Chicks	No. of Farms	No.of Farms in Selected Districts				
			TVM	EKM	KTM	KANN	KOLL
Actual Universe		2520	568	645	427	408	472
Effective Universe		759	235	145	140	125	114
SAMPLE :							
Small size farms	100-300	54 (35.33)	12	11	10	12	9
Medium size farms	300-500	61 (40.13)	21	10	11	9	10
Large size farms	500&above	37 (24.34)	14	8	7	4	4
		152 (100.00)	47	29	28	25	23

Most of the data pertaining to poultry farming was collected from the owners of the farms, who were the primary respondents of the study. Data relating to the wage payment, medication, shed cleaning, feeding practices etc. were collected from the workers also as they are better sources of information about these matters, than many of the owners. This approach also provided chances for cross checking. The data so collected formed the basis for preparing Trading, Profit and Loss accounts and Balance sheet of individual units over the period.

Except a few, all other poultry farms in private sector were unable to give dependable information with regard to the flock size during previous years, the records of hatcheries and feed suppliers were used for counter checking.

Information like feed conversion ratio, weeks grown, mortality rate, average live weight in different conditions, usual diseases etc. were collected from the concerned field staffs of hatcheries, pharmaceuticals and government veterinary departments, as part of counter checking with that collected from primary respondents and workers of the poultry farms.

Personal observation was also used for collection of data especially on issues such as flock size, equipments used, type of housing, floor space, number of sheds occupied and unoccupied, number of lots and other trivial things like litter used, water and storage facilities, gap between sheds etc.

1.4.10. Pretest of the tool

Before starting the actual data collection, a pretesting of the tool of data collection was conducted with the draft interview schedule, in two of the local private poultry farms. This enabled the investigator to modify certain questions and even the mode of approach in certain sections of the schedule.

1.4.11. Sources of data

After pretesting, being convinced that all the required information cannot be collected form the owners of the private poultry farms itself, the investigator identified the following collateral sources of primary data. These sources include field staff and other functionaries of hatcheries, feed manufacturers, pharmaceutical distributors and officials of government veterinary departments.

Alongwith primary data, secondary data from various sources such as Directorate of Animal Husbandry Department, Thiruvananthapuram, District Veterinary Departments, Kerala Poultry Development Corporation, Thiruvananthapuram, books and journals on Poultry Sciences, Publications of Directorate of Economics and Statistics, Poultry Industry Year books, M.V.Sc. dissertations and Ph.D. theses on poultry science and technical information from NABARD offices. Unpublished materials and

documents from major hatcheries, suppliers of feed and pharmaceuticals within and outside the state formed the core material for secondary data.

1.4.12. Grouping of farms

Dr. N.K. Pandey and Dr. S.K. Tiwari (1983) in their study about space utilisation, labour productivity and capital productivity in broiler poultry farms; Dr. Talikder, C.V. Reddy and Taj Bahadur (1985) in their study about input-output analysis for a viable size and Dr. Sivaselvam and R. Prabhakaran (1985) in their study about Economics of Broiler Production in and around Madras City, had grouped the farms into small, medium and large sizes on the basis of number of birds reared.

Jadhav M.S. and Kasav D.V. (1989), in their study about Break Even point analysis of poultry farms in Maharashtra, categorised the broiler poultry farms into small (upto 500), medium (500 to 1000) and large (1000 and above) on the basis of average purchase of day old chicks per week. Dr. Krishnakumar (1992), in his study about commercial viability of egg and meat type poultry enterprise in Andhra Pradesh, grouped the broiler poultry farms into small, medium and large.

Aboobecker (1988), in his study about productivity of broiler poultry farms in and around Trichur has categorised the farms into four groups. K.X. Joseph, in the M.Phil. dissertation

entitled 'Finance Management in Broiler Poultry Farms in Ernakulam District' (1988) categorised the farms into three groups as small (less than 300), medium (300 to 500) and large (500 and above) on the basis of the guidelines given by the Centre for Advanced Poultry Science, Kerala Agricultural University[37]. The same categorisation has been adopted for the purpose of the present study.

1.4.13. Analysis of Data

The data collected from sample units and that from secondary sources was analysed and interpreted by using descriptive and inferential statistical tools.

Analysis of data from Finance angle was made with the help of ratio analysis and other techniques of horizontal and vertical analysis.

The hypothesis was duly tested by using correlation analysis and 'F' test.

1.4.14. Scope and Limitations

The study covered the organised broiler poultry farms in Kerala in the private sector. Informations are collected from primary as well as secondary sources. Publications and records of Directorate of Animal Husbandry, District Veterinary

Departments, Kerala Poultry Development Corporation, Tamil Nadu Poultry Development Corporation, relevant records of hatcheries, feed suppliers and pharmaceuticals, published journals, books, etc. on poultry science; M.V.Sc. dissertations and Ph.D. theses on poultry science formed the secondary data.

The study covered the period 1987 - 91 and the effective universe according to the inclusion criteria came to 759 commercial broiler poultry farms in the districts of Thiruvananthapuram, Ernakulam, Kollam, Kottayam and Kannur. Among these a 20 percent sample, after giving due weightage for various sizes, is selected on a random basis, by using the Random Sample Table.

The study about the economics of poultry farming has to cover aspects relating to factors of growth, production, processing, marketing, consumption, export, employment, productivity, credit and insurance, government policy, linkage between rural and urban areas etc. In this study emphasis is given to aspects like growth, development, functional problems, trend of cost and revenue, effect of productivity, capacity utilisation and capital intensity on income generation, as well as the impact of farm size on the profitability and financial position.

Though the term poultry covers fowls, ducks, guinea fowls, turkey and quails, this study is about fowls only, since the rearing and farming of other varieties have not yet been developed as a commercially viable sector in Kerala.

In the public sector poultry farms in Kerala both layer and broiler chicks are reared. These farms are concentrating on breeding, hatching and rearing of genetically superior varieties of layer fowls. Public sector farms also engage in rearing and hatching of broiler fowls but the output of day old chicks are negligible and it is the private sector which practically dominates the broiler poultry sector in Kerala. Therefore, public sector farms are excluded from this study.

The co-operative sector farms are totally excluded due to the lack of sufficient number of units.

Statistics relating to some aspects of broiler poultry farming are rudimentary and inadequate. Moreover, farmers are unwilling to disclose many of the general aspects of their farms. Most of the respondents were using crude form of accounting and they were not in a position to provide past data. Hence, primary data for the period 1987-91 alone is incorporated in this study.

Many of the data collected from employees of the farms are estimates rather than accurate measurements. In order to facilitate analysis the accounting data has been arranged in such a manner that it is closed on 31st December of every year.

Geographical difference in the location of farms was not taken as a variable in the study.

Layer poultry farms were excluded from the major study for want of representativeness and universality.

Day old chick cost, feed cost, feed requirements, batch size, lot size, mortality rates, sales price and other incomes are taken on an yearly average.

There is wide disparity in land value and rental value of land, among villages, towns, districts etc. and hence rental value of land as well as land value is excluded from the analysis. Because of inclusion criteria the proposed universe and the effective universe taken for the study were different. The study about broiler poultry farming was based on sampling and the limitations applicable to any sample survey will be applicable to the present study.

1.4.15. Chapter Scheme

For the purpose of analysis, the thesis is divided into six chapters. The first chapter gives a brief introduction, overview of poultry farming, review of literature, research problems, significance, objectives, hypothesis, methodology, scope and limitations of the study.

The second chapter traces the growth, development and functional problems of layer and broiler poultry farms in Kerala.

Trends in costs and revenue in broiler poultry farms in Kerala are dealt with in the third chapter.

Fourth chapter examines productivity, capacity utilisation, capital intensity and feed convertibility of various sizes of broiler poultry farms in Kerala.

Fifth chapter analyses the financial performance of various sizes of broiler poultry farms in Kerala.

The concluding chapter, besides dealing with summary and findings of the study, highlights some of the suggestions emerging from the study.

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CHAPTER II

GROWTH, DEVELOPMENT AND FUNCTIONAL PROBLEMS OF POULTRY FARMING IN KERALA

There is historical evidence to show that in Kerala almost all the indigenous breeds of fowls were reared even in the distant 15th century. Constant trade connections with China even before the Christian era, interference of Portuguese and Egyptian military during the 16th century belief in witchcrafts during the 17th century, British rule during 19th century etc. paved the way for the growth and exchange of varied species of fowls in Kerala, especially in and around Cochin, Calicut and Quilon[38].

2.1 LAYER POULTRY FARMING

Kerala was considered to be one of the major sources of poultry meat and egg and the state was exporting large quantities of egg, meat and fowls to other states previously. After the long period of rearing desi fowls under the primitive methods of backyard rearing, scientific poultry rearing started in the year 1955. With the functioning of district poultry farm at Kollam (1955) and Central Hatchery at Chengannur (1961) the improved layer fowls were made available to the farmers in many of the districts in Kerala. The government hatchery at Kozhikode (1962) and district poultry farm at Malampuzha (1964) were started basically with the task of popularising improved fowls. The

attempt proved to be successful and the tempo was maintained till the surging of broiler poultry farming in the state.[39]

In 1991 Kerala had third place in India with regard to the number of improved layer fowls, fifth place for the number of layer hatcheries, tenth place for the strength of desi layer fowls and fourteenth place on account of layer parent stocks.[40]

The layer farms in public sector were organized mainly for breeding and hatching of improved layer fowls and popularising them among poultry farmers in the state. But the private layer poultry farms and the layer poultry farms in co-operative sector have practically degenerated into egg marketing units. This was due to the fact that eggs are available from Tamil Nadu, Karnataka and Andhra Pradesh at a price less than the cost of production in Kerala (Table 2.1).

2.1.1. Number of Farms

In 1991 there were 79 organised layer poultry farms in Kerala; consisting of 12 farms in private sector, 10 in public sector and 57 in co-operative sector. Districtwise analysis of private sector layer poultry farms revealed that in 1991 Thiruvananthapuram had the highest number of farms (3), This was followed by Ernakulam (2), Thrissur (2), Alappuzha (2), Kollam (1), Kottayam (1) and Kannur (1). With regard to the layer poultry farms in public sector the districts of Alappuzha,

Table 2.1

Comparative statement showing the profit from eggs produced in Kerala and that imported from neighbouring states

	1980	1981	1982	1983	1984	1985
Selling price in Kerala (Per 100 eggs)	45.00	44.00	46.00	48.00	50.00	50.60
Cost of eggs produced in Kerala('')	37.94	40.08	44.22	47.35	51.12	49.87
Cost of imported eggs ('')	37.00	40.70	41.96	43.40	46.70	47.34
Profit when eggs are produced and sold ('')	7.06	3.92	1.78	0.65	- 1.12	0.73
Profit when eggs are imported and sold ('')	8.00	3.30	4.04	4.60	3.30	3.26

Source: A.H. Statistics, Kerala, Livestock Census Report, and Poultry Industry Year Books

Thrissur, Kasargod and Wynad had no farms, whereas all the other districts had one farm each. As regards the layer poultry farms in the co-operative sector, Thiruvananthapuram and Kannur had the highest number with 10 each, which was followed by Alappuzha (8), Kottayam (8), Kasargod (7), Ernakulam (5), Pathanamthitta (3), Kozhikode (2), Wynad (2), Kollam (1) and Thrissur (1) (Table 2.2).

2.1.2. Fowl Strength

According to Livestock Census 1987, the total layer poultry strength in the state was 35.81 million, comprising of 34.78 million desi fowls and 1.03 million improved fowls. At the national level the total layer fowl strength was 252 million comprising of 170 million desi fowls and 82 million improved fowls (Table 1.11). The data clearly shows that 97.11 percent of the total layer fowls in Kerala was desi type whereas at the national level it was only 67.46 percent (Table 2.3). The analysis also revealed that Kerala accounted for 20.46 percent of desi layer fowls (34.78 million) in the country while that of improved type was only 1.26 percent (1.03 million) (Table 2.4). A districtwise analysis of desi fowls revealed that in Thiruvananthapuram it was 12.83 million (35.83 percent) and in Kollam it was 11.28 million (31.50 percent). Which accounted for 67.33 percent of the state output in 1987. The contribution from other districts were Malappuram 1.54 million (4.3 percent), Thrissur 1.26 million (3.52 percent), Ernakulam 1.22 million

Table 2.2

Number of organised commercial layer poultry farms in each district in Kerala in 1991

District/State	Number of Farms			
	Private	Public	Cooperative	Total
Thiruvananthapuram	3	1	10	14
Kollam	1	1	1	3
Alappuzha	2	-	8	10
Pathanamthitta	0	1	3	4
Kottayam	1	1	8	10
Idukki	-	1	-	1
Ernakulam	2	1	5	8
Thrissur	2	-	1	3
Palakkad	0	1	-	1
Malappuram	0	1	-	1
Kozhikode	0	1	2	3
Kannur	1	1	10	12
Kasargod	-	-	7	7
Wynad	-	-	2	2
Kerala	12	10	57	79

Source: Animal Husbandry Statistics 1991, Thiruvananthapuram.

Table 2.3

Districtwise layer fowl strength in Kerala in 1987

District/ State	No.of Fowls in Millions			Percentage to state output			Percentage to District output		
	Desi	Improved	Total	Desi	Improved	Total	Desi	Improved	Total
Thiruvananthapuram	12.83	0.20	13.03	35.83	0.56	36.39	98.47	1.53	100.00
Kottayam	1.10	0.12	1.22	3.07	0.34	3.41	90.16	9.84	100.00
Malappuram	1.54	0.11	1.65	4.30	0.32	4.62	93.33	6.67	100.00
Ernakulam	1.22	0.09	1.31	3.41	0.25	3.66	93.13	6.87	100.00
Thrissur	1.26	0.07	1.33	3.52	0.20	3.72	94.74	5.26	100.00
Alappuzha	0.84	0.06	0.90	2.34	0.17	2.51	90.00	10.00	100.00
Kollam	11.28	0.06	11.34	31.50	0.17	31.67	99.47	0.53	100.00
Kozhikode	1.02	0.06	1.08	2.85	0.17	3.02	94.44	5.56	100.00
Palakkad	0.97	0.05	1.02	2.71	0.14	2.85	95.10	4.90	100.00
Idukki	0.51	0.04	0.55	1.42	0.11	1.53	92.72	7.28	100.00
Pathanamthitta	0.75	0.04	0.79	2.09	0.11	2.20	94.94	5.06	100.00
Wynad	0.33	0.02	0.35	0.92	0.05	0.97	94.28	5.72	100.00
Kasargod	0.48	0.02	0.50	1.34	0.05	1.39	96.00	4.00	100.00
Kerala	34.78	1.03	35.81	97.11	2.89	100.00	97.12	2.88	100.00

Source: Livestock Census Report 1987

Table 2.4

Comparative figures of Desi and improved fowls in India and Kerala - 1987

(Percentage to national figures in brackets)

State/Nation	Layer fowls in millions		
	Desi	Improved	Total
Kerala	34.78 (20.46%)	1.03 (1.26%)	35.81 (14.21%)
India	170.00	82.00	252.00

Source: Livestock Census 1987 - Kerala and Annual Report of Dept. of Agriculture and Co-operation, Ministry of Agriculture - Govt. of India.

(3.41 percent), Kottayam 1.11 million (3.0 percent), Kozhikode 1.02 million (2.85 percent), Palakkad 0.97 million (2.71 percent), Alappuzha 0.84 million (2.34 percent), Pathanamthitta 0.75 million (2.09 percent), Kannur 0.65 million (1.81 percent), Idukki 0.51 million (1.42 percent), Kasargod 0.48 million (1.34 percent) and Wynad 0.33 million (0.92 percent) (Table 2.3).

With regard to the districtwise strength of improved layer fowls, Thiruvananthapuram with 0.20 million fowls stood first. The output from other districts in order of importance were Kottayam (0.12 million), Malappuram (0.11 million), Ernakulam and Kannur (0.09 million each), Thrissur (0.07 million), Alappuzha, Kollam and Kozhikode (0.06 million each), Palakkad (0.05 million), Idukki and Pathanamthitta (0.04 million each), Wynad and Kasargod (0.02 million each) (Table 2.3).

2.1.3. Egg Production

In 1991 the egg production by public sector layer poultry farms in the state came to 1.738 million (0.11 percent) whereas the requirement for hatching purpose alone was estimated at 1.792 million. The output from the layer poultry farms in private sector was 1588.262 million eggs (99.89 percent), in 1991[41]. This comprise of 1060 million eggs (66.67 percent) raised from desi fowls and 528.262 million (33.33 percent) raised from improved fowls (Table 2.5). This was found to be not sufficient for the consumption requirements of the state. Hence, the state

Table 2.5

Sectorwise output of egg from layer poultry farms in Kerala 1991

(Percentage to total output in brackets)

Sector	Eggs Produced (in Millions)					
	Improved Fowls		Desi Fowls		Total Fowls	
Organised	1.738	(0.11)	-	-	1.738	(0.11)
Unorganised	528.262	(33.22)	1060.00	(66.67)	1588.262	(99.89)
Total	530.00	(33.33)	1060.00	(66.67)	1590.00	(100.00)

Source: Animal Husbandry Dept. Statistics 1991
Thiruvananthapuram

had to import eggs from Tamil Nadu, Karnataka and Andhra Pradesh at a rate of 4 lakh eggs a day, to meet its internal requirements.[42]

The study about the egg production in each district in 1991 revealed that Thiruvananthapuram accounted for 306.55 million (19.28 percent). This was followed by Kottayam 190.01 million (11.95 percent), Malappuram 164.88 million (10.37 percent), Ernakulam 143.58 million (9.02 percent), Kannur 130.22 million (8.19 percent), Thrissur 108.44 million (6.82 percent), Alappuzha 100.17 million (6.30 percent), Kollam 97 million (6.10 percent), Kozhikode 93.97 million (5.91 percent), Palakkad 77.11 million (4.85 percent), Idukki 68.37 million (4.30 percent), Pathanamthitta 56.28 million (3.54 percent), Wynad 28.3 million (1.78 percent) and Kasargod 25.12 million (1.58 percent) (Table 2.6).

2.1.4. Other Factors

2.1.4.1. Number of hatcheries

Number of hatcheries and strength of parent stock is considered as a yardstick to assess growth. The enquiry about the number of layer poultry hatcheries in Kerala revealed that in the private sector none of them is engaged in hatching of layer chicks, except under custom hatching. All the 10 public sector poultry breeding farms including Central Hatchery at Chengannur is hatching layer chicks alongwith broiler chicks.

Table 2.6

Poultry Egg production and density of improved layer Fowls in various districts in Kerala in 1991

District	Density of Improved layer fowl per Sq.km.	Total Eggs production in millions	Percentage to total output
Thiruvananthapuram	91	306.55	19.28
Kottayam	56	190.01	11.95
Malappuram	30	164.88	10.37
Ernakulam	40	143.58	9.03
Kannur	29	130.22	8.19
Thrissur	24	108.44	6.82
Alappuzha	48	100.17	6.30
Kollam	25	97.00	6.10
Kozhikode	26	93.97	5.91
Palakkad	11	77.11	4.85
Idukki	9	68.37	4.30
Pathanamthitta	14	56.28	3.54
Wynad	9	28.30	1.78
Kasargod	8	25.12	1.58
Kerala	27	1590.00	100.00

Source: Animal Husbandry Statistics 1991 - Thiruvananthapuram.

2.1.4.2. Strength of parent stock

As regards the strength of layer parent stock in the state poultry breeding farms, in 1991 it was only 13600.[43]

Thus the inadequate strength of improved layer fowls, the growing dependence on import of eggs from neighbouring states, the insufficient number of layer poultry farms and layer fowl hatcheries in private sector, and the meagre strength of layer parent stock clearly indicated the overall decline of layer poultry farming in the private sector in Kerala.

2.1.5. Causes for the decline of Layer Poultry Farming in Kerala

This section of study is made mainly with secondary data from State Animal Husbandry Department, National Egg Co-ordination Committee, Centre for Advanced Poultry Science, Mannuthy and Poultry Industry year books. Moreover, the opinion analysis of the farmers in private sector who has already shifted from layer farming to broiler farming was also incorporated here. The views expressed by well known veterinarians who are at present engaged in farm-aid services were also used.

2.1.5.1. Cost of major inputs

Cost of feed and day old chicks accounted for 90 percent of the working capital in layer poultry farms. The share of feed in total cost decides the success or failure of layer poultry farming in India, as it accounts for 75 to 80 percent of cost of production[44].

With regard to the layer poultry farms in Kerala, it was found that the cost of feed and day old chicks constituted the major portion of the total cost on an average. While looking at the cost of feed and chicks from 1980 to 1985 it was found that the total cost ranged from 82.59 percent to 83.76 percent (Table 2.7). This clearly shows the dominance of cost of day old chicks and feed in layer poultry farms in Kerala. While evaluating the growth rate of these major input items it was seen that cost per day old chick increased from Rs.4.25 in 1980 to Rs.6.72 in 1985, recording a growth rate of 58.12 percent. The annual figures over the period showed that in 1981 the growth rate was 20 percent while in the subsequent years it was 7.84 percent, 12.73 percent, 3.23 percent and 5 percent (Table 2.8).

The cost per kilogram feed grew from Rs.1.96 in 1980 to Rs.2.61 in 1985, recording a growth of 33.16 percent. While coming to the annual figures it was found that the rate of growth in the cost of feed in 1981 was 10.71 percent and during the subsequent years it was 2.3 percent, 6.31 percent, 8.9 percent and 1.56 percent (Table 2.8).

Table 2.7

Selling Price, Cost and Profit per 100 eggs of layer poultry farms in Kerala

	1980	1981	1982	1983	1984	1985
Selling price	45.00(118.60)	44.00(109.78)	46.00(104.03)	48.00(101.39)	50.00 (97.81)	50.60(101.46)
Variable cost	31.77(83.73)	33.33(83.15)	36.59(82.74)	39.10(82.59)	42.82 (83.76)	41.57(83.36)
Gross margin	13.23(34.87)	10.67(26.62)	9.41(21.28)	8.90(18.80)	7.18 (14.05)	9.03(18.10)
Fixed cost	6.17(16.26)	6.75(16.84)	7.63(17.25)	8.25(17.43)	8.30 (16.24)	8.30(16.64)
Net Margin	7.06(18.60)	3.92(9.78)	1.78(4.03)	0.65(1.37)	- 1.12 (-2.19)	0.73(1.46)

Source: Livestock Census data,
Pricelists of NECC,
A.H. Statistics Kerala,
and Poultry Industry Year books

(Percentage to total cost in parenthesis)

Table 2.8

Growth rate in various elements of cost and revenue, in layer poultry farms in Kerala

(Growth rate in Percentages in brackets)

	1980	1981	1982	11983	1984	1985	Growth rate between 1980 & '85
Selling Price:							
Per 100 eggs	45.00 -	44.00 (-2.22)	46.00 (4.54)	48.00 (4.35)	50.00 (4.17)	50.60 (1.20)	12.44%
Per spent bird	12.00 -	14.00 (16.67)	15.00 (7.14)	17.00 (13.33)	18.00 (5.88)	20.00 (11.11)	66.67%
Cost:							
Per day old chick	4.25 -	5.10 (20.00)	5.50 (7.84)	6.20 (12.73)	6.40 (3.23)	6.72 (5.00)	58.12%
Per kg. of feed	1.96 -	2.17 (10.71)	2.22 (2.30)	2.36 (6.31)	2.57 (8.90)	2.61 (1.56)	33.16%
Fixed cost per 100 eggs	6.16 -	6.75 (9.58)	7.63 (13.03)	8.24 (7.99)	8.30 (0.73)	8.30 (0.00)	34.74%

Sources: Livestock Census data, Price lists of NECC, A.H. Statistics, Kerala, and Poultry Industry Year Books

The above analyses made it clear that the cost of feed and day old chicks recorded a continuous growth over the period and this influenced the cost of production. When the cost of production increased the layer poultry farming operation in Kerala became less attractive, particularly when imported eggs were available at a price less than the cost of production (Table 2.1).

2.1.5.2. Imbalance between cost and import price

In 1980, 92.76 percent of the layer fowls were reared in rural areas and 75 to 80 percent of the eggs produced in the state was traded in urban markets[45]. The transporting of eggs from far away rural farms to the urban markets added to the cost. Alongwith this the consistently growing cost of feed and day old chicks had taken the layer farmers to buy and sell eggs rather than producing and selling it.

The analysis of selling price per 100 eggs and the wholesale rate of egg when it reaches here from Tamil Nadu, Karnataka and Andhra Pradesh substantiates the above. The wholesale rate of imported eggs in 1980 was Rs.37.00 per 100 eggs whereas the local cost of production at that time was Rs.37.94 per 100 eggs. This mean that from the imported eggs the margin of profit was Rs.8.00 per 100 eggs whereas that from locally produced eggs was Rs.7.06. In 1981 the situation was slightly

different. When the cost of producing 100 eggs was Rs.40.08, the import price was Rs.40.70. However, since 1982 the farmers preferred to have imported eggs for the opportunity profit per 100 eggs amounted to Rs.2.26 in 1982, Rs.4.05 in 1983, Rs.4.42 in 1984 and Rs.2.53 in 1985 (Table 2.1). This analysis makes it clear that import of eggs is better than producing it, both from profit angle and risk angle.

While matching the trend of cost with the price of eggs it was found that when the cost of major input items increased by 50.24 percent from 1980 to 1985, the wholesale price of eggs went up only by 12.44 percent (Table 2.8).

While making an year wise analysis it was found that when the cost of feed and day old chicks grew by 17.07 percent in 1981 the selling price of eggs declined by 2.22 percent. During 1981 the gross margin per bird per month decreased from Rs.2.34 to Rs.1.89, resulting in a decline of 19.23 percent. During 1982 the cost of feed and chicks grew by 6.19 percent and the price of eggs by 4.54 percent resulting in the decline of gross margin per bird per month from Rs.1.89 to Rs.1.66. In 1983 the cost of feed and chicks together increased by 10.88 percent whereas egg price grew by 4.35 percent and the gross margin per bird per month went down from Rs.1.66 to Rs.1.57. In 1984 and 1985 the cost of feed and chicks went up by 4.79 percent and 4.01 percent respectively, but the price of eggs increased only by 4.17 percent and 1.20 percent respectively. This made the gross margin per bird per

month to slide down from Rs.1.57 in 1983 to Rs.1.27 in 1984 and to Rs.1.66 in 1985 (Table 2.8 and 2.7). While looking at the gross margin per bird per month it was found that the excessive growth in the cost of day old chicks and feed was slightly compensated by a 66.67 percent growth rate in revenue realised from spent birds over 1980 to 1985 (Table 2.8).

Thus the analysis about the cost of input items clearly showed that the increase in selling price of eggs was less than proportionate to the increase in the cost of feed cum day old chicks and this led to a decline in gross margin per bird per month and it made way for the decline of layer poultry farming in Kerala, especially in private sector.

2.1.5.3. Other factors

Other factors which led to the failure of layer poultry farming in Kerala were declining return on investment, higher investment per fowl and longer cycle of fowls.

The Return on Investment was found to be 18.65 percent in 1980, 9.11 percent in 1981, 3.73 percent in 1982 and 1.23 percent in 1983. In 1984 the rate was (-)2.12 percent and in 1985 it was 1.30 percent (Table 2.9). The increase in the cost of fixed assets, equipments and the need for enhanced working capital

Table 2.9

Gross Profit, Net Profit and Return on Investment from layer poultry farms in Kerala

	1980	1981	1982	1983	1984	1985
Average Gross Margin per bird per month (in Rs.)	2.34	1.89	1.66	1.57	1.27	1.66
Average Net Margin per month (in Rs.)	1.24	0.69	0.31	0.11	-0.20	0.13
Investment per bird (in Rs.)	79.80	90.90	99.65	107.65	113.45	120.00
Return on Investment (in percentage)	18.65	9.11	3.73	1.23	-2.12	1.30

Source: A.H. Dept. Statistics, Kerala, Poultry Industry year books and Livestock Census Report.

caused the decline in the Return on Investment. This forced the layer poultry farmers to change their area of operation to broiler poultry farming.

Between the capital investment per layer fowl and that for a broiler fowl the variation was found to be wide. The investments in a layer fowl and a broiler fowl were Rs.120; and Rs.70 respectively.[46] This again prompted the layer farmers to switch over to broiler poultry farming. Moreover, when the investment per layer fowl increased from Rs.79.80 in 1980 to Rs.120 in 1985, marking an increase of 50.38 percent, the gross margin per fowl was found to be declining over this period (Table 2.9). This was another reason which contributed to the failure of layer farming.

The cycle of a layer fowl is ranging from 17 to 18 months and that for a broiler fowl is 1.5 to 2 months.[47] Being shorter in duration, broiler farming provides advantages of lesser interest burden and lesser risk. The long life cycle, delayed payback period, and high investment per bird increased the risk factor and decreased the overall farm productivity and profitability of layer poultry farms[48]. These factors forced many of the layer poultry farmers to shift to broiler poultry farming.

The study made it clear that chances of getting quick but better rate of earnings with comparatively lesser risk prompted the farmers to shift from layer to broiler farming. Together with this the vehement drive for broiler poultry farming at the national level made way for the entry of breeders of international repute into the state. This very soon put a strong hold on the broiler poultry scene in Kerala, particularly since 1980. Though the state government was earnestly propagating improved layer fowls, many of the former layer poultry farmers faced total failure by around 1980s. By 1987 the broilers have undisputedly overtaken layers, in southern states of India, especially in Kerala[49].

Now, with the incorporation of Kerala Poultry Development Corporation in 1989, the layer poultry farming is given more importance than before. The thrust area according to the plan is to popularise improved layer fowls under backyard rearing system. However, the performance of Kerala State is dismally poor with regard to layer poultry farming, whereas the states of Karnataka, Tamil Nadu and Andhra Pradesh have attained remarkable progress.

2.2. BROILER POULTRY FARMING

2.2.1. Evolution and growth of broiler poultry farming in Kerala

The phenomenal expansion of broiler farming at national level and its buoyant spread in Andhra Pradesh, Tamil Nadu and Karnataka made the government of Kerala think about broiler farming. The starting of broiler poultry units in Regional Poultry Farm at Koovapady (1980) and District Poultry Farm at Kozhikode (1980) was the beginning of the organised broiler poultry farming in Kerala[50]. Gradually some of the private layer poultry farmers began to rear broiler fowls, in limited number, alongwith layer fowls. As the venture was found successful, a number of layer poultry farmers began to shift from layer farming to broiler farming by taking the day old chicks from Tamil Nadu and Karnataka. With the establishment of broiler division in Central Hatchery, Chengannur (1985), and government broiler farm at Petta (1987), broiler farming had a boom. With the functioning of Regional Poultry Farm at Kannur (1988), District Poultry Farms at Manarcaud (1988) and Kollam (1989), Intensive Poultry Development Blocks at Moovattupuzha and Petta broiler poultry farming began to spread widely. Though the number of poultry breeding units increased over a period of time, they were not in a position to supply high quality day old chicks.. To overcome this, government has entered into tie-up agreements with leading breeders outside the state, and it was really a boost to broiler poultry farming in Kerala. Despite all this, the available infrastructure and the service rendered by the

government in this regard was not at all sufficient to meet the internal demand especially that of day old chicks, feed, medicines and preventives. This resulted in the entry of hatcheries, feed manufacturers and pharmaceutical companies in private sector, from within and outside the state.

In 1991 the state has seven medium scale broiler hatcheries, four medium scale feed manufacturing units, three small scale pharmaceutical companies and five small scale equipment manufacturing companies in private sector. But the supply position is not at all sufficient enough to meet the home demand[51]. This made the broiler poultry farmers in the state to depend on the private entrepreneurs of other states, especially for day old chicks, feed, pharmaceutical items and farm equipments. In 1991 Kerala had the 8th place on account of broiler fowl strength, 10th place for the number of broiler hatcheries and 13th place for the broiler parent stock, at all India level (Table 1.12).

2.2.2. Number of farms

The number of regularly operating broiler poultry farms in the state amounted to 1087 in the year 1991 of which 1076 were in the private sector, 9 in the public sector and 2 in cooperative sector. (Table 2.10).

Table 2.10

Number of organised Commercial Broiler Poultry farms in each district in 1991

District/State	Number of organised farms			
	Private	Public	Cooperative	Total
Ernakulam	253	2	-	255
Thiruvananthapuram	158	2	1	161
Kottayam	133	1	-	134
Kollam	112	1	-	113
Kannur	103	1	-	104
Palakkad	55	-	-	55
Thrissur	49	-	-	49
Kozhikode	45	1	-	46
Alappuzha	43	-	1	44
Kasargod	42	-	-	42
Pathanamthitta	33	1	-	34
Malappuram	21	-	-	21
Idukki	20	-	-	20
Wynad	9	-	-	9
Kerala	1076	9	2	1087

Source: Animal Husbandry Dept. Statistics 1991 - Tiruvananthapuram and Broiler Farmer's Association at District level.

The highest number of private broiler poultry farms were found in Ernakulam (253), followed by Thiruvananthapuram (158), Kottayam (133), Kollam (112), Kannur (103), Palakkad (55), Thrissur (49), Kozhikode (45), Alappuzha (43), Kasargod (42), Pathanamthitta (33), Malappuram (21), Idukki (20) and Wynad (9) (Table 2.11). With respect to broiler poultry farms in public sector in each district, Thiruvananthapuram and Ernakulam had two farms each, Pathanamthitta, Kollam, Kottayam, Kannur and Kozhikode had one each. Broiler production in cooperative sector was confined to Thiruvananthapuram and Alappuzha districts having one farm each (Table 2.10).

