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Studies on carcass traits of weaned Osmanabadi kids fed with different combination of leguminous foliage

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Abstract

Twenty-four Osmanabadi weaned kids of same age and uniform confirmation was selected for experimental trails. The kids were grouped under same weight and average age in four treatment group with six kids (3males and 3female) in each group. The control (T₀) included 80% DCP from concentrate mixture + 20% DCP from green Sorghum + *ad-lib* sorghum *Kadbi*; T₁ included 20% DCP from concentrate mixture +20% DCP from green sorghum fodder+ 30% DCP from *Sesbania grandiflora* (Hadaga) foliage + 20% DCP from *Leucaena leucocephala* (Subabul) foliage + 10% DCP from *Desmanthus virgatus* (Dashrath) foliage + *ad-lib* sorghum *kadbi*; T₂ included 20% DCP from 20% DCP from green sorghum fodder + 20% DCP from *Sesbania grandiflora* (Hadaga) foliage + 20% DCP from *Leucaena leucocephala* (Subabul) foliage + 30% DCP from *Desmanthus virgatus* (Dashrath) foliage + *ad-lib* sorghum *kadbi*; T₃ included 20% DCP from 20% DCP from green sorghum fodder + 10% DCP from *Sesbania grandiflora* (Hadaga) foliage + 30% DCP from *Leucaena leucocephala* (Subabul) foliage + 20% DCP from *Desmanthus virgatus* (Dashrath) foliage + *ad-lib* sorghum *kadbi*; The experimental period was 270 days and 10 days as a pre-experimental period.

The average dressing percentage on PSW basis of Osmanabadi kids in T₀, T₁, T₂ and T₃ were as 49.10, 49.64, 50.11 and 48.37 percent, respectively. The average dressing percentage on ESW basis of Osmanabadi kids were as 52.98, 5.53, 54.30 and 52.85 percent, respectively. The dressing percentage on Pre-slaughter weight basis under treatment T₂ and T₁ was significantly ($P < 0.05$) higher over T₀ and T₃. However T₀ was significantly over T₃. The dressing percentage on Empty slaughter weight (ESW) basis under treatment T₂ and T₁ was significantly ($P < 0.05$) higher over T₀ and T₃. Therefore, it can be concluded that the dressing percentage on PSW and ESW were significantly higher in kids fed T₂ (20% DCP from concentrate mixture + 20% DCP from green sorghum fodder 20% DCP from *Sesbania grandiflora* (Hadaga) foliage + 10% DCP from *Leucaena leucocephala* (subabul) foliage + 30% DCP from *Desmanthes virgatus* (dashrath) foliage + *ad-lib* sorghum *kadbi*) combination of leguminous foliage than other treatment (T₁, T₃ and T₀) groups.

Keywords: *Leucaena leucocephala*, *Desmanthus virgatus*

Introduction

Goats are the lifeblood of India's small, marginal farmers and landless labourers. It protects farmers from crop failure and provides them with additional sources of income throughout the year (Anonymous, 2012) [1] and deserve to have better management practices (Vijay Kumar, 2021). They have an important role in generating money and employment, as well as boosting household nutrition. Under changing agro-geo-climatic conditions and depleting resources for crop-based subsistence, the goat "poor man's cow" has significant potential to be projected as the "Animal of the Future" for rural prosperity (Patil *et al.*, 2020) [10].

In India, some goat breeds are basically reared for meat purpose. The goat meat, known as 'chevon,' is preferred by the country's non-vegetarians because to its great taste, wonderful flavour, high protein (22 g), low fat (12.3 g), calories (2 Kcal), saturated fat 85 mg and less cholesterol (94 mg) than other species meat such as chicken, cattle, pork and mutton. Higher value of iron, potassium and thiamine associated with a low sodium level further aggravate the consumption of meat (Eastridge and Johnson, 1990). Although goat meat intake is not associated with any religious attitude, it is critical to raise goats and increase their number at a faster rate. Goats are regarded as valuable 'gold' that can be cashed by their owners at any time. Agathi (*Sesbania grandiflora L.*) is a legume plant of tropical Asia and very popular among the dairy farmers used to supplement rice straw in animal diets probably due to high levels about 25-30%, of crude protein content in leaves (Karmakar *et al.*, 2016) [6]. Agathi is traditionally used for anti-inflammation, anti-microbial activities, anti-cancer, anti-diabetic activities, anti-oxidant activities, anti-ulcer activity, an immune-modulatory activity, and

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associated diseases such as hepatic diseases, respiratory diseases and renal diseases. Agathi leaves and pods were reported palatable and non-toxic to cattle (Jiraungkoorskul and Jiraungkoorskul, 2015) [5].

