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Economics of Feeding Sun-Dried Poultry Dropping Based Diets on Growing Rams Consuming Sorghum Stover

Research Article

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ABSTRACT

This study analyzed the economics of feeding dried poultry droppings as supplement in ram production. Gross margin analysis and profitability ratio was used to analyze the data collected. The result of the budgetary analysis revealed that highest total cost of ₦5292.98/ram was incurred, highest total revenue of ₦7565.40/ram, highest gross margin of ₦3272.41/ram and highest net farm income of ₦2272.42/ram were observed for the supplemented treatment groups. The profitability ratio gave the best benefit-cost ratio of 1.43, rate of return of 0.43, gross ratio of 0.70 and expense structure ratio of 0.23. This indicates that feeding of dried poultry droppings to rams is a profitable venture. This study therefore recommends the supplementation of dried poultry droppings at 20% inclusion level for optimum profitability.

KEY WORDS cost and returns, dried poultry droppings, profitability, rams.

INTRODUCTION

Productivity and profitability in any livestock sector is determined to a large extent by feed resources and the quality of the feeds available, as feed is the single largest recurring expenditure accounting for 60-75% of the cost of production (Anandan *et al.* 2013). It is the single most significant variable cost in any livestock operation. It averages 64% of the variable cost of an operation excluding labour costs (Solaiman, 2006). The feeding of grains, pulses and oil seed cakes as supplement to hitherto low grade fodders is no longer tenable in the present day Nigeria to enhance production because of the fierce competition with man and other monogastric animals for their usage as feed (Abdul *et al.* 2008; Adama, 2008; Ajayi *et al.* 2008) and coupled with their high cost, short and irregular supply (Akinmutimi, 2004).

It is against this backdrop that animal scientist are now looking inward for possible use of non-conventional feed resources which are cheap with comparable nutritive value, health friendly, readily available and without usage by Man (Amaefule, 2002; Egbo *et al.* 2001; Ndubueze *et al.* 2006; Devendra and Leng, 2011). One of such non-conventional feed resources is poultry droppings; previous studies showed that it can be use as protein supplement (Aro and Tewe, 2007; Belewu and Adeneye, 1996; Ibeawuchi *et al.* 1993; Mubi *et al.* 2008; Ndubueze *et al.* 2006; Zinn *et al.* 1996; Saleh *et al.* 2002; Onimisi and Omage, 2006; Bello and Tsado, 2014). There is paucity on the study of the economics of feeding this product as a supplement to small ruminant like sheep; this present study therefore seeks to ascertain the cost and returns and the profitability of feeding dried poultry droppings based diet to growing rams fed sorghum stover.

MATERIALS AND METHODS

Experimental site location

The study was carried out at the Animal Production Department Research and Teaching Farm, small ruminant unit of the School of Agriculture and Agricultural Technology, Federal University of Technology, Minna, Nigeria. It is sited at the southern Guinea Savannah Agricultural Zone of the country (NSADP, 1995; Lanko, 2005). The average monthly temperature is 30.5 ˚C which is observed in the month of March and August and yearly mean rainfall of 1400 mm in the month of July and August prevails. Humidity ranges from 60% to 75% (Danwake, 1999).

Experimental feed

Fresh poultry manure was obtained from caged layers reared commercially at Abu-Turab poultry farm in Minna. The poultry manure was sun-dried for 5-6 hours daily for 3-5 days to ensure pathogenic microbial safety. The product was thereafter pounded using pestle and mortar and used as feed. Sorghum stover was sourced in Bosso and Chanchaga areas of the town after the grain harvest and chopped using cutlass to 2-3 cm long before feeding as basal feed *ad-libitum*.

Experimental animals and their management

Thirty Yankasa rams, an intermediate in size between the west African Dwarf sheep and long-legged Uda, less than 12 months old with mean weight of 13.5 kg were used for this study. The animals were kept in pens. The floor of the pen was covered with sawdust for animal's comfort. The animals were treated against ectoparasites, dewormed against endoparasites and were treated with broad antibiotic to prevent bacterial infections. Thereafter the animals were shared into five experimental groups and fed for one week for acclimatization to the experimental diets before data collection. Salt-licks were supplied during the experiment. Water was supplied *ad libitum*.

Experimental design

The experimental rams were grouped into five treatments (T1-T5) consisting of three replicates with two animals per replicate in a complete randomized design. Treatment one (T1) had 0% sun-dried poultry droppings (SDPD) inclusion, T2 had 20% SDPD, T3 had 40% SDPD, T4 had 60% SDPD and T5 had 80% SDPD.

Animal feeding

The Yankasa rams were fed sun-dried poultry dropping-maize bran blended ration as supplement with sorghum stover as basal diet. Feeds were offered twice daily at 8.00 and 16.00 hours.

Fresh clean water was also supplied to each animal *ad libitum* daily. The experimental animals were fed at 3% and 2% of their body weight on dry matter basis. Weekly weight gain was recorded throughout the duration of the study. The feeding trial lasted 112 days.

Methods of data analysis

Data generated in the present study were analyzed using gross margin analysis, net farm income and profitability ratio to achieve the objectives of the study.

