RESEARCH PAPER

Profitability of Feeding Sun-Dried Poultry Dropping based Diets as Supplement to Goat

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الربح المتوقع من تغذية الماعز بفضلات الدواجن المجففة باستخدام اشعة الشمس كمكمل غذائي

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ABSTRACT. The profitability of feeding dried poultry droppings-based diet as a supplement in goat production enterprise was analyzed in this present study. The data generated in the study was analyzed using gross margin analysis and profitability ratio. The result of the budgetary analysis showed that the highest total cost of Rs 855.9/goat was incurred, the highest total revenue of Rs 1254.3/goat, highest gross margin of Rs 773.24/goat and highest net farm income of Rs 713.24/goat were observed for the supplemented treatment groups (T2-T5). The profitability ratio gave the best benefit-cost ratio of 4.62, a rate of return of 3.62, a gross ratio of 0.22 and an expense structure ratio of 0.12. This suggests that feeding of dried poultry droppings-based diet to goats is a profitable enterprise. This present study, therefore, recommends the supplementation of sun-dried poultry dropping based diet at 80% inclusion level for maximum profitability of goat production enterprises.

KEYWORDS: *Economics; goats; sun-dried poultry dropping based diet*

الملخص: تم في هذه الدراسة تحليل الربح المتوقع من تغذية الماعز بنظام غذائي يعتمد على فضلات الدواجن المجففة كمكمل في شركات إنتاج الماعز. تم تحليل البيانات الناتجة عن الدراسة باستخدام تحليل الهامش الإجمالي ونسبة الربحية. حيث أظهرت نتيجة تحليل الميزانية أنه تم تكبد أعلى تكلفة إجمالية قدرها ٨٥٥,٩ روبية / ماعز، وأعلى إجمالي إيرادات بلغت ١٢٥٤,٣ روبية / عنزة ، وأعلى هامش إجمالي قدره ٧٧٣,٢٤ روبية / ماعز ، و لوحظ أن أعلى دخل مزرعة صافٍ قدره ٧١٣,٢٤ روبية / ماعز كان للمجموعات التي تم إعطائها المكملات (T2–T5). كذلك أعطت نسبة الربحية أفضل نسبة فائدة إلى التكلفة و قدرها ٤,٦٢ ، ومعدل عائد ٣,٦٢ ، ونسبة إجمالية قدرها ٠,٢٢ ونسبة هيكل المصاريف ٠,١٢. و هذا يشير إلى أن تغذية الماعز من فضلات الدواجن المجففة هي مشروع مربح. لذلك ، توصي هذه الدراسة بإضافة فضلات الدواجن المجففة بالشمس في غذاء الماعز عند مستوى إدراج بنسبة ٨٠٪ لتحقيق أقصى قدر من الربحية لشركات إنتاج الماعز.

الكلمات المفتاحية: اقتصاديات؛ الماعز. نظام غذائي يعتمد على فضلات الدواجن المجففة بالشمس

Introduction

Least cost feeding of livestock is immensely essential for the best productivity. Under productivity of livestock is attributed to the insufficient and exorbitant high costs of feeds (Beigh et al., 2017). Therefore, comparatively low cost agricultural and industrial by-products are essential for profitable livestock production enterprises. It could be achieved by reducing feed costs (Sontakke et al., 2014

Thus, non-conventional feeds can be used to minimize feed cost, and add to self-sufficiency in nutrients from the local feed sources (Bello, 2016; Bello and Tsado, 2014; Sontakke et al., 2014; Mubi et al., 2008; Aro and Tewe, 2007; Onimisi and Omage, 2006; Ndubueze et al., 2006; Saleh et al., 2002; Belewu and Adeneye, 1996; Zinn et al., 1996; Ibeawuchi et al., 1993). Sun-dried poultry droppings could be the non-conventional feed resourc-

es. This study was therefore designed to find profitability of the sun-dried poultry dropping when it was used in supplemented diet (i.e. finger millet straw) to Konkan Kanyal goats.

Materials and Methods

Experimental Location

This study was carried out at the Institutional livestock farm, goat unit of Department of Animal Husbandry and Dairy Science farm, College of Agriculture, Dapoli, India. It is located at 280 m above mean sea level (MSL) and in the subtropical region at 17°45' north latitude and 13°12' east longitude. The area is characterized by hilly terrain. The soil is lateritic and acidic. The soil is low in fertility, having poor water holding capacity. The climate is warm and humid with 3500 mm average annual rainfall. The maximum temperature at Dapoli is about 33.4°C in summer and 21.1°C in winter while, relative humidity ranges from 55 to 96 percent.