2.2.3. Output

Districtwise analysis of weekly demand and supply of day old chicks disclosed that 73.45 percent of the demand was from five districts namely Thiruvananthapuram (26.12 percent), Ernakulam (15.43 percent), Kottayam (13.62 percent), Kollam (9.72 percent) and Kannur (8.56 percent). The output form other districts in percentage were Thrissur 6.2, Kasargod 4.11, Palakkad 3.87, Kozhikode 3.5, Alappuzha 3.1, Malappuram 2.09, Idukki 1.82, Pathanamthitta 1.11 and Wynad 0.72 (Table 2.11).

Table 2.11

Demand and Supply position of Day old broiler chicks in various districts in Kerala 1991

District/State	Total Number of Farms	Weekly Demand	Sources of chicks in %		
			Private	Government	
				Inside state	Outsid state
Thiruvanathapuram	161(14.81)	38675(26.12)	98.87	1.13	-
Ernakulam	255(23.46)	22850(15.43)	90.80	9.64	0.56 (0.08)
Kottayam	134(12.33)	20170(13.62)	88.94	11.06	-
Kollam	113(10.40)	14385(9.72)	92.75	7.25	-
Kannur	104(9.57)	12680(8.56)	96.94	3.06	-
Thrissur	49(4.51)	9175(6.20)	92.29	6.10	1.61 (0.10)
Kasargod	42(3.86)	6085(4.11)	100.00	-	-
Palakkad	55(5.06)	5740(3.87)	100.00	-	-
Kozhikode	46(4.23)	5195(3.50)	90.09	9.91	-
Alappuzha	44(4.05)	4600(3.10)	92.80	7.20	-
Malappuram	21(1.93)	3100(2.09)	100.00	-	-
Idukki	20(1.84)	2700(1.82)	100.00	-	-
Pathanamthitta	34(3.13)	1645(1.11)	82.13	13.31	4.56 (0.05)
Wynad	9(0.82)	1060(0.72)	100.00	-	-
Kerala	1087(100.00)	148060(100.00)	94.45	5.38	0.17

Source: Animal Husbandry Dept. Statistics - 1991 - Thiruvananthapu

2.2.4. Density of Fowls

The average density of broiler fowls per square kilometer in the state in 1991 was 30. On a districtwise analysis it was found that Thiruvananthapuram had 142, Ernakulam 78, Kottayam 74, Kollam 46, Kannur 34, Alappuzha 27, Kasargod 25, Thrissur 24, Kozhikode 17, Palakkad 10, Malappuram 9, Pathanamthitta 5, Idukki 4 and Wynad 4 (Table 2.12).

2.2.5. Network

The poultry network consists of the agencies which provide chicks, feed, pharmaceuticals, equipment and farm aid services.

2.2.5.1. Supply of day old chicks

The number of hatcheries and breeding farms in the state in 1991 came to 17, of which 10 are in public sector and 7 in private sector[52]. Hatcheries in private sector are producing broiler chicks only whereas all public sector hatcheries except that at Petta and Kudappanakkunnu are dealing with improved layer chicks, broiler chicks and other species of fowls.

On analysis it was found that supply of day old broiler chicks are mainly under the control of private hatcheries, accounting for 94.45 percent of the total requirements, 5.38 percent of the requirements are met by government hatcheries and 0.17 percent by reputed breeders from other states under tie-up agreements (Table 2.11).

Table 2.12

Average Density of broiler fowls in each district 1991

District	Density/Km.
Thiruvananthapuram	142
Ernakulam	78
Kottayam	74
Kollam	46
Kannur	34
Alappuzha	27
Kasargod	25
Trissur	24
Kozhikode	17
Palakkad	10
Malappuram	9
Pathanamthitta	5
Idukki	4
Wynad	4
Kerala	30

Source: Animal Husbandry Statistics 1991 Thiruvananthapuram

The enquiry about the sources of day old broiler chicks in the state in 1991 revealed that private hatcheries are in a dominant position. 100 percent of the requirements in Palakkad, Malappuram, Wynad, Idukki and Kasargod are met by private hatcheries. 98.87 percent of the requirements in Thiruvananthapuram, 96.94 percent in Kannur, 92.8 percent in Alappuzha, 92.75 percent in Kollam, 92.29 percent in Thrissur, 90.09 percent in Kozhikode, 90.08 percent in Ernakulam and 82.13 percent in Pathanamthitta are met by private hatcheries (Table 2.11).

The supply from government hatcheries and breeding units in the state recorded 13.31 percent of the requirements in Pathanamthitta, 11.06 percent in Kottayam, 9.91 percent in Kozhikode, 9.64 percent in Ernakulam, 7.25 percent in Kollam, 7.2 percent in Alappuzha, 6.01 percent in Thrissur, 3.06 percent in Kannur and 1.13 percent in Thiruvananthapuram (Table 2.11).

The availability of day old broiler chicks under tie-up agreements with leading breeders of other state amounted to 0.17 percent in 1991. And it was found that the inflow of this pure-line chicks mainly went to Centre for Advanced Poultry Science, Mannuthy (0.10 percent) Regional poultry and breeding farm at Koovapady (0.08 percent) and Central Hatchery, Chenganoor (0.05 percent) (Table 2.3).

2.2.5.2. Feed Supply

There are four public sector broiler feed manufacturing units in Kerala located at Alappuzha, Thiruvananthapuram, Ernakulam and Kannur. Moreover, there are four such units in the private sector. Kerala had to depend on the neighbouring states like Andhra Pradesh, Karnataka and Tamil Nadu for its feed requirements because the units in Kerala could not produce sufficient quantities of feed as far as the requirements of the state was concerned. the non-availability of sufficient quantities of major feed ingredients was the major constraint in this regard.

2.2.5.3. Pharmaceuticals

With respect to the pharmaceutical aids Kerala mainly depends on other states like Karnataka, Maharashtra and Tamil Nadu. There are only three private firms which manufacture and supply pharmaceuticals in Kerala.

2.2.5.4. Equipments

In the field of equipment manufacturing, Kerala is not self sufficient. Nearly 90 percent of the poultry equipment comes from Maharashtra, Andhra Pradesh, Delhi, Tamil Nadu and Karnataka. Recently five small scale equipment manufacturing units have started functioning in the state, but their output is

very low. Moreover, quality equipments from large scale equipment manufacturing companies of other states are available here at lesser rates.

2.2.5.5. Disease Control

Alongwith the veterinary units widely spread over in the state, the institutions like Central Hatchery, Chengannur, Centre for Excellence in Pathology, Thiruvalla, Avian Disease Diagnostic Center, Thiruvalla, poultry disease diagnostic centres at Kozhikode and Thiruvananthapuram, and Centre for Advanced Poultry Science, Mannuthy help in the disease control, diagnosis and treatment of broiler fowls in the state.

2.2.5.6. Institutions under Animal Husbandry Department

While evaluating the role of various institutions in the growth and development of poultry farming in Kerala, the support given by Regional and District Poultry farms are really effective. The service given by various departments of Central Hatchery at Chengannur such as chick sexing school, poultry training institute, feed compounding factory, feed testing laboratory, mobile dispensaries etc. are remarkably good. Apart from these specialist centres, the Animal Husbandry Department has five district veterinary centres, fifty one veterinary poly clinics, one hundred and six veterinary hospitals, twelve mobile veterinary hospitals, eighteen mobile farm aid units, four

hundred and thirty six veterinary dispensaries, one hundred and six veterinary sub centres, one fodder development unit, two extensive poultry development blocks, two poultry sub units and four feed mixing plants.[53]

2.2.7. Yield Response

The factors which influenced the broiler performance are feed conversion, liveability, weight gaining and marketing age of fowls.

The factors like efficient feed conversion, better liveability, reasonable weight gaining etc. are the outcome of technological advancements in the field of poultry farming. The credit goes to breeders, feed manufacturers and pharmaceuticals. The service rendered by Centre for Advanced Poultry Science, Mannuthy, Veterinary and Animal Husbandry Departments of the state are really commendable in this regard. Kerala Poultry Development Corporation with its headquarters at Thiruvananthapuram coordinates the infrastructure facilities available in the state for increasing and improving poultry production, which indeed supported the growth of poultry farming in the state. Moreover, increase in the level of literacy, growth of per capita income, increase in the number of households, inclination towards urban culture, enhancement of

disposable income of agriculturists, growth of townships and cities etc. had influenced the demand generation of broiler poultry meat in Kerala.[54]

The study thus revealed that technological advancements in the field of hatching and rearing, and incessant support from various government departments are behind the growth and development of broiler poultry farming. In general, the poultry development in the state has taken rapid strides in recent years and poultry meat production has registered substantial increase. Favourable price and increase in the demand of poultry products are the major reasons for the growth of broiler poultry farms in Kerala.[55]

2.3. GENERAL FUNCTIONAL PROBLEMS OF BROILER POULTRY FARMS IN KERALA

Every business is confronted with a series of functional problems during the course of their day to day operations. These problems differ from industry to industry, business to business or even from unit to unit. The efficiency or otherwise of the management will be reflected through the ability to face the problems scientifically and tactfully.

The important problems faced by broiler poultry farms are those related to finance, supply of farm inputs, labour, marketing, technical and managerial aids and state policy. The detailed analysis of the problems are given below.

2.3.1. Finance

Finance is an important catalyst for the smooth functioning of every business. Capital is needed both for the establishment of the farm and for the working capital requirements.

The opinion analysis of the revealed that 133 out of 152 farms (87.5 percent) have financial problems in one way or other. Of this, 35 farms (23.02 percent) faces problems relating to the shortage of working capital. 81 farms (53.29 percent) experienced delay in official procedures from various agencies. 75 farms

(49.34 percent) complained about levying excessive rate of interest especially on working capital. 112 farms (73.68 percent) were dissatisfied with the assistance and support from government agencies especially in matters connected with refinance facilities and subsidies (Table 2.13).

Sizewise analysis revealed that 37 small size farms (68.51 percent), 43 medium size farms (70.49 percent) and 32 large size farms (86.48 percent) were dissatisfied with the meagre financial assistance from government agencies for poultry farming and poultry development. 21 (38.88 percent) small size farms, 31 (51.82 percent) medium size farms and 29 (78.38 percent) large size farms complained about delays in office procedures for availing loans and advances from various sources. 29 (53.70 percent) small size farms, 26 (42.62 percent) medium size farms and 20 (54.05 percent) large size farms were annoyed about the excessive rate of interest levied by various agencies. 25 (46.29 percent) small size farms, 5 (8.19 percent) medium size farms and 5 (13.51 percent) large size farms had working capital problems (Table 2.13).

Other problems common to all sizes relating to finance include the difficulties in connection with debt collection and lack of credit facility from most of the suppliers especially hatcheries and feed suppliers. Instances of reluctance of commercial banks and other financial institutions in giving financial support to the farmers were also reported.

Table 2.13

Functional Problems relating to Finance in broiler Poultry Farms in Kerala for the year 1990-91

(Percentagewise)

Size of farms	Shortage or working capital	Delay in office procedure	High rate of interest	Insufficient assistance from Govt.	Other difficulties	Total units facing problems	Units with no problems	Total units
Small	25(46.29)	21(38.88)	29(53.70)	37(68.51)	-	49(90.74)	5(9.26)	54(100.00)
Medium	5(8.19)	31(51.82)	26(42.62)	43(70.49)	-	52(85.24)	9(14.76)	61(100.00)
Large	5(13.51)	29(78.38)	20(54.05)	32(86.48)	-	32(86.48)	5(13.51)	37(100.00)
Farm Average	35(23.02)	81(53.29)	75(49.34)	112(73.68)	-	133(87.50)	19(12.50)	152(100.00)

Table 2.14

Functional Problems relating to Marketing in broiler poultry farms in Kerala for the year 1990-91

(Percentagewise)

Size of farms	Competition from other states	Competition between farms	Inconsistent demand	Exploitation by intermediary	Distance to markets	Specification regarding weight of bird	Other problems	Farms with some problems
Small	50(92.59)	52(96.29)	46(85.18)	43(79.63)	25(46.29)	33(61.11)	19(35.18)	54(100.00)
Medium	56(91.80)	50(81.96)	40(65.57)	45(73.77)	42(68.85)	45(73.77)	31(50.82)	61(100.00)
Large	32(86.48)	28(75.67)	33(89.19)	25(67.56)	23(62.16)	20(54.05)	10(27.02)	37(100.00)
Farm Average	138(90.78)	130(85.52)	119(78.28)	113(74.34)	90(57.21)	97(63.81)	58(38.16)	152(100.00)

2.3.2. Marketing

Successful marketing of poultry products is an important factor for the efficient running of a farm. One of the major reason for the underutilisation of poultry sheds and lag in rearing of fowls is due to poor marketing. As revealed from the opinion analysis it is found that marketing is a major factor in deciding the success or failure in broiler poultry farming. Among the problems faced, competition from farms in neighbouring states is considered a crucial problem. 138 (90.78 percent) farms comprising 50 (92.59 percent) small size farms, 56 (91.80 percent) medium size farms and 32 (86.48 percent) large size farms had this opinion (Table 2.14).

Besides external competition, the competition from within the state coming even to the stage of unhealthy price cutting is another constraint. Internal competition, leading to unhealthy price cutting, was regarded as a serious problem by 130 (85.52 percent) farms consisting of 52 (96.29 percent) small size farms, 50 (81.96 percent) medium size farms and 28 (75.67 percent) large size farms. (Table 2.14).

Inconsistent demand, especially during certain seasons, give chances for speculation and accordingly hatcheries boost up and reduce the hatching operations. Hatcheries do this to safeguard their interest but the farmers usually become the victims. 46 (85.18 percent) small size farms, 40 (65.57 percent)

medium size farms and 33 (89.19 percent) large size farms had this opinion (Table 2.14).

Undue domination and interference of intermediaries in the marketing process retards the share of profit to the farmer. 43 (79.63 percent) small size farms, 45 (73.77 percent) medium size farms and 25 (67.56 percent) large size farms made this opinion at the time of survey (Table 2.14). On analysing the outlets of sale of birds it was found that cold storages dominated the field. 39 (72.22 percent) small size farms, 42 (68.86 percent) medium size farms and 9 (24.32 percent) large size farms depended on cold storages (Table 2.15). Again, the sale of meat to canteens, hospitals, government departments, ship chandlers etc. were made through intermediaries as it is of a long term contract in nature, which needs certain qualifications as prescribed by the authorities. Only 24 (64.87 percent) large size farms, 17 (27.87 percent) medium size farms and 5 (9.25 percent) small size farms could supply their fowls through these channels (Table 2.15).

Distance to market is another impediment noticed by the broiler poultry farmers. 25 (46.29 percent) small size farms, 42 (68.85 percent) medium size farms and 23 (62.16 percent) large size farms have pointed out this drawback. (Table 2.14). It is also found that 17 (31.48 percent) small size farms, 10 (16.39 percent) medium size farms and 2 large size farms (5.41 percent)

Table 2.15

Various outlets of sale of Broiler meat in Kerala (in percentage)

Size of Farms	Cold storage	Clubs, Hotels and Restuarants	Canteens and Hospitals	Ship chandlers	Govt. depts.	Others
Small	39 (72.22)	4 (7.42)	2 (3.70)	-	3 (5.55)	6 (11.11)
Medium	42 (68.86)	- -	11 (18.03)	2 (3.28)	4 (6.56)	2 (3.27)
Large	9 (24.32)	4 (10.81)	4 (10.81)	10 (27.03)	10 (27.03)	-
Farm Average	84 (55.26)	19 (12.50)	9 (5.92)	14 (9.21)	19 (12.5)	7 (4.61)

Source: Survey data

had to cover only a distance of less than 5 kilometers, to reach the market. But 6 (11.11 percent) small size farms, 12 (19.67 percent) medium size farms and 10 (27.02 percent) large size farms have a distance of 15 to 20 kilometers from the farm to the market. 5 (8.20 percent) medium size farms, 5 (13.51 percent) large size farms had to cover a distance between 20 to 25 kilometers and 3 (4.92 percent) medium size farms and 4 (10.81 percent) large size farms had to cover a distance exceeding 25 kilometers from the farm (Table 2.16). Interestingly, many of the large size farms market their fowls to far away districts within the state.

Specification according to buyers choice is another constraint which disturbs the farmers. Depending on their specification about weight per bird, which varies from customer to customer or institution to institution, the batches and even lots in each batch shall be adjusted. This really disgusts the farmer. 33 (61.11 percent) small size farm, 45 (73.77 percent) medium size farms and 20 (54.05 percent) large size farms had this opinion (Table 2.14).

In general all broiler poultry farms, irrespective of their size, have problems relating to marketing. It is noteworthy that none of the farmers have faced problems of low demand as the supply of day old chicks is regulated by hatcheries taking into consideration the seasonal variations. Moreover, the

Table 2.16

Average distance from farms to market

(percentagewise)

Distance in Kms.	Size of Farms		
	Small	Medium	Large
Less than 5 Km	17 (31.48)	10 (16.39)	2 (5.41)
5 to 10 Km	12 (22.22)	14 (22.95)	1 (2.71)
10 to 15 Km	19 (35.19)	17 (27.87)	15 (40.54)
15 to 20 Km	6 (11.11)	12 (19.67)	10 (27.02)
20 to 25 Km	-	5 (8.20)	5 (13.51)
25 & Above	-	3 (4.92)	4 (10.81)
TOTAL	54 (100.00)	61 (100.00)	37 (100.00)

Source: Survey data

hatcheries automatically regulate the quality of the day old chicks which results in producing good quality chicks by the farmers, whereby the market accepts the product.

2.3.3. Farm Inputs

Farm inputs in broiler poultry farming consists of day old chicks, feed and medicines. The scarcity of these inputs can lead to underutilisation of available capacity and assets. Moreover, increase in the cost of these inputs are likely to affect the profit.

The opinion analysis revealed that excessive price for the major inputs, inferior quality of inputs, time lag in supply, artificial scarcity made by hatchery and feed suppliers etc. are the major constraints. 96 (63.15 percent) farms had grievance about excessive levying of price for input items. 84 (55.26 percent) farms had complaint about inferior quality of input items, especially day old chick and feed. 69 (45.39 percent) farms expressed their dissatisfaction about the generation of artificial scarcity by the hatcheries and feed suppliers. Time lag in the supply of day old chicks was another complaint raised by the broiler farmers in general and they came to 51 (33.55 percent) in number. (Table 2.17).

Table 2.17

Functional Problem relating to Farm inputs in broiler poultry farm in Kerala for the year 1990-'91 (Percentage)

Size of farms	Excessive pricing	Inferior Quality	Artificial scarcity	Time lag in supply	Other problems	Farms with problem	Farms without problem	Total
Small	39(72.22)	31(57.40)	41(75.92)	37(68.52)	4(7.40)	47(87.03)	7(12.96)	54(100.00)
Medium	35(57.37)	29(47.54)	24(39.34)	10(16.28)	2(3.28)	49(80.33)	12(19.67)	61(100.00)
Large	22(59.46)	23(63.16)	4 (10.81)	-	34(91.89)	3(91.89)	3(8.11)	37(100.00)
Farm Average	96(63.15)	84(55.26)	69(45.39)	51(33.94)	6((3.94)	130(85.52)	22(14.48)	152(100.00)

Table 2.18

Functional Problem relating to labour in broiler poultry farm in Kerala for the year 1990-91 (Percentagewise)

Size of farms	Want of skilled labour	Absenteesm of Hired labour	Indolence of family labour	Labour turnover	Other problems	Farms with problems	Farms without problems	Total
Small	17(31.48)	2(3.70)	14(25.93)	6(11.11)	4(7.41)	35(64.81)	19(35.18)	54(100.00)
Medium	14(22.95)	12(19.67)	7(11.47)	10(16.39)	-	44(72.13)	17(27.87)	61(100.00)
Large	13(35.13)	14(37.88)	5(13.51)	10(27.02)	-	21(56.76)	16(43.24)	37(100.00)
Farm Average	44(28.95)	28(18.42)	26(17.10)	26(17.11)	4(2.63)	100(65.78)	52(34.21)	152(100.00)

While making a sizewise analysis it was found that 39 (72.22 percent) small size farms, 35 (57.37 percent) medium size farms and 22 (59.46 percent) large size farms raised the complaint about excessive price of farm inputs. 31 (57.40 percent) small size farms, 29 (47.54 percent) medium size farms and 23 (62.16 percent) large size farms leveled their criticism against inferior quality of inputs like feed and day old chicks. 41 (75.92 percent) small size farms, 24 (39.34 percent) medium size farms and 4 (10.81 percent) large size farms are annoyed about the artificial scarcity made by hatcheries and feed suppliers. With respect to the time lag in supply of chick and feed 37 (68.52 percent) small size farms, 10 (16.39 percent) medium size farms and 4 (10.81 percent) large size farms have complaints (Table 2.17).

In general, 130 (85.52 percent) farms had some problems with respect to the input prices while the other 22 (14.48 percent) farms had no complaint at all. On a sizewise analysis it was seen that 47 (87.03 percent) small size farms, 49 (80.33 percent) medium size farms and 34 (91.89 percent) large size farms had certain problems relating to the supply of inputs (Table 2.17).

2.3.4. Labour

As labour occupies an important position in broiler poultry farming activity, any problem relating to labour is capable of influencing the profit of the farm. Labour is considered vital not only because it is productive but also because it activates other factors and make them useful for enhancing farm outputs.

Even though Kerala is well known for its labour unrest, poultry rearing at present is totally free from the so called phenomenon. On making a deeper enquiry about the other functional problems relating to labour it was projected that, want of skilled labour was a major issue in 17 (31.48 percent) small size farms, 14 (22.95 percent) medium size farms and 13 (35.13 percent) large size farms (Table 2.18).

Labour absenteeism was another problem faced 2 (3.70 percent) small size farms, 12 (19.67 percent) medium size farms and 14 (37.88 percent) large size farms. Indolence of family labour is another menace to 14 (25.93 percent) small size farms, 7 (11.47 percent) medium size farms and 5 (13.51 percent) large size farms (Table 2.18). Labour turnover is another constraint faced by broiler poultry farms. 6 (11.11 percent) small size farms 10 (16.39 percent) medium size farms and 10 (27.02 percent) large size farms had this problem.

2.3.5. Managerial and Technical Problems

The opinion analysis relating to the problems faced by the farmers revealed that there exists certain managerial and technical problems. Lack of technical guidance, inadequacy of disease diagnostic centres and feed testing laboratories, lack of training programmes etc. were the issues raised in general. Twenty three (42.59 percent) small size farms, 26 (42.62 percent) medium size farms and 10 (27.02 percent) large size farms complained about the lack of technical assistance. While 19 (35.18 percent) small size farms, 19 (31.14 percent) medium size farms and 16 (43.24 percent) large size farms were concerned about the lack of efficient training facilities to farmers and farm assistants. Thirty seven (86.51 percent) small size farms, 33 (54.09 percent) medium size farms and 14 (37.84 percent) large size farms were worried about the dearth of veterinary aid. Thus 142 farms were having managerial and technical problems, whereas the other 10 have not reacted about such problems (Table 2.19).

2.3.6. Government Policy

The government policy and attitude towards the growth and development of broiler poultry farming are not appealing to the broiler poultry farmers in general. According to their view Government of Kerala is inactive towards broiler poultry farmers, when compared to the neighbouring states of Tamil Nadu and Karnataka. Among the complaints raised the major ones are:

Table 2.19

Functional Problems relating to Managerial and Technical problems in broiler poultry farms in Kerala for the year 1990-91

(Percentagewise)

Size of Farm	Technically qualified staff	Trained staff	Availability of Lab.	Veterinary Aid	Farms with problem	Farms without problem	Total
Small	23 (42.59)	19 (35.18)	12 (22.22)	37 (68.51)	54 (100.00)	-	54 (100.00)
Medium	26 (42.62)	19 (31.14)	31 (50.62)	33 (54.09)	56 (91.80)	5 (8.20)	61 (100.00)
Large	10(27.02)	16 (43.24)	12(32.43)	14 (37.84)	33 (89.19)	4 (10.81)	37(100.00)
Farm Average	59(38.81)	54 (35.52)	55(35.53)	84 (55.26)	142 (93.42)	10(6.58)	152(100.00)

Table 2.20

Functional Problems relating to Govt. policy in broiler poultry farm in Kerala for the year 1990-91

(Percentagewise)

Size of Farm	Subsidised feed	Competition from out-side	Regular Farm Aid	Control over hatchery etc.	Protection for small	Insurance coverage	Farm with problem	Farmers without problem
Small	50(92.59)	46(85.18)	33(61.11)	37(68.52)	48(88.88)	37(68.52)	54(100.00)	
Medium	33(54.09)	47(77.05)	24(39.34)	23(37.70)	5 (8.20)	14(22.95)	58(95.08)	3(4.92)
Large	35(94.59)	32(86.48)	12(32.43)	7(18.92)	- -	2(5.41)	32(86.48)	5(13.51)
Farm Average	118(78.29)	125(82.23)	69(45.39)	67(44.07)	48(31.58)	53(43.87)	142(93.42)	10(6.58)

(1) non-availability of subsidised chick, feed and electricity; (2) Lack of regular and dependable veterinary farm aid services; (3) Lack of control over unfair trade made by hatcheries and feed suppliers in the state; (4) Lack of protection from outside competition; (5) Non-protection of small and medium size farms from internal competition; (6) Non-availability of effective and meaningful insurance schemes.

While making a sizewise analysis it was found that 50 (92.59 percent) small size farms, 33 (54.09 percent) medium size farms and 35 (94.59 percent) large size farms remarked about the reluctance in granting subsidy for chick, feed and electricity. Thirty three (61.11 percent) small size farms, 24 (39.34 percent) medium size farms and 12 (32.43 percent) large size farms were annoyed about the poor farm veterinary aid given by Animal Husbandry Department. Lack of forceful control over the unfair practices of hatcheries and feed suppliers in Kerala were raised by 37 (68.52 percent) small size farms, 23 (37.70 percent) medium size farms and 7 (18.92 percent) large size farms. Forty eight (88.88 percent) small size farms and 5 (8.2 percent) medium size farms complained about the lack of protection to small and medium size farms. Weak and meagre steps taken by the government against the competition from neighbouring states was the point of criticism raised by to 46 (85.18 percent) small size farms, 47 (77.05 percent) medium size farms and 32 (86.48 percent) large size farms. Whereas the impropriety of insurance and its weaker

coverage were the drawbacks pointed out by 37 (68.52 percent) small size farms, 14 (22.95 percent) medium size farms and 2 (5.41 percent) large size farms (Table 2.20).

Thus 142 (93.42 percent) farms reacted against government policies towards broiler poultry farming while 10 (6.58 percent) farms have not made any opinion in this regard (Table 2.20).

2.3.7. Other Problems

Among other problems raised by broiler farmers the lack of availability of feasibility reports about the demand for various meat products, lack of opportunity to utilise the farm wastes profitably, unorganised nature of farmers, delicacy for optimum expansion due to the fear of mortality and morbidity of fowls etc. are the major ones. These complaints were made by almost all farms, invariably by farms of all sizes.

Thus the above discussion revealed that most of the broiler poultry farms in the state is facing a series of problems in finance, marketing, farm inputs, labour, etc. Among them the major constraints were finance and marketing. Virtually these may be the cause for the underutilisation of capacity in many of the broiler poultry farms in the state of Kerala.

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CHAPTER III

TRENDS IN COSTS AND REVENUE IN BROILER POULTRY FARMS IN KERALA

The previous chapter has outlined the evolution growth and development of broiler poultry farming. This section is to enumerate the trends in major input cost and output prices. The movements in output, cost and revenue are the major aspects dealt with.

Commercial broiler poultry farming operation deals with the conversion of day old chicks into saleable birds. The cost incurred for upbringing the day old chicks consist of both variable and fixed cost elements. The variable elements are cost of day old chicks, cost of feed, brooding and litter cost, cost of preventives and medicines and shed cleaning charges. The fixed elements of cost are salary and wages, shed maintenance charges, depreciation of equipments and other assets, office expenses, travelling expenses, carriage outwards and interest on capital. The revenue consists of sale of meat, manure, gunny and other waste parts[56]. This section deals with the elements of cost in broiler poultry farms in Kerala.

Like every business, poultry farming also needs a stable price so that risk and uncertainty can be reduced considerably whereby the marketing system can be made more efficient.

The pricing of raw materials have to be viewed explicitly within the specific features of their market structure and in the light of the conditions of demand and supply. In India, supply conditions are identified as essential reasons for the difference in price changes (Pandit Som Nath 1982).

3.1. Cost Analysis

The analysis of cost showed that the cost of feed and day old chicks accounted for 89.23 percent of total cost and the share of cost of feed was 63.97 percent and that of day old chick was 25.26 percent. Though insignificant, when compared to the major input costs, the share of other variable overheads amounted to 2.62 percent of the total cost. The share of fixed cost in the total cost amounted to 8.15 percent on an average (Table 3.1).

While analysing the elements of cost on the basis of size of farms it was found that the major element of cost was the cost of feed which accounted for 65.86 percent of total cost in small size farms whereas in medium size and large size farms it was 63.6 percent and 62.46 percent respectively. The advantages of economies of purchasing was mainly behind the reduction in the percentage of cost of feed in large and medium size farms. The evaluation of the level of consistency with regard to the cost of feed disclosed that the highest rate was found in small size farms while the least consistency was found in medium size farms (Table 3.1).

Table 3.1

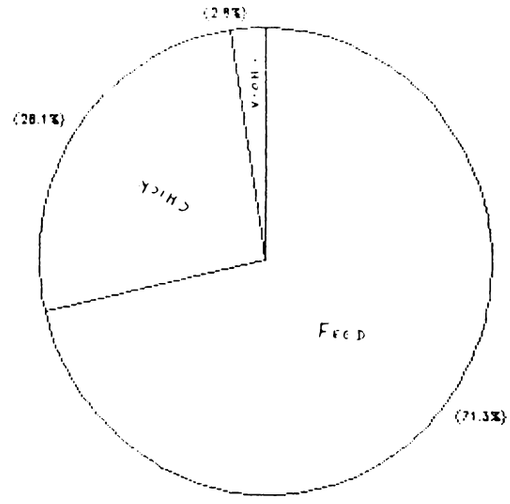
Percentagewise Distribution of elements of cost in broiler poultry farms in Kerala (on the basis of size) - 1987-'91

Expense	Small Size			Medium Size			Large size			Farm Average
	Mean	Standard Deviation	Coefficient of Variation	Mean	S.D.	C.V.	Mean	S.D.	C.V.	
Feed	65.86	0.73	1.11	63.60	2.97	4.80	62.46	1.70	2.73	63.97
Day old chick	23.70	1.91	8.07	25.25	2.38	9.43	26.85	1.44	5.38	25.26
Total	89.56	-	-	88.85	-	-	89.31	-	-	89.23
Variable overhead	2.44	0.45	18.43	2.47	0.46	18.76	2.94	0.64	21.80	2.62
Total variable cost	92.00	-	-	91.32	-	-	92.25	-	-	91.85
Fixed overhead	8.00	1.51	18.91	8.68	1.55	17.81	7.75	1.35	17.38	8.15
Total cost	100.00	-	-	100.00	-	-	100.00	-	-	100.00

Source: Survey data

DIAGRAM 2

COMPONENTS OF PRODUCTION COST IN SMALL, MEDIUM AND LARGE SIZE BROILER POULTRY FARMS IN KERALA



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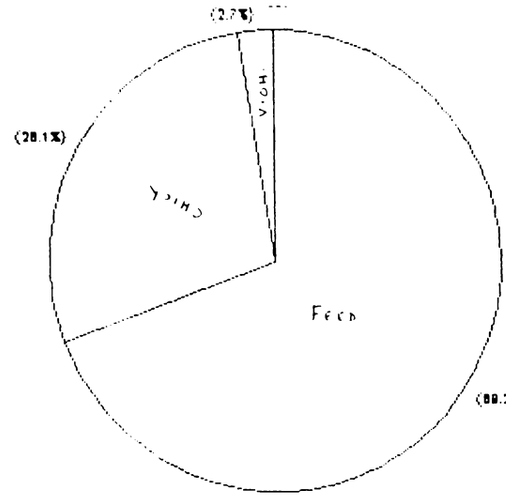

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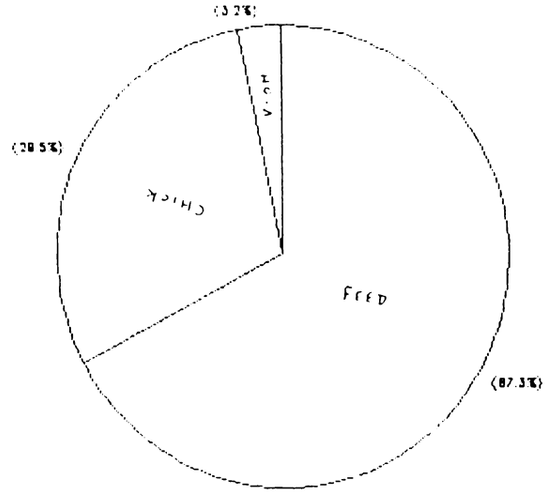
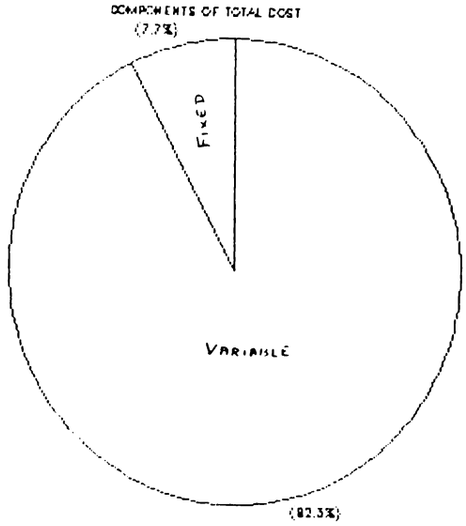


LARGE SIZE

DIAGRAM 3



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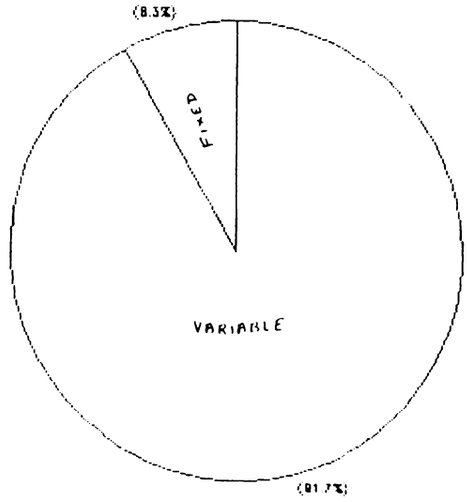

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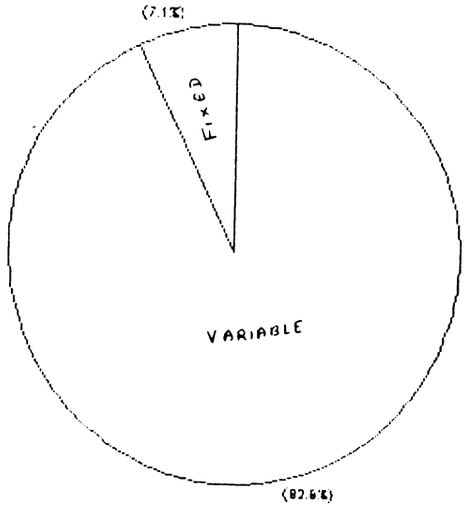


LARGE SIZE

The cost of day old broiler chicks accounted for 23.70 percent of total cost in small size farms, 25.25 percent in medium size farms and 26.85 percent in large size farms. The mode of carrying the day old chicks and involvement of own labour in matters connected with this was behind the variation in cost. Large size farms with a coefficient of variation of 5.38 percent showed least variability in the cost of day old chicks largely due to consistent pattern of buying equal number of and equally phased out purchases of chicks. The price variability of day old chicks was found to be maximum in the case of new farms. Location of farms near to the hatcheries also benefited the large size farms to claim the best consistency.

