

Research Article



Comparison of Net Revenues of Open Shed and Environmentally Controlled Shed Broiler Farms in Punjab, Pakistan: Dummy Variable Regression

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Abstract | Poultry sector of Pakistan is generating direct and indirect employment and provision of income for millions. This study, therefore, estimated and compared costs and revenues of open shed and environmentally controlled (EC) shed broiler farms in Punjab, Pakistan. Multistage sampling technique was applied for selection of sampled respondents. 120 farmers, 60 farmers of open shed and 60 farmers of EC shed were interviewed during 2014. Dummy variable regression was applied for estimation and comparison of costs and revenues of open shed and EC shed broiler farms. Results revealed that there was statistically significant difference between the cost of production and net revenue of open shed and EC shed farms. Cost of production of open shed was PKR¹ 247.22 per broiler and that of EC shed was PKR 221.61 per broiler. Gross revenue was PKR 257.489 per broiler for open shed and PKR 294.112 per broiler for EC shed. Net revenue was PKR 10.269 per broiler for open shed and PKR 72.502 per broiler for EC shed. It is suggested that open shed broiler farmers also need to buy vaccinated day old chicks from standard hatcheries for fostering boiler productivity and net revenue. Moreover, use of high quality feed for highest possible output is a good option for open shed farmers.

1 PKR = Pakistani Rupees; 1 US \$ = 102 PKR

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Introduction

Poultry are those birds which have been domesticated and rendered for meat and eggs and certain by products. There are three types of chicken on the basis of purposes. Chicken (*Gallus domesticus*) is the chief bird of poultry. The chicken reared for meat production are broilers, for table eggs production are layers and those for the production of fertile eggs to get new offspring, are known as breeder. The chicken meat and eggs has excellent nutritional value having better digestibility and it is the cheap source of animal protein. The share of protein in egg and chicken

meat is 74 and 66 percent, respectively. The contribution of energy in liquid egg and chicken meat is 163 and 200 k cal., respectively. Vitamins and minerals are also part of the liquid egg and chicken meat (Haq and Akhtar, 2004). Poultry products provide direct cash and other sources of livelihood for many inhabitants and also are the sources of organic manure (Oyedipe, 2000).

In early sixties, there was no commercial poultry farming in Pakistan, the demand of egg and meat was fulfilled by the rural poultry. In 1965, first commercial hatchery was started in Karachi (Pakistan) by mutual

collaboration of Pakistan international airline and a Canadian firm shaver, Canada (Maqbool et al., 2005). After that government of Pakistan established poultry research institute at Karachi and Rawalpindi. Loans were provided to the poultry farmers without interest rate by ADBP and UNDP. The establishment of poultry board and directorates of poultry production in Karachi and Punjab for extension services were the major steps of government.

In Pakistan, the poultry industry is the second largest industry after textile. Egg and chicken meat is used in most food items and it gives us quick service dining menus. It has shown very rapid growth and has impact on the national economy as increase in GDP. It creates most job opportunity in government and private sector. Poultry farming has very splendid future in the competition of other industries because it provides quick return after investment, size of the bird is small than the large animals and in rural area it can be started with less investment as a cottage industry. In future it will reduce the demand of beef and mutton (Haq and Akhtar, 2004).

The poultry sector of Pakistan is generating the employment (direct or indirect) and provision of income for 1.5 million people. The share of poultry in agriculture and livestock is 6.4% and 11.5% respectively. The current investment in poultry sector is 200.00 billion. The poultry sector has shown a growth rate of 8% to 10% annually (GOP, 2012).

During 2011-2012 the layer, broiler, breeding stock and rural production was 244.86, 497.11, 11.83 and 37.23 million respectively, in Punjab out of which the share of Rawalpindi division was 2.33, 55.34, 1.22 and 4.2 million respectively. Total numbers of farms of layer, broiler and breeder was 581, 3267 and 128, respectively in Rawalpindi division. In Punjab total investment was 165 billion in 2011-12 and per capita availability of eggs and meat was 84.34 (numbers) and 5.76 (kg) respectively (Govt. of Punjab, 2012). Poultry sector is of key importance and there is vast scope of development of poultry industry. The Government of Punjab is encouraging the small and medium scale projects of power generation from biomass and controlling the energy crises. It has double benefit first one for poultry breeder and second one for provision of cheap electricity. Government of Punjab is also encouraging the new investment in this sector.

