THE INFLUENCE OF ENERGY SUPPLEMENTATION AND ZERANOL IMPLANTS ON GROWTH AND CARCASS CHARACTERISTICS OF AUSTRALIAN FERAL GOAT KIDS

B.A. McGREGOR*, T. WOLDE-MICHAEL+ and J.H.G. HOLMES+

SUMMARY

Ninety three feral goat kids born in spring and weaned at four months of age were either slaughtered or fed 400 g/d grain plus hay for 98 days with or without zeranol implants. Kids slaughtered at weaning weighed 13.3 kg and had a carcass weight of 5.3 kg with 0.2 mm subcutaneous backfat; these carcasses were of little commercial value. Male and wether kids grew faster(78 g/d)than female kids (57 g/d)($P<0.001$) and yielded heavier carcasses,(9.7 kg vs 7.9 kg). Mean subcutaneous back fat was 1.2mm. Zeranol implants increased growth rate ($P<0.001$) but only by 13 g/d. Grain-fed females grew faster ($P<0.001$) and gained 4 kg more than 55 pasture-fed females grazing senescent summer pasture. For each 1 kg increase in liveweight, grain-fed goats gained 515g of carcass. Carcass length was a useful indicator of carcass weight. Retaining kids that are usually culled on fleece characteristics at weaning and feeding them on grain for 98 days resulted in 3.8 kg carcass gain with 1 mm more subcutaneous backfat and a commercially attractive product. Use of zeranol provided no economic benefit.

Key words: Goat, grain, pasture, zeranol

INTRODUCTION

During breeding and upgrading programs of feral goats for cashmere production many kids are culled for poor fleece type or colour and sold for slaughter at very low prices (Ebbot and Morey 1983). There is no published information on the likely meat yield of such culled goats or on the carcass characteristics of weaned feral goats (McGregor 1985). In southern Australia most goats are born in late winter and spring and are often not weaned or culled until mid to late summer. There is no information on management practices such as provision of additional feed or other inputs to increase the meat yield or carcass fatness of weaned feral goats carried over the summer on dry pastures (McGregor 1985). With the objective of developing markets for prime kid meat, particularly at Easter (Cullen and Davies 1981), for spring born kids carried over summer, farmers and advisory officers require information on potential benefits of management options.

Recent reports indicated that zeranol, an anabolic steroid (Ralgro, Wellcome Australia) increased the growth rate of mixed-aged Angora goats from 47 to 73 g/day (McGregor *et al.* 1984) and the carcasses of goats fed grain are fatter than goats of similar weight being grazed (McGregor 1985). This paper reports the growth and carcass characteristics of spring-born feral goat kids culled from a breeding program in mid-summer and the benefits of providing supplementary grain or zeranol implants.

MATERIALS AND METHODS

The experiment investigated four management strategies for weaner feral goats: (1) immediate slaughter of cull animals; (2) feeding a ration of grains plus ad libitum hay for 98 days before slaughter; (3) as for (2) but with zeranol implants; (4) grazing on mature pasture. Pasture germination at Mt. Derrimut (20 km west of Melbourne) generally

* Department of Agriculture and Rural Affairs, Werribee, Victoria, 3030.
+ University of Melbourne, Parkville, Victoria, 3052.

occurs in late April, so the experiment was designed to terminate before green feed would be available. At Mt. Derrimut, the University of Melbourne maintains a flock of domesticated feral goats which are being selected for production of white cashmere. This experiment used 148 kids from the 1983 spring kidding. Ninety three kids (32 males, 28 females and 33 wethers castrated at 7 weeks of age) were culled for poor fleece type or colour. They were randomly allocated to three treatment groups. At about four months of age, immediately after weaning and two days after shearing, one third of each sex group was slaughtered and one third implanted with 12 mg zeranol at the dorsal base of the ear. Goats fed grain received 400g whole grain/head/day (barley 77.5%, sweet lupins 20%, crushed limestone 2.5%) in metal troughs with 10cm trough space/goat and average quality grass hay fed ad libitum in hayracks. The goats were kept in bare yards (0.2ha) for 14 weeks and then slaughtered. Bucks were separated from does and wethers to avoid harassment. Fifty five doe kids retained for breeding were grazed at 10/ha on senescent ryegrass and barley grass typical of the pasture available at this time. Grain-fed goats were vaccinated against clostridial diseases and treated with an effective anthelminthic at weaning. Goats were weighed each fortnight. . Feed samples were taken to estimate organic matter digestibility (Clark et al. 1982).