Table 3.1 also reveals that the average variable overheads as a percentage of the total costs are 2.44, 2.47 and 2.94 respectively for the small, medium and large size farms. Fluctuations in variable overheads is found to be increasing correspondingly to the size of farm.

Thus the analyses of various elements of cost made it clear that overall economies of bulk purchase and scale of operations placed the large size farms at an advantageous position.

3.1.1. **Price movements of raw materials**

In an attempt to trace the variations in and the contributions of the constituent element prices in the running of the farms, the following item wise analysis was undertaken.

3.1.1.1. Cost of feed

The broiler poultry feed price exhibited a growth from 1981 to 1991, except in 1987 when there was a fall of 0.9 percent. The overall growth rate from 1981 to 1991 was 56.8 percent and the mean annual growth rate was 5.20 percent with extreme values of (-)0.90 percent in 1987 and 12.40 percent in 1982 (Table 3.2).

Table 3.2

Cost of Major Inputs of Broiler Farms

in Kerala (1981 - 91)

Year	Feed Cost per Kg.	Growth rate	Rate of old chick	Growth rate
1981	2.50	-	3.90	-
1982	2.81	12.4	4.32	10.8
1983	2.85	1.4	4.50	4.2
1984	2.94	3.2	4.80	6.7
1985	3.20	8.8	5.20	8.3
1986	3.28	2.5	5.30	1.9
1987	3.23	0.9	5.90	11.3
1988	3.32	2.8	6.30	6.8
1989	3.52	6.02	7.20	14.3
1990	3.79	7.7	7.40	2.8
1991	3.92	3.4	7.90	6.8
Overall growth (1981 -91)	-	56.8	-	102.60
Average growth	-	5.2	-	7.39

Source : Kerala A.H. Statistics, Thiruvananthapuram, Kerala Hatcheries and India Poultry farm records, Animal Feed Stuffings Division records - Mysore Feed Pvt. Ltd & Lipton India Ltd. Bangalore.

The rate of growth in feed price in 1983 and 1984 were 1.4 percent and 3.2 percent respectively. In 1985 it went up to 8.8 percent while in 1986 it was 2.5 percent and in 1987 the trend showed a negative value of (-)0.9 percent growth. The trend of growth in 1988, 1989, 1990 and 1991 was 2.80 percent, 6.02 percent, 7.7 percent and 3.4 percent respectively (Table 3.2).

3.1.1.2. Cost of day old chicks

The overall changes found in the price of day old broiler chicks was continuously positive. Over the period from 1981 to 1991 the overall growth rate came to 102.6 percent, with a mean yearly growth rate of 7.39 percent with extreme mean values of 1.90 percent in 1986 and 14.30 percent in 1989 (Table 3.2).

When compared to 1981, the cost of day old broiler chicks recorded 10.8 percent growth in 1982, while it was 4.2 percent in 1983. The growth rate during the subsequent years were 6.7 percent in 1984, 8.3 percent in 1985, 1.9 percent in 1986, 11.3 percent in 1987, 6.8 percent in 1988, 14.3 percent in 1989, 2.8 percent in 1990 and 6.8 percent in 1991 (Table 3.2).

Thus it is found that price of major inputs like day old chicks and poultry feed has increased considerably during the period under survey.

3.1.2. **Demand and supply of raw materials**

3.1.2.1. Poultry feed production

The lack of self sufficiency in major poultry feed ingredients like maize, groundnut cake, cotton seed and other food grains made the state to depend on imports rather than producing them.

At the national level over 75 percent of total poultry feed production in 1991 was in the hands of poultry breeders and larger commercial poultry farmers who have in-built feed compounding units. The feed production accounted by Compound Livestock Feed Manufacturer's Association of India (C.L.F.M.A.) was only 17.5 percent of the national output[57]. The rest of the output was provided by other leading poultry feed producers in India.

On analysing the number of major poultry feed manufacturing companies in India in 1991 it was found that 36.18 percent of it was located in South India. Karnataka state with 56 major feed manufacturing companies claimed the highest number (18.42 percent), Andhra Pradesh with 40 companies (13.16 percent)

Maharashtra with 37 companies and Punjab with 26 companies came next to it. When compared to this, the state of Kerala with eight poultry feed compounding units accounted for only 1.97 percent of the national output (Table 3.3).

Though the state is a supplier of minor poultry feed ingredients like tapioca products, fish and meat wastes and few chemicals, the state still depend on Tamil Nadu and Karnataka for the internal requirements[58].

In 1989 maize production in Kerala was nil, when contribution from South India was 18.37 percent of national output. With regard to the groundnut production Kerala accounted for 0.08 percent of national output when contribution from South India was 68.67 percent whereas cotton seed production in Kerala came to 0.14 percent when output of South India was 24.33 percent. Tapioca production in Kerala came to 61.02 percent of national output when the contribution from South India was 98.8 percent. Regarding other food grains, Kerala produced only 0.77 percent of national output, when contribution from South India touched 17.84 percent (Table 3.4).

Even the government broiler poultry farms are meeting the feed requirements from outside purchases as the feed compounding potential is limited. Feed manufacturers in the state remarked that the non-availability of maize (which constitutes 40 to 50 percent of poultry feed), cotton seed, groundnut cake and other

Table 3.3

Statewise distribution of major Poultry feed Manufacturing Companies in India 1990

Region/State	No.of Units	Percentage to Total
Karnataka	56	18.42
Andra Pradesh	40	13.16
Tamil Nadu	8	2.63
Kerala	6	1.97
South India	110	36.18
Maharashtra	37	12.17
Punjab	26	8.55
Delhi	23	7.57
West Bengal	19	6.25
Gujarat	14	4.61
Madhya Pradesh	12	3.95
Haryana	12	3.95
All India	304	100.00

Source: Indian Poultry Industry Year Book 1990

Table 3.4

Output of Poultry Feed ingredients from South India in 1989
(Percentagewise)

Product	Andra Pradesh	Tamil Nadu	Karnataka	Kerala	South India	India
Maize	8.62	0.57	9.18	-	18.37	100.00
Groundnut	30.10	22.19	16.30	0.08	68.67	100.00
Cotton seed	7.96	7.27	8.96	0.14	24.33	100.00
Tapioca	2.47	35.06	0.25	61.02	98.80	100.00
Other grains	7.00	5.48	4.59	0.77	17.84	100.00

Source: Data Base 1990 Volume I pp. 508-519.

food grains regularly at reasonable rates was the main reason for the backwardness in broiler feed production in Kerala. In addition, the increased labour cost, heavy installation cost, and cost of funds keep the poultry farmers away from in-built feed compounding units in their farms in the state.

3.1.2.2 Day old chicks

Supply of day old chicks is mainly under the control of private hatcheries. In 1991 there were 10 broiler poultry hatcheries in Kerala - 5 in private sector and 5 in public sector (Table 1.12). It is worth noting that the role of private hatcheries in Kerala was reduced to the marketing of day old chicks supplied by leading hatcheries of other states and the supply price of day old chicks was found to be less than that of government hatcheries in Kerala.

On analysing the data regarding the sources of day old broiler chicks it was found that 94.45 percent of it was from private hatcheries functioning in Kerala and outside. The supply potential of hatchable eggs in Kerala came to 5.45 percent which included 0.17 percent under tie-up agreement with reputed breeding farms in India (Table 2.11).

Since the production of poultry feed and day old chicks is not adequate to meet the internal requirements, the farmers are compelled to depend on other states which resulted in a heavy

drain of funds from the state. Other factors which hindered the production of poultry feed and chicks are competition from other states, need for heavy investment non-availability of feed ingredients at reasonable rates, increased labour, power costs etc.

3.2. REVENUE ANALYSIS

The profitability of any business venture can be explicated only by analysing and comparing the costs and revenue involved in its operation. Sales revenue being the most important source of funds, an itemised analysis was attempted at. The revenue of poultry farms comprises mainly of the sale of meat (95.58 percent),sale of manure (3.45 percent) and gunnies and waste parts (0.97 percent) (Table 3.5).

The sizewise analysis revealed that the share of meat in total revenue in case of small, medium and large size broiler poultry farms amounted to 95.37 percent, 95.49 percent and 95.89 percent respectively (Table 3.5). It thus revealed that irrespective of the size of farms, sale of meat constituted the major source of revenue.

Regarding the share of manure, gunny and waste parts in the total revenue, there was practically no difference in various sizes of farms. Slight variations were found in large size farms as the waste parts and droppings of birds were removed at the

Table 3.5

Average share of individual items in Total revenue in broiler poultry farms in Kerala (on the basis of size)

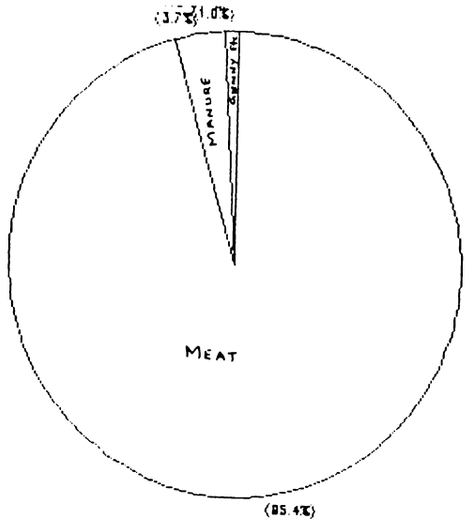
1987-91 (in Percentage)

Income	Small size			Medium size			Large size			Farm Average
	Mean	Standard Deviation	Coefficient of variation	Mean	Standard Deviation	Coefficient of variation	Mean	Standard Deviation	Coefficient of variation	
Meat	95.37	0.63	0.66	95.49	0.26	0.27	95.89	0.20	0.21	95.58
Manure	3.66	0.61	16.67	3.44	0.11	3.19	3.25	0.14	4.31	3.45
Gunny and others	0.97	0.15	15.46	1.07	0.25	23.36	0.86	0.16	18.60	0.97
Total	100.00	-	-	100.00	-	-	100.00	-	-	100.00

Source: Survey data

DIAGRAM 4

COMPONENTS OF GROSS REVENUE IN SMALL, MEDIUM AND LARGE SIZE BROILER POULTRY FARMS IN KERALA



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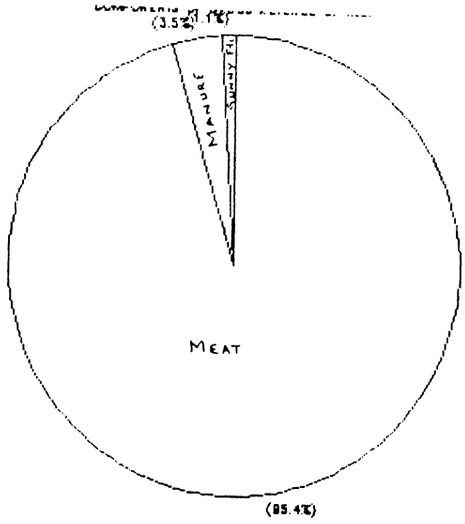

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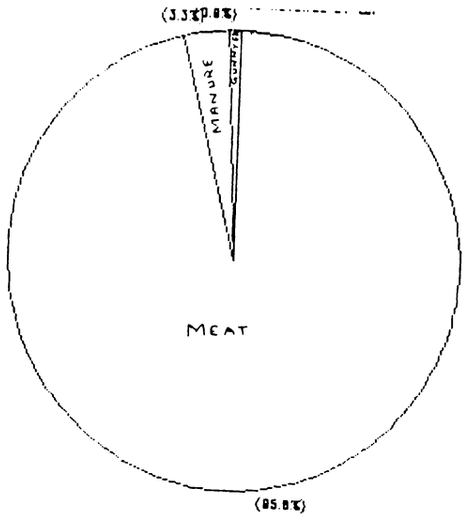

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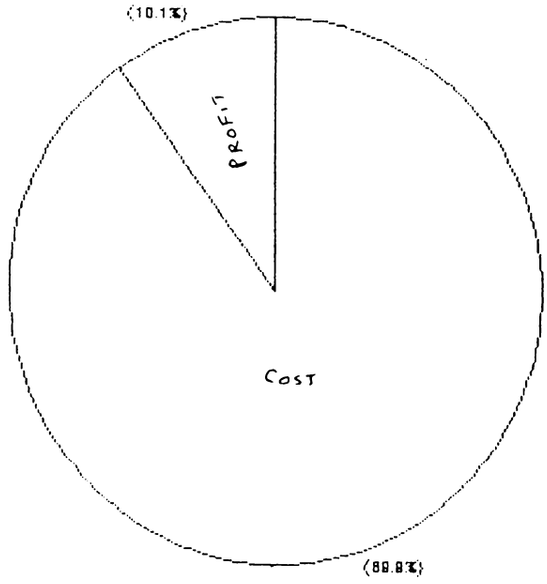
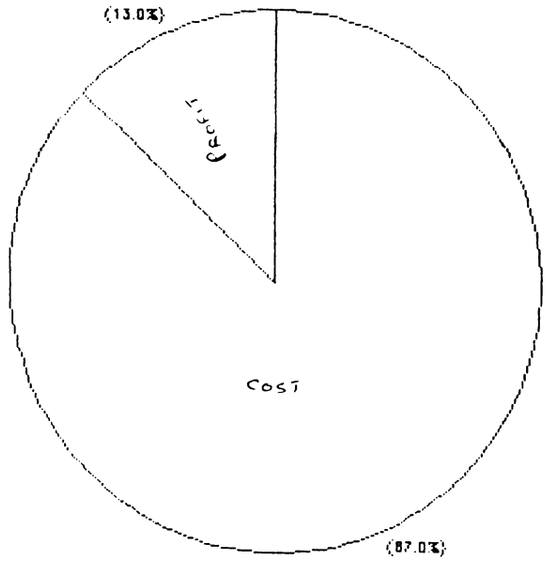
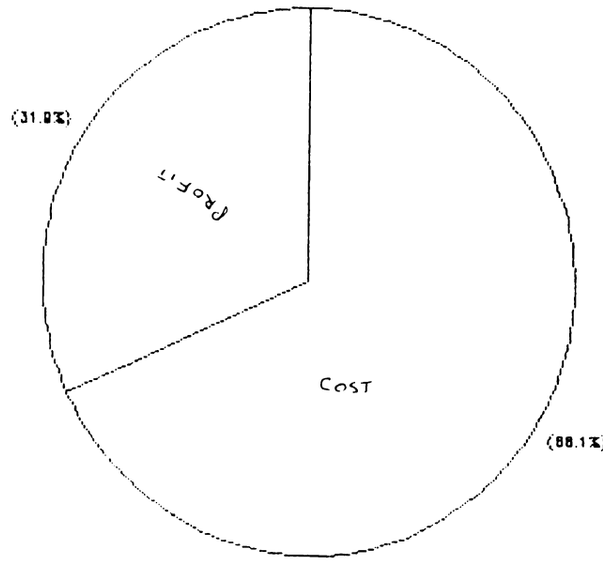


REVENUE, COST AND PROFIT IN SMALL, MEDIUM AND LARGE SIZE BROILER POULTRY FARMS IN KERALA

SMALL SIZE



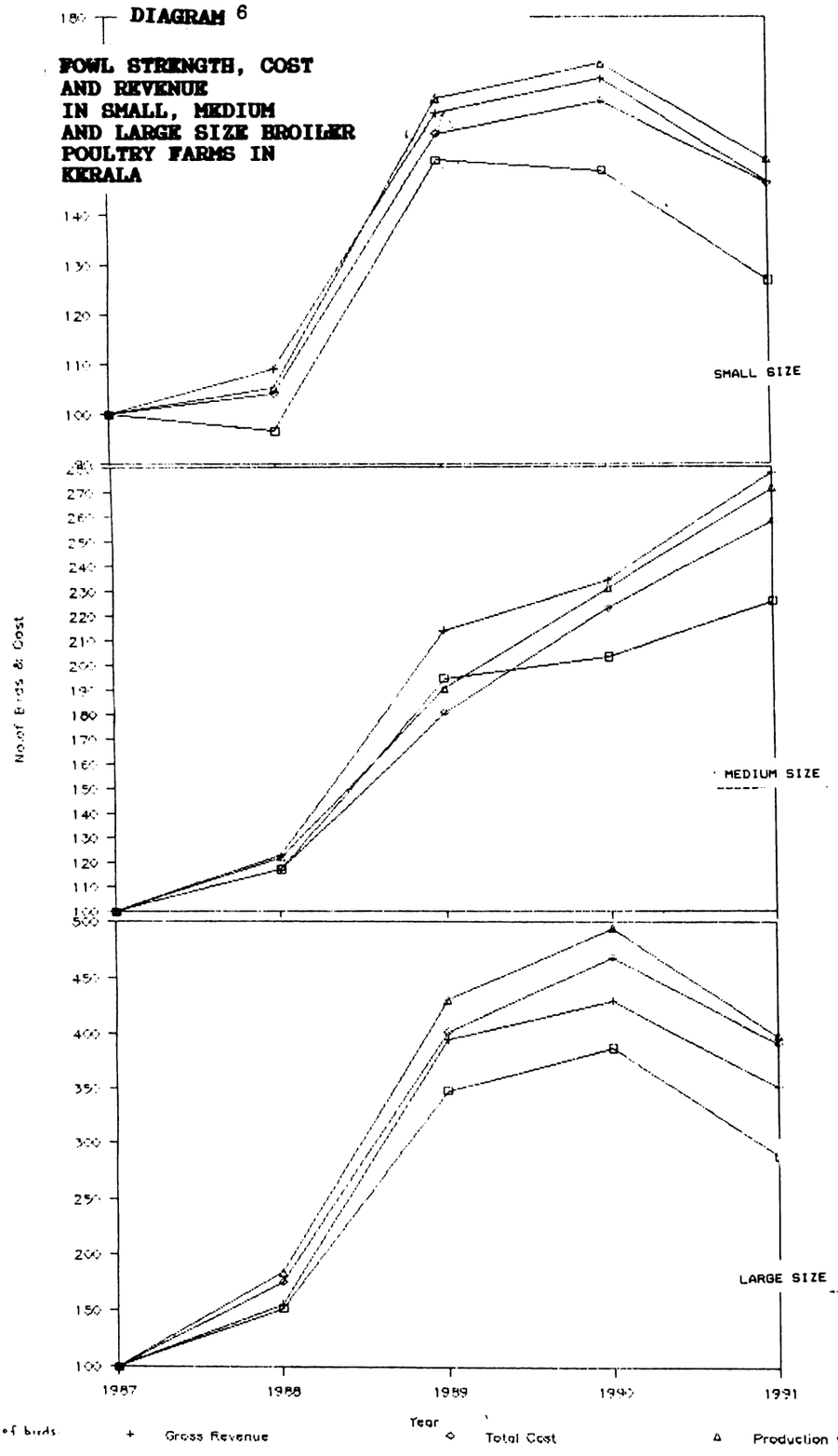
MEDIUM SIZE



LARGE SIZE

DIAGRAM 6

FOWL STRENGTH, COST AND REVENUE IN SMALL, MEDIUM AND LARGE SIZE BROILER POULTRY FARMS IN KERALA



earliest without waiting for a better bargain. It was observed that the sale proceeds of manure, gunny and waste parts were sufficient enough to meet the variable overheads in full and fixed overheads to some extent.

Thus the surplus of broiler poultry meat price over the major input cost (feed + day old chicks) provided for the margin of profit in broiler poultry farms.

On comparing the total cost with the revenue from meat, it was found that 95.31 percent of meat price was represented by the total cost in small size farms, 98.37 percent in medium size farms and 85.99 percent in large size farms. This proved that cost of production was high in medium size farms and low in large size farms. Economics of scale of operation enjoyed by large size farms placed them in a better position than other sizes of farms.

3.2.1. Price movements of meat

The major output of broiler poultry farms is meat. Except the variations during certain festival seasons the general price level of meat in Kerala was growing reasonably well. The price variations during festival seasons affect the small size farms which depend on retail outlets and cold storages. The farmers who depend on regular markets at predetermined contract prices are not actually affected by this. However, the regular inflow

of spent birds and cull birds from Tamil Nadu and Karnataka has adversely affected the internal market. Inter state tax policy on live birds, increased transporting cost and veterinary check up for imported birds have all controlled the inflow of live birds, spent birds and cull birds to some extent. But the leading breeders and feed manufacturers in India do not like to loose the market potential in Kerala, and their control very much works upon the demand and supply of meat products and its price.

The analysis of trend in the meat prices revealed that it went up considerably over the period. Starting from Rs.10.80 in 1981 it went up to Rs.18.50 in 1991. The overall growth rate was 71.30 percent with an average of 5.60 percent with extreme mean values of 0.61 percent in 1989 and 12.4 percent in 1984 (Table 3.6). The opinion analysis revealed that consistent growth in meat price was due to the increase in demand for the product over the period.

Thus the foregoing discussion shows that cost of inputs like feed and day old chick and the output price of meat have increased considerably over the period.

Table 3.6

Trend in the Output Price of Broiler

Poultry Farms in Kerala 1981 - '91

Year	Meat Price per Kg. of live bird	Growth rate in Percentage
1981	10.80	-
1982	11.75	8.8
1983	12.10	2.98
1984	13.60	12.40
1985	13.80	1.47
1986	15.20	10.14
1987	15.80	3.94
1988	16.40	3.79
1989	16.50	0.61
1990	18.00	9.09
1991	18.50	2.78
Overall growth rate	(1981-91)	
Average growth rate		5.6

Source: Animal Husbandry Dept. Statistics, Kerala.

3.3. MOVEMENTS IN OUTPUT, COST AND REVENUE

In this section the relation between input cost and output price is analysed from different angles. The data regarding output price, cost of feed, and cost of day old chicks, were collected from Animal Husbandry Department statistics for the period 1981-1991. The details of Performance Efficiency Factor (P.E.F.), Feed Conversion Ratio (F.C.R.) and average live weight of fowls were collected from the records of hatcheries, feed suppliers and broiler poultry farmers' association in Kerala, for the period 1987-1991. The selection of the time frame for secondary data regarding P.E.F., F.C.R. and live weight was restricted by availability of data with the sources.

The study about broiler poultry economics is centred round the efficiency factors like productivity and profitability. Efficiency of broiler poultry farming depends on the rate at which each unit of input is transformed into a unit of output. The major indices used to assess the relative farming efficiency are F.C.R. and P.E.F.

F.C.R., the key to broiler poultry farm economics, evaluates the productive efficiency of the flock. It is a quantitative expression regarding the proportionate feed consumption for every unit of output of meat. Symbolically -

$$\text{F.C.R.} = \frac{\text{Quantity of feed consumed}}{\text{Live weight of fowls}}$$

F.C.R. denotes the efficiency of feed consumption resulting in favourable weight gain, accompanied by good liveability.

Liveability denotes the ability of broiler fowls to survive under intensive system of rearing. Symbolically -

$$\text{Liveability} = \frac{\text{Number of saleable fowls}}{\text{Number of fowls started with}} \times 100$$

Efficiency in weight gaining depends on the period of rearing (weeks grown or market age), quality of day old chick and feed, optimum input of medicines, additives and preventives and even the climatic conditions to a great extent. Symbolically -

$$\text{Weight gain} = \frac{\text{Total live weight of fowls}}{\text{Total number of fowls}}$$

Another major index of broiler poultry farm productivity is P.E.F. It evaluates the proportionate change in weight gain with every change in F.C.R. Symbolically -

$$\text{P.E.F.} = \frac{\text{Average live weight of fowls}}{\text{Average F.C.R.}} \times 100$$

A study conducted in Centre for Advanced Poultry Science Mannuthy in 1988 approved that the claims made by hatcheries and feed manufacturers regarding the relation between F.C.R. and weeks grown, is right to a great extent in Kerala situations. The study revealed that the differential intake of feed (in grams) during fourth, fifth, sixth and seventh week of rearing broiler fowls was 440, 620, 715, 775 and 690 and the corresponding live weight gain (in grams) during the period was 240 grams, 280, 320, 345 and 200 respectively. It was seen that differential F.C.R. was gradually increasing from 1.83 in fourth week to 2.21 in fifth week, 2.23 in sixth week, 2.25 in seventh week and 3.45 in eighth week and it was made clear that the influence of market age on F.C.R. during eighth week was unfavourable (Table 3.7).

The study revealed that maximum weight gain was observed during sixth and seventh week of rearing. Again it was found that when fowls are reared for seven weeks the feed consumption as well as weight gain was found increasing positively. When it goes beyond this, the relative weight gain out of feed consumption was found declining.

TABLE 3.7

Random sample test results of broiler fowls reared in Kerala
(Conducted by the Centre for
Advanced Poultry Science, Mannuthy - 1988)

Particulars	Weeks grown				
	4	5	6	7	8
Differential feed consumption (in grams)	440	620	715	775	690
Differential weight gain (in grams)	240	280	320	345	200
Differential F.C.R.	1.83	2.21	2.23	2.25	3.45

3.3.1. Indices of Output

3.3.1.1. Change in output and price of broiler poultry meat

The analysis about the changes in the output of broiler poultry meat in Kerala over the period 1980 to 1991 disclosed that the progression of meat output was comparatively quick when compared to other meats. The output of broiler poultry meat in 1980-81 was 2716 tons and it increased to 22,000 tons in 1990-91, recording an increase of eight times.

The index values of output were found to be 147.13 in 1981-82, 177.98 in 1982-83, 201.03 in 1983-84, 293.96 in 1984-85, 361.93 in 1985-86, 446.10 in 1986-87, 624.04 in 1987-88, 693.37 in 1988-89, 736.38 in 1989-90 and 810.01 in 1990-91. The marginal increase during the same period was 47.13 in 1981-82, 30.95 in 1982-83, 23.05 in 1983-84, 92.93 in 1984-85, 67.97 in 1985-86, 84.17 in 1986-87, 177.94 in 1987-88, 69.33 in 1988-89, 43.01 in 1989-90 and 73.63 in 1990-91 (Table 3.8).

While comparing the marginal change in the price of meat and that in the output over the period, it was found that when output increased by 0.47 times, the selling price of meat increased by 0.08 times in 1981-82. The respective changes in poultry meat and the corresponding change in the selling price went up by 0.31 times and 0.03 times in 1982-83, 0.23 times and 0.14 times in 1983-84, 0.93 times and 0.02 times in 1984-85, 0.68

TABLE 3.8

Output, cost and revenue of various meat items in Kerala

(index in brackets. 1981 = 100)

Year	output of poultry meat (tons)	output of other meats (tons)	selling price of beef (rupees)	selling price of mutton (rupees)	selling price of poultry meat (rupees)	cost of poultry feed (rupees)	cost of day old chick (rupees)
1981	2716 (100.00)	26619 (100.00)	7.56 (100.00)	15.75 (100.00)	10.80 (100.00)	2.50 (100.00)	3.90 (100.00)
1982	3996 (147.13)	26936 (101.19)	7.90 (104.50)	16.80 (106.67)	11.75 (108.80)	2.81 (112.40)	4.32 (110.77)
1983	4834 (177.98)	27500 (103.31)	8.32 (110.05)	18.48 (117.33)	12.10 (112.04)	2.85 (114.00)	4.50 (115.38)
1984	5460 (201.03)	28652 (107.64)	9.00 (119.05)	19.38 (123.05)	13.60 (125.93)	2.94 (117.60)	4.80 (123.08)
1985	7984 (293.96)	32506 (122.12)	9.60 (126.98)	20.10 (127.62)	13.80 (127.78)	3.20 (128.00)	5.20 (133.33)
1986	9830 (361.93)	44600 (167.55)	9.75 (128.97)	21.27 (135.05)	15.20 (140.74)	3.28 (131.20)	5.30 (135.90)
1987	12116 (446.10)	62814 (235.97)	10.00 (132.28)	22.70 (144.13)	15.80 (146.30)	3.23 (129.20)	5.90 (151.28)
1988	16949 (624.04)	84991 (319.29)	10.40 (137.57)	24.50 (155.56)	16.40 (151.85)	3.32 (132.80)	6.30 (161.54)
1989	18832 (693.37)	88386 (332.04)	11.20 (148.15)	25.50 (161.90)	16.50 (152.78)	3.52 (140.80)	7.20 (184.62)
1990	20000 (736.38)	90000 (338.10)	11.50 (152.12)	27.00 (171.43)	18.00 (166.67)	3.79 (151.60)	7.40 (189.74)
1991	22000 (810.01)	95000 (356.89)	13.50 (178.57)	30.00 (190.48)	18.50 (171.30)	3.92 (156.80)	7.90 (202.56)

Source : compiled from the data from :-

(i) Animal Husbandry statistics, Thiruvananthapuram

(ii) Hatcheries and feed suppliers in Kerala

times and 0.13 times in 1985-86, 0.84 times and 0.13 times in 1985-86, 0.84 times and 0.06 times in 1986-87, 1.78 times and 0.06 times in 1987-88, 0.69 times and 0.09 times in 1988-89, 0.43 times and 0.14 times in 1989-90, and 0.74 times and 0.04 times in 1990-91 (Table 3.8).

It was thus found that when output of poultry meat increased considerably, the selling price of broiler poultry meat went on increasing at a slow pace and this was in conformity with the natural phenomenon of declining prices with enhanced output. This peculiar trend was basically due to the steady but highly growing demand for the broiler poultry meat over the period.

3.3.1.2. Change in output and price of other common meats

The output of other meats such as beef and mutton increased from 26,619 tons in 1980-81 to 95,000 tons in 1990-91, recording a growth in output by 3.56 times. As against this the selling price per kilogram of beef increased from Rs.7.56 to Rs.13.50, recording a growth of 1.78 times and that of mutton from Rs.15.75 to Rs.30.00, recording a growth of 1.9 times (Table 3.8).

It was found that between 1980 and 1984 while the output of other meats increased by 1.07 times, that of broiler poultry meat increased by 2.01 times. As against this, the price change of beef and mutton went up by 1.9 times and 2.01 times

respectively while that of broiler poultry meat increased by 1.26 times. Between 1984 and 1987 the output level of other meat went up to 2.36 times and that of broiler poultry meat enhanced to 4.46 times. The corresponding increase of price of beef, mutton and broiler poultry meat were 1.32, 1.44 and 1.46 times respectively. Between 1987 and 1991 the output of other meat and broiler poultry meat increased to 3.56 times and 8.1 times respectively. Corresponding to this, the price increase of beef, mutton and broiler poultry meat was 1.78 times, 1.9 times and 1.71 times respectively (Table 3.8).

Thus the foregoing discussion about output and price of broiler poultry meat and other meats revealed that the tempo of growth was considerably good and that of broiler poultry meat had progressed substantially over the period. The major reason for such an appealing performance of broiler poultry meat was the timely adoption of technological upgradations in broiler poultry farming by the enlightened broiler poultry farmers in the state of Kerala.

3.3.2. Indices of Technological Progress

Broiler poultry farming at the global and national level has undergone tremendous changes over the last two decades. Though of recent origin, broiler poultry farming in Kerala made use of almost all the technological advancements in time. The major achievements in technological front were reduction in

F.C.R., increase in weight gain and the decrease in the market age of fowls. This, to a great extent, was brought in by the hatcheries, feed manufacturers and the suppliers of other poultry accessories, with a commercial outlook.

This section is to brief the level of progress attained by the broiler poultry farming in the state, on its technological front with the help of secondary data collected from Animal Husbandry Departments, hatcheries, and feed manufacturers in Kerala.

3.3.2.1. Movements in F.C.R.

It was found that F.C.R. declined from 3.1 in 1987 to 2.3 in 1991. While looking at the F.C.R. during the other periods, it was 2.98 in 1988, 2.75 in 1989 and 2.61 in 1990. It was thus found that from 1987 to 1991 F.C.R. declined by 25.81 percent and of this the maximum decline was found during 1990-91 with 10 percent (Table 3.8). Thus the overall trend in F.C.R. was coming down resulting in an increased efficiency of feed conversion over the period.

