Economic Analysis of Poultry (Broiler) Production in Amman and Irbid District in Jordan

Ahmad Abdallah Ahmad Al Khraisat

Livestock Research Diroctate

National Center for Agricultural Research and Extension (NCARE), Baqa', Jordan.

Abstract: **This paper is based on primary data collected from 98 poultry farms in Amman district, Irbid district in Jordan. Farms were categorized as: (A) farms having a population of less than 5000, (B) farms having a population of 5000 – 10000, (C) farms having a population of 10001 -15000, (D) farms having a population of 15001 -30000 and (E) farms having a population of 30001 and above. Results indicate that this business is adopted as major source of income; however, most of the commercial poultry farms have been closed due to lesser profits and even heavy losses during last few years. Majority of poultry farms (39.80 %) are small farms and the farmers are forced to rely on non-institutional source of credit. Seasonal and cyclical price fluctuations in input and output are found higher. Poultry producers are major stakeholders having no role in price fixation. The estimated input output ratio of poultry production is 1:1.39 (in winter) and 1: 1.75 (in summer) without marketing costs as they are added to the live weight sold to the consumer per kilogram live weight , which is estimated 0.15 to 0.2 JD / kg . The per rupee return does not look promising for investors of this sector especially in case of small farmers who are unable to reap the benefit of economy of scale.**

Keyword: **Poultry production, Broiler farm, Economics, Analysis, Amman, Irbid, Jordan.**

I. INTRODUCTION

Forty five years ago Jordan was completely dependent on the small-scale production of poultry to meet the consumption requirements of chicken meat and table eggs, with a quantity of table eggs being imported to satisfy the market requirements. The commercial poultry industry has undergone a rapid development in recent years as a result of many factors including :shortage in the supply of competitive products (red meat),High prices of competitive products compared to the production cost of poultry, Low level of capital investment required by poultry enterprises compared to other agricultural projects, Good profits and a quick turnover of capital, The growing role of companies specialized in importing production inputs and selling them to small farmers, The role of the government, including access to agricultural credit, extension, health services, rules and production/distribution of multi-purpose chicks during the early seventies ,Favourable climate for low cost poultry production. As a result of this rapid development, poultry production in Jordan achieved a high level of self-sufficiency; however in the early eighties, the market started to suffer from a surplus of poultry products, particularly broiler meat and table eggs. Since Jordanian poultry products were not able to compete in export markets, the government was forced to implement production control programs in order to harmonize local production levels with domestic consumption. By taking advantage of such programs, producers were able to harvest a good profit during the eighties. However, these programs had also negative impacts on the whole sector as poultry farms felt no imperative to keep up with technical developments in the sector (MoA, 2011).

The total production on poultry meat amounts to 396 million JD, which represents 51% of total livestock sector in Jordan (MoA, 2011). 77.2% of expenditure on poultry meat goes to meat processed by Natafat (informal slaughter facilities), while 19.7% goes to meat slaughtered in slaughter houses. The remaining 2.1% is expended on chicken innards (MoA, 2011). However, the demand of meat has increased over time owing to cheap rate and high quality protein required to maintain good human health. Therefore, there is a dire need to facilitate and promote poultry production in the area to provide quality protein at low rates to the general masses. In spite of efforts being made to improve poultry production, the net returns in poultry production are not promising (Rahman, et al, 2003). The present study was conducted to overview the existing broiler production system in Jordan with emphasis on the estimation of cost of production and returns to poultry producers. This

study has also focused on the major problems faced by the poultry producers. Following were the main objectives of the study: 1) To overview the existing production system of poultry (broiler) and the problems faced by the producers in Amman and Irbid districts in Jordan; (2) To estimate the input-output ratio in poultry production and (3) to analyze cost and returns structure in contract broiler farming activities.

II. Materials and Methods

Universe:

The study was based on primary data collected from the poultry producers of district Amman, Irbid districts in Jordan during 2009-10. The said district was selected for having large number of the poultry farms. Before launching the survey, the questionnaire was pretested and improved accordingly. Key informant technique was also employed to get the basic relevant information of the proposed study.

