REPRODUCTIVE PERFORMANCE OF CASHMERE GOATS IN SOUTH WESTERN QUEENSLAND

S.J. EADY* and MARY ROSE**

A flock of cashmere goats was joined in south western Queensland in April 1986. The introduction of bucks to the flock synchronised oestrus in the does, producing a peak in activity from day 6 to 9 of joining. Oestrus was detected by vasectomised bucks and a pregnancy rate of 89% was achieved by the daily mating of oestrous does to fertile bucks. The number of kids born per doe joined was 1.57 with a high incidence of multiple births (69.2%) which were predominantly twins. Kid losses from day 0 to 14 were mainly attributed to mismothering of kids from multiple births. Losses from birth to weaning were approximately 15%, resulting in 1.42 kids weaned per doe joined. Growth rates to weaning of 141.3 g/d and, 105.3 g/d were recorded for single and multiple births respectively.

Keywords: goat, oestrus, reproduction rate, cashmere

INTRODUCTION

In the pastoral areas of south western Queensland fibre goats are being considered as a complementary species in sheep enterprises and as a means of controlling undesirable pasture species. Much of the foundation breeding stock for both Angora and cashmere flocks in this region consists of feral goats. The economic success of these fibre goats will rely on the upgrading of the feral goats to produce profitable quantities of fibre. This process will depend, in part, on an understanding and optimisation of reproduction rate; a subject which has not been investigated in western Queensland.

In the subtropical, coastal environment of northern New South Wales, Restall (pers. comm.) has observed that domesticated feral does show a peak in spontaneous ovarian activity in June and July but could be induced to ovulate in April by the introduction of bucks to the flock. Studies of Creole goats in Guadeloupe (Chevineau 1983) have shown that many does will ovulate in the first four days after introduction of the bucks, but will not form a normal corpora lutea. This occurs three to four days later with most does showing oestrus. As the same phenomena appeared to occur in the flock studied by Restall (pers. comm.) the joining regime in this study was planned to take this into account. Little information is available on the fecundity of fibre goats in the different regions of Australia, although a general figure of 140% has been quoted as an acceptable kidding percentage for cashmere goats (Scheurmann 1983).

A study of down-bearing goats was commenced in south western Queensland with the aim of generating regional information on their reproductive performance.

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Location, and management

The goats were run on Croxdale Field Station, 10 km west of Charleville in southwestern Queensland (26°25'S, 146°13'E), with a mean annual rainfall of 467 mm. Mean minimum and maximum temperatures for January are 34.6°C and 21.5°C respectively and for July are 19.5°C and 2.5°C. The goats were run in a 140 ha paddock comprising 40% open grassland on heavy clay soil dominated by Mitchell grass (Astrebla spp.). The remainder of the paddock was of lighter soil growing wire grass (Aristida spp.), lovegrass (Eragrostis spp.), mulga (Mitrilepis parviflora), beak (Eucalyptus populnea) and beefwood (Grevillea striata). The paddock was fenced with ringlock wire netting and one strand of barbed wire, with an internal electric wire offset 300 mm from the fence at a height of 300 mm. The goats were handled through conventional sheep yards, but were shorn twice a year, in February/March and July/August, in separate shed facilities. A routine treatment for lice and worms was given off-shears.

Animals

The flock was transported from Warwick to Croxdale in January 1986 and comprised 166 goats (Capra hircus), 160 does and 6 bucks. The goats were bred-on from a feral origin and the only known selective breeding, prior to their establishment at Croxdale, was for white coat colour. These goats are regarded as cashmere goats by the industry. The flock has been on a self-replacing basis with mature does culled on age; younger does and bucks are selected on production measurements.

Reproduction records

The does were mated naturally, commencing in April 1986. Oestrus was detected by vasectomised bucks wearing raddle harnesses. The total number of does exhibiting oestrus from day 1 to 5 of joining was recorded on day 5. After this period oestrus was recorded daily. From day 6 of joining raddled does were drafted off each morning, allocated at random to a buck and joined in a small pen. Does were released in the afternoon. During periods of low oestrus activity between cycles and for the third cycle, the does were run in a paddock with one buck. The does were kidded in individual pens to facilitate correct dam-offspring identification. The kids were weighed at birth and litter size and sex were recorded. The does and kids were kept under observation in a small enclosure for approximately 14 days after kidding. They were then returned to the paddock. The kids were weighed in January 1987. As only one buck sired the progeny conceived during the third oestrous cycle these kids were omitted from the liveweight analyses.