3.3.2.2. Movements in weight gain

The consistent decline of F.C.R. was accompanied by progression in live weight of broiler fowls, which enhanced the productivity of farms in Kerala. The average live weight of

broiler fowls reared in Kerala recorded major changes between 1987 and 1991. From 1560 grams in 1987, it went up to 1820 grams in 1991, recording a growth of (+)16.67 percent. The weight gains during the other periods were 1590 grams in 1988, 1630 grams in 1989, 1750 grams in 1990 and 1820 grams in 1991. The marginal weight gain during these periods were 30 grams in 1988, 40 grams in 1989, 120 grams in 1990 and 70 grams in 1991 (Table 3.9). The survey regarding the change in trend of weight gain disclosed that there was consistent growth over the period and the highest marginal weight gain of 120 grams was found in 1990.

3.3.2.3. Movements in market age

The market age of fowls was found decreasing from sixty days in 1987 to forty five days in 1991, representing a 25 percent decline over the period. The market age was fifty four days in 1988, fifty days in 1989 and forty nine days in 1990 (Table 3.9). The marginal decrease in number of days grown declined by six days in 1988, four days in 1989, one day in 1990 and four days in 1991.

This very well showed that there was consistent decline in market age throughout the period and the decline was found to be the most profound in 1988 with six days reduction.

TABLE 3.9

Average farm productivity indices of broiler poultry farms in Kerala

(index in brackets. 1987 = 100)

Year	F.C.R.	Live weight	Market age	P.E.F.
1987	3.10 (100.00)	1.56 (100.00)	60 (100.00)	50.32 (100.00)
1988	2.98 (96.13)	1.59 (101.92)	54 (90.00)	53.36 (106.04)
1989	2.75 (88.71)	1.63 (104.49)	50 (83.33)	59.27 (117.79)
1990	2.61 (84.19)	1.75 (112.18)	49 (81.67)	67.05 (133.25)
1991	2.30 (74.19)	1.82 (116.67)	45 (75.00)	79.13 (157.25)

Source : Compiled from the records of private hatcheries and feed suppliers in Kerala

Thus the overall effect of technological advancements in the field of broiler poultry farming in Kerala was reflected through the P.E.F. over the period under review. In 1987 it was 50.32 percent which increased to 79.13 percent in 1991, claiming a growth of 57.25 percent. The P.E.F. was 53.36 percent in 1988, 59.27 percent in 1989 and 67.05 percent in 1990. The marginal growth was the highest in 1991 with 24 percent and it was 6.04 percent in 1988, 11.75 percent in 1989 and 15.46 percent in 1990 (Table 3.9).

3.3.3. Relation between Input Cost and Output Price

In order to compare the trend of output price with that of input cost the weighted base of F.C.R. is given to the major input items. The weighted cost of day old chick, cost of feed and cost of feed cum day old chick when related to the output price is called chick price rate, feed price ratio and chick cum feed price ratio respectively. These ratios express the change in selling price for a corresponding change in each of the input cost.

Feed price ratio expresses the rupee of sales revenue from every rupee of feed cost. Symbolically -

$$\text{Feed Price Ratio} = \frac{\text{Average Selling price per kilogram of meat}}{\text{Average feed cost per kilogram X Average F.C.R.}}$$

Chick price ratio expresses the sales revenue in rupees from every rupee spent on day old chick symbolically -

$$\text{Chick Price Ratio} = \frac{\text{Average selling price per kilogram of meat}}{\text{Average cost per day old chick} \div \text{Average live weight per fowl}}$$

The feed cum chick price ratio expresses the sales revenue in rupees from every rupee spent on feed and day old chick. Symbolically -

$$\text{Feed cum chick price ratio} = \frac{\text{Average selling price per kilogram of meat}}{(\text{Average feed cost per kilogram X F.C.R.}) + (\text{Average cost per day old chick} \div \text{Average live weight per fowl})}$$

3.3.3.1. Feed Price Ratio

The assessment of movements in output price with that of the weighted feed cost disclosed that the index values of feed price ratio was increasing over the period from 105.06 in 1988 to 108.23 in 1989, 115.19 in 1990 and 129.75 in 1991. It was 1.66 times in 1988, 1.71 times in 1989, 1.82 times in 1990 and 2.05 times in 1991. The marginal growth of feed price ratio was 0.08 in 1988, 0.05 in 1989, 0.12 in 1990 and 0.23 in 1991 (Table 3.10).

TABLE 3.10

Ratio of various input cost to meat price in broiler poultry farms in Kerala

(index in brackets. 1987 = 100)

Year	Feed price ratio	Chick price ratio	Feed cum chick price ratio
1987	1.58 (100.00)	4.17 (100.00)	1.15 (100.00)
1988	1.66 (105.06)	4.14 (99.28)	1.18 (102.61)
1989	1.71 (108.23)	3.73 (89.45)	1.17 (101.74)
1990	1.82 (115.19)	4.25 (107.91)	1.28 (111.30)
1991	2.05 (129.75)	4.26 (102.16)	1.39 (120.86)
Average	1.76 ---	4.11 ---	1.23 ---

Source : Computed from survey data

The analysis clearly showed that the meat price has increased at a more than proportionate rate than that of feed cost and the increase during the last years of study was at an accelerated rate.

3.3.3.2. Chick Price Ratio

The index of chick price ratio revealed fluctuations In 1988 the index wa 99.28 and that in 1989 was 89.45, representing a downward trend. The index of 1990 and 1991 was 107.91 and 102.16 respectively. This made it clear that though the chick price ratio in 1988 and 1989 declined slightly, the overall velocity was high. In 1987 the meat price was 4.17 times the day old chick cost. It was 4.14 times in 1988, 3.73 times in 1989, 4.25 times in 1990 and 4.26 times in 1991 (Table 3.10). The evaluation of marginal growth in chick price ratio during this period revealed that in 1988 it was (-)0.07, (-)0.41 in 1989, 0.52 in 1990 and 0.01 in 1991.

This made it clear that increase in meat price was more than proportionate to that of cost of day old chick during the period under review.

3.3.3.3. Feed and chick price ratio

The study about the variability of meat price with the combined cost of feed and day old chick revealed that the trend of growth had slight fluctuations but was positive throughout the period. The index values were 102.61 in 1988, 101.74 in 1989, 111.30 in 1990 and 120.86 in 1991. The study made it clear that the rate of growth of meat price was 1.15 times that cost of feed cum day old chick in 1987 while it was 1.18 times in 1988, 1.17 times in 1989, 1.28 times in 1990 and 1.39 times in 1991. The marginal variation in the ratio was found to be 0.03 in 1988, (-)0.01 in 1989, 0.11 in 1990 and 0.11 in 1991 (Table 3.10).

This analysis showed that the ratio of meat price to the combined cost of feed and day old chick was found continuously increasing except in 1989. It is thus made clear that the trend of meat price was much higher than that of the major input costs.

Thus the study about the trends in input cost and output price in broiler poultry farms in Kerala brings to light certain valuable facts.

Feed accounted for 63.97 percent and day old chicks for 25.26 percent of total cost (Table3.1). Cost of feed and day old chicks increased by 56.80 percent and 102.60 percent respectively (Table 3.2).

The state was depending on imported feed and day old chicks. Non - availability of sufficient quantity of major ingredients at reasonable price was behind the low internal output of feed. Quality of supply and services at economical rates made the established hatcheries of other states to dominate the Kerala markets.

Meat price represented 95.58 percent of total revenue when the output of poultry meat over the period has increased by 8.1 times, the corresponding increase in the price has been 71.30 percent (Table 3.8). The price changes of broiler poultry meat did not have any relation to the poultry meat output. The inflow of spent birds, live birds and cull birds from neighbouring states have adversely affected the internal market.

F.C.R. declined from 3.1 to 2.3, market age was reduced to 45 days from 60 days and the live weight gain increased from 1560 grams to 1820 grams. Feed Price ratio increased by 29.75 percent, chick price ratio by 2.16 percent and feed cum chick price ratio by 20.86 percent, over the period. (Table 3.9).

Thus the study clearly revealed that price movement of broiler poultry meat was more than proportionate to that of feed cost and cost of day old chick. The selling price determination

in broiler poultry farms in Kerala was not found as a function of cost of major inputs, suggesting the involvement of factors other than those considered in the present study such as the adoption of technology and the short term, opportunistic and commercial interest of the middlemen in the market. The analysis thus serves to disprove the hypothesis that the upward trend in the output price of broiler meat is being brought about by an increase in the input price.

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CHAPTER IV

PRODUCTIVITY, CAPACITY UTILISATION, CAPITAL INTENSITY, AND FEED CONVERTIBILITY IN BROILER POULTRY FARMS IN KERALA

In the previous chapter the trends in cost and revenue and its impact on financial performance in broiler poultry farms was analysed. This chapter, divided into four sections, evaluates the productivity, capacity utilisation, capital intensity and feed convertibility of broiler poultry farms in Kerala.

Section I

4.1. PRODUCTIVITY IN BROILER POULTRY FARMS IN KERALA

Productivity refers to a comparison between the quantity of goods and services produced and the quantity of resources employed in turning out these goods and services. The term productivity is used to refer to the efficiency in production of land, labour and capital separately or together, unit quantities of mixes of various commodity or financial expenditures and investments[59].

This section evaluates the efficiency with which factor inputs are used in broiler poultry farms in Kerala. Though a number of indicators are available to evaluate productivity, in this study, the measurement is restricted to the following indices

a) labour productivity, and

b) capital productivity

4.1.1. Labour Productivity

Labour productivity is the relation between the quantity of meat produced and the total input of labour hours therein. Symbolically,

$$\text{Labour productivity} = \frac{\text{Total live weight of fowls in kilograms}}{\text{Labour input in hours}}$$

Labour productivity as such does not reveal the changes in the intrinsic efficiency of labour only but it shows the changing effectiveness with which labour is utilised in conjunction with other factors. Labour productivity is influenced by skill, experience and level of personal involvement in the farming operations.

Empirical results

The average labour productivity in broiler poultry farms in Kerala was 5.25 with extreme mean values of 3.31 and 6.38. Among the different sizes of broiler poultry farms the productivity was maximum in large size farms. The corresponding index was 7.784 with extreme mean values of 4.843 and 9.85. In

medium size farms the productivity index was 3.725 with extreme mean values of 2.55 and 4.60. In small size farms the productivity was 2.656 with extreme mean values of 2.257 and 2.867 (Table 4.1). The analysis of variance revealed an $F_{0.05}$ value of 17.05 denoting significant variation in this regard, between various sizes of farms.

4.1.1.1. Skill of farmers

The study revealed that in 55.55 percent of large size farms, 30.00 percent of medium size farms and 28.57 percent of small size farms the men employed as labourers or supervisors were either veterinary science graduates or properly trained staff. The review of technical and professional skill of farmers pointed out that 21 large size farms (56.76 percent), 23 medium size farms (37.71 percent) and 15 small size farms (27.77 percent) had staff with necessary knowhow for maintaining and running the farm. Five large size farms (13.52 percent) and 2 medium size farms (3.28 percent) had veterinary science graduates. In 8 large size farms (21.62 percent) and 6 medium size farms (9.84 percent) the staff were diploma holders in poultry management. Eight large size farms (21.62 percent) 15 medium size farms (24.59 percent) and 15 small size farms (27.77 percent) had personnel who had undergone the poultry training given by State Animal Husbandry Department. Thus it was found that labour productivity is positively related to the percentage of skilled labour in the farm (Table 4.2).

TABLE 4.1

Labour productivity in broiler poultry farms in Kerala

Size of farm	1987	1988	1989	1990	1991	mean	s.d.	c.v.
Small	2.257	2.556	2.764	2.836	2.867	2.656	0.227	8.54
Medium	2.550	3.143	4.040	4.292	4.600	3.725	0.762	20.45
Large	4.843	5.572	9.281	9.376	9.850	7.784	2.125	27.30
Farm average	3.31	4.09	6.15	6.33	6.38	5.25	1.29	24.57

Source : Computed from survey data

4.1.1.2. Previous experience

The proprietors of 22 large size farms (59.46 percent), 17 medium size farms (27.86 percent) and 3 small size farms (5.56 percent) were previously the partners in some other broiler poultry farms. The proprietors of 8 large size farms (21.62 percent), 26 medium size farms (42.62 percent) and 12 small size farms (22.22 percent) were formerly the employees of other poultry farms (Table 4.3). The evaluation thus showed that labour productivity is closely associated with the experience in poultry farming.

4.1.1.3. Personal involvement

While evaluating the impact of personal involvement of farmers in broiler poultry farming it was found that 20 large size farms (54.05 percent), 12 medium size farms (19.67 percent) and 8 small size farms (14.82 percent) took the farming operation as a full-time occupation. Broiler poultry farming operation was carried on alongwith other business activities in the case of 12 large size farms (32.43 percent), 11 medium size farms (18.03 percent) and 11 small size farms (20.37 percent). In 3 large size farms (8.11 percent), 12 medium size farms size farms (19.67 percent) and 14 small size farms (25.92 percent) the farmers were company employees. Proprietors of 2 large size farms (5.41 percent), 18 medium size farms (29.51 percent) and 16 small size

TABLE 4.2

Number of broiler poultry farms with technically qualified hands in Kerala

(1987 - 91)

Category		Number of farms (percentage in brackets)		
		small size	medium size	large size
Unskilled		39 (72.23)	38 (62.29)	8 (21.62)
Skilled :	Veterinary science degree	-- --	1 (1.64)	5 (13.52)
	Diploma in poultry farming	-- --	3 (4.92)	8 (21.62)
	Training in poultry farming	15 (27.77)	19 (31.15)	16 (43.24)
Total (skilled)		15 (27.77)	23 (37.71)	29 (78.38)

Source : Survey data

TABLE 4.3

Previous experience of farmers in broiler poultry farming

(1987 - 91)

Category	Number of farms (percentage in brackets)		
	small size	medium size	large size
Partners in other farms	3 (5.56)	17 (27.86)	22 (59.46)
Employees of other farms	12 (22.22)	26 (42.62)	8 (21.62)
Others	39 (72.22)	18 (29.52)	7 (18.92)

Source : Survey data

farms (29.62 percent) were social workers. While the proprietors of 8 medium size farms (13.11 percent) and 5 small size farms (9.26 percent) were contractors. It was seen that the proprietors of 85.18 percent of small size farms; 80.33 percent of medium size farms and 45.95 percent of large size farms regarded poultry farming operation as a part-time engagement whereas 54.05 percent of large size farms, 19.67 percent of medium size farms and 14.82 percent of small size farms took it as a full-time engagement (Table 4.4).

This clearly shows that the degree of personal involvement of the farmer in broiler poultry farming operation has a positive influence on labour productivity.

The study clearly indicated that the skill, experience and level of personal involvement made the labour productivity of large size broiler poultry farms higher than that of other sizes of farms. Thus the hypothesis that productivity of broiler poultry farms, other things being comparable, is directly proportional to size of farms, stands valid with regard to labour productivity.

4.1.2. Capital productivity

Capital productivity indicates the quantity of meat produced from every rupee of investment.

$$\text{Capital productivity} = \frac{\text{Total live weight of fowls}}{\text{Total asset in rupees}}$$

Empirical results

The overall capital productivity index was 0.250 with extreme mean values of 0.231 and 0.279. On a sizewise analysis it was found that the highest capital productivity of 0.271 with extreme mean values of 0.208 and 0.342 was found in small size farms. In large size farms it was 0.253 with extreme mean values of 0.176 and 0.440. In medium size farms it was 0.231 with extreme mean values of 0.199 and 0.245 (Table 4.5). It is evinced that capital productivity is not directly proportional to size of farms. Hence the second hypothesis stands disproved with respect to capital productivity.

The survey of consistency level with respect to capital productivity revealed that maximum consistency of 6.93 percent was found in medium size farms, while the least level of consistency of 37.54 percent was found in large size farms. In small size farms the level of consistency was 17.71 percent (Table 4.5). Analysis of variance showed an $F_{0.05}$ value of 0.4323, evidencing significant relation in this regard among different sizes of farms (Table 5.3).

For the analysis, Capital productivity is divided into fixed capital productivity and working capital productivity.

TABLE 4.4

Level of involvement of broiler poultry farmers in farming activities in Kerala

(1987 - 91)

Category	Number of farms (percentage in brackets)		
	small size	medium size	large size
Full-time	8 (14.82)	12 (19.67)	20 (54.05)
Business	11 (20.37)	11 (18.03)	12 (32.43)
Company Employees	14 (25.93)	12 (19.67)	3 (8.11)
Part-time:			
Contractors	5 (9.26)	8 (13.11)	- --
Social workers	16 (29.62)	18 (29.51)	2 (5.41)
Total (Part-time)	46 (85.18)	49 (80.33)	17 (45.95)

Source : Survey data

TABLE 4.5

Total capital productivity in broiler poultry farms in Kerala

Size of farm	1987	1988	1989	1990	1991	mean	s.d.	c.v.
Small	0.208	0.229	0.301	0.342	0.272	0.271	0.048	17.71
Medium	0.199	0.234	0.245	0.234	0.241	0.231	0.016	6.93
Large	0.440	0.237	0.220	0.176	0.195	0.253	0.095	37.54
Farm average	0.279	0.231	0.252	0.249	0.240	0.250	0.016	6.40

Source : Computed from survey data

4.1.2.1. Fixed capital productivity

Fixed capital productivity indicates to what extent it influences the total capital productivity. This index is arrived at by relating total live weight of fowls to the total investment in fixed assets. Symbolically -

$$\text{Fixed capital productivity} = \frac{\text{Total live weight of fowls}}{\text{Fixed Asset in rupees}}$$

Empirical results

Overall fixed capital productivity was found to be 0.426 with extreme mean values of 0.347 and 0.613. A sizewise analysis showed that the highest productivity of 0.424 was found in small size farms with extreme mean values of 0.289 and 0.563. This is followed by large size farms having an index of 0.390 with extreme mean values of 0.341 and 0.431. The lowest productivity level of 0.346 was found in medium size farms with extreme mean values of 0.297 and 0.389. The large size farms with coefficient of variation of 7.92 percent stood first with regard to consistency level. This was followed by medium and small size farms with 9.34 percent and 24.29 percent respectively (Table 4.6). $F_{0.05}$ with 1.14 showed significant relation between various sizes of farms in this respect (Table 5.3).

TABLE 4.6

Components of Fixed Capital Productivity in Broiler poultry farms in Kerala

	Productivity based on POULTRY SHEDS			Productivity based on EQUIPMENT			Productivity based on OTHER FIXED ASSETS			Productivity based on TOTAL FIXED ASSETS		
	Small size	Medium size	Large size	Small size	Medium size	Large size	Small size	Medium size	Large size	Small size	Medium size	Large size
1987	0.344	0.350	0.454	4.05	8.72	4.24	3.35	2.52	2.04	0.289	0.297	0.341
1988	0.384	0.453	0.514	3.95	8.34	4.91	4.32	3.12	3.32	0.324	0.378	0.409
1989	0.596	0.421	0.497	4.71	9.34	4.48	5.62	5.63	8.00	0.484	0.376	0.424
1990	0.563	0.421	0.499	5.33	10.38	4.79	6.57	6.24	9.12	0.563	0.380	0.431
1991	0.570	0.425	0.397	4.28	11.65	3.82	5.38	7.50	7.34	0.460	0.389	0.343
mean	0.491	0.414	0.472	4.46	9.68	4.45	5.05	5.00	5.96	0.424	0.364	0.390
s.d.	0.105	0.034	0.042	0.506	1.20	0.392	1.11	1.89	2.77	0.103	0.034	0.039
c.v.	21.38	8.21	8.89	11.34	12.40	8.81	21.98	37.80	46.48	24.29	9.34	10.09

Source Computed from survey data.

From the above analysis it is clear that the capital productivity of various sizes of farms were significantly influenced by the fixed capital productivity.

The major components of fixed asset in broiler poultry farms are found to be poultry sheds, equipments and other fixed assets. Accordingly the productivity of each one of these factors is estimated to identify the particular factor which strongly influences the fixed capital productivity.

4.1.2.1.1. Poultry sheds investment productivity

The type of poultry sheds were found to be varying from farm to farm. Forty one small size farms (75.92 percent), 26 medium size farms (42.62 percent) and 18 large size farms (48.65 percent) had kucha type sheds and 13 small size farms (24.08 percent) 35 medium size farms (57.38 percent) and 19 large size farms (51.35 percent) had pucca type sheds (Table 4.7).

Among the kucha type sheds, 23 small size farms (42.59 percent), 22 medium size farms (36.06 percent) and 12 large size farms (32.42 percent) had thatched sheds, and 18 small size farms (33.33 percent), 4 medium size farms (6.56 percent) and 6 large size farms (16.22 percent) had lite roof sheds (Table 4.7).

TABLE 4.7

Types of poultry sheds in broiler poultry farms in Kerala

Size of farm	Number of farms (percentage in brackets)						
	Pucca construction				Kucha construction		
	Tiles	Asbestos	R.C.C.	Total	Thatched	lite roof etc.	Total
Small	13 (24.08)	--	--	13 (24.08)	23 (42.59)	18 (33.33)	41 (75.92)
Medium	18 (29.51)	14 (22.95)	3 (4.92)	35 (57.38)	22 (36.06)	4 (6.56)	26 (42.62)
Large	6 (16.22)	13 (35.14)	--	19 (51.35)	12 (32.42)	6 (16.22)	18 (48.65)

Source : Survey data

Among the pucca type sheds, 13 small size farms (24.08 percent), 18 medium size farms (29.51 percent) and 6 large size farms (16.22 percent) had tiled roof sheds with brick walls. In 14 medium size farms (22.95 percent) and 13 large size farms (35.14 percent) it was with asbestos roof and brick walls; and 3 medium size farms (4.92 percent) had reinforced concrete poultry sheds (Table 4.7).

On analysing the impact of poultry shed on fixed capital productivity, small size farms with an index of 0.491 ranked first. This was followed by large size farms and medium size farms with 0.472 and 0.414 respectively. On account of consistency, medium size farms had the best result (8.21 percent). In large size farms it was 8.89 percent and in small size farms it was 21.38 percent (Table 4.6).

From the above analysis of poultry sheds it was seen that when the majority of small size farms depended on kucha type construction the large and medium size farms depended on pucca type construction. This made the small size farms to have a relatively higher capital productivity. Regarding shed investment productivity the hypothesis number two stands rejected.

4.1.2.1.2. Equipments and productivity

The major components of equipments used in broiler poultry farms were found to be brooders, feeders, drinkers, chick guards and grills.

It was observed that the type of equipments used in broiler poultry farms ranged from sub standard type to the standard type. 39 small size farms (72.23 percent), 36 medium size farms (59.02 percent) and 26 large size farms (70.27 percent) had been using sub standard type brooders. In 15 small size farms (27.77 percent), 23 medium size farms (37.70 percent) and 6 large size farms (16.22 percent) the average type brooders were being used. 2 medium size farms (3.28 percent) and 5 large size farms (13.51 percent) they were found using standard type brooders (Table 4.8).

The type of feeders used by different sizes of farms were found to be sub standard, average and standard. 22 small size farms (40.74 percent), 28 medium size farms (45.90 percent) and 10 large size farms (27.02 percent) were found using sub standard type feeders, 19 small size farms (35.18 percent), 31 medium size farms (50.82 percent) and 14 large size farms (37.84 percent) had average type feeders for use. 13 small size farms (24.08 percent), 2 medium size farms (3.28 percent) and 13 large size farms (35.14 percent) were found using standard type feeders (Table 4.8).

TABLE 4.8

Types of equipments used in broiler poultry farms in Kerala

Equipment		Number of farms (Percentage in brackets)		
		Small size farms	Medium size farms	Large size farms
Brooders	: Sub standard	39 (72.23)	36 (59.02)	26 (70.27)
	Average	15 (27.77)	23 (37.70)	6 (16.22)
	Standard	-- --	2 (3.28)	5 (13.51)
Feeders	: Sub standard	22 (40.74)	28 (45.90)	10 (27.02)
	Average	19 (35.18)	31 (50.82)	14 (37.84)
	Standard	13 (24.08)	2 (3.28)	13 (35.14)
Drinkers	: Sub standard	10 (18.52)	24 (39.34)	8 (21.62)
	Average	25 (46.29)	35 (57.38)	-- --
	Standard	19 (35.19)	2 (3.28)	29 (78.38)
Guards and Grills	: Sub standard	20 (37.04)	12 (19.67)	4 (10.81)
	Average	19 (35.19)	32 (52.46)	14 (37.84)
	Standard	15 (27.77)	17 (27.87)	19 (51.35)

Source : Survey data

While ten small size farms (18.52 percent), 24 medium size farms (39.34 percent) and 8 large size farms (21.62 percent) were found using sub standard type drinkers, 25 small size farms (46.29 percent) and 35 medium size farms (57.38 percent) had average type drinkers. In 19 small size farms (35.19 percent), 2 medium size farms (3.28 percent) and 29 large size farms (78.38 percent) the standard type drinkers were found used (Table 4.8).

Regarding chick guards and grills it was seen that 20 small size farms (37.04 percent), 12 medium size farms (19.67 percent) and 4 large size farms (10.81 percent) were found using the sub standard type guards and grills. 19 small size farms (35.19 percent), 32 medium size farms (52.46 percent) and 14 large size farms (37.84 percent) were found using average type grills and guards. In 15 small size farms (27.77 percent), 17 medium size farms (27.87 percent) and 19 large size farms (51.35 percent) they had standard type grills and guards (Table 4.8).

On analysing the impact of equipments on fixed capital productivity it was observed that maximum productivity index of 9.68 was found in medium size farms. In small size farms it was 4.46 while in large size farms it was 4.45. The highest consistency level was found in large size farms with a coefficient of 8.81 percent. In small size farms it was 11.34 percent and in medium size farms 12.40 percent (Table 4.6).

Thus it was found that when most of the small size farms used sub standard equipments the majority of medium size farms depended on average type equipments and in many of the large size farms standard type equipments were used. The analysis thus gave the inference that medium size farms, by using the average type equipments gave a better and positive impact on fixed capital productivity than other sizes of farms. Hence the second hypothesis is found to be disproved.

4.1.2.1.3. Other Fixed Assets and productivity

Other fixed assets in broiler poultry farms include weighing scale, auto-vaccinators, sprayers, showels and other farm equipments.

On a comparative basis it was found that the productivity of other fixed assets in large size farms was 5.96 as against 5.05 in small size farms and 5.00 in medium size farms. With regard to consistency level the small size farms had the highest degree of consistency with a coefficient of 21.98 percent. In medium size farms it was 37.80 percent and in large size farms it was 46.48 percent (Table 4.6).

The two major factors which have directly affected the production of other fixed assets were variation in fowl strength and degree of utilisation of such assets in different sizes of farms.

Thus the analysis of fixed capital productivity disclosed that small size farms had a comparatively better position due to the use of low cost poultry sheds and equipments alongwith comparatively better utilisation of other fixed assets.

Though medium size farms had a relatively high productivity with regard to equipments, the high cost poultry sheds and underutilisation of other fixed assets made them to have the least overall fixed capital productivity.

4.1.2.2. Working capital productivity

Working capital productivity shows the quantity of output realised from every rupee of investment in gross working capital. Symbolically -

$$\text{Working capital productivity} = \frac{\text{Total live weight of fowls}}{\text{Working capital in rupees}}$$

Empirical results

Overall working capital productivity was found to be 1.74 accompanied by extreme mean values of 1.57 and 2.08 alongwith consistency level of 10.28 percent (Table 4.9).

Table - 4.9

Working Capital Productivity in Broiler Poultry Farms in Kerala

Size of Farm	1987	1988	1989	1990	1991	X		C.V
Small	1.348	1.283	1.250	1.146	1.500	1.310	0.117	8.93
Medium	1.660	1.610	1.430	1.650	1.570	1.580	0.080	5.06
Large	1.980	1.770	2.170	3.360	2.210	2.298	0.553	24.06
Farm Average	1.680	1.570	1.630	2.080	1.760	1.740	0.179	10.28

Source : Computed from Survey Data.

The sizewise analysis of productivity revealed that large size farms with an index of 2.298 ranked first, which was followed by medium size farms with 1.58 and small size farms with 1.31. With regard to consistency level medium size farms with 5.06 percent stood first. This was followed by small size farms with 8.93 percent and large size farms with 24.06 (Table 4.9). Regarding working capital productivity the relationship with size is found inversely related and thus the second hypothesis stands unaccepted.

Analysis about the components of working capital productivity is to assess the contribution made by each current asset towards working capital productivity. The major components of gross working capital were found to be inventory, receivables, deposit with hatcheries and bank balance.

4.1.2.2.1. Inventory and productivity

The Working capital productivity related to inventory was found to be 0.721 in small size farms with extreme mean values of 0.675 and 0.793. The second best index of productivity of 0.702 was found in medium size farms alongwith the extreme mean values of 0.65 and 0.78. In large size farms the productivity index was 0.617. The highest consistency level was found in small size farms with a coefficient of 5.96 percent and in medium size farms and large size farms it was 6.40 percent and 14.26 percent respectively (Table 4.10).

TABLE 4.10

Components of working capital productivity in broiler poultry farms in Kerala

	Productivity based on inventory			Productivity based on Receivables			Productivity based on Deposit with Hatch.			Productivity based on Cash and Bank		
	small	medium	large	small	medium	large	small	medium	large	small	medium	large
1987	0.675	0.67	0.568	0.292	0.3	0.34	0.05	0.02	0.02	0.326	0.61	1.06
1988	0.68	0.65	0.607	0.232	0.36	0.61	0.05	0.03	0.03	0.314	0.57	0.53
1989	0.742	0.72	0.496	0.251	0.56	0.96	0.06	0.03	0.04	0.191	0.12	0.67
1990	0.717	0.69	0.759	0.206	0.66	0.42	0.06	0.03	0.02	0.160	0.26	2.16
1991	0.793	0.78	0.658	0.286	0.42	0.69	0.07	0.04	0.05	0.286	0.33	0.81
mean	0.721	0.702	0.617	0.253	0.46	0.605	0.05	0.03	0.03	0.243	0.378	1.05
s.d.	0.043	0.045	0.088	0.032	0.132	0.218	0.007	0.006	0.012	0.086	0.186	0.583
c.v.	5.96	6.40	14.26	12.65	28.69	36.03	14.00	20.00	40.00	35.39	49.20	55.52

Source : Computed from survey data

4.1.2.2.2. Receivables and productivity

The productivity related to receivables was the highest in large size farms where the index was 0.605 as against 0.46 in medium size farms and 0.253 in small size farms. The highest consistency coefficient was found in small size farms (12.65 percent). This was followed by medium size farms with 28.69 percent and large size farms with 36.03 percent (Table 4.10).

4.1.2.2.3. Deposit with hatcheries and Productivity

The index of productivity was found to be the highest in small size farms with 0.05. In medium size and large size farms it was 0.03 each. The level of consistency was the highest in small size farms with 14.00 percent. In medium size farms and large size farms it was 20.00 percent and 40.00 percent respectively (Table 4.10).

4.1.2.2.4. Cash cum Bank balance and Productivity

Large size farms had shown the maximum efficiency in regard. The index value was 1.05 in large size farms, which followed by medium size farms and small size farms with 0.378 0.243 respectively. The consistency was found to be the best small size farms with a coefficient of 35.39 percent. In medium size farms it was 49.20 percent and in large size farms it 55.52 percent (Table 4.10).

The analysis made it clear that efficiency indices of cash management and receivables management made the overall working capital productivity index of large size farms to be at a high level. With a relatively good inventory and receivables management, the medium size farms came next to large size farms in this regard. The small size farms had a comparatively better inventory management index.

Thus, among the components of working capital inventory and receivables had a strong say. The reasons why the highest level of performance with regard to capital productivity was claimed by large size farms particularly are the efficient utilisation of receivables and inventory better than the other sizes of farms. It was very clear that the share of deposit with hatchery and even the cash and bank balance on the working capital productivity was rather insignificant for all sizes of farms.

Section II

4.2. Capacity utilisation

Better capacity utilisation provides an opportunity for a quick increase in output and productivity in the short run. Capacity utilisation influences cost of production, profitability and generation of internal resources. Capacity utilisation rates can tell us the real scope for enhancing output in the short run and in taking long run decisions relating to the expansion of farms.

Better capacity utilisation is regarded as an important parameter to determine the efficiency or otherwise of broiler poultry farms. Therefore, an attempt is made to analyse the capacity utilisation in the present study.

Though a series of prefixes are available to qualify capacity, ratio of floor area occupied to the floor area available is taken here to measure capacity utilisation. Symbolically -

$$\text{Capacity utilisation} = \frac{\text{Occupied floor area in square foot}}{\text{Actual floor area in square foot}} \times 100$$

Empirical results

The estimated rates of capacity utilisation of broiler poultry farms are listed in table 4.11. The assessment of capacity utilisation disclosed that 51.97 percent of the surveyed farms in Kerala was functioning at 100 percent and above capacity level.

The sizewise analysis revealed that 57.42 percent of small size farms 44.26 percent of medium size farms and 56.75 percent of large size farms had capacity utilisation of 100 percent and above. Out of this 35.20 percent of small size farms, 29.51 percent of medium size farms and 45.94 percent of large size farms were within 100 percent to 120 percent capacity level. 22.22 percent of small size farms, 14.75 percent of medium size farms and 2.70 percent of large size farms were within the range of 120 percent to 140 percent capacity level. In large size farms 8.11 percent of the farms were within the range of 140 percent to 150 percent capacity utilisation.

