DETERMINATION OF COMMERCIAL BROILER AGE OF SLAUGHTER BASED ON FEED CONVERSION EFFICIENCY AND RETURN PER DOLLAR INVESTED

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ABSTRACT

B*roiler production is increasingly becoming popular among small and large producers in Zimbabwe. Costs of production are a hindrance to increased production which has caused production to stagger below a national market demand of 3000 tonnes per month. Poultry sector viability challenge calls for a need to establish the age at which production maximizes both return per dollar and feed conversion efficiency. The study aimed at establishing the age at which production maximizes both the return per dollar and feed conversion efficiency. The gross margin was used as an analytical tool. The observation found out that the return per dollar and feed conversion efficiency maximises at 35 days, and beyond that both parameters decrease with broiler age of slaughter. Carcasses of over one kilogram are achieved at a cost to the producer.*

Key words: *Hubbard, return per dollar, feed conversion efficiency.*

INTRODUCTION

The production of broilers is carried out at small and large enterprises in Zimbabwe. Maximising returns for the producers is very important for the viability of any enterprise. Every producer's aim is to stay in business, and can only be so if the returns to the limiting factors are maximized. Therefore there is need to determine the optimum age beyond which feed as a limiting factor may not continue to be fed beneficially to broilers.

BACKGROUND

Broiler production has become very popular among small and large scale farmers in Zimbabwe, and like all rational producers, profit maximization is their aim. Field in the Meat Trade News Daily (2010) reported that broiler national production levels stand at 1900 tones per month versus the consumer demand of 3000 tones. The gap between current production and the demand is very wide and provides a challenge to the local producers. Zawe, Chairman of the Poultry Producers Association, in World Poultry.Net (undated) stated that the main causes affecting production include the high cost of the feed, the shortage of feed and the cost of the day old chicks. Broiler research in Zimbabwe has focused on reduction of mortality based on poultry scavenging systems (Pedersen 1998) and use of mash versus pelted feed (Garikayi et al 2006) among many other topics. There appears to be a knowledge gape in terms slaughter age at which return per dollar and feed conversion efficiency are maximized hence the need for the study.

Producers have at times faced heavy competition due to imports from countries like South Africa and Brazil which slaughter an average of seven hundred thousand and five million birds a day respectively (World Poultry.Net undated) Because of the need to satisfy the local market requirements it is important for producers to realize good returns that will allow them to keep on producing and to even expand to a larger scale.

Feed is the biggest cost item on the producer's budget, amounting to seventy percent of the total variable costs (Aviagen 2007). At that level it is important that returns be maximized to the most limiting factor, which is the feed. The aim of the project was to compare, throughout the production period, the relationship between the behavior of the return per dollar and the feed conversion efficiency curves in order to arrive at a point at which the two are maximized. The traditionally accepted slaughter age of the six to ten weeks (Farm Management Handbook 1993) has been adopted

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by the producers based on the advice from the poultry feed manufacturers and extension agents, and it is assumed that profits are maximized within the period. Feed quantities of about five kilograms per bird are also recommended by the feed manufacturers for both the growing and fattening period to give a 1.8 to 2.0 kilogram carcass.

Profitability of broiler production is the value of the end product minus the input cost to produce that product .It is also important to optimize broiler nutrition from a stand point of both the biological performance and economics (Aviagen 2007).

PROBLEM STATEMENT

High cost of production emanating from high feed costs, cost of day old chicks and feed shortage has resulted in lower returns in broiler production. The production costs are one of the limiting factors that are hindering producers to achieve the consumer demand of 3 000 tonnes per month thus placing current production at sixty three percent of potential.

MAIN OBJECTIVE

The main objective was to determine the stage of growth at which the food conversion efficiency and return per dollar invested were most favourable.

Studies on cost of production

Zawe, chairman of Zimbabwe Poultry Association, in The Poultry Site Latest News(2011) claims that it costs about US$2.85 to rear one chicken compared to US$1.00 in Brazil. The Zimbabwe situation is that one day old chick's cost ranges between US$0,90 and US$I.00. He also claims that use of generators due to electricity load shedding also added to cost of production. Chihambakwe, CFI Holdings Ltd chairman said that the use of non- GMO feeds also added to high costs of production (The Poultry Site Latest News 2010).

Studies on age of slaughter at which returns and feed conversion efficiency are maximised

Revesayi, Windmill Sales Manager for Animal Health observed that chickens should not exceed six weeks before slaughter as profits would decline. He also observed that feed conversion ratio topped 1.59 at this age (The Poultry Site Latest News 2009).

MATERIALS AND METHODS:

Description of Study site

The study was carried out at the Teaching and Research Unit of the Midlands State University in the Midlands Province of Zimbabwe.