Goats were slaughtered at a commercial abattoir and 18hr fasted liveweight, hot carcass weight (CW), carcass length (distance between gambol at achilles tendon and brisket at midpoint of the first rib), weight of perirenal fat (PRF) and subcutaneous fat cover at the 13th rib (using calipers measuring to 0.5mm) were recorded. Dressing percentage was calculated as (CW-PRF) divided by liveweight. Carcasses were assessed by a commercial buyer.' Growth and carcass data were analysed by analysis of variance, and by regression. analysis. All regressions are significant at the 1% level.

RESULTS

Five weaned goats died during the experiment from causes unrelated to the treatments and all their data have been excluded from the analysis. Following weaning and after 48 hours of rain', approximately 15% of goats had diarrhoea for two weeks. Pasture organic matter digestibility was 51.6% and the grass hay estimated at 64% OMD.

'-Male and wether goats slaughtered at weaning weighed 14.4 kg and carcass weight was 5.5 kg; female goats weighed 10.9 kg and had a carcass weight. of 4.1 kg ($P<0.01$). Males grew fastest and females slowest . ($P<0.001$). All grain-fed goats lost weight (lkg) during the first fortnight and then gained weight until the end of the experiment. Zeranol increased growth rate by 13g/d ($P<0.01$), 18g/d in males and 10g/d in wethers and does. There was no relationship between initial liveweight and growth 'rate. All treatment groups had lean carcasses (Table 1). Zeranol had no specific effects on carcass parameters and carcass weight increased only 0.75 kg. Carcasses from doe kids were significantly smaller ($P<0.05$) than males and wethers., Mean dressing % of the final slaughter group was 43.3%. Pooled data (Table 2) indicated that for each 1 kg increase in liveweight,' hot carcass weight increased 515g. Carcass length was closely related to carcass weight with the most significant regression provided by the pooled data from both slaughter groups (Table 2). There was no relationship between gerirenal fat or' subcutaneous fat and carcass weight.

Table 1. Growth rate and carcass characteristics of feral goat kids slaughtered at weaning or after feeding 400 g of grain/day plus hay, with or without zeranol for 14 weeks and growth of females grazed on dry pasture.

Group	N	Initial livewt. kg.	Growth rate g/d	Carcass weight kg.	Dressing %	Carcass length cm	Back fat mm	Perirenal fat g
Slaughtered at weaning	28	13.3	-	5.31	37.4	77.8	0.2	30
Slaughtered after 14 wks	60	14.1		9.09	43.3	87.5	1.2	263
SEM+		0.7		0.27	1.1	0.6	0.1	17
Sex-male	22	14.8	82.2	9.70	41.9	88.5	1.3	240
-wether	22	14.5	72.9	9.75	45.0	88.0	1.2	278
-female	16	12.6	56.6	7.87	43.2	83.5	1.0	286
-grazing females	55	13.8	15.4	-				
SEM*		1.1	6.2	0.71	1.7	1.7	0.2	34
Zeranol-nil	30	14.0	65.2	8.86	42.8	86.1	1.1	261
-12mg	30	14.2	78.6	9.61	44.0	87.9	1.2	271
SEM		0.8	4.9	0.56	1.3	1.3	0.2	27

* Grazing females compared to grain fed females by 't' test.
\+ Covariance analysis using initial liveweight as covariate.