Gross margin= total revenue - total variable cost
Total cost= fixed cost + variable cost
Net farm income= total revenue - total cost
Benefit cost ratio= total revenue / total cost
Expense structure ratio= fixed cost / variable cost
Rate of returns= net profit / total cost
Gross ratio (GR)= total cost / total revenue

RESULTS AND DISCUSSION

Cost and return of feeding dried poultry droppings as supplement in rams

Table 1 reveals the estimate of cost and return analysis obtained from feeding dried poultry droppings as supplement in rams using average cost (fixed and variable cost) and average body weight gain by each of the treatment groups. The average mutton price/kg was lowest (₦1560.00) in control treatment group (T1) and was highest (₦3480.00) in supplemented treatment group (T2), closely followed by (T5) (₦3000.00). Total revenue was highest in T2 (₦7565.40), followed keenly by T5 (₦7562.40) and was lowest in T1 (₦3216.30). The Net farm income in T1 was (-₦2005.42) but was highest in T2 (₦2272.42) followed closely by T5 (₦2205.10). Gross margin followed similar trend as was observed for total revenue and net farm income in which highest values were recorded for supplemented treatment group T2 (₦3272.42), closely followed by T5 (₦3205.10) and least in T1 (-₦1005.42). This present study showed that feeding dried poultry droppings as supplement to rams were profitable and it agrees with the findings of (Fawola and Fa-jemisin, 2011; Nadeem *et al.* 1993; Lanyasunya *et al.* 2006; Jokthan *et al.* 2013; Anigbogu and Nwag-bara, 2013), who reported that the inclusion of poultry litter in the diet of ruminants increases farmer's income, thus it is a profitable venture.

Profitability and viability estimate of feeding dried poultry droppings as supplement in rams

Table 2 reveals the profitability and viability estimate of feeding dried poultry droppings as supplement in rams in the present study.

Table 1 Cost and return of feeding dried poultry droppings as supplemental feed in rams

Item	Treatment				
	T1	T2	T3	T4	T5
Performance traits					
Initial average body weight of rams (kg)	11.5	12.4	14.2	14.6	15.3
Average body weight gain (kg/rams)	1.3	2.9	1.5	2.1	2.5
Average total feed consumed (kg/rams)	12.9	14.8	18.2	18.3	24.0
Variable cost					
Total cost of feed (₦*)	31.72	102.98	126.64	127.34	167.00
Average material cost (₦)	900	900	900	900	900
Depreciation cost of material (10%)	90	90	90	90	90
Cost of rams	3000	3000	3000	3000	3000
Misc. expenditure (drug, water and labour, etc.)	200	200	200	200	200
Total variable cost	4221.72	4292.98	4316.64	4317.34	4357.00
Fixed cost					
Cost of house rent	1000	1000	1000	1000	1000
Total cost	5221.72	5292.98	5316.64	5317.34	5357.00
Sales returns					
Average mutton price (1200 ₦/kg)	1560.00	3480.00	1800.00	2520.00	3000.00
Average total manure obtained (kg/ram)	55.21	136.18	149.51	124.11	152.07
Total price of manure (30 ₦/kg)	1656.3	4085.4	4485.3	3723.3	4562.1
Total returns (₦)	3216.3	7565.4	6285.3	6243.3	7562.1
Net profit/ram (₦)	-2005.42	2272.42	968.66	925.96	2205.1
Gross margin	-1005.42	3272.42	1968.66	1925.96	3205.1

T1: had 0% sun-dried poultry droppings (SDPD) inclusion; T2: 20% SDPD; T3: 40% SDPD; T4: 60% SDPD and T5: 80% SDPD.
* Naira-Dollar= ₦199.00-$1.00.

Table 2 Profitability ratios

Treatment	Benefit cost ratio	Expense structure ratio	Gross ratio	Rate of return
T1	0.62	0.24	1.62	-0.38
T2	1.43	0.23	0.70	0.43
T3	1.18	0.23	0.85	0.18
T4	1.17	0.23	0.85	0.17
T5	1.41	0.23	0.71	0.41

T1: had 0% sun-dried poultry droppings (SDPD) inclusion; T2: 20% SDPD; T3: 40% SDPD; T4: 60% SDPD and T5: 80% SDPD.

The benefit-cost ratio ranged from (0.62) in T1 to (1.43) in T2. From the result of this present study supplemented treatment group (T2-T5) has the best benefit-cost ratio (1.17; 1.18; 1.41 and 1.43) and this implies that supplementation of dried poultry droppings in the diet of growing rams is profitable according to rule of thumb of project evaluation which states that any business with benefit-cost ratio higher than one means is profitable, equals to one means break-even, while less than one indicates loss (Olagunju *et al.* 2007).

The gross ratio ranged from 1.62 in T1 to 0.85 in T3 and T4. This implies that in T1, for every ₦1.00 returns to ram feeding, ₦1.62 are being spent while for T2 for every ₦1.00 returns to ram feeding 70 Kobo is being spent. The rate of returns ranged from -0.38% in T1 to 0.43 % in T2. This shows that for every ₦1.00 invested into ram feeding in T1 38 Kobo was lost by the farmer and in T2 for every ₦1.00 invested into ram feeding 43 Kobo was gained by the farmer. The expense structure ratio ranged from 0.24 in T1 to 0.23 in (T2-T5).

The best value was observed in supplemented treatment groups (0.23) which implies that about 23% of the total cost of production is made up of fixed cost component and this make ram farming a valuable venture because increase in production with variable cost also leads to increase in total revenue while the fixed cost remained constant.

CONCLUSION

This present study revealed that rams fed diets with dried poultry droppings had better weight gain, total revenue and net farm income, thus it is a profitable venture. Therefore based on the result of the present study, it is recommended that rams supplemented with dried poultry droppings at 20% inclusion level has the best net profit.

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