Sampling Procedure

A sample of 30 broilers was drawn from a population of 700 hundred broilers using random numbers. Mead's resource equation (1988) was used to confirm appropriateness of sample size. The population was reared in two batches of 100 broilers each and one of 500.The first batch arrived on the 10th of February, second on the 3rd of March and the last one on the 6th of April 2011. Standard commercial feeds were sourced from one manufacturer simply because it was our usual supplier. Hubbard was the strain of broilers ordered during the observation through a local agent.

Data collection

Data on feed consumption was collected from daily feeding records maintained by the department and recorded on each small information board stuck at the door of the respective fowl runs.

There was weekly weighing of broilers using a sensitive digital scale. A factor of 0,67 was used to change live mass to dressed carcass mass thus representing a 67 % dressing (Teete,Saleh and Berry 1981) for broilers. The revenue from each broiler was obtained by multiplying the dressed mass by US$3.00 per kilogram which was the average price during the period of study.

Data Analysis

Gross margin analysis (Barnard and Nix 1972) was used to get the return per dollar and the food conversion efficiency.

RESULTS

The results of the three broiler batches are indicated in figure 1, 2 and 3 below respectively. The feed conversion efficiency and return per dollar invested were most favourable at thirty-five days of age.
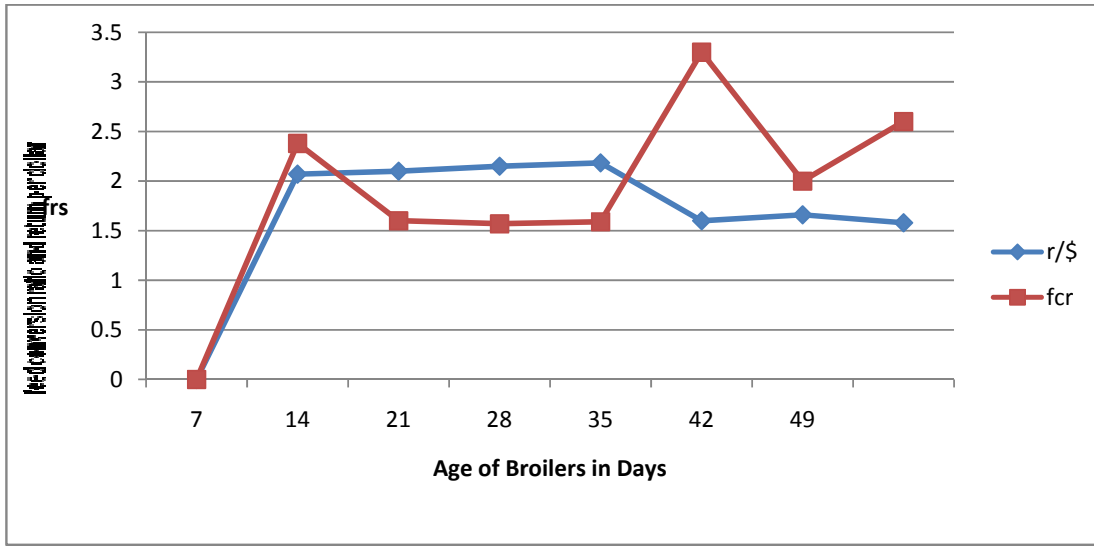

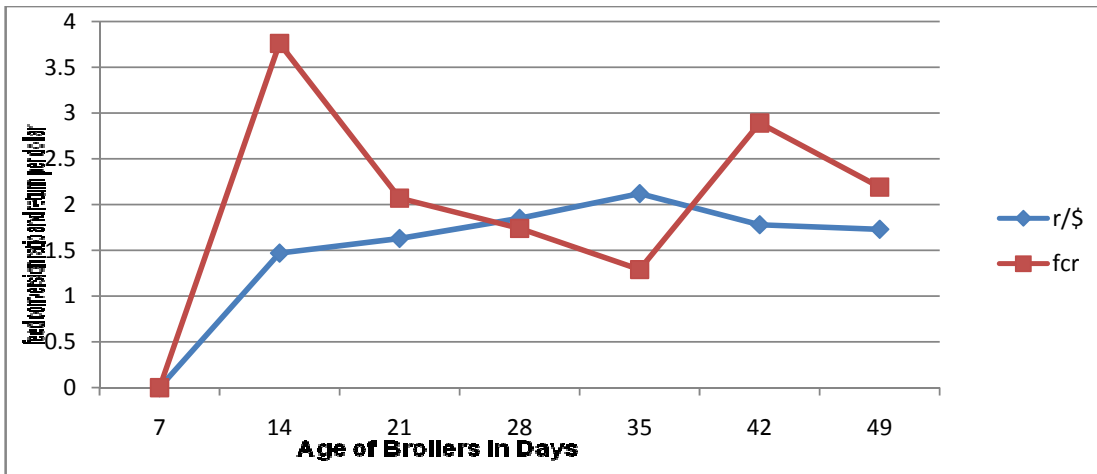**Fig: 1**. Batch 1 Broiler Feed Conversion efficiency versus Return per dollar

