

ORIGINAL ARTICLE

**ECONOMIC ANALYSIS OF TURKEY PRODUCTION IN ZURU EMIRATE, KEBBI STATE,
NIGERIA**

^{1*}M.A. Maikasawa, ¹A.L. Ala and ²M.D. Baba

¹Department of Agricultural Economics, Faculty of Agriculture, Usmanu Danfodiyo University, Sokoto, Sokoto State, Nigeria.

²Department of Farm Management and Extension, College of Agriculture, Zuru, Kebbi State, Nigeria.

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ABSTRACT

The study examined the economics of turkey production in Zuru Emirate of Kebbi State, Nigeria. Proportionate random sampling technique was used to select one hundred and eighty seven (187) turkey producers from four Local Government Areas of the Emirate. Primary data were collected using interview schedule. Data analysis was carried out using descriptive statistics, farm budgeting technique, financial analysis and Pearson product moment correlation. Results revealed that majority (57.8%) of turkey producers had their ages between 31-40 years, were males (78.1%) and most of them were (68.9%) were are civil servants. Similarly, majority of them (70.6%) were married and most of them (67.9%) had a household size of between 1 – 5 persons. The costs and returns structure indicated that, variable cost accounted for 73.2% of the total cost of turkey production per bird in the study area, while fixed cost accounted for the remaining 26.8%. However, the average total cost per bird was ₦4, 350.43, average total revenue was ₦6, 866.81 and net income was ₦2, 516.38 indicating that turkey production in the study area was profitable. Result of the correlation analysis showed that only educational level, household size and years of experience had significant positive relationships with profit in turkey production ($P < 0.05$). In order to increase revenue generation from turkey production by those engaged in the business therefore, there is the need for them to acquire more education, more farming experience and at the same time utilize more family labour in turkey production.

Key words: Economic, analysis, Production, Turkey,

1. INTRODUCTION

Turkey (*Meleagris gallopavo*) production is an aspect of the poultry industry which is not popular in Nigeria until recently (Hogan, 2008). Turkeys have been found to be of considerable economic and social significance in traditional life of Nigerians, in that they are used as presents during festivals like Christmas as sign of appreciation and expression of goodwill. So far, there is no known discriminatory attitude towards the production and consumption of turkeys (Nwagu, 2002).

Adult males have a naked, heavily carunculated (bumpy) head that is normally bright-red but that turns to white overlaid with bright blue when the bird is excited. Other distinguishing features of the common turkey are: a long red fleshy ornament (called a snood) that grows from the forehead over the bill; a fleshy wattle growing from the throat; a tuft of coarse, black, hairy feathers (known as a

beard) projecting from the breast; and more or less prominent leg spurs. The male wild turkey (variously called gobbler, Tom or Jake – immature male), may be 50 inches long and weigh up to 22 pounds, although the average weight is less. Female turkeys (Hens) generally weigh half as much and have less warty heads. Domesticated strains of the common turkey, developed for their fine-tasting flesh, may be much heavier (Mercia *et al.*, 2010). Bland (2009) reported that in many European as well as African countries roasted turkey has long been a customary Christmas dish. In the United States, the bird is especially associated with thanksgiving. Turkey production is seasonal, although in United States and some other countries, ready-to-cook, lean, boned turkey is available in rolls any time of the year.

Economic Importance of Turkey Production

A producer values the goods at the amount it costs to produce it – total cost of all the productive resources employed. If the consumer places a higher value on the goods, an exchange will take place and the producer will earn some return. Lance (2003) state that the firm making the largest profit is the one

*Corresponding author: M.A. Maikasawa, Department of Agricultural Economics, Faculty of Agriculture, Usmanu Danfodiyo University, Sokoto, Sokoto State, Nigeria.

whose costs are lowest. It will have an incentive to expand production, and, if necessary, can afford to pay more of factors of production. Returns not only indicate that consumers want more of the goods; they are also the inducement to firms to produce these goods.