Regarding the farms operating at less than 100 percent capacity, 26.97 percent of them were within 80 percent to 100 percent capacity level. 9.22 percent within 60 percent to 80 percent range and 11.84 percent within 40 percent to 60 percent capacity utilisation range. The sizewise analysis showed that 42.58 percent of small size farms, 55.74 percent of medium size farms and 45.25 percent of large size farms were under the under

TABLE 4.11

Average Capacity utilisation of sheds in broiler poultry farms in Kerala

Capacity Utilisation (in percentage)	Number of farms (percentage in brackets)			
	Small	Medium	Large	Farm Average
40 - 60	10 (18.51)	6 (9.84)	2 (5.41)	18 (11.84)
60 - 80	5 (9.26)	7 (11.47)	2 (5.41)	14 (9.22)
80 - 100	8 (14.81)	21 (34.43)	12 (32.43)	41 (26.97)
100 - 120	19 (35.20)	18 (29.51)	17 (45.94)	54 (35.53)
120 - 140	12 (22.22)	9 (14.75)	1 (2.70)	22 (14.47)
140 - 150	--	--	3 (8.11)	3 (1.97)
Average	108.67	108.56	112.80	---
Total	54 (100.00)	61 (100.00)	37 (100.00)	152 (100.00)

Source : Computed from survey data.

utilisation category. Out of this 14.81 percent of small size farms, 34.43 percent of medium size farms and 32.43 percent of large size farms had capacity utilisation between 80 percent and 100 percent, whereas 9.26 percent of small size farms, 11.47 percent of medium size farms and 5.41 percent of large size farms were functioning at 60 percent to 80 percent capacity level. 18.51 percent of small size farms and 5.41 percent of large size farms were found functioning between 40 percent and 60 percent capacity level.

This analysis revealed that majority of the farms, comprised of 50.01 percent of small size farms, 63.94 percent of medium size farms and 80.37 percent of large size farms had the capacity utilisation between 80 percent and 120 percent. There were not many farms which had capacity utilisation above 120 percent. Only 22.22 percent of small size farms, 14.75 percent of medium size farms and 10.81 percent of large size farms had the capacity utilisation exceeding 120 percent.

4.2.1. Gross margin per square foot

Gross margin per square foot is another index to assess farm productivity. The gross margin per square foot is dependent on space utilisation, interest on borrowings and many other trivial factors such as utilisation of manure, timely sale of gunnies and sale of waste parts.

The data analysis revealed that in small size farms the gross margin per square foot was Rs.23.43 per annum with extreme mean values of Rs.13.90 and Rs.37.39. In medium size farms it was Rs.23.99 per annum with extreme mean values of Rs.10.29 and Rs.39.47. In large size farms it was Rs.49.65 with extreme mean values of Rs.26.54 and Rs.62.36. With regard to the consistency level large size farms with 23.02 percent had the best result. This was followed by small size farms with 37.39 percent and medium size farms with 38.56 percent (Table 4.12). It is found that there is direct relationship between size of farms and gross margin per square foot. Hence hypothesis in this regard stands proved.

The analysis of variance showed an $F_{0.05}$ value of 8.374 with regard to the gross margin per square foot (Table 4.13). Thereby it is inferred that there is a significant difference in gross margin among various sizes of farms.

Table - 4.12

Indices of Farm Efficiency in Broiler Poultry Farms in Kerala (Average)

Ratios	SMALL SIZE					MEDIUM SIZE					LARGE SIZE				
				Extr	Mean				Extr	Mean				Extr	Mean
	Avg	SD	CV	Min	Max	AVg	SD	CV	Min	Max	Avg	SD	CV	Min	Max
Feed Conversion Ratio	2.97	.27	9.23	2.56	3.27	2.88	0.33	11.42	2.37	3.38	2.35	0.43	18.29	2.13	3.3
Gross Margin per Sq. foot	23.43	8.25	35.21	13.9	37.39	23.99	9.25	38.56	10.27	39.4	49.65	11.43	23.02	26.54	62.36
Weight per Bird	1.59	.08	5.52	1.49	1.75	1.52	.09	5.85	1.37	1.63	1.69	0.13	7.89	1.39	1.77
Performance Efficiency Factor	55.62	4.45	8.0	50.7	63.22	53.76	8.58	15.95	41.82	67.84	73.95	14.31	19.35	42.02	81.42
Feed Price Ratio	1.606	.14	8.65	1.43	1.84	1.72	0.19	10.03	1.51	2.03	2.13	0.30	14.07	1.48	2.4
Liveability Index	98.58	.44	.44	97.71	98.85	98.37	0.30	0.30	97.98	98.96	98.54	0.45	0.46	97.78	98.96

Source: Computed from Survey Data

Table - 4.13

Analysis of Variance Table (Farm Indices)

Particulars		Factors Analysed					
		F.C.R.	Gross Margin per Sq.ft	Weight per bird	P.E.F.	Feed Price ratio	Lineability
SUM OF SQUARES (SS)	SSb	1.21	2481.93	0.10	301.29	0.827	3.09
	SSw	2.76	1778.15	0.38	990.71	0.833	4.831
MEAN SQUARE (MS)	MSb	0.605	1240.965	0.05	150.645	0.4135	1.545
	MSw	0.23	148.18	0.03	82.56	0.069	0.403
'F' Value		2.63	8.374	1.667	1.824	5.99	3.83

Source : Computed from Survay Data.

Section III

4.3. Capital intensity

The above partial productivity indices are not capable of giving a clear picture of productivity in commercial broiler poultry subject to the influence of so many other factors. Hence it is difficult to isolate the scale effect from the rise in productivity due to the technical change. Labour productivity is primarily a function of three factors, namely capital intensity, labour productivity and wages (Raju K.V. 1992) Labour productivity is generally linked to capital intensity since the productivity in labour is assumed to increase with an increase in the amount of capital invested per worker per hour. Excessive capital necessarily implies unutilised capacity and wastage of capital. Therefore a study of capital intensity is also of prime importance in an economy. Symbolically capital intensity can be expressed as :

$$\text{Capital intensity per person per hour} = \frac{\text{Input of fixed capital in rupees}}{\text{Input of labour hours}}$$

Increase in the above partial productivity ratio means that over a period time more output is possible with decreasing amount of input and there is saving in the use of particular input over the time.

Empirical results

The overall capital intensity was found to be 12.54 with extreme mean values of 9.55 and 17.53. The sizewise analysis showed that maximum capital intensity was in large size farms with 19.56, alongwith extreme mean values of 11.81 and 28.71. This was followed by medium size farms with 10.15 alongwith extreme mean values of 8.33 and 11.83 and in small size farms it was as low as 6.53 with extreme mean values of 5.03 and 7.89. On account of consistency, medium size farms with 14.09 percent stood first. This was followed by small size farms with 17.42 percent and large size farms with 31.45 percent (Table 4.14). This made it clear that the size of farms and capital intensity are inversely related. Among the various sizes of farms capital intensity was found varying significantly ($F_{0.05} = 8.21$) (Table 5.3).

Section IV

4.4. Farm productivity indices

This section deals with the farm productivity indices. The farm productivity indices measure the relative level of efficiency in utilising the major farm inputs. The general farm indices available for assessing the farm productivity are F.C.R., P.E.F., Feed Price Ratio and Gross margin per square foot.

4.4.1. Feed Conversion Ratio (F.C.R.)

Feed conversion ratio is one of the major indices of broiler poultry farm productivity. Though the efficiency is measured in terms of feed intake, feed conversion depends on the intake of balanced feed, quality of day old chicks and many trivial factors such as type of litter used, duration and intensity of light, ventilation and temperature in poultry sheds, presence of ammonia fumes in litter, floor-space available per bird, quality of equipments used, steps taken for diseases prevention and effectiveness in stress control. Thus, low F.C.R. always indicates proper management of feed and other trivial factors mentioned above.

In the small size farms the F.C.R. was 2.97 with extreme mean values of 2.56 and 3.27. In medium size farms it was 2.88 with extreme mean values of 2.37 and 3.38 and in large size farms

it was 2.35 with extreme mean values of 2.13 and 3.30. With regard to consistency, the small size farms with 9.23 percent had the first place which was followed by the medium size farms and the large size farms with 11.42 percent and 18.29 percent respectively (Table 4.12).

Thus the third hypothesis which reads as feed conversion ratio varies significantly with varying size of farms has been established.

The F.C.R. is the rate of change in feed consumption for a change in live weight of fowls. The efficiency of feed convertibility depends on the live weight gain and percentage of liveability of fowls. The liveability of fowls is influenced by the period of rearing and the number of batches reared at a time. Analysis of variance result was 2.63, which showed significant relation between various sizes of farms in this respect (Table 4.13).

4.4.1.1. Weight gain in fowls

The weight per fowl is considered as an effective index of success in rearing broiler fowls. Better weight gaining depends mainly on the quality of day old chick, quality of feed, optimum input of medicines, additives and preventives. it is also influenced by climatic conditions.

The average weight per fowl was 1.60 kilograms. In small size farms it was 1.59 kilograms with extreme mean values of 1.49 and 1.75 kilograms. In medium size farms it was 1.52 kilograms with extreme mean values of 1.37 and 1.67 kilograms. In large size farms the average weight came to 1.69 kilograms with extreme mean values of 1.39 and 1.77 kilograms. The consistency level was maximum in small size farms with a coefficient of 5.52. In medium and large size farms it was 5.85 and 7.89 respectively (Table 4.12).

The inferential statistical analysis made it clear that the correlation coefficient between live weight gain and feed consumed in small size farms was (+)0.8871 with probable error of 0.0642 and 't' value of 3.328. In medium size farms it was (+)0.9968 with probable error of 0.0019 and 't' value of 21.581. In large size farms it was (+)0.9993 with probable error of 0.0004 and 't' value of 46.258 (Table 4.15). This evidenced a positive and highly significant relationship between the variables in all sizes of farms. The 'F' test results with a coefficient of 1.667 ($F_{0.05}$) revealed that there was no significant difference in live weight gain in various sizes of farms (Table 4.13).

4.4.1.2. Liveability index

Liveability, the inverse of mortality cum morbidity, determines the success or failure in broiler poultry farming.

Mortality rate indicates the proportion of the number of birds brought in and the number of saleable birds. The average liveability rate was 98.5 percent. The small size farms had a liveability index of 98.58 percent with extreme mean values of 97.71 percent and 98.96 percent. In large size farms it was 98.54 percent with extreme mean values of 97.78 percent and 98.96 percent. The level of consistency recorded in medium size farms was 0.30 percent. In small size farms it was 0.44 percent and in large size farms it was 0.46 percent (Table 4.12).

The $F_{0.05}$ value of 3.83 made it clear that there is no significant difference in the liveability aspect in various sizes of farms (Table 4.13).

There was no significant difference in the liveability factor and weight per fowl among various sizes of farms. The $F_{0.05}$ value of F.C.R. was found to be 2.63 (Table 4.13). Thus the F.C.R. of various sizes was found to be statistically insignificant. The $F_{0.05}$ value in this regard was 3.83 (Table 4.13).

4.4.1.2.1. Period of rearing

Liveability of broiler fowls is influenced by the period of rearing and the number of batches in the farm.

TABLE 4.14

Components of capital intensity in broiler poultry farms in Kerala

	Capital intensity on poultry sheds			Capital intensity on equipment			Capital intensity on other fixed assest			Capital intensity on total fixed assets			Farm average (Total)
	small	medium	large	small	medium	large	small	medium	large	small	medium	large	
1987	6.56	7.28	10.67	0.56	0.29	1.14	0.67	1.01	2.37	7.80	8.58	14.19	9.55
1988	6.65	6.94	10.83	0.65	0.38	1.14	0.59	1.00	1.68	7.89	8.33	13.64	10.61
1989	4.63	9.60	18.67	0.59	0.43	2.07	0.49	0.72	1.16	5.71	10.74	21.91	14.67
1990	4.07	10.18	18.78	0.53	0.41	1.96	0.43	0.69	1.03	5.03	11.28	21.76	10.34
1991	5.03	10.82	24.79	0.67	0.39	2.58	0.53	0.61	1.34	6.23	11.82	28.71	17.53
mean	5.39	8.96	16.75	0.60	0.38	1.78	0.54	0.81	1.52	6.53	10.15	20.04	12.54
s.d.	1.04	1.566	5.37	0.05	0.05	0.56	0.08	0.166	0.48	1.138	1.428	5.60	3.06
c.v.	19.29	17.48	32.06	8.33	13.16	31.46	14.81	20.49	31.58	17.42	14.07	27.94	24.43

Source : Computed from survey data

The time lag in rearing the fowls (number of days grown) is another determinant of liveability index. It varied from 56 to 58 days in small size farms, 54 to 60 days in medium size farms and 52 to 58 in large size farms. The relation between time lag in rearing and feed conversion ratio revealed that in small size farms, the correlation coefficient was (+)0.7124 with probable error of 0.1486 and 't' value 1.7582. In medium size farms the correlation coefficient was (+)0.9214 with probable error of 0.0455 and 't' value 4.107. In large size farms the correlation coefficient was (+)0.8744 with probable error 0.0784 and 't' value 3.1215 (Table 4.15).

Thus it was observed that with every change in number of days grown, the feed conversion ratio changed positively in all sizes of farms.

4.4.1.2.2. Number of batches and number of lots

The number of batches of fowls reared per annum differed from size to size and farm to farm. In small size farms it ranged from 45 to 52. In medium size farms it ranged from 48 to 54 and in large size farms it ranged from 52 to 58 batches.

The relationship between the number of batches reared and the rate of mortality on an average was found to be (-)0.3328. In small size farms it was (-)0.3776 with probable error of 0.2586 and 't' value 0.7063. In medium size farms the

Table 4.15

Inferential Statistic Regarding Farm Productivity in Broiler Poultry Farms in Kerala

Description	Small Size				Medium Size				Large Size			
	r	r^2	P.E	t	r	r^2	P.E	t	r	r^2	P.E	t
F.C.R. & No. of Birds	-.3627	.1316	.2619	.6741	-.2137	.0456	.2879	.3788	-.80	.64	.3016	2.309
Rate of Mortality and No. of Batches	-.3776	.1426	.2586	.7063	-.2433	.5525	.1350	1.9245	-.2865	.0821	.2768	.5179
Body Weight in Kgs. and Feed Consumed	.8871	.7869	.0642	3.328	.9968	.9936	.0019	21.581	.9993	.9986	.0004	46.258
F.C.R. & Number of days grown	.7124	.5075	.1486	1.7582	.9214	.8490	.0455	4.107	.8744	.7646	.0784	3.1215
Rate of Mortality and Lot size	.9109	.8297	.0514	3.823	.9577	.9172	.3016	5.7646	.9542	.9104	.0270	5.521

Source: Computed Fram Survey Data.

correlation coefficient was (-)0.2433 with probable error of 0.1350 and 't' value 1.9245. In large size farms the correlation coefficient was (-) 0.2865 with probable error of 0.2768 and 't' value 0.5179 (Table 4.15).

The above data made to infer that the number of batches reared is totally indifferent to the rate of mortality.

The study about the liveability index needs an evaluation about the number of lots into which each batch is divided. In small size farms it ranged from one to two lots. In medium size farms it was one to four lots and in large size farms the number of lots varied from one to ten on an average. It was observed that lot size and rate of mortality were closely related. When the number of lots in large size farms varied from one to ten the corresponding rate of mortality was 1.38 percent. In medium size farms, when the number of lots varied from one to four the corresponding rate of mortality was 1.57 percent and when the number of lots was one to two in small size farms, the mortality rate was 1.4 percent.

While correlating the number of fowls in a lot with the corresponding rate of mortality, in small size farms it was (+)0.9109 with probable error of 0.0514 and 't' value 3.823. In medium size farms the correlation coefficient was (+)0.9577 with probable error of 0.3016 and 't' value of 5.7646. In large size farms the correlation coefficient was (+)0.9542 with probable

error of 0.0270 and 't' value 5.521 (Table 4.15). This clearly showed that though the number of batches and the rate of mortality were found indifferent, the relation between rate of mortality and fowl strength in a lot was highly positive and statistically significant.

4.4.2. Performance Efficiency Factor (P.E.F.)

Performance Efficiency Factor is another index to evaluate the productivity of broiler poultry farms. The broiler poultry farms had an overall performance efficiency factor of 0.6111. It was found that in small size farms the index was 0.5562 with extreme mean values of 0.507 and 0.6322. In medium size farms it was 0.5376 with extreme mean values of 0.4182 and 0.6784. In large size farms the index was 0.7395 with extreme mean values of 0.4202 and 0.8142. The consistency level of small, medium and large size farms were 8.00 percent, 15.95 percent and 19.35 percent respectively (Table 4.12).

The analysis of variance disclosed an $F_{0.05}$ value of 1.824 with regard to the performance efficiency factor (Table 4.13). This clearly showed that there is no significant difference in performance efficiency factor among various sizes of farms. $F_{0.05}$ value was found to be 1.824. Thus the relation between sizes of farms in this respect was significant (Table 4.13).

4.4.3. Feed Price Ratio

This measure of farm productivity expresses the value of sales from every rupee of feed input in broiler poultry farms. The overall feed price ratio was found to be 1.818. In small size farms it was 1.606 with extreme mean values of 1.43 and 1.84. In medium size farms it was 1.72 with extreme mean values of 1.51 and 2.03. In large size farms it was 2.13 with extreme mean values of 1.48 and 2.40. Regarding consistency level the small size farms with 8.65 percent ranked first. This was followed by 10.03 percent in medium size farms and 14.07 percent in large size farms (Table 4.12). The statistical analysis proved that there is significant difference in Feed Price Ratio among various sizes of farms for $F_{0.05} = 5.99$ (Table 4.13).

Thus the study about the farm productivity indices disclosed that statistically insignificant variation in liveability factor and weight per bird resulted in an F.C.R. of the same trend. The variation, if any, in liveability factor, F.C.R. and weight gain was brought in by the variation in the period of rearing, the number of batches and the number of lots. There was statistically a significant relation between the fowl strength in a lot and the rate of mortality. But there was no such relation between the number of batches reared and the rate of mortality in all sizes of farms. Gross profit per square foot

and feed price ratio were found to be significantly related to the size of farms. But no change was observed in Performance Efficiency Factor in relation to a change in size of farms. Analysis of variance disclosed that there is no significant relation between farm sizes in this regard ($F_{0.05} = 8.374$) (Table 4.13).

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CHAPTER V

PERFORMANCE ANALYSIS OF BROILER POULTRY FARMS IN KERALA

The previous chapter discussed the impact of labour productivity, capital productivity, capital intensity and feed convertibility on earning capacity of farms. This chapter is intended to evaluate the changes in financial performance with a change in the size of farms and it is divided into three sections. The first section deals with the profitability as well as activity positions and evaluates the earning power of various sizes of farms. The second section is intended to analyse the solvency position of farms and the third section is to evaluate the overall efficiency of farms.

Section I

This section analyses the profitability of farms by applying profitability ratios and the activity position is analysed by means of activity ratios.

5.1. PROFITABILITY RATIOS

The end results of business operations are reflected by profitability. Profitability can be measured on the basis of turnover as well as investment.

On the basis of turnover usually two profit margin ratios are used namely Gross profit margin ratio (G.P. ratio) and Net profit margin ratio (N.P. ratio). Gross profit margin ratio shows the relationship between gross profit and turnover. Net profit ratio relates the net profit with turnover. When these profit margin ratios are taken together a valuable understanding of the cost and profit structure of the firm becomes possible. Similarly, the sources of business efficiency also can be measured.

Profit can also be related to investment. Such a relationship leads us to evaluate the adequacy of return in relation to the investment. Return on investment is a measure of business performance and it focuses on operating performance.

This section evaluates the profitability aspects of various sizes of farms by using gross profit ratio, net profit ratio, operating ratios and return on investment.

5.1.1. Gross Profit ratio

Gross profit is the difference between net sales and cost of goods sold. Gross Profit ratio is a measure of efficiency of production as well as pricing. Symbolically -

$$\text{Gross profit ratio} = \frac{\text{Gross Profit}}{\text{Net sales}} \times 100$$

Empirical results

The analysis disclosed that large size farms had the highest rate of gross profit, of 38.99 percent, with extreme mean values of 35.07 percent and 45.26 percent. In medium size farms the ratio was 20.78 percent with extreme mean values of 18.11 percent and 27.67 percent. The small size farms had a rate of 18.37 percent with extreme mean values of 15.91 percent and 21.93 percent. The variation in gross profit ratio was minimum for large size farms with coefficient of variation of 9.18 percent followed by small size farms (C.V. of 11.39 percent) with more variation and medium size farms with maximum variation (Table 5.1).

The correlation coefficient between fowl strength and gross profit was found to be (+)0.0783 with probable error of 0.2998 and '$t'_{0.05}$ value of 0.1360 in small size farms. In medium size farms the correlation coefficient was (+)0.0673 with probable error of 0.3002 and '$t'_{0.05}$ value of 0.116. The correlation coefficient in large size farms was (+)0.2980 with probable error of 0.2748 and '$t'_{0.05}$ value of 0.5407 (Table 5.2).

TABLE 5.1

Profitability ratio (average) of broiler poultry farms in Kerala
1987 - 91

	Small size farms					Medium size farms					Large size farms				
	Avg	S.D.	C.V.	Extreme Mean Values Min.	Max.	Avg	S.D.	C.V.	Extreme Mean Values Min.	Max.	Avg	S.D.	C.V.	Extreme Mean Values Min.	Max.
Gross Profit ratio X 100	18.14	2.07	11.39	15.91	21.93	20.78	3.51	16.87	18.11	27.67	38.99	3.58	9.18	35.07	45.26
Net Profit ratio X 100	10.60	1.71	16.09	8.59	13.19	12.73	5.00	39.30	6.47	21.66	33.52	3.31	9.88	29.96	37.93
R.O.I. X 100	40.31	9.79	24.29	23.56	52.42	43.76	19.26	44.03	16.89	74.84	107.96	8.86	8.21	97.92	122.20

Source : Computed from survey data

Table - 5.2

Inferential Statistic Regarding Farm Operations in Kerala (1987-91)

Description	Small Size				Medium Size				Large Size			
	r	r^2	PE	t	r	r^2	PE	t	r	r^2	PE	t
R.O.I. & No. of Birds	.5476	.2998	.2112	1.133	.4591	.2107	.2381	0.895	.8421	.7091	.0877	1.4586
M/P & No. of Birds	.4339	.1883	.2448	0.834	.3843	.1447	.2571	0.7210	.7704	.5935	.1226	2.093
G/P & No. of Birds	.0783	.0061	.2998	0.1360	.0673	.0045	.3002	0.116	.2980	.0888	.2748	0.5407
Total Investment & No. of Birds	.8443	.7128	.0866	2.728	.7645	.5845	.1253	2.054	.8198	0.6721	.0989	2.4797
Operating Expenses & No. of Birds	.6647	.4418	.1684	2.06	.5843	.3414	.1986	1.537	.2873	.0825	.2768	0.542
Selling Price of Meat & Total Cost	0.9702	0.9413	0.0177	6.935	0.7527	0.5666	0.1307	1.98	0.7952	0.6323	0.1109	2.271
Selling Price of Meat & Production Cost	0.9472	0.8973	0.0309	5.119	0.8639	0.7464	0.0765	2.971	0.8664	.7506	.0752	3.01

Source: Compute from Survey Data.

The 't' test results thus revealed that the relationship between fowl strength and gross profit ratio is statistically insignificant in all sizes of farms. It is thus obvious that the gross profit ratio is being influenced by other factors. The analysis of variance, with an $F_{0.05}$ value of 62.16 (Table 5.3), revealed that there is significant variation in the gross profit ratio of different sizes of farms. This also confirms that, gross profit ratio is influenced by factors other than fowl strength, in broiler poultry farms in Kerala.

5.1.2 Net Profit ratio

Net profit ratio is an overall efficiency measure. It is influenced by the factors like production, administration, selling, financing, pricing, etc. This measures the relationship between net profit and sale value. Symbolically -

$$\text{Net profit ratio} = \frac{\text{Net profit}}{\text{Net sales}} \times 100$$

Empirical results

The data analysis revealed that net profit ratio of large size farms dominated the other sizes with 33.52 percent with extreme mean values of 29.96 percent and 37.93 percent. In medium size farms it was 12.73 percent with extreme mean values of 6.47 percent and 21.66 percent. The lowest ratio was found in small

size farms with 10.60 percent with extreme mean values of 8.59 percent and 13.19 percent.

The net profit ratio was more consistent among the medium size farms (C.V. = 6.47 percent). The minimum consistency was found in large size farms (9.88 percent). In small size farms it was 16.09 percent (Table 5.1)

The correlation between fowl strength and net profit in small size farms was (+)0.4339 with a probable error of 0.2448 and $t_{0.05}$ value of 0.834. In medium size farms it was (+)0.3843 with probable error of 0.2571 and $t_{0.05}$ value of 0.7210. In large size farms the correlation coefficient was (+)0.7704 with probable error of 0.1226 and $t_{0.05}$ value of 2.093 (Table 5.2). It is thus explained that relationship between these variables were not found statistically significant in all sizes of farms. The $F_{0.05}$ value in this regard was found to be 53.33 which indicates a highly significant variation between sizes of farms (Table 5.3.).

The statistical analysis thus leads to the conclusion that fowl strength and net profit ratio had no significant relationship within each size as well as between various sizes of farms. This, like Gross Profit ratio, seems to be having influenced by factors other than the cost of production.

Table - 5.3

Analysis of Variance Table (Management Indiecs) of Broiler Poultry Farms in Kerala.

Factors Analysed	SUM OF SQUARE		MEAN SQUARES		"F" Value
	SSb	SSw	MSb	MSw	
Labour Productivity	73.181	25.75	36.591	2:1458	17.05
Total Capital Productivity	0.0041	0.0569	0.00205	0.00474	0.4323
Fixed Capital Productivity	0.0119	0.0631	0.0060	0.00525	1.14
Capital Intensity	489.07	357.59	244.54	29.80	8.21
Gross Profit Ratio	0.1493	0.0144	0.0746	0.0012	62.16
Net Profit Ratio	0.1603	0.0182	0.08	0.0015	53.33
Operating Ratio	0.1625	0.0155	0.081	0.0013	62.31
Return on Investment	1.4589	0.2971	.7295	.0248	29.42
Fixed Asset Turnover Ratio	4.182	72.67	2.09	6.05	0.345
Working Capital Turnover Ratio	141.91	47.12	70.955	3.9267	18.07
Curfent Asset Turnover Ratio	29.61	7.476	14.805	0.623	23.76
Receivables Turnover Ratio	1358.25	913.72	679.125	76.14	8.92
Inventory Turnover Ratio	2.24	37.25	1.12	3.104	0.36
Cash Turnover Ratio	0.067	0.363	0.0335	0.03025	1.107
Deposit with Hatchery Turnover Ratio	.0000028	.0000052	.0000014	.0000004	3.5
Creditors Turnover Ratio	282.63	622.51	141.315	51.876	2.72
Production Cost per Fowl	22.39	36.80	11.195	3.066	3.65
Operational Management Efficiency	1.1636	0.4214	0.5818	0.0351	16.575
Financial Management Efficiency	8.307	4.913	4.1535	0.4098	10.145
Management Achievement Index	28.409	5.346	14.2045	0.4455	31.88
Farm Management Index	0.8466	0.0437	0.4233	0.0036	117.58
Total Asset Turnover Ratio	0.8805	3.8495	0.44	0.32	1.375
Selling Price per Fowl	39.05	37.53	19.53	3.128	6.242

Source : Computed from Survey Data. [Table Value (F = 3.89)]

5.1.3. Operating ratio

This ratio relates the net operating expenses with sales value. Higher the operating ratio, lower will be the operating income and vice versa. Symbolically -

$$\text{Operating ratio} = \frac{\text{Operating expenses}}{\text{Sales}} \times 100$$

Empirical results

Operating ratio was found to be the minimum in large size farms with 67.67 percent. The extreme mean values were 62.19 percent and 71.97 percent. In medium size farms the ratio was found to be 88.30 percent with extreme mean values of 81.21 percent and 92.67 percent. In small size farms the ratio was 90.89 percent with extreme mean values of 88.63 percent and 92.56 percent (Table 5.4).

Regarding the consistency level small size farms recorded the most appealing position with 1.44 percent. This was followed by medium size farms with 4.36 percent and large size farms with 4.96 percent (Table 5.4).

The correlation coefficient between operating ratio and fowl strength in small size farms was found to be (+)0.6647 with a probable error of 0.1684 and $t_{0.05}$ value of 2.06. In medium

TABLE 5.4

Operating ratios (average) of broiler poultry farms in Kerala
1987 - 91

	Small size farms					Medium size farms					Large size farms				
	Avg	S.D.	C.V.	Extreme Mean Values Min.	Max.	Avg	S.D.	C.V.	Extreme Mean Values Min.	Max.	Avg	S.D.	C.V.	Extreme Mean Values Min.	Max.
Production Cost ratio X 100	86.72	1.73	2.00	84.05	88.63	83.95	3.36	4.00	77.32	86.44	65.29	3.77	5.77	58.58	69.28
Fixed expense ratio X 100	7.54	1.56	20.69	5.96	9.93	8.05	1.96	24.39	6.02	11.64	5.47	1.54	28.19	3.33	7.33
Chick Cost ratio X 100	22.34	1.82	8.16	19.52	24.38	23.13	1.20	5.18	21.04	24.67	19.02	1.59	8.35	15.92	20.24
Variable O.H ratio X 100	2.30	0.08	3.63	2.21	2.42	2.26	0.23	10.00	1.88	2.53	2.09	0.35	16.57	1.69	2.64
Operating ratio X 100	90.89	1.31	1.44	88.63	92.56	88.30	3.85	4.36	81.21	92.67	67.67	3.36	4.96	62.19	71.97

Source : Computed from survey data

size farms the coefficient of correlation was (+)0.5843 with probable error of 0.1986 and $t_{0.05}$ value of 1.537. In large size farms the correlation coefficient was found to be (+)0.2873 with probable error of 0.2768 and $t_{0.05}$ value of 0.542 (Table 5.2). This revealed that the relation between the variables was not statistically significant. The $F_{0.05}$ value was found to be 62.31 (Table 5.3). These explain high variation in operating ratio between the farm sizes.

A detailed analysis about the various components of operating ratio disclosed that production cost as a percentage of sales value was 65.29 in large size farms with extreme mean value of 58.58 percent and 69.28 percent. In medium size farms it was 83.95 percent accompanied by extreme mean values of 77.32 percent and 86.44 percent. In small size farms the ratio was 86.72 percent alongwith extreme mean values of 84.05 percent and 88.63 percent (Table 5.4).

The chick cost when related to the sales value disclosed that in large size farms the percentage was 19.02 with extreme mean values of 15.92 percent and 20.24 percent. In small size farms the rate was 22.34 percent with extreme mean values of19.52 percent and 24.38 percent. In medium size farms the ratio was found to be 23.13 percent with extreme mean values of 21.04 percent and 24.67 percent. The analysis also showed that the variation with regard to variable overheads was not considerable among different sizes of farms (Table 5.4).

With respect to the consistency level it was observed that the maximum level of consistency was found in small size farms and the minimum, in large size farms. This general trend was noticed for production cost, fixed costs, and variable overheads.

The consistency pattern relating to chick cost was found to be maximum in medium size farms with 5.18 percent while it was minimum in large size farms with 8.35 percent. In small size farms it was 8.16 percent (Table 5.4).

5.1.4. Return on investment

Return on investment brings to light how the various resources are employed and whether the return is justifiable with investments made in various assets. Symbolically -

$$\text{Return on investment} = \frac{\text{E.B.I.T.}}{\text{Capital employed}} \times 100$$

Empirical results

The yield obtained by large size farms was 107.96 percent with extreme mean values of 97.92 percent and 122.20 percent. The share of small size farms was 40.31 percent with extreme mean values of 23.56 percent and 52.42 percent. In medium size farms it was 43.76 percent with extreme mean values of 16.89 percent and 74.86 percent. The consistency level in large size farms was

8.21 percent. In small size farms it was 24.29 percent and in medium size farms, 44.03 percent (Table 5.1).

The coefficient of correlation between R.O.I. and fowl strength was (+)0.5476 in small size farms with probable error of 0.2112 and $t_{0.05}$ value of 1.133. In medium size farms the coefficient of correlation was (+)0.4591 with probable error value of 0.2381 and $t_{0.05}$ value of 0.8950. In large size farms the coefficient of correlation was found to be (+)0.8421 with probable error value of 0.0877 and $t_{0.05}$ value of 1.4586 (Table 5.2). Though the coefficient of correlation shows relationship between the variables, the relation was not found statistically significant. The $F_{0.05}$ value was found to be 29.42 (Table 5.3). This revealed that the variation in R.O.I. between sizes of farms was statistically significant.

Thus the analysis of profitability revealed that gross profit ratio, net profit ratio and return on investment have varied with the size of farms. This variation was found to be the result of operating ratio. Operating ratio was found to be influenced by cost of production. It was clearly observed that the change in cost was in proportion to the fowl strength except that of fixed cost and cost of chicks.

Interestingly, when production cost of various sizes of farms were compared, it was found that there was no significant variation in production cost per fowl of various sizes of farms

($F_{0.05}$ = 3.65). While relating the total cost of various sizes of farms the $F_{0.05}$ value was 5.09. This indicated significant variation in total cost in different sizes of farms. With regard to the selling price of meat in various sizes of farms the $F_{0.05}$ value was found to be 6.242, which shows represented significant variation between different sizes of farms (Table 5.3).

The analysis thus revealed that the production cost seemed to be indifferent in all sizes of farms while total cost and selling price were found to be varying significantly in different sizes of farms. This made the gross profit ratio, net profit ratio and R.O.I vary from size to size and the variation was found to be statistically significant.

Thus the hypothesis that the profitability of poultry farms, other things being comparable, is a function of size of farms stands accepted.

