PROFITABILITY INDEX AND CAPITAL TURN OVER IN OPEN HOUSE BROILER FARMING: A CASE STUDY OF DISTRICT RAWALPINDI

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ABSTRACT:- This investigation reveals the profitability index of open house broiler farms and is based on the survey of 40 broiler farms in district Rawalpindi. The analysis covers the descriptive analysis of socioeconomic characteristics of the sample poultry farmers along with cost and profitability analysis. Broiler farming was done by adult males on full time basis. It was the main source of income of a family. The average flock size in the study area was 4033 birds. The study also bifurcates the cost structure and fixed cost accounts for 7 % while variable cost accounts for 93% of total cost of production. Feed makes the major share and accounts for 49.34%. Broiler production in the study area is profitable with a profitability index of 0.24, capital turnover of 1.32 with a rate of return on fixed cost 424% and on variable cost 135%. The issues and problems in broiler farming are also narrated.

Key Words: Profitability Index; Capital Turn Over; Open House Broiler Production; Pakistan.

INTRODUCTION

Pakistan has a vibrant poultry sector, with more than half a billion birds produced annually (GoP, 2006 a & b). Poultry production in Pakistan is an important part of agro industry and plays its role in food security of the country. Commercial poultry production has bridged the gap between supply and demand of animal protein. It has kept a check on prices of mutton and beef meat. Poultry is the cheapest available meat protein for our masses and is the second largest industry having 200 billion investment. It is producing and supplying in the market 10712 million table eggs, 601,000 tons of poultry meat and at present contributes 19% of total meat consumption (GoP, 2008).

At present 66% Pakistani are deficient in protein. The requirement of protein is 102.7 g head^{-1}day^{-1} while available protein for consumption is 69.61 g head^{-1} day^{-1}. The gap in requirement of protein is 33.09 g head^{-1}day^{-1} (GoP, 2003). Animal proteins are important food source to provide us essential amino acids in proper proportion and in digestible form (Ahmad, 2009). Poultry meat is a good source of cheap, palatable and nutritious protein (Ghafoor et al., 2010) available in the country. The time required for raising broiler birds is lesser than that for mutton and beef animals. The consumption of white meat is increasing due to growing health consciousness in the masses. According to the Agriculture Statistics of Pakistan the per capita consumption of poultry meat is increasing at a rate of 4% per annum (SMEDA, 2008).To overcome the gap between supply and demand of proteins, poultry meat is contributing a dominant share which can be enhanced by improving the profitability of producers and by decreasing prices at the retail level. The existing infrastructure of poultry sector has capability to narrow down the gap between supply and demand of proteins (Maqbool et al., 2005).

Higher demand for broiler meat in Pakistan, earlier market age and rapid returns over the invested capital, have increased the popularity of broiler farming (Farooq et al., 2001). At present there are about 22688 poultry farms in the Punjab province with an investment of Rs. 28500 million. There are 119 feed mills which produced 2.17 million ton poultry feed. There is a capacity to produce 491.04 million broiler birds, 20.8 million layer birds and 5.53 million breeding stock while 329

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million broiler birds, 16.61 million layer birds and 4.85 breeding stock are actually being produced in Punjab province (PRI, 2008). This sector generates employment (direct/indirect) and income for about 1.5 million people (GoP, 2010).

In Pakistan, broilers are commonly produced in open-sided houses. Broiler farming in these structures may not be a significant problem in mild climates. However, it would become more complex in open-sided houses when the environmental conditions are unfavorable in winter or summer seasons. Severe economic losses may be indicated if an optimal environment is not ensured within the houses (Zahir-ud-Din et al., 2005).The cost of production in Pakistan is comparatively high as 70% of feed ingredients are still imported causing increased cost in freight as well as exchange rates. Poultry farming operations in Pakistan still depend solely on imports of all inputs, the bulk of which come from the U.S. and the U.K (USAID, 2005). Although, the farmers have managed to keep the mortality rate on lower side under normal circumstances, however, the marginal efficiency of the capital is not promising for investors of this sector due to high cost of production (Ahmad et al., 2008). For economical production mortality in broilers should be in the range of 2-5 % (Kitsopanidis and Manos, 1991). However higher mortality rate in broilers (6.13%) was reported by Asghar et al. (2000) in Mardan. A wide variability in the profitability in broiler production is reported in literature. As the broiler farming is one of the important businesses in the study area therefore, the present study was conducted to provide the cost and profitability structure for the investors and to highlight issues and problems in open house broiler production with possible suggestions for policy makers to take possible measure for providing conducive enabling environment for the broiler industry.

