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## **EFFECT OF CONCENTRATE SUPPLEMENTATION ON GROWTH AND CARCASS CHARACTERISTICS IN GRAZING RAM LAMBS**

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### **ABSTRACT**

An on-farm experiment was conducted for 120 days in grazing native ram lambs in Ananthapur district of Andhra Pradesh, India by supplementing the concentrate mixture at 1.0 per cent body weight to assess the growth and carcass characteristics. 800 ram lambs were selected from local farmers and grouped in to two, first group (Treatment) animals (n=750) were supplemented the concentrate @ 1.0% body weight after 6-8 hours daily traditional grazing and second group (Control) animals (n=50) were maintained solely on grazing for a period of four months. Results revealed that, the final body weight, total weight gain and average daily gain were significantly ( $P < 0.01$ ) higher in concentrate supplemented ram lambs in comparison to solely grazed animals. The cost per kg gains also less in supplemented animals than grazed. Therefore, based on these field trial results it is concluded that supplementation of concentrate at 1.0 per cent body weight would be economical for obtaining optimum growth in grazing ram lambs than sole grazing.

**Key Words:** *Concentrate Mixture, Supplementation, Growth, Carcass Characteristics, Grazing Ram Lambs*

### **INTRODUCTION**

Sheep and goats are mostly managed under village system as per Kamalzade, (2005). Most of the sheep flocks are fed by traditional grazing in open fields, cropped lands after harvesting, tank bunds, forest areas and road sides to get their nutrients. Conventional grazing of sheep does not supply adequate nutrients for obtaining optimum growth in India. Sheep grazing on such lands are underfed for most part of the year and consequently decreased production. Majority of the sheep farmers in tropical and semi-arid region don't supplement their sheep feed with concentrate mixture even in critical physiological stages as per Chaturvedi *et al.*, (2002). It was observed that, limited concentrate supplementation in addition to free grazing on community rangeland substantially improves production performance of ewes according to Chaturvedi *et al.*, (2003) and growth performance of lambs as per workers Shinde *et al.*, (1995); Chaturvedi *et al.*, (2000) and Santra *et al.*, (2002). A supplementation of 250g concentrate in addition to grazing has been recommended to raise sheep under extensive production system in semi-arid regions of India reported by Karim *et al.*, (2004). The information on the effect of supplementary feeding on growth and meat parameters of ram lambs under field conditions is scanty. The present field experiment was aimed to study the effect of concentrate mixture supplementation @ 1.0 per cent body weight on growth/gain and carcass characteristics in grazing native ram lambs.

### **MATERIALS AND METHODS**

This on-farm trial was conducted for four months period by supplementing concentrate mixture at 1.0 per cent body weight in grazing ram lambs in Ananthapur district of Andhra Pradesh, India during the months January to April, 2012.

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#### Procurement of Concentrate Mixture

Concentrate mixture containing 20 per crude protein (CP) was purchased from local vendor and the composition is presented in Table 1. The concentrate was checked for its quality before payment was made. This feed was distributed to farmer's doorstep every fortnight after taking ram lambs body weights.

**Table 1: Ingredient composition of concentrate mixture (%)**

Name of the Feed Ingredient	Per Cent (or) Amount/100kg
Maize Grains	31.0
Ground Nut Cake	16.5
Sunflower Cake	20.0
Deoiled Rice Bran	23.0
Molasses	05.0
Urea	01.5
Mineral Mixture	02.0
Salt	01.0

*Vitamin AD<sub>3</sub> was Added @10g/Quintal*

#### Selection and Grouping of Experimental Animals

Growing healthy native ram lambs (n=750) of about 4-5 months old (Figure 1 and 2) were selected and identified from the various local sheep farmers and were treated as experimental group (T). 50 animals from another farmer were treated as control group (C). The mean initial body weights of ram lambs were 14.15 and 13.90kg in treatment and control groups, respectively. The majority of ram lambs have Nellore X Deccani crossbred characteristics because farmers are crossing their sheep with improved Nellore (Brown) breed of India to get more body weight in next generation.