5.2. ACTIVITY RATIOS

Activity ratios or asset management ratios explain how efficiently the assets are employed by the firm. These are based on the relationship between the level of activity represented by sales or cost of goods sold and level of various assets. The major activity ratios used in this section are -

a) Total asset turnover ratio,

b) Fixed asset turnover ratio,

c) Current asset turnover ratio,

d) Inventory turnover ratio,

e) Receivables turnover ratio,

f) Working Capital turnover ratio and

g) Creditors turnover ratio

5.2.1. Total asset turnover ratio

This is regarded as an index of productivity of capital employed in a business. It focuses on the utilisation aspect of assets. It relates the sales value with the capital employed. Symbolically -

$$\text{Total asset turnover ratio} = \frac{\text{Sales}}{\text{Capital employed}}$$

Empirical results

The empirical results of the study revealed that the total asset turnover ratio of small size farms was 3.80 with extreme mean values of 2.74 and 4.65. In medium size farms it was 3.35 with extreme mean values of 2.61 and 3.91. In large size farms it was 3.24 with extreme mean values of 2.73 and 3.55. The coefficient of variation in large size farms was 8.33 percent, 12.83 percent in medium size farms and 19.74 percent in small size farms (Table 5.5).

Table 5.5

Activity Ratios (Average) of Broiler Poultry Farms in Kerala

				Ext.Mean					Ext.Mean					Ext. Mean	
	$\bar{X}$	σ	CV	Min.	Max.	$\bar{X}$	σ	CV	Min.	Max	$\bar{X}$	σ	CV	Min.	Max.
F.A. Turnover	5.97	1.58	26.47	3.81	7.66	5.29	0.79	14.93	3.9	6.3	5.83	0.73	12.52	4.57	6.67
P. Shed Turnover	7.31	2.05	28.04	4.53	9.47	6.00	0.77	12.83	4.6	6.89	7.05	0.58	8.23	6.08	7.73
Equip. Turnover	62.52	7.94	12.70	52.96	72.55	141.33	28.39	20.09	114.41	186.86	66.37	5.63	8.48	56.75	74.18
C.A. Turnover	10.77	0.72	6.69	9.77	11.85	9.15	0.88	9.62	7.9	10.3	7.33	0.46	6.28	6.75	7.77
T.A. Turnover	3.80	0.75	19.74	2.74	4.65	3.35	0.43	12.83	2.61	3.91	3.24	0.27	8.33	2.73	3.55
W/Cap. Turnover	15.35	1.66	10.81	13.05	17.77	11.84	0.83	7.01	10.7	13.2	17.71	1.52	19.71	4.89	9.42
Inventory Turnover	17.69	1.18	6.66	16.51	19.92	18.55	1.5	8.11	17.19	21.35	18.77	1.99	10.58	14.92	21.39
Receivables Turnover	50.65	2.69	5.32	45.26	52.0	35.43	10.27	28.98	24.64	52.0	28.56	9.72	34.03	19.08	48.14
Creditors Turnover	30.72	10.45	34.02	16.80	40.8	20.82	3.19	15.32	14.08	24.0	22.40	1.78	7.98	19.20	24.0
Prodn. Cost/Fowl	19.83	1.15	5.80	18.01	21.44	18.45	1.46	7.91	16.87	20.71	16.84	1.72	10.21	13.81	19.06
T.Cost/Fowl	21.55	1.03	4.78	20.11	23.15	20.20	1.48	7.33	18.18	22.32	18.26	1.79	9.80	15.54	21.10
S.Price/Fowl	22.87	1.08	4.72	21.11	24.19	21.98	1.58	7.19	19.91	24.46	25.76	1.83	7.10	23.58	28.64

Source : Computed from Survey Data.

5.2.2. Fixed asset turnover ratio

Fixed asset turnover ratio indicates the efficiency with which fixed assets are employed in a firm. Symbolically -

$$\text{Fixed asset turnover ratio} = \frac{\text{Sales}}{\text{Fixed assets}}$$

Empirical results

With regard to the fixed asset turnover, large size farms ranked first. The Fixed assets turnover ratio of small, large and medium size farms were 5.97, 5.83 and 5.29 times respectively. The extreme mean values were 3.81 and 7.66 in small size farms, 3.9 and 6.3 in medium size farms and 4.57 and 6.67 in large size farms. Coefficient of variation in large size farms was found to be 12.52 percent, recording the highest level of consistency among various sizes of farms. In medium size farms it was 14.93 percent and in small size farms, 26.47 percent (Table 5.5).

The detailed analysis of fixed asset turnover ratio indicated that the poultry shed investment turnover in small size farms was 7.31. In large farms it was 7.05 and in medium size farms, 6.00. With regard to the equipments, the highest turnover was found in medium size farms with 141.33. In large size farms the turnover was found to be 66.37 and the small size farms had a turnover of 62.52 (Table 5.5).

The analysis of variance with respect to total asset turnover, fixed asset turnover, poultry shed turnover and equipment turnover revealed the following results. The $F_{0.05}$ value was 1.375 in respect of total asset turnover, 0.345 with regard to fixed asset turnover, 1.11 in connection with poultry shed turnover and 25.94 in respect of equipment turnover (Table 5.3). There was no significant variation in the turnover ratios referred to above except with respect to equipment turnover.

5.2.3. Current asset turnover ratio

Current asset turnover reveals the efficiency with which current assets are managed by a firm. Symbolically -

$$\text{Current asset ratio} = \frac{\text{Sales}}{\text{Current assets}}$$

Empirical results

The analysis revealed that current asset turnover was 10.77 times in small size farms with extreme mean values of 9.77 and 11.85. In medium size farms it was 9.15 times with extreme mean values of 7.9 and 10.3. In large size farms it was 7.33 times with extreme mean values of 6.75 and 7.77. The coefficient of variation was found to be 6.28 percent in large size farms,

6.69 percent in small size farms and 9.62 percent in medium size farms (Table 5.5). The $F_{0.05}$ value was 23.76 in this regard (Table 5.3).

5.2.3.1. Inventory turnover ratio

This is an index of efficiency of inventory management and production. Inventory turnover depicts the relationship between cost of goods sold and average inventory. Symbolically -

$$\text{Inventory turnover ratio} = \frac{\text{Cost of goods sold}}{\text{Average inventory}}$$

Empirical results

Regarding inventory turnover ratio large size farms ranked first with 18.77 times and the extreme mean values were 14.92 and 21.39. This was followed by medium size farms with 18.55 times with extreme mean values of 17.19 and 21.35 and small size farms with 17.69 times with extreme mean values of 16.51 and 19.92. Though the velocity of stock turnover was found to be relatively high in large size farms, the level of consistency was low (10.58 percent). Small size farms had a coefficient of variation of 6.66 percent whereas it was 8.11 percent in medium size farms (Table 5.5). The analysis of variance showed an $F_{0.05}$ value of 0.36 (Table 5.3).

5.2.3.2. Receivables turnover ratio

This ratio indicates the rate at which cash is generated by turnover of debtors. It establishes the relationship between credit sales and average debtors of a particular period. Symbolically -

$$\text{Receivables turnover ratio} = \frac{\text{Credit sales}}{\text{Average debtors}}$$

Empirical results

Receivables turnover was found to be maximum in small size farms with 50.65 times with extreme mean values of 45.26 and 52.00. It was minimum in large size farms with 28.56 times with extreme mean values of 19.08 and 48.14. In medium size farms the turnover was 35.43 times with extreme mean values of 24.64 and 52.00. Regarding consistency, small size farms with 5.32 percent ranks first. The coefficient of variation in medium size farms and large size farms were found to be 28.98 percent and 34.03 percent respectively (Table 5.5). $F_{0.05}$ value result was 8.92 which revealed an insignificant relation between various sizes of farms (Table 5.3).

5.2.3.3. Turnover of Cash, bank and deposit with hatchery

The turnover position of cash and bank balance was 0.102 times in medium size farms, 0.05 times in large size farms and 0.018 times in small size farms. Deposit with hatchery in various sizes was found to be insignificant. It was 0.004 times in small and medium size farms and 0.003 times in large size farms (Table 5.5).

The statistical analysis with $F_{0.05}$ test revealed that the F value of current asset turnover was 23.76. This showed that there was significant variation in current asset turnover among various sizes of farms. The 'F' values of inventory turnover was 0.36, receivables turnover 8.92, cash turnover 1.107 and turnover of deposit with hatcheries 3.5 (Table 5.3).

5.2.4. Working capital turnover ratio

This ratio is an index of efficiency of utilising working capital. It relates the working capital with sales. Symbolically -

$$\text{Working capital turnover ratio} = \frac{\text{Sales}}{\text{Net working capital}}$$

The working capital turnover of small size farms was 15.35 times with extreme mean values of 13.05 and 17.77. In medium size farms it was 11.84 times with extreme mean values of 10.7 and 13.2. In large size farms it was 7.71 times with extreme mean values of 4.89 and 9.42. The coefficient of variation was found to be 7.01 percent in medium size farms, 10.81 percent in small size farms and 19.71 percent in large size farms (Table 5.5). The $F_{0.05}$ value of working capital turnover was found to be 18.07 and the velocity of working capital turnover differed in various sizes of farms (Table 5.3).

5.2.5. Creditors turnover ratio

The creditors turnover ratio shows the speed at which the current obligations of creditors are paid off. It is an interaction between credit purchases and average creditors of the given period. Symbolically -

$$\text{Creditors turnover ratio} = \frac{\text{Credit purchases}}{\text{Average Creditors}}$$

Empirical results

Creditors turnover ratio was found to be 20.82 times in medium size farms with extreme mean values of 14.08 and 24.0. In large size farms it was 22.40 with extreme mean values of 19.20 and 24.0. In small size farms it was 30.72 with extreme mean

values of 16.8 and 40.8. The coefficient of variation was found to be minimum in large size farms (7.98 percent) and maximum in small size farms (34.02 percent). In medium size farms it was 15.32 percent (Table 5.5).

The analysis of variance regarding creditors turnover revealed an $F_{0.05}$ value of 2.72 (Table 5.3). It thus made it clear that though there is difference in the velocity of creditors turnover between the sizes of farms, the variation was not found to be significant.

Section II

The previous section has enumerated the major profitability ratios and evaluated the earning power of various sizes of farms. This section evaluates the solvency position of farms. To analyse the long term solvency, debt ratios or leverage ratios such as debt-equity ratio, debt-asset ratio and interest coverage ratios are used. To evaluate the short term solvency, current ratio, quick ratio and the major aspects of working capital management are analysed.

5.3. LEVERAGE RATIOS

Financial leverage refers to the use of debt finance Leverage ratios help in assessing the risk arising from the use of debt capital. To evaluate the risk of debt financing in broiler poultry farms debt-equity ratio debt-asset ratio and interest coverage ratio are used.

5.3.1. Debt-equity ratio

Debt-equity ratio is a structural ratio. It evaluates the proportion of debt and equity in the financial structure of the farm. Debt is composed of current liabilities, bank loan and other borrowings. Equity is represented by net worth.

$$\text{Debt-equity ratio} = \frac{\text{Debt}}{\text{Equity}}$$

Empirical results

The debt-equity proportion of medium size farms was 1.06 with extreme mean values of 0.63 and 1.72. In small size farms it was 1.79 with extreme mean values of 0.72 and 2.58. In large size farms it was 2.64 with extreme mean values of 1.55 and 3.56. Regarding the consistency level, large size farms with the coefficient of variation of 28.41 percent stood first. In small size farms it was 39.11 percent and in medium size farms it was 39.62 percent (Table 5.6). The evaluation thus revealed that comparatively a better solvency was demonstrated by medium size farms and the solvency level was found to be the minimum in large size farms.

5.3.2. Debt-asset ratio

This is another ratio dealing with the structural position of farms. It relates the debt to total assets. Symbolically -

$$\text{Debt-asset ratio} = \frac{\text{Debt}}{\text{Total Asset}}$$

Table - 5.6

Leverage Ratios (Average) of Broiler Poultry Farms in Kerala (1987 - 91)

Ratio	Small Size					Medium Size					Large Size				
	Avg	SD	CV	Extr Value Min	Mean Value Max	Avg	SD	CV	Extr Value Min	Mean Value Max	Avg	SD	CV	Extr Value Min	Mean Value Max
Debt Equity Ratio	1.79	0.70	39.11	0.72	2.58	1.06	0.42	39.62	0.63	1.72	2.64	0.75	28.41	1.55	3.56
Debt Asset Ratio	0.616	0.10	16.23	0.42	0.72	0.492	.09	19.71	0.38	0.63	0.710	0.06	8.45	0.61	0.78
Interest Coverage Ratio	4.42	1.09	24.85	2.81	5.70	5.3	3.11	58.70	2.19	11.15	18.88	6.05	43.60	7.05	25.17

Source : Computed form Survey Data.

Empirical results

The ratio of debt to total asset was found to be 0.492 in medium size farms with extreme mean values of 0.41 and 0.63. In small size farms it was 0.616 with extreme mean values of 0.42 and 0.72. In large size farms it was 0.71 with extreme mean values of 0.61 and 0.78. The coefficient of variation was found to be 8.45 percent in large size farms, 16.23 percent in small size farms, and 19.71 percent in medium size farms (Table 5.6).

The analysis of structural ratios revealed that all sizes of farms had debt financing. It was found that large size farms had an intensive debt financing practice when compared to other sizes of farms.

5.3.3. Interest coverage ratio

Interest coverage ratios are designed to relate the financial charges of a firm to its ability to service them. It actually measures the margin of safety enjoyed by the firm with respect to its interest burden.

$$\text{Interest coverage ratio} = \frac{\text{Earnings before interest and taxes}}{\text{Interest}}$$

Empirical results

Interest coverage was found to be 13.88 times in large size farms with extreme mean values of 7.05 and 25.17. In medium size farms it was 5.3 with extreme mean values of 2.19 and 11.15. The ratio was found to be the minimum in small size farms with 4.42, with extreme mean values of 2.81 and 5.70. The coefficient of variation was found to be 24.85 percent in small size farms, 43.60 percent in large size farms and 58.70 percent in medium size farms (Table 5.6).

The evaluation of leverage ratios thus revealed that large size farms had intensive debt financing practices accompanied by the ability to meet the interest burden. In medium size farms the debt financing was relatively low, but they had the coverage position better than the small size farms.

5.4. LIQUIDITY RATIOS

Liquidity ratios are used to evaluate the firm's ability to meet its short term obligations. It depicts the present cash solvency position of the firm and its ability to remain solvent in the event of adversities. The major liquidity ratios discussed here are current ratio and quick ratio.

5.4.1. Current ratio

Current ratio relates the current assets to current liabilities. Current assets of the farm includes cash in hand, cash at bank, deposit with hatchery, receivables and inventory. Current liabilities includes sundry creditors and outstanding expenses. Symbolically -

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

Empirical results

The current ratio was found to be the highest in large size farms accounting for 9.23 with extreme mean values of 6.01and 11.71. In medium size farms it was 5.25 with extreme mean values of 2.49 and 6.91. In small size farms the ratio was lower than that in medium size farms. The ratio was found to be 3.89 with extreme mean values of 2.22 and 5.17. The coefficient of variation in this regard was 26.81 percent in large size farms, 30.52 percent in small size farms and 33.16 percent in medium size farms (Table 5.7). The analysis thus revealed that large size farms had the highest liquidity position among various sizes of farms, and the consistency level was found to be most appealing.

TABLE 5.7

Liquidity ratios (average) of broiler poultry farms in Kerala
1987 - 91

	Small size farms					Medium size farms					Large size farms				
	Avg	S.D.	C.V.	Extreme Mean Values Min.	Max.	Avg	S.D.	C.V.	Extreme Mean Values Min.	Max.	Avg	S.D.	C.V.	Extreme Mean Values Min.	Max.
Current Ratio	3.89	1.19	30.52	2.22	5.17	5.25	1.74	33.16	2.49	6.91	9.23	2.47	26.81	6.01	11.71
Quick Ratio	1.65	0.41	24.59	1.13	2.25	2.96	0.90	30.52	1.53	4.13	6.62	1.80	27.22	4.42	8.91

Source : Computed from survey data

5.4.2. Quick ratio

The ratio is the same as the current ratio, except that it excludes inventory from the numerator. Thus Quick ratio is a fairly stringent measure of liquidity. Symbolically -

$$\text{Quick ratio} = \frac{\text{Current assets - Inventory}}{\text{Current liability}}$$

Empirical results

The trend found in the quick ratio was similar to that of current ratio. Large size farms had the highest position in this regard. The quick ratio was found to be 6.62 with extreme mean values of 4.42 and 8.91 in large size farms. In medium size farms it was 2.96 with extreme mean values of 1.53 and 4.13. In small size farms it was 1.65 with extreme mean values of 1.13 and 2.25. The coefficient of variation, denoting the variability in mean observations was found to be 24.59 percent in small size farms, 27.22 percent in large size farms and 30.52 percent in medium size farms (Table 5.7).

Thus the analysis of current ratio and quick ratio clearly revealed that large size farms had the highest level of liquidity and it was found to be the lowest in small size farms. Thus a simple relation between size of farms and liquidity was observed in broiler poultry farms.

5.5. WORKING CAPITAL MANAGEMENT

Working capital is a significant facet of financial management. Management of working capital refers to the management of current assets and current liabilities. The thrust area of working capital management is the management of current assets, since current liabilities are arising in the context of current assets (Van Horne C. James. 1986). This section evaluates the contribution of working capital towards the liquidity and profitability of various sizes of farms.

Empirical results

It was found that current assets represented 45.31 percent of total assets in large size farms, 36.73 percent in medium size farms and 34.99 percent in small size farms (Table 5.8). With regard to current liabilities it was found to be 4.81 percent of total liability in large size farms. In medium size farms it was 7.24 percent and in small size farms it was 9.57 percent (Table 5.9).

5.5.1. Components of current assets

The analysis of current assets in various sizes of farms revealed that inventory accounted for 28.46 percent of current assets in large size farms. In medium size farms it was 43.46

TABLE 5.8

Components of Total Assets (average) of broiler poultry farms in Kerala 1987 - 91

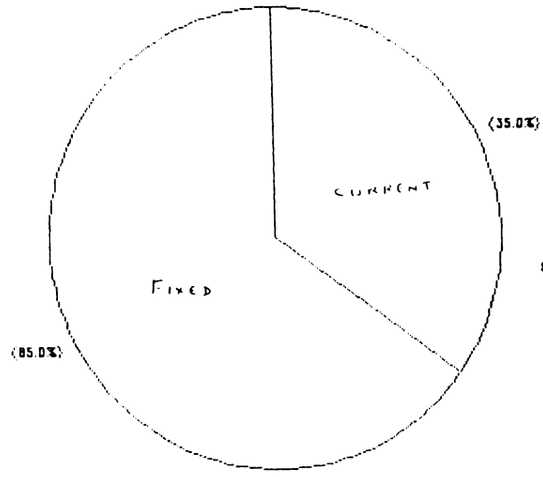
(Percentage in brackets)

Item	Small	Medium	Large
Current Assets	22457.00	45939.60	190197.60
	(34.99)	(36.73)	(45.31)
Cash & Bank	4258.40	9698.80	67249.40
	(6.64)	(7.75)	(16.02)
Dep. with Hatchery	1086.00	1922.80	5706.60
	(1.69)	(1.54)	(1.36)
Receivables	4337.60	14350.60	63103.80
	(6.67)	(11.47)	(15.03)
Inventory	12775.00	19967.40	54137.80
	(19.91)	(15.96)	(12.90)
Fixed Assets	41720.80	79137.80	229558.20
	(64.31)	(63.27)	(54.69)
Poultry Shed	34367.80	70119.80	193240.80
	(53.55)	(56.06)	(46.04)
Equipments	3864.00	2963.20	20542.20
	(6.02)	(2.37)	(4.89)
Other Fixed Assets	3489.00	6054.80	15775.20
	(5.44)	(4.48)	(3.76)
Total Assets	64177.80	125077.40	419755.80
	(100.00)	(100.00)	(100.00)

Source : Computed from survey data

DIAGRAM 7

COMPONENTS OF TOTAL ASSETS IN SMALL, MEDIUM AND LARGE SIZE BROILER POULTRY FARMS IN KERALA



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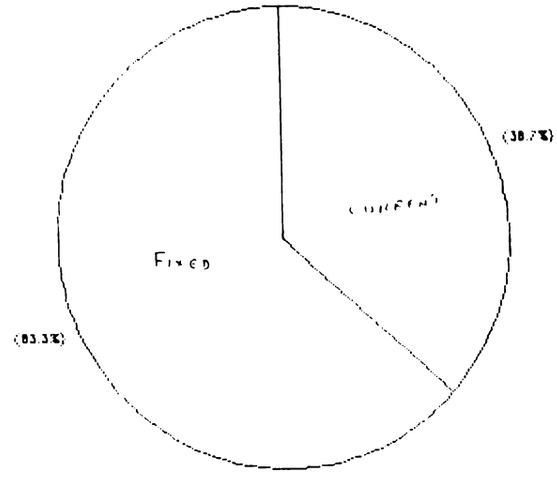

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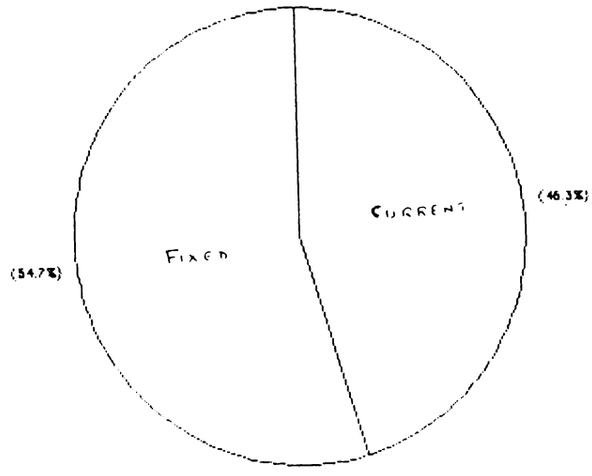

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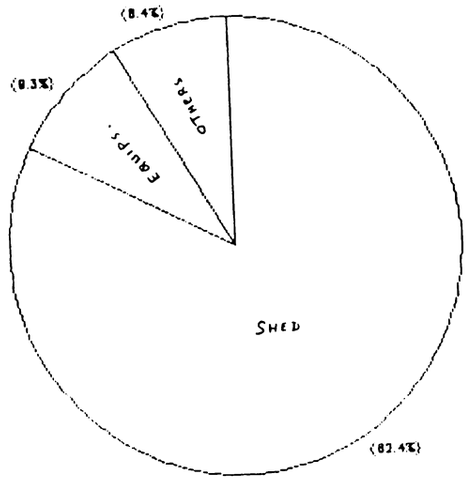
DIAGRAM 8

COMPONENTS OF FIXED ASSETS IN SMALL, MEDIUM AND LARGE SIZE BROILER POULTRY FARMS IN KERALA



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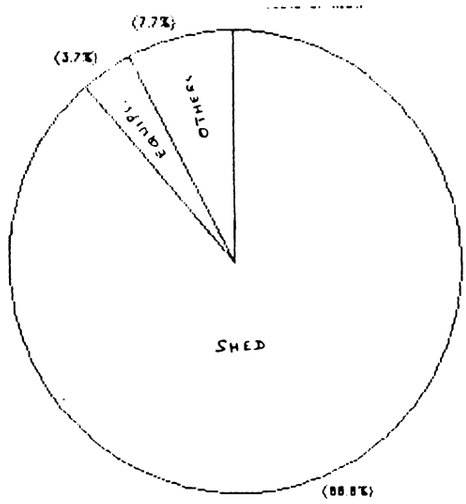

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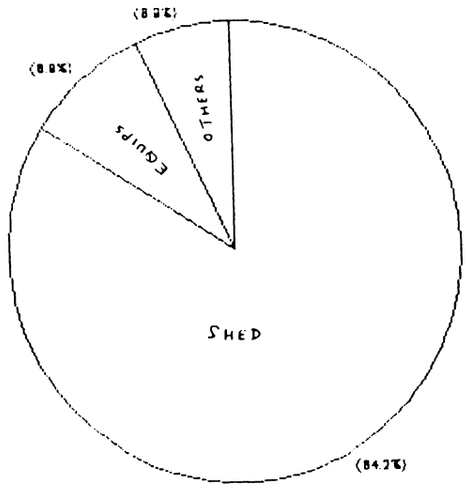

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TABLE 5.9

Components of liabilities of broiler poultry farms in Kerala
1987 - 91

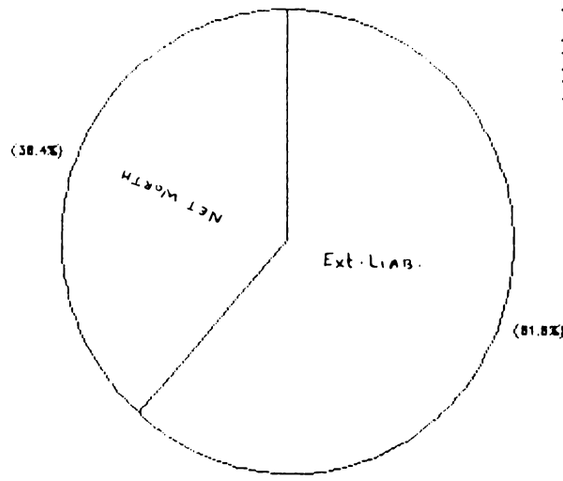
(Percentages in brackets)

	Small	Medium	Large
Current Liabilities	6140.00	9061.40	20226.40
	(9.57)	(7.24)	(4.81)
Creditors	5952.20	8675.20	19106.20
	(9.27)	(6.94)	(4.54)
O/S Expenses	187.80	386.20	1120.20
	(0.29)	(0.31)	(0.27)
Bank Loan	7184.80	20085.00	49899.20
	(11.20)	(16.06)	(11.86)
Other Borrowings	26215.80	30239.00	231077.00
	(40.85)	(24.18)	(54.94)
Total Ext. Liabs.	39540.60	59385.40	301202.60
	(61.61)	(47.48)	(71.62)
Net Worth	24637.20	65692.00	119361.57
	(38.39)	(52.52)	(28.38)
Net W.Capital	16317.00	36878.20	204178.60
	(25.42)	(29.48)	(48.55)
Total Liability	64177.80	125077.40	420564.17
	(100.00)	(100.00)	(100.00)

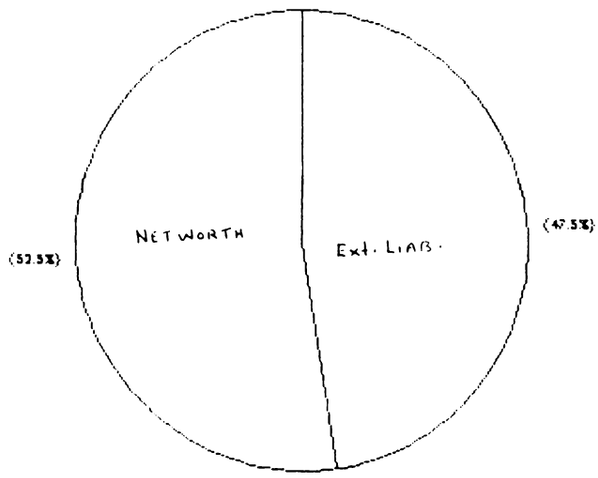
Source : Computed from survey data

DIAGRAM 9

COMPONENTS OF TOTAL LIABILITY IN SMALL, MEDIUM AND LARGE SIZE BROILER POULTRY FARMS IN KERALA



SMALL SIZE



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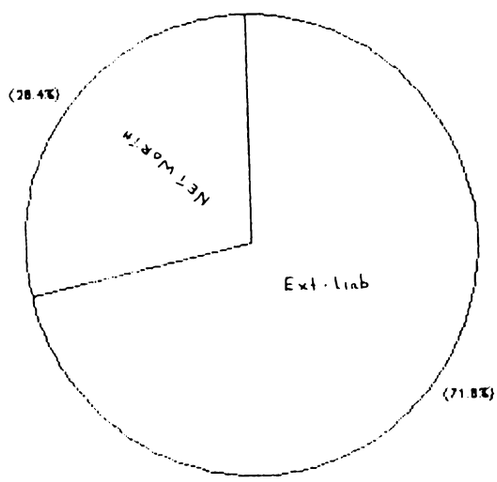
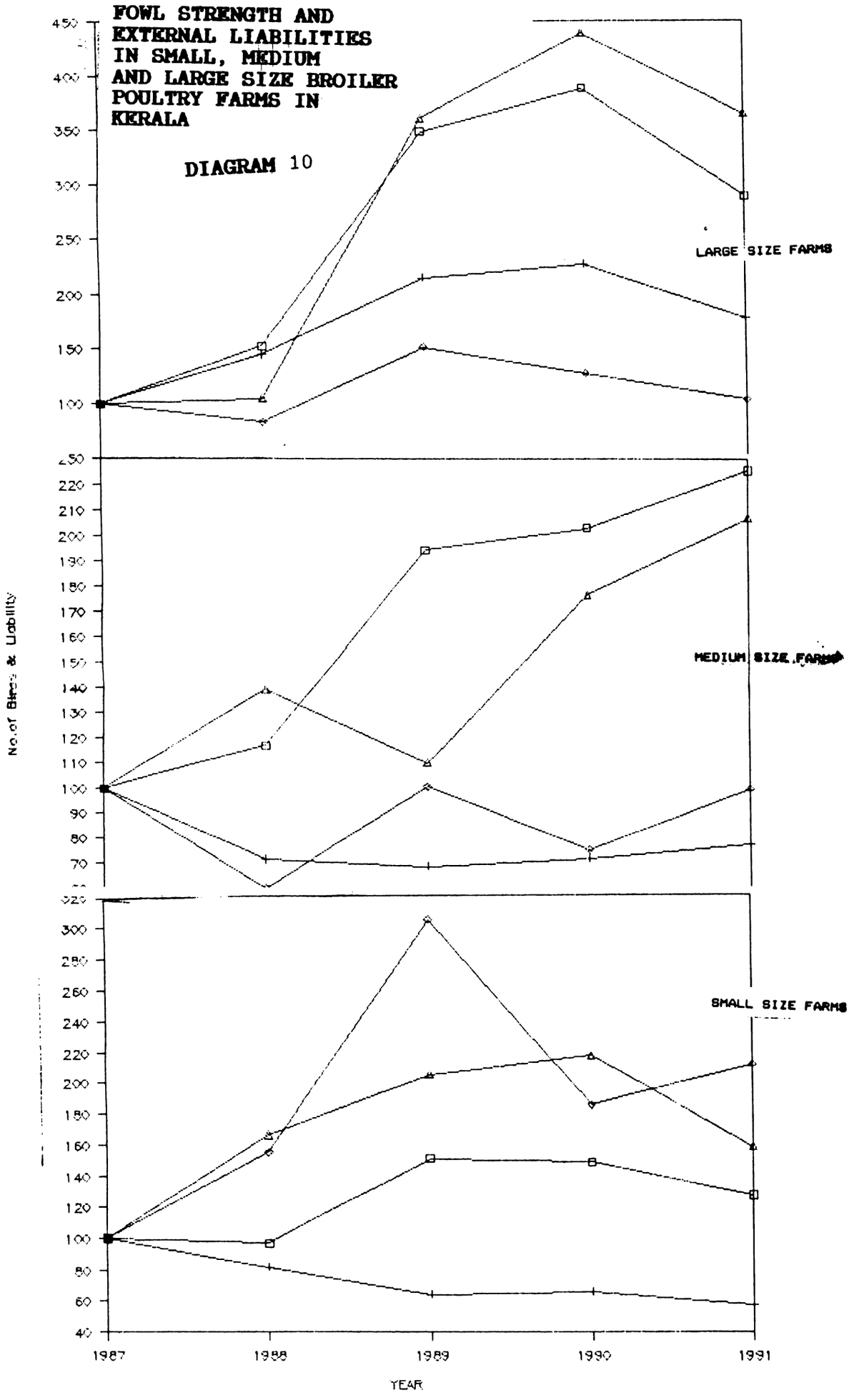


LARGE SIZE


FOWL STRENGTH AND EXTERNAL LIABILITIES IN SMALL, MEDIUM AND LARGE SIZE BROILER POULTRY FARMS IN KERALA
DIAGRAM 10
LARGE SIZE FARMS
MEDIUM SIZE FARMS
SMALL SIZE FARMS
No.of Birds & Liability
YEAR
1987
1988
1989
1990
1991

percent and in small size farms it was 56.89 percent (Table 5.10). Thus the percentage of inventory in current assets indicated an inverse relationship with size of farms.

Receivables is another major element in current assets. In large size farms it was 33.18 percent of current assets. In medium size farms it was 31.24 percent and in small size farms it was 19.32 percent (Table 5.10). Thus the percentage of receivables in current asset showed direct relationship with size of farms. This variation was mainly due to the change in collection period. In large size farms the average collection period was found to be thirteen days. In medium size farms it was ten days and in small size farms, seven days.

Another major element of current asset was cash in hand and cash at bank. The cash in hand and cash at bank in large size farms was 35.36 percent of current assets. In medium size farms it was 21.11 percent and in small size farms, 18.96 percent (Table 5.10). The large size farms had larger deposits with banks. To satisfy the requirements of the hatcheries and feed suppliers, large size farms were bound to have a relatively higher deposits with banks.

