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Measuring Profitability and Viability of Poultry Meat Production in Khartoum State, Sudan

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Abstract: The main objective of the paper was to study the economics of poultry meat production in open system in Khartoum State. Specific objectives were to study socio-economic features of poultry meat producers, investigate the main factors contributing to the production cost, and compare between production costs, total returns and gross margins in different farm sizes. A questionnaire was prepared in order to obtain information on quantities and costs beside socio-economic questions such as level of education. The farms were stratified into strata according to the size of the flock to increase the homogeneity of sampling units. The data was subjected to descriptive statistical analysis to analyze socioeconomic characteristics of poultry meat producers. Also, quantitative technique tools were used to measure profitability of the farms. The study revealed that 60% from poultry meat producers their main job are poultry breeding, and 64% of poultry producers have experience more than five years. The feed cost is the main cost item in meat farm in open system that, it represents 59.10%, 60.06% and 61.60% of total production cost in small, medium and large farm sizes of meat production, respectively. Also the study revealed that the other factors of production such as price of day-old chicks, mortality cost, vaccines and drugs and labor cost represent the most total cost of production. The highest gross profit is obtained in large size farm sizes while the lowest ones is observed in small one. All farms have CPP greater than unity. The study concluded that: feed cost is main cost item in different farms sizes. Mortality cost and price of day-od chicks are also high. Also, it concluded that, large size farm is more efficient than others.

Key words: poultry meat production, farm sizes, open system farms, Profitability.

INTRODUCTION

Commercial poultry production in Khartoum state is divided into three farms systems, the modern dosed system, semi-closed system and the open-system (Sharabeen, 1996). Most of the private poultry farms in Khartoum State are the open-system with different scales of poultry production. The characteristics of the open system are the open-sided house and baladi roof with gable-shape, usually made of corrugated metal (Emam and Hassan, 2010). The walls are constructed of bricks and the rest is covered with meshwork. The open system is share the big percentage in poultry production in Khartoum State; it represents 96% from the total number of farms in the state (Ministry of Agriculture, Khartoum State, 2005). The population of Khartoum State has grown by tenfold since 1956 and continues to grow by about 4% annually, faster than national average of 2.8% (FAO, 2002). In spite of the increasing investment in this industry, there are an obvious gap between the production of poultry meat and its needs (Table 1).

The main objectives of the study are to analysis the economics of poultry meat production in open system in Khartoum State during 2006. The specific objectives are to assess the socio-economic features of poultry meat producers, investigate the main factors contributing to the production cost of poultry meat production, estimate the gross return, gross margin and profitability for different farms sizes and then compare between them. Also, returns per Sudanese pound invested were calculated.

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Table 1: Needs and production of poultry meat in Khartoum State (1000 tones).

Year	Needs	Production	Gap%
2001	12.75	9.0	41.66%
2002	12.50	7.5	66.66%
2003	13.25	9.5	39.47%
2004	13.75	9.9	38.88%

Source: Ministry of Agriculture, Khartoum State, 2005.

Methodology:

Methods of Data Collection:

The study depended on primary and secondary data. Primary data was collected through questionnaire while secondary data was collected from relevant sources. In order to increase the degree of precision of the results poultry meat farms were stratified on the basis of the size of the flock into three strata; Small sized farms with less than 5000 birds, medium-sized farms with 5000-10.000 birds and large-sized farms meat with more than 10.000 birds. Due to the limited resources and difficulty of transportation among the poultry meat farms in the three areas of Khartoum State, the sample was chosen to include 44 poultry farms in the three strata (29 small, 10 medium and 5 large - sized farms).

Methods of Analysis

Descriptive statistical analysis method was used to explain socio- economic features of poultry meat producers. It was also used quantitative analysis tools such as net returns, gross margin, benefit cost ratio and return per Dinners invested.

Quantitative Analyses Techniques: (Emokaro and *et al*., 2010):

Net returns: this was determined by the following equation:

Net returns =TR - TC

Where;

TR = Total Returns

TC = Total Cost

Gross Margin Analysis:

Gross margin is the difference between total returns and total variable cost and was determined using:

GM = TR-TVC

Where;

GM = Gross Margin

TVC = Total variable cost

TVC = TC - TFC

TFC = Total fix cost (cost of housing and equipment)

Returns per Sudanese Dinner Invested:

Returns per Sudanese dinner invested = GM / TVC

Coefficient of Private Profitability:

(CPP) is used to measure of profitability of the farm. If CPP is less than unity that means it is unprofitable to produce that product at the present productions level and /or the present price level.

CPP = TR/ TC

RESULT AND DISCUSSION

Socio- Economic Characteristics of Poultry Meat Producer in Khartoum State (Open System):

Occupation:

Table (2) showed that about 60% of the poultry meat produce`s are specialist i.e. their main job was poultry breeders.

Table 2: percentage of poultry meat producer according to their main job.

Farms' main job	Percent
Farmers	60.0%
Others	40.0%
Total	100.0%

Source: Data collected and calculated, 2005.

Age:

Table (3) showed that about 72% of the farmer's age less than 45. That means the majority of farmers are younger.

Table 3: percentage of poultry meat producers according to their age.

Age producer years	Percent
< 25	14.0%
26 - 35	24.0%
36 - 45	34.0%
> 46	28.0%
Total	100.0%

Source: Data collected and calculated, 2005.

Experience:

Table (4) indicated that about 64% of poultry meat producers have experience more than 5 years and that mean poultry meat production is practical done by well experienced farmers.

Table 4: percentage of poultry meat producers according to their experience.