#### Feeding Management of Experimental Ram Lambs

Ram lambs were sent for grazing from 09.00am to 05.00 pm every day for 120 days. In addition to this 8 hours grazing, a concentrate mixture was offered in the evening at the rate of 1.0 per cent of their body weight. Amount of concentrate mixture offered was calculated based on fortnightly body weights of animals.

All the experimental animals were offered clean, fresh drinking water when they were in shed in the evening. Hygienic surroundings were maintained throughout the experimental period. All the animals were treated for external and internal parasites with Ivermectin and Fenbendazole drugs, respectively, in the beginning of experimental period. Animals were vaccinated against PPR disease seven days after the initial deworming.

#### Growth Study

The animals were weighed fortnightly using a spring balance before offering the feed and water in the morning. Weights were recorded on two consecutive days and the mean was taken to represent the body weight. Average daily gain (ADG) and feed conversion efficiency (FCE) was calculated by using the formulae.

$$\text{ADG (g)} = \frac{\text{Final weight (g)} - \text{Initial weight (g)}}{\text{Number of days}}$$

#### Carcass Characteristics Study

At the end of trial three ram lambs from each group were slaughtered by 'Halal' method after overnight starving. The live weights before slaughter were recorded. The stripping, legging, dressing and evisceration were performed by adopting the standard procedure described by Gerrand (1964).

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**Figure 1: Grazing of ram lambs in harvested paddy (Rice) fields**



**Figure 2: Grazing of ram lambs in open barren lands during day time**

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The weights of hot carcasses, edible (liver, heart, testes, diaphragm, kidney and spleen) and non-edible organs (blood, lungs, trachea, stomach and intestines) were recorded. The carcasses were then divided into 5 cuts - leg, loin, rack, shoulder and neck and fore shank and brisket as suggested by the National Livestock and Meat Board of United States of America by Brandly *et al.*, (1968). The leg was taken off from the carcass by cutting with a saw at right angle to back close to the hip bone. The loin was removed from the carcass from the hip bone to the anterior part of the last rib. The rack was obtained by cutting from the posterior part of the 12<sup>th</sup> rib to the anterior part of the 5<sup>th</sup> rib. Shoulder and neck was carved out by cutting from the posterior part of the 4<sup>th</sup> rib to the neck (including the neck). The weights of the different wholesale cuts were recorded separately. The weights of fat, muscle and bone were recorded separately from the carcass.

Data obtained in the trial was analyzed according to the statistical procedures suggested by Snedecor and Cochran (1994). Analysis of variance was utilized to test the significance of various treatments and the difference between treatment means was tested for significance by Duncan's Multiple Range and F test by Duncan (1955).

## RESULTS AND DISCUSSION

### Growth Study

The results revealed that, the total weight gains were 10.87 and 6.84kg, respectively (Table 2) in the ram lambs maintained on grazing plus concentrate supplementation and sole grazing. Significantly ( $P<0.01$ ) increase in weight gains were observed in concentrate supplemented ram lambs than sole grazed ram lambs. The average daily gain (ADG) recorded in treatment and control groups were 90.58 and 57.00g, respectively (Table 2). Significant ( $P<0.01$ ) increase in ADG was observed in the ram lambs maintained on grazing plus concentrate supplementation in comparison to solely grazed animals. The ADG values obtained in this trial are little higher than the values of Chaturvedi *et al.*, (2009) who observed an ADG of 80g in lambs maintained on 8hours grazing plus supplementation of concentrate at 300g per animal day. Higher gain in the present trial might be due to good quality pastures available in the grazing lands and genetic makeup of animals. Tripathi *et al.*, (2007) also reported improvement in growth and feed efficiency with increasing amount of concentrate in the lamb's ration. Shinde *et al.*, (1995) also observed similar weight under farm conditions where the lambs were maintained on good quality established pasture. However, 98.1g ADG in 90days of feeding was reported in wiener lambs grazing on established pasture with concentrate supplementation @1.5% of the body weight under farm conditions according to Santra *et al.*, (2002); Girish *et al.*, (2012) reported the ADG 108 and 94 g respectively in Grazing plus concentrate supplementation and Sole garzing in Nellore (Brown) ram lambs.