RESULTS

After introduction of the vasectomised bucks in April 1986 a peak in oestrus activity was seen from day 6 to 9 of joining (Fig. 1). The next peak in oestrus activity occurred about day 27 and a third peak about day 47. Does returning to oestrus had an average cycle length of 19.8 days (S.D. 1.48). During joining, 52% of does conceived on their first oestrus, 82% by second oestrus and 89% by their third oestrus cycle.

The average length of gestation was 148.8 days (S.D. 1.97). Three pregnant does were lost at kidding from milk fever, pregnancy toxaemia and an unknown.
cause. Kidding rate was 1.57 kids per doe joined and featured 69.2% multiple births of which 98% were twins. Kid losses from birth to 14 days were 6.4%, largely due to maiden does mismothering the lighter one or two kids from a multiple birth. Survival rate at weaning was 1.42 kids per doe joined. The causes of kid mortality from 14 days to three months were not identified.

![Graph showing oestrus and mating data](image)

**Fig 1.** Number of does showing oestrus up to day 5 then daily as detected by vasectomised bucks (□) and number subsequently mated by fertile bucks (■) during an autumn joining in south western Queensland.

**Table 1** Mean birth weight and live weight at weaning and average daily gain of single and multiple born cashmere goat kids

<table>
<thead>
<tr>
<th></th>
<th>Survivors</th>
<th>Non-survivors</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Single</td>
<td>Multiple</td>
<td>Multiple</td>
</tr>
<tr>
<td>Number of animals</td>
<td>30</td>
<td>144</td>
<td>15</td>
</tr>
<tr>
<td>Birth weight (kg)</td>
<td>2.94 a</td>
<td>2.50 b</td>
<td>1.91 c</td>
</tr>
<tr>
<td>Weaning weight at 3 months of age (kg)</td>
<td>19.0 a</td>
<td>15.1 b</td>
<td>2.31</td>
</tr>
<tr>
<td>Average daily weight gain (g/day)</td>
<td>141 a</td>
<td>105 b</td>
<td>18.3</td>
</tr>
</tbody>
</table>

Means within rows with different superscripts differ significantly (P<0.01).
Single born kids were significantly heavier than twins at birth and three months (Table 1), and showed a greater daily weight gain (P<0.01). Kids that died were lighter at birth than the surviving singles or twins. Male kids were significantly heavier than females (2.76 kg vs 2.54 kg) at birth and (17.55 kg vs 15.22 kg) at three months (P<0.01).

**DISCUSSION**

The pattern of oestrus exhibited by the does in the 1986 study was similar to that described by Chemineau (1983), with the synchronising effect of the bucks clearly evident. Such an effect can be employed by goat breeders to synchronise joining, thereby providing the opportunity to manage does intensively during kidding. The use of harnessed bucks with crayon colour changed every fortnight would allow the breeder to handle does in two or three kidding groups, thus reducing the number of animals that need to be observed at any one time. If such intensive management is not feasible, the buck effect still assists in the timing of kidding and has the potential to concentrate kidding, thus enabling management practices such as supplementary feeding and predator control to be employed more effectively.

Scheurmann (1983) quotes the level of reproductive performance that should be achieved in Australian goat flocks as being close to 100% pregnancy rate, 140% kidding rate, and average birth weights of 2.75 kg and 2.45 kg for male and female kids respectively. Despite the involved daily mating regime in this study, the pregnancy rate was acceptable, but was probably lower than would be expected from a paddock joining owing to the time delay between oestrus detection and mating. The high proportion of multiple births (69.2%) contributed to a kidding rate of 1.57 kids per doe joined and weaning rate of 1.42 kids per doe joined. Kidding in individual pens followed by accommodation in a small enclosure achieved a 93.6% survival rate up to 14 days of age. The predominant loss appeared to be associated with maternal behaviour of a small proportion of maiden does which failed to bond with all kids from a multiple birth.

These survival rates may be moderated under paddock conditions where other factors such as predation may be involved. However, the birth weights of male and female kids are comparable to those quoted by Scheurmann (1983) and the growth rates of >100 g per day are consistent with a high survival rate in Merino sheep under Queensland pastoral conditions (Stephenson 1982).

These results suggest that the Australian cashmere goat is highly fecund in the south western Queensland environment when joined in autumn. Manipulating the reproductive cycle by using the buck effect and knowledge of the oestrus pattern will assist in the management of kidding does to reduce perinatal losses.

Achieving the high reproductive potential demonstrated by this flock will greatly assist in maximising the rate of genetic improvement of heritable production traits in the cashmere goat.

**REFERENCES**