A Study on Comparison of Stall Feeding System of Goat Rearing with Grazing System

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Abstract

A study was undertaken to compare the grazing system and stall feeding system in goats in Gulbarga district, Karnataka state. Twenty Osmanabadi goats were divided into two groups; stall feeding group and grazing group each containing 10 goats. The overall weight gain was significantly higher in stall fed group (7.90 ±0.12 kg) compared to grazing group (5.30 ±0.55 kg). Blood parameters (average Hb (g/dl), PCV (%) and RBC (10⁶/cmm) count) were higher in stall feeding group (9.16±0.68, 25.09±0.43 and 10.75±0.37 respectively) compared to grazing group (8.64±0.52, 22.97±0.16 and 8.97±0.42 respectively). Upon DLC analysis, different leukocytes were in the normal range in the stall fed group compared to the grazing group. On the 1st day deworming was done for all the goats. At the end of the study, no Strongyle eggs were observed in both the groups. However, coccidial oocysts were found in three goats in grazing group. After three months of experimental period for 10 goats the profit was calculated to be $ 464.4 ($ 96.84 more) in stall fed group as compared to $ 367.56 in grazing group. Therefore goats grow healthier, gain better body weight, and are more healthy and farmers gain more profit in stall feeding system of goat rearing compared to grazing system.

Keywords: Stall feeding system; Grazing system; Growth; Blood parameters; Economics

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1. Introduction

Goat is a very important component in dry land farming system. There are nearly 102 breeds of goats in the world, of which 20 breeds are in India. As per the 18th livestock census the total goat population of India is 140 million (MOSPI). Goats are among the main meat-producing animals in India, whose meat (chevon) is one of the choicest meats and has huge domestic demand. The goat is an animal that adapts itself readily to almost any climate especially in arid region. It is hardy, prolific and can be cheaply reared (Banerjee, 2004).

The goat eats a class of fodder on which other animals would starve and for that reason, goat-rearing is followed as an occupation by a large section of small holders and landless laborers in rural areas (Singh et al., 2000 and FAO, 1991). Marginal or undulating lands unsuitable for other types of animals like cow or buffalo, goat is the best alternative. Goats provide a dependable source of income to 40 percent of the rural population below the poverty line in India (Maske and Phule, 2011). With very low investments goat rearing can be made in to a profitable venture for small and marginal farmers.

Goat rearing by grazing method (extensive method) is commonly followed throughout the Karnataka state. But, due to deforestation and non availability of grazing land, intensive method of goat rearing has its own significance. According to CSWRI, Avikanagar, desired grazing area is 1.3 hectre/ACU, but availability is 0.77 hectre/ACU. So, in future, shepherds have to search for alternatives for sustained production in goat or sheep rearing and stall feeding with minimal inputs is one such promising option (Singh and Shalander Kumar, 2007).

Therefore the present study was undertaken to compare the grazing system and stall feeding system in goats with the objectives to educate and provide technical inputs to farmers regarding intensive system of goat rearing, to supply essential nutrients to goats in intensive farming system thereby helping in attaining better growth of animals as compared to grazing system, to do economic analysis of the intensive farming system in comparison with grazing system and to appraise the farmers on prospects and economics of rearing animals under intensive method.

2. Materials and Methods

2.1. Farmers and the Goats

The study was conducted during first of March 2011 to first of June 2011 (3 month field trial). Two farmers were selected from the village Harsoor, taluq Gulbarga, Gulbarga district of Karnataka state. Each farmer was given 10 Osmanabadi goats aged 3 months; one should rare the goats under stall feeding system (intensive system) (group A) and another should rare the goats under the grazing system (extensive system) (group B).

2.2. Experimental Design

The farmer A (intensive system) was educated about scientific method of raising goats through Training and method demonstration. Then he was given 10 goats and told to rare the goats under stall feeding system. The farmer B was given the 10 goats and was told to rare the goats through extensive as he as well versed with goat raring by grazing. In case of intensive system, the goats were stall-fed (per day basis) as follows;
The goats were administered with Albanic (albendazole and niclosamide) solution for deworming on the 1st day of the experiment. The body weight of all the goats at 0 day (on the day of purchase-3 month old), 1 month, 2 month & 3 month of the experiment were recorded. The blood samples of all the goats of the two groups were collected in EDTA vials on 0th, 30th, 60th and 90th day of the experiment and analyzed for hemoglobin concentration, packed cell volume (PCV), RBC count, WBC count and DLC (Coles, 1986). The fecal samples of all the goats of the two groups were collected on 0th, 30th, 60th and 90th day of the experiment and analyzed for parasitic eggs and oocysts. The economic analysis was done after the 3 month experiment, amount of gross earning of the farmers was worked out and comparative analysis was done with stall feeding system and grazing method.

2.3. Statistical Analysis

In the present study mean as a measure of central tendency and the standard error as a measure of random error were employed for the statistical analysis (Snedecor and Cochran, 1994). The two sample test with \( P \) value of 0.05 was used to know the significant variation between the two groups.

3. Result

3.1. Body Weight

The average body weights of goats are illustrated in Table 1. The average weight of the goats significantly increased from 13.65±0.21 to 21.55±0.09 with 7.90±0.12 kg body weight gain at the end of 3 month experimental period in stall feeding group (Group A). While it increased from 13.64±0.18 to 17.01±0.25 kg with 3.37±0.55 kg body weight gain in grazing group (Group B).

