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Effect in meat composition and carcass characteristics of goat feeding mixture of different medicinal leaves of north east India

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Abstract

The study was conducted to determine the effect of feeding diet containing *Carica papaya*, *Artocarpus heterophyllus*, *Terminalia bellirica leaf* mixture (1:1:1) in concentrate mixture at 5% and 10% level on carcass characteristics and meat composition. Eighteen Assam hill goats were divided into three groups- T₁ served as Control and in treatment groups T₂ and T₃, the concentrate mixture was replaced with 5% and 10% level of leaf mixture respectively. No significant difference was found in carcass characteristics and meat composition between the groups but T₃ group showed better result than other groups. It was concluded that the leaf mixture of *Carica papaya*, *Artocarpus heterophyllus*, and *Terminalia bellirica* could be used up to 10% level as supplement in the diet of goats.

Keywords: Goat, carcass characteristics, meat composition

Introduction

Meat contains small amount of carbohydrates and a high amount of purine, creatine, creatinine and minerals like phosphorus, iron. Meat is rich in soluble vitamins - B complex. Meat contains approximately 20% proteins. Meat of any animal has a composition correlated with the age and nutritional status of animal. Goats are browsing animal that generally browse on about 104 species of plants [1]. Colour of the meat is influenced by the diet. Grass fed animals have darker meat with lower intramuscular fat than grain fed ones [2-5]. Supplementation of forage trees to goats improves body weight and improvement in the body weight could have a positive effect in the meat quality [6] (Oni *et al.*, 2010). Growth rate and chemical composition of meat are mostly influenced by physiological state, microclimate and rearing conditions of the animal [7]. Further the colour of the meat is influenced by concentration of haemoprotein in the muscle [8]. The present study was undertaken to investigate the effect of meat composition and carcass characteristics of goat fed different mixture of medicinal leaves.

Material and Methods**Experimental animals**

Eighteen Assam hill (local) kids of 3-4 months of age and average 6-8 kg body weight were procured locally. Prior to the start of the actual experiment the animals were conditioned for a period of 15 days during which they were treated with ecto and endo parasites. During the conditioning period, the animals were fed a standard concentrate mixture @100g per day and *ad libitum* green fodder.

Housing and management

The experimental kids were housed in a well ventilated goat shed having wooden bed.

Period of experiment and parameters studied

The feeding trial was performed for a period of 120 days followed by a metabolic trial for 7 days.

Experimental dietary treatment

Standard ration was prepared using conventional feed ingredients *viz.* Maize, Rice bran, Groundnut cake, Mineral mixture, Salt and Vitamins. Thus, the groups with their dietary treatment were as follows:

(i) Ingredients of the experimental diets

Ingredients	Control	5% level	10% level
Maize	65	56	60
Wheat Bran	20	25	20
GNC	12	11	7
Min. mixture	2	2	2
Salt	1	1	1
Medicinal Leaves	----	5	10
Total	100	100	100

Slaughter Experiment

At the end of the feeding trial 3 animals from each group were sacrificed for the evaluation of carcass characteristics and body composition. Prior to slaughter the goats were fasted for 18 hr. However, clean drinking water was provided to them. Body weight, heart girth, height and body length was recorded just before slaughter. All the edible and inedible offal were weighed individually and expressed as percent to carcass weight. The weight of the hot carcass was recorded.

Proximate analysis of body composition

Samples were taken from each cut of the carcass and edible organs by 1/100th part of the weight. Then each sample was manually chopped to homogenous mass. This mass was used for analysis. The proximate analysis of meat samples were estimated by the method described in AOAC [9].

Statistical Analysis

The data obtained during the experiment were subjected to analysis of variance as per the method of Statistical Package for Social Sciences (SPSS 11.5).

Results and Discussion

Feeding level (Control, T₁, and T₂) has no significant difference in respect of moisture, protein, fat and ash content in the body but group T₂ found to be better than other two groups. The percentage of moisture, protein, fat and ash ranged from 67.62±2.33 to 69.74±1.60, 19.4±0.42 to 20.66±0.89, 5.1±0.6 to 6.12±0.24 and 1.21±0.12 to 1.59±0.26 respectively among the different groups.

Mean value of slaughter weight, hot carcass weight and dressing percentage are given Table 3 and Fig. 2, 3 and 4. There was no significant difference among treatments in major slaughter parameters but numerically the values increased in treatments supplemented with concentrate consisting of leaf meal and the result was consistent with that

of body weight. In the study of substitution of concentrate mix with graded levels of dried moringa (*Moringa stenopetala*) leaf meal on carcass characteristics of Arsi-bale sheep found none significant difference among treatments concerning slaughter weight, hot carcass weight, dressing percentage [10]. Nutrition greatly influences dressing percentage through variation in weight of gut contents or variation in actual organ weights [11]

The live body measurement in respect of height, body length and heart girth were recorded. No significant difference ($P>0.05$) was found between the groups.