MATERIALS AND METHODS

The study was confined to Rawalpindi district (Punjab) and was based on primary data collected through a well structured questionaire during 2009 from 40 open house broiler farmers. The list of poultry farms who were working in Rawalpindi district was obtained from Poultry Research Institute, Rawalpindi open house poultry farmers were selected through simple random sampling.

In first stage initial information from secondary sources were gathered, while in the second stage, informal and formal surveys were conducted in the study area. It was vital to have the basic information regarding broiler farming, farm's practices, important issues and problems for detailed investigations. The information was collected from different sources such as, Poultry Research Institute, Rawalpindi; National Agricultural Research Centre, Islamabad and Provincial Livestock Department, Lahore as well as from review of literature. Besides the cost of different components broiler production the information collected also includes socioeconomic characteristics of broiler farmers like education level, family structure, age, etc. Along with the descriptive analysis and budgetary techniques (Akinsoye, 1989) the most common technique used in this study was profitability analysis (Ajala et al., 2007, Mohsin et al., 2008, Zubair et al., 2004).

Profitability Index

The profitability index (PI) is the Net Farm Income (NFI) per unit of Gross Revenue (GR). Data was analysed using descriptive and budgetary technique (Akinsoye, 1989 and Ajala et al., 2007).

Therefore PI=NFI / GR
This equation can also be stated as:
NFI=TR - (TVC+TFC)
where,
NFI = Net farm income in rupees
TR = Total revenue in rupees
TVC = Total variable cost in rupees
TFC = Total fixed cost in rupees
Net farm income signifies the difference between total revenue in rupees for the farm and total expenses of production in rupees. Total revenue is defined as total money value of all broilers sold in last flock.

Total cost (TC) is defined as the sum of fixed cost (FC) plus variable costs (VC) i.e., TFC + TVC + TMC = TC (Bishop and Toussaint, 1958). The total cost of production (TC) was divided into fixed costs and variable costs. Fixed costs included the cost of land and equipment whereas, the variable costs included, the cost of day old chicks, cost of feed, vaccination, labor charges and other miscellaneous charges such as electricity and gas etc. (Mohsin et al., 2008).

The variable costs are specific to an enterprise and vary with its scale i.e., variable cost has direct relationship with the level of output. The variable cost includes the cost incurred on: day old chicks; feed; vaccination; energy charges; litter; lime and medication; wages of casual labor; and, others day to day expenditure of the farm. These costs are known as working capital required for the production cycle (Nix, 1979). Total fixed costs (TFC) are those costs incurred which don't change when output, changes and therefore no influence on production decisions in the short run. Total variable cost (TVC) is the cost of variable inputs used in production. They change directly with the level of production. Gross margin is the difference between total revenue and total variable cost.

GR = TR-TVC

The following profitability measures were calculated

TC = TFC + TVC

Rate of Returns on investment % = (NFI / TC) * 100

Rate of Return on Variable Cost % = (TR – TFC) / TVC * 100

Rate of Return on Fixed Cost % = (TR – TVC) / TFC * 100

Capital Turn Over (CTO) = TR / TC

Above techniques were applied for the analysis of the survey data following the methodology used by Ajala et al. (2007).

RESULTS AND DISCUSSION

Socioeconomic Characteristics of Broiler Farmers

Structured questionnaire was used to collect information on socioeconomic variables such as age, gender, household size, education and respondent position, major source of income, farm size and years of experience. The largest proportion (37.5%) of respondents falls between the active working ages of 31-40 years while 20 % and 27.5% respondents fall in the age group of 21-30 years and 41-50 years (Table 1).

Table 1. Socioeconomic characteristics of sample broiler farmers

Characteristics/unit	
Age of respondent (%)	
Less than 21	05
21-30	20
31-40	37.5
41-50	27.5
51-60	10
Broiler farming	
Experience (years)	11
Family size (No.)	7
Involvement in poultry farming	
Full time (%)	82.5
Part time (%)	17.5
Major source of income	
Poultry farming (%)	77.5
Other agriculture crops, livestock (dairy etc) (%)	2.5
Private business (%)	15
Employment (%)	5

The age group of 51-60 years accounts for 10% while >21 years age group respondents account for only 5%. The average poultry farming experience was 11 years. Average household size of sample producers was 7 mostly (67%) living in joint family setup. As there was no tradition of female participation in broiler farming therefore all respondents were male. Majority of the broiler farmers (90%) were educated while 10% were illiterate (Table 2).