Experimental Feed

Three experimental diets were used for the study, finger millet straw, green fodder as basal diets and supplementary diets. Five supplementary diets were prepared. The

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supplementary diets consisted of the following: 100% Concentrate, 20% dried poultry droppings concentrate based diet, 40% dried poultry droppings concentrate based diet, 60% dried poultry droppings concentrate based diet 80% dried poultry droppings concentrate based diet.

Experimental Animals and their Management

Thirty Konkan Kanyal goats, aged 9-12 months and with an average weight of 13.66 kg, were used in this present study. The goats were randomly assigned to five treatments designated T1-T5 comprising of three replicates with two animals per replicate. The animals were kept in individually designed pens. The experimental animals were sprayed against ectoparasites, dewormed orally against endoparasites and treated with a wide-ranging antibiotic to prevent bacterial infections. Thereafter, animals were randomly assigned into five experimental groups and fed for three weeks. The feeding trial was conducted for 90 days. The animals were penned in solitary confinement.

Experimental Design

The experimental design used was the Randomized block design (RBD). Thirty Konkan Kanyal goats aged 9-12 months with an average weight of 13.66 kg were used for this study. The goats were randomly assigned to five treatments designated T1-T5 comprising of three replicates with two animals per replicate.

Animal Feeding

The experimental animals were fed at 3% of their body weight (BW). One-third (1/3) were fed as green feed, two-thirds (2/3) were fed as dry feeds while out of this dry feed two-thirds (2/3) were fed as dry roughages and one-third (1/3) were fed as concentrates. The level of inclusion of dried poultry dropping in the treatments is T1 0%, T2 20%, T3 40%, T4 60% and T5 80%. Chopped finger millet straw (2 cm long) was offered to the animals as basal diets. The goats were fed in individually designed pens.

The experimental animals were weighed at the start of the experiment, subsequently (i.e. weekly). An adaptation period of 21 days was allowed before data was collected for 90 days. The animals were dewormed, dipped against ectoparasites and dosed with antibiotics as prophylaxis before the commencement of the experiment. Clean fresh clean water was offered throughout the study.

Data Analysis

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

Gross Margin = Total Revenue − Total Variable Cost (1)

Total Cost = Fixed Cost + Variable Cost (2)

Net Farm Income = Total Revenue − Total Cost (3)

Benefit-Cost Ratio = Total Revenue/Total Cost (4)

Expense Structure Ratio = Fixed Cost/Variable Cost (5)

Rate of Returns = Net Profit/Total Cost (6)

Gross Ratio (GR) = Total Cost/Total Revenue (7)

Result and Discussion

Cost and Return Analysis

Table 1 reveals the estimated cost and returns analysis as obtained from feeding sun-dried poultry dropping based diet as supplement for goats using average cost (i.e. fixed and variable cost) and average body weight gained by each of the treatment group. The average chevon price/kg was lowest (Rs 857.5) in control treatment group (T1) and was the highest (Rs.1130.5) in supplemented treatment group (T5) followed by (T4) (Rs 1067.5); total revenue was the highest in T5 (Rs 1254.30), keenly followed by T4 (Rs 1185.95) and was the lowest in T1 (Rs 958.38). The net farm income in T1 was (Rs 102.48) but was the highest in T5 (Rs 713.24) followed by T4 (Rs 652.45) respectively. Gross margin result followed a similar trend as was observed for total revenue and net farm income in which the highest values were recorded for supplemented treatment group T5 (Rs 773.24), followed by T4 (Rs 712.45) and least in T1 (Rs 162.48). This present study revealed that feeding dried poultry droppings based diet as a supplement to goats was profitable and it is in agreement with the earlier findings (Bello, 2016; Jokthan et al., 2013; Anigbogu and Nwagbara, 2013; Fawola and Fajemisin, 2011.). The inclusion of poultry litter in the diet of ruminants reduces feed costs and increased farmer's income.