Farms experience in years	Percent
< 5	36.0%
6 - 10	26.0%
11 - 15	20.0%
> 16	18.0%
Total	100.0%

Source: Data collected and calculated, 2005.

Education:

From table (5), the bulk farm poultry meat producers are educated (98%), only 2% of them are illiteracy. Upton (1987) reported that education has important influence in managerial ability and decision making. Therefore it may be concluded that producers with higher level of education were able to adopt new technologies.

Table 5: percentage of poultry meat producers according to their education.

Farms' level education	Percent
Illiteracy	2.0%
Primary	30.0%
Intermediate	18.0%
Secondary	16.0%
University	24.0%
Post-graduate	10.0%
Total	100.0%

Source: Data collected and calculated, 2005.

Comparison of Production Costs Between Different Farms Sizes of Poultry Meat:

Table (6) showed that the feed cost is most important cost item for all farm sizes, it constitutes 59.35%, 60.06% and 61.60% of total production costs for small, medium and large size farm. This result was confirmed with previous study (Sharabeen, 1996). He revealed that, feed cost is the main cost item in poultry meat production; it constitutes about 67.5% of the total production cost in open system farms. From the table the second cost item is day-one chicken price cost for small (25.10%), medium farm size (25.53%) and large farm size (26.88%) of the total production cost. The third cost item is the mortality cost which is ranked as:

6.55%, 5.99% and 4.80% of total production cost for small, medium and large farm size, respectively. Vaccines and drugs cost constitutes about 03.82%, 3.42% and 3.04% of total production costs for small, medium and large farm size, respectively. This reduction in the percentage of vaccines and drugs according

to the size of the farms reflecting to the fact that large size farms have better management towards diseases control and benefit from economies of scale. Reference to compare total production cost of poultry meat among the different farms sizes, the results indicated that the large farm size ranks at the lowest production cost, followed by medium and small, respectively.

This was assured by study of Abdalla (1999). The study confirmed that the feed cost constitutes about 72.6% of the total production cost in the open system one day old chick. These results are consistent with the findings of previous studies but focusing in marketing. Kaudia and Kitalyi (2002) reported high mortality rates and transport costs as major constraints of chicken trade in Kenya. The high mortality rates can be attributed to poor modes of transport for live chickens. Also, According to Tabbaa and Alshawabkeh (2000) high mortality rates in birds during transit is a function of factors which includes stress and spread of disease infections during mass transportation of birds.

Table 6: comparison of production cost between different farms- sizes of poultry meat (Dinner/bird).

Cost items	Size of farm					
	Small size Farm		Medium size Farm		Large size Farm	
	Din/unit	%	Din/unit	%	Din/unit	%
Day-old chick	184	25.10	179	25.53	168	26.88
Feed cost	435	59.35	421	60.06	385	61.60
Vaccine and Drugs	28	03.82	24	03.42	19	03.04
Labor	13	01.77	13	01.85	9	01.44
Mortality cost	48	06.55	42	05.99	30	04.80
Housing and equipment cost	14	01.91	13	01.85	8	01.28
Other cost	11	01.50	9	01.28	6	00.96
Total cost	733	100	701	100	625	100

Source: Data collected and calculated, 2005.

Quantitative Analysis Technique Results:

The average yields in Khartoum state in open system are found to be 1.18, 1.20 and 1.20 Keg/bird in small, medium and large size farms, respectively. The average price is found to be 900 Dinner/Keg. Table (7) recorded that cost of production per bird. It is lower in large farm size (625 Dinner/ bird), followed by medium (701 Dinner/ bird) and small farm size (733 Dinner/ bird).

Table (7) showed that total returns equals to 1062, 1080 and 1080 Dinner/bird in small, medium and large farms, respectively. The high total return is recorded in medium and large farm size that may be due to economies of scale, while the lowest one in small size farm. From the table gross margins are recorded about 343, 392 and 463 Dinner/bird for small, medium and large size farms, respectively. The highest gross margin is obtained in large size farm reflecting the fact that lesser in total production cost than other farm sizes. The table showed that returns per Dinners invested are higher in larger farm size (0.75 Din.) followed by medium (0.56 Din.) and small (0.47 Din.) farms sizes.

Table 7: Quantitative analysis results of poultry meat production in different farms sizes.

	Farm size		
	Small size bird cost	Medium size bird cost	Large size bird cost
Average yield Keg/bird	1.18	1.20	1.20
Price/Keg	900.0	900.0	900.0
Total return Din./bird	1062	1080	1080
Total cost (Din./bird)	733	701	625
Total fixed costs(houses and equipment)	14	13	8
Total variable cost	719	688	617
Gross margin	343	392	463
Returns/Dinner invested	0.47	0.56	0.75

Source: Data collected and calculated, 2005.

Results of Coefficient of Private Profitability Measure (CPP):

According to results in table (8) all farms sizes are profitable at producing level and/or the present price level. All farms have CPP greater than unity. When ranking such results, higher in large size farms (1.73) followed by medium (1.54) and small (1.45) size farms.

Table 8: Coefficient of private profitability in poultry meat production farms.

Farm sizes and type	TC (Dinnar/bird)	TR (Dinnar/bird)	CPP (TR/TC)
Small size farm	733.0	1062.0	1.45
Medium size farm	701.0	1080.0	1.54
Large size farm	625.0	1080.0	1.73

Source: Data collected and calculated, 2005.

Conclusion:

In conclusion feed cost is main cost item in different farm sizes, beside high percentage of mortality cost and prices of hens (4-5 months) are also high. Also, it concluded that, large size farm is more efficient than others.

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