Edible and inedible offals were found to be higher in group T₂ although no significant difference was found between the groups. Due to differences in taste and in eating habits, edible and inedible proportions of the carcass in one area of the country may not be the same for another [12]

(ii). Chemical composition in body of Experimental Kids under Different feeding regime

Particulars	Groups		
	Control	T ₁	T ₂
Moisture	67.62±2.33	68.29±1.54	69.74±1.60
Protein	19.4±0.42	20.26±0.52	20.66±0.89
Fat	5.1±0.6	5.30±0.38	6.12±0.24
Ash	1.21±0.12	1.58±0.17	1.59±0.26

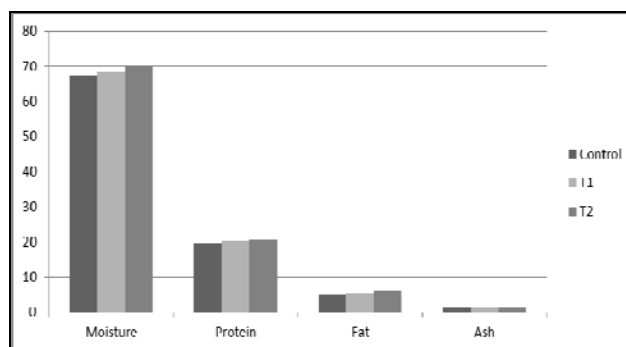


Fig 1: Mean values of Chemical Composition of meat of Goat fed with different concentration of medicinal leaves

(iii): Carcass Characteristics of Experimental Kids under Different Feeding Regimes

Particulars	Groups		
	Control	T ₁	T ₂
Live body measurements			
Body heights (cm)	50.07±0.89	49.30±0.48	52.04±0.67
Body length (cm)	61.95±1.12	63.03±1.47	67.28±1.45
Heart girth (cm)	60.73±0.78	61.04±0.51	62.33±1.13
Slaughter and dressing			
Slaughter weight (kg)	8.76±0.29	9.77±0.18	10.32±0.26
Hot carcass weight (kg)	4.89±0.19	4.83±0.42	4.97±0.381
Dressing percentage	55.8±1.08	49.38±3.89	48.05±2.61
Edible offals	2.49±0.31	3.08±0.04	3.376±0.13
Inedible offals	31.24±0.74	32.36±0.9	34.55±1.24

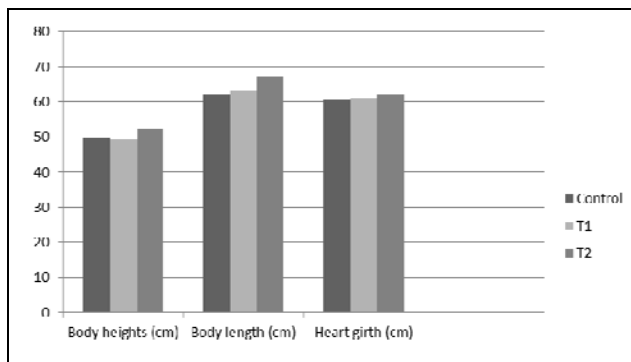


Fig 2: Live body measurement of Experimental Kids under Different Feeding Regimes

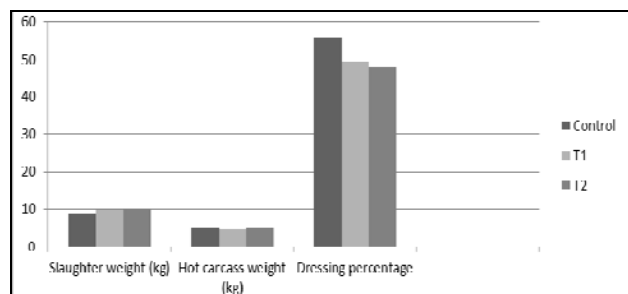


Fig 3: Slaughter and dressing percentage of Experimental Kids under Different Feeding Regimes

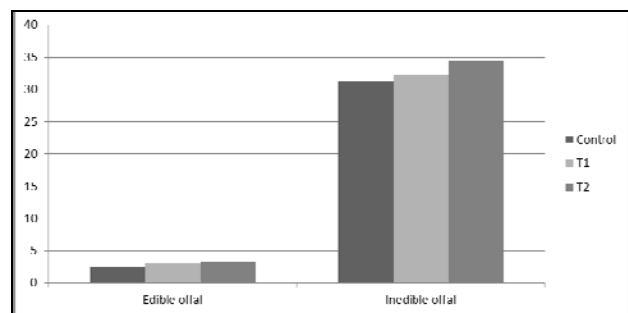


Fig 4: Edible and Inedible offals of Experimental Kids under Different Feeding Regimes

Conclusion

It can be concluded from the results of the study that supplementation of concentrate feed with *Carica papaya*, *Artocarpus heterophyllus*, and *Terminalia bellirica* showed better carcass characteristics and meat composition though there is no significant difference among the groups.

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