Profitability and Estimated Viability

Table 2 reveals the profitability and estimated viability of the feeding trial with sun-dried poultry dropping based diet as supplement. The cost-benefit ratio ranged from 0.94 (i.e. T1) to 4.62 (i.e. T5). From the result of this present study supplemented treatment group (T2-T5) showed cost-benefit ratios as 1.60, 1.91, 4.26 and 4.62, respectively. This implies that supplementation of sun-dried poultry dropping based diet was profitable. It is commonly considers that any business with cost-benefit ratio higher than one means is profitable, and equals to one means break-even, while less than one indicates loss (Olagunju et al., 2007). The gross ratio ranged from 1.06 (i.e. T1) to 0.22 (i.e. T5). This implies in T1, for every Rs 1.00 returns to goat feeding, Rs.1.06 are being spent, while for T5 for every Rs 1.00 returns while 22 Paisa is being spent. The rate of returns ranged from -0.06% in T1 to 3.62% in T5. This shows that for every Rs. 1.00 invested into goat feeding in T1 (i.e. -0.06 Paisa) was lost by the farmer and in T5 for every Rs 1.00 invested into goat feeding Rs. 3.62 was gained by the farmer. The expense structure ratio ranged from 0.08 (i.e. T1) to 0.12 (i.e. T5). The best value was observed in supplemented treatment groups (i.e. 0.12) which implied that about 12% of the total cost of production

Table 1. Cost and Return of Feeding Sun-dried Poultry Dropping based diet as Supplement for Goats:

S.N.	Statements	T1	T2	T3	T4	T5
1	Initial average body weight of goats (kg)	12.45	13.85	13.93	13.38	14.00
2	Average body weight gain (kg/ goats)	2.45	2.58	2.67	3.05	3.23
3	Average total feed consumed (kg/ goats)	55.43	55.58	59.57	58.72	60.01
4	Initial live weight cost (Rs)	4357.5	4847.5	4875.5	4683	4900
5	Final live weight cost (Rs)	5215	5750.5	5810	5750.5	6030.5
Variable cost						
6	Total cost of feed (Rs)	667.9	326.9	350.5	345.5	353.06
7	Average material cost (Rs)	105	105	105	105	105
8	Depreciation cost of material (10%)	10.5	10.5	10.5	10.5	10.5
9	Misc. Expenditure (drug, water and labour, etc.)	12.5	12.5	12.5	12.5	12.5
10	Total variable cost	795.9	454.9	478.5	473.5	481.06
Fixed cost						
11	Cost of house rent	60.00	60.00	60.00	60.00	60.00
12	Total cost	855.9	514.9	538.5	533.5	541.06
Sales returns						
13	Average chevon price (350Rs/kg)	857.5	903	934.5	1067.5	1130.5
14	Average total manure obtained (kg/ goats)	40.35	48.48	42.05	47.38	49.52
15	Total price of manure (2.5 Rs / kg)	100.88	121.2	105.13	118.45	123.8
16	Total returns (Rs)	958.38	1024.2	1039.63	1185.95	1254.3
17	Net profit/goat (Rs)	102.48	509.3	501.13	652.45	713.24
18	Gross margin	162.48	569.3	561.13	712.45	773.24

Rupees-Dollar= Rs.66.23 $ 1.00

T1: had 0% sun-dried poultry dropping based diet (SDPDBD) inclusion; T2: 20% SDPDBD; T3: 40% SDPDBD; T4: 60% SDPDB and T5 80% SDPDB

Table 2. Profitability ratios

Treatment	Cost-benefit ratio Value	Expense structure ratio Value	Gross ratio Value	Rate of return Value
T1	0.94	0.08	1.06	-0.06
T2	1.60	0.13	0.62	0.60
T3	1.91	0.13	0.52	0.91
T4	4.26	0.13	0.23	3.26
T5	4.62	0.12	0.22	3.62

T1: had 0% sun-dried poultry dropping based diet (SDPDBD) inclusion; T2: 20% SDPDBD; T3: 40% SDPDBD; T4: 60% SDPDB and T5 80% SDPDB

was made up of fixed cost component. This makes goat farming a valuable venture because an increase in production with variable cost also leads to increase in total revenue while the fixed cost remained constant.

Conclusion

This present study showed that goats fed diets with sun-dried poultry droppings had better weight gain, total revenue, and net farm income, thus increasing the profitability of goat production. Therefore, it is recommended that goats supplemented with sun-dried poultry dropping based diet up 80% inclusion level has the best net profit.

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