

STATUS OF BROILER PRODUCTION IN KERALA WITH SPECIAL REFERENCE TO TRICHUR

By

M. ABOOBACKER, B.V.Sc. & AH.

THESIS

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DECLARATION

I hereby declare that this thesis entitled "STATUS OF BROILER PRODUCTION IN KERALA WITH SPECIAL REFERENCE TO TRICHUR" is a bonafide record of research work done by me during the course of research and that the thesis has not previously formed the basis for the award to me of any degree, diploma, associateship, fellowship, or other similar title, of any other University or Society.

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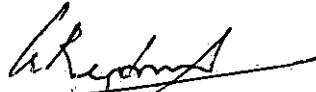
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Date : 26-12-1988.

Name of the
candidate

M. Alexbacher

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**Name of the Guide : Dr. G. Raghunathan Nair
(Chairman, Advisory Board)**

**Designation : Associate Professor,
Department of Poultry
Science**

Place: Mannuthy.

Date : 26-12-1968.

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N. Abeebaker

In commemoration of

MOHAMMED ALI JINNAH

MOHAMMED MALMI

UMMUL HALEEMA

with Reverence and Obeisance

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CHAPTER I
INTRODUCTION

INTRODUCTION

The ready availability of all the inputs required for commercial poultry operations has converted the conventional method of backyard poultry farming into a fullfledged self sufficient major Agro-Industry. Broilers appeared on the poultry scene in the seventies and from nearly four millions in 1971, production has increased to around 100 millions in 1988. Traditionally, non-vegetarians relied on spent fowls and cockerels in the form of table birds. With the emergence of feed-efficient broilers raised scientifically, an absolutely new kind of tender, tastier and easy-to-cook meat has been made available. The popularity of broiler meat is also augmented by consumer awareness about its nutritive value and organoleptic qualities. Besides, chicken meat which was a luxury has now become economically attractive due to its low price when compared to mutton, chevon and fish. The demand for broiler meat is very high since mutton, chevon and meat from culled birds are in short supply. During the past decade, tremendous expansion has taken place and the broiler production increased from 10 millions in 1975 to almost 100 millions now - obviously reflecting the consumer preference for the tender and flavoured broiler meat.

Considering the increasing human population, even if the broiler industry grows at the rate of 50 per cent, the per capita availability of poultry meat by 1990 will be only 625g. This cannot be considered as high when compared to

other developed nations. If this level of production has to be attained, this segment of poultry industry has to expand tremendously and continuously and no saturation point in the sector is predictable in the foreseeable future.

Thus, there is a need for gigantic effort to promote growth and to establish well-knit and co-ordinated market set-up particularly in the vast rural areas. There should also be proper storage facilities and distribution channels like cold storages and effective chain of distribution. Broiler production is expected to take a very big leap forward with the advent of fast food products which have already started taking shape in the cosmopolitan cities of our country.

In contrast to the spectacular improvement in overall broiler production in India, the progress in this segment in Kerala cannot be considered as satisfactory. Kerala occupies only the 13th place in the broiler map of India with a population of 1.5 million which accounts only for two per cent of the production in 1985. The probable factors that have contributed for this low level of broiler production in Kerala are:

1. The public and private sector have made only limited impact on popularising broiler industry.
2. There are no 'integrators' for popularising this segment of poultry industry in Kerala.

3. The inputs required for broiler production are not readily available for want of financial assistance and subsidy for broiler farming. Poultry farming has not been considered as an agricultural enterprise by the Government of Kerala.

4. The transfer of modern technology to the farmers is not prompt.

Any attempt to popularise broiler production in Kerala will be successful only if an accurate picture of the present status of this segment of poultry production is readily available. So far, no work has been undertaken to critically evaluate the status of broiler farming in Kerala. Therefore, the present investigation is undertaken with the limited objective of collecting the available information with respect to broiler farming in Kerala with special reference to Trichur District in order to portray the status of broiler production in the State. With these information the possible avenues for planning future development will also be portrayed.

CHAPTER II
REVIEW OF LITERATURE

REVIEW OF LITERATURE

During the last few years broiler farming is catching the attention of poultry farmers in Kerala. Planned development is an essential pre-requisite for sustained progress of this sector in the State. Information on the intake frequency, type of housing and management and marketing strategies adopted by farmers in the State of Kerala is practically not available. The present review therefore attempts to project information that has been collected by researchers in other parts of India, so that it can be used as base line information for interpreting data now collected.

A survey conducted on poultry rearing in Trichur-Saluk revealed that 68.13 per cent of households reared chickens for supplementary income (Sureshnan and Pushkaran, 1977).

Bandari (1984) stated that the rapid growth of broiler industry was very healthy and this industry would continue to grow atleast 15 to 20 per cent every year. Rapid growth of the industry in a small span of time was attributed to many factors working together e.g. wide spread adoption of modern methods, incorporation of agro-industrial byproducts in broiler rations to reduce feed cost, better returns as compared from other avenues in agriculture and this has enticed the urban entrepreneurs to take up broiler farming as an industry.

The allocation of funds to poultry development during various Five Year Plans reveals that, fund allotment which

was Rs.23 million during the Second Five Year Plan (1956 to 1960) increased to Rs.355 million during Fifth Five Year Plan (1974 to 1978) and further increased to Rs.692 million during the Seventh Five Year Plan (1985 to 1990)(Anon., 1986).

2.1. Housing and management

Irrespective of the system of housing, investment per bird was found to decrease as flock size increased (Davis and Mann, 1963).

Sreed (1971) found that corrugated asphaltic sheets for poultry sheds reduced heat radiation in summer than the other materials like cement sheets, galvanised iron sheets and Mangalore tiles.

Indian Standard Institution (1972) recommended the code of procedure for poultry house with regard to its location, orientation and roofing materials. According to this the poultry house should be oriented so as to avoid excessive solar heat and heavy draft. They recommended the use of asbestos cement sheets, aluminium sheets, galvanised iron sheets, asphalt light roofing, tiles and thatch as roofing materials.

Gopalakrishnan et al. (1977) reared 300 day-old 'Starbro' brand of commercial hybrid chicks under deep litter system upto eight weeks of age. The average hatch weight was 37.82g and eight week body weight was 1390g. The mortality percentage was 2 to 3 and feed efficiency was 1:2.32.

Hadkarni et al. (1979) after analysing the data collected from 130 commercial layer farms in Punjab, opined that commercial farms in rural areas incurred higher cost of maintenance and production than those in the urban areas due to lack of better technical knowhow for efficient farm management. They also pointed out that the farmers of the co-operative societies incurred less cost than the individual farmers because the co-operative farmers obtained inputs at cheaper rates and also got advice and guidance of the extension services organised by the Government.

Nashain et al. (1979) reported that the number of days required to reach 3.50 lb live body weight was 74 during 1952 and it was only 49 days during 1964. The pounds of feed required for each pound of gain was 3.13 during 1952 and only 1.87 during 1964. This was possible due to improved managerial practices and research development in the areas of nutrition and breeding.

Punia et al. (1981) conducted an empirical study and enumerated the problems among 29 farmers in the Rewari region of Haryana. The number of respondents to each problem was recorded, and it was nil for high cost of chicks, 26 for lack of finance, 24 for costly feed, 19 for heavy risk, 14 for marketing problems, nil for uneconomic, 17 for non-availability of veterinary facilities and four for problems of management.

Singh and Singh (1981) suggested that an ideal broiler should attain 1200g body weight at eight weeks of age with a

feed conversion efficiency of 2.5 and mortality should not exceed 2 to 3 per cent upto this age.

Al-Massan *et al.* (1982) demonstrated that increasing stocking density by reducing the floor area by 0.2 ft² per broiler, from the bench mark densities, would result in at least \$ 0.01 per kg increase in returns of live meat produced and large savings in construction costs. They suggested an average floor space of 0.8 ft² per broiler.

Kothandaraman and Narahari (1982) opined that broiler chick might be reared on floor and provided with one sq. foot per bird. Either all-in-all-out or weekly or fortnightly systems could be adopted depending on market requirement. The authors suggested selling of males and other well grown birds when they were seven weeks of age. There must be at least one week interval between batches for cleaning and disinfection. Feed efficiency was reported to be 2.4 and mortality upto eight weeks was four per cent.

It was reported that among the different systems of housing for layers and broilers, the deep litter system was most suitable for a well organized farm from the economic point of view (Sarma and Saharia, 1983).

Rosario (1983) stated that width of broiler house should not exceed 30 feet in any case and in temperate areas the height from the foundation to roof should be 8 to 10 ft at the eaves with central height of 14 to 15 ft. He also suggested that gable roof type was advisable with an overhand of

3 to 4 feet and all-in-all-out system of rearing of broilers being preferred.

Sekar (1983) in his studies on broiler farming in and around Madras city reported that, of the 93 Broiler farms visited, 12 were of major occupation, four were as secondary occupation, two were mixed farming along with other agricultural enterprises and six were as backyard poultry keeping. The remaining 69 broiler farmers were introduced through farmers development scheme of Tamil Nadu Poultry Development Corporation (TAPDC). Ninetyone farms followed the Deep Litter system and two reared in cages. Ninetyone farms had concrete cement flooring, one had earthen flooring and one with cuddapah slab flooring. All the farms had side brick walls raised upto a height ranging from half to two ft from the floor, with pillar to support roof structure. Roofing materials used were Mangalore tiles and Asbestos in two farms each, Light roof in 29 farms, Thatch in 57 farms and Reinforced Cement Concrete in three farms. The commercial strains used were Gamrat (60.21%), Cobb (30.10%), Arbor Acres (5.37%), Hybro, Koyatona and Hubbard one per cent each. Paddy husk was found to be the most commonly used litter material. The common disease reported were Coccidiosis, Pullorum, Coryza and Marek's. Heat stroke and Leg weakness were also reported. Mortality rate was lower in larger farms (4.28%) whereas in smaller group it was 7.75 per cent and in medium group 4.40 per cent.

Sharma et al. (1983) found that body weight at eight weeks

in four broiler strains ranged from 926.00 to 1024.90g in males and 735.40 to 668.30g in females.

Prasad *et al.* (1984) reported the effect of three types of floor house viz. deep litter, slats and cages. Lower floor space allowance in each housing system gave better performance than higher allowance. Body weight gain or mortality were not related to any of the test variables studied.

Choudary (1985) opined that proper management had a wide range scope for maximising profits. He suggested asbestos roofing as more strong and economic. The width of house should not be more than 30 ft. According to him a width of 20 to 22 ft was ideal with an overhang of three ft and the floor level of the house from the ground level should be at least one foot up.

Nitra (1985) stated that in the conventional open housing system house width of more than nine meter might cause serious ventilation problems.

Sharma and Gangwar (1985) in their experiment with broilers found that the highest growth rate occurred at a temperature of $27.30 \pm 1.29^\circ$ to $30.00 \pm 1.59^\circ\text{C}$ in May to July and at $26.28 \pm 0.68^\circ\text{C}$ to $31.93 \pm 0.34^\circ\text{C}$ in July to September. It was also found that cooling methods in hot weather directly reflected on the efficacy of broilers in their gain in body weight and feed utilization in both periods.

Kumar (1986) opined that poor ventilation in poultry house leads to accumulation of moisture, ammonia and carbon dioxide and caused airsacculitis and respiratory disorders.

Rosario (1986) suggested that a FCR of 2.1:1 is attainable with good breed, feed and management. Body weight at eighth weeks of broiler found to be 1.75 kg with feed consumption of 4.03 kg. The author recommended a floor space of 1.25 sq.ft per bird after fourth weeks of age.

Sharma et al. (1986) conducted experiments in broiler chicks subjecting them to no-cooling (control), evaporative cooling, fogging and use of an exhaust fan. In the four groups body weight gain at eight weeks of age averaged 1006.50, 1230.50, 1153.50 and 1117.00 g respectively.

Tyagi (1986) reported that live weight for male and female broilers averaged from 1.38 and 1.46 kg respectively with average dressing percentage of 78.76 ± 3.80 and 77.94 ± 5.99 at eight weeks of age.

Choudary (1987) reported that India stood as number one country in the world as far as availability of commercial chicks of widest range. The author opined that chicken production depended primarily on the availability of quality inputs which included, identification of the farmer/beneficiary, credit/loans for initial investment and operational investment, training to rural youth, quality stock, balanced feed, health coverage, marketing and extension service.

Narahari (1987) stated that rapid development occurred in broiler production only from 1962 onwards. The market age (days), market weight (kg), feed efficiency and the livability (%) were 49.00, 1.65, 2.10 and 95.00 respectively in 1986 whereas in 1962, these were 84.00, 1.40, 3.50 and 95.30 respectively.

Ranappa (1987) opined that the best way to select a suitable hybrid chick was to go by All India Random Sample Broiler Test performance results. He suggested that the width of the poultry house should not exceed 9.2 metre (30 ft) in order to have proper ventilation.

Rankumar (1987) reported that the major reason for non-adoption of some improved Animal Husbandry Practice among dairymen is due to inadequate veterinary service.

Reddy (1987) stated that poultry shed with width of 18 to 20 ft was most preferred for good ventilation and a side wall height of 10 ft. All-in-all-out system was more suitable.

Rozario (1987) suggested that the most strongly recommended programme for broiler rearing was the all-in-all-out system. The width of the shed should be around 25 ft and never more than 30 ft. The height from floor to eaves could be around eight ft. In high temperate areas, the height should be 10 ft, with a central height of 14 to 15 ft was advisable. According to him east-west direction must be followed. Cable roofing with asbestos, light roofing or tiles depending on

the budget and size of the investment should be preferred. A roof overhang of 3 to 4 ft and a side wall of 3.5 ft might be built to serve as wind breaker. The mortality rate permissible was two per cent. Body weight must be 1.5 kg at seven weeks of age and feed conversion ratio 2.2:1.

Sarker (1987) pointed out that poultry house should be oriented east-west with an overhang of three feet to cut direct sun rays and rain fall into the house. A floor space of 1.5 sq. ft should be provided to broilers during hot weather. The broiler house should be constructed with the largest dimension in east to west direction and preferably with tall trees all round.

Singh *et al.* (1987) had made a field study in two units of broilers in Haryana and reported that the mortality rate of unit one and two averaged 10 and five per cent respectively upto eighth weeks of age.

Singh (1988) suggested east-west orientation for poultry shed and in general 0.9 to 1.0 sq.ft of floor space per broiler was required.

2.2. Feeding

Saxena and Singh (1978) reported that broilers fed on medium and high protein diets gave more profits than those fed on low protein diets.

Ahmed (1977) conducted a study on broiler raising in agroclimatic condition of Vidarbha (Maharashtra State) and

reported that a chick from day old consumed 4012g feed to attain 1306g live weight giving a feed gain ratio of 3.21.

Rogers (1980) examined the ways in which large poultry units had offset feed and labour costs. According to him, the modern integrated units that were operated according to economics of sale, increased in production and responded to every research advancement and improved their feed-to-gain and other economic measures.

Shukla (1982) stated that feed cost for poultry production was 65 to 70 per cent of the total cost and it was better to formulate the feed with locally available feed ingredients. He also opined that a least cost ration was always economical.

Rosario (1983) opined that the Feed Conversion Ratio of 2:1 to 2.2:1 was excellent and economical. Mortality rate within two per cent was indicated as desirable and the weight at eight weeks of age must be 1.5 kg.

Cekar (1983) reported that out of 93 broiler farms in and around Madras city, 69 farms used TAPCO feed, 14 farms Godrej feed, three farms Mysore feed and seven farms used own mixed feed.

Rahmathulla *et al.* (1984) found that average weight per broiler was 1.74 kg at eight weeks of age with feed intake of 4.25 kg and feed efficiency was 2.44.