Table 2. Education level of sample response

Education level	Percent
Illiterate	10.0
Primary	12.5
Secondary	75.0
Tertiary	02.5

It was analyzed that 80% broiler respondents were head of the family while the remaining 20% were the family members, managers and workers. Majority of the farmers (82.5%) were involved in the full time farming while 17.5% was carrying part time farming activities. The data shows that 77.5% respondents pointed out poultry farming as the main source of their livelihood while the remaining 22.5% broiler producers were involved either in government jobs, private services and other agricultural activities. Most of the farmers were small holders (65%) having upto 3000 birds, 28% farmers own 3001-6000 birds while only 7% farmers operated their business on 6100-13000 birds (Table 3).

Table 3. Broiler farm size of sample respondents

Farm size	Percent
Up to 3000	65
3001-6000	28
6001-13000	07

In the study area four breeds of broilers were reported by the sample farmers. The majority of the farmers (77.5%) were having Hubbard breed. Among the other breeds 10% farmer reported each Arbor and Hybro while only 2.5% were rearing Starbro breed (Table 4).

Table 4. Broiler breeds used

Broiler breeds used	Percent
Hubbard	77.5
Arbor	10.0
Hybro	10.0
Starbro	2.5
Total	100.0

Returns and Profitability Measures of Small Broiler Farmers

The average flock size in the study area was 4033 birds and average cost of day old chick amounted to Rs 40 which account for 31.29% of total cost (Table 5). Out of the total cost, cost of finisher feed (Rs 51.27) constituted the highest share of the total cost, accounting for 40.11% while cost of starter feed accounts for 9.22% of total cost. Cost of labor accounts for 3.89% while the cost of vaccination and medication was 3.11% of total cost. Other items such as feeders, drinkers, fuel, electricity bills, litter cost, spray cost, gloves cost and repair cost contributed <1% to total cost of production. The variable costs per flock accounts for 90% while fixed cost per flock account for 10% of total cost of investment. Similar results were deducted by Ahmed et al. (2008) in Azad Kashmir and Rajendran et al. (2008) in India. The total revenue per broiler bird was Rs. 169 while the total cost incurred per bird was Rs.128. Khan et al. (2004) found smaller cost of production and net profit in Chakwal than the present study which implies that overtime prices has increased.

Net factor income or net return are defined as difference between total revenue (TR) and total cost (TC) i.e. TR-TC. Net returns were determined by subtracting total cost of production from total income per flock realized by the broiler producer (Table 5).

The average net return earned by the selected producers were Rs. 164318 per flock of 4033 birds (Rs 40.75 per bird). Farooq et al. (2001) used same methodology to calculate the net returns for broiler production in Mardan, KPK and the net return were Rs.79200 flock^{-1} of 1000 birds.

The broiler farmers generated revenue through the sale of live chicken. Income generated by the enterprise was used back into business for purchasing medicines, feed, vaccines, etc. thus making the Capital Turn Over (CTO) to be greater than 1, implying that for every Rupee spent on broiler production about 1.32 Rs. returned to the farmer as revenue. Mohsin et al. (2008) also found CTO of about 1.10 to 1.34 for medium to large size open house broiler farms in Rawalpindi district.

At the end of production year a total of 6069 kg of broiler live weight @ Rs. 4480 40 kg^{-1} was achieved. During the production period the average farmer had invested Rs.515410, out of which Rs. 464648 and Rs. 50762 were variable and fixed cost respectively. The Net farm income (NFI) which represents the return to management and labor accounted for Rs.164318, hence a return to investment about 32%.