Ironkwe *et al.* (2007) advocates that turkeys are easier to manage, have relatively high turnover and quick returns to capital invested. Turkey production is a means of livelihood and a way of achieving certain level of economic independence in Nigeria. Its production is carried out in all parts of the country with no known religious, social or cultural inhibitions associated with its consumption. The total expenditure in turkey production is generally of two categories – variable and fixed expenditures. The fixed expenditures are the costs that remained relatively constant regardless of the level of production. These costs are not used up in one production cycle. The most common fixed costs in turkey production are the costs of buildings and equipment or their depreciation, interest on loans and loan repayment, depreciation on vehicles and taxes. The variable or operating expenses are those that will be incurred only if production is carried out and the amount of this cost will depend on the kinds and quantities of inputs used. These costs components are used up in production cycle and thus must be re-incurred for each batch. Operating expenses include cost of birds, feed, drugs, vaccination, litter materials, heating (cost of fuel, electricity and gas), water, salaries or wages for labour, marketing cost, advertisement, etc (Ogundipe and Sanni, 2002). Ogundipe and Sanni (2002), added that the initial costs of acquiring a poultry house will depend on the scale of operation and the type of materials used. The type and number of equipment used for poultry production also depend on the scale of production. The major equipment used in poultry production include: tray-feeders, trough feeder, hanging feeder, chick drinkers, plastic drinkers, adult size drinkers, drinker stands, kerosene stoves, buckets, shovels, bowls, brooms, nests, egg and tray. Specifically, investment in turkey enterprise is attractive because the production cost per unit is low compared to other type of livestock. Owing to these obvious advantages of turkey production, large number of farmers both men and women venture into turkey production mostly for income generation purpose, besides meeting the protein needs of the households. Turkey production for meat and eggs is practiced by urban and peri-urban dwellers. Turkey population in Nigeria is estimated at 0.2 million (Eduvie, 2002). This is said to constitute a major animal protein source in the country.

In Nigeria, the supply of meat falls short of demand, most Nigerians are poorly fed and suffer from malnutrition due to lack of adequate protein of animal source (Ajala and Balogun, 2004). In a nutritional profile of Nigeria, Okoruwa *et al.* (2006) reported that the protein supply per capita was 44g, out of which animal products constituted less than 2%. With the continued rise in the cost of production of cattle, sheep and goat, which are the primary sources of animal protein in Nigeria, it has become very necessary to explore efficient and less common but potential sources of animal protein for economic viability (Okoruwa *et al.*, 2006).

Turkey production in Zuru Emirate is relatively low compared to other poultry species (Broilers, Layers, Duck, Guinea fowl and Pigeon). While the sales and marketing of turkeys in the study area is carried out by residents with the

highest sales recorded during festive periods such as Sallah, Christmas and New Year, the potentials of turkey production in the study area if properly harnessed, will increase farmer's income, improve household food security and nutrition thereby improving their livelihood. It is in view of the importance of turkey production in the study area that this study intends to examine the economics of smallholder local turkey production in Zuru Emirate.

2.METHODOLOGY

Description of the Study Area

Zuru Emirate is one of the four Emirates in Kebbi state. The emirate comprise of four Local Government Areas (LGAs) namely; Danko-Wasagu, Fakai, Sakaba and Zuru. The emirate is located within latitudes 11° and 12° N and longitudes 4° and 5° E of the equator (KBSG., 2003). The state was carved out of the former Sokoto State in 1991; the Emirate is located in the extreme South-eastern part of the state and covers an area of approximately 9,000 square kilometers. It is located on a hilly terrain and is bounded to the north by Gummi Local Government Area of Zamfara State, North-west by Koko Local Government Area, South-west by Yauri Local Government Area, North-east by Bukuyum Local Government Area of Zamfara State and south by Rijau Local Government Area of Niger state (Girma, 2008).

The estimated population of the Emirate is 582, 106 people (NPC., 2006). The various indigenous cultural and ethnic groups of the Emirate are the Dakkarkari, Fakkawa, Dukkawa, Kelawa, Kambarawa, Katsinawa and Achifawa. Other non-indigenous ethnic groups in the area are the Hausa, Fulani, Yoruba, Igbo and other tribes found in Nigeria. The different religions found in the area are Islam, Christianity and traditionalist. Like any other African society, these came as a result of the interaction with the outside world (KBSG., 2003). However, the traditional worship of different deities is still upheld in the area with many festivals celebrated at various times of the year. The weather is marked by a single rainy season and long dry season, the average rainfall of the area is between 750mm and 1050mm/annum. Mean temperature range between 31°C and 38°C, the rainy season is between April to October. The climatic condition of the area is characterized by hot and wet seasons as in the tropics; the months of November to February are the hamattan period. The soil type is sandy loam and rich, which makes it suitable for agriculture (KBSG., 2003).