Babu *et al.* (1986) reported that a diet containing 23.00 per cent protein and 2656 Kcal ME per kg or 24.00 per cent

protein and 2750 Kcal ME per kg would earn a profit per cent of 35.6 and 38.60 for seven week and 37.40 and 39.50 for eight weeks of age.

Kalitha *et al.* (1986) conducted investigation in the broiler strain URI and UM2 and reported that UM2 males had mean body weight of $883.78 \pm 6.47g$ and $1358.54 \pm 6.47g$ at six and eight weeks of age respectively as against $877.36 \pm 5.52g$ and $1327.94 \pm 7.55g$ in the URI male at the corresponding age. The mean body weight of UM2 female was $792.09 \pm 5.33g$ and $1150.35 \pm 6.74g$ at six and eight weeks of age respectively as against $761.02 \pm 4.20g$ and $1114.67 \pm 5.30g$ in the URI female at the same age.

Lance (1986) studied broiler production in Georgia during 1983 and reported that feed conversion rates varied by 0.1 kg or less of feed per kg of body weight, from February to September 1983. Production efficiency was more adversely affected in Georgia by winter temperature.

Singh *et al.* (1987) conducted trial studies on the economics and performance of broiler of two units under field condition and reported that weight gain (g) feed consumption (g) and conversion ratio averaged 1325, 3333 and 2.72 respectively for unit one and for second unit these were 898, 2501 and 2.50 respectively.

Sen (1987) stated that a school of poultry nutritionists advocated a 'Gradual change' system of feeding broilers as follows (1) 0 to 3 weeks complete broiler starter, (2) 4th week

75 per cent broiler starter and 25 per cent finisher, (3) 3th week, 50 per cent each of starter and finisher, (4) 5th week, 25 per cent starter and 75 per cent finisher and (5) 7th week till disposal 100 per cent broiler finisher ration.

Greenivasalaiah (1987) stated that the live weight per broiler at eight weeks of age was 1.8 kg and feed conversion ratio ranged from 2.00 to 2.40.

Vohra and Ernest (1987) in their study obtained a live weight of 2.290 kg with a feed intake of 4.95 kg at 56 days of age in broilers. At 42 and 49 days of age the body weights were found to be 1.56 and 1.93 kg respectively with a feed intake of 2.85 and 2.86 kg respectively.

2.3. Costs of production

In an attempt to study the input-output ratio structure of seven poultry farms in Ludhiana, Kahlon and Deivedi (1969) observed that the per unit cost declined as the size of the flock increased.

Singh (1975) worked in four groups of layer and reported that all costs were found decreasing as the size of the poultry unit has increased. The higher costs were associated with smaller size units and lower costs were associated with larger groups.

Singh and Rai (1976) in a comparative study of cost and return from egg and broiler production found that broiler production was more remunerative than egg production. While

working out the cost of broiler production during 1979 the authors reported that the percentage contribution of fixed cost to the total cost was 9.79 per cent, whereas variable cost was 90.21 per cent of the total cost of raising a broiler.

Ahmed (1977) conducted a study on broiler economics and reported that the variable cost and total cost of production of each bird worked out to Rs.7.33 and Rs.8.40 respectively.

Gopalakrishnan et al. (1977) reported that the total cost of production of broiler worked out to be Rs.0.96 per broiler in eight weeks of age.

Chhikara and ^{Subag} (1980) suggested that Government should provide the necessary input supplies at subsidised rates to farmers, and to create for the poultry enterprise the necessary infrastructural facilities for which the State Government should take active part in educating farmers.

Hunter (1980) while discussing about Australian broiler industry, stated that lower cost of broiler production had been achieved through more intensive production practices and rapid adoption of technological improvement. Factors contributing to this had been the specialisation of function and integration of production stages, better genetic stock, improved disease control methods, high stocking densities and improved feed conversion ratio.

Karanjkar and Soni (1980) studied the input output relationship of poultry units in Jabalpur city and concluded that

net profit per broiler was highest in large size group and lowest in smaller size group. Labour earning too increased in the same proportion.

The total cost per bird at eight week of age was reported to be Rs.9.37 which included the cost of chick (24.12%), feed (42.69%), electricity (3.42%), labour (6.51%), Litter (0.43%), medicine (1.28%), depreciation on building (4.91%), depreciation on equipment (0.96%) and interest on investment (15.69%) (Agarwal *et al.*, 1981).

Kothandaraman and Narahari (1982) made an attempt to work out the cost of production of broiler and concluded that feed cost was the major item of expenditure (53%), followed by chick cost (29%), health cover (6%), housing and equipment (5%), electricity and water charges (4%), labour charge (2%).

Rosario (1963) reported that the highest cost item in broiler production was feed cost (57.33%), followed by chick cost (27%), labour cost (3.20%), medicines (2.53%), electricity (1.27%) and maintenance (0.64%).

Sekar (1983) conducted a study on broiler farms in and around Madras city and reported costs of production per bird and its percentage in three groups viz., small, medium and large as follows:

	Rs (%)	Rs (%)	Rs (%)
Depreciation of building	0.31(1.60)	0.29(1.90)	0.38(2.36)
Depreciation of equipments	0.03(0.19)	0.04(0.26)	0.05(0.34)
Permanent family labour	1.00(6.60)	0.36(2.36)	0.29(1.90)

	Rs(%)	Rs(%)	Rs(%)
Interest on fixed capital	0.04(0.26)	0.09(3.53)	0.16(0.93)
Rental value of owned land	0.11(0.70)	0.37(2.43)	0.20(1.31)
Total fixed cost	1.49(9.53)	1.15(7.54)	1.04(6.83)
Chick cost	3.56(22.78)	4.07(26.71)	4.18(27.35)
Feed cost	8.65(55.34)	8.81(57.81)	8.71(57.00)
Litter cost	0.12(0.77)	0.03(0.33)	0.08(0.52)
Electricity charges	0.38(2.43)	0.21(1.36)	0.33(2.16)
Medicine and veterinary charges	0.43(2.75)	0.54(3.54)	0.47(3.07)
Insurance charges	0.06(0.38)	-	-
Hired labour	0.50(3.20)	-	0.04(0.26)
Repair charges of building and equipments	0.15(0.96)	0.11(0.72)	0.13(0.85)
Interest on working capital	0.29(1.86)	0.30(1.97)	0.30(1.96)
Total variable costs	14.14(90.47)	14.09(92.46)	14.24(93.77)
Grand total	15.63(100)	15.24(100)	15.28(100)

Talukder *et al.* (1983) in their studies on investment pattern of input-output ratio of different flock size groups of poultry farms in Secunderabad and Hyderabad, found that the average investment per farm increased with an increase in farm size. The large size farms showed comparatively high input-output ratio as against the small and medium size groups with high margin between small and medium size and marginal between medium and large size groups. They also stated that labour cost in a poultry farm decreased with an increase in farm size.

Prabhakaran and Natarajan (1984) conducted a study on the economic performance of eight types of broiler strains reared at Poultry Research Station, Madras and observed a total variable cost of 83.19 per cent which included the costs of chick (16.21%), feed (65.28%), labour (2.31%) and litter (0.93%). The fixed cost was found to be 11.61 per cent.

Prakash et al. (1984) while discussing growth and development of Indian poultry industry during last two decades, made an attempt to forecast egg and meat production upto 1990. He indicated that while input costs had moved up, prices of the products remained stagnant.

Rahmathulla et al. (1984) studied on the profitability in broiler farming and reported that the variable cost worked out to be; chick cost (22.60%), litter (1.99%), feed (65.21%), medicine (4.46%), electricity (1.40%) and labour for 56 days (4.33%).

Patil (1985) studied the economics of broiler production in India and reported that the variable and fixed costs were 92 and eight per cent respectively of the total costs. The cost of feed (43.93%), was the major item followed by chick cost (27.36%), depreciation on buildings and equipments (4.69%) and miscellaneous costs i.e., electricity, medicine, litter etc. (8.89%). The benefit cost ratio, broiler feed price ratio and cost of production per kg were found to be 1:1.12, 1:2.3 and Rs.12.42 respectively.

A net profit of Rs.3.25 per broiler was reported and percentage cost of production included chicks (20.50%), feed (55.65%), litter, medicine and labour (8.35%), depreciation on building (2.14%), depreciation on equipment (0.51%), interest on working capital (3.42%) and insurance (1.43%) (Anon., 1986).

Arysov and Kaseros (1986) analysed 47 large scale broiler production units in the Ukrainian and reported that farm productivity and profitability were hardly influenced by equipment, slightly influenced by expenditure on feed but much by utilization of available labour force and capital. It was suggested that the organizational changes would improve the work flow and lead to better farm results.

Banerjee (1986) studied the cost per broiler, cost benefit ratio and percentage of profit over expenditure and found to be rupees eight, 1:1.54 and 54.34 respectively. The costs included feed (42.74%), chick (27.14%), medicine and vaccine (3.39%), labour (16.98%) and miscellaneous (6.78%). Depreciation on building and equipment were calculated as five per cent and 20 per cent respectively.

Rajamanickam (1986) studied resource productivity in layers in Pondichery State and reported that there was a declining trend in proportion of capital investment as the farm size increased and profitability was higher in larger farms due to operational efficiency.

Rosario (1986) opined that the important parameters of

broiler economics were Feed Conversion Ratio, feed-cost per kg of broiler produced, performance efficiency ratio, livability percentage, average weight per bird at sale and average age of birds at sale. He reported that the major cost items were feed (59%) and chick (29%).

Rasaria (1987) while discussing about project economics of 1000 broiler unit stated that the major cost items were feed (53.37%), chick (32.35%), medicine (2.70%), labour (3.45%), power and overhead (2.77%) and interest on working capital (4.59%).

2.3.1. Fixed costs.

Mathur and Reddy (1970) worked out depreciation on building and equipment at the rate of five per cent and 20 per cent respectively.

Gopalakrishnan *et al.* (1977) reported that the fixed cost for broiler production was 12.44 per cent. This included depreciation on building and equipment (6.55%) and interest on fixed cost (2.03%).

Rao *et al.* (1979) included depreciation on buildings (2.7%), equipment (1.6%) and interest on fixed capital (3.1%) under fixed costs.

Prabakaran and Sivassivam (1985) calculated the fixed cost at the rate of Rs.1.05 (6.97%), 1.26 (7.90%) and 1.34 (8.67%) per bird facility respectively for small, medium and large sized broiler farms. The depreciation on building was

Rs.0.30 (2.52%), 0.35 (2.19%) and 0.34 (2.20%) and depreciation on equipment was 0.04 (0.27%), 0.05 (0.30%) and 0.06 (0.52%) respectively for small, medium and large groups.

Banerjee (1986) reported that depreciation on the building and equipments were five and 20 per cent respectively.

2.3.2. Operational costs.

Gopalakrishnan et al. (1977) reported that the variable cost for broiler production was 87.50 per cent which included chick cost (10.50%), feed cost (46.41%), labour cost (4.67%), electricity charges (1.32%), litter charges (0.64%), medicine (1.19%) and interest on variable cost (2.63%).

Rao et al. (1979) in their study on costs and returns of poultry farming around Hyderabad found that the investment showed a direct relationship with farm size and feed accounted for the highest expenditure item in the total cost of production (57.0%). Other variable costs included chick cost (23.3%), medicine (2.2%), labour (3.6%), miscellaneous (2.0%) and interest on working capital (5.5%).

Prabakaran and Sivaselvan (1985) in their study to analyse the costs and returns among different size groups in broiler farms in Madras city during 1983-84 reported that the variable costs were Rs.14.02 (93.03%), 14.70 (92.10%) and 14.12 (91.33%) respectively for small, medium and large groups of farms. The major cost item included feed cost 8.67 (57.53%),

0.84 (55.51%) and 0.26 (53.56%) and chick cost was 4.12 (27.34%), 4.20 (20.82%) and 4.35 (20.13%) respectively for small, medium and large groups of broiler flocks.

The percentage of variable costs for the broiler production for feed, day old chicks, litter and medicine, labour and electricity were reported to be 47.62, 26.90, 1.95, 7.26 and 3.66 respectively giving a total variable cost of 87.65 and fixed cost of 12.35 per cent (Singh, 1985).

2.4. Returns

Mathur and Reddy (1970) and Maurice (1970) reported that the average net profit per broiler was Rs.1.15 (20.80%) and 1.27 (22.67%) respectively.

The First Random Sample Test for broilers at Bangalore (Anon., 1972) revealed that the average gross profit over feed and chick cost in eight weeks of rearing ranged between Rs.0.49 (14.20%) to 1.69 (41.50%).

Ahmad (1977) reported that the gross and net profits per broiler were Rs.3.12 and 2.05 respectively. The percentage margin of profit over total cost was found to be 24.40.

Allison *et al.* (1976) developed broiler profit maximising models over feed costs. The optimum selling weight was determined at 1.724 kilogram live weight. The analysis suggested that if finishing weight element varied, then the system of weight premiums or penalties which varied by level of feed ingredient price or selling price of the bird should be investigated.

Kitsopanidis *et al.* (1981) analysed data collected from 260 poultry meat farms in 50 villages in Greece and concluded that poultry meat farming could be profitable both as family farms in villages and as large business supplying cities. The success of either type of operation depended on the timely provision of healthy chicks and good quality, cheap feed and timely marketing of broilers. They suggested that this could be achieved by an institution which controlled demand and supply of poultry meat.

Chandra *et al.* (1982) studied economics of 50 commercial poultry farms in Ajmer city of Rajasthan and reported that the commercial farms should maintain atleast 1500 birds or more in order to obtain the advantage of economic efficiency. The return could be increased by maintaining superior quality birds and adopting modern scientific management practices.

Kothandaraman and Narahari (1982) worked on economics of broiler production and reported that 98 per cent of the receipt was by sale of broilers and the remaining two per cent was by sale of manure and empty gunny bags. The authors concluded that out of the total receipts, 84.34 per cent accounted for the cost of broiler production and remaining 13.66 per cent the net profit. The authors opined that profit in a broiler farm depended on the feed cost, market price of broiler, feed efficiency and mortality.

Rosario (1983) reported that the percentage of profit over expenditure of broiler was 15.28 and profit per broiler was Rs.2.45.

Gokar (1983) conducted a study on broiler in Madras city and reported that the returns/bird in three groups viz., small, medium and large farms were as follows:

	Rs (%)	Rs (%)	Rs (%)
Sale of broiler	15.37(92.53)	16.46(99.28)	19.94(99.16)
Manure	0.10(0.61)	0.62(0.12)	0.09(0.42)
Gunny	0.11(0.64)	0.19(0.63)	0.08(0.42)
Insurance claimed	1.03(6.20)	-	-
Total	16.61(100)	16.58(100)	19.10(100)

The author also reported the net profit per bird was rupees 0.98, 1.34 and 2.75 respectively in small, medium and large groups of farms.

Prabakaran and Natarajan (1984) found that the total cost of production, gross return, net return and input-output ratio were Rs.8.64, 9.31, 0.67 and 1:1.08 respectively.

Rahmatulla *et al.* (1984) reported that the return from sale of broilers accounted 97.23 per cent and from gunny bags (0.83%) and manure (1.64%). The net profit per broiler was Rs.3.75.

Reece and Lott (1984) developed a procedure for calculating net return on a daily basis from 35 to 55 days of age. The profit or loss for producing broiler chicks of any given age or weight was arrived at by subtracting production costs from selling price of dressed bird.

Pandy and Tewari (1985) conducted a study to assess the

profitability of commercial eggs and broiler production, to determine the minimum economic size of a commercial layer and broiler unit and observed that the broiler unit of 75 birds appeared to be financially feasible.

Patil (1985) reported a net return of Rs.0.12 per rupee from a broiler. The author suggested that the profit margin of broiler production depended on maximisation of its production or minimisation of its cost of production.

