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CARCASS CHARACTERISTICS OF CREOLE GOAT OF GUADELOUPE (FWI) AS A FUNCTION OF FEEDING MANAGEMENT

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Introduction

In Guadeloupe goats are mainly raised under the suckling system for meat production and grazing is the most common mode of production. Due to its high production level (Alexandre *et al.*,1999) and good adaptation to tropical conditions, the Creole goat could be a valuable genetic resource for the region. For flocks reared under intensive grazing systems, the reproductive performances are high and the pre-weaning growth of kids varies from 60 to 95 g/d (Alexandre *et al.*,1999). Although it is a meat breed, very few studies deal with the assessment of carcass characteristics (Alexandre 1987). The carcass weight, varying from 6 to 10 kg among breeders, does not meet the needs of the formal modern sub-network. So there is a need to increase the growth during fattening and the carcass performances while ensuring the promotion of the local breed. However, tropical forage, even when exploited intensively, is of average food value (Humphreys, 1991) and is a major limiting factor in animal production. High levels of productivity partly depend on the supplementary intake of more energy-rich foods. Therefore, experiments are going on to test the effects of the growth potential and the feeding mode upon meat production. The aims of this paper is to give the first trends in this area.

Objectives

Creole meat type goats, a small-sized breed (28 kg LW) were used in two concurrent experiments from weaning to slaughter. Entire male kids were weaned at 87 ± 5 days. In the first experiment animals were reared on rotationally grazed tropical pasture (P) every 28 days (9.05 MJ ME and 123 g CP per kg DM) at an average stocking rate of 1200 kg LW/ha and recieved no supplementation. In the second experiment, the animals were supplemented (S) and reared in collective pens on a slatted floor. The diet was composed of the same stand of tropical pasture as mentionned above. In addition, they were offered commercial pellet (10.4 MJ ME and 180 g CP per kg DM), composed of maize (32.5%), wheat issues (40.0%), soya bean meal (15.0%) sugar cane molasse (6.0%) and minerals (6.5%). In both experiments, two groups of kids were determined (Table 1) according to their pre-weaning ADG level low (L; 69 ± 10 g/day) and high (H; 91±14 g/day). Thus treatments were defined as LP vs. HP and LS vs. HS. Regular drenchings were carried out, in order to control gastro-intestinal parasitism, monthly for kids from birth to

weaning and every two months for weaned kids and goats. External parasites were controlled every two weeks for young and adults (spraying of acaricides).

Kids of P experiment (12 in each group) were slaughtered at the end of 8 months of growth whereas those of S experiment were slaughtered as soon as the mean live weight of the group reached 19 to 20 kg (14 and 18 in LS vs. HS group, respectively). Prior to slaughter, each goat was weighed. Length of fast (24 hrs) prior to slaughter was standardized for all goats in order to minimize variation in fill. Weights of all items (head, feet, pelt, lungs, liver, heart, and viscera) were taken during the slaughter process. The weight of the gastro-intestinal tract and all of its contents were recorded prior to and after cleaning. The cleaned GI-tract was separated and weighed as large and small intestines and mesenteric and intestinal fat. Hot carcass weight and chilled carcass weight (24 hr. post slaughter) and cut weight (leg, shoulder, neck, loin, breast, ...) were obtained according to procedures outlined by Colomer-Rocher *et al.* (1987). Kidney and pelvic fat was removed and weighed on the chilled carcass before cutting. Empty body weight (EBW) was calculated by subtracting values of gut content from slaughter weight. Two dressing percentages were calculated, true carcass yield calculated as cold (chilled) carcass weight related to EBW and commercial carcass yield expressed as proportion of hot carcass weight to slaughter weight (SW). Carcass was graded according to conformation, colour of the meat and fat cover score (Colomer-Rocher *et al.*,1987).

Results & Discussion

The weights at weaning, and at slaughter (Table 1) of HP and LP kids were 10.6 vs. 8.4 ($P< 0.01$) and 18.7 vs. 18.4 ($P> 0.05$), respectively. Same values for HS and LS kids were 9.1 vs. 7.6 ($P< 0.01$) and 19.4 vs. 20.8 ($P> 0.05$), respectively. The HS kids spent significantly less time in the feedlot stall than the LS ones (107 vs. 178 days ; $P< 0.01$)..

The hot carcass weight (Table 2) was similar for P kids (6.5 kg) while it was significantly lower ($P< 0.05$) for HS vs. LS group: 8.2 vs.9.5 kg. At the same time the white full organs represented 38% vs. 31% of the carcass weight ($P<0.05$) for LP vs. HP kids; same values for HS and LS kids were 27% vs. 23 % ($P<0.05$). These proportions are linked to the feeding mode of the animals. In the case of P kids, the diet is 100% grazed tropical forages known for its high level of structural elements (Humphreys 1991) leading to a high gut content**.** The true carcass yield reached 52% for P kids and 5 points more for S kids (no significant difference occured between groups of L vs. H kids). Commercial yields of S goats were higher than those of Black Bengal goats reared in comparative intensive conditions (42 %; Moniruzzaman *et al.*,2002) but slaughtered at a lighter live weight (10 to 12 kg). Those of P kids were lower than those of Criollo kids reared in commercial farms of South Chile (46 %, Gallo *et al.*,1996) although the slaughter weight was similar (19 kg LW).