It is evident from the literature that the major focus of the firm is to maximize profit by reducing cost of production and increasing gross revenue. Though poultry sector is producing the lucrative output but still there is room to enhance the productivity and profitability of this sector. Poultry farming is a profitable business. It also meets the demand for food and government of Pakistan is also taking keen interest in this sector as compared to other sectors but unfortunately broiler farmers are facing various constraints in the way of optimal profit margin.

In Pakistan the poultry sector is one of the lucrative sectors, however, the poultry farmers are not fully aware of costs and net revenues producing broiler. To evaluate the poultry farms productivity and profitability, there is dire need to estimate and compare costs and net revenues of open shed and environmentally controlled shed broiler farming on farm level as well as per broiler basis. The estimation and comparison of costs and revenues of broiler farming is an important measure because there is potential to increase the production and net revenue by reducing cost of production per broiler and thereby increasing income level of the poor broiler farming community. This study will help to identify the input issues that cause lower profit margins in broiler farming and will also help to suggest the policy guidelines to increase the broiler production in the country. This study, therefore, investigates to estimate and compare costs and revenues of open shed and environmentally controlled shed broiler farming in the study area.

Data and Methodology

Universe, sampling technique and sample size of the study

This study was carried out in four districts of Rawalpindi Division, Punjab, Pakistan. Multistage sampling technique was used for the selection of sample size. In the first stage, out of four major broiler farming districts, four districts namely Chakwal, Rawalpindi, Jhelum and Attock were purposively selected. The reason behind this selection was that these four districts have large number of broiler farms in Rawalpindi Division (GoP, 2012). In the second stage from each district, 8 villages were randomly selected from a list of major broiler producing villages. In the third stage 120 sampled farms, 60 farms of open shed and 60 farms of environmentally controlled shed were randomly selected through proportional allocation

sampling technique as shown in table 1 (Cochran, 1977; Chaudhry and Kamal, 2010; Pandey and Verma, 2008).

$$n_i = n * (N_i/N) \dots\dots\dots (1)$$

Where;

n_i = Number of sampled broiler farms in ith district.

n = Total sample size.

N_i = Total number of broiler farms in ith district.

N = Total numbers of broiler farms in the study area.

Table 1: Population and sample size of broiler farms in Rawalpindi Division

Districts	Number of poultry broiler farms	Sample size*
Chakwal	1519	56
Rawalpindi	865	32
Jhelum	525	19
Attock	358	13
Total	3267	120

Source: Statistical Report of PPRI, 2012.

*Author's estimates from statistical report of PPRI, 2012.

Data collection

A well-structured interview schedule was used for the gathering of primary data from the broiler farmer. The sampled farmers were interviewed personally either at their farms or at homes. Through this research the farmers were provoked in order to obtain exact and relevant data for accurate results. Secondary data was collected from different government and official sources e.g. government of Pakistan, Punjab poultry Research institute Rawalpindi, Economic survey of Pakistan and Agriculture Statistics of Pakistan.

Analytical framework

After collecting required data on broiler yield in numbers as well as kilograms, inputs used in the production process, prices of broiler output and by product and inputs and other factors involved in the production was analyzed using the following analytic procedure to achieve the objectives set in the introductory section.

Estimation of costs and revenues of broiler production

The following procedure was used while classifying, tabulating and analyzing data on various costs borne and the income generated from broiler production.

Actual wage rate which was paid to the hired labor was considered, and in case of family labor the cur-

rent rate of the labor was considered. For land rent, the actual cash paid to the owner was taken, while for owned operated shed, imputed values of rent was calculated. Actual sale price per kilogram of broiler, manure and empty bags was considered for calculating gross revenue from broiler farms.