Prabaharan and Sivaselvan (1985) calculated the return among size groups in broiler farms in Madras and reported that receipt from sale of broiler was Rs.15.75 (98.62%), 17.16 (98.79%) and 19.23 (98.96%) respectively for small, medium and large group of farms. The net return per broiler was Rs.0.90, 1.41 and 4.32 respectively for small, medium and large groups of farms. They also noted that large farms performed well in comparison with small and medium farms.

Sinha (1985) stated that the initial investment on broiler worked out to about Rs.12.00 per chicken which brought a net income of two or three rupees per broiler within a period of two to three months.

Banerjee (1986) reported that the sale of broiler constituted 98.90 per cent and of manure 1.10 per cent of income and the net profit was Rs.8.00 per bird.

Rosario (1987) in a project report stated that the return per broiler Rs.4.25 which worked out to 22.90 per cent of total production cost.

Singh *et al.* (1987) reported that the net return per broiler chick in one unit was Rs.2.80 while in the second unit the figure was Rs.2.74.

Greenivassiah (1987) reported that gross income, gross profit and net profit per bird were Rs.28.29, Rs.9.00 to 10.00 and Rs.7.50 to 8.50 respectively.

2.5. Marketing

Huang and Raunekar (1978) reported that the consumption patterns of the two markets studied differed with respect to their response to the price of substitutes and population characteristics.

Sekar (1983) reported that the selling price of broiler on live weight basis in and around Madras city was Rs.12.19, 11.83 and 13.31 per kg for small, medium and large farm size groups. In large group five out of seven farms had their own retail selling shop and hence selling price was maximum in large groups.

Rao (1984) stated that the main marketing channels were (1) producer-wholesaler-retailer to consumer, (2) Producer to collector to retailer to consumer, (3) producer to federation/co-operatives to consumer and (4) producer to consumer. The author reported that 75.80 per cent of egg marketing was through first two channels.

Rao (1985) opined that a successful marketing depended upon availability of sufficient cold storage capacity, quick

and accurate communication regarding supply and demand situation in various centres and large scale exports. The author reported that, in broiler marketing the problems were less than in egg marketing.

Thulasi et al. (1988) conducted a study on marketing channels and price spread for broiler chicken in Madras Corporation area and found that five marketing channels were operated.

1. Producer-wholesaler-retailer-consumer
2. Producer-retailer-consumer
3. Producer-chainstore-consumer
4. Producer-consumer
5. Producer-commission agent-wholesaler-retailer-consumer.

The first one was found to be common (74.07%) followed by second (13.63%), third (6.93%) and fourth (4.60%) in that order. The fifth channel was found to be not popular. The authors also observed that in general live birds were preferred over dressed chicken in Madras City.

CHAPTER III
MATERIALS AND METHODS

MATERIALS AND METHODS

The present study was taken up to assess and evaluate the status and potential of broiler production in Kerala State with special reference to Trichur District. The total broiler population in Kerala State during the year 1985 has been reported as 1.5 million which contributed to two per cent of the total broiler population in India. Eighty per cent of the broiler population in Kerala is concentrated in three pockets viz., Trivandrum, Trichur and Cullion districts (Anon., 1986). The study was carried out in Trichur because of its proximity to the Centre for Advanced Studies in Poultry Science, Kerala Agricultural University and to enable the investigator for collection of the data as per the technical programme.

3.1. Technical programme

The technical programme consisted of indepth studies among selected broiler farms for the following aspects:

1. Current status of the farm
2. Techno-economic performance and efficiency
3. Managerial and husbandry practices
4. Process of production and marketing, and
5. To identify constraints in broiler farming.

In order to obtain the details of farmers engaged in broiler production in Trichur, enquiries were made at District Animal Husbandry Headquarters and Hatcheries under

private sector. In addition, lists of farmers available at the Centre for Advanced Studies in Poultry Science were also utilised to locate the broiler farmers in and around Trichur District. After enlisting the farms, the investigator contacted the owners personally. Depending upon the current status and viability of the units 32 progressive farms were identified at random for further study. Only those farms which had an intake capacity of more than 100 chicks per crop and those farmers engaged in broiler farming on a regular basis were included in the study.

The study was undertaken in the Centre for Advanced Studies in Poultry Science and the objectives of the study were made clear to the selected farmers by mailing an informal letter from the Directorate and requesting them for the supply of required data accurately without any hesitation.

The collection of data was planned by personal interviews, direct observations and recording in the schedule prepared for the purpose.

3.2. Construction of schedules

Four schedules were prepared to carry out the technical programme envisaged in the study. The schedules were pre-tested among five farmers to find out their acceptance/response towards various points in the schedule. The actual persons involved in broiler production and marketing were contacted for scrutinising the schedule. After such preliminary testing, necessary modifications/alterations in the

schedules were finalised for further collection and recording of data. The approved schedules are presented in appendices I, II, III and IV.

Schedule I - General information consisting of details about current status of the farm and the owner

Schedule II - Poultry house and infrastructure - information pertaining to farm and infrastructure of broiler houses

Schedule III - Brooding and rearing - Managerial and Husbandry practices adopted for rearing the broiler are recorded

Schedule IV - Processing and Marketing - process of production and marketing methods are furnished.

Apart from these schedules, working sheets were maintained separately for each farm for recording parameters related to performance traits, costs and returns.

3.3. Period of study

The survey was conducted for a period of one year from April 1997 to May 1998.

3.4. Collection of data

The selected farms were visited at fortnightly intervals for collection of data. The schedule I to IV were filled by personal interview and direct observation at the time of first few visits. During the subsequent visits the parameters detailed for indepth studies were recorded. The

crop-wise performances of broilers raised and its cost and return are recorded as follows:

I. Performance traits of broilers

- a) Frequency of intake and number of chicks per crop
- b) Mortality number from day-old till marketing
- c) Number sold
- d) Total live body weight at the time of marketing
- e) Quantity of feed intake from day-old to marketing
- f) Feed conversion ratio - the quantity of feed required to produce 1 kg of broiler.

II. Cost components of broiler production

1. Fixed costs

- a) Depreciation on building - at the rate of five per cent per annum
- b) Depreciation on equipments - at the rate of 20 per cent per annum
- c) Maintenance and repairs - expenditure incurred in maintaining building and equipments every year
- d) Interest on working capital - at the rate of 11 per cent per annum.

Total fixed costs:

2. Operational costs

- a) Chick cost - the cost of one day old chick delivered at the farm

- b) Feed cost - the cost of feed delivered at the farm
- c) Litter cost - the cost of litter material used
- d) Hired labour charges - amount spent as labour charges on regular labour employed.
- e) Family labour charges - amount spent as labour charges to family members involved in the work.
- f) Medicine and vaccines cost - cost of medicines and vaccines used.
- g) Disinfection cost - cost of disinfection used in the farm
- h) Electricity charges - the charges towards the current supply
- i) Miscellaneous charges - charges spent on conveyance, delivery of birds, etc.

Total operational costs:

Total cost (1+2)

III. Gross returns (in rupees)

- a) Sales of broiler
- b) Sales of manure
- c) Sales of gunny bags

Total returns

IV. Economic indicators

- a) Gross returns (Rs)
- b) Total costs (Rs)
- c) Net returns (profit, Rs)

- d) Benefit-cost ratio - this is the proportion between gross return and total expenditure including all cost components
- e) Ratio of fixed cost to net profit
- f) Ratio of operational cost to net profit
- g) Percentage of net profit over total production costs

V. Processing and Marketing

- a) Number of broiler marketed by wholesale/retail per crop
- b) Mean selling price per kg (live weight)
- c) Number of broiler birds dressed after sale
- d) Number of birds transported to wholesaler

3.5. Analysis of Data

The data recorded were tabulated separately for individual farms. The cropwise performance of each farm was pooled and aggregated means were calculated for each parameter. These means were converted as per bird basis and per kg live weight basis for interpretation of results. The percentage distribution of individual cost items and returns were also tabulated. The overall performance of broiler production in Trichur District was assessed by calculating mean values of each parameter.

The whole data obtained from 32 farms were classified for interpretation of results as follows:

1. Periodicity of intake

- a) Weekly
- b) Fortnightly
- c) Monthly

2. Farm grouping

Based on the average volume of intake of chicks per crop, farms were classified into three group size, viz.,

<u>Sl.No.</u>	<u>Size group</u>	<u>Number of chicks/batch</u>
1	Small	100 to 250
2	Medium	251 to 500
3	Large	Above 501

3. Labour efficiency

According to the pattern of labour engagement, farms were classified into three for comparisons.

1. Farms with hired labour alone
2. Farms with family labour alone
3. Farms with hired as well as family labour.

4. Net profit basis

Based on net profit, farms were classified into three categories:

1. High profit - profit more than Rs.6.00 per bird sold
2. Medium profit - profit between Rs.2.00 to Rs.6.00 per bird sold
3. Low profit - profit less than Rs.2.00 per bird sold

8. Seasonality - data pertaining to seasons was collected from four farms only since they maintained data separately.

- a) Summer - February to May
- b) Rainy - June to September
- c) Cold - October to January

3.6. Statistical analysis

The statistical analysis of the data was carried out following the methods outlined by Snedecor and Cochran (1967).

CHAPTER IV
RESULTS

RESULTS

The results of the study on broiler farms carried out in Trichur District which is considered as one of the leading districts in the State is presented in this chapter.

For better understanding, the analysed data are grouped under three broad sections depicting (1) General characteristics of the broiler units, (2) Technical parameters relating to feeding and rearing efficiencies and (3) Economic analysis relating to cost income aspects of broiler business.

4.1. General characteristics

In this section the basic information pertaining to the owner, managerial practices adopted and marketing strategies followed are presented in tables 1, 2 and 3 respectively.

4.1.1. Basic informations.

The basic informations collected are classified under the seven classes and shown in table 1.

4.1.1(1). Ownership status.

Most of the farms i.e. 87.50 per cent were owned by individuals. Partnership concern and co-operative sector constituted only 9.16 and 3.12 per cent respectively. The ownership structure is, therefore, largely private proprietorship. Co-operative and partnership ventures have their own limitations in as much as more individuals are involved in decision making, resulting in limited assumption of responsibility.

4.1.1(2). Educational status of owner(s).

All the owners were found to be literate and 10.75 per cent among them were found to be graduates. Twentyfive per cent had studied upto pre-degree after school final stage. The rest 54.25 per cent had completed secondary school leaving certificate (SSLC) with no college education. In Kerala as a whole, literacy and education are much higher than elsewhere in the country. With the very acute problem of educated unemployed, broiler farming can be a profitable venture for self-employment of such persons.

4.1.1(3). Motivation for starting broiler farm.

The owners of 75.00 per cent opined that they have taken up broiler production as a means of self-employment. There are 18.75 per cent of farms functioning as a supplementary source of income. It was interesting to note that 6.25 per cent units took broiler farming as a hobby. It is possible that this last category also wanted to supplement their income. It can be concluded that broiler farming is primarily commercial in nature.

4.1.1(4). Registration of units.

Only nine farms among the 32 are found to be registered with small scale industries (SSI), three with Panchayath and a large number (20 farms) had not registered with any statutory bodies. The percentage distributions are 28.12 registered with SSI, 9.38 with Panchayath and 62.50 without registration. Registration of units may be advantageous

for seeking financial assistance. But majority of units seems to have not got themselves registered, whatever the reason might be, although large number of them appear to have availed institutional finance as shown in sub section 1(5).

4.1.1(5). Source of finance.

Bank loans were the source of finance for 78.12 per cent farms while only 21.88 per cent used their own financial resources. Apparently, either bank do not insist on units being registered for extending loans or the response in the previous sub-section regarding registration does not reveal the correct situation.

4.1.1(6). Source of expert advice.

The advice of experts from veterinary college are utilised by 50.00 per cent farmers for getting technical assistance, while 43.75 per cent had no definite source of expert advice. A meagre 6.25 per cent of the farms are found seeking advice from the agent delivering chicks to them. The location of the Veterinary College in Trichur gives physical proximity to the units in and around Trichur. But this need not be the situation in other districts, although it is well known that in problem cases the assistance of experts from the College is sought, irrespective of the distance.

4.1.1(7). Mode of delivery of chicks.

Taking delivery of chicks from railway station was resorted to by 65.62 per cent farms and to 34.38 per cent of

farms chicks were delivered at their door. The relative advantage of these two methods are not very clear, since gross cost per chick is almost the same. However delivery of chicks through rail may give the owners a wider choice of selection of strains from far away hatcheries.

4.1.2. Management practices adopted.

The data collected in respect of important managerial practices adopted by broiler farms are presented in 15 sub-sections of table 2.

4.1.2(1). Site of farm.

Most of the farms are found to be constructed on garden land. Such land having satisfactory drainage were found quite suitable for broiler housing. Other locations were relatively unimportant. It can be said that location of the broiler units was quite ideal.

4.1.2(2). Type of housing.

Most of the farms (81.25%) were constructed as permanent pucca poultry houses while 15.62 per cent as semi-permanent building and only one farm (3.13%) was operating in temporary structure.

4.1.2(3). Type of roofing.

It is observed that gable roof type was common among 96.87 per cent farms and only one farm (3.13%) had double storied concrete roof.

Table 1. Basic information on the broiler farms studied (n=32)

Particulars	Number of farms	Per cent
1.1. Ownership status		
Individual	28	87.50
Partnership	3	9.38
Co-operative	1	3.12
1.2. Educational status of individual owner		
Upto SSLC	18	56.25
Pre-Degree	8	25.00
Graduate	6	18.75
1.3. Motivation for starting broiler unit		
Self-employment	24	75.00
Side income	6	18.75
Hobby	2	6.25
1.4. Registration of units		
Small Scale Industries	9	28.12
Panchayath	3	9.38
Not registered	20	62.50
1.5. Source of finance		
Bank loans	25	78.12
Self	7	21.88
1.6. Source of expert advice		
Veterinary College	16	50.00
Chick agent	2	6.25
None	14	43.75
1.7. Mode of delivery of chicks		
Door delivery	11	34.38
Railway Station	21	65.62

4.1.2(4). Roofing materials used.

Tiles are being used in 62.50 per cent of the farms, light roof in 19.75 per cent, asbestos in 6.25 per cent, thatch in 9.37 per cent and concrete roof in 9.13 per cent cases. All these materials were found to be suitable for broiler sheds.

4.1.2(5). Electricity supply.

All the farms had electric supply. There was no problem in providing heat and light during brooding period. But no farm had used standby generator during power cut.

4.1.2(6). Ventilation arrangements.

Ventilation as adjudged by visual condition was good in 75.00 per cent farms. There was no farm in the survey which had poor ventilation as adjudged using above score.

4.1.2(7). Distance from owners residence.

Regarding the location of farm with respect to proximity to owners residence, the majority of the owners (87.50%) had units within one kilometer of their own residence. Less than 10 per cent were located at distance between 1 and 5 km, while about three per cent was more than 5 km away from the owner's residence.

4.1.2(8). System of brooding and rearing.

The distribution of farms among those resorting to brooding and rearing in the same room and those who use

separate rooms for brooding was almost equal, the respective percentages being about 99 to 41.

4.1.2(9). Type of chick guards used.

Metallic chick guards were used in 40.62 per cent farms and self-made hard board chick guards were used in 43.75 per cent farms. Cheap materials like bamboo mat were used by 15.63 per cent farms.

4.1.2(10). Type of brooding.

Ordinary incandescent bulbs were used by 65.62 per cent farms. Even those who used infra-red bulbs (25.00%) for brooding chicks, also used incandescent bulbs. Heater with incandescent bulbs were used by 9.38 per cent farms. There was no farm in the survey which used infra-red bulb as the sole source of heat. All farms showed satisfactory results in brooding by using above methods.

4.1.2(11). Vaccination schedule.