Sampling Procedure:

One of the objectives of this study was to assess the existing production system of poultry in Amman, Irbid districts. However, in an empirical investigation, it is impossible to collect information from the whole population. Therefore, the researchers are often forced to make inferences based on information derived from a representative sample of the population. The sample size and the degree of variation usually affect the quantity and quality of information obtained from the survey. Using appropriate sampling methods, both factors can be controlled. The aim is to devise a sampling scheme which is economical; easy to operate; and, provides unbiased estimates with small 'variance'. The main characteristics of sampling theory applied in this study are discussed below.

Sampling Method:

The time and cost constraints generally forced the researchers in social sciences to select an appropriate sample size from a population as a true representative of it. Cost is the main constraint to carry out interviews of the whole population. Given limitations in terms of money; time; efforts; and, data management - sampling is more appropriate method. Further, sampling not only saves cost and time but can also give more accurate results than a census which are more acceptable.

Following steps have been involved in the sampling procedure:

Defining the Population:

Classification of the population is the first step in the sampling procedure, namely, the sector or element under investigation, the sampling unit, the area or extent of investigation, and the duration of investigation. All the poultry farms of the two districts engaged in broiler production were classified as population of the study.

Sampling Frame:

A sampling frame is a list of all sampling units available for selection at a given stage of the remedial measures to improve the poultry production system in Amman, Irbid districts. Sampling process. The frame must define and present every sampling unit and give it a weight in the population, registered voters, farm size or maps of rural areas, town plans or a list of towns, villages and administrative areas. Accordingly, the sampling frame of poultry producers of the given district was prepared through an informal survey depending on their location and size with the help of Poultry Department of Minstery of Agriculture. The sampling frame consists of 309 elements.

Sample size:

A good survey sample should have both a small sampling error and minimum standard error. This can be obtained if one has unlimited resources. However, given constraints, such as finance, time and data management compromises have to be made in selecting the sample size. Thus on the basis of nature of research and analysis; number of variables; resource constraints; and, the importance of decision, a sample size of 98 poultry farms engaged in broiler production was selected. Additionally, 10 collection agents, 10 retailers and 100 consumers were also interviewed for getting a realistic view about existing marketing system of poultry (broiler) and consumption behaviour in Amman, Irbid districts.

Analytical Technique:

Production of farm commodities involves numerous relations between resources and commodities. Some of these relationships are simple while the others are complex but they all provide the tools by which problems of production can be analyzed. The production function has been used to analyze the data collected from the poultry farmers.

III.   Results and Discussion

The main objective of this chapter is to describe the demographic and socioeconomic characteristics of the studied poultry farmers including their – age; education; and, farming experience. Besides, farm characteristics such as involvement in poultry farming and access to institutional credit have also been described.

1. *Age of the respondents:*

The data on age group of the sampled poultry farmers revealed that 25.51 percent respondents fall in the age group of 45-54 years, followed by 21.43 percent in the age group of 35-44 and 19.39 percent in the age group of 55-64 years, while 12.24 percent respondents fall within the age group of 65 and above.

2. *Education level:*

Information about education of selected poultry farmers was analyzed and found that 23.47 percent respondents were University Degree and 20.41 percent had Intermediate Diploma and 19.39 percent Secondary education, 15.31 percent respondents were found Preparatory while the percentage of Primary, Read and write and   Illiterate was 8.16, 6.12 and 7.14 percent, respectively.

3. *Poultry farming experience:*

The analysis of information regarding the poultry farming experience of selected farmers revealed that 44.90 percent of the respondent farmers are having poultry farming experience above 10 years followed by 37.76 percent and 12.24 percent of respondents having experience of 6-10 and 4-5 years, respectively.

Table 1: Distribution of different broiler farmers based on socio – economic characteristics in Jordan

Index	Frequency	Percentage	Cumulative Percentage
Age (yrs)			
20-25	12	12.24	12.4
26-34	9	9.18	21.43
35-44	21	21.43	42.86
45-54	25	25.51	68.37
55-64	19	19.39	87.76
Above 65	12	12.24	100.00
Total	98	100.00	
Educational Level (Yrs)			
Illiterate	7	7.14	7.14
Read and write	6	6.12	13.27
Primary	8	8.16	21.43
Preparatory	15	15.31	36.73
Secondary	19	19.39	56.12
Intermediate Diploma	20	20.41	76.53
University Degree	23	23.47	100.00
Total	98	100.00	
Number of Children			
0-1	10	10.20	12.4
2-3	17	17.35	27.55
4-5	37	37.76	65.31
6-9	27	27.55	92.86
Above 10	7	7.14	100.00
Total	98	100.00	
Experience (yrs)			
1-3	5	5.10	5.10
4-5	12	12.24	17.35
6-10	37	37.76	55.10
Above 10	44	44.90	100.00
Total	98	100.00	

Source: field Survey Data, 2012.