Hedge Lucerne or Dasharath (*Desmanthes virgatus L.*) is grown as a forage legume and produces green fodder containing high amount of crude protein as well as good palatability. And 22.4% crude protein and yield up to 15-25 t/ha under optimum soil and climate conditions.

Subabul (*Leucaena leucocephala*) it can produces up to 60 t/ha/year nutrient rich leaf biomass. Leaves contains higher amounts of protein (About 27.5%) compared to common grasses, beside leaves, pods and seeds are also rich in proteins, minerals and essential fatty acids which increase growth rate and milk production in animals. Most preferred feed for goat and sheep due to its high palatability, selectivity and dry matter intake level (Gunasekaran *et al.*, 2014) [4].

Material and method

Twenty four Osmanabadi weaned kids of same age and

uniform conformation was selected from the Goat Unit, Department of Animal Husbandry and Dairy Science, VNMKV, Parbhani to conduct the experiment. Kids were grouped under same weight and average age in four treatment groups with six kids in each group. All the kids were free from diseases and physiological disorders. The details of selected experimental kids are given in table 1.

1. Collection of foliage

Different foliage i.e Hudga (*Sesbania grandiflora*), Subabul (*Leucaena leucocephala*) and Dashrath (*Desmanthus virgatus*) were cut and carry, and collected from CCBP, AHDS Department, VNMKV, Parbhani.

2. Duration of experiment

The experiment was conducted from 12th February 2021 to 12th November 2021 at Goat unit, Department of Animal husbandry and Dairy Science, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani. The experimental period was 270 days and 10 days as a pre-experimental period.

Table 1: Feed details and treatment

Treatments	Feed details
T ₀	80%DCP from concentrate mixture + 20% DCP from green sorghum fodder + <i>ad lib</i> sorghum kadbi
T ₁	20% DCP from concentrate mixture + 20% DCP from green sorghum fodder +30% DCP from hudga foliage + 20% DCP from subabul foliage + 10% DCP from dashrath foliage + <i>ad lib</i> sorghum kadbi
T ₂	20% DCP from concentrate mixture + 20% DCP from green sorghum fodder 20%DCP from hudga foliage + 10%DCP from subabul foliage + 30% DCP from dashrath foliage + <i>ad lib</i> sorghum kadbi
T ₃	20%DCP from concentrate mixture + 20% DCP from green sorghum fodder +10% DCP from hudga foliage + 30%DCP from subabul foliage + 20% DCP from dashrath foliage + <i>ad lib</i> sorghum kadbi

3. Dressing percentage

The meat prouction performance of the male kids was measured in terms of dressing percentage.

$$\text{Dressing \% PSW} = \frac{\text{Hot carcass weight}}{\text{Pre-slaughtered weight}} \times 100$$

$$\text{Dressing \% ELW} = \frac{\text{Hot carcass weight}}{\text{Empty live weight}} \times 100$$

Where,
PSW is pre-slaughter weight (kg)

ELW is empty live weight (kg)

4. Results and discussion

The results of present research work entitled “Studies on carcass traits of weaned Osmanabadi kids fed with different combination of leguminous foliage” were recorded, analyzed and presented in the following headings.

4.1 Weight of hot carcass

The observation of hot carcass weight in osmanabadi slaughtered male goat under four different treatments were recorded analyzed and presented in Table 2

Table 2: Effect of different combination of leguminous foliage feed treatment on weight of hot carcass (kg)

Treatment	T ₀	T ₁	T ₂	T ₃
R ₁	13.26	13.31	13.83	12.11
R ₂	12.73	13.48	13.98	12.49
R ₃	12.40	13.23	13.81	12.85
Mean	12.79 ^{bc}	13.34 ^{ab}	13.87 ^a	12.48 ^c
SE ±	0.1737			
CD at 5%	0.557			
CV%	2.254			
F test	Significant			

(Means with dissimilar superscripts differed significantly P<0.05)

The average weight of hot carcass under treatments T₀, T₁, T₂ and T₃ were 12.79, 13.34, 13.87 and 12.48 kg, respectively. The average weight of hot carcass under treatment T₂ and T₀ was significantly (P<0.05) higher over T₃ while T₀ was at par with T₁.

Among all treatment groups, the combination of leguminous foliage (20% from homemade concentrate mixture + 20% DCP from green Sorghum fodder + 20% DCP from Hadaga + 10% DCP from Subabul + 30% Dashrath + *ad-lib* Sorghum kadbi) in T₂ group had highest weight of hot carcass, which

could be due to higher growth rate from higher feed intake in term of DM and significantly higher digestibility of DM, CP, EE, NFE and CF than other treatment groups.