Protective vaccination against Raniket Disease (RDT₁) was done by 93.33 per cent farms whereas 6.67 per cent farms were not resorting to any immunisation practice at all. All the chicks were reported to be protected against Marek's disease at the hatchery itself before packing and delivery.

4.1.2(12). Mode of purchase of feed.

Procurement of feed directly from the shop by themselves and transporting to their farms was resorted to by 61.50 per cent farmers whereas door delivery of the feed was enjoyed by only 37.50 per cent farmers.

Table 2. Management practices adopted (n=32)

Particulars	Number of farms	Per cent
1	2	3
2.1. Farm site		
Low lying	1	3.13
Garden land	30	93.74
Hilly area	1	3.13
2.2. Type of house		
Permanent	26	81.25
Temporary	1	3.13
Semi-permanent	5	15.62
2.3. Type of roofing		
Gable	31	96.87
Double storeyed flat	1	3.13
2.4. Roofing materials used		
Tiles	20	62.50
Light roof	4	12.73
Asbestos	2	6.25
Thatch	3	9.37
Concrete flat	1	3.13
2.5. Electricity supply		
Permanent	26	81.25
Temporary	6	18.75
2.6. Ventilation arrangements		
Good	24	75.00
Satisfactory	8	25.00
2.7. Distance from owner's residence		
Less than 1 km	26	87.50
1 to 5 km	3	9.37
Above 5 km	1	3.13

(contd.)

Table 2 contd.

1	2	3
2.8. System of brooding and rearing		
In same pens	19	59.37
In separate brooding pens	13	40.62
2.9. Type of chick guard used		
Metallic	13	40.62
Hard board	14	43.75
Wood and bamboo mats	5	15.63
2.10. Type of brooding		
Infra-red with ordinary bulb	8	25.00
Ordinary bulb alone	21	65.62
Heater with ordinary bulb	3	9.38
2.11. Vaccination details (NDP)		
Vaccination done at first week of age	30	93.33
No vaccination	2	6.67
2.12. Mode of purchase of feed		
Received at farm gate	12	37.50
Lifted from shop	20	62.50
2.13. Type of feeders used		
Linear	14	43.75
Hopper	10	31.25
Mixed type	8	25.00
2.14. Type of waterers used		
Basin with grille	30	93.75
Water fountain and basins	2	6.25
Water channel	Nil	-
2.15. Litter materials used		
Saw-dust	24	75.00
Other materials	8	25.00

4.1.2(13). Type of the feeders.

Linear type feeders were used by 43.75 per cent farms whereas feed hopper (tubular feeder) and both types were used by 31.25 and 25.00 per cent of the farms respectively. All types are, apparently satisfactory and sufficient space was seen provided for the birds in all the units.

4.1.2(14.). Type of waterers.

For watering the birds perimeter waterers were not used in any farms whereas most of farms, 93.75 per cent, used plastic basin with grills and only 6.25 per cent farms used water fountain for watering the birds.

4.1.2(15). Litter materials.

It was observed that saw dust was the common litter material used among 75.00 per cent of farms. Other materials like wood shavings, paddy husk etc. are used by only 25.00 per cent farms. All these were seen to be good as litter material.

4.1.3. Marketing practices.

Various marketing practices adopted by the farmers are presented in sub-section 3.1 to 3.7 of table 3.

4.1.3(1). Age at marketing.

It was observed that age at marketing preferred by 75.00 per cent of the farmers was between 7 to 9 weeks. Marketing of birds at earlier age of six weeks was resorted

to by only 25.00 per cent farmers. It was seen that the birds are attaining marketing age by about eighth weeks, which seems to be the age preferred by three-fourth of broiler producers.

4.1.3(2). Marketing channels.

None of the farms adopted cent per cent wholesale marketing of broilers. For large percentage of farms (93.75) the marketing link comprised of producer to consumer through agent with the agent being wholesaler as well as retailers. Only 6.25 per cent farms sold their birds directly to consumers, that too only partly.

4.1.3(3). Wholesale retail sale ratio.

Based on quantity of birds sold through wholesale and retail outlet it was observed that 56.25 per cent farms sold around 60 to 90 per cent of birds in wholesale. In 25.00 per cent of farms, wholesale was around 60 to 80 per cent of the total sales, while in 9.37 per cent, wholesale was between 40 to 60 per cent. Around 6.25 per cent of farms had resorted to sales almost wholly in retail. This shows that marketing by farmers is almost wholly in big lots. Perhaps the owners want to dispose each crop in one lot rather than piece meal to save on cost of maintenance for longer periods that may be required under retail sales.

4.1.3(4). Place of disposal of birds.

It could be seen from the table that sale of birds at

farm gate itself was preferred by 75.00 per cent farms whereas 25.00 per cent farms made home delivery at customer's premises in addition to farm gate sales. Thus the predominant practice was disposal right in the farm, mostly to agents (wholesalers) as observed earlier.

4.1.3(5). Dressing of birds after sale.

Generally, birds are not sold as dressed birds, as is the practice in advanced countries. But many farms do it as a service to oblige customers, by dressing birds after sales for a nominal fee. Those who did dressing used polyethylene bags as packing materials. In 87.50 per cent farms this service was provided, while 12.50 per cent farms did not extend this facility to the customers. But, on the whole, such facility was required in very limited cases only, since bulk of sales was as live birds to wholesalers.

4.1.3(6). Disposal of offals.

In majority of farms i.e., 82.14 per cent the offals were buried, while offals used as manure and for feeding pigs were resorted to by 10.72 and 7.14 per cent farmers respectively. Although dressing is on a minor scale, what little offal obtained is wasted. It is well known that offals, when well treated, can form valuable protein supplements in poultry and livestock feeds.

4.1.3(7). Availability of cold storage facility.

Most of the farms - over 90.62 per cent had no cold storage facility whereas 9.38 per cent used cold storage

Table 3. Marketing practices adopted (n=32)

Particulars	Number of farms	Per cent
3.1. Age at marketing		
7 to 9 weeks	24	75.00
6 to 9 weeks	8	25.00
3.2. Marketing channels		
Producer-agent-consumer	30	93.75
Producer-consumer	2	6.25
Wholesale (100 per cent)	Nil	-
3.3. Wholesale retail sale ratio		
Wholesale 80 to 90 per cent	18	56.25
Wholesale 60 to 80 per cent	8	25.00
Wholesale 40 to 60 per cent	3	9.37
Wholesale below 40 per cent	1	3.13
Retail alone	2	6.25
3.4. Place of disposal of birds		
Farm gate and door delivery	8	25.00
Farm gate only	24	75.00
3.5. Dressing of birds after sale		
80 to 100 per cent of retail	9	28.12
60 to 80 per cent of retail	8	25.00
40 to 60 per cent of retail	9	28.12
Below 40 per cent of retail	2	6.25
No dressing from farm	4	12.50
3.6. Disposal of offals		
Feeding to pigs	2	7.14
Using as manure	3	10.71
Buried	23	72.14
No dressing from farm	4	0.00
3.7. Availability of cold storage facilities		
Available	3	9.38
Not available	29	90.62

facility in the marketing of dressed birds. Installation of cold storage facilities require fairly huge investment which may not be justified taking into account the very minor quantum of sale of dressed birds. Not only there must be economic rationale for installing cold storage, the discerning consumers must also develop the taste and be willing to pay higher price for frozen dressed broiler.

4.2. Technical parameters

In this section data pertaining to the technical parameters collected during the study were analysed according to overall performance, seasonal effects, strength of intake, periodicity of intake, source of labour employed and magnitude of net profit and are furnished in tables 4 to 9.

4.2.1. Overall performance in the technical parameters.

The mean values of the major technical parameters relating to the broiler units as a whole surveyed in Trichur are presented in table 4.

From the table it can be seen that the average intake of chicks per crop was 330.34 ± 33.44 with the range from 101 to 1014. The average number sold per crop was 305.25 ± 32.27 . The 32 farms taken for the study had an overall mortality of 6.69 per cent. There is thus a loss of 22 birds per crop on the average due to mortality. The mean live weight per bird at the time of disposal was 1.48 ± 0.03 kg and the average feed consumed per bird sold was 3.68 kg. The

Table 4. Indicators of technical parameters of broiler farms in Trichur district

Parameters	Values
1. Total number of farms	32
2. Mean intake of birds per crop (No.)	330.34 \pm 33.42
3. Mortality (percentage)	6.69
4. Mean number sold per crop	308.25 \pm 32.27
5. Mean live body weight per bird at the time of disposal (kg)	1.48 \pm 0.02
6. Mean feed consumed per bird sold (kg)	3.68 \pm 0.06
7. Feed conversion ratio	2.49

feed required to get 1 kg live body weight worked out to be 2.49 kg.

4.2.2. Seasonal variations in the technical parameters.

The year was divided into three seasons, viz., summer, rainy and cold seasons. Each season consisted of four months as February to May (summer), June to September (rainy) and October to January (cold).

The technical parameters relating to the performance of farns during these three different seasons are presented in table 5.

From the table it can be seen that the percentage of mortality was highest in summer and almost equal in rainy and cold seasons. The respective figures are 15.00, 11.89 and 11.95 per cent during summer, rainy and cold seasons. The mean live weight per bird sold and the average quantity of feed consumed per bird sold was slightly higher in rainy and almost equal in summer and cold seasons. The corresponding figures are 1.40, 1.35 and 1.36 kg live weight per bird sold and 3.49, 3.38 and 3.37 kg feed consumed per bird sold. The feed conversion ratio was found to be almost same at 2.50, 2.49 and 2.49 kg for summer, rainy and cold seasons respectively. Thus, although birds consumed slightly more feed during rainy compared to other seasons they also put on slightly more weight maintaining the feed conversion ratio almost the same throughout the year. However, the slightly better gross weight (with slightly more feed) during rainy

Table 3. Certain technical parameters in broiler production relating to seasons

Sl. No.	Parameters	Summer (Feb-May)	Rainy (June-Sept)	Cold (Oct-Jan)
1	Mortality (Percentage)	15.00	11.83	11.93
2	Mean live body weight per bird sold (kg)	1.35	1.40	1.36
3	Mean feed consumed per bird sold (kg)	3.38	3.49	3.37
4	Feed conversion ratio	2.50	2.40	2.48
5	Mean sale price per kg live weight (Rs)	16.31	17.16	16.57

season along with low mortality are positive indications of possible seasonal influence. The sale price per kg live weight was also found to be highest during rainy months (Rs.17.16) followed by Rs.16.97 during cold seasons and Rs.16.51 during summer months. This seasonal variation in price may also be an indicator of the relative demand for broiler meat.

4.2.3. Technical parameters based on strength of intake.

The technical data were classified according to strength of intake and the results on this basis are presented in tables 6.1 and 6.2.

4.2.3(1). Distribution of farms with average intake.

Distribution of broiler farms based on strength of birds are given in table 6.1.

It is evident from table 6.1 that majority of farms could be grouped under small size (100 to 250) followed by medium (251 to 500) and large groups (501 and above), the respective percentages were 46.90, 31.20 and 21.90 respectively. The average intake of chicks was 209.33, 304.20 and 629.14 per crop in small, medium and large size farms respectively. The aggregate average size was around 330 chicks per crop.

4.2.3(2). Mortality and mean body weight.

Mortality and mean body weight at disposal of different farm size are presented in table 6.2. From table 6.2 it can be seen that the per cent mortality was highest (9.64) in

Table 6.1. Distribution of broiler farms based on strength of birds

Sl. No.	Size group	Range (Number of broilers)	Distribution of farms		Mean number of broiler/farm
			Number	%	
1	Small	100-250	15	46.90	208.33 ± 9.36
2	Medium	251-500	10	31.20	304.20 ± 22.99
3	Large	501 and above	7	21.90	629.14 ± 66.42
	Overall		32	100.00	330.34 ± 33.42

Table 6.2. Mortality pattern and mean body weight at disposal of different size groups

Sl. No.	Size group	Average number of broiler/farm	Mortality		Mean live body weight at disposal (kg)
			Number	%	
1	Small	208.33	18	8.64	1.49 ± 0.03
2	Medium	304.20	21.5	7.07	1.50 ± 0.04
3	Large	629.14	31.7	5.04	1.45 ± 0.03
	Overall	330.34 ±33.42	22.09 ±2.71	6.69 ±0.79	1.48 ± 0.02

small farms followed by 7.07 per cent in medium farm and lowest (5.04%) in large sized farm. The mean live body weight at disposal was 1.49, 1.50 and 1.49 kg per bird respectively for small, medium and large farms. The overall mortality for all the farms put together was 6.69 per cent and mean live weight at disposal was 1.48 kg per bird as mentioned in an earlier section. The declining mortality with increasing size may be an indicator of the better management but this is not well reflected by the mean body weight, where large farms are not better off than small one.

4.2.4. Technical parameters related to periodicity of intake.

Technical parameters related to the farms distributed according to the periodicity of intake is given in tables 7.1 and 7.2.

4.2.4(1). Distribution of farms with average intake.

Distribution of farms according to periodicity of intake is presented in table 7.1.

It is observed from table 7.1 that majority of the farms (63.62%) were getting chicks at fortnightly intervals followed by 31.25 per cent at weekly intervals and only one farm was receiving chicks at monthly interval. The farms with monthly intake had flock strength of over 500 followed by weekly intake with over 440 birds. The majority that formed the fortnightly intake group had only less than 300 birds. Thus, fortnightly purchase of 250 to 300 birds appeared to be more prevalent.

Table 7.1. Distribution of farms according to periodicity of intake

Sl. No.	Periodicity of intake	Distribution of farms		Average number of broiler per farm
		Number	Per cent	
1	Weekly	10	31.25	442.60 ± 86.14
2	Fortnightly	21	65.62	269.14 ± 21.00
3	Monthly	1	3.13	514
	Overall	32	100.00	330.34 ± 33.42

Table 7.2. Mortality pattern and mean body weight at disposal in farms distributed according to periodicity of intake

Sl. No.	Periodicity of intake	Average number of broiler per farm	Mortality		Mean live body weight at disposal (kg)
			Number	Per cent	
1	Weekly	442.60	31 ± 7.11	7.00	1.47 ± 0.03
2	Fortnightly	269.14	17.9 ± 1.72	6.63	1.49 ± 0.05
3	Monthly	514	21	4.09	1.49
	Overall	330.34	22.09	6.69	1.49 ± 0.02

4.2.4(2). Mortality and mean live weight.

Mortality and mean live body weight at disposal in farms distributed according to periodicity of intake is given in table 7.2.

The overall mortality of 6.69 per cent presented in table 7.2 showed that it was not influenced by periodicity of intake at weekly and fortnightly intervals. Likewise the aggregated overall mean body weight at disposal was 1.48 kg per bird which was also not influenced by periodicity of intake. The respective percentage of mortality was 7.00 in weekly and 6.68 in fortnightly and 4.09 in monthly while the mean body weight at disposal was 1.47, 1.49 and 1.49 kg in weekly, fortnightly and monthly farms.

4.2.5. Technical parameters related to labour efficiency.

Technical parameters of broiler farms distributed according to source of labour employed are presented in table 8.

Only 28.10 per cent of farms depended solely on hired labour whereas 34.40 per cent of farms used family labour. Remaining 37.50 per cent farms utilized both family labour as well as hired labour. The mortality was highest in farms depending solely on hired labour, i.e., 10.35 per cent and in these farms the mean body weight at disposal was lowest viz., 1.39 kg per bird. Although weight gain was almost same there was appreciable difference in the mortality between farms managed exclusively by family labour and those managed

Table 8. Technical parameters of broiler farms distributed according to source of labour employed

Parameters	Family labour	Family + hired labour	Hired labour
1. Number of farms	11 (34.40%)	12 (37.50%)	9 (28.10%)
2. Mortality (percentage)	6.67	4.63	10.35
3. Mean live body weight at the time of disposal (kg)	1.52	1.51	1.39

by both family and hired labour. The mortality in the former was 6.67 per cent compared to 4.62 per cent in the latter types. The mortality rate clearly shows that where there is good labour (even if hired) with adequate supervision (contribution through family labour) there is better control of diseases and management and thus lower deaths. It is also possible, that, where family labour is the sole source of labour, broiler farming is considered largely as a supplementary enterprise with less than optimum required managerial care than supervision and thus having higher death rates.