Animal husbandry is practiced side by side with crop production, even though on limited scale. The people of Zuru Emirate depend largely on the pastoral Fulani for meat, milk and butter. Hunting was the second important economic activity after crop production. Hunting was regarded as a supplementary occupation and was carried on throughout the year because it provides a means of getting meat for consumption. It also serves as a source of obtaining skins of animals for shoes, warfare robes and for making local drums. Other important economic activities are local handicrafts like pot-making and weaving by women and blacksmithing by men (Augi and Lawal, 1990). Turkey production in Zuru emirate is relatively low compared to other poultry species (Broilers, Layers, Duck, Guinea fowl and Pigeon). While the sales and marketing of turkeys in the study area is done by

both residents and visitors with the highest sales recorded during the festive period such as Sallah, Christmas and New Year day. However, there is no known discriminatory attitude towards the production and consumption of turkey in the study area.

Sampling Procedure and Instrument for Data Collection

Zuru Emirate comprises of four Local Government Areas (LGAs) namely; Danko-Wasagu, Fakai, Sakaba and Zuru Local Government Areas comprising of eight, four, two and six administrative districts, respectively. Multi-stage sampling technique was used to draw the sample for the study. The first stage involved proportionate selection of four, two, one and three districts from Danko-Wasagu, Fakai, Sakaba and Zuru local government areas, respectively. The second stage involved purposive selection of two villages that were predominant in turkey production from each of the selected districts. The third stage involved selection of 40% out of the number of turkey producers from each of the selected villages as contained in the list of Turkey farmers in the Emirate obtained from Kebbi Agricultural and Rural Development Authority (KARDA) Zone III Zuru. At the end, one hundred and eighty seven (187) turkey farmers constitute the sample size for the study.

Questionnaire was used to collect primary data. Secondary information was collected from materials such as textbooks, journals, conference proceedings and other related literatures. The data for the study was collected with the help of trained enumerators.

Analytical Tools

Net farm income signifies the difference between total returns in naira for the farm and total expenses of production in naira. Total revenue is defined as the total money value of all output produced whether sold, consumed or in stock. Total fixed cost are those cost incurred which do not vary when output changes and therefore have no influence on production decisions in the short run. Total variable cost is the cost of variable inputs such as feeds, labour and drugs used for production. They change directly with the level of production. (Ajala *et al.*, 2007).

In this study, Net Farm Income was estimated as follows:

$$NFI = TR - (TVC + TFC) \dots \dots \dots (1)$$

- Where;
- NFI = Net Farm Income (₦)
- TR = Total Revenue (₦)
- TVC = Total Variable Costs (₦)
- TFC = Total Fixed Costs (₦)

Profitability index (PI) is the net farm income (NFI) per unit of gross revenue (GR) (Olukosi and Erhabor, 1988). Therefore,
$$PI = \frac{NFI}{GR} \dots \dots \dots (2)$$

- Where, PI = Profitability Index
- NFI = Net Farm Income (₦)
- GR = Gross Revenue (₦)

Rate of Return on Investment is a performance measure used to evaluate the efficiency of an investment or to compare the efficiency of different investments. Rate of return on investment is net farm income divided by total cost of investment and is usually expressed as a percentage or ratio. Rate of return on investment is expressed as follows;

$$RRI (\%) = \frac{NFI}{TC} 100\% \dots \dots \dots (3)$$

- Where, RRI = Rate of Return on Investment
- NFI = Net Farm Income
- TC = Total Cost

Capital Turnover is a ratio of total revenue to total cost. Generally it measures the efficiency of a business and provides information about the business capability to deliver a return per naira of its capital investment. Capital turnover is expressed as follows;

$$CTO = \frac{TR}{TC} \quad \text{Where, CTO} = \text{Capital}$$

- Turnover
- TR = Total Revenue
- TC = Total Cost

3.RESULTS AND DISCUSSION

Socio-economic Characteristics of Turkey producers.