The present result were in line with those of Lamrot *et al.* (2018) [7] reported highest significant difference ($P < 0.05$) hot carcass weight (9.00 kg) in experimental Fatra sheep fed with ration containing urea treated rice straw (UTRS) as basal diet supplemented with dried 400g Sesbania leaves compared with other experimental group and also reported that supplemented sheep had higher value slaughter weight (SW), empty body weight (EBW) and hot carcass weight ($P < 0.001$) than sheep fed sole urea treated rice straw. Mohammad Abdul Gaffar (1986) [8] reported hot carcass weight with edible offal weight as (9.125 to 10.560 kg) in Osmanabadi male kids fed with different level of protein energy.

4.2 Weight of hot carcass cuts

The observation of hot carcass cut weight viz., shoulder with neck cut, rack, loin and hind quarter in osmanabadi slaughtered male kids of treatment groups were recorded and presented in Table 3.

The average weight of hot carcass cut in T₀, T₁, T₂ and T₃ viz. shoulder with neck cut as 5.18, 5.70, 5.90 and 5.00 kg; rack cut as 1.60, 1.60, 1.68 and 1.54 kg; loin cut as 1.87, 1.88, 1.96 and 1.81 kg and hind quarter with testis 4.14, 4.15, 4.31 and 4.08 kg, respectively. The average weight of shoulder with neck cut of slaughter male goats under treatment T₂ and T₁ was significantly ($P < 0.05$) higher than T₀ and T₃. The average weight of rack cut of slaughter male goats under treatment T₂, T₁ and T₀ (control) were significantly ($P < 0.05$) higher than T₃. However, T₁ and T₀ did not differ significantly. The average weight of loin cut of slaughtered male goats under treatment T₂ was significantly ($P < 0.05$) higher than T₁, T₀ and T₃ while T₁, T₀ and T₃ did not differ

significantly. The average weight of hind quarter with testis of slaughtered male goats under treatment group T₂ was significantly ($P < 0.05$) higher than T₁, T₀ (control) and T₃ while T₀, T₁ and T₃ did not differ significantly.

Among all treatment groups, the combination of leguminous foliage (20% DCP *Sesbania grandiflora* + 10% DCP *Leucaena leucocephala* + 30% *Desmanthus virgatus*) in T₂ group had highest weight of hot carcass cut and lowest hot carcass cut weight observed in T₃ fed, with (10% DCP *Sesbania grandiflora* + 30% DCP *Leucaena leucocephala* + 20% DCP *Desmanthus virgatus*). The statistically significant highest weight of shoulder with neck cut, rack cut, loin cut and hind quarter with testis cut in T₂ fed with 20% DCP concentrate mixture + 20% DCP from green sorghum + 20% DCP from *Sesbania grandiflora* + 10% DCP from *Leucaena leucocephala* + 30% DCP *Desmanthus virgatus* + *ad-lib* Kadbi individually could be due to higher growth rate resulted from higher feed intake and better feed utilization. The values of hot carcass cut weight in present study were higher as comparable to those of Fernandes (2004) [3] reported weight (kg) of prime cut of male kids viz., leg (2.05 to 0.86 kg), loin (0.84 to 0.89 kg), rack (0.82 to 0.86kg), neck and shoulder (1.86 to 2.00 kg) and breast and shank (1.53 to 1.74 kg) in weaned Osmanabadi kid fed with diet 100% Lucerne + concentrate (T₀), 50% Lucerne + 50% Dhaincha + Concentrate (T₁), 25% Lucerne + 75% Dhaincha + concentrate (T₂) and 100% Dhaincha + Concentrate (T₃). Patil (2006) [10] reported weight of different cut (kg) of male Osmanabadi kids in treatment T₀, T₁, T₂, T₃, T₄ and T₅ viz., hind quarter (2.34 to 2.79 kg), loin cut (0.79 to 1.07 kg), rack cut (1.02 to 1.29 kg) and shoulder (3.09 to 3.54 kg) in weaned Osmanabadi kids which were exposed to six housing patterns with common feeding regime consisting of required concentrate mixture, green and dry fodder as per requirement.