4.3.6. Technical parameters based on magnitude of net profit.

The results pertaining to the technical parameters of broiler farms distributed according to the magnitude of net profit per bird sold are presented in table 9. Majority of farms i.e., 62.50 per cent had medium profit per bird sold ranging from Rs.2.00 to 6.00 while the distribution between high profit (more than Rs.6.00 per bird sold) and low profit (less than Rs.2.00 per bird sold) was almost equal i.e. 18.75 per cent each. The mortality was highest (13.56%) and mean live weight at disposal lowest at 1.36 kg per bird in farms making low profit. In high profit making units the mortality was low (4.22%) and mean live weight was high, 1.62 kg at disposal. In the farms grouped under medium profit the mortality was 5.53 per cent and mean live weight at disposal was 1.46 kg per bird sold. These two parameters,

Table 9. Technical indicators of broiler farms distributed according to magnitude of net profit per bird sold

Parameters	High profit Rs. > 6	Medium profit Rs. 2-6	Low profit < Rs. 2
1. Number of farms	6 (18.75%)	23 (62.50%)	6 (16.75%)
2. Mortality (percentage)	4.22	8.53	13.56
3. Mean live body weight at the time of dis- posal (kg)	1.62	1.46	1.36

- Notes: 1. High performance farm indicate net profit over Rs.6.00 per bird sold
2. Medium performance farm indicate net profit between Rs.2.00 to 6.00.
3. Low performance farms indicate net profit below Rs.2.00

vis. mortality and weight gain seems to exert substantial influence over the profit margin of broiler unit.

4.3. Economic Analysis

In this section various cost components involved and returns realized in broiler production are presented. The selected economic parameters relating to the farms surveyed have been viewed on the basis of differences in overall performances, seasonal effects, strength of intake, periodicity of intake, source of labour employed and magnitude of net profit. The results are presented in tables 10 to 13.

4.3.1. Economic analysis based on overall performance.

Results of the overall performance in broiler production surveyed in 32 farms have been presented in tables 10, 13.1, 13.2 and 13.3.

4.3.1(1). Cost components of production.

The total cost of production per bird sold is presented in table 13.1.

The total cost of production of Rs.22.08 per broiler consisted of Rs.1.59 (7.21%) towards fixed cost and Rs.20.47 (92.79%) towards operational costs. On further classification of fixed cost items it can be seen from table that interest on fixed capital of 4.49 per cent constituted the highest component followed by depreciation on buildings, 1.08 per cent, depreciation on equipments 0.54 per cent and maintenance and repairs of buildings, equipments.etc. at 0.50 per cent.

It may be recalled that aisable proportion of broiler farmers had taken institutional credit on which interest is paid.

Among the various components of operational cost, feed cost dominated as the major cost item (56.26%) followed by chick cost of 29.56 per cent. The other operational cost items consisted of hired labour charges 2.27 per cent, family labour charges 2.06 per cent, medicine and vaccine cost 1.27 per cent, litter cost 0.86 per cent, electricity charges 0.63 per cent, miscellaneous expenses 0.56 per cent and disinfection cost 0.35 per cent. Thus, out of the total estimated cost of production per broiler (at mean body weight of 1.48 kg) of Rs.22.05, about 85 per cent was accounted by cost of the chick and the feed consumed.

4.3.1(2). Gross returns.

It can be seen from table 13.2 that the gross returns per bird sold was Rs.26.61, which consisted of Rs.25.63 (96.32%) as value of the bird, Rs.0.85 (3.19%) as value of manure and Rs.0.13 (0.49%) as value of empty gunny bags.

4.3.1(3). Economic indicators.

Certain economic indicators related to broiler production are presented in table 13.3. The net return or profit worked out to Rs.4.55 per bird for all the farms put together.

Ratio of fixed cost to net profit, operational cost to net profit and benefit cost ratio were 0.35, 4.59 and 1.21 respectively. The percentage of net profit over production cost

Table 10. Indicators of economic parameters of broiler farms in Trichur district

Parameters	Values
1. Total fixed cost per bird sold (Rs)	1.59 ± 0.12
2. Total operational cost per bird sold (Rs)	20.47 ± 0.29
3. Total production cost per bird sold (Rs)	22.06 ± 0.32
4. Gross returns per bird sold (Rs)	26.61 ± 0.45
5. Net profit per bird sold (Rs)	4.55 ± 0.33
6. Ratio of fixed cost to net profit	0.33
7. Ratio of operational cost to net profit	4.50
8. Benefit-cost ratio	1.21
9. Percentage of net profit to total production cost	20.6

was 20.60 and net profit as a percentage of gross returns was 17.10. The ratio of the fixed cost to net profit is an indicator of the burden of capital investment on the profit margin. In the aggregate, the fixed cost is almost one-third the net profit, which should be considered as fairly tolerable. Similarly, the running expenses or operational cost involved to produce broiler also exerts considerable influence on profit margin. Hence, for every rupee profit, operational cost was Rs.4.50 meaning that operational costs were over four times that of profit. It is obvious that for higher profit this ratio must be narrower.

The benefit-cost ratio is again another indicator of the margin of benefit in this case money profit - over the total cost. The ratio of 1.21 obtained indicates that for every rupee spent (both fixed and operational costs together), the gross return is Rs.1.21. It is only rational that for every enterprise to sustain even with zero profit the ratio should be at least one. Any ratio less than one indicates loss. The ratio here states a net return of about Rs.0.21 to a rupee spent. This is presented in per cent net profit to total cost shown as 20.60 in the table.

4.3.2. Seasonal effects in economic parameters.

The results of the economic analysis in broiler production relating to the seasons are given in table 11. It was observed that total production cost per bird sold was Rs.18.61, 19.19 and 19.20 for summer, rainy and cold seasons respectively

and the gross returns corresponding to the seasons were Rs.23.19, Rs.25.07 and Rs.24.32. Net profit per bird sold were Rs.4.78, Rs.5.94, Rs.5.12 and net profit per kg live weight were Rs.4.06, Rs.5.23 and Rs.4.46 respectively for summer, rainy and cold seasons which shows that the broiler performance during rainy season was found to be better than in cold and summer seasons.

The benefit-cost ratio was 1.26, 1.31 and 1.27 while the percentage of net profit over total production cost was calculated to be 25.96, 31.05 and 26.67 respectively for summer, rainy and cold seasons. The above ratios also indicated that broiler production performance during rainy season was better than that of cold and summer seasons. The benefit cost ratio of 1.31 obtained during rainy season indicated that for every rupee spent the gross return is Rs.1.31. This is substantial, as the per cent of net profit to total cost was 31.05, shown in the table 11.

4.3.3. Economic analysis based on strength of intake.

The data collected were classified according to strength of intake of chicks and the results on the basis of economic analysis and presented in table 12.1 to 12.3.

4.3.3(1). Cost components of production.

The various cost components with their percentages based on farm size are presented in table 12.1 and Fig.1.

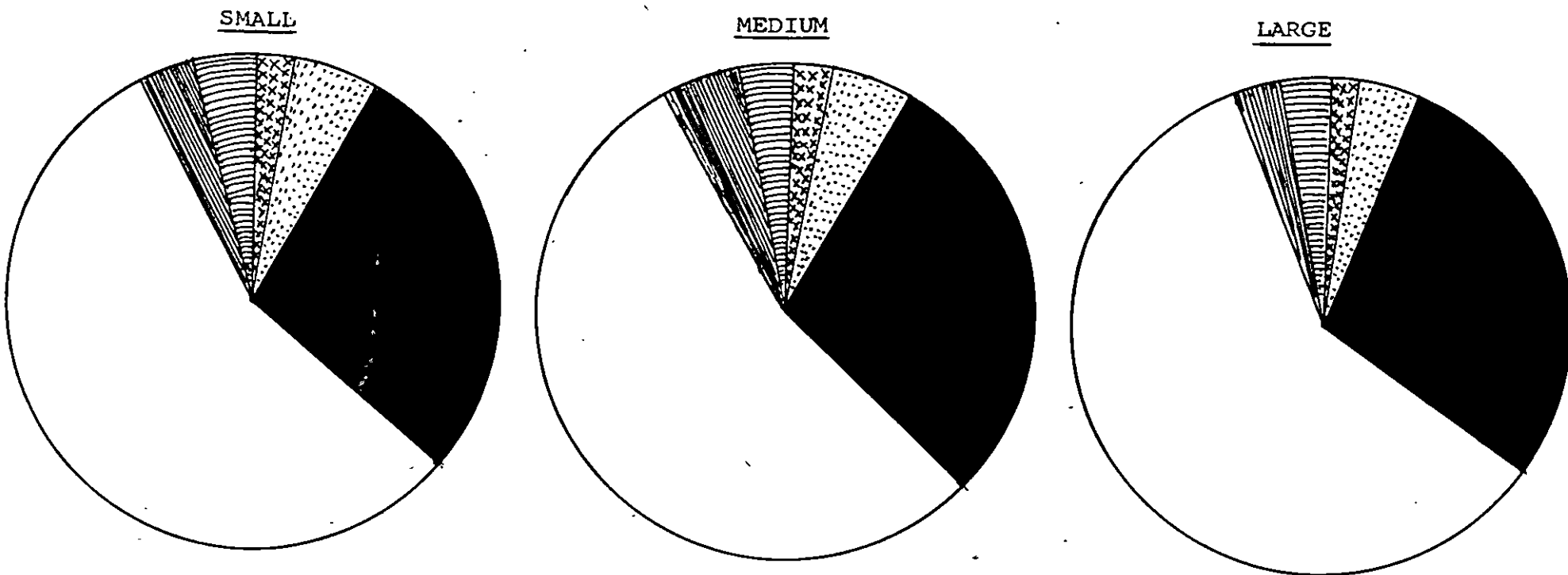
Total cost of production per bird sold was Rs.22.80 in small, Rs.22.24 in medium and Rs.21.43 in large farms

Table 11. Certain economic parameters in broiler production relating to seasons

Sl. No.	Parameters	Summer (Feb-May)	Rainy (June-Sept)	Cold (Oct-Jan)
1	Total production cost per bird sold (Rs)	18.41	19.13	19.20
2	Gross returns per bird (Rs)	23.19	23.07	24.32
3	Net profit per kg live weight sold (Rs)	4.05	3.23	4.45
4	Net profit per bird sold (Rs)	4.73	3.94	3.12
5	Benefit-cost ratio	1.26	1.31	1.27
6	Percentage of net profit over total cost of production	25.96	31.03	25.67

Table 12.1. Cost components in production per broiler based on size of farm

Items	Small		Medium		Large	
	Rs	%	Rs	%	Rs	%
1. Fixed costs						
Depreciation on buildings	0.44	1.93	0.44	1.99	0.29	1.35
Depreciation on equipments	0.11	0.49	0.10	0.43	0.13	0.61
Maintenance and repairs	0.12	0.53	0.10	0.43	0.10	0.47
Interest on fixed capital	1.13	4.95	1.11	4.99	0.81	3.78
Total fixed costs	1.80	7.89	1.75	7.87	1.33	6.21
	±0.17		±0.22		±0.09	
2. Operational costs						
Chick cost	6.43	28.20	6.48	29.14	6.10	28.47
Feed cost	12.60	55.24	12.01	54.00	12.56	58.61
Litter cost	0.21	0.92	0.16	0.72	0.20	0.93
Hired labour charges	0.40	1.75	0.59	2.65	0.50	2.33
Family labour charges	0.60	2.63	0.60	2.70	0.23	1.07
Medicine and vaccine cost	0.35	1.54	0.29	1.30	0.24	1.12
Disinfection cost	0.09	0.40	0.07	0.32	0.07	0.33
Electricity charges	0.20	0.88	0.14	0.63	0.09	0.42
Miscellaneous charges	0.12	0.53	0.15	0.67	0.11	0.51
Total operational cost	21.00	92.11	20.49	92.13	20.10	93.79
	±0.66		±0.39		±0.57	
Total cost (1+2)	22.80	100.00	22.24	100.00	21.43	100.00
	±0.53		±0.36		±0.60	



PER CENT COSTS







	<u>Small</u>	<u>Medium</u>	<u>Large</u>
<u>Fixed costs</u>			
 Depreciation on building and equipments	2.41	2.43	1.96
 Maintenance and repair and interest on fixed capital	5.48	5.44	4.25
<u>Operational costs</u>			
 Chick.	28.20	29.14	28.47
 Feed	55.26	54.00	58.61
 Labour	4.38	5.35	3.40
 Others - medicine and vaccine, litter, dis-infection, electricity and miscellaneous	4.27	3.64	3.31

Fig. I. Cost components of broiler production based on farm size

indicating a declining trend with increase in farm size. Fixed cost accounted for 7.09, 7.87 and 6.31 per cent of the total cost in small, medium and large farms respectively. Thus relatively, the higher the farm size, the lower will be the fixed costs. Although chick costs were more or less same in all the size groups, feed accounted for higher proportion of total cost among large size farms compared to other size groups. Total labour cost was highest among medium sized farms and lowest among large sized farms. Similarly other costs including medicines, miscellaneous expenses etc, were lowest among the large sized farms and highest among the small sized farms. The cost percentages clearly show the economics that can possibly be derived by larger farms.

4.3.3(2). Gross returns.

The gross returns per bird presented in table 12.2 showed Rs.27.24, Rs.26.76 and Rs.26.03 respectively for small, medium and large group farms. Large farms have been only marginally lower in return per bird.

4.3.3(3). Economic indicators.

Economic indicators presented in table 12.3 revealed that the net returns were Rs.4.44, Rs.4.52 and Rs.4.65 per bird respectively for small, medium and large farms. The benefit to cost ratio was 1.19, 1.20 and 1.22 whereas the percentage of net profit over total production cost was 19.47, 20.32 and 21.73 respectively for small, medium and large

farms. The ratio of fixed cost to net profit was 0.41, 0.39 and 0.29 while the ratio of operational cost to net profit was 4.73, 4.53 and 4.33 respectively for small, medium and large size group of farms. All the results showed the economic advantage with large sized farms, in spite of them receiving a slightly less returns per bird as shown in table 12.2.

4.3.4. Economic analysis related to periodicity of intake.

The data collected were analysed according to the periodicity of intake and the results of economic analysis are presented in tables 13.1 to 13.3. Only one farm was receiving chicks at monthly interval, hence omitted from the economic analysis.

4.3.4(1). Cost components of production.

The various cost components with their percentage involved in the production of broiler based on periodicity of intake is presented in table 13.1 and Fig.11.