Net revenues (Economic profit) of broiler farmers were calculated by using the following formula (Debertin, 2012; Varian, 1992).

$$NR_i = TR_i - TC_i \dots\dots\dots (2)$$

$$TR_i = P_{Yi1} * Y_{i1} + P_{Yi2} * Y_{i2} \dots\dots\dots (3)$$

$$TC_i = \sum P_{Xi} * X_i \dots\dots\dots (4)$$

Where

NR_i is net revenue of ith farmer from broiler production (PKR per shed), TC_i represent total cost of broiler production of ith farmer (PKR per shed), TR_i is for total revenue of ith farmer from broiler production (PKR per shed), P_{Yi1} stands for price of main output (broiler) of ith farmer (PKR per kilogram), Y_{i1} is quantity of main output (broiler) produced by ith farmer (kg per shed), P_{Yi2} is Price of byproduct (liter) of ith farmer (PKR per kilogram), Y_{i2} is quantity of byproduct (broiler) produced by ith farmer (kg per shed), X_i is quantities of inputs applied by ith farmer (unit) and P_{Xi} is prices of input of ith farmer (PKR per unit)

Comparison of costs and revenues of open shed and EC shed broiler production

Literature reveals that there are two approaches to compare data on variable i.e., t-test and dummy variable approach. T-test shows whether there is statistically significant difference between two variables or not but it does not take into account the magnitude of difference between two variables. Dummy variable approach has the capability of describing significant/insignificant difference as well as magnitude of difference between two variables (Gujarati and Porter, 2009). Dummy variable approach also provides the direction of differences through positive and negative signs.

Data regarding number of broilers, average weight of broiler in kilograms, total variable cost of broiler, total fixed cost of broiler, total cost of broiler, gross revenue per broiler, net revenue per broiler, and average weight of feed of broiler and average cost of feed of broiler was statistically analyzed by using SPSS. The following regression models were applied.

$$MR_i = \beta_0 + \beta_1 D_{1i} \dots\dots (5)$$

$$CDCM_i = \beta_0 + \beta_1 D_{1i} \dots\dots (6)$$

$$FCB_i = \beta_0 + \beta_1 D_{1i} \dots\dots (7)$$

$$CFCB_i = \beta_0 + \beta_1 D_{1i} \dots\dots (8)$$

$$VAC_i = \beta_0 + \beta_1 D_{1i} \dots\dots (9)$$

$$LBD_i = \beta_0 + \beta_1 D_{1i} \dots\dots (10)$$

$$CLB_i = \beta_0 + \beta_1 D_{1i} \dots\dots (11)$$

$$OOC_i = \beta_0 + \beta_1 D_{1i} \dots\dots (12)$$

$$TVC_i = \beta_0 + \beta_1 D_{1i} \dots\dots (13)$$

$$TFC_i = \beta_0 + \beta_1 D_{1i} \dots\dots (14)$$

$$TC_i = \beta_0 + \beta_1 D_{1i} \dots\dots (15)$$

$$AWB_i = \beta_0 + \beta_1 D_{1i} \dots\dots (16)$$

$$GR_i = \beta_0 + \beta_1 D_{1i} \dots\dots (17)$$

$$NR_i = \beta_0 + \beta_1 D_{1i} \dots\dots (18)$$

Where

MR_i is the mortality rate of broiler of ith farm in percentage, CDCM_i is the cost of day old chick after mortality of ith farm, FCB_i is the feed consumed per broiler of ith farm, CFCB_i is the cost feed consumed per broiler of ith farm, VAC_i is the vaccination cost per broiler of ith farm, LBD_i is the labor days spent per broiler of ith farm, CLB_i is the cost of labor per broiler of ith farm, OOC_i is other operating cost per broiler of ith farm, TVC_i is average variable cost per broiler ith farm, FCB_i is average fixed cost per broiler of ith farm, TC_i is the average total cost per broiler of ith farm, GR_i is the average gross revenue per broiler of ith farm, NR_i is the average net revenue per broiler of ith farm.

β₀ shows average of respective dependent variable of open shed, β₁ is the differential slopes showing average difference of respective dependent variable between open shed and EC shed farm, D_{1i} is dummy variable, D_{1i} = 0 for open shed farm and D_{1i} = 1 for EC shed farm.