Socio-economic characteristics of smallholder turkey producers in the study area were examined with respect to age, sex, level of education, occupation, marital status and household size. The results are presented in Table 1. Age may be considered as the length of past life of a person. Age composition among other things had implication on decision-making on the farm and it is also an important determinant of the amount of work that can be performed on the farm (Dabai, 2011).

Table 1. Distribution of Turkey Producers According their socio-Economic characteristics

VARIABLES	FREQUENCY	PERCENTAGE
Age (years)		
20 - 30	42	22.5
31 - 40	108	57.8
41 - 50	32	17.0
51 and above	5	2.7
Age (years)		
Male	146	78.1
Female	41	21.9
Educational Level (years)		
No Education	6	3.2
Primary	16	8.6
Secondary	56	29.9
Tertiary	109	58.3
Occupation		
Civil Servants	129*	68.9
Farming	82*	43.9
Trading	49*	26.2
Students	27*	14.4
Marital Status		
Married	132	70.6
Single	55	29.4
Household Size		
1 - 5	127	67.9
6 - 10	55	29.4
11 - 15	3	1.6
16 and above	2	1.1

Source: Field Survey, 2013. *Multiple Responses

It was revealing from the Table majority that (80.3%) of turkey producers were within the ages of 20-40 years. Only 2.7% fell within the age of 51 and above years. This showed that turkey production in the study area was dominated by youths. Turkey producers that are within this age bracket are likely to be stronger and therefore, can produce more, which means more profit and more protein intake. Similarly, younger farmers are likely to adopt new innovations more

than the older ones. Onwumere and Obasi (2010) in their study of the analysis of small-scale turkey production in Owerri reported that turkey production in the area was dominated by people within the age bracket of 31-50 years (56%).

Information pertaining to sex showed that majority (78.1%) of turkey producers were males and only 21.9% of turkey producers were females. This indicated that female participation is very low compared to their male counterparts. This is probably because as most households in the study area were headed by men, they have to engage in income generating activities to raise money in order to provide for their families. Similarly, the high level of men involvement may also be due to high demand for labour in terms of feeding and medication which women may not be able to combine with household activities. Another reason might be that women might not be in a financial position to purchase turkey poults or growers for rearing turkey production required more initial cost compared to chickens. This coincided with the findings of Ajala and Adesehinwa (2006) that there were more males in turkey production business in Zaria than females (66% to 34%). This finding however, contradicted other findings such as Brorholt and Odgaard (2009) who found that poultry keeping is the skill of housewives in Nicaragua which may not be unconnected with the environmental or cultural difference of the people of Nicaragua and Nigeria.

Level of education is the number of years spent in school by an individual. Education of an individual plays an important role to greater extent in his/her ability to adopt improved production technologies and in decision-making. It also has bearing on person's ability to evaluate and manage risk which to some extent determines the overall success of the business (Murtala *et al.*, 2004). The Table depicted that, majority (58.3%) of turkey producers had acquired education up to tertiary level. The high level of education acquired by the majority of the producers may enable them accept innovations easily; perform effectively in their management practices such as administration of drugs, vaccines, feeds as well as effective marketing of turkeys. High level of education among turkey producers could auger well for extension services in transferring research results for sustainable food production. This finding has therefore, reflected the importance of education in agricultural production activities. The more an individual is exposed to any form of education, the more he will have a better understanding of his environment. This is in line with the findings of Onwumere and Obasi (2010) that majority (83%) of turkey producers in Owerri had formal education.

Table 1 revealed further that, most (68.9%) of turkey producers are civil servants as compared with 43.9%, 26.2% and 14.4% whose occupations were farming, trading and studentship, respectively. This indicated that majority of turkey producers have other jobs. The implication is that, turkey production in the study area is a part time job and that most producers do not depend on it as a sole means of livelihood. The reason could be that civil servants in the study area are becoming more enterprising in turkey production as a source income other than their main occupation. This tallied with the findings of Ajala *et al.* (2007) that majority (62%) of turkey producers in Zaria were civil servants. The result also agreed with the finding of

Amaza (2000) that it is common for some farm households to engage in other non-farming activities to complement their farming occupation for their livelihood.