Table 5. Cost of production profitability index of broiler farmers flock

Items	Avg. cost (Rs/flock)	% of Total cost	Avg. cost(Rs./bird)
Variable cost			
Day old chicks	161300	31.30	40.00
Starter feed	47537	09.22	11.79
Finisher feed	206744	40.11	51.27
Vaccines and medicines	16038	3.11	3.98
Fuel/gas bills	4100	0.80	1.02
Electricity bills	4248	0.82	1.05
Litter cost	2000	0.39	0.50
Spray cost	502	0.10	0.12
Gloves/mask cost	116	0.02	0.03
Labor	20070	3.89	4.98
Other cost	428	0.08	0.11
Repair cost	1566	0.30	0.39
Total variable cost	464648	90.15	115.23
Fixed cost			
Interest rate @ 16%/annum	12406	2.41	3.08
Round feeders	1133	0.22	0.28
Trough feeders	483	0.09	0.12
Water trough/drinkers	427	0.08	0.11
Others	15063	2.92	3.74
Rent	21250	4.12	5.27
Total fixed cost	50762	9.85	12.59
Total cost	515410	-	127.81
Total Revenue	679728	-	168.56
Net factor income	164318	-	40.75

The profitability index (PI) was 0.24, indicating that for every rupee earned as revenue 24 paisas are returned to the farmer as net income (Table 6).

Table 6. Different profitability measures of broiler farming

Indicators	Values
Profitability index (PI)	00.24
Capital turn over (CTO)	01.32
Rate of returns on investment (%)	31.88
Rate of return on variable cost (%)	135.36
Rate of return on fixed cost (%)	423.71

With a CTO of about 1.32 and PI of about 0.24, improvements in broiler production is likely to increase the returns of broiler farmers. The turnover (Gross Revenue) of Rs.679728 resulted in a net income (return to management) of Rs.164318 per farmer per flock. The rate of returns on fixed cost and variable cost was estimated at 424% and 135%, respectively. Hence every rupee cost incurred on fixed cost generated Rs.4.24 while the rate of return on variable cost generated Rs 1.35. This indicated that to maximize profit from broiler production, all the inputs should be used at their optimal level. For example, more efficient use of feed input can bring about increased revenue realized from broiler production because it accounts for highest cost of production.

Broiler producers in the area responded to different problems. High feed prices (25%), inappropriate marketing outlets (15%), high input prices (15%), diseases (10%), lack of quality of inputs (7.5%) and unavailability of veterinary services (7.5%) were the major problems faced by the broiler producers in the area (Table 7). Other problems reported by broiler farmers were lack of poultry farming knowledge, unavailability of inputs, labor unavailability and harsh weather.

Broiler production is a profitable business in the study area. With a Capital Turnover (CTO) of about 1.32 and Profitability Index (PI) of about 0.24, improvements in the broiler production is likely to increase the returns to investment of broiler farmers. Most of the farmers are small farmers and they should increase their level of production for increased profitability. For this purpose day old chicks should be supplied to farmers at affordable rates. The cost of feed makes the highest proportion of cost of production, therefore proper attention for input market development be given to make the small scale production competitive. Monitoring of feed quality and proper laboratory testing facility must be ensured by the concerned departments for production of quality feed. Feed prices should also be controlled by the government. There was lack of high quality laboratories for proper viral and bacterial isolation and confirmation of causative agents in the study area. Poultry producers take the diseased birds to local veterinarians and the often guess at the diseases based on previous experience and post mortem. Proper disease and health management will improve the overall productivity of farmers which in turn will generate more income. Least cost was incurred on health and disease management at open house small farms which implies that traditional practices were being used

Table 7. Problems faced by broiler producers

Constraints	Frequency	Percent response
High cost of feed	10	25
Inappropriate marketing outlets for sale of produce	06	15
High input prices	06	15
Diseases	04	10
Lack of quality	03	07.5
Unavailability of veterinary services	03	07.5
Lack of poultry farming knowledge	02	05
Unavailability of inputs	02	05
Labor unavailability	02	05
Harsh weather	02	05
Total	**40**	**100**

for disease control due to lack of knowledge. Mortality plays a major role in determining the rate of income generated from broilers. Higher mortality could be attributed to poor management, ineffective health coverage programs and severe outbreaks of diseases. Effective vaccination against diseases, antibiotic therapy and cleanliness could reduce incidence of mortality (Mukherjee and Khamapurkar, 1994). It is therefore recommended that extension staff should be able to motivate farmers to bring about desired changes in the poultry farming pattern and to adopt recommended farming practices. Small poultry producers should also be able to get credit facility from formal credit market and short term soft loans should be offered to them. The identified problems to broiler production by the farmers must be addressed by the research and development agencies.

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