Results and Discussion

Average cost of production and net revenue from broilers of open shed farms

Table 2 and 3 presents cost of production and net revenue from broilers of open shed farms. On average, initial flock size of day old chicks was 3,395 in number. Day old chicks cost accounted for about PKR 122,287.90 which was about 16.49 percent while average feed cost was about PKR 507,796.00 which accounted for about 68.47 percent of the total cost of production in open shed. Vaccination cost in broiler production was PKR 30,723.32 which accounted for 4.14 percent. Labor cost includes family labor and hired labor cost, was PKR 24,084.00 which accounted for 3.25 percent. Electricity cost for 2 month was PKR 2405.77 with 0.32 percent share and wood for brooding stage having cost of PKR 26,281.64 with percentage of 3.54. The average cost of litter is PKR 5,024.80 with share of 0.68 percent. The managerial cost of one farmer for 80,000 broilers was PKR 40,000 per month so for 3,395.00 broilers and two

Table 2: Average cost of production of broilers of open shed farms

Variables	Units	Quantity	Unit cost (PKR)	Total cost	%
Day old chicks	No	3,395.00	36.10	122,559.50	16.49
Feed	Kg	12,061.67	42.10	507,796.00	68.47
Vaccination	PKR			30,723.32	4.14
Family labor	MDays	29.75	450	13387.50	
Hired labor	MDays	23.77	450	10696.526	
Total labor	MDays	53.52	450	24084.00	3.25
Managerial cost	PKR			3395.00	0.46
Electricity bills	Month	2.00	1,202.88	2,405.77	0.32
Wood (for brooding)	Mounds	69.82	376.42	2,6281.64	3.54
Litter	Trolley*	1.32	3,806.67	5,024.8	0.68
I. TVC	PKR			722,270.03	
II. Rent of building	PKR			16,566.67	2.23
III. Equipment**	PKR			3,117.44	0.42
IV. TFC (II + III)	PKR			19,684.11	
V. TC (I + IV)	PKR			741,954.14	

Source: Estimated from survey data, 2014.

*1 trolley = 150 mounds; ** 20 percent value taken from the total value of equipment for two month

Table 3: Average net revenue of broilers of open shed farms

Particulars	Unit	Quantity	Rate (PKR/unit)	Total value (PKR)
I. Broiler (No)	No	3,002.17 *	158	766,221
II. Manure (Trolley)	Trolley	1.51	2,741.00	4,151.34
III. Empty bags (No)	No	246.15	9.80	2,412.27
IV. Gross revenue (I+II+III)	PKR			772,784.63
V. TVC	PKR			722,270.03
VI. TFC	PKR			19,684.11
VII. TC (V+VI)	PKR			741,954.14
VIII. Net revenue (IV-VII)	PKR			30,830.49

Source: Estimated from survey data, 2014.

* 1 broiler = 1.61533 kilograms; 3,002.17 broilers = 4,849.50 kilograms

month it was about PKR 3,395.00 which was about 0.46 percent of total cost. Total variable cost is PKR 721998.43. Fixed cost includes rent of building and depreciation cost of equipment with having value of PKR 16,566.67 and PKR 3,117.44 with share of 2.23 and 0.42 percent respectively. Sum of total variable cost and fixed cost was PKR 741,954.14.

Average number of broilers (after mortality) sold in the market were 3,002.17 with average weight of 1.615 kg so total quantity sold was 4849.50 kg at the rate of PKR 158 per kg. Revenue obtained from quantity of broiler was PKR 766, 221.00 while revenues obtained from broiler manure and empty bags were PKR 4,151.34 and PKR 2,412.27, respectively. Sum of these three types of revenue was PKR 772,784.63. Average net revenue of obtained from broilers of open shed farms was PKR 30,830.49.

Average cost of production and net revenue from broilers of EC shed farms

Table 4 and 5 presents cost of production and net revenue from broilers of EC shed farms. On average, initial flock size of day old chicks was 79,350.00 which constitute 18.42 percent of total cost with value of PKR 3,150,988.00. The average feed cost was about PKR 10,324,992.70 with 60.32 percent of total cost of production. EC shed vaccination cost was PKR 421908.33 which account for 2.47 percent, respectively. Labor cost was PKR 1,257,024.48 which account for 7.34 percent of total cost of production. Electricity/petroleum/gas cost for 2 month was PKR 617,000.00 with 3.61 percent share in total cost of production. Cost of litter was PKR 208,016.28 with 1.22 percent of total cost of production. Managerial cost was PKR 79,350.00 with share of 0.46 percent. EC shed farms have produced broilers on large scale

