

CARCASS CHARACTERISTICS OF YOUNG GOATS FROM DIFFERENT BREED GROUPS UNDER TWO FEEDING SYSTEMS

[CARACTERÍSTICAS DE LA CANAL DE CAPRINOS JÓVENES DE DIFERENTES GRUPOS RACIALES EN DOS SISTEMAS DE ALIMENTACIÓN]

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SUMMARY

The present trial was conducted with the purpose of comparing breeds, sex and feeding systems on carcass characteristics of goat kids. Seventy-eight goats from both sexes, five breeding groups and two management systems were used in this trial: 13 Alpine (7 male and 6 female), 14 Boer x Alpine F1 (7 male and 7 female), 15 ½ Anglo-Nubian x ½ Alpine (9 male and 6 female), 17 Boer x Alpine F2 (7 male and 10 female) and 19 ½ Anglo-Nubian x ¼ Alpine x ¼ Boer (9 male and 10 female). The animals were raised under feedlot conditions, weaned at 60 days of age and fed a pelleted diet containing 70% concentrate and 30% hay (S1 = 40 animals) or grazing on cultivated Tanzania grass pasture (*Panicum maximum*) (S2 = 38 animals). Animals were slaughtered after reaching 120 days of age. The effects of breed, sex and feeding system on live weight at slaughter (LWS) were significant ( $P < 0.01$ ). Boer x Alpine (F1) presented a higher LWS ( $P < 0.01$ ) than other breeds, male goat kids were heavier than female goat kids (23.7 vs 20.0 kg) and animals from S1 had higher LWS in comparison to animals from S2 (26.0 vs 17.7 kg). Hot carcass of Boer x Alpine (F1) goat kids was heavier (11.5 kg) than Boer x Alpine F2 (9.2 kg), Alpine (9.7 kg), ½ Anglo-Nubian x ¼ Alpine x ¼ Boer (10.4 kg) and ½ Anglo-Nubian x ½ Alpine (9.9 kg). Dressing percentage was affected ( $P < 0.01$ ) by feeding system and was greater ( $P < 0.01$ ) for S1 (47.0%) than for S2 (43.9%). The size of wholesale cuts were affected by breed. Boer x Alpine (F1) goat kids showed better performance with respect to size of leg, loin and rib cuts. In addition, the proportion of all cuts for male and goat kids raised on S1 was found to be greater ( $P < 0.01$ ) than that of S2 and females. Findings of this study indicated that Boer x Alpine (F1) goat kids had better carcass characteristics than the other breeds.

**Key words:** *Boer, carcass weight, dressing percentage, grazing.*

INTRODUCTION

Relatively few studies utilizing direct grazing of cultivated pastures by goats exist but those that do indicate that results can be positive, even when compared with cattle (Devendra and Burns, 1983) and be more economically viable.

Differences in carcass characteristics suggest that existing breeds should be utilized for different production and marketing environments by establishing suitable mating systems and breed combinations (Ruvuna et al., 1992).

Goats in Brazil used for meat have not been selected for meat production traits, resulting in variable market weight and carcass traits. Breed differences in performance characteristics offer an opportunity to improve efficiency of meat goat production and product uniformity. Thus, the use of Boer bucks as terminal sires should yield crossbred kids that grow faster and produce a more uniform and well muscled carcass compared with kids from sires of other goat types such as the Alpine and Nubian.

The objectives of the study were to compare breeds, sex and feeding systems on carcass characteristics of goat kids.

MATERIAL AND METHODS

The experiment was conducted at the Goat Production Center, University of Sao Paulo State, Sao Paulo, Brazil. A total of kids from both sexes, five breeding groups and two management systems were used in this trial: 13 Alpine (7 male and 6 female), 14 Boer x Alpine F1 (7 male and 7 female), 15 Nubian x Alpine F1 (9 male and 6 female), 17 Boer x Alpine F2 (7 male and 10 female) and 19 Nubian x ¼ Alpine x ¼ Boer (9 male and 10 female). Kids were randomly divided after 60 days of age in two groups: Feeding system 1: weaned at 60 days of age and fed intensively. Feeding

system 2: weaned at 120 days of age and fed extensively.

Kids under the intensive feeding system (S1) were maintained in collective stalls according breed group and fed concentrate and oat hay at a ratio of 70:30. The concentrate mixture was made up of maize (30%), soybean meal (28%), wheat meal (8%), limestone (1%), dicalcium phosphate (1%) and mineral mixture (2%). On a dry matter (DM) basis, the diet contained 16.8% crude protein (CP), 90.7% organic matter (OM), 15.2% crude fibre, 3.1% ether extract and 9.3% ash (AOAC, 1995). Kids in the extensive system (S2) left outdoors on pasture consisting of essentially Tanzania grass (*Panicum maximum*) from 09:00-16:00 h daily.

Animals were slaughtered when reached 120 days of age. Live weights and hot carcass weights were collected. Carcass were chilled at 4°C, and, at approximately 24 h postmortem, longissimus muscle area at the 12th rib was taken. The carcass was split along the vertebral column into left and right sides. The right half carcass was divided into the standard carcass cuts (leg, loin, flank, ribs and neck), weighted and relative proportions determined.

Analysis followed a 5 x 2 x 2 factorial arrangement with breed, sex and feeding system as the main effects. All data were analysed with PROC GLM (SAS, 2001). Analyses were conducted with a model that included breed, sex and feeding system as main effects and their interactions on carcass traits and carcass cuts

proportion. Least-square means were computed and tested for differences.

