International Journal of Science, Environment
and Technology, Vol. 2, No 2, 2013, 128 - 132

EFFECT OF FEEDING MAIZE SILAGE SUPPLEMENTED WITH CONCENTRATE / LEGUME HAY ON CARCASS CHARACTERISTICS IN NELLORE RAM LAMBS

[1]Venkateswarlu Malisetty*, [2]Ramana Reddy Yerradoddi and [3]Narasimha Jatoth
[1,3]Department of Animal Nutrition, College of Veterinary Science,
Sri Venkateswara Veterinary University, Rajendranagar, Hyderabad-500 030, India
[2]International Livestock Research Institute (ILRI),
International Crop Research Institute for Semi Arid Tropics (ICRISAT), Hyderabad, India
Emails: [1]malisettyv46@gmail.com, [2]ramanayr19@yahoo.co.in, [3]njatoth@yahoo.com
(**Corresponding author*)

Abstract: An experiment was conducted on-farm with Nellore ram lambs by feeding intensively for five months period with sole maize silage (R-I), silage + concentrate at 0.5 per cent body weight (R-II), silage + concentrate at 1.0 per cent body weight (R-III), silage + concentrate at 1.5 per cent body weight (R-IV), silage + lucerne hay (R-V) and silage + GN haulms (R-VI) to study the carcass characteristics and compared with the ram lambs fed sweet sorghum bagasse based complete diet (R-VII). Results revealed that, the dressing percentage on live weight or empty body weight basis and lean, bone and fat per cent was not significantly ($P > 0.05$) different among the seven rations. Leg portion was significantly ($P < 0.01$) higher in ration R-IV and lowest in R-I ration. The weight of edible organs were significantly ($P < 0.05$) different among the animals in seven experimental rations and the protein, fat and ash contents in the meat of ram lambs were comparable among the different maize silage based rations in comparison to SSB based ration. Based on the results, it is concluded that, feeding of maize silage supplemented with concentrate or legume hay did not affected the carcass parameters barring leg portion and edible organ's weight in Nellore ram lambs.

Key words: Maize silage, concentrate or legume hay supplementation, carcass characteristics, Nellore rams lambs.

INTRODUCTION

Feeding of silage based rations is becoming popular among the farmers rearing sheep on commercial basis in India particularly in Andhra Pradesh, Tamilnadu and Karnataka states. However, a feeding system based on silage needs to be developed for rearing of ram lambs on commercial scale since the literature on silage feeding in ram lambs is limited. Silage, which is anaerobically fermented green fodder, is valued throughout the world as a source of animal feed during lean months (Ragothaman Venkataramanan *et al.,* 2010). Maize (*Zea mays)* is the third most important cereal crop of the world and it is used as food, feed and forage. Maize fodder can safely be fed at all stages of growth without any danger of oxalic acid, prussic acid as in case of sorghum or other fodders. Therefore, green maize

*Received Jan 29, 2013 * Published April 2, 2013 * www.ijset.net*

fodder is referred as 'king of crops' suitable for good silage making (Muhammad *et al.,* 1990).

The main intension of this experiment is to study the effect of feeding maize silage supplemented with concentrate mixture and legume hay at certain levels on meat/carcass characteristics like dressing percentage, wholesale cuts and proportions of meat, bone and fat in the carcass, edible and non edible organs and meat composition in Nellore ram lambs.

MATERIALS AND METHODS

The present experiment was conducted by a farmer on-farm basis at Indugula village in Nalgonda district of Andhra Pradesh**,** India.

Preparation of experimental rations

Maize silage and lucerne hay was prepared by the farmer at the village. The concentrate mixture (17% CP and 70%TDN) and the sweet sorghum bahgasse (SSB) based complete ration (50R:50C) were prepared at department of animal nutrition, Hyderabad and transported to Indugula village. Groundnut haulms were purchased from another farmer.

Selection of experimental animals and feeding

Forty nine 3-4 months old growing Nellore ram lambs with an average body weight of 14.26±0.24 kg were purchased from local sandy and were randomly distributed into seven groups of seven animals each. Seven experimental groups were fed with respective rations as for a period of five months.

The first group (R-I) of growing Nellore ram lambs were fed sole maize silage at *ad libitum.*

The second group (R-II) animals fed concentrate mixture @ 0.5 per cent of body weight + maize silage *ad libitum.*

The third group (R-III) animals fed concentrate mixture @ 1.0 per cent of body weight + maize silage *ad libitum.*

The fourth group (R-IV) animals fed concentrate mixture @ 1.5 per cent of body weight + maize silage *ad libitum.*

The fifth group (R-V)) of ram lambs fed lucerne hay to meet 25 per cent of dry matter requirement and maize silage *ad libitum*.

The sixth group (R-VI) of ram lambs fed groundnut haulms (straw) to meet 25 per cent of dry matter requirement and maize silage *ad libitum.*

The seventh group (R-VII) ram lambs fed solely on SSB based complete ration (50:50).

Experimental ram lambs were housed in a well ventilated house with an open area for movement during day time. All the experimental animals were offered clean, fresh drinking water round the clock and were treated for external and internal parasites in the beginning as well as after three months of experimental period.

Carcass Characteristics

At the end of experiment the ram lambs 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). 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 (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^{th} rib to the anterior part of the 5^{th} rib. Shoulder and neck was carved out by cutting from the posterior part of the 4^{th} 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.