Table 4: Average cost of production of broilers of EC shed farms

Variables	Units	Quantity	Unit cost (PKR)	Total cost	%
Day old chicks	No	79,350.00	39.71	3,150,988.00	18.42
Feed	Kg	232,283.30	44.45	1,032,4992.7	60.32
Vaccination	PKR			421908.33	2.47
Hired labor	MDays	411.33	3056	1,257,024.48	7.34
Managerial cost	PKR			79350	0.46
DVM Doctor	PKR			79350	0.46
Electricity/POL/Gas	PKR			617,000	3.61
Litter	Mounds	512.05	406.33	208,061.28	1.22
I. TVC	PKR			16,188,208.41	
II. Rent of building	PKR			503,916.66	2.94
III. Equipment*	PKR			473,055.55	2.76
IV. TFC (II + III)	PKR			976,972.21	
V. TC (I + IV)	PKR			17,165,180.62	100

Source: Estimated from survey data, 2014.

*20 percent value taken from the total value of equipment for two month.

therefore DVM was hired and paid for two months about PKR 79,350.00 which accounts for 0.46 percent in total cost. Total variable cost was PKR 16,188,208.41. Fixed cost includes rent of building and depreciation cost of equipment having value of PKR 503,916.66 and PKR 473,055.55 with share of 2.94 and 2.76 percent, respectively. Sum of total variable cost and total fixed cost was PKR 17,165,180.62.

Average number of broilers (after mortality) sold in market were 77,462.00 with average weight of 1.844 kg so total quantity sold was 142,891.56 kg at the rate of PKR 158 per kg. Revenue obtained from sale of broilers was PKR 22,576,867.95 while broiler manure and empty bags were sold at PKR 145,592.24 and PKR 58,869.64, respectively. Sum of these three types of revenues was PKR 22,781,329.83. Average net revenue from broilers of EC shed farm was PKR 5,616,148.80.

Table 5: Average net revenue of broilers of EC shed farms

Particulars	Unit	Quantity	Rate (PKR / unit)	Total value (PKR)
I. Broiler (No)	No	77462*	158	22,576,867.9
II. Manure (Trolley)	Truck	13.46	10816.7	145,592.24
III. Empty bags (No)	No	4595.7	12.81	58,869.64
IV. Gross revenue (I+II+III)	PKR			22,781,329.8
V. TVC	PKR			16,188,208.4
VI. TFC	PKR			976,972.21
VII. TC (V+VI)	PKR			17,165,181.0
VIII. Net revenue (IV-VII)	PKR			5,616,148.8

Source: Estimated from survey data, 2014.

*1 broiler = 1.844 kilograms; 77462 broilers = 142891.56 kilograms.

Comparison of cost of production and net revenue per broiler of open shed and EC shed farms

Table 6 compares cost of production of open shed and EC shed farms on per broiler basis. In broiler production the first step is to take the day old chicks from the hatchery. Some good quality hatcheries but not all vaccinate the day old chicks to prevent the attack of viral disease (omphalitis) which spread due to contaminated incubators, equipments and room. Cost of day old chicks after mortality was PKR 40.82 per chick for open shed and PKR 40.70 per chick for EC shed. As economic theory suggest that aver-

age cost is the cost per unit of output. Therefore per chick cost was estimated after mortality of broilers at the end of production process. Feed is one of the important components in the production of broiler because broilers need food for growth and healthy life. If farmers buy superior quality chicks and their shelter type is standardized but do not give balance and quality diet to chicks, different diseases will attack chicks. At the end, farmers cannot attain good quality meat from broiler. Feed provides healthy body, important nutrients for growth and defensive power against diseases. Feed is considered as a vehicle of life in poultry. In broiler rearing process feed must be consumed with care. For higher production of broilers, on time availability and required quantity of feed is immeasurably important. Feed used in open shed was 4.02 kg per broiler and in EC shed was 3.00 kg per broiler. Feed consumed in EC shed was less than the feed consumed in EC shed because EC shed farmers used good quality feed and wastage of feed was minimum. Quality feed has recommended contents of carbohydrates, protein, vitamins (A, D, E, K, B1, B2, B6, B12), choline, niacin, biotin, folic acid, panthonic acid and minerals (manganese, calcium, phosphorous). Cost of feed consumed by open shed broiler was PKR 169.24 per broiler and that of EC shed was PKR 133.35 per broiler.