The fixed cost constituted 6.82 and 7.82 per cent for farms with weekly and fortnightly intake respectively. The overall fixed cost was 7.31 per cent of total cost. Total operational costs were 93.43 and 92.10 per cent respectively for weekly and fortnightly intervals while it was 92.79 per cent when considered without taking the periodicity into account. The total production cost per bird sold was found to be Rs.21.79, Rs.22.39 and Rs.22.06 respectively for weekly and fortnightly intake and for overall performance. On the

Table 12.2. Gross returns (in rupees) per broiler based on size of farm

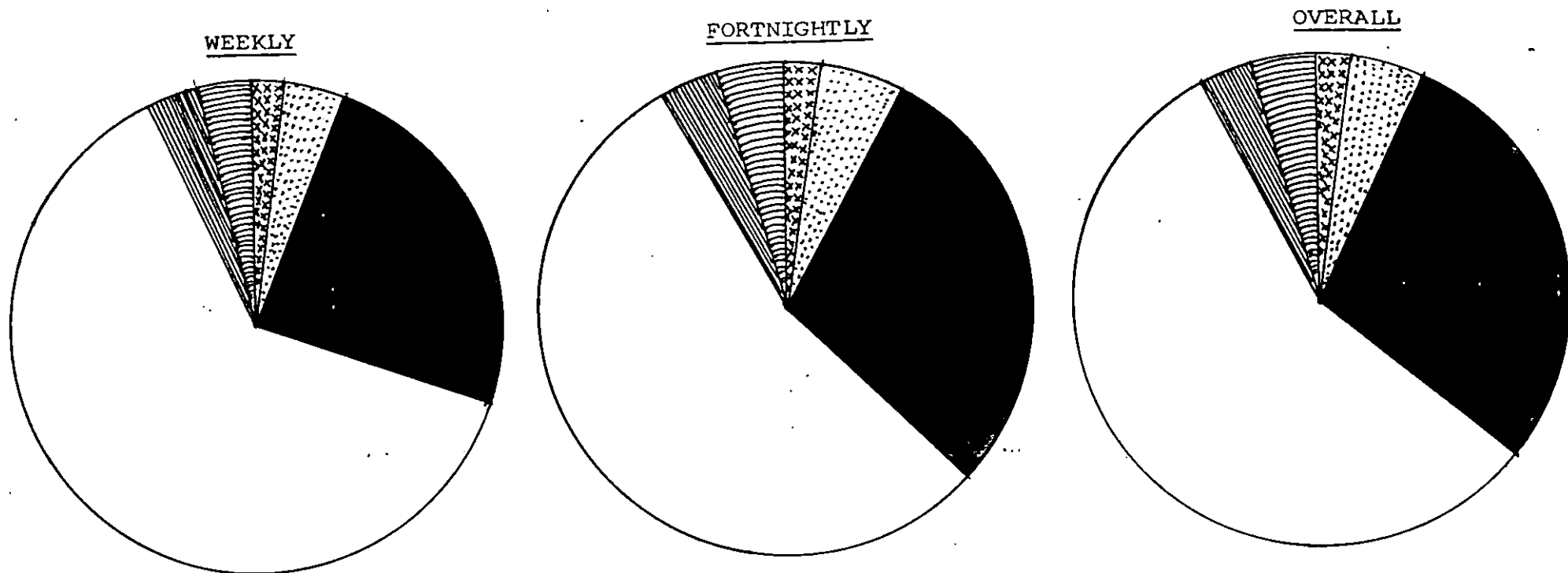
Items	Small		Medium		Large	
	Rs	%	Rs	%	Rs	%
Sale of broiler	26.29	96.51	25.79	95.38	25.06	96.09
Sale of manure	0.02	3.01	0.64	3.14	0.63	3.37
Sale of gunny bags	0.13	0.48	0.13	0.49	0.14	0.54
Total returns	27.24	100.00	26.76	100.00	26.08	100.00
	±0.61		±0.78		±1.00	

Table 12.3. Economic indicators based on size of farm

Particulars	Small (Rs)	Medium (Rs)	Large (Rs)
Gross returns (Rs)	27.24	26.76	26.08
Total costs (Rs)	22.80	22.24	21.43
Net returns (Profit, Rs)	4.44	4.52	4.65
	±0.52	±0.66	±0.67
Benefit-cost ratio	1.19	1.20	1.22
Ratio of fixed cost to net profit	0.41	0.39	0.29
Ratio of operational cost to net profit	4.73	4.53	4.32
Percentage of net profit over total production cost	19.47	20.32	21.70

Table 13.1. Cost of production per broiler based on periodicity of intake

Items	Weekly		Fortnightly		Overall	
	Rs	%	Rs	%	Rs	%
1. Fixed costs						
Depreciation on buildings	0.33	1.31	0.42	1.63	0.37	1.63
Depreciation on equipments	0.13	0.60	0.11	0.49	0.12	0.54
Maintenance and repairs	0.03	0.37	0.12	0.54	0.11	0.50
Interest on fixed capital	0.83	4.04	1.10	4.91	0.99	4.49
Total fixed costs	1.42 ±0.11	6.32	1.75 ±0.10	7.52	1.59 ±0.12	7.21
2. Operational costs						
Chick cost	0.14	23.15	0.44	23.76	0.30	23.56
Feed cost	12.66	58.10	12.26	54.76	12.41	56.25
Litter cost	0.23	1.05	0.16	0.71	0.19	0.88
Hired labour charges	0.55	2.52	0.51	2.23	0.50	2.27
Family labour charges	0.24	1.10	0.33	2.59	0.45	2.04
Medicine and vaccine cost	0.27	1.24	0.31	1.39	0.29	1.27
Disinfection cost	0.06	0.29	0.09	0.40	0.06	0.36
Electricity charges	0.10	0.46	0.16	0.71	0.14	0.63
Miscellaneous charges	0.12	0.55	0.13	0.56	0.12	0.54
Total operational cost	20.37 ±0.47	93.45	20.64 ±0.37	92.19	20.47 ±0.39	92.79
Total cost (1+2)	21.79 ±0.50	100.00	22.39 ±0.40	100.00	22.06 ±0.32	100.00









		<u>PER CENT COSTS</u>		
<u>Fixed costs</u>		<u>Weekly</u>	<u>Fortnightly</u>	<u>Overall</u>
	Depreciation on building and equipments	2.11	2.37	2.22
	Maintenance and repair and interest on fixed capital	4.41	5.45	4.99
<u>Operational costs</u>				
	Chick	28.18	28.76	28.56
	Feed	58.10	54.76	56.26
	Labour	3.62	4.87	4.31
	Others - medicine and vaccine, litter, dis-infection, electricity and miscellaneous	3.58	3.79	3.66

Fig.II. Cost components of broiler production based on periodicity of intake.

whole there seems to be no appreciable effect for the periodicity of intake on the cost components, although feed cost showed some difference. This may be due to the large number of birds in farms with weekly intake as was observed in the analysis with size of farms.

4.3.4(2). Gross returns.

The gross returns per bird sold, presented in table 13.2 revealed that Rs.26.12 and Rs.27.05 respectively for weekly and fortnightly farms with an overall return of Rs.26.61. This also reflects the pattern observed under size of farms, wherein farms with larger number received marginally less return per bird than farms with lesser numbers.

4.3.4(3). Economic indicators.

Economic indicators given in the table 13.3 revealed that the net return per bird was Rs.4.33 and Rs.4.66 respectively for farms with weekly and fortnightly intake. The percentage of net profit over total production cost was 19.57 in weekly and 20.81 in fortnightly intake farms. The ratio of fixed cost to net profit was 0.33 and 0.30 while the ratio of operational cost to net profit was 4.70 and 4.43 respectively for weekly and fortnightly intake farms. All these results concur with those based on size of farms. Frequency of intake is, therefore, basically an indicator of size of farms, and higher the frequency, larger the farms tend to be.

Table 13.2. Gross returns (in rupees) per broiler based on periodicity of intake

Items	Weekly		Fortnightly		Overall	
	Rs	%	Rs	%	Rs	%
Sale of broiler	25.11	96.13	26.03	96.41	25.63	96.32
Sale of manure	0.67	3.13	0.84	3.11	0.85	3.19
Sale of gunny bags	0.14	0.54	0.13	0.48	0.13	0.49
Total returns	26.12	100.00	27.03	100.00	26.61	100.00
	±1.03		±0.45		±0.43	

Table 13.3. Economic indicators based on periodicity of intake

Particulars	Weekly	Fortnightly	Overall
Gross returns (Rs)	26.12	27.03	26.61
Total costs (Rs)	21.79	22.39	22.06
Net returns (Profit, Rs)	4.33	4.64	4.55
	±0.04	±0.41	±0.33
Benefit-cost ratio	1.20	1.21	1.21
Ratio of fixed cost to net profit	0.33	0.33	0.35
Ratio of operational cost to net profit	4.70	4.63	4.50
Percentage of net profit over total production cost	19.87	20.81	20.60

4.3.5. Economic analysis related to labour efficiency.

Labour accounts for the third highest component of operational cost and its impact on cost and returns has been analysed, based on the source of labour supply and are presented in table 14.

Of the total cost of production at Rs.21.97, 21.60 and 22.84 respectively for farms managed by family labour, family labour along with hired labour (mixed labour) and hired labour alone, the operational cost accounted for 93.90, 93.17 and 91.24 per cent of total production cost respectively for the three categories of farms. It could be seen from the table that gross return per bird (Rs.27.40), net return per bird (Rs.5.49) and benefit to cost ratio (1.23) were highest in farms maintained by family labour; the respective figures at Rs.23.26, Rs.2.44 and 1.11 were lowest in farms depending solely on hired labour. The gross return Rs.26.87, net return Rs.5.19 and benefit cost ratio 1.24 worked out for mixed labour farms are found to be almost equal to those farms maintained by family labour alone. Ratio of fixed cost to net profit and ratio of operational cost to net profit at 0.25 and 3.76 respectively, were found to be lowest in family labour farms, followed by 0.29 and 3.69 for mixed labour farms and 0.62 and 5.54 (highest) in farms depending on hired labour. The percentage of net profit over total production cost was found to be higher at 24.99 in family labour farms followed by 23.94 in mixed labour farms and lowest at 10.60

Table 14. Techno-economic parameters of broiler farms distributed according to source of labour employed

Parameters	Family labour	Family + hired labour	Hired labour
1. Total fixed cost per bird sold (Rs)	1.34 (6.10%)	1.49 (6.98%)	2.00 (9.76%)
2. Total operational cost per bird sold (Rs)	20.63 (93.90%)	20.20 (93.17%)	20.84 (91.24%)
3. Total cost per bird sold (Rs)	21.97	21.69	22.84
4. Gross returns (Rs)	27.46	26.87	25.23
5. Net returns (Profit, Rs)	5.49	5.19	2.44
6. Benefit-cost ratio	1.23	1.24	1.11
7. Ratio of fixed cost to net profit	0.25	0.29	0.82
8. Ratio of operational cost to net profit	3.76	3.89	8.84
9. Percentage of net profit over total production cost	24.99	23.94	10.69

in farms managed solely by hired labour. Thus all the parameters for the farms depending solely on hired labour, indicated poor performance. This gives rise to the observation that source of labour is an important factor to be reckoned with in the profitability of broiler farming, with farms owned by self-employed persons showing relatively, better management efficiency and profitability.

4.3.6. Economic analysis based on magnitude of net profit.

The results obtained from the analysis of economic indicators of the farms distributed according to magnitude of net profit are presented in table 15. From the table it can be seen that the total cost of production per bird was Rs.21.92, Rs.21.73 and Rs.23.43 respectively for high, medium and low profit farms. Of this total production cost 9.70, 6.93 and 9.73 per cent accounted for fixed cost per bird sold and the remaining 94.30, 93.05 and 90.27 per cent accounted for operational cost of farms with high, medium and low profit performance. The gross return and the net return per bird sold were found to be Rs.29.53 and Rs.7.61 for high profit farms, Rs.26.14 and Rs.4.41 for medium profit farms and Rs.24.48 and Rs.1.03 for low profit farms. The benefit cost ratio and percentage of net profit over total production cost observed to be 1.35 and 34.72 were highest in high profit farms whereas the value of 1.04 and 4.43 were lowest in low profit farms. The medium profit group had 1.20 towards benefit to cost ratio and 20.29 as percentage of net profit

Table 18. Economic indicators of broiler farms distributed according to magnitude of net profit

Parameters	High profit	Medium profit	Low profit
1. Total fixed cost per bird sold (Rs)	1.23 (5.70%)	1.51 (6.95%)	2.28 (9.73%)
2. Total operational cost per bird sold (Rs)	20.67 (94.30%)	20.22 (93.65%)	21.15 (90.27%)
3. Total cost per bird sold (Rs)	21.92	21.73	23.43
4. Gross returns	29.53	26.14	24.48
5. Net returns (Profit, Rs)	7.61	4.41	1.05
6. Benefit-cost ratio	1.35	1.20	1.04
7. Ratio of fixed cost to net profit	0.16	0.34	2.17
8. Ratio of operational cost to net profit	2.72	4.59	20.14
9. Percentage of net profit over total production cost	34.73	20.29	4.48

Note: 1. High performance farm indicate net profit over Rs.6.00 per bird sold.

2. Medium performance farm indicate net profit between Rs.2.00 to 6.00.

3. Low performance farms indicate net profit below Rs.2.00.

over total production cost. The ratio of fixed cost to net profit and ratio of operational cost to net profit worked out to 0.16 and 2.72 for high profit farms, 0.36 and 4.59 for medium profit farms and 2.17 and 20.14 for low profit performance farms. The results shown in this table have clearly indicated the role of economic indicators in distinguishing between farms with different profit margins.

CHAPTER V
DISCUSSION

DISCUSSION

Owing to paucity of literature on broiler production in Kerala this research study was undertaken with a view to obtaining some primary and basic information on broiler rearing under field conditions in the State. The impact of rapid development of broiler industry during the last decade in the country has been reflected in Kerala also with the starting of hatcheries and many households taking to broiler production. With the liberalisation of institutional credit for the agricultural sector, many have come forward to initiate broiler farming, particularly the educated unemployed. Broiler production has its attraction since it helps to relieve the pressure of educated unemployed and underemployed family members, promises quick returns through short duration crops and requires least land area for operation. However, these production advantages are dampened by the marketing problems encountered in the disposal of finished broilers. Broiler market eventhough known for its wide fluctuations in demand and prices, producers do not adjust their production schedule resulting in bitter experience among farmers. Thus like any other livestock products, marketing of broilers plays a very important role in the prospects of broiler production in Kerala.

The study of 32 broiler producers in Trichur district has revealed interesting and informative techno-economic aspects

of production and marketing of broilers. The pattern observed may not be significantly different elsewhere in the State.

It was observed that by and large broiler enterprise is in the hands of individuals. The concept of collective or co-operative farming is practised only by 12.5 per cent of farms indicating that this concept has not caught the imagination of the farmers engaged in this sector of animal production industry. Hence there is scope for educating and motivating farmers to assert themselves and to form co-operative organisations thereby production cost can be reduced and better returns obtained through centralised procurement and marketing system which, incidentally may also increase their bargaining power. Madkarni *et al.* (1979) reported that the co-operative farms incur less cost since they obtain inputs at cheaper rates and receive advice and guidance from the extension service organised by the Government.

The hypothesis that broiler farming helps to relieve unemployment among the educated has been proved in this study, since all the owners had completed minimum of 10th standard with about 20.00 per cent of them being degree-holders. This coupled with the observation that 75.00 per cent of farmers had established broiler farms with the objective of self-employment or for his family members and another 19.75 per cent with the objective as side income indicated the capacity and confidence reposed on this sector of animal industry in overcoming unemployment and underemployment. This must have

prompted many producers to go for broiler production on a more or less permanent basis with well located farms and, mostly, permanent structures in housing the birds. The majority of the farms (94.00%) were constructed in garden land which is suitable for broiler rearing under Kerala conditions. The housing, feeding, watering and brooding arrangements have in most of the farms found to be satisfactory aiming at profitable broiler farming. The findings of the present study were found to agree in general with those of Reddy (1967), Rosario (1967) and Sarkar (1967). In all the farms ventilation in poultry houses was found to be satisfactory and there was no poorly ventilated farms. The broiler houses in majority of the farms (97.00%) had gable type of roofing. The roofing materials used by farmers were Tiles (62.50%), Light roof (18.75%), Asbestos (6.25%) and Thatch (9.37%). These types of materials already have been recommended by Indian Standard Institution (1972) as suitable for roofing of poultry sheds. All the farms had side walls upto a height ranging from 0.5 to 3.5 ft over which wire mesh was fastened upto 4.0 to 6.0 ft.