Table 3: Effect of different combination of leguminous foliage feed treatment on weight of hot carcass cuts (kg)

Replication	Hot carcass cuts															
	Shoulder with neck				Weight of rack				Weight of lion cut				Weight of hind quarter with testis			
	T ₀	T ₁	T ₂	T ₃	T ₀	T ₁	T ₂	T ₃	T ₀	T ₁	T ₂	T ₃	T ₀	T ₁	T ₂	T ₃
R1	5.65	5.64	5.93	4.56	1.62	1.621	1.623	1.600	1.86	1.90	1.99	1.81	4.13	4.15	4.29	4.14
R2	5.07	5.83	5.96	5.07	1.62	1.610	1.670	1.510	1.88	1.85	1.99	1.75	4.16	4.19	4.36	4.16
R3	4.83	5.63	5.83	5.47	1.57	1.591	1.770	1.530	1.88	1.89	1.92	1.89	4.12	4.12	4.29	3.96
Mean	5.183 ^{bc}	5.700 ^{ab}	5.90 ^a	5.003 ^c	1.604 ^{ab}	1.607 ^{ab}	1.687 ^a	1.547 ^b	1.876 ^b	1.880 ^b	1.969 ^a	1.817 ^b	4.141 ^b	4.153 ^b	4.313 ^a	4.087 ^b
SE	0.211				0.028				0.027				0.039			
CDat5%	0.481				0.088				0.082				0.116			
CV%	4.849				2.917				2.322				1.481			
F test	Significant				Significant				Significant				Significant			

Table 4: Effect of different combination of leguminous feed treatment on carcass characteristics of male Osmanabadi goat during experimental period.

Treatments	Carcass parameter				
	Pre slaughter weight (%)	Empty slaughter weight (%)	Weight of edible offal's (g)	Weight of Non-edible offals (kg)	Weight of hot carcass (kg)
T ₀	49.10 ^b	52.98 ^b	0.722 ^b	6.15 ^b	12.79 ^{bc}
T ₁	49.64 ^{ab}	53.53 ^{ab}	0.745 ^b	6.18 ^b	13.34 ^{ab}
T ₂	50.11 ^a	54.30 ^a	0.813 ^a	6.86 ^a	13.87 ^a
T ₃	48.37 ^c	52.85 ^b	0.719 ^b	6.15 ^b	12.48 ^c
SE±	0.232	0.349	0.024	0.179	0.1737
CD at 5%	0.691	1.038	0.063	0.526	0.557
CV%	0.70	1.032	4.428	4.42	2.254
F test	Significant	Significant	Significant	Significant	Significant

(Means with dissimilar superscripts differed significantly $P < 0.05$)

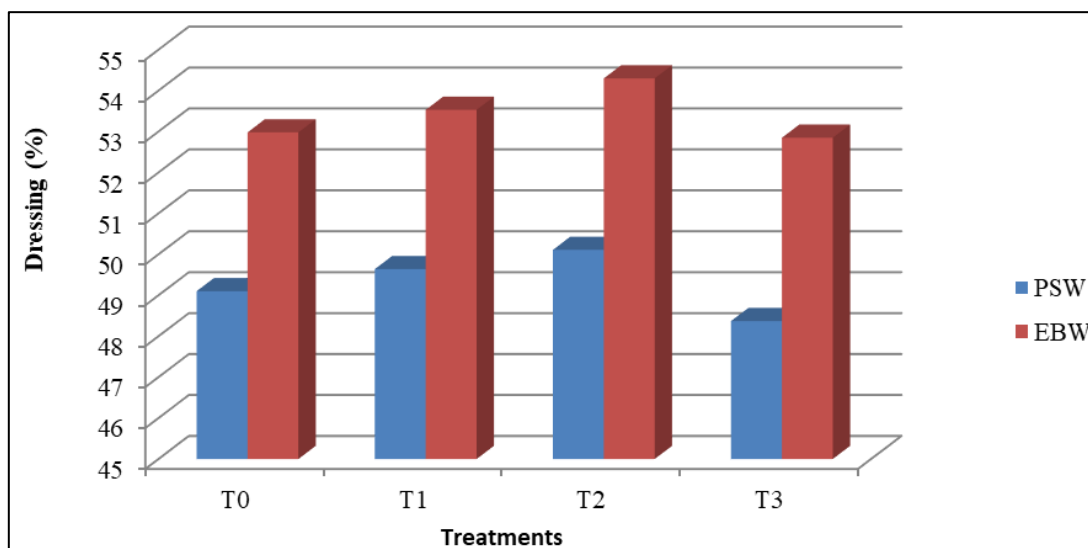


Fig 1: Dressing (%) of pre slaughter weight

Table 4: Effect of different combination of leguminous feed treatment on weight of hot carcass cuts (kg).