Marital status is the categorization of human population into state of being single or married. Marital status determines the status of households towards their responsibilities. Results on marital status revealed that majority (70.6%) of the turkey producers were married as against 29.4% who were singles, indicating that turkey production in the study area is common among couples. Information pertaining to household size revealed that most (67.9%) of turkey producers had household size of 1 – 5 persons, while 29.4% had a household size of 6 – 10 persons. This implied that those with small-sized households were engaged into turkey production more than the large-sized households in the study area. This is in line with the findings of Ajala and Adesehinwa (2006) that 50% of turkey producers in Zaria had a family size of 1–5 persons.

Costs and Returns of Turkey Production

The profitability of any business can be deduced from the relationship between the costs incurred in running the farm business and the returns accruing to it. Net farm income on the other hand, signifies the difference between total returns in naira for the farm and total expenses of production in naira. The costs and returns and net farm income associated with turkey production in the study area are presented in

Table 2: Average Costs and Returns of Turkey Production/Bird/Production Cycle

Items	Unit Price (₦)	Quantity/ Bird	Cost/ Value (₦)	Percentage
A. Variable Costs				
Labour (man-day)	180	4.55	828	19.1
Feeds (kg)	108	20.4813	2,214	50.8
Medication (litre)	5	0.35	1.75	0.1
Water (litre)	0.8	19.61	15.68	0.4
Kerosene (litre)	150	0.6	90	2.1
Transportation	30	-	30	0.7
Total Var. Cost (TVC)			3,179.43	73.2
B. Fixed Costs				
Foundation Stock	700	-	700	16.1
Depreciation on Housing	234	-	234	5.4
Depreciation on Feeders	87	-	87	1.9
Depreciation on Drinkers	87	-	87	1.9
Depreciation on lanterns	63	-	63	1.5
Total Fixed Cost (TFC)			1,171	26.8
Total Cost (TC)			4,350.43	100
C. Revenue				
Sales of Turkeys (kg)	1,640	3.9813	6,529.33	
Sales of Eggs (number of eggs)	120	2.03	243.28	
Sales of Droppings (kg)	200	.471	94.2	
Total Revenue (TR)			6,866.81	
Net Farm Income (NFI)			2,516.38	
Profitability Index (PI)			0.37	
RRI			57.8%	
Capital Turnover (CTO)			1.58	

Field Survey: 2013. **Note:** Depreciation on Housing and Equipment were calculated using the Straight line method.

Table 2 shows the average costs and returns per bird of turkey production in the study area. Cost of water amounted to ₦15.68 which represents 0.4% of the total cost of production. Cost of feeds (₦2, 214) constituted the highest

share of the total cost, accounting for 50.8%. This validates the claims of Emmah (2006), Ubasi and Sekona (2000) that cost of feed is the most important variable cost item in poultry production. This value confirmed that feed constitutes major factor in turkey production. The value is however lower than the value obtained by Emmah (2006) who reported a feed cost of ₦53,006 per farmer in Kaduna and Zaria towns of Kaduna State. This may be due to the fact that most turkey producers especially those that practice the semi-intensive and extensive system of management provided supplemental feed to the turkeys, which include food/crop processing by-products, household waste and food remnants. Another reason could be related to that advanced by Okoruwa *et al.* (2006) especially for those that practiced intensive and to some extent semi-intensive system of management, that various substitutes of feed ingredients are becoming available to the farmers for feed formulation whereby most costly feed ingredients are often being supplemented with less costly ones thereby reducing the

Table 3. Pearson Product Moment Correlation of the Relationship between Profit in Turkey Production and Socio-economic

Variables	r-value	t-value	Decision
Age (X ₁)	-0.138	-0.752	Accepted
Sex (X ₂)	-0.130	-0.589	Accepted
Educational Level (X ₃)	0.497*	0.047	Rejected
Marital Status (X ₄)	0.107	0.263	Accepted
Household Size (X ₅)	0.504*	0.039	Rejected
Income Level (X ₆)	0.115	0.924	Accepted
Years of Experience (X ₇)	0.479*	0.025	Rejected

Source: Field survey, 2013. * correlation significant at 5% levels of probability.