4. Scale of poultry business:

In order to examine the resource management and its impact on productivity and sustainability, the Poultry producers were divided into five groups on the basis of number of birds: A) Less than 5000 birds; B) From 5000 – 10000 birds; C) from 10001 -15000 birds ; D) from 15001 -30000 birds and, E) from 30001 and above . The results revealed that 39.80 percent of the respondent farmers were rearing the poultry birds on group (B) i.e. from 5000 – 10000 birds; 22.45 percent respondents were in group (A) Less than 5000 birds; 19.39 percent respondents were in group (C) 10001 -15000 birds; 12.24 percent respondents were in group (D) 15001 -30000 birds; while, a small number of 6.12 percent respondents were having 30000 and above (E) poultry birds on at their farms (Table 2). The development of poultry sector in Jordan and all over the world has transformed this business from subsistence level to commercialization. The farmers have adopted this business as primary source of their income. The results of the study revealed that 66.33 percent of farmers have adopted poultry farming as their main profession as primary source of income while 33.67 percent farmers have adopted it as secondary source of their income (Table 2).

Table 2. Size of poultry farms and business commitment

Category	Number	Percent
Farm Size		
A) Less than 5000 birds	22	22.45
B) 5000 – 10000 birds	39	39.80
C) 10001 -15000 birds	19	19.39
D)15001 -30000 birds	12	12.24
E) 30001 and above	6	6.12
Total	98	100
Business commitment		
Full time	65	66.33
Part time	33	33.67
Total	98	100

Source: Survey Data 2009-10

5. Access to credit:

Access to credit is an important instrument that enables farmers to acquire command over the use of working capital and proper inputs for a better yield. It is commonly believed that credit availability for small farmers is one of the main indicators of rural development. But in case of poultry farming, it was found that only 26.53 percent poultry farmers availed the institutional credit from bank, while 73.47 percent did not borrow the loan from any bank (Table 3). It was also found that that 68.37 percent respondent farmers purchased the feed on credit from the feed dealers and remaining 31.63 percent purchased it on cash. The farmers who were forced to purchase poultry feed on credit reported their (40.63 percent) inability of having requisite capital while remaining 59.18 percent viewed it as the routine of poultry farming business (Table 3).

IV. Economic analysis of poultry farming

1. Poultry production:

It was investigated and observed that the poultry production varies from farm to farm and depends on:

No of birds at the farm; Mortality rate in the flock; and, quality of feed and ratio of pure breed supplied. The average production of a standard poultry farm having 10000 birds with the mortality rate of 5% in summer and 7% in winter was found 16625 kg with 1750 grams average live weight of a bird (Parker 2003).

2. Poultry prices:

There is frequent price variation in poultry products as well as day old chicks markets. Seasonal price variation is also observed in day old chick ranged from 0.20 JD (0.28 $) to 0.30 JD (0.42$) i.e. the price was higher in winter season and lower in summer season. Seasonal price fluctuation was mainly attributed by the fact that farming is at peak in winter and lowest in summer due to climatic conditions less suitable for poultry farming. Likewise, the prices of poultry birds also varied from time to time and season to season but there is no thumb rule for poultry prices. It was also observed that the sale prices of produce ranged from 1.55 JD (2.18 $) to 2.20 JD (3.10 $) per Kg in summer season and 1.80 JD (2.54 $) to 2.30 JD (3.24 $) per Kg in winter season (Table 4).

3. Cost of production:

Total cost (TC) is defined as the sum of fixed cost (FC) plus variable costs (VC) i.e. TFC + TVC + TMC = TC (Rubina Bano et al, 2011). The total cost of production was calculated to determine the input-output relationship. However, it was found that majority of the poultry producers have only incurred the variable cost on poultry production as shown in Table 5. 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 and Medication; Electricity; Litter; Gas ;Water ;Disinfectants; Litter; Permanent labor; and, others day to day expenditure of the farm. These costs are known as working capital required for the production cycle.

The estimated TVC of each flock of 10000 birds in the instant study was found 19400 (JD) (= 27323.94 $) in winter and 19372(JD) (= 27284.51 $) in summer however, it varies from time to time and area to area. The cost variation is explained by a number of socio-economic and geographic factors.