TABLE 5.10

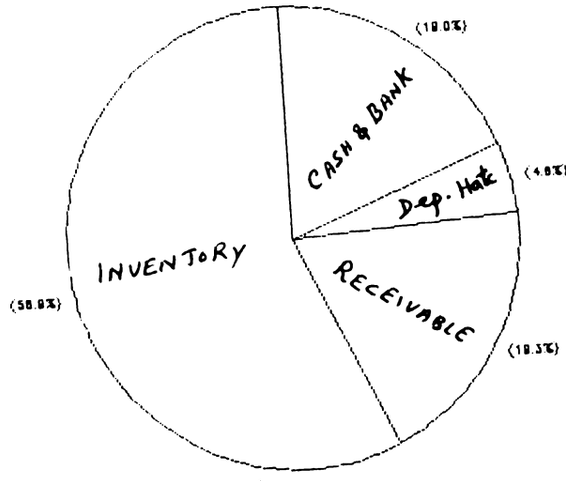
Components of Current Assets (average) of broiler poultry farms in Kerala 1987-91

(Percentage in brackets)

Items	Small	Medium	Large
Current Assets	22457.00	45939.60	190197.60
	(100.00)	(100.00)	(100.00)
Cash & Bank	4258.40	9698.80	67249.40
	(18.96)	(21.11)	(35.36)
Dep. with Hatchery	1086.00	1922.80	5706.60
	(4.84)	(4.19)	(3.00)
Receivables	4337.60	14350.60	63103.80
	(19.32)	(31.24)	(33.18)
Inventory	12775.00	19967.40	54137.80
	(56.89)	(43.46)	(28.46)

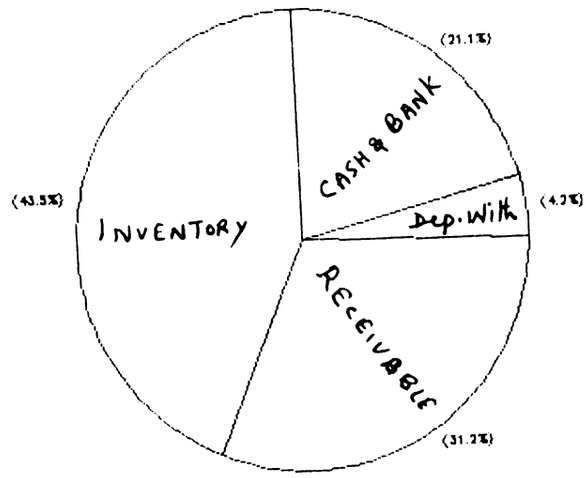
Source : Computed from survey data

DIAGRAM 11

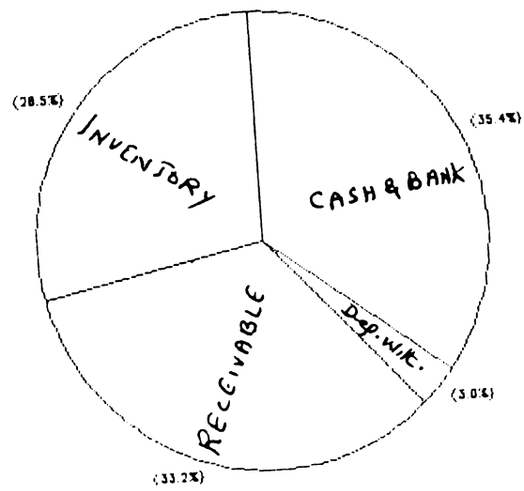


COMPONENTS OF CURRENT ASSETS IN SMALL, MEDI AND LARGE SIZE BROILE POULTRY FARMS IN KERALA

SMALL SIZE I



MEDIUM SIZE



LARGE SIZE I

Deposits with hatcheries is another element of current assets. It was 4.84 percent of current assets in small size farms. In medium size farms it was 4.19 percent and in large size farms, 3.0 percent (Table 5.10). The influence of large size farms over the hatcheries helped them to manage with lesser amount of deposits.

The analysis of current assets thus revealed that, with sufficient cash and bank balance or through the existence of receivables and inventory, all sizes of farms were found to be having sufficient level of liquidity.

5.5.2. Components of current liabilities

The current liabilities of broiler poultry farms include sundry creditors and outstanding expenses. Sundry creditors was found to be the major element of current liabilities in all sizes of farms. In small size farms creditors accounted for 96.94 percent of current liabilities. In medium size farms it was 95.74 percent and in large size farms, 94.46 percent (Table 5.9).

It was observed that many of the large size farms were usually in a better position because of the easy availability of credit facilities. Moreover, they were found to have strong command over certain assured markets for the sale of meat.

Again, the comparison between inventory and the current liabilities revealed that in small size farms the inventory was found to be 2.08 times the current liabilities. In medium size farms it was 2.2 times and in large size farms it was 2.68 times (Table 5.11).

This revealed that a portion of inventory was sufficient enough to repay the current obligations in all sizes of farms. It was found that depending on the size of farms, the cushion available in this regard was going up. It was also found that in small size farms the current liabilities was only 24.92 percent of the net worth. In medium size farms it was 13.79 percent and in large size farms, 16.94percent (Table 5.9).

Thus it was found that current liabilities was not a major factor which influenced working capital in broiler poultry farms, especially in small and medium size farms. The analysis made it clear that profit maximisation objective was well achieved in broiler poultry farms through effective current asset management by all sizes of farms. The sizewise analysis made it clear that large size farms were ahead of other sizes, in this regard.

TABLE 5.11

Balance Sheet (average) of broiler poultry farms in Kerala
1987 - 91

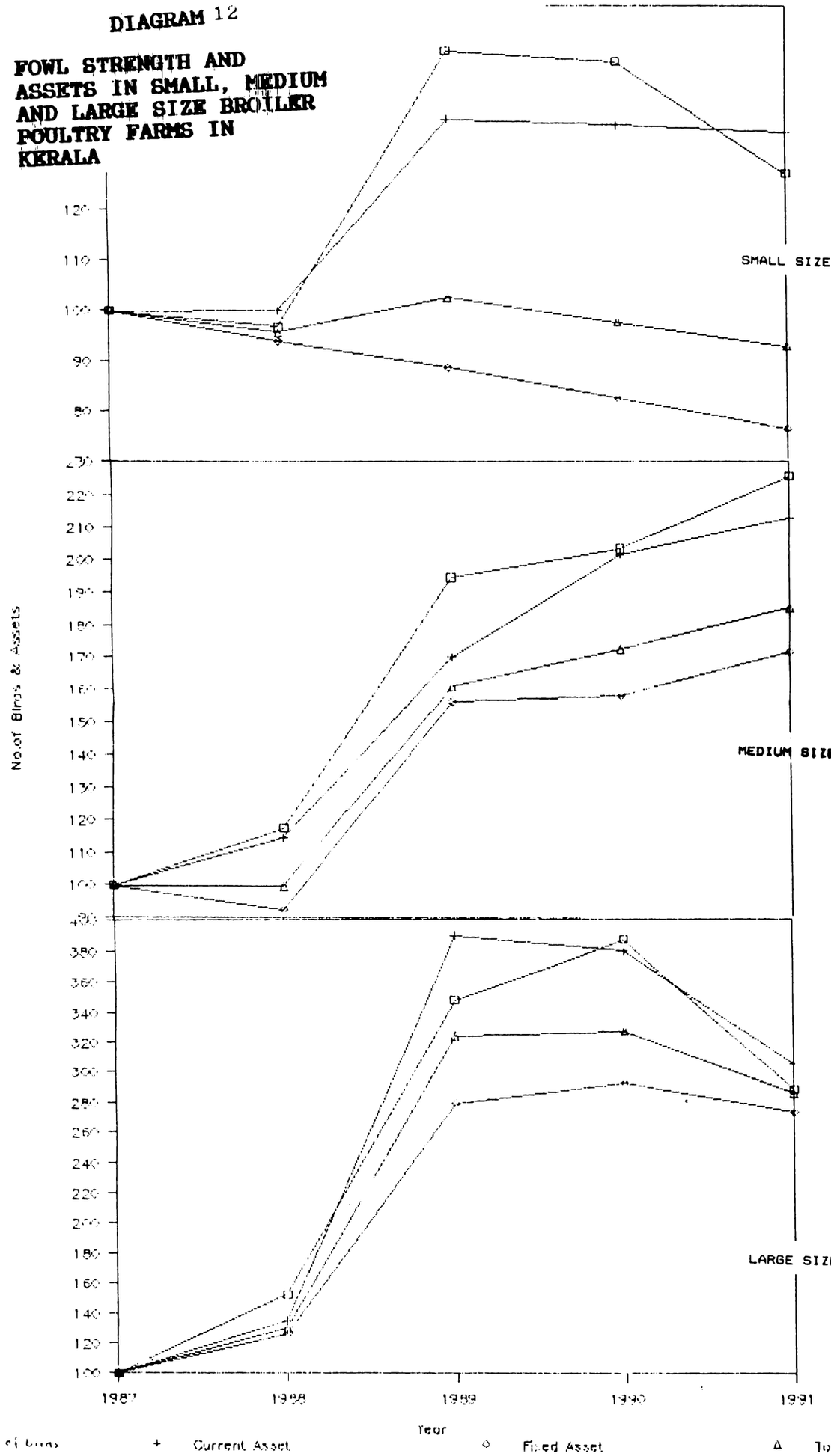
(Percentage in brackets)

Revenue/cost	Small	Medium	Large
Current Assets	22457.00	45939.60	190197.60
	(34.99)	(36.73)	(45.31)
Cash & Bank	4258.40	9698.80	67249.40
	(6.64)	(7.75)	(16.02)
Dep. with Hatchery	1086.00	1922.80	5706.60
	(1.69)	(1.54)	(1.36)
Receivables	4337.60	14350.60	63103.80
	(6.76)	(11.47)	(15.03)
Inventory	12775.00	19967.40	54137.80
	(19.91)	(15.96)	(12.90)
Fixed Assets	41720.80	79137.80	229558.20
	(65.01)	(63.27)	(54.69)
Poultry Shed	34367.80	70119.80	193240.80
	(53.55)	(56.06)	(46.04)
Equipments	3864.00	2963.20	20542.20
	(6.02)	(2.37)	(4.89)
Other Fixed Assets	3489.00	6054.80	15775.20
	(5.44)	(4.84)	(3.76)
Total Assets	64177.80	125077.40	419755.80
	(100.00)	(100.00)	(100.00)
Current Liabilities	6213.25	9137.96	20396.73
	(9.68)	(7.31)	(4.86)
Creditors	5952.20	8675.20	19106.20
	(9.27)	(6.94)	(4.55)
O/S Expenses	187.80	386.20	1120.20
	(0.29)	(0.31)	(0.27)
Bank Loan	7184.80	20085.00	49899.20
	(11.20)	(16.06)	(11.89)
Other Borrowings	26215.80	30239.00	231077.00
	(40.85)	(24.18)	(55.05)
Total Ext. Liabs.	39613.85	59461.96	301372.93
	(61.61)	(47.48)	(71.80)
Net Worth	24563.95	65615.44	118382.87
	(38.39)	(52.52)	(28.20)
Net W.Capital	16317.00	36878.20	204178.60
	(25.42)	(29.48)	(48.64)
Total Liability	64177.80	125077.40	419755.80
	(100.00)	(100.00)	(100.00)

Source : Computed from survey data

DIAGRAM 12

FOWL STRENGTH AND ASSETS IN SMALL, MEDIUM AND LARGE SIZE BROILER POULTRY FARMS IN KERALA



5.5.3. Working capital leverage

Working capital leverage reflects the sensitivity of return on investment to changes in the level of current assets. Symbolically -

$$\text{Working capital leverage} = \frac{\text{C.A.}}{\text{T.A.} + \Delta\text{C.A.}}$$

Where, C.A. = Current Assets

T.A. = Total Assets

ΔC.A. = Change in level of Current Assets

Empirical results

The average working capital leverage was found to be highly sensitive in large size farms with a coefficient of 0.4309 with extreme mean values of 0.3627 and 0.4711. In medium size farms it was 0.3788 with extreme mean values of 0.3300 and 0.4228. In small size farms it was 0.3720 with extreme mean values of 0.2945 and 0.4352. Regarding the coefficient of variation it was 7.92 percent in medium size farms, 13.44 percent in small size farms and 13.92 percent in large size farms (Table 5.12).

Table 5.12

Working Capital leverage in broiler poultry farms in Kerala 1988 - 91

Size of farm	1988	1989	1990	1991	Av.	S.D.	C.V.
Small	0.2945	0.3553	0.4029	0.4352	0.3720	0.05	13.44
Medium	0.3839	0.3300	0.3785	0.4228	0.3788	0.03	7.92
Large	0.3627	0.3738	0.4711	0.5160	0.4309	0.06	13.92

Source : Computed from survey data

While analysing the inter-period leverage of working capital in various sizes of farms, it was seen that in small size farms the coefficient was moving up gradually. In medium size farms, fluctuations were noticed. in large size farms the coefficient was found increasing at a more than proportionate rate.

The coefficient of leverage in medium size farms was 0.3839 in 1988, 0.33 in 1989, 0.3785 in 1990 and 0.4228 in 1991. In small size farms it was 0.2945 in 1988, 0.3553 in 1989, 0.4029 in 1990 and 0.4352 in 1991. In large size farms it was 0.3627 in 1988, 0.3738 in 1989, 0.4711 in 1990 and 0.5160 in 1991 (Table 5.12).

Thus it was found that the sensitivity of working capital was consistently growing over the period. It means, with every change in current assets the return on investment was quickly responsive. This sharp response indicated the positive role of gross working capital upon the return on investment in broiler poultry farms in Kerala.

Section III

5.6. OVERALL FARM MANAGEMENT EFFICIENCY

The farm management efficiency index, proposed in this study as a tool for establishing the relative economic viability and entrepreneurial potential of poultry farms of varying sizes accomplishes the task from three angles, namely -

a) the profit margin involved,
b) the capital funding pattern and
c) the yield response displayed.

These three dimensions have been incorporated by considering the Operational Management Efficiency, Financial Management Efficiency and Farm Management Efficiency.

5.6.1 Operational management efficiency

Operational management efficiency index is the product of total asset turnover ratio, margin of safety ratio and profit volume ratio.

$$\text{Total assets turnover ratio} = \frac{\text{Sales}}{\text{Total assets}}$$

$$\text{Profit volume ratio} = \frac{\text{Contribution}}{\text{Sales}}$$

$$\text{Margin of safety ratio} = \frac{\text{E.B.I.T.}}{\text{Contribution}}$$

Empirical results

The total asset turnover ratio in small size farms was 3.8 times with coefficient of variation of 19.74 percent. In medium size farms it was 3.44 with a coefficient of variation of 12.83 percent. In large size farms it was 3.33 times with coefficient of variation of 8.33 percent (Table 5.13). Thus the analysis revealed that with respect to total asset turnover, small size farms had the highest value. The lowest turnover was recorded by large size farms. It signifies an inverse relationship between sizes of farms and total asset turnover.

The profit volume ratio was found to be 0.3834 in large size farms with coefficient of variation of 10.26 percent. In medium size farms it was 0.2121 with coefficient of variation of 14.44 percent. In small size farms it was 0.1785 with coefficient of variation of 11.03 percent (Table 5.13). The study revealed that large size farms had the highest position in this regard while the small size farms, the lowest because the large size farms could dictate the selling price whereas small size farms couldn't do this due to the fact that the small size farms were catering to the needs of the unorganised sector of the meat market. This signifies direct relationship of size of farms with profit volume ratio.

Table - 5.13

Overall Farm Efficiency Indices of Broiler Poultry Farm in Kerala (1987 - 91)

Size of Farm		Total Asset Turn-over	P/V	M/S	Oper-ational Manage-ment Effi-ciency	Finan-cial Oper-ations	Finan-cial Lever-age	Financial Manage-ment Effi-ciency	Manage-ment Achi-evement Index	P.E.F	Live-ability	Farm Manage-ment Index	Overall Farm Manage-ment Effi-ciency Index
	Avg	3.80	.1785	.7729	0.5243	.7695	2.61	2.01	1.05	.5562	.9858	.5483	
Small	SD	.75	.02	.03	.25	.06	.65	.36	.30	.04	.004	.02	0.5757
	CV	19.74	11.03	3.90	49.06	7.91	25.02	17.92	28.32	8.00	0.44	3.52	
	Avg	3.44	.2121	.8095	0.5906	.7952	1.91	1.52	0.90	.5376	.9837	.5288	
	SD	.4413	.03	.07	.18	.13	.40	.27	.23	.08	.003	.03	0.4759
Medium	CV	12.83	14.44	8.95	31.25	16.02	20.79	17.74	26.07	15.95	0.30	4.79	
	Avg	3.33	.3834	.9463	1.2082	.9168	3.55	3.25	3.93	.7395	.9854	.7287	
	SD	.27	.04	.02	.11	.03	.72	.38	.24	.14	.004	.06	2.8638
Large	CV	8.33	10.26	2.13	9.27	3.28	20.35	11,57	6.25	19.35	0.46	8.901	

Source : Computed from Survey Data.

The margin of safety ratio was found to be 0.9463 with coefficient of variation of 2.13 percent in large size farms. In medium size farms it was 0.7824 with coefficient of variation of 8.95 percent and in small size farms it was 0.7729 with coefficient of variation of 3.90 percent (Table 5.13). Thus the margin of safety ratio is found moving in the same direction of profit volume ratio in all sizes of farms.

Further, the operational management efficiency was found to be 1.2082 in large size farms with coefficient of variation of 9.27 percent. In medium size farms it was 0.5906 with coefficient of variation of 31.25 percent. In small size farms it was 0.5243 with coefficient of variation of 49.06 percent (Table 5.13). The analysis of operational management efficiency revealed that with favourable profit volume and margin of safety ratios, large size farms stood first among various sizes of farms. Though the total asset turnover ratio was the highest, with a comparatively lower profit volume ratio and margin safety ratio, the position of small size farms was found to be the lowest. The variability with regard to operational management efficiency was significant in different sizes of farms. ($F_{0.05}$ = 16.575). Since the operational management efficiency index and total asset turnover ratio are inversely related the hypothesis that high capital turnover is a major determinant of profitability irrespective of their size, stands disapproved.

5.6.2. Financial management efficiency

Financial management efficiency index is the product of financial operations ratio and financial leverage ratio.

$$\text{Financial operations ratio} = \frac{\text{Net profit}}{\text{E.B.I.T.}}$$

$$\text{Financial leverage} = \frac{\text{Total assets}}{\text{Net worth}}$$

Empirical results

The analysis disclosed that the financial operations ratio was 0.9168 with coefficient of variation of 3.28 percent in large size farms. In medium size farms it was 0.7952 with coefficient of variation of 16.02 percent. In small size farms it was 0.7695 with coefficient of variation of 7.91 percent (Table 5.13). It was revealed that large size farms had the most efficient index and the small size farms, the lowest. With respect to financial operations ratio, no significant relationship was found with the size of farms.

Financial leverage ratio was found to be 3.55 with a coefficient of variation of 20.35 percent in large size farms. In small size farms it was 2.61 with coefficient of variation of 25.02 percent and in medium size farms it was 1.91 with

coefficient of variation of 20.79 percent (Table 5.13). It was observed from the analysis that large size farms had more impressive results and the less impressive result was shown by medium size farms. Thus financial leverage ratio seemed to be statistically nonresponsive to size of farms.

The financial management efficiency index in large size farms was found to be 3.25 with coefficient of variation of 11.57 percent. In small size farms it was 2.01 with coefficient of variation of 17.92 percent. In medium size farms it was 1.52 with coefficient of variation of 17.74 percent (Table 5.13). The analysis of financial management efficiency thus revealed that with the influence of financial operations ratio and financial leverage ratio the large size farms had a better position. The coefficient of 'F' test was 10.145, showing an insignificant relation between size of farms in this regard.

5.6.3. Management achievement index

Management achievement index is the product of operational management efficiency index and financial management efficiency index.

Management)=(operational management x financial management
achievement index) (efficiency index efficiency index

Empirical results

The management achievement index was found to be 3.93with coefficient of variation of 6.25 percent in large size farms. In small farms it was 1.05 with coefficient of variation of 28.32 percent. In medium size farms it was 0.8438 with coefficient of variation of 26.07 percent (Table 5.13). The $F_{0.05}$ test in this regard was 31.88, recording an insignificant relation between various sizes of farms (Table 5.3).

The analysis thus disclosed that with the highest financial management efficiency index, highest profit volume ratio and highest margin of safety, the large size farms occupied the first position with regard to management achievement. Between the medium and small size farms, the former had a better, p/v ratio, margin of safety and operational management efficiency, but due to the low financial leverage ratio, the overall management achievement index was found to be inferior than small size farms. It was thus found that with attempts to elevate the financial leverage medium size farms could very well improve the Management achievement index substantially.

5.6.4. Farm management index

Farm management efficiency index is the combination of performance efficiency factor and liveability.

$$\text{Performance efficiency factor} = \frac{\text{Average live weight of fowls}}{\text{Average F.C.R.}} \times 100$$

$$\text{liveability} = \frac{\text{Number of birds sold}}{\text{Number of birds started with}}$$

The performance efficiency factor (P.E.F.) in large size farms was found to be the best. The index of large size farms was 0.7395, while that of small size and medium size farms were 0.5562 and 0.5376 respectively. The coefficient of variation was 8.0 percent in small size farms, 15.95 percent in medium size farms and 19.35 percent in large size farms (Table 5.13).

The analysis revealed that comparatively high P.E.F. was found in large size farms and medium size farms had the least efficiency in this regard. Thus no direct relationship was established between size of farms and P.E.F.

Liveability factor was observed to be almost equal in all sizes of farms. Small size farms had the highest rate with 0.9858. The rate of liveability found in large size farms was 0.9854 while it was 0.9837 in medium size farms. Regarding the coefficient of variation it was 0.30 percent in medium size farms, 0.44 percent in small size farms and 0.46 percent in large size farms (Table 5.13).

The analysis came to the conclusion that the variation in the level of efficiency with regard to liveability was almost equal and all sizes of farms had maintained it consistently. over the period under review. No significant relation was found between sizes of farms. $F_{0.05}$ value was found to be 117.58 (Table 5.3)

The study regarding the farm management index revealed that large size farms with 0.7287 had occupied the top position. This was followed by small size farms and medium size farms with 0.5483 and 0.5288 respectively. The coefficient of variation was 3.52 percent in small size farms, 4.79 percent in medium size farms and 8.90 percent in large size farms.

The study of farm management index thus revealed that large size had supremacy over the other sizes. But small size farms had a better position than that of medium size farms.

5.6.5. Overall farm management efficiency

Overall farm management efficiency index is the product of management achievement index and farm management efficiency index where management achievement index is the product of operational management efficiency index and financial management efficiency index. Symbolically -

$$\text{Operational Management Index} = \frac{\text{Sales}}{\text{Total asset}} \times \frac{\text{Contribution}}{\text{Sales}} \times \frac{\text{E.B.I.T.}}{\text{Contribution}}$$

$$\text{i.e.,} \quad \frac{\text{E.B.I.T.}}{\text{Total asset}}$$

$$\text{Financial management efficiency index} = \frac{\text{Net profit}}{\text{E.B.I.T.}} \times \frac{\text{Total asset}}{\text{Net worth}}$$

$$\text{Management achievement index} = \frac{\text{E.B.I.T.}}{\text{Total asset}} \times \frac{\text{Net profit}}{\text{E.B.I.T.}} \times \frac{\text{Total asset}}{\text{Net worth}}$$

$$\text{i.e.,} \quad \frac{\text{Net profit}}{\text{Net worth}}$$

$$\text{Farm management efficiency index} = \frac{\text{No. of birds sold}}{\text{No. of birds started with}} \times \frac{\text{Average live weight}}{\text{Average F.C.R.}}$$

$$\text{Overall farm management efficiency index} = \frac{\text{Net profit}}{\text{Net worth}} \times \frac{\text{No.of birds sold}}{\text{No.of birds started with}} \times \frac{\text{Average live weight}}{\text{Average F.C.R.}}$$

The overall farm management efficiency was substantially high in large size farms with an index of 2.8638. The dominance with regard to operational management efficiency, financial

management efficiency and farm management efficiency took large size farms to this position. The efficiency level of small size farms was found to be better than medium size farms with an index of 0.5757. This was due to the better efficiency with regard to financial management efficiency and farm management efficiency than medium size farms. The overall farm management efficiency index of medium size farms was 0.4759 (Table 5.13).

CHAPTER VI

FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

In this chapter an attempt is made to recapitulate and summarise the findings of the study with a view to providing a basis for the policies that should be formulated for the growth and development of broiler poultry farms in Kerala.

6.1. Growth and development of broiler poultry farms in Kerala

Kerala witnessed a gradual withering of layer farms during 1980-85 period and began to depend more on the import of eggs. The indigenous production of eggs was proved to be non-lucrative and consequently turned out to be inadequate to meet internal requirements.

The analysis of cost of input items established that the increase in the selling price of eggs was less than proportionate to the increase in the cost of feed and cost of day old chicks resulting in a decline in gross margin of layer farms. Declining return on investment, increase in cost of fixed assets and equipments, need for ever increasing levels of working capital requirements were the prominent factors that forced the layer poultry farmers to switch over to broiler poultry farming.

Lesser interest burden, lesser risk, quicker returns, better rate of earnings and the entry of internationally reputed agencies provided the initial fillip to the broiler farming operations. Moreover, the timely interaction and multiprolonged support made available by the governmental quarters created a conducive atmosphere for the broiler farms to get established in the state.

6.2. Functional problems of broiler poultry farms

The broiler poultry farms in Kerala do face a series of problems both internal and acquired. An awareness of the problems would provide the requisite insight into the management in steering their ventures through the storms and shoals characteristic to the business. The important problems being faced by the broiler farms are:

(a) Financial

Shortage of working capital, bureaucratic delays and official disregard in availing loans and advances, excessive interest levied on working capital, problems related to refinancing and subsidies, problems involved in debt collection and lack of credit facilities have been identified under this category.

(b) Marketing

While internal competition leading to price cutting, inconsistent and seasonal demand, domination and exploitation by intermediaries, specifications in long term contracts for supply of meat with institutional buyers etc. were identified as marketing-related problems by farms in general, the distance between the farms and markets was identified by some as a significant impediment.

(c) Scarcity of farm inputs

Scarcity of farm inputs like day old chicks, the feed and medicines led to severe underutilisation in many cases. Inferior quality of inputs, longer lead time in obtaining replenishments of day old chicks and feed, artificial scarcity created by hatcheries and feed suppliers and the consequent price hike of inputs are some other problems relating to farm inputs.

(d) Labour

Absenteeism, non-availability of skilled labour, labour turnover etc. are the usual problems confronted by the poultry farmers in the running of their farms.

(e) Managerial and technical problems

Lack of technical guidance and proper training, inadequate diagnostic assistance, dearth of veterinary aid etc. were identified as the predominant problems in this section.

The above problems made poultry farming a non-lucrative activity to most of the entrepreneurs in Kerala.

6.3. **Trends in cost**

The major share of the costs involved in running broiler poultry farms is accounted for by cost of feed (63.95 percent) and cost of day old chicks (25.26 percent). This is true irrespective of the size of farms. Similarity was also observed in the other elements of costs in the three categories. But variable overheads incurred, though insignificant in its proportion to total cost, were found to be a function of the size of farms.

The price of major inputs like day old chicks and poultry feed has increased considerably during the period 1981-91. The overall growth rate was 56.8 percent with an annualised increment of 5.20 percent in the case of price of feed while the corresponding figures were 102.6 percent and 7.39 percent respectively as regards the price of day old chicks.

The inadequate production of both the poultry feed and day old chicks within the state, due to various reasons, led to large scale import from outside resulting in the continuous price escalation during the period of observation.

6.4. Trends in Revenue

The selling prices of meat revealed a steady increase over the years 1981-91. The overall growth rate in meat price which was 71.30 percent with an average growth rate of 5.60 percent every year can be attributed to the steady growth in demand for the product.

The sale proceeds of manure, gunny and waste parts were found to be more than enough to meet the variable overheads in full and part of fixed overheads.

Comparison of total cost of production as against the revenue from meat price showed that the cost of production was relatively higher (98.37 percent) in medium size farms compared to small size (95.31 percent) and large size (85.99 percent) farms. This revealed that the overall cost of production was the highest in medium size farms.

Economies of large scale purchase and operation have made large size farms a profitable proposition than medium and small size farms.

Cutting across the various sizes, the surplus of poultry meat price over the input costs of feed and day old chicks accounted for the margin of profit in poultry farming.

6.5. Movements in output, cost and revenue

The movement in output of poultry meat displayed an increasing trend from 1981-82 through 1990-91 to the order of 8.10 times (810 percent), in association with an increase in the selling price of meat also. But quite interestingly the variation of the latter was only 0.71 times (71.30 percent). The increase in selling price, though less than proportionate, is brought about by the ever growing demand for the meat.

The escalation of meat price during the period was more than proportionate as against the increase in feed cost, especially during the latter years of the period under study.

The analysis thus serves to disprove the hypothesis that the upward trend in the output price of broiler poultry meat is being brought about by the increasing input prices.

6.6. **Productivity**

Skill and experience of the workers and the farmers' personal involvement have been found to be influencing the labour productivity significantly. Large size farms were found to have attained the highest labour productivity and the small size farms the lowest.

Thus the hypothesis that productivity of broiler poultry farms, other things being comparable, is directly proportional to the size of farms, stands valid with regard to labour productivity.

Productivity of investment in poultry sheds was the highest in small size farms, consequently resulting in their high fixed capital productivity.

With regard to the equipment productivity, medium size farms ranked first because of the use of standard equipments. The equipment productivity of small and large size farms were almost equal. But the lowest values of fixed capital productivity, poultry shed investment productivity, and total capital productivity were recorded by medium size farms.

Among the various productivity indices, only equipment productivity is found to have statistically significant variations between the different sizes of farms.

Regarding the working capital productivity, small size farms ranked first. It was due to the result of better receivables and cash management. The second position is occupied by the small size farms with a better inventory management.

With reference to overall capital productivity the hypothesis number two stands negated. The productivity of fixed capital, poultry shed investment, equipment and working capital are found negating the hypothesis that productivity is directly proportional to the size of farms.

6.7. Capacity utilisation

The average capacity utilisation was found to be higher in large size farms compared to the other farms. Similarly, the gross margin per square foot also was found to be higher in large size farms. These signify that there is statistically significant variation among various sizes of farms. It is proved that there is direct relationship between size of farms and capacity utilisation. Hence the fifth hypothesis stands proved.

6.8. Capital Intensity

Small size farms recorded the lowest rate of capital intensity. The study revealed, among other things, that the size of farms and capital intensity were inversely related.

6.9. **Feed Convertibility**

The F.C.R. was found influenced by liveability and weight gain which is decided by days grown and number of batches reared. With the highest number of batches and days grown, large size farms had the highest weight gain and thus the maximum efficiency with regard to the F.C.R. Small size farms remained with the lowest efficiency in this respect. The above facts revealed that variations in F.C.R. is dependent on the size of farms.

Thus the third hypothesis that Feed Conversion ratio varies significantly with varying size of farms has been established.

6.10. **Financial Performance**

Gross Profit Ratio and Net Profit Ratio were found to be associated with farm sizes with the highest gross profit and net profit levels for large size farms and lowest rates for small size farms. It is further concluded that as the size of farms has no influence on the profit levels of the farms, the highest gross profit and net profit levels were the contribution of the corresponding revenue per bird. The operating ratio analysis also projects the above.

Large size farms were characterised by the highest rate of return on investment. The small and medium size farms ranked second and third respectively. The study disclosed that the various sizes of farms have witnessed different levels of return on their investment significantly.

Thus, the hypothesis that profitability of poultry farms, other things being comparable, is a function of the size of farms, stands accepted.

Small size farms are in a dominant position with regard to total assets turnover, fixed assets turnover, current assets turnover and working capital turnover. Large size farms showed the lowest profile in all these. Nevertheless, the R.O.I. was found to be the highest in large size farms due to the handsome gross profit and net profit margins, the influencing factor being the selling price advantage. The lowest operating ratio also had served as an important factor in deciding the level of R.O.I. The small size farms had the lowest gross profit and net profit ratios. In comparison with medium size farms, small size farms had a better R.O.I. as a result of a similar total assets turnover ratio.

Debt financing is very common in poultry farm capitalisation. Large farms, though not debt intensive, have higher levels of debt components in their total capital vis-a-vis

farms of lower sizes. Large farms are having comfortable long-term liquidity positions whereas small size farms have their feet slogging in meeting liquidity demands.

While the coefficient of working capital leverage is consistently on the rise for small size farms, the large size farms have achieved remarkable foot hold in this respect.

Significant variations across farm sizes have been discerned in current asset management indices with conspicuous departures in inventory and receivable management.

6.11. Overall farm management efficiency

The overall farm management efficiency is being presented as the epitome of a number of indices reflecting the operational, financial and management facets of the poultry farms. The succeeding paragraphs present the results of data analysis towards the overall efficiency.

(a) Total asset turnover

The total asset turnover analysis indicated that small size farms were most effective with an index value of 3.8 followed by medium size and large size farms with corresponding values of 3.44 and 3.33 respectively.

(b) Profit/Volume analysis

Profit/volume analysis established a direct advantage for larger sizes in poultry farms. Large size farms have the most advantageous profit propensity followed by medium and small size farms. The corresponding result values being 0.1785, 0.2121 and 0.3834 in order of the farm sizes beginning with large farms.

(c) Margin of safety analysis

Excess of sales revenue over the break-even point was found to be most impressive in the case of large size farms (0.9463) with lesser margins characterising medium and small farms with corresponding values of 0.7824 and 0.7729.

Thus combining the results of total asset turnover, profit/volume and margin of safety analysis it was established that large size farms had the most impressive operational management efficiency. The operational ratio values were :

Large size farms	:	1.2082
Medium size farms	:	0.5906
Small size farms	:	0.5243

It is worth mentioning that operational management efficiency and total asset turnover are inversely related. Thus the hypothesis that high capital turnover is a major determinant of profitability irrespective of their size, stands disproved.