Table 6: Comparison of cost of production per broiler of open shed and EC shed farms

Particulars	Units	Open Shed	EC Shed
I. Day old chicks	No	3,395.00	79,350.00
II. Output of broilers (after mortality)	No	3,002.17	77,462.00
III. Cost of day old chick (after mortality)	PKR	40.82*	40.70*
IV. Feed consumed	Kg	4.02	3.00
V. Price of feed per kg	PKR	42.10	44.45
VI. Cost of feed consumed	PKR	169.24	133.35
VII. Vaccination cost	PKR	10.23	5.55
VIII. Labor	M Days	0.017	0.0053
IX. Labor cost	PKR	8.02	16.40
X. Other operating cost	PKR	12.36	13.00
XI. TVC	PKR	240.67	209.00
XII. TFC	PKR	6.55	12.61
XIII. Total cost of production (XI+XII)	PKR	247.22	221.61

Source: Estimated from survey data, 2014.

For enhancement of broiler production and for creating resistance against diseases in broilers, farmers vaccinate them at proper interval. Different types of disease i.e. i) Viral diseases ii) Bacterial diseases and ii) Parasital diseases can attack broiler. Broilers are vaccinated to develop resistance against these diseases. Vaccination cost of open shed was PKR 10.23 per broiler and that of EC shed was PKR 5.55. This gap is due to high mortality rate in open shed and mortality rate shows that disease attack on broilers of open shed was more as compared to EC shed.

Broiler farming is a labor intensive business because in broiler production process all activities are carried out by both family and hired labors for different operation like cleanness of shed, management of litter and equipment, caring of broilers and loading and unloading etc. Cost of labor was PKR 8.02 per broiler for open shed and PKR 16.22 per broiler for EC shed. Other operating cost components include managerial cost, DVM doctor pay, electricity/petroleum/gas cost, burning wood and litter. Other operation cost for open shed was PKR 12.36 per broiler and for EC shed was PKR 13.00 per broiler.

Total variable cost includes cost of day old chicks, feed cost, vaccination cost, labor cost and other operating cost. TVC for open shed was 240.67 per broiler and PKR 209.00 per broiler for EC shed. TFC was the cost of fixed asset of rent of building and depreciation cost of equipments. TFC for open shed was PKR 6.55 per broiler and for EC shed was PKR 6.55 and 12.61 per broiler. Total cost of production (TC) is the sum of TVC and TFC. TC for open shed was PKR 247.22 per broiler and for EC shed was PKR 221.61.

Comparison of gross and net revenues per broiler of open shed and EC shed farms

Table 7 presents comparison of gross and net revenues per broiler of open shed and EC shed farms.

Gross revenue includes revenue from the sale of broilers and by products (litters and empty bags) in market. Gross revenue was PKR 257.489 per broiler for open shed and PKR 294.112 per broiler for EC shed. This difference was due to (i) large number of broilers and (ii) high weight gain of broilers of EC shed farms. Net revenue was PKR 10.269 per broiler for open shed and PKR 72.502 per broiler for EC shed.

Table 7: Comparison of gross and net revenues per broiler of open shed and EC shed farms

Particulars	Units	Open Shed	EC Shed
Production period	Days	40.00	40.00
Mortality rate**	%	11.57	2.60
Output (Number of broilers)	No	3,002.17	77,462.00
Weight gain	Kg	1.615	1.844
Price per kg	Rs	158	158
Revenue per boiler	Rs	255.22	291.35
By product (Manure + Empty bags)	Rs	2.269	2.762
Gross revenue	Rs	257.489	294.112
Total cost of production	Rs	247.22	221.610
Net revenue (V-III)	Rs	10.269	72.502

Source: Estimated from survey data, 2014.