Table 1. Body weight gain in stall fed goats in comparison to grazing goats

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Stall fed system</th>
<th>Grazing system</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0th day</td>
<td>30th day</td>
</tr>
<tr>
<td>Average body weight (Kg) (mean±SE)</td>
<td>13.65±0.21</td>
<td>19.92±0.29</td>
</tr>
<tr>
<td></td>
<td>16.77±0.43</td>
<td></td>
</tr>
<tr>
<td>Overall average weight gain (Kg) (mean±SE)</td>
<td>7.90±0.12</td>
<td></td>
</tr>
</tbody>
</table>

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3.2. Blood Analysis

The measure of various blood parameters is presented in the Table 2.

Table 2. Hematological examination in stall fed goats in comparison to grazing goats

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Stall fed system</th>
<th>Grazing system</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0th day</td>
<td>30th day</td>
</tr>
<tr>
<td>Blood - Hb (g/dl)</td>
<td>9.68±0.19</td>
<td>9.06±0.90</td>
</tr>
<tr>
<td>PCV (%)</td>
<td>22.0±0.17</td>
<td>20.1±0.80</td>
</tr>
<tr>
<td>RBC (10^6/L)</td>
<td>8.8±0.89</td>
<td>7.9±0.75</td>
</tr>
<tr>
<td>WBC (10^3/L)</td>
<td>12.46±0.11</td>
<td>16.14±0.35</td>
</tr>
<tr>
<td>DLC-Lymphocyte (%)</td>
<td>73.4±0.21</td>
<td>82±0.47</td>
</tr>
<tr>
<td>Neutrophil (%)</td>
<td>20.4±0.09</td>
<td>17.6±0.23</td>
</tr>
<tr>
<td>Eosinophil (%)</td>
<td>1.0±0.23</td>
<td>0.8±0.18</td>
</tr>
</tbody>
</table>

* Mean±SE

The average Hb (g/dl), PCV (%) and RBC (10^6/cmm) count were higher in the goats of Stall feeding group (9.16±0.68, 25.09±0.43 and 10.75±0.37 respectively) compared to the goats in grazing group (8.64±0.52, 22.97±0.16 and 8.97±0.42 respectively).

3.3. Fecal Examination

Based on fecal examination on 0th day the Strongyle eggs were observed in the goats of both the groups. Later on, no Strongyle eggs were observed in the goats of both the groups. However, coccidial oocysts (Eimeria spp) were observed in the feces of three goats in grazing group.

3.4. Economic Analysis

The cost and benefit analysis is depicted in the Table 3. The dressing percentage of 50 % and $ 4.32 chevon as the current market price of the goat meat in Gulbarga district are taken for calculation propose. The gross earning of the farmers, after three months of experimental period for a unit of 10 goats the net profit was $ 464.4- in stall fed group (Group A) as compared to the grazing group ($ 367.56/-) (Group B).

4. Discussion

The average body weight gain of goats under stall feeding system was observed to be significantly higher than that in grazing system. Miah and Alim, (2009) also reported higher increase in body weight of black Bengal goats under intensive system compared to semi-intensive system though non significant. The blood parameters; the average Hb (g/dl), PCV (%) and RBC (10^6/cmm) count were higher in the goats of Stall
feeding group compared to the goats in Grazing group which indicates healthy growth in Stall fed goats. Based upon DLC analysis, different leukocytes were in the normal range in the stall fed group compared to the Grazing group. This indicates the safety of the health which supports better development of immune system, growth and body weight gain in stall feeding.

Table 3: Economic analysis of Stall fed system over Grazing system

<table>
<thead>
<tr>
<th></th>
<th>Stall fed system</th>
<th>Grazing System</th>
<th>Difference in the profit ***</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Input cost</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average weight at 3 months is 21.55 kg. Dressed meat weight* is 10.75 kg. For each goat income** is 10.75 x $4.32 = $46.44. For 10 Goats $46.44 x 10 = $464.4</td>
<td>$464.4</td>
<td>$ 367.56</td>
<td></td>
</tr>
<tr>
<td>Weight at 3 months is 17.01 kg. Dressed meat weight* is 8.51 kg. For each goat income** is 8.51 x $4.32 = $36.76. For 10 Goats $36.76 x 10 = $367.56</td>
<td>$367.56</td>
<td>$96.84</td>
<td></td>
</tr>
</tbody>
</table>

* Dressing % = 50%
** Market price for chevon (goat meat) = $ 4.32 per kg
*** Between stall feeding and grazing system

After doing the economic analysis, it can be interpreted as there was significantly higher profit in stall fed groups ($96.84) as compared to grazing group for a unit of 10 goats of breed Osmanabadi.

It can be concluded that in stall feeding system of goat rearing, goats grow healthier, gain better body weight, and are safer on health grounds. By adopting intensive farming system of goat rearing progressive farmers have a large potential for gaining more economic benefit with positive net returns compared to grazing system in arid region. This is important because of shrinking resources for extensive grazing. The result obtained in this study can be adopted as a base for large scale commercial goat farming (Shalander Kumar, 2007).

References