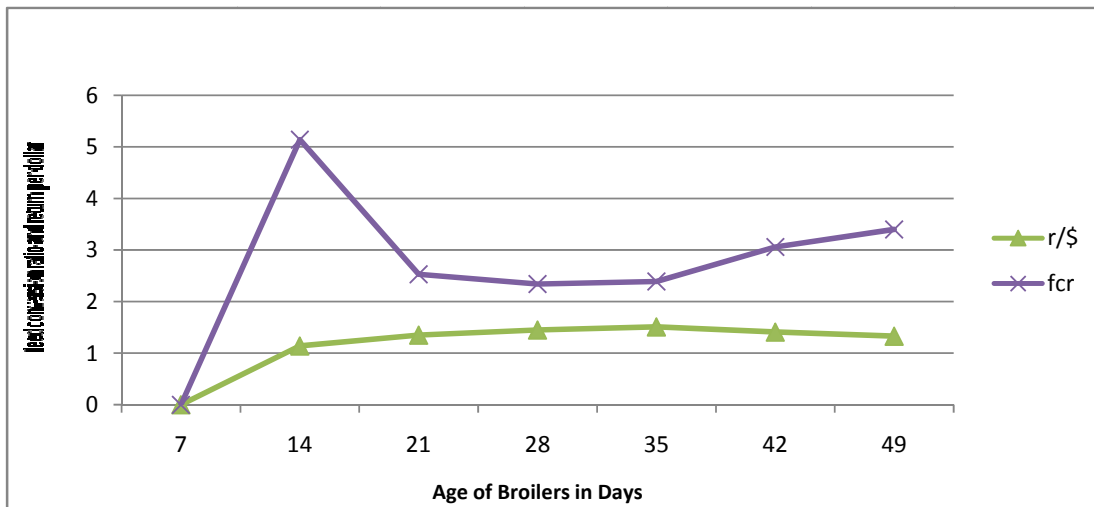**Fig: 2** Batch 2 Broiler Feed Conversion efficiency versus Return per dollar

Fig: 3. Batch 3 Broiler Feed Conversion efficiency versus Return per dollar

Table 1 Farm and Financial Performance of broilers.

Farm Performance	Batch 1	Batch 2	Batch 3	Mean
Age at highest food conversion ratio	35	35	35	35
Highest food conversion ratio/efficiency	1.59	1.3	2.39	1.76
Cold dressed mass at highest feed conversion ratio (grams)	670	703.5	728.96	700.82
Cold dressed mass at 42 days (grams)	904.5	964.8	1039.84	
Cold dressed mass at 49 days (grams)	1360.1	1370.15	1352.73	1361.00
Financial Performance				
Age of bird at highest return per dollar (days)	35	35	35	35
Highest return per dollar invested	2.184	2.12	1.51	1.938
Return per dollar at 42 days	1.6	1.78	1.41	1.6
Return per dollar at 49 days	1.66	1.73	1.33	1.57

RETURN PER DOLLAR INVESTED ANALYSIS

A mean of US$1,938 per dollar invested was obtained at 35 days, with the returns decreasing with age for all batches. At the age of 49 days the return per dollar dropped by 19 % to a mean of US$1.57 per bird. Table 1 above shows the results of the farm and financial performance of the three batches.

FEED CONVERSION RATIO

Feed conversion efficiency was highest at the same age as that of highest return per dollar. A carcass of 670grammes was obtained at that age, and going for a larger carcass at 42 days will be at the expense of the producer as the feed conversion ratio or efficiency goes down to an average of two.

DISCUSSION

The study revealed that the highest return to feed as the most limiting factor is attained at thirty-five days of age. This supports the observation by Revesai (The Poultry Site Latest News 2009) that broilers should not be slaughtered at more than six weeks. Rearing broilers beyond six weeks will be at the expense of the producer through a reduction in incomes.

CONCLUSION AND RECOMMENDATION

The study recommends that broilers be marketed at the age of thirty-five days. Marketing broilers at the age older than 35 days is matched with decreasing returns as a result of lowered feed conversion efficiency and return per dollar. Both parameters decrease with age, hence aiming for carcasses older than five weeks will greatly lower the returns to the producer.

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