## RESULTS AND DISCUSSION

Least squares means and overall standard errors (SE) of carcass traits are shown in Table 1. The effects of breed, sex and feeding system on live weight at slaughter were significant ( $P < 0.01$ ). Boer x Alpine (F1) presented a higher LWS ( $P < 0.01$ ) than other breeds, male goat kids were heavier than female goat kids (24.3 vs 20.0 kg) and animals from S1 had higher LWS in comparison to animals from S2 (26.2 vs 18.0 kg). Hot carcass of Boer x Alpine (F1) goat kids was heavier (11.5 kg) than Nubian x Alpine F1 (10.6 kg) Anglo-Nubian x  $\frac{1}{4}$  Alpine x  $\frac{1}{4}$  Boer (10.5 kg), Alpine (9.6 kg) and Boer x Alpine F2 (9.3 kg).

Dressing percentage (based on full liveweight) was in the range of 44 – 47% and it not varied significantly between breeds and sex. Dressing percentage was affected ( $P < 0.01$ ) by feeding system and was greater ( $P < 0.01$ ) for S1 (47.1%) than for S2 (44.0%).

Table 2 depicts proportions of each carcass cuts. As expected and due to the differences on carcass weight, most of the proportions were significantly greater in the system 1 (S1). System 1 showed a significantly higher percentage of leg, loin, flank and ribs. No significant difference was recorded in the percentage of neck. Such results can be interpreted as consequences of a better level of nutrition that animals in the S1 system were submitted.

Table 1. Least squares means and SE of carcass traits of experimental kids.

Variables	N	Live slaughter weight (kg)	Hot carcass weight (kg)	Dressing (percentage)	Loin eye area (cm <sup>2</sup> )
<i>Breeds</i>					
Alpine	13	21.3 <sup>ab</sup>	9.6 <sup>ab</sup>	44.1	8.6 <sup>b</sup>
Boer x Alpine F1	14	24.6 <sup>a</sup>	11.5 <sup>a</sup>	45.6	10.6 <sup>a</sup>
Boer x Alpine F2	18	20.0 <sup>b</sup>	9.3 <sup>b</sup>	45.6	9.9 <sup>ab</sup>
Nubian x Alpine F1	15	22.4 <sup>ab</sup>	10.6 <sup>ab</sup>	46.0	9.9 <sup>ab</sup>
Nubian x $\frac{1}{4}$ Alpine x $\frac{1}{4}$ Boer	18	22.4 <sup>ab</sup>	10.5 <sup>ab</sup>	46.0	10.3 <sup>a</sup>
<i>Sex</i>					
Male	38	24.3 <sup>a</sup>	11.3 <sup>a</sup>	45.5	10.3 <sup>a</sup>
Female	40	20.0 <sup>b</sup>	9.3 <sup>b</sup>	45.6	9.5 <sup>b</sup>
<i>Feeding system</i>					
Intensive (1)	39	26.2 <sup>a</sup>	12.5 <sup>a</sup>	47.1 <sup>a</sup>	11.6 <sup>a</sup>
Pasture (2)	39	18.0 <sup>b</sup>	8.0 <sup>b</sup>	44.0 <sup>b</sup>	8.2 <sup>b</sup>
Overall	78	22.1±0.66	10.3±0.35	45.5±0.32	9.9±0.29

<sup>a,b</sup> $P < 0.01$ .

Table 2. Least squares means and SE of carcass cuts of experimental kids.

Variables	N	Carcass part (%)				
		Leg	Loin	Flank	Ribs	Neck
<i>Breeds</i>						
Alpine	13	32.0	11.0	22.9	26.5	7.5
Boer x Alpine F1	14	32.0	11.8	22.3	26.4	7.4
Boer x Alpine F2	18	31.7	10.8	23.4	26.6	7.3
Nubian x Alpine F1	15	32.7	11.4	22.5	25.7	7.5
Nubian x ¼ Alpine x ¼ Boer	18	32.7	11.3	22.4	26.0	7.4
<i>Sex</i>						
Male	38	32.1	11.2	22.9	26.1	7.6
Female	40	32.3	11.3	22.5	26.4	7.3
<i>Feeding system</i>						
Intensive (1)	39	31.6 <sup>b</sup>	11.7 <sup>a</sup>	22.4 <sup>b</sup>	26.7 <sup>a</sup>	7.4 <sup>a</sup>
Pasture (2)	39	32.8 <sup>a</sup>	10.8 <sup>b</sup>	23.0 <sup>a</sup>	25.8 <sup>b</sup>	7.4 <sup>a</sup>
Overall	78	32.2±0.18	11.3±0.13	22.7±0.12	26.2±0.22	7.4±0.10

<sup>a,b</sup>P<0.01.

### CONCLUSION

Findings of this study indicated that Boer x Alpine (F1) goat kids had better carcass characteristics than the other breeds.

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### REFERENCES

- A.O.A.C. Association of Official Analytical Chemist. 1995. Official Method of Analysis. 16<sup>th</sup> Edition. Washington, D.C.
- Devendra, C. and Burns, M., 1983. Goat production in the Tropics. CAB, Slough, 183 pp.
- Ruvuna, F., Taylor, J.F., Okeyo, M., Wanyoike, M., Ahuya, C. 1992. Effects of breed and castration on slaughter weight and carcass composition of goats. Small Rumin. Res. 7, 175 - 183.
- SAS. 2001. *SAS user's guide: Statistics*, Version 8.0. Cary, NC; SAS Institutt Inc.

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