Whatever the pre-weaning ADG level or the feeding mode during fattening, the proportion of cuts was similar, among them 30% long leg, 20% shoulder, 12% neck and 12 % breast. This is in concordance with the conclusion of Sheridan *et al.* (2003) for Boer goats reporting that diet did not affect the weight of commercial cuts as a proportion of carcass weight.

The meat colour was mainly pale for P kids while it was mainly pink for S kids (Table 3). Fat cover score and fat weights did not differ significantly between L and H

kids within P or S experiment (Table 3). However these variables seem to be lower for pasture fed kids against supplemented kids: 8 and 3 points less for mesenteric and kidney fat, respectively. This might be due to the lower energetic value of the P diet vs. the S diet. Nevertheless, the subcutaneous fat cover is thin and poorly developed as reported by many researchers that have studied different breeds or management as reviewed by Warmington and Kirton (1990)

Conclusions

The mode of feeding seemed to slightly affect carcass quality and composition while it seemed to have a marked influence upon live and carcass weight as well as upon gut content weight. Marketing practices would depend on the feeding mode. It woud be more interesting for breeders, to sell live animals in the case of kids reared at pasture whereas for the others in the form of entire carcasses if a grading system is used. Further studies are required with more animals in order to increase the carcass weight. It is necessary to improve the supplementation strategies (quantity, quality and cost) especially for light weaned kids.

References

Alexandre, G.1987. The production of goat meat and carcass quality in humid tropics. In 4th IGC, 195–209.

Alexandre, G., Aumont, G., Mainaud, JC., Fleury, J. &, Naves, M. 1999. Productive performances of guadeloupean Creole goat during the suckling period. Small Ruminants Research. 34, 157–162.

Colomer-Rocher, F., Morand-Fehr, P. & Kirton, A.H. 1987. Standard methods and procedures for goat carcass evaluation, jointing and tissue separation. Livest. Prod. Sci. 17, 149–159.

Gallo, C., Le Breton, Y., Wainnright, I. & Berkoff M. 1996. Body and carcass composition of male and female Criollo goats in the South of Chile. Samll. Rumin. Res. 23, 163–169.

Humphreys, L.R., 1991. Tropical pasture utilization. 1st ed. Cambridge University, Great Britain. 206 pp.

Tables and Figures

Table 1 Creole kid perfomances during fattening period in two experiments: at pasture (P) or supplemented (S) according to preweaning ADG, low level (L) and high level (H)

Kid group		Weaning weight (kg)	Slaughter weight (kg)	Age at slaughter (d)	Fattening period (d)
Pasture	LP	8.4 [a] ± 0.7	18.0 ± 2.1	349.5 ± 3.4	249.0 ±3.1
	HP	10.6 ± 1.1	18.7 ± 2.1	348.3 ± 3.9	249.0 ± 3.1
Supplement	LS	7.6 [a] ± 0.7	20.8 ± 2.2	293.4 [a] ± 41.6	177.8 [a] ± 41.0
	HS	9.1 [b] ± 0.5	19.4 ± 1.3	217.9 [b] ± 13.4	106.7 [b] ± 9.1

[a,b)] data within same column with different supscripts differ significantly , $P<0.05$

Table 2 Carcass weights and yields of Creole kids in two experiments : reared at pasture (P) or supplemented (S) according to preweaning ADG, low level (L) and high level (H)

Kid group		GI[1] and gut fill (% EBW)	Hot carcass (kg)	True[2] carcass yield (% EBW)	Commercial[3] carcass yield (% LW)
Pasture	LP	31[a] [29-38]	6.5 ± 0.9	51 [41-56]	40 [37-44]
	HP	38[b] [32-50]	6.5 ± 1.0	53 [47-71]	38 [37-42]
Supplement	LS	23[a] [18-26]	9.5[a] ± 1.2	58 [57-61]	50 [48-54]
	HS	27[b] [24-30]	8.1[b] ± 0.5	56 [57-60]	47 [43-51]

[1)] GI : gastrointestinal tract weight plus gut fill weight related to empty body weight (EBW); [2)] calculated as cold carcass weight related to empty body weight (see in text); [3)] calculated as hot carcass weight related to live weight at slaughter; [a,b)] data within same column with different supscripts differ significantly , P<0.05; [x-y]: variations

Table 3 Carcass quality of Creole kids in two experiments : fed at pasture (P) or supplemented (S) according to preweaning ADG, low level (L) and high level (H)

Kid group		Meat Colour[1]	Fat cover score[2]	Mesenteric fat (g)	Kidney fat (g)
Pasture	LP	1.7 ± 0.4	2.2 ± 0.6	9 ± 5	7 ± 3
	HP	1.7 ± 0.5	1.7 ± 0.6	7 ± 4	7 ± 2
Supplement	LS	2.0 ± 0.5	3.1 ± 0.5	30[a] ± 19	13 ± 7
	HS	2.5 ± 0.6	2.8 ± 0.4	20[b] ± 7	12 ± 4

[1)] colour of meat, classification based on Colomer-Rocher et al. 1987 (1= pale, 2 = pink and 3 =red); [2)] classification based on Colomer -Rocher et al. 1987 (scale from 1 to 5); [a,b)] data within same column with different supscripts differ significantly , P<0.05