Table 3. Status of institutional credit

Status	Number	Percent
Status of access to institutional credit		
Borrowed the credit	26	26.53
Did not borrowed the credit	72	73.47
Total	98	100
Status of purchased of poultry feed		
Purchased on credit	67	68.37
Purchased on cash	31	31.63
Total	98	100
Reasons for purchase of poultry feed on credit		
Lack of finance	40	40.82
Routine of the market	58	59.18
Total	98	100

Source: Survey Data 2009-10

Table 4. Average sale prices of poultry

Season	Price (JD)		Mean
	Minimum	Maximum	(JD)
Summer	1.55	2.20	1.83 (2.57$)
Winter	1.80	2.30	2.05 (2.89$)

Source: Survey Data 2009-10 , JD : Jordan Diner

Table 5. Cost of production of 10000 birds (flock)

Cost Items	Cost (JD) in Winter	Cost (JD) in Summer
A) Fixed Costs		
A) Cost Of Permanent Labor	500	500
B) Rent Of Poultry House	1250	1250
Total Fixed Cost	1750	1750
B) Variable Costs		
Price of Day Old Chick	3000	3000
Cost of Feed	11718	11970
Cost of Electricity/Flock	100	100
Cost of Vaccination	2000	2000
Cost of Gas	300	120
Cost of Water	7	12
Cost of Disinfectants	300	300
Cost of Litter	225	120
Total Variable Cost	17650	17622
Total (A+B)	19400	19372

Notes:

1. Fixed cost is estimated by calculating all the costs incurred at initial stage of Poultry farming business. The main costs involved are purchase of land, construction of poultry shed and installation of accessories (water pump, feeding pans, water pans and electric premises). In sampled area, majority poultry farmers hired the poultry sheds so in this case the fixed cost include rent of the shed and wages of permanent labor and their opportunity cost in case of owned shed and family labor.

2. Marketing cost are the expenses required in bringing the goods and services from farm to market. This term frequently used to estimate the expenditure incurred on movement of commodity from farm gate to the ultimate consumer. The marketing costs in case of poultry in sampled area are not applicable because collection agent collect the poultry birds from the poultry farm and supply it to the retailer so poultry producer did not incur any marketing cost.

4. Net Returns

Net returns 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 poultry producer. The net returns given in Table 6 indicate that the average net return earned by the selected producers were 13963.8 JD (winter) and 11051.8 JD (summer) / per flock of 10000 birds.

Table 6. Net returns of poultry producers

Items	Net Returns in Winter	Net Returns in Summer
Quantity sold (kg)	16275	16625
Price (JD/ kg)	2.05	1.83
Total revenue (JD/ flock)	33363.75	30423.75
Total cost (JD/ flock)	19400	19372
Net returns (JD/ flock)	13963.8	11051.8

5. Value of Input to Value of Output Ratio

Ratios of the value of output to input are calculated by dividing as values of output by total costs. The input-output ratio in case of poultry (Broiler) is presented in Table 7. It is indicated that the ratio was 1: 1.39 (winter) and 1: 1.75 (summer).

Table 7. Value of Input to Output (Returns) Without Marketing Cost *

Items	Input-Output Ratio in Winter	Input-Output Ratio in Summer
Input cost (JD/ flock of 10000 birds)	19400	19372
Output (returns) JD/ flock	13963.8	11051.8
Ratio	1.39	1.75

***Marketing Cost: the Farmer Don't Pay for Marketing but Addition to Price of Kg Sale to Customer. Estimated between 0.15-0.2 JD /kg**

Conclusions and Recommendations

The economic analysis of poultry has been carried out on the basis of primary data collected from Amman and Irbid   districts in Jordan. It was found that majority poultry farmers have adopted this business as a primary source of their income and fall in the category of small group (5000 - 10000 birds). Moreover, they are financially weak and forced to rely on non-institutional source of credit due to the limited credit facility extended by the financial institutions. Input–Output price variation is also found higher resulting in destabilization of the farmers' income. 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. It is recommended that:

1) Minstery of Agriculture should establish or assist the private sector in establishment of commercial hatcheries in Amman an Irbid districts to ensure the availability of day old chick on cheaper prices to reduce the cost of production of poultry farmers.

2) Poultry sale price may be fixed on weekly or fortnightly basis in consultation with producers.

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