The vital role of institutional finance has been brought out clearly in this study. Most of the farms (79.00%) have had financial assistance from banks and only 22.00 per cent were using their own finance which, not only reveal the acceptance of this sector by financing agencies, but also depicts the encouragement that financing agencies provided for developing this sector. Repayment of loans from the income

generated out of the broiler business was also satisfactory thus, re-emphasising the fact that financial assistance to educated employed for engaging in quick income yielding activities can go a long way in solving unemployment in the State.

It can be seen from table 1.7 that eventhough 50 per cent of the farmers surveyed were using the services of the Veterinary College for expert technical assistance, an almost equal number (43.75%) had no source of veterinary advice. This lacuna is serious. The possible reason for this situation could be distance of the farms to veterinary institutions and also the higher educational status of the farmers which have helped them to build up their expertise through various media like handouts, radio, television, newspaper, correspondence courses, etc. Rastumar (1967) had indicated inadequate veterinary service as one of the major reason for non-adoption of some improved animal husbandry practices among dairymen. This could be true with the poultry farming community as well. There is, therefore, the need for Governmental agencies to adopt a two pronged approach to the broiler production process by intensifying the financial and technical services.

All the farms studied were on deep litter following multiple rearing system wherein broiler of different age groups are reared at a time. None of the farms adopted cage system of rearing possibly because of higher capital investment and higher management skill required for the adoption of

this system. Sarua and Saharia (1993) also opined that deep-litter system was most suitable for well organised farms from the economic point of view.

In all the farms the usual method of sale was as live birds between 7 and 9 weeks of age and there was no sale as dressed and cut-up parts. The main marketing channels were found to be producer-agent-consumer and producer-consumer. Rao (1984) and Tulasi *et al.* (1988) have also reported similar marketing practices in Madras. Out of 32 farms only two farms practiced exclusive retail sales and the rest of the farms were practicing wholesale as well as retail marketing. Irrespective of the sale practices, the majority of farms were disposing the birds at the farm gate itself. This clearly indicated that the producer need not run about for marketing his birds. Hence broiler production promises better avenues due to the continuous demand among the consumers. Most of the farms were providing dressing facilities by levying additional nominal charges whenever consumers indicated a preference for dressed birds. Due to this, consumers prefer to get their birds dressed from the farm itself and as per the opinion of farmers this trend is on the increase. Since most of the birds are sold as live and/or as freshly dressed ones, the investment of cold storage facility and the sale of dressed, preserved broilers has not become popular. However, three of the farms were maintaining cold storage facility for marketing their birds. But, as in the marketing of many other commodities,

the intermediaries are assuming major role in marketing broilers. Perhaps it is time that some form of public agency like a corporation is ushered in to protect the interests of broiler producers.

The overall picture of broiler production indicated that the aggregate average farm size was around 300 birds with almost half of the farms possessing around 200 birds per crop. This is in line with the expectation of the reasonable size for a small producer if he has to cover overheads.

The mean live body weight of broiler at disposal was 1.45 kg per bird. This seems to be satisfactory and concurs with the observation made by Gopalakrishnan *et al.* (1977), Mashim *et al.* (1979), Tyagi (1985), Kalita *et al.* (1986) and Rosario (1987). The live body weight at disposal of less than 1.25 per bird has been reported by Singh and Singh (1981), Sharma *et al.* (1983), Sharma and Dhingra (1986) and Singh (1987) whereas a higher body weight at disposal of more than 1.65 kg/bird was also reported by Rahmathulla (1984), Narahari (1987), Sreenivasiah (1987) and Vohra and Ernest (1987). These differences can possibly be attributed to differences in the hybrids raised and the management practices. Body weight at disposal being one of the major profit deciding factors, it can be safely said that the managerial practices followed by the farmers are by and large, satisfactory although there is scope for improvement. However, the overall mean mortality of 6.69 per cent observed in the survey is on the

higher side. Average mortality rates of organised broiler units ranged from 2 to 4 per cent (Gopalakrishnan *et al.*, 1977; Singh and Singh, 1981; Kothandaraman and Narahari, 1982 and Rosario, 1987). Higher rates of 4 to 8 per cent mortality under field conditions have been reported by Sekar (1985) and 5 to 10 per cent by Singh *et al.* (1987). It is a general dictum that mortality rate must be low for higher profit and this norm was confirmed in the present study wherein it was observed that mortality rate was directly linked with profit margin. Farms earning the highest profits had low mortality rates and vice-versa. In the absence of data on age-wise distribution of mortality it is difficult to suggest corrective measures.

The average feed consumption per bird sold from start to disposal was 3.60 kg with a feed efficiency of 2.40. Even though feed efficiency is poor when compared to values reported under controlled experimental condition such as 1.87 reported by Hashin (1979), 2.00 to 2.20 observed by Rosario (1983), 3.10 suggested by Narahari (1987) and 2.00 to 3.40 observed by Vohra and Ernest (1987, it agrees well with figures reported by Kothandaraman and Narahari (1982) and Rahmathulla (1984) but much lower than those reported by Ahmed (1977) and Singh *et al.* (1987).

The stocking strength was found to influence the mortality but it had no relation to weight gain since mortality was found to decline from over eight per cent to about five per cent when

strength increased from 200 to over 500 birds per crop with the overall mortality being slightly below seven per cent. Comparing the performance in terms of mortality and body weight at disposal among the different size groups of farms it was observed that the mortality per cent of 8.64 was more in small farms compared to large farms with 5.04 per cent. Between the farms classified as small and medium, the mortality per cent was comparable. The higher mortality among the farms classified as small and medium could be due to their inability to obtain timely professional advice as well as economic constraints. However, mean body weight of birds at disposal was comparable indicating thereby that even though the farmers may be conversant with routine managemental operations, small and medium farms have a set back, possibly in getting timely diagnostic and treatment facilities for their birds. This re-emphasizes the earlier observation of the need to provide an exclusive agency to cater to the techno-economic needs of broiler producers.

Most of the farms (65.62%) covered by this survey indicated that they were receiving broiler chicks at fortnightly intervals whereas 31.25 per cent farms were receiving at weekly intervals. This trend could possibly due to two major reasons. Firstly the absence of a regular and organized marketing agency to assure a regular market for the farmers. Secondly the farmers especially new entrants with broiler production prefer to grow with the business rather than

launching large scale production and face marketing problems. However, none of the techno-economic parameters tended to confer any superior benefit or otherwise to the periodicity of intake. Nevertheless, with adequate marketing opportunities, weekly intake could help to suggest returns on a commercial scale. The frequency of intake of birds normally is an indirect measure of the farm size, in as much as, the higher the frequency the larger the farm size. The observation in this study based on frequency of intake did not show any discernible pattern; with monthly intake having the largest number compared to fortnightly and weekly intakes. However, mortality rate tended to be low whenever the frequency of intake was also low. The intake frequency also had no relation to weight gain. It is clear, therefore, that the size of farms need not necessarily be an important variable in influencing mortality and weight gain, since it was observed earlier that the units studied had provided all the requirements regarding the housing, breeding and rearing.

Factors other than size of farm and frequency of intake appeared to influence mortality rate and these were season and management, the latter being represented by source of labour. The technical parameters grouped according to seasons prevailing in Kerala indicated that most of the parameters were not affected by season of the year except mortality which was higher at 19 per cent during summer, and 12 per cent during rainy and cold seasons. Mortality was highest in the summer months of February to May compared to other two seasons where

the rates were almost equal. The rate of 13 per cent in summer was three per cent more than the rate during the rest of the year which by itself is very high. Enquiry revealed that higher mortality during summer was due to heat stress, a potent factor to be reckoned with on days when the atmosphere was comparatively more hot and humid. Rainy season appeared to be comparatively more beneficial for rearing broilers than other seasons in terms of body weight at disposal and net profit per bird and it had a slight edge over the other two seasons. Nevertheless the margin of difference among the seasons is so subtle that general recommendation to consider one season superior to the other is superfluous and may possibly be impracticable when the totality of broiler farming is considered.

The data were classified according to sources of labour employed to decipher whether any positive economic benefit could be discerned for adoption by farmers. Only 29.10 per cent farms were dependent solely on hired labour and 37.30 per cent had both family labour and hired labour (mixed labour). Family labour was the only source of labour in 34.40 per cent of farms. This indicates that majority of farm owners takes this avocation as a means of self-employment whereas the rest considered it as a means of subsidiary income in addition to other avocations. The information on mortality and body weight at disposal indicated that the mortality was high (10.35%) and body weight at disposal was poor (1.39 kg per bird) in farms which were solely dependent on hired labour.

whereas farms involving family labour either completely or partly had lower mortality rates and better body weight at disposal indicating better personal attention in management. The difference in mortality rates observed with differing sources of labour input is a clear indication of the management efficiency. The lowest rate of mortality was in farms where hired labour was combined with family labour, whereas the mortality rate was highest in farms which depended solely on hired labour.

From the earlier discussion it can be seen that size of the farms and frequency of intake need not necessarily be an important variable in influencing mortality and weight gain. Season and management as represented by source of labour employed, therefore are very influential in the economics of broiler farming through mortality rates. Similarly these two factors were also observed to induce slight difference in weight gain. Body weight at disposal time was lowest among farms which depended solely on hired labour, and this is another indication of the less efficient management whereas it was better in farms having personal involvement through family labour. None of the studies reviewed have given any emphasis on these two very vital parameters viz., season and labour, the two crucial factors which are widely applicable to Kerala conditions. Labour is a very costly input in Kerala and the season is very hot and humid particularly in summer, which will increase stress conditions. Incidentally the

significant role of family labour in improved efficiency may also bring down total costs.

Table 9 depicts farms classified according to magnitude of net profit. It could be seen that majority of the farms are in the medium profit level ranging from Rs.2.00 to Rs.6.00 per bird sold. Farms making net profit over Rs.6.00 per bird constituted only 18.75 per cent. The low profit farms had higher mortality (13.56%) while the high profit farms had comparatively lower mortality (4.22%) as depicted in the table mentioned. Likewise, the body weight at disposal also showed a similar trend. Thus it appears that high mortality and low body weight at disposal eat away the profit that could have been obtained through good management.

It is well known that the quality of feed and strain of chicks influence the feed conversion ratio markedly even if other conditions remain the same. Thus in the absence of well laid out standards, no definite conclusion can be arrived at as to their influence on profitability in Kerala condition. Feed and chick cost being the two dominant cost items, the amount of these two assume considerable importance and it is desirable that lower feed conversion ratio are obtained. This is, therefore, an area where much more research work needs to be carried out to evolve workable standards. Least cost rations utilising locally available materials also need exploration.

Turning to the cost and returns, the total cost of production Rs.22.08 per bird was found to yield a net profit of

Rs.4.55 providing a margin of about 21.00 per cent over costs. This can be considered to be a very reasonable ratio of return compared to other livestock enterprises. The net profit received appears to be much better than those reported by Kothandaraman and Karahari (1982), Rosario (1983), Sekar (1983), Prabakaran and Natarajan (1984), Rahmathulla (1984), Patel (1985), Simha (1985) and Singh (1987). It was almost similar to reports of Nathur and Reddy (1970), Prabakaran and Sivassivan (1985) and Rosario (1987). But it was lower than those reported by Ahmad (1977), Banerjee (1986), Greenivasaiah (1987) and others. These profit variation may largely be due to regional and time differences in the pricing of inputs and outputs. The fact that broiler production in Erichur in general, is receiving a fairly reasonable profit margin augures well for the broiler industry. Viewing economics from the seasonal point of view, the benefit-cost ratio and net profit margin were more favourable during rainy season than summer and cold seasons. Earlier it was observed that rainy season had lesser mortality and better management. It is, therefore logical that this season also yields the highest profits. Costwise rainy season did not fare better, but the returns per bird in rainy season was about one rupee more than the other seasons. Whether this difference is due to increase in demand during rainy season or decline in supply or to the management favoured by climatic condition can be explained only through further indepth studies.

As the size of farm is increased a very interesting observation was the declining trend in cost of production per bird and increasing trend in net profit. It is the fixed cost per broiler that declined with increase in size of farm whereas the operational cost remained more or less the same. This clearly shows economics of scale associated with larger strengths. This agrees with Sekar (1963), Prabhakaran and Sivaselvan (1965) and the generally held views of cost reduction and income increase possible in larger farms handling larger numbers. All the economic parameters studied confirm this view.

The frequency of intake did not show any influence on cost although net profits were slightly more with fortnightly intake. But no economic significance could be attached to these observations.

The management status as measured by the source of labour input did show appreciable differences in the economic parameters between farms. Farms relying solely on hired labour not only had higher costs, but also had lower returns and net profits compared to farms which had some family labour input. Net profit as percentage to total cost was around 10 per cent in farms with hired labour compared with over 20 per cent in farms with family labour input. None of the studies reviewed appeared to have thrown light on the role of labour in influencing costs and profits in broiler production.

In all the farms studied about 95 per cent of gross income

was received by the sale of broilers and this situation is true with almost all farms elsewhere.

Ratios of fixed cost and operational cost to net profit are indicators of cost behaviour and should be as low as possible for higher profit in broiler enterprise. These ratios do not seem to have been worked out in the literature reviewed. Hence no comparison could be made in this respect. But the percentage of net profit over production cost agreed well with the observation of Rosario (1987) and, judging from the factors influencing production of broilers any percentage over 20 should be considered as very satisfactory. The total cost of production is an additive function of fixed cost and operational cost. Out of this the operational costs account for 93 per cent and the balance fixed cost. Interest on fixed capital was the highest among fixed costs whereas feed cost (about 60%) and chick cost (about 30%) accounted almost wholly the operational cost. The high proportion of interest in the fixed costs is at variance with the observations of Gopalakrishnan *et al.* (1977) and Banerjee (1983) who obtained depreciation as the largest component. But interest charges were found to be the highest proportion by Rao *et al.* (1979) and Prabaharan and Sivaselvan (1985). On the operational cost, the finding that feed cost was the highest followed by chick cost, with these two occupying between 80 and 90 per cent of the total cost, agree with the observations of almost all the studies reviewed. Interest on fixed capital may be the interest

paid on borrowed funds for investment on fixed assets. Public financing institutions should consider this aspect while formulating their lending policies and use interest rates to stimulate growth of broiler industry.

The benefit-cost ratio of over 1.20 observed under different production conditions, ensures over 20 per cent net return to costs, which should be considered as reasonably remunerative when compared to returns from other enterprises. This is especially so in the livestock sector, where returns are very low. The net returns observed are fairly good over capital investment, enabling the producers to repay the loans taken from financing institutions. As an income and employment generating activity, broiler production holds out great promise for the future. The present study has only indicated certain broad patterns and the role of easily recognisable variables. However, more indepth studies in different zones of the States, on the demand and consumption patterns have to be initiated to give a fillip to this nascent and promising economic activity of broiler farming.

The findings of this study have implication in improving further the techno-economic management of broiler farms. Reducing mortality to reasonable limits, reducing stress conditions, providing better environment, reducing feed wastage, improving feed conversion, deriving cost economies and initiating efficient marketing systems are some of the areas that will help improve from broiler farming. To provide impetus

to broiler industry the introduction of a public agency in the form of a Corporation or similar institutions and modelled (with relevant modification) on the pattern in vogue for dairy development would appear to be feasible as, such an institution can co-ordinate all production and marketing activities, including financing of broiler units.