Statistical analysis of the data was carried out according to the 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 (Duncan, 1955).

RESULTS AND DISCUSSION

Results of present study revealed that, there is no significant difference was observed in the dressing percentage expressed either on live weight or empty body weight among the experimental Nellore ram lambs fed different maize silage and SSB based rations (Table 1), but increased trend was observed due to supplementation depending on quality and level of supplementation in R-II, R-III, R-IV, R-V and R-VI rations in comparison to R-I ration. Bosman *et al*. (2000) fed the South African Mutton Merino wethers with maize silage at 50 and 70% levels and remaining with concentrate mixture and reported carcass mass (kg) was 21.80±0.6 and 20.90±0.4; dressing percentages were 48.60±1.6 and 47.30±1.3 in lambs fed maize silage based rations, respectively. Wildeus *et al.* (2007) reported dressing percentage

(54.0 per cent vs. 52.2 per cent ($P < 0.05$) in Boer wethers 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. In contrast to present findings, diets based on whole plant maize silage significantly ($P<0.01$ to $P<0.001$) improved the carcass traits like slaughter weights, hot and cold carcass weights, dressing percentage (Mekonnen *et al.*, 2009) in Ethiopian highland Arsi type ram lambs. Leg portion was significantly ($P<0.01$) different in ram lambs fed different rations in the present experiment, being highest in ram lambs fed ration R-IV and lowest in R-I ration. This could be due to high level of concentrate supplementation to the experimental ram lambs. However, loin, rack, shoulder and neck and fore shank and brisket proportions were non significantly ($P>0.05$) different among the seven rations. The bone:meat ratio in carcasses of animals fed experimental rations were also comparable. The weight of edible organs were significantly ($P<0.05$) different among the seven experimental rations and was highest in lambs fed R-V followed by R-VII, R-IV, R-III, R-II, R-VI and R-I rations. No variation in the chemical composition of meat of different experimental animals in the present investigation might be due to less influence of maize silage and SSB based rations on meat composition. Feeding of grass silage as total mixed ration (TMR) had no effect on carcass traits (Keane *et al*., 2006).

Table 1: Effect of feeding maize silage based rations on dressing percentage of carcasses in Nellore ram lambs

Ration	Live weight at slaughter (kg)	Empty body weight (kg)	Carcass weight (kg)	Dressing per cent on live weight	Dressing per cent on empty body weight
R-I	18.50±0.30	15.80±0.30	8.80±0.20	47.49±1.50	55.70±1.50
R-II	21.10±1.20	18.60±1.20	10.86±0.40	51.58±1.10	58.38±1.20
R-III	22.10±1.60	19.60±1.50	11.46±0.70	52.00±2.40	58.47±2.50
R-IV	26.50±2.62	23.80±2.58	13.80±1.44	52.08±0.48	57.98±0.46
R-V	24.80±0.63	21.80±0.63	12.72±0.09	51.31±1.41	58.35±1.47
R-VI	20.30±0.21	18.00±0.20	10.49±0.02	51.70±0.64	58.28±0.62
R-VII	23.90±2.03	21.10±2.03	12.45±1.05	52.18±0.07	59.00±0.18
SEM	**0.64**	**0.63**	**0.36**	**0.54**	**0.56**

Each value is a mean of four observations

CONCLUSION

Feeding of maize silage solely or supplementation with concentrate mixture or legume hays did not affect the carcass characteristics like dressing percentage, wholesale cuts and proportions of meat, bone and fat in the carcass, edible and non edible organs and meat composition in growing Nellore ram lambs, but the leg portion was significantly ($P<0.01$) being highest in ram lambs fed ration R-IV and lowest in R-I (sole silage fed animals) ration.

ACKNOWLEDGEMENTS

The authors acknowledge the authorities of NAIP-NRC on Meat Project for the financial grant to carry out this experiment.

REFERENCES

[1] Bosman, M. J. C., Webb, E. C., Cilliers, H. J. and Steyn, H. S. 2000 *South African Journal of Animal Science*, 30 (1): 36.

[2] Brandly, P. J., George, Migaki, Kenneth, E. and Taylor. 1968 Meat hygiene, 3rd edition, Lea and Febiger, Philadedphia, USA.

[3] Duncan, D. B. (1955) *Biometrics* 11: 1.

[4] Gerrand, F. 1964 Meat Tech. 3rd edition Leonard Hell Limited, London.

[5] Keane, M. G, Drennan, M. J. and Moloney, A. P. 2006 Livestock Science 103: 169.

[6] Mekonnen, H., Endale, M., Salvador, F. and Tegegne, A. 2009 Revue Méd. Vét. 160:293.

[7] Muhammad, D., Hussain, A. and Bhati, M. B. 1990 *Pakistan Journal of Science and Research* 33: 454-457.

[8] Ragothaman, Venkataramanan, Chirukandoth, Sreekumar, Rishipal, Anilkumar, Selvaraj, P., Nainar, M, Vidhya and Iyue, Mathagowder. 2010 *Tropical Animal Health and Production* 42 (5): 1027.

[9] Snedecor, G. W. and Cochran, W. G. 1994 Statistical Methods (8th edn). Iowa State university Press, Ames, Iowa, USA.

[10] Wildeus, J., Luginbuhl, J. M., Turner, K. E., Nutall, Y. L. and Collins, J. R. 2007, *Sheep & Goat Research Journal* 22 : 15.