Treatments	Hot carcass cuts			
	Sholder with neck (kg)	Weight of rack (kg)	Weight of loin cut (kg)	Weight of hind quarter with testis (kg)
T ₀	5.183 ^{bc}	1.604 ^{ab}	1.876 ^b	4.141 ^b
T ₁	5.700 ^{ab}	1.607 ^{ab}	1.880 ^b	4.153 ^b
T ₂	5.900 ^a	1.687 ^a	1.969 ^a	4.313 ^a
T ₃	5.000 ^c	1.547 ^b	1.817 ^b	4.087 ^b
SE±	0.211	0.028	0.027	0.039
CD at 5%	0.481	0.088	0.082	0.116
CV%	4.849	2.917	2.322	1.481
F test	Significant	Significant	Significant	Significant

(Means with dissimilar superscripts differed significantly P<0.05)

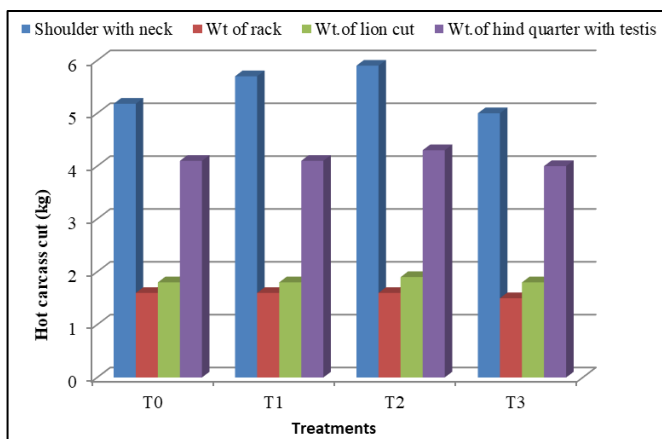


Fig 2: Weight of hot carcass cut (kg)

Summary and conclusion

The average dressing percentage on PSW basis of Osmanabadi kids in T₀, T₁, T₂ and T₃ were as 49.10, 49.64, 50.11 and 48.37 percent, respectively. The average dressing percentage on ESW basis of osmanabadi kids were as 52.98, 5.53, 54.30 and 52.85 percent, respectively. The dressing percentage on Pre-slaughter weight basis under treatment T₂ and T₁ was significantly (P < 0.05) higher over T₀ and T₃. However T₀ was significantly over T₃. The dressing percentage on Empty slaughter weight (ESW) basis under treatment T₂ and T₁ was significantly (P < 0.05) higher over T₀ and T₃.

The average weight of edible offals of Osmanabadi male kids

in treatment T₀, T₁, T₂ and T₃ were 0.722, 0.745, 0.813 and 0.719 g, respectively. The average weight of edible offals under treatment T₂ was significantly (P < 0.05) higher over T₁, T₀ and T₃, while T₁ and T₃ did not differ significantly with from each other.

The average weight of non-edible of fals of Osmanabadi male kids in treatments T₀, T₁, T₂ and T₃ were 6.15, 6.18, 6.86 and 6.18, kg, respectively. The mean value of non- edible offals weight under treatment T₂ was significantly (P < 0.05) higher than T₀, T₃ and T₁ while T₀, T₃ and T₁ did not differ significantly from each other.

The average weight of hot carcass of Osmanabadi male kids in treatments T₀, T₁, T₂ and T₃ were 12.97, 13.34, 13.87 and 12.48 kg, respectively. The average weight of hot carcass under treatment T₂ and T₀ was significantly (P < 0.05) higher over T₃ while T₀ was at par with T₁.

The average weight of hot carcass cut in T₀, T₁, T₂ and T₃ vize. shoulder with neck cut as 5.18, 5.70, 5.90 and 5.00 kg; rack cut as 1.60, 1.60, 1.68 and 1.54 kg; loin cut as 1.87, 1.88, 1.96 and 1.81 kg and hind quarter with testis 4.14, 4.15, 4.31 and 4.08 kg, respectively. The average weight of shoulder with neck cut of slaughter male goats under treatment T₂ and T₁ was significantly (P < 0.05) higher than T₀ and T₃. The average weight of rack cut of slaughter male goats under treatment T₂, T₁ and T₀ (control) were significantly (P < 0.05) higher than T₃. However, T₁ and T₀ did not differ significantly. The average weight of loin cut of slaughtered male goats under treatment T₂ was significantly (P < 0.05) higher than T₁, T₀ and T₃ while T₁, T₀ and T₃ did not differ significantly. The average weight of hind quarter with testis of slaughtered male

goats under treatment group T₂ was significantly ($P < 0.05$) higher than T₁, T₀ (control) and T₃ while T₀, T₁ and T₃ did not differ significantly.

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