**Constraints in broiler farming and possible
remedies suggested**

Broiler farming is like any other farming and is being taken up by many marginal farmers and landless households as a source of income. Instances of large scale farming of broiler chicken as a major occupation is practically non-existent in the State of Kerala. There are several constraints that retard the rapid expansion of broiler farming. Some of them are high cost of feed, scarcity of feed at the time of necessity, non-availability of chicks at proper time, high cost of building materials and equipments, lack of marketing outlets, fluctuating demands for broiler meat and inadequate technical know-how. Moreover the planners and policy makers consider broiler farming as an industry and not as a farming profession when compared to the liberal concession bestowed on crop husbandry. In crop husbandry subsidies are available on inputs like fertilisers, pesticides, plant protection equipments, pumps etc. which are instrumental in the alleviation of hardships encountered by the common farmer. On the contrary, broiler farming being treated as an industry has to pay higher sale tax on all inputs, higher rates of electricity tariff which is on par with domestic/commercial use, higher interest on bank loans, no subsidy on equipments and inputs and has to invest high cost on building materials. These constraints either deter new farmers from taking up this profession or prompt farmers already in the profession to give up. This, unfortunately is

an unhealthy trend, especially since broiler meat is a cheap source of animal protein and is acceptable to all categories of people. In view of these facts broiler farming has to be given its due importance and has to be encouraged. Considering the importance and experience gathered during the course of the present investigation, the following measures are advocated to give an impetus to the broiler industry.

Being a tender meat of high nutritive value with organoleptic quality broiler meat has found wide acceptability among peoples of all religions. Therefore the popularisation of the use of broiler meat should receive much more attention than what is being bestowed currently. All programmes aimed at the popularisation of broiler farming should be based on the above facts.

1. Broiler farming must be considered as any other farming profession for eg. paddy cultivation, coconut farming etc. and, therefore, should enjoy the benefits of lesser electricity tariff allowed for agricultural purposes and subsidy for equipments, pumps, pipe line, tube well etc. Subsidies must also be allowed for building materials like cement (levy cement) and roofing materials, well digging, storage tank, so that the capital investment in poultry houses are kept low. This will encourage more and more people to take up broiler farming, and also encourage expansion by the farmers already in the profession. As in the case of agricultural loans, low interest loans and subsidy must be freely available to the

broiler farmers as is extended to the coconut farmer etc.

2. Most of the farmers complained about poor and unequal rate of growth of chicks. The variation in weights gain at market age was found to be ranging from 700 g to 1700 g. Broiler farmer need maximum growth rate to get high income. Most of the chicks originate from private farms. To overcome this setback some procedure for certification of farms to assure quality chicks to farmers may be useful.

3. Since most of the compounded feeds and raw materials for such feeds have to come from outside State, it should be possible for the Government to devise methods, such as bulk procurement of raw materials, tax concession etc. to keep the feed cost at reasonable levels. Subsidy on poultry feeds also may be introduced as is allowed on fertilizers, pesticides etc.

4. As in the case of agricultural commodities, market intelligence must be established and information regarding the price of broiler meat, its market trend and demand in different localities must be disseminated through mass media like news papers, All India Radio etc.

5. Broiler farmers must be organized on co-operative basis for the pooling, processing, cold storing and marketing of broiler meat according to public demand. Such co-operative must be able to transport the poultry meat to the areas of higher demand as gathered from market intelligence, in refrigerated vans as is practised in the Fishery Industry. Such organized selling of broiler meat will enable the farmers to

getting better prices. The lean periods of demand in certain localities during periods of religious penance often put the farmer in difficult situation. In such periods the co-operatives must be able to transport the meat to areas of higher demand, and save the farmer from loss. This will also help the farmer to put more attention in production. Such co-operatives must be equipped to supply all inputs required by the broiler farmer.

6. Due attention must be bestowed on the production and supply of vaccine and medicines required for the broiler farmer. Such medicines and vaccines must be made available in sufficient quantities at all veterinary hospitals and sub-centres.

7. Most of the farmers complained about the lack of scientific knowledge about modern technology in broiler rearing. Sufficient refresher courses to broiler farmers must therefore be organised periodically by the Agricultural University and/or by the Animal Husbandry Department. It is advisable that the Agricultural University establish a cell for dissemination of information on scientific poultry practice and preventing periodic epidemics which practically exterminate the entire flock. In fact broiler farmings require high technical skill. Hence existing farmers should be provided with short trainings so that they become more skilled.

8. At present there is a heavy inflow of spent birds and broilers from the nearby States. Because of the low

labour costs and lenient taxation policies of the neighbouring States the cost of imported birds remain much lower than that of local broiler. This tendency has to be curtailed by imposing restriction on the quality and quantity of birds entering the State and also by imposing taxation at the entry point.

9. Construction of broiler houses, manufacture of feed, feeders, waterers and energy saving brooding equipments etc. are to be standardised through researches suitable for the environmental conditions of Kerala. Digital thermometer for Agricultural purpose must be made available for the broiler farmer to monitor the poultry house temperature. Scientific use of the poultry manure among farmers must be popularised, which may bring additional income to the farmer.

10. The availing of insurance facility provided to broiler farmers is not being widely utilised as in the case of crop insurance and cattle insurance on the part of broiler farmers about the availability of such insurance and also because of the complexity of procedural formalities associated with bird insurance. To overcome this lacuna the broiler farmer have to be educated about the benefits of insurance by extension agencies, and the procedures for claiming insurance money have to be simplified.

11. It is of much useful if the State Government is encouraging marginal farmers/educated youth to start broiler units by providing infrastructural facilities and necessary

inputs at subsidised rates through IADP or other developmental schemes. Moreover introduction of demonstration of broiler units in all districts of Kerala, so that farmers can get acquainted with modern management practices.



SUMMARY

SUMMARY

In order to understand the current status of broiler farming in the State both in terms of management and techno-economic aspects a survey was undertaken in Trichur district, a major broiler producing district in Kerala State. Thirty-two farms were selected based on holding strength and frequency of intake for the survey. Data were collected through schedules, by periodical visits to selected farms and recording basic information and changes between visits. Many farmers maintained some form of records from which many information could be obtained. The results obtained, on analysing the data revealed valuable information on the working of broiler units. The principal findings are summarised below.

1. The concept of collective or co-operative farming has not taken root among the broiler farmers, although some attempt has been made in this direction.
2. All the farmers were literate and have studied upto and some above 10th standard. Over 10 per cent were graduates.
3. One of the major motivating factor for taking to broiler farming is its ability to generate income quickly and to sustain the farmer in this enterprise.
4. Involvement of financing agencies have greatly augmented broiler production in the State.
5. Most of the farmers have adopted scientific management practices and were getting reasonably good body weight.

feed efficiency and net returns. However, health cover was not adequate.

6. Majority of the farmers had constructed permanent structures for housing birds, indicating that they may continue in this profession for quite some time.
7. It was also observed during the survey that, there was no definite marketing agency or market channel. Consequently one of the major bottle-neck faced by the farmer is the lack of remunerative prices for the product and absence of any protective buffering system during lean periods.
8. All the farmers disposed off their birds at the farm site itself either to wholesaler or through retail market. Retail marketing was very small.
9. The general trend among broiler farmers is to sell live birds. The practice of selling dressed broiler, or as cut-up parts has not caught up on a significant scale. Dressing of birds after sale is done as a service to oblige the consumers.
10. Majority of the farmers were raising 300 birds per crop and the frequency of intake in most cases was fortnightly.
11. The overall results of the present survey has yielded valuable information on mortality rate, body weight and feed conversion ratio, the mean values being 6.69 per cent, 1.48 kg and 2.49 respectively. The different cost components per bird sold were also assessed.

These farms had higher mortality (13.56%) and low body weight at disposal resulting in low profit margins.

19. The study revealed that further progress in terms of better productivity can be achieved only by improving the efficiency of production. Some of the areas warranting attention of the farmers are reduction in feed cost, increasing livability and adoption of a marketing system which will ensure better returns.

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APPENDICES

APPENDIX I

PROFORMA

A SURVEY OF BROILER PRODUCTION AND MARKETING IN TRICHUR

SCHEDULE I - GENERAL INFORMATION

1. Name of the Farm :
2. Location and distance from nearest city/town (km) :
3. Date of establishment :
4. Ownership status : Individual/Partnership
5. Name and address of principal operator :
6. Age :
7. Religion :
8. Educational status :
9. Occupation of principal operator :
10. If registered - place and year of registration :
11. Total area of the farm :
12. Total capacity of the farm :
13. Total birds at the time of first visit :
14. Frequency of chick purchase : Weekly/fortnightly/monthly
15. Number of chicks purchased per consignment :
16. Mode of delivery of chicks : Door delivery/Railway Station/Hatchery counter/Agency
17. Size of holding (in the case of individual ownership)

	<u>Acres</u>	<u>Cent</u>
Wet land		
Dry land		

(contd.)

Appendix II contd.

18. Total number of family members :

19. Labour engaged	:	Male	Female	Child
a) Family labour				
b) Hired labour				

20. Source of expert advice :

21. Source of finance :

22. Motivation :

23. Constraints and other experiences :

APPENDIX II

SCHEDULE II - POULTRY HOUSE AND INFRASTRUCTURE

- | | |
|--|---|
| 1. Site | : Lowlying/garden land/hilly area |
| 2. Direction (lengthwise) | : a) East-west (b) North-south |
| 3. Type of building | : Temporary/permanent/
semi-permanent |
| 4. Power supply | : Temporary (Elect)/Permanent
(Elect)/Kerosene |
| 5. Availability of standby generator | : Yes/No |
| 6. Special devices if any for thermoste-regulation | : |
| 7. Location of farm in relation to owners residence (km) | : |
| 8. Number of poultry houses | : |
| Dimension of each house (in feet/metres) | |
| a) Length | : |
| b) Width | : |
| c) Height from ground | : |
| d) Height of side wall | : |
| e) Height of chicken mesh | : |
| f) Height at eave | : |
| g) Height of poles | : |
| h) Number of pan | : |
| i) Type of roofing | : |
| j) Roofing material | : |
| k) Flooring | : |
| l) Ventilation | : |

(contd.)

Appendix II contd.

- m) Construction cost :
- n) Year of construction :
- o) Overhang (length) :
- p) Separation in between ,
pen :

- 9. Annual repair and maintenance cost :
- 10. If loan amount, then interest paid :
- 11. Insurance/Taxes paid, if any :
- 12. Miscellaneous expenditure :
- 13. Cost of land in that area :
- 14. Average current charge per month :
- 15. Approximate expenditure for veterinary aid :
- 16. Other details if any :

APPENDIX III

SCHEDULE III - BROODING AND REARING

1. Type of brooding : Brooder/Infrared/Ordinary bulb
2. Period of brooding : One week/two week/three week
3. Type of chick guard : Metallic/card board/wood
4. Type of hover :
5. Do you perform brooding-
cun rearing in same pen : Yes/No
6. If so, do you have separate
brooding room : Yes/No
7. Feeding time :
8. Period of feeding (a) starter (b) Finisher

Details pertaining to each crop in each pen

1. Number of chicks/pen :
2. Total floor area :
3. Floor space/chick(sq.ft) :
4. Type & number of feeders :
5. Type & number of waterers :
6. Capacity of waterers :
7. No. & Wattage of bulbs :
8. Wattage/chick :
9. Average body weight :
10. Average feed consumption :

(contd.)

Appendix III contd.

Details pertaining to equipment

Equipment	Total No.	Total value	Year of purchase	Life period	Dimension
Feeder					
a)					
b)					
c)					
d)					
Waterers					
a)					
b)					
Other					
Others, if any					
Total cost of equipments					: Rs.

APPENDIX IV

SCHEDULE IV - PROCESSING AND MARKETING

1. Do you have a processing unit : Yes/No
2. If no, do you perform hand dressing : Yes/No
3. If yes, do you skin the bird/
pluck the bird : Yes/No
4. Do you sell cut up parts : Yes/No
5. Do you have cold storage : Yes/No
6. If yes, at what percentage
selling through cold storage
(mention average selling
price/kg meat) :
7. Age at marketing (in weeks) : 5 6 7 8 9 10
8. How birds sold : Wholesale/retail/both
9. If both at what proportion :
10. Mode of sale : Live/dressed/both
11. If both at what proportion :
12. If selling to the wholesaler,
does he come and collect
from the farm : Yes/No
13. Do you transport to the
wholesaler : Yes/No
14. Do you dress live birds
after sale : Yes/No
15. If yes at what percentage :
16. If dressed, what packing
material used :
17. Dressing charge collecting
from the consumer :
18. How the offals disposed :

(contd.)

Appendix IV contd.

19. Average quantity of feed required to produce 1.8 kg/2 kg broiler and period required
20. Monthly demand in the area : Highest
Average
Low
21. Special seasonal demand :
22. Experience about different chicks :
23. Experience about different feeds :
24. Mode of delivery of feeds : Door delivery/agent/shop

**WORKING SHEETS FOR RECORDING PRODUCTION AND MARKETING
PARAMETERS PERTAINING TO EACH CROP**

1. Date of consignment
2. Number of crops purchased and brand of chicks
3. Source of chicks
 - a) Local - Inside State
 - b) Import - Outside State
4. Number of chicks purchased
5. Value of chicks including tax (Rs)
6. Transportation charges of chicks (Rs)
7. Feed consumption
 - a) Quantity (kg)
 - b) Value (Rs)
8. Litter materials
 - a) Quantity (kg)
 - b) Value (Rs)
9. Hired labour
 - a) Number of labours
 - b) Wages (Rs)
10. Cost of medicine and vaccine
11. Disinfection cost
12. Miscellaneous
13. Mortality (No.)
14. Number sold (live/dressed)
 - a) Wholesale (No.)
 - b) Retail (No.)
 - c) Wholesale (kg)
 - d) Retail (kg)

(contd.)

Appendix V contd.

15. Dressing charges (Rs)
16. Marketing cost (Rs)
17. To whom sold with quantity
18. Sale price per kg
 - a) Wholesale (Rs)
 - b) Retail (Rs)
19. Sales of manure (Rs)
20. Sales of gunny (Rs)
21. Average weight per bird sold
22. Average feed consumed per bird sold
23. Feed conversion ratio.

STATUS OF BROILER PRODUCTION IN KERALA WITH SPECIAL REFERENCE TO TRICHUR

By

M. ABOOBACKER, B.V.Sc. & AH.

ABSTRACT OF A THESIS

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Faculty of Veterinary and Animal Sciences

Kerala Agricultural University

Centre for Advanced Studies in Poultry Science
COLLEGE OF VETERINARY AND ANIMAL SCIENCES
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ABSTRACT

A survey was undertaken to assess the present status of broiler farming in Trichur, a major broiler producing district in Kerala. Thirtytwo farms were selected for the survey based on holding strength and frequency of intake.

The following are some of the salient points that emerged from the survey.

All the farmers were literate and had taken up broiler farming for generating additional income to sustain the family. Majority of the farmers were raising 300 birds per crop with fortnightly intake and were adopting scientific management practices. Organised marketing channel was absent and the birds were disposed off at the farm site itself in retail or wholesale. Dressing of birds in large scale was not being practised. Results indicated that the mortality rate, body weight at marketing and Feed Conversion Ratio were 6.69 per cent, 1.48 kg and 2.49 respectively. The major portion of production cost was attributed to feed (56.26%) followed by chick (28.56%) and labour (4.31%). Seasons of the year had no appreciable effect on broiler productivity except slight higher mortality due to heat-stress during hot seasons. Study also revealed that increasing the stock intake reduces the cost of production with increase in net return. The productivity both in terms of market body weight and livability were adversely affected

in farms where hired labour was used resulting in much lower net income. Low profit farms (less than Rs.2.00 per bird sold) showed higher mortality (13.86%) and low body weight at disposal.

The survey revealed that better productivity could be achieved by improving efficiency of production particularly reduction in feed cost, increasing livability and adoption of a tangible marketing system so as to obtain remunerative price even during lean seasons.