Dummy variable regression results of comparison of costs and revenues per broiler of open shed and EC shed farms

Table 8 portrays dummy variable regression results of comparison of costs and revenues per broiler of open shed and EC shed farms. Results revealed that there was statistically significant difference between the costs components and revenues of open shed and EC shed farms. Mortality rate of broiler was 11.57 percent for open shed farms and 2.60 percent of EC shed farms. Cost of day old chicks after mortality was PKR 40.82 per chick for open shed and PKR 40.70 per chick for EC shed. Therefore per chick 3.00 kg per broiler cost was estimated after mortality. Feed consumed per broiler of open shed was 4.02 kg and 3.00 kg per broiler of EC shed farm. Feed consumed in EC shed was less than the feed consumed in EC shed because EC shed farmers used good quality feed and wastage of feed was minimum. Cost of feed consumed by open shed broiler was PKR 169.24 per broiler and that of EC shed was PKR 133.35 per broiler. Vaccination cost of open shed was PKR 10.23 per broiler and that of EC shed was PKR 5.55. This gap is due to high mortality rate in open shed and mortality rate shows that disease attack on broilers of open shed was more as compared to EC shed. Cost of labor was PKR 8.02 per broiler for open shed and PKR 16.22 per broiler for EC shed farm. Other operating cost components include managerial cost, DVM doctor pay, electricity/petroleum/gas cost, burning wood and litter. Other operation cost for open shed was PKR 12.36 per broiler and for EC shed was PKR 13.00 per broiler.

Table 8: Dummy variable regression results of comparison of costs and revenues per broiler of open and EC shed farms

Particulars	Open shed β_0	Difference β_1	EC shed $\beta_0 + \beta_1$
MR _i (Mortality rate, %)	11.57 (0.96) (12.05)*	- 8.97 (1.36) (- 6.60)*	2.60
CDCM _i (Cost of day old chick after mortality in PKR)	40.82 (0.73) (55.92)*	- 0.10 (0.05) (- 2.00)*	40.70
FCB _i (Feed consumed in kg)	4.02 (0.09) (44.66)*	- 1.02 (0.121) (- 8.50)*	3.00
CFCB _i (Cost of feed consumed in PKR)	169.24 (3.62) (46.75)*	- 35.89 (5.12) (- 7.01)*	133.35
VAC _i (Vaccination cost in PKR)	10.23 (0.35) (29.23)*	- 4.68 (0.49) (- 9.55)*	5.55
LBD _i (Labor in Man Days)	0.017 (0.001) (17.00)*	- 0.0117 (.001) (- 11.70)*	0.0053
CLB _i (Labor cost in PKR)	8.02 (0.76) (10.55)*	8.38 (1.08) (7.76)*	16.40
OOC _i (Other operating cost in PKR)	12.36 (1.02) (12.12)*	0.64 (0.35) (1.83)**	13.00
TVC _i (Total variable cost in PKR)	240.67 (4.93) (48.81)*	- 31.67 (2.15) (- 14.73)*	209.00
TFC _i (Total variable cost in PKR)	6.55 (0.45) (14.55)*	6.06 (0.63) (9.62)*	12.61
TC _i (Total cost of production in PKR)	247.22 (4.97) (49.74)*	- 25.61 (5.67) (- 4.52)*	221.61
AWB _i (Average weight gain in kg)	1.615 (0.07) (23.07)*	- 0.229 (0.10) (- 2.29)*	1.844
GR _i (Gross Revenue in PKR)	257.49 (8.48) (30.36)*	36.62 (11.98) (3.06)*	294.11
NR _i (Net revenue in PKR)	10.27 2.47 (4.16)*	62.23 (12.50) (4.97)*	72.502

* and ** indicates significance at 0.01 and 0.05 probability, respectively.

Source: Estimated from survey data, 2014.

Total variable cost includes cost of day old chicks, feed cost, vaccination cost, labor cost and other operating cost. TVC for open shed was 240.67 per broiler and PKR 209.00 per broiler for EC shed. TFC was

the cost of rent of building and depreciation cost of equipments. TFC for open shed was PKR 6.55 per broiler and for EC shed was Rs 6.55 and 12.61 per broiler. TC for open shed was PKR 247.22 per broiler and for EC shed was PKR 221.61. Average weight gain per broiler was 1.615 kg of open shed and 1.844 kg of EC shed farm. Gross revenue includes revenue from the sale of broilers and by products (litters and empty bags) in market. Gross revenue was 257.489 per broiler for open shed and PKR 294.112 per broiler for EC shed. This difference was due to (i) large number of broilers and (ii) high weight gain of broilers of EC shed farms. Net revenue was PKR 10.269 per broiler for open shed and PKR 72.502 per broiler for EC shed.