**Table 2: Effect of concentrate supplementation on growth performance in grazing ram lambs**

Parameter	Treatment	Control	SEM	t-Value
Initial Weight (kg)	14.15	13.90	0.10	
Final Weight (kg)	25.02 <sup>b</sup>	20.74 <sup>a</sup>	0.62	7.35
Weight Gain (kg)	10.87 <sup>b</sup>	6.84 <sup>a</sup>	0.62	6.83
Average Daily Gain (g)	90.58 <sup>b</sup>	57.00 <sup>a</sup>	5.47	6.83
Extra Weight Gain (9kg) in Supplemented Ram Lambs	3.49	--	--	--
Conc. Feed Consumed/Animal (kg)	22.67	--	--	--
Cost of Input/Animal (Rs.)	317	--	--	--
Extra Income/Animal (Rs.)	628	--	--	--
Cost Benefit Ratio	1:1.98	--	--	--

<sup>a,b</sup> values bearing different superscripts in a row differ significantly ( $P<0.01$ )

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### Carcass Characteristics Study

The carcass parameters i.e. Pre slaughter weight, Empty body weight, Carcass weight, dressing percentage (% slaughter weight-SW) and Dressing percentage (% empty body weight-EBW) were shown in Table 3. The carcass weight was significantly ( $P<0.01$ ) higher in treatment group animals than control. This might be due to consumption of concentrate in treatment group and which is high in protein and energy than traditional grazed lambs. The dressing per cent (DP) on SW and EBW observed was 46.2, 55.22 and 41.72 and 54.74, respectively in treatment (concentrate supplementation) and control (sole grazing) group ram lambs. The DP on SW was significantly ( $P<0.05$ ) higher in concentrate supplemented ram lambs than unsupplemented (sole grazed) animals. The DP on EBW was comparable among the ram lambs maintained either with concentrate supplementation and grazing or solely fed by grazing. The DP on EBW in this study were comparable with the results reported by Wildeus *et al.*, (2007) as dressing percentage (54.0 per cent vs. 52.2 per cent ( $P<0.05$ ) in Boer weathers either chopped alfalfa (15.2 per cent CP) or grass hay (10.9 per cent CP) and forage was supplemented with concentrate (16.3 per cent CP) at 1 per cent of body weight. Alfalfa forage feeding improved dressing percentage, but had no effect on other carcass characteristics. Girish *et al.*, (2012) reported significantly higher mean dressing percentage with  $51.07\pm 0.44\%$  based on preslaughter weights (live weight) in lambs supplemented concentrate plus grazing, when compared to lambs in control group (grazing only) with  $47.55\pm 0.78\%$  of dressing. Karim *et al.*, (2007) in Kheri lambs which recorded 44.9% (on live weight) dressing percentage when reared on grazing and 48.8% (on live weight) when fed with *ad lib*. Concentrate combined with grazing.

**Table 3: Effect of concentrate supplementation on carcass characteristics in grazing ram lambs**

Parameter	Treatment	Control	SEM	t-Value
Pre Slaughter Weight (kg)	26.45	21.86	0.95	6.87
Empty Body Weight (kg)	22.13	16.66	1.20	5.03
Carcass Weight (kg)**	12.22 <sup>a</sup>	9.12 <sup>b</sup>	0.81	6.37
Dressing Percentage (% SW)*	46.2 <sup>a</sup>	41.72 <sup>b</sup>	0.86	4.25
Dressing Percentage (% EBW)	55.22	54.74	0.94	1.02

Each value is the average of three observations

Values bearing different superscripts in a row differ significantly;

\*\* $P<0.01$ , \* $P<0.05$

In conclusion, supplementation of concentrate mixture at 1.0 per cent of body weight could be economical for obtaining optimum growth in grazing native ram lambs than sole traditional grazing. Supplementation of concentrate in ram lambs has increased the dressing per cent on slaughter weight and had an effect on empty body weight.

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