(d) Financial operations levels

The ratio analysis to ascertain the financial operation efficiency disclosed the comparability of all the three sizes of poultry farms. Though various sizes had divergent absolute values, the difference in values are only marginal and statistically insignificant. Thus it was concluded that financial operating efficiency was more or less the same for varying farm sizes.

(e) Financial leverage

Advantages of financial leverage is relatively higher in large size farms owing to the employment of low cost funds. Debt financing is also justifiable from the point of view of interest coverage which came to nearly 14 times and it is sufficiently higher than the coverage ratios of other sizes of farms.

6.12. Financial management efficiency

The mathematical product of financial operational levels and financial leverage positions indicated the financial management efficiency of the poultry farms. The financial management efficiency was seen as the highest in the case of large size farms and marginally less in small size farms. Medium size farms had the least financial management efficiency.

6.13. Management achievement efficiency

The index of management achievement efficiency obtained as the product of financial management efficiency and operational management efficiency established the preferability of large size farms with the efficiency value of 3.93 over the small and medium size farms. The management achievement efficiency index of large size farms is 73.28 percent more than the immediate lower index value of 1.05 pertaining to the small size farms. The high value of management achievement efficiency index is found to have been brought about by the favourable financial management efficiency index, margin of safety and profit/volume ratio of large farms.

6.14. Farm Management Efficiency Index

Farm management efficiency being a product of P.E.F. and liveability, reflects the yield response in broiler poultry farming. Yield response was found to be most appealing in large size farms both in terms of P.E.F. and liveability as compared to lower farm sizes. Analysis of variance did not prove any significant variation in the liveability factor across the farm sizes.

Recommendations

In the light of the present study, the researcher proposes the following points by way of recommendations in order to strengthen the poultry farming in Kerala :

1. The study has revealed the shortage of skilled personnel to man poultry farms. Intensive training programmes with special orientation to poultry hatching, rearing and processing may be offered at various levels preferably by the Agricultural University and similar institutions.

2. Maintaining feed compounding units as part of poultry farms would be an effective method of achieving rationalisation of input costs in the business of poultry farming.

3. Return on investment of layer size farms may be further strengthened through improving total asset turnover by using kucha type poultry sheds and standard equipments.

4. The tremendous employment generation and export potential of broiler poultry farming is largely untapped at present. The State Government may be, therefore, prevailed upon to extend appropriate support measures to the poultry farming sector also.

5. Banks and other financial institutions have the inclination to under-estimate the economic potency of broiler poultry farms as worthwhile business ventures. They should be encouraged to undertake realistic appraisals of poultry farming and take initiatives in popularising it as a sustainable employment generating sector.

6. There should be a proper machinery for controlling the unhealthy pricing practices followed by leading farmers.

APPENDIX - I

TABLE 1

Components of Total Cost (average) of broiler poultry farms in Kerala 1987 - 91

(Percentage in brackets)

Item	Small	Medium	Large
Production Cost	212134.20	359606.80	922494.00
	(92.33)	(91.71)	(92.86)
Feed	151275.20	248839.60	620795.60
	(65.84)	(63.46)	(62.49)
Chick	55264.60	101181.60	272178.80
	(24.05)	(25.80)	(27.40)
Variable Overhead	5594.40	9585.40	29519.60
	(2.43)	(2.44)	(2.77)
Total Fixed Cost	17631.80	32521.00	70893.60
	(7.67)	(8.29)	(7.14)
Interest on Capital	7751.80	15130.20	42153.60
	(3.37)	(3.86)	(4.24)
Other Fixed O.H	9880.20	17390.80	28740.00
	(4.30)	(4.43)	(2.89)
Total Cost	229766.40	392127.80	993387.60
	(100.00)	(100.00)	(100.00)

Source : Computed from survey data

TABLE 2

Components of revenue (average) of broiler poultry farms in Kerala 1987 - 91

(Percentage in brackets)

	Small	Medium	Large
Gross Revenue	255647.20	450890.20	1458085.00
	(100.00)	(100.00)	(100.00)
Meat	243785.40	430368.80	1396998.60
	(95.36)	(95.45)	(95.81)
Mannure	9345.00	15649.60	47746.00
	(3.66)	(3.47)	(3.27)
Gunny etc	2516.80	4871.60	13340.40
	(0.98)	(1.08)	(0.91)

Source : Computed from survey data

TABLE 3

Income statement (average) of broiler poultry farms in Kerala 1987 - 91

(Percentage in brackets)

Revenue/cost	Small	Medium	Large
Gross Revenue	255647.20	450890.20	1458085.00
	(100.00)	(100.00)	(100.00)
Meat	243785.40	430368.80	1396998.60
	(95.36)	(95.45)	(95.81)
Manure	9345.00	15649.60	47746.00
	(3.66)	(3.47)	(3.27)
Gunny etc	2516.80	4871.60	13340.40
	(0.98)	(1.08)	(0.91)
Production Cost	212134.20	359606.80	922494.00
	(82.98)	(79.75)	(63.27)
Feed	151275.20	248839.60	620795.60
	(59.17)	(55.19)	(42.58)
Chick	55264.60	101181.60	272178.80
	(21.62)	(22.44)	(18.67)
Variable Overhead	5594.40	9585.40	29519.60
	(2.19)	(2.13)	(2.02)
Gross Profit	43513.00	91283.40	535591.00
	(17.02)	(20.25)	(36.73)
Total Fixed Cost	17631.80	32521.00	70893.60
	(6.90)	(7.21)	(4.86)
Interest on Capital	7751.80	15130.20	42153.60
	(3.03)	(3.36)	(2.89)
Other Fixed O.H	9880.20	17390.80	28740.00
	(3.86)	(3.86)	(1.97)
Total Cost	229766.40	392127.80	993387.60
	(89.88)	(86.97)	(68.13)
Net Profit	25880.80	58762.40	464697.40
	(10.12)	(13.03)	(31.87)
No. of Birds	10638.00	19195.60	53053.60
	(4.16)	(4.26)	(3.64)

Source : Computed from survey data

Table 4

Major input costs and output price of broiler poultry farms in Kerala

(index 1987 = 100)

Year	Cost per kilogram of feed	cost per day old chick	selling price per kilogram of meat
1987	3.23 (100.00)	5.90 (100.00)	15.80 (100.00)
1988	3.32 (102.78)	6.30 (106.78)	16.40 (103.80)
1989	3.52 (108.98)	7.20 (122.03)	16.50 (104.43)
1990	3.79 (117.34)	7.40 (125.42)	18.00 (113.92)
1991	3.92 (121.36)	7.90 (133.90)	18.50 (117.09)

Source : Animal Husbandry statistics, Thiruvananthapuram

Table 5

INCOME STATEMENT OF SMALL SIZE FARMS (INDEX 1987 = 100)

	1987	1988	1989	1990	1991
Gross Revenue	186790.00	203867.00	300169.00	313279.00	274131.00
	100.00	109.14	160.70	167.72	146.76
Meat	179860.00	192369.00	285941.00	298523.00	262234.00
	100.00	106.95	158.98	165.98	145.80
Manure	5286.00	9643.00	11076.00	11372.00	9348.00
	100.00	182.43	209.53	215.13	176.84
Gunny etc	1644.00	1855.00	3152.00	3384.00	2549.00
	100.00	112.83	191.73	205.84	155.05
Production Cost	153485.00	161688.00	251221.00	261859.00	232418.00
	100.00	105.34	163.68	170.61	151.43
Feed	114300.00	116800.00	177753.00	185292.00	162231.00
	100.00	102.19	155.51	162.11	141.93
Chick	35107.00	40230.00	67080.00	69967.00	63939.00
	100.00	114.59	191.07	199.30	182.13
Variable Overhead	4078.00	4658.00	6388.00	6600.00	6248.00
	100.00	114.22	156.65	161.84	153.21
Gross Profit	33305.00	42179.00	48948.00	51420.00	41713.00
	100.00	126.64	146.97	154.39	125.25
Total Fixed Cost	17853.00	16795.00	17207.00	17785.00	18519.00
	100.00	94.07	96.38	99.62	103.73
Interest on Capital	8498.00	7997.00	6899.00	7159.00	8206.00
	100.00	94.10	81.18	84.24	96.56
Other Fixed O.H	9355.00	8799.00	10308.00	10626.00	10313.00
	100.00	94.06	110.19	113.59	110.24
Total Cost	171338.00	178485.00	268428.00	279644.00	250937.00
	100.00	104.17	156.67	163.21	146.46
Net Profit	15452.00	25382.00	31741.00	33635.00	23194.00
	100.00	164.26	205.42	217.67	150.10
No. of Birds	8520.00	8250.00	12880.00	12700.00	10840.00
	100.00	96.83	151.17	149.06	127.23

Table 6

INCOME STATEMENT OF MEDIUM SIZE FARMS

	1987	1988	1989	1990	1991
Gross Revenue	237550.00	292231.00	508515.00	556434.00	659721.00
	100.00	123.02	214.07	234.24	277.72
Meat	227216.00	279694.00	484310.00	530393.00	630231.00
	100.00	123.10	213.15	233.43	277.37
Mannure	7839.00	9907.00	17645.00	18975.00	23882.00
	100.00	126.38	225.09	242.06	304.66
Gunny etc	2495.00	2630.00	6560.00	7066.00	5607.00
	100.00	105.41	262.93	283.21	224.73
Production Cost	196399.00	239882.00	374486.00	453621.00	533646.00
	100.00	122.14	190.68	230.97	271.72
Feed	143093.00	169330.00	250250.00	315197.00	366328.00
	100.00	118.34	174.89	220.27	256.01
Chick	47802.00	64483.00	111966.00	126188.00	155469.00
	100.00	134.90	234.23	263.98	325.24
Variable Overhead	5504.00	6069.00	12270.00	12236.00	11848.00
	100.00	110.27	222.93	222.31	215.26
Gross Profit	41151.00	52349.00	134029.00	102813.00	126075.00
	100.00	127.21	325.70	249.84	306.37
Total Fixed Cost	26453.00	21712.00	29142.00	43770.00	41528.00
	100.00	82.08	110.17	165.46	156.99
Interest on Capital	12301.00	9077.00	10333.00	24671.00	19269.00
	100.00	73.79	84.00	200.56	156.65
Other Fixed O.H	14152.00	12635.00	18809.00	19099.00	22259.00
	100.00	89.28	132.91	134.96	157.29
Total Cost	222852.00	261594.00	403628.00	497391.00	575174.00
	100.00	117.38	181.12	223.19	258.10
Net Profit	14698.00	30637.00	104887.00	59043.00	84547.00
	100.00	208.44	713.61	401.71	575.23
No. of Birds	11414.00	13393.00	22200.00	23200.00	25771.00
	100.00	117.34	194.50	203.26	225.78

Table 7

INCOME STATEMENT OF LARGE SIZE FARMS

	1987	1988	1989	1990	1991
Gross Revenue	509320.00	794767.00	2010286.00	2185022.00	1791030.00
	100.00	156.04	394.70	429.01	351.65
Meat	490475.00	761625.00	1924447.00	2090848.00	1717598.00
	100.00	155.28	392.36	426.29	350.19
Mannure	15381.00	26784.00	65133.00	70358.00	61074.00
	100.00	174.14	423.46	457.43	397.07
Gunny etc	3464.00	6358.00	20706.00	23816.00	12358.00
	100.00	183.55	597.75	687.53	356.76
Production Cost	287326.00	527688.00	1233932.00	1420479.00	1143045.00
	100.00	183.65	429.45	494.38	397.82
Feed	200979.00	358100.00	828939.00	965908.00	750052.00
	100.00	178.18	412.45	480.60	373.20
Chick	78071.00	151910.00	369037.00	414306.00	347570.00
	100.00	194.58	472.69	530.68	445.20
Variable Overhead	8276.00	17678.00	35956.00	40265.00	45423.00
	100.00	213.61	434.46	486.53	548.85
Gross Profit	221994.00	267079.00	776354.00	764543.00	647985.00
	100.00	120.31	349.72	344.40	291.89
Total Fixed Cost	35948.00	38926.00	64124.00	93245.00	122225.00
	100.00	108.28	178.38	259.39	340.01
Interest on Capital	18233.00	18472.00	29466.00	57673.00	86924.00
	100.00	101.31	161.61	316.31	476.74
Other Fixed O.H	17715.00	20454.00	34658.00	35572.00	35301.00
	100.00	115.46	195.64	200.80	199.27
Total Cost	323274.00	566614.00	1298056.00	1513724.00	1265270.00
	100.00	175.27	401.53	468.25	391.39
Net Profit	186046.00	228153.00	712230.00	671298.00	525760.00
	100.00	122.63	382.82	360.82	282.60
No. of Birds	20800.00	31667.00	72367.00	80467.00	59967.00
	100.00	152.25	347.92	386.86	288.30

Table 8

BALANCE SHEET OF SMALL SIZE FARMS (INDEX 1987 = 100)

	1987	1988	1989	1990	1991
Current Assets	18404.00	18421.00	25370.00	25184.00	24906.00
	100.00	100.09	137.85	136.84	135.33
Cash & Bank	4647.00	4508.00	3878.00	3500.00	4759.00
	100.00	97.01	83.45	75.32	102.41
Dep. with Hatchery	742.00	819.00	1154.00	1417.00	1298.00
	100.00	110.38	155.53	190.97	174.93
Receivables	3992.00	3335.00	5095.00	4515.00	4751.00
	100.00	83.54	127.63	113.10	119.01
Inventory	9023.00	9759.00	15243.00	15752.00	14098.00
	100.00	108.16	168.93	174.58	156.25
Fixed Assets	47176.00	44312.00	41955.00	38980.00	36181.00
	100.00	93.93	88.93	82.63	76.69
Poultry Shed	39723.00	37359.00	34032.00	31520.00	29205.00
	100.00	94.05	85.67	79.35	73.52
Equipments	3373.00	3632.00	4313.00	4115.00	3887.00
	100.00	107.68	127.87	122.00	115.24
Other Fixed Assets	4080.00	3321.00	3610.00	3345.00	3089.00
	100.00	81.40	88.48	81.99	75.71
Total Assets	65580.00	62733.00	67325.00	64164.00	61087.00
	100.00	95.66	102.66	97.84	93.15
Current Liabilities	8285.00	6782.00	5336.00	5483.00	4814.00
	100.00	81.86	64.41	66.18	58.11
Creditors	8126.00	6657.00	5115.00	5237.00	4626.00
	100.00	81.92	62.95	64.45	56.93
O/S Expenses	159.00	125.00	221.00	246.00	188.00
	100.00	78.62	138.99	154.72	118.24
Bank Loan	3750.00	5830.00	11444.00	6960.00	7940.00
	100.00	155.47	305.17	185.60	211.73
Other Borrowings	15452.00	25751.00	31742.00	33635.00	24499.00
	100.00	166.65	205.42	217.67	158.55
Total Ext. Liabs.	27487.00	38363.00	48522.00	46078.00	37253.00
	100.00	139.57	176.53	167.64	135.53
Net Worth	38093.00	24370.00	18803.00	18086.00	23834.00
	100.00	63.98	49.36	47.48	62.57
Net W.Capital	10119.00	11639.00	20034.00	19701.00	20092.00
	100.00	115.02	197.98	194.69	198.56
Total Liability	65580.00	62733.00	67325.00	64164.00	61087.00
	100.00	95.66	102.66	97.84	93.15

Table 9

BALANCE SHEET OF MEDIUM SIZE FARMS

	1987	1988	1989	1990	1991
Current Assets	28768.00	32858.00	48960.00	57950.00	61162.00
	100.00	114.22	170.19	201.44	212.60
Cash & Bank	10922.00	11689.00	3981.00	8998.00	12904.00
	100.00	107.02	36.45	82.38	118.15
Dep. with Hatchery	1133.00	1145.00	1996.00	2316.00	3024.00
	100.00	101.06	176.17	204.41	266.90
Receivables	5666.00	7357.00	19231.00	23323.00	16176.00
	100.00	129.84	339.41	411.63	285.49
Inventory	11047.00	12667.00	23752.00	23313.00	29058.00
	100.00	114.66	215.01	211.03	263.04
Fixed Assets	58260.00	53984.00	91185.00	92262.00	99998.00
	100.00	92.66	156.51	158.36	171.64
Poultry Shed	49411.00	45013.00	81434.00	83265.00	91476.00
	100.00	91.10	164.81	168.52	185.13
Equipments	1986.00	2442.00	3670.00	3381.00	3337.00
	100.00	122.96	184.79	170.24	168.03
Other Fixed Assets	6863.00	6529.00	6081.00	5616.00	5185.00
	100.00	95.13	88.61	81.83	75.55
Total Assets	87028.00	86842.00	140145.00	150212.00	161160.00
	100.00	99.79	161.03	172.60	185.18
Current Liabilities	11559.00	8317.00	8020.00	8390.00	9021.00
	100.00	71.95	69.38	72.58	78.04
Creditors	11331.00	8069.00	7534.00	8015.00	8427.00
	100.00	71.21	66.49	70.74	74.37
O/S Expenses	228.00	248.00	486.00	375.00	594.00
	100.00	108.77	213.16	164.47	260.53
Bank Loan	22933.00	13867.00	23200.00	17400.00	23025.00
	100.00	60.47	101.16	75.87	100.40
Other Borrowings	20607.00	28752.00	22728.00	36434.00	42674.00
	100.00	139.53	110.29	176.80	207.08
Total Ext. Liabs.	55099.00	50936.00	53948.00	62224.00	74720.00
	100.00	92.44	97.91	112.93	135.61
Net Worth	31929.00	35906.00	86197.00	87988.00	86440.00
	100.00	112.46	269.96	275.57	270.73
Net W.Capital	17209.00	24541.00	40940.00	49560.00	52141.00
	100.00	142.61	237.90	287.99	302.99
Total Liability	87028.00	86842.00	140145.00	150212.00	161160.00
	100.00	99.79	161.03	172.60	185.18

Table 10

BALANCE SHEET OF LARGE SIZE FARMS

	1987	1988	1989	1990	1991
Current Assets	72641.00	97965.00	283134.00	275602.00	221646.00
	100.00	134.86	389.77	379.40	305.13
Cash & Bank	38752.00	29178.00	85040.00	102048.00	81229.00
	100.00	75.29	219.45	263.34	209.61
Dep. with Hatchery	989.00	2410.00	8368.00	9538.00	7228.00
	100.00	243.68	846.11	964.41	730.84
Receivables	12349.00	40447.00	122008.00	71200.00	69515.00
	100.00	327.53	988.00	576.56	562.92
Inventory	20551.00	25930.00	67718.00	92816.00	63674.00
	100.00	126.17	329.51	451.64	309.83
Fixed Assets	107280.00	135027.00	299687.00	313408.00	292389.00
	100.00	125.86	279.35	292.14	272.55
Poultry Shed	80698.00	107190.00	255457.00	270412.00	252447.00
	100.00	132.83	316.56	335.09	312.83
Equipments	8642.00	11246.00	28365.00	28187.00	26271.00
	100.00	130.13	328.22	326.16	303.99
Other Fixed Assets	17940.00	16591.00	15865.00	14809.00	13671.00
	100.00	92.48	88.43	82.55	76.20
Total Assets	179921.00	232992.00	582821.00	589010.00	514035.00
	100.00	129.50	323.93	327.37	285.70
Current Liabilities	11281.00	16309.00	24180.00	25491.00	19829.16
	100.00	144.57	214.34	225.96	175.77
Creditors	11217.00	16245.00	24116.00	25427.00	18526.00
	100.00	144.82	215.00	226.68	165.16
O/S Expenses	502.00	833.00	1568.00	1560.00	1138.00
	100.00	165.94	312.35	310.76	226.69
Bank Loan	44533.00	36866.00	67000.00	56032.00	45065.00
	100.00	82.78	150.45	125.82	101.19
Other Borrowings	84534.00	88152.00	304139.00	371298.00	307262.00
	100.00	104.28	359.78	439.23	363.48
Total Ext. Liabs.	140348.00	141327.00	395319.00	452821.00	372156.16
	100.00	100.70	281.67	322.64	265.17
Net Worth	39573.00	91665.00	187502.00	136189.00	141878.84
	100.00	231.64	473.81	344.15	358.52
Net W.Capital	60922.00	80887.00	249918.00	427184.00	201982.00
	100.00	132.77	410.23	701.20	331.54
Total Liability	179921.00	232992.00	582821.00	589010.00	514035.00
	100.00	129.50	323.93	327.37	285.70

APPENDIX - II

ECONOMICS OF BROILER POULTRY FARMING IN KERALA.

TOOL OF DATA COLLECTION

INTERVIEW -- SCHEDULE

I. Name and address :

II. Qualification and experience

1. Academic (specify) :

2. Technical/Professional:

3. Years of experience in farming :

4. Other qualifications and :

III. Social and Economic Background

1. Present occupation/ Profession other than poultry farming :

2. Have you got any previous exposure to the field of farming : YES/NO

If yes, specify :

IV. A. 1. Building (with electrification charges)

Height above ground level in feet :

Height above foundation in feet :

Height above brick wall in feet :

Height above wire net in feet :

Length of houses in feet :

Breadth of houses in feet :

Total height of house above ground level :

2. Type of construction : Pucca/Kucha

Materials used for walls: Bricks/laterites/bamboo/wood

Flooring : Plastered/not plastered

Materials for beams : Timber/fabrication/REC/bamboo

Materials for roofing : Coconut leaf/tiles/lite roof/ asbestos.

3.

	1987	1988	1989	1990	1991
No. of sheds					
No. of rooms in one shed					
No. of pens in one hall/ room					
Expected life of sheds					
No. of sheds remaining vacant for fumegation					
No. of sheds remaining vacant for other reasons					
Facility of accommodation in one room					
Total value of sheds					

B. Equipments:

	1987	1988	1989	1990	1991
	Nos. Book value Life	Nos. Book value Life	Nos. Book value Life	Nos. Book value Life	Nos. Book value Life.
Brooders					
Chick feeder					
Adult feeder					
Chick drinker					
Adult drinker					
Chick guard					
Chick grill					

C. Other Assets

	Vehicle		
	Cycle		
	Weighing scale		
	Sprayers		
	Showels etc.		

D. 1. Things used as feeders etc. : Alum. plates/buckets/basins/ plastic dubbas/plastic plates/ hanging feeders/bamboo/ kerosine tin/long feeder/G.I. sheet/powder tin

2. Things used as waterers : Dubbas/earthen ware/basins/ bucket/auto chick drinkers/ auto adult drinkers.

E. Do you use any Eviscerators, feed mixers, grinding mill, automatic vaccinator, auto round drinker etc. : YES/NO.

If yes, specify :

V. Which system of rearing do you follow : All in All Out/Multiple Rearing

VI. Have you got a store room : Yes/No

VII. Flock Schedule

	1987	1988	1989	1990	1991
Cost per chick (day old)					
No. of batches					
No. of lots in a batch					
No. of birds started with					
Closing balance of birds					
Breed of Chick					
Average weeks grown					
Transportihg cosf of chicks					
Means of transportation					
Distance from hatchery (in Kms)					
Amount of deposit with hatchery for day old chick					

VIII.1. Feed

	1987	1988	1989	1990	1991
No. of bags per week					
Rate per bag					
Brand name					
Distance from market in kms					
Means of transporting					
Average cost of transporting per bag.					

2. Do you maintain records of weekly feed consumption ? : YES/NO

3. What is the percentage of wastage of feed :

4. Is it controllable? If yes, to what extend : YES/NO

5. Through what all ways there arises wastage : Feed carrying/rodents/ from feeders.

IX. Health care:

1. What are the usual preventives given : Glucose/RDF/Thylocne Tartrate/RDF booster/ B Complex/Teramycin/ liver tonic

2. What is the time lag of providing each :

3. How much is spent for preventives per month

1987	1988	1989	1990	1991

4. What are the types of ailments that affects the birds : Sub clinical/Chronic/ Communicable

5. From where do you get medical aid : Government Vetinery Department/Hatchery

6. How much do you spend on medical treatment : Rs.....per..... birds per batch

7. What is the percentage of mortality (average) ?

1987	1988	1989	1990	1991
%	%	%	%	%

8. Have you noticed any weight reduction in any of the batch or batches?

1987	1988	1989	1990	1991
YES/NO	YES/NO	YES/NO	YES/NO	YES/NO

9. Have you enquired about the causes of such weight reduction If No, specify the reasons for not enquiring. : YES|NO

10. What all steps you have taken: to avoid weight reduction (specify)

X. Shed cleaning:

1. What are the materials used for cleaning and sanitation? : Lime/bleaching powder/ malathion/formalin/ pottassioum permagnate/ finol lotion

2. How much do you spend on shed cleaning (per batch)?

1987	1988	1989	1990	1991
Rs.....	Rs.....	Rs.....	Rs.....	Rs.....

3. What is the duration of keeping the shed empty after culling ? : .....(weeks)

4. What is the mode of washing waterers, feeders, water drums etc. : Cleaning in hot water/ cleaning in plain water/ no cleaning/washing in 5% phenyle lotion/ idophor spray

XI. 1. Litter:

	1987	1988	1989	1990	1991
Material used					
Cost per bag (75 Kg.)					
Quantity used (in bags)					

2. Brooding and Lighting:

	1987	1988	1989	1990	1991
No. of days for which brooding is done for day old chicks					
Type of brooder used - 100 wt bulbs/infra red bulbs/auto brooders					
No. of brooders used					
Duration of light provision: Full time / For hrs.					
Average life of brooders					

3. Power

	1989	1988	1989	1990	1991
Monthly charges	Rs...	Rs...	Rs...	Rs...	Rs...
Tariff Category					

XII. 1. Own Labour:

	1982	1983	1984	1985	1986
No. of Persons employed per month					
Total No. of man-hours per month					
No. of full timers					
No. of Part timers					

2. Hired Labour:

Total No. of man-days worked	
Are they employed on - Full time	
- Part time	
Monthly pay of each	

XIII. 1. Shed Maintenance:

At what interval do you re-thatch your sheds? : .....months

How much do you spend on re-thatching or proper maintenance of your building

1987	1988	1989	1990	1991
Rs...	Rs...	Rs...	Rs...	Rs...

2.

3. How much do you spend for chick insurance

4. Carriage Outwards:

Place of marketing birds

Distance to market in kms

Mode of transporting

Cost (per month)

5. Do you have any sharing programme for carriage outwards? : Yes/No

If yes, specify :

6. Do you club together the purchase of chick & feed along with sale of birds? : Yes/No

If yes, specify :

7. What are the contingency expenses in connection with farming? : Tips to visiting doctors/ veterinarian/Hatchery field staff/Government Officials.

XIV 1. Sale of Birds:

Which are your cutlets of sale (indicating the share of each)	1987	1988	1989	1990	1991

What is the nature of your customers? : Permanent/Temporary/Not sure

What is the nature of competition? : Healthy/Unhealthy/Direct/ Indirect.

2. What is the percentage of cash sale?

1987	1988	1989	1990	1991
%	%	%	%	%

3. How much is the debtors velocity? : .....weeks

4.	How much live weight do the customers prefer	1987	1988	1989	1990	1991
5.	What is the adverage body weight of live birds?	1987	1988	1989	1990	1991
	1.25 Kg/1.5 Kg/1.5-1.75 Kg/ 1.75-2.00 Kg.					
6.	At what rate do you sell live-birds?	1987	1988	1989	1990	1991

7. Do you prefer selling live birds or dressed birds? (specify reasons) :

8. Is there any extra margin from selling dressed birds? : YES/NO

9. What is your opinion about selling the bird at 6th or 7th week? :

(Give reasons)

10. Do you take body weight of the birds every week? : YES/NO

11. Is there any exploitation by intermediaries? : YES/NO

If yes, specify :

12. What is your opinion about the price realised? : Satisfactory/Good/Bad

13. Do give commission on sale? : YES/NO

14. Have you ever experienced the problem of bird becoming too heavy due to dull market? : YES/NO

If yes, for how many days you have waited : 1 week/2 weeks/above 2 weeks

15. Don't think that marketability can be increased by reducing selling price in dull period? : YES/NO

XV Sale of Manure:

	1987	1988	1989	1990	1991
Quantity sold per month					
Rate per ton					

2. Do you take it for your on cultivation? : YES/NO

If yes, how much : .....tons per year

XVI. Sale of Gunny:

	1987	1988	1989	1990	1991
No. of Gunnies sold per month					
Rate per gunny					

XVII. Other revenues:

1. Do you sell the waste of dressed chicken as: fooder to fish, pork, etc. YES/NO

2. Do you use the waste of dressed chicken as feed of grown chicks? YES/NO

   How far this helps in: gaining body weight of broiler chicks? Highly effective/Effective/ No effect.

XVIII. Other details:

1. How much feed will you stock? : 1 week's/2 week's/above 2 week's

2. How many batches of birds will be on stock at a time as work-in-progress? : 5 week's/6 week's/7 week's/ 8 week's/9 week's

3. What is the percentage of completion with respect to work in progress

		1987	1988	1989	1990	1991
Chick	in %					
Feed	in %					
Other expenses	in %					

4. Do you like to stick on : YES/NO
   If No, give reasons :

XIX 1. How much iscreditor's velocity?

For Feed - Nil/1 week/2 weeks/3 weeks/1 month

For Chick- Nil/1 week/2 weeks

2. What is the time lage for wage and salary payment?
Daily/1 week/2 weeks/1 month/above 1 month

XX. 1. Do you retain something: YES/NO
from profit?

If yes, specify the
percentage :

2. Do you withdraw cash or goods or both from : YES/NO
business for personal
use?

If yes, specify the amount
of drawings per month :

3. Do you have own capital?: YES/NO
If yes, specify the
amount :

XXI. Major functional problems

1. Marketing:

a) External competition

b) Internal competition

c) Other problems

2. Finance :

a) Shortage of working capital

b) Procedural delay

c) Inconsistent demand

d) Other problems

3. Input cost:

a) Excessive price

b) Artificial scarcity

c) Other problems

4. Labour:

a) Want of skilled workers

b) indolence of family labour

c) Other problems.

5. Managerial & Technical:

a) Technically qualified

b) Training facility

c) Veterinary aid

6. Govt. Policy:

a) Lack of subsidy for input items

b) Competition from other states

c) Others.

XXII. 1. What are the available banking facilities? : Co-operative Bank/ Land Mortgage Bank/ Scheduled Bank/Rural Bank/Nabard/Others (specify)

2. Do you make use of the above : YES/NO

3. Are you satisfied with their functioning? : YES/NO

If no, specify reasons. :

4. Do you have borrowed capital? : YES/NO

If yes, specify the amount and rate of interest :

Term loan Rs.....rate.....duration,.....months

Working capital Rs.....rate.....duration.....months

5. How much is the monthly repayment to bank? : Rs.....

6. Do you have any deposit A/C with bank? : YES/NO

7. Do you have any recurring deposit scheme? : YES/NO

8. How much liquid cash you use to keep always? : Rs...../Not a fixed sum

XXIII. 1. Are you a member of broiler farmer's association? : YES/NO
If No, give reason :

2. What is the degree of participation in the association : Active/Passive/In role only

3. What are your suggestions for improving broiler farming in the State :

4. Any other relevant informations in this regard, from your personal experience :

APPENDIX - III

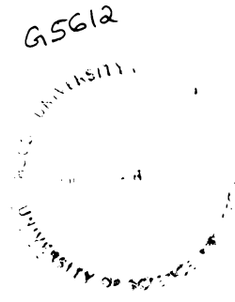
GLOSSARY OF TERMS

1. All in all out system - A group of day old chicks bought on a particular day will be reared together till the time of its disposal, without changing them from one shed to the other.
2. Brooding - Rearing of chicks after hatching till the age upto which warmth has to be provided by artificial means.
3. Cage system - System of housing fowls on horizontal or vertical or stepped configurations made up of steel, wood, weld mesh etc., usually in two or three tiers.
4. Chick cost - The price of chicks payable to the hatchery plus the expenses incidental to carrying them to the farm.
5. Contract growing - An agreement between poultry processors and farmers regarding the supply of poultry products for a specified period at a predetermined price.
6. Cost of feed - The cost when one kilogram of feed reaches the farm.
7. Culling - The elimination of unproductive or otherwise undesirable fowls for optimising the earnings.
8. Custom hatching - Incubating eggs given by outsiders, for a specified rent.
9. Day old chick - When the chick (unseperated by sex) reaches the farm irrespective of the day of hatching, it is regarded as a day old chick.

10. Deep litter - The system of keeping the fowls in a shed, on the floor on which is placed litter composed of wood shavings, saw dust, chaff etc., about 4 to 6 inches depth.
11. Desi fowl - Fowls indigenous to India with laying capacity of less than 100 eggs per annum and not a pure breed, It is best suited to village husbandry conditions.
12. Dressed weight - The weight after slaughter and dressing.
13. Feed utilisation - The total quantity of feed used for rearing the fowls rather than the actual intake by the fowls.
14. Improved fowls - The exotic and modern breeds of layer fowls bred and acclimatised to local conditions with high egg laying capacity which usually exceeds 230 per annum.
15. Liveability - The percentage of birds reaching the disposable age.
16. Man hours - Hours spent for various tasks in a farm. For arriving at the man hours the day is considered to be of 12 hours of 360 days in an year.
17. Manure - The litter-mixed droppings of fowls.
18. Morbidity - The stage of reduced performance due to sickness. During this period the output will not be directly proportionate to the feed intake.
19. Mortality - The death rate of birds exeeding the extra chicks which are given free of cost by hatcheries to offset the anticipated death of fowls.
20. Own labour - Any amount of work done by the farmer and his family members in connection with poultry farming operations.

21. Stress - Any physical or mental discomfort to the birds resulting in low productivity or diseases.

22. Weight gaining - The additional weight acquired by the bird with the help of various intakes, from the day it is taken for rearing to the date of disposal. As the weight of day old chick is not uniform and the farmers have no practice of weighing it on arrival, the total live weight at the time of sale is regarded as the gaining from rearing.



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