Table 2. Regression constants (±SE) for relationships between carcass components, carcass weight (CW) and liveweight of goats.

Dependent variable	Constant	Regression coefficient	Independent variable	R	N	RSD
18hr fasted liveweight	-1.06	+0.995(0.016)	Liveweight	0.99	60	0.51
Weaning CW.	-0.94	+0.450(0.031)	Liveweight	0.94	28	0.46
CW after grain feeding.	-1.735	+0.515(0.025)	Liveweight	0.94	60	0.94
Carcass length	64.64	+2.443(0.095)	Carcass wt.	0.95	88	2.72

Grain feeding of does resulted in growth rates nearly four times that of grazing does ($P<0.001$) and live weights 4 kg heavier after 14 weeks. Retaining weaner culls and feeding them on grain resulted (Table 1) in significantly ($P<0.001$) increased carcass weight, dressing percentage, perirenal and subcutaneous backfat. The carcasses of kids slaughtered at weaning were small, very lean and of little comercial value. Buyers (F.Sztrochlic, per.comm.) reported that carcasses sold following grain feeding were regarded as ideal for the Easter kid market.

DISCUSSION

This experiment indicates that goats weaned at about 14 kg will gain weight from January to mid April if provided with grain-based diets. In order to obtain 10 kg carcasses grain-fed feral kids should be slaughtered at 22.8 kg liveweight similar to that reported for wild New

Zealand feral goats (Kirton 1970). Pasture-fed Saanen wether goats (McGregor 1980) produced 10 kg carcasses at 25.9 kg liveweight. This study identified carcass length as a useful indicator of carcass weight of goats.

The growth response of these feral goat kids to zeranol was only half of that reported for mixed-age Angbra goats fed grain and hay (McGregor et al- 1984). This suggests that the influence of zeranol on growth is greater with larger goats than with smaller goats. This study supports observations of Silva and Berenguer (1984) that zeranol increases the growth of rate of male goats to a greater extent than the increase in growth of wether goats.

The occurrence of post weaning diarrhoea is common with sheep whose diet is changed (Hungerford 1975). Post weaning diarrhoea may also indicate that a heavier weaning weight is preferable. The liveweight loss after weaning is similar to that observed in sheep when introduced to concentrate rations.

In conclusion, the strategy of weaning goats and feeding grain supplements resulted in significantly heavier carcasses, which had more subcutaneous fat coverage and were a more commercially attractive product. The strategy of using zeranol implants for weaned goats would appear unprofitable because the cost of the implant was greater than the improvement in carcass value in this experiment.

ACKNOWLEDGEMENTS

The authors thank Wellcome Australia for Ralgro implants, G. Anderson of Ryabram Abattoirs and Dr. E. Scheurmann for assistance.

REFERENCES

CLARKE, T., FLINN, P.C. and McGOWAN, A.A. (1982). Grass and Forage Sci. 37 : 147.

CULLEN, R.G. and DAVIES, L. (1981). Commodity Bulletin, 9 (10).

EBBOT, T. and MOREY, P. (1983). Research Project Rep. 171, 30 pp. Dept. of Agric.Vic.

HUNGERFORD, T.G. (1975). Diseases of Livestock, 8th ed. (McGraw-Hill, Sydney).

KIRTON, A.H. (1970). N.Z.J.Agric.Res. 13 : 167.

McGREGOR, B.A. (1980). Proc.Aust.Soc.Anim.Prod. 13 : 345.

McGREGOR, B.A. (1985). Proc.Goat Production and Research in the Tropics. (A.C.I.A.R., AGPS ed. J.W. Copland).

McGREGOR, B.A., MIENTJES, D.J., ADAMS, M. and WELLINGTON, J.K.M. (1984). Aust.Vet.J. 61 : 327.

SILVA, M. and BERENGUER, F. (1984). Animal Prod. 38 : 546.