Conclusions and Recommendations

This study was conducted to estimate and compare costs and revenues of open shed and EC shed broiler farms in Punjab, Pakistan. Multistage sampling technique was applied for selection of 120 sampled respondents. Average numbers of day old chicks were 3,395 for open shed farms and 79,350 for EC shed farms. Average cost of broiler production was PKR 741,682.54 for open shed and PKR 17,165,180.62 for EC shed. Average gross revenue was estimated PKR 772,784.63 for open shed and PKR 22,781,329.83 for EC shed. Average net revenue was PKR 31,267.95 for open shed and PKR 5,616,148.80 for EC shed farms.

Dummy variable regression results of comparison of costs and revenues per broiler of open shed and EC shed farms revealed that there was statistically significant difference between the costs components and revenues of open shed and EC shed farms. Cost of production for open shed was PKR 247.22 per broiler and for EC shed was PKR 221.61 per broiler. Gross revenue was PKR 257.489 per broiler for open shed and PKR 294.11 per broiler for EC shed. This difference was caused by (i) large number of broilers and (ii) high weight gain of broilers of EC shed farms. Net revenue was PKR 10.269 per broiler for open shed and PKR 72.502 per broiler for EC shed.

As results indicated that EC shed farmers were rearing vaccinated day old chicks purchased from standard hatcheries and farmers of open shed purchased day old chicks from local hatcheries. Vaccinated day old chicks have greater potential to resist diseases and

have got a higher weight gain of 229 grams per broiler as compared to weight gain of open shed broiler. Therefore open shed broiler farmers should also buy vaccinated day old chicks from standard hatcheries for fostering boiler productivity.

In broiler production feed was important cost component and quality feed had high price but low consumption by broilers and high weight gain. Therefore cost of feed consumed per broiler in EC shed farms was lower as compared to open shed farms. Government and extension workers should educate open shed broiler farmers to use high quality feed for highest possible output and cost savings.

Author's Contribution

Shahid Ali reviewed the literature, wrote introduction, methodology, analyzed the primary data. This author also wrote results, discussion, conclusion and recommendations. Salamat Ali helped in writing introduction, review of literature, results and discussion and references. Salamat Ali collected the data used in this study from sampled respondents and incorporated in Excel Sheet.

References

- Haq, A.U. and M. Akhtar. 2004. Poultry Farming, Pakistan. Chapter 1, pp. 1-7.
- Cochran, W.G. 1977. Sampling Techniques, 3rd Edition. John Wiley and Sons, New York. pp. 37-45.
- Chaudhry, S.M. and S. Kamal. 2010. Introduction to Statistical Theory (Part 2) Chapter 14. Illmi Kitab Khana, Kabir Street, Urdu Bazar Lahore, Pakistan.
- Debertin, D.L. 2012. Agricultural Production Economics, 2nd Edition. Macmillan Publishing Company, a division of Macmillan Inc., New York.
- FAO. 2012. FAO Outlook for Poultry Production and Consumption, 2010-2012. www.fao.org
- Govt. of Punjab. 2012. Statistical Report of Punjab Poultry Sector. Punjab Poultry Research Institute Rawalpindi.
- GoP. 2012. Economics Survey of Pakistan, 2011-12. Economic advisory Wing. Finance Division, Islamabad, Pakistan.
- Gujarati, D.N. and D.C. Porter. 2009. Basic Econometrics, 5th Edition. McGraw Hill Inc., New York, USA.
- Maqbool, A., M.N. Sarwar and K. Bakhsh. 2005. Modernization of poultry farming. The Daily Dawn, Economic and Business Review, 03 January.
- Oyedipe, E.O. 2000. Optimizing the Potential of Livestock Production in Nigeria: Improving Nutritional Standard. Int. J. Agric. Vet. Sci. 1(2): 19-20.
- Pandey, R. and R.M. Verma. 2008. Samples Allocation in Different Strata for Impact Evaluation of Developmental Programme. Rev. Bras. Biom., São Paulo. 24(4): 103-112.
- Varian, H.R. 1992. Microeconomic Analysis, 3rd Edition. W.W. Norton & Company, Inc., 500 Fifth Avenue, New York, N.Y. 10110.