Cost of labour per bird was ₦828 which constituted about 19.1% of the total cost, while medication, transportation and kerosene had ₦1.75 ₦30 and ₦90 per bird, accounted for 0.1, 0.7 and 2.1%, respectively of the total cost of production. The cost of foundation stock was found to be ₦700 representing 16.1% of the total cost. Other cost components such as depreciation on housing, feeders, drinkers and lanterns contributed ₦234 (5.4%), ₦87 (1.9%), ₦87 (1.9%) and ₦63 (1.5%) to total cost of production, respectively. The cost structure as shown in Table 2 revealed that variable cost constituted 73.2% of the total cost of production of turkey enterprise, while fixed capital accounted for the remaining 26.8% of investment in turkey production in the study area. Fixed cost could be low because cheap materials were used for building houses for the birds and fixed components could be used and re-used for many years.

Turkey producers generated revenue through the sales of turkeys, eggs and manure. Results revealed that a typical farmer realized a net farm income of ₦2, 516.38 per bird indicating that turkey production in the study area is profitable. The average production period was seven (7) months with an average flock size of 15 birds. Tijani and Ajobo (2005) in their research on optimal decision in turkey marketing in south-western Nigeria asserted that turkey production is profitable with a mean return to management of ₦103, 712 per farmer. Emmah. (2006) in his study of economic analysis of turkey production in Kaduna and Zaria towns of Kaduna state, Nigeria reported that turkey production is profitable with a net farm income of ₦87, 016 per farmer. Oluyemi and Roberts (2000) also reported that it

is practicable to produce turkeys profitably on a small scale provided the enterprise is efficiently managed. The net farm income of two hundred thousand naira (₦200, 000.00) per farmer obtained by Ironkwe and Akinola (2010) in their study of profitability of turkey production in Ahoada East local government area of Rivers state Nigeria is higher than that obtained in Zuru, Zaria and even in the south-western Nigeria. This means that location and other socio-economic factors are likely to affect profitability in turkey farming.

The profitability index (PI) was 0.37, indicating that for every naira earned as revenue; 37 kobo is returned to turkey producer as net income. PI of 0.37 is likely to improve turkey production by increasing the profit generating capacity of turkey producers. This is in line with the finding of Ajala *et al.* (2007) who reported a profitability index of turkey production in Zaria was 0.35. The rate of return on investment was estimated at 57.8%. This means that, every naira invested on turkey production per bird generated 57.8% net income to the producer. This implied that, to maximize profit accruing from turkey production, there has to be a concerted effort directed at increasing the scale of production and efficient use of the inputs. For example, more efficient use of the feed input can bring about increased income from turkey production in the study area. Olukosi and Erhabor (1988) opined that the higher the rate of return on investment the better the success of farm business. The capital turnover (CTO) per bird was 1.58, implying that for every naira invested per bird about ₦1.58 kobo is returned to turkey producers as revenue, which is in line with the findings of Ajala *et al.* (2007) who reported a capital turnover of ₦1.54 kobo by turkey producers in Zaria. Olukosi and Erhabor (1988) suggested that a capital turnover ratio greater than 1 is acceptable for a farm business.

Correlation Analysis

One of the important preoccupations of economists is to investigate the relationship among variables. In this endeavour, answers are sought to how variables are related. Pearson Product Moment Correlation was employed to determine how the socio-economic characteristics of turkey producers in the study area are related to the profit generated from the enterprise and the results are presented in Table 3. Results revealed that marital status (0.107) and income level (0.115) of turkey producers were found to have positive but non-significant relationships with profit in turkey production. Age (-0.138) and sex (-0.130) were also found to have negative and non-significant relationship with profit in turkey production. However, Educational level (0.497), household size (0.504) and years of experience in turkey production (0.479) have positive and significant relationships with profit in turkey production. This implied that the more the level of education, household size and turkey farming experience acquired by turkey producers the higher the profit generated from turkey production.

4.CONCLUSION

From the findings, it could be concluded that turkey production was profitable in the study area. Though turkey production in the study area was profitable, but increase in the scale of production is advocated so that the high cost of feed can be covered through economies of scale. This could be done through acquisition of more education, Farming

experience and committing more family labour into turkey production.

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