

Diseases and mortality of goat kids in a South African milk goat herd

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Abstract

Saanen milk goats were crossed with South African Indigenous goats to evaluate productivity, milk production and disease incidence, and to assess their suitability for milk production by small-scale farmers and households in developing areas. Goat kids were separated from their mothers at one week of age, and were kept in groups of 10 in pens with slatted floors. They were fed one litre of milk per day in two feeding periods, and had access to a total mixed ration. A mean annual goat kid mortality of 29% was observed over a period of three years. No effect of breed, gender or of multiple births was apparent. Most goat kid deaths were a result of coccidiosis and pneumonia. Two categories were discerned: kids that died soon after being born; and kids that died from coccidiosis and its complications, at about two to four months of age. In most cases, when pneumonia was diagnosed as the cause of death, it was a complication arising from the debilitating effects of earlier coccidiosis. Other relatively less important disease conditions that affected the goat kids included: rotavirus, orf and limb fractures.

Keywords: Goat kids, diseases and mortality

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Introduction

The Milch Goat Project in the Department of Animal Health and Production (Medunsa) was initiated in 1987 to study the factors affecting the establishment of goat milk production for small-scale farmers and households in the developing areas of Southern Africa. The goats were kept on a zero grazing system (total mixed ration diet). Some results have been reported (Donkin *et al.*, 1992; Donkin *et al.*, 1996; Donkin, 1997; Donkin *et al.*, 2000).

Materials and Methods

Saanen milk goats were purchased from Fairview Estates in the Western Cape Province and South African Indigenous goats were loaned from the Department of Development Aid farm Delftzyl in the Limpopo Province. Crossbred goats were produced and compared to the Saanens and Indigenous goats. Breeding, kidding, milk production, diseases and mortality were recorded (Donkin, 1997). In the first three years, kids were taken from their mothers and kept in groups of up to 10 in nursery pens with slatted floors. They were fed 0.5 L goat milk twice a day, and had free access to a complete feed containing 140 g CP/kg DM. After weaning they were fed this total mixed ration *ad libitum*. Diagnosis of diseases was based on clinical signs, lesions and specific diagnostic tests. Post-mortems were carried out by the Pathology Department of the Faculty of Veterinary Science.

Results and Discussion

The mean annual goat kid mortality was unacceptably high at 29%. The overwhelming reasons for the death of goat kids were coccidiosis and pneumonia, usually occurring together. If the diagnosis "enteritis" is also taken to be indicative of coccidiosis, and "cachexia" is the logical consequence before death, then there is no doubt that this was the major problem in the herd. The causative organisms have been studied (Harper & Penzhorn, 1999). Pneumonia also occurred separately from coccidiosis, and this was probably the final reason for the death of goat kids that had not received enough colostrum. Many kids were lost in the early days after being born, probably as a result of poor mothering ability, pendulous udders, overcrowding and lack of close attendance by the staff responsible.

Two distinct groups were discerned (Table 1):

- * Kids that died soon after being born. In this group, those that died from pneumonia in the first 35 days after birth, on average at two to three weeks (range: 1 to 33 days).

* Kids that died from coccidiosis and its complications, at about two to four months of age.

In most cases the pneumonia diagnosed after two months was a complication arising from the debilitating effects of earlier coccidiosis. A timely treatment with diclazural (Vecoxan®, Janssen) was usually effective in stopping the diarrhoea, but by then much damage had been done. Affected goat kids usually died, if not from diarrhoea, then from pneumonia. Those that were saved remained stunted. Preventative measures included the addition of an ionophore to the feed, either monensin (Romensin®, Elanco) or lasalocid (Taurotec®, Instavet). Such compounds have a coccidiostatic effect, but this was only partially effective in limiting mortality.

The system of kid rearing that was initially used had to be abandoned because of labour difficulties related to the turbulent political situation in South Africa at that time. The kids were allowed to run with their mothers until about six weeks of age. This system was inefficient, although similar to the method used by farmers in the developing areas. An improvement in hygiene and in careful husbandry of the kids in later years made a great difference in reducing the effects of coccidiosis, but it remained the most important problem in the herd. High kid mortality can occur even with animals kept under extensive management systems (Ndlovu & Sibanda 1991).

Table 1 Age of goat kids at death (days)

Age at death (days)					Totals (three years)	
	1988	1989	1990	10d	30d	Percent*
0 to 10	3	8	17	28		
11 to 20	1		4	5		
21 to 30	4			4	37	36.3
31 to 40	2	1	1	4		
41 to 50	5	2		7		
51 to 60		4		4	15	14.7
61 to 70		4		4		
71 to 80		4	4	8		
81 to 90		3	1	4	16	16.7
91 to 100		2	5	7		
101 to 110	1	5	4	10		
111 to 120		3	2	5	22	21.6
121 to 130		2	3	5		
131 to 140		1	1	2		
141 to 150		1	1	2	8	8.8
151 to 160			1	1		
161 to 170			2	2		
171 to 180					3	2.9
Totals	16	40	46	102	102	100

*Note: Percent of animals which died per age group

Breed of goat as well as gender of kid had no effect on mortality. Multiple births did not have a negative effect on mortality. The data in Table 2 might suggest that single goat kids showed a higher mortality than did twins or triplets, but the incidence varied greatly from year to year, and no clear trend was apparent (Donkin 1997).

Since most goat kids that died did so from diarrhoea / coccidiosis / pneumonia complex of the disease (Table 3), other problems relating to the kids were often not recorded. Some other conditions associated with death are indicated in Table 4. Rotavirus was isolated from the faeces of goat kids in 1990, and reported in 1994 (Da Costa Mendes *et al.*, 1994). This was believed to be the first report of rotavirus in goats in southern Africa.

Further attempts to isolate the virus in other years were unsuccessful, and it cannot be assumed to be the cause of subsequent mortality.

Table 2 Effect of multiple births on mortality of goat kids

Breed	Singles		Twins and triplets		Totals	
	No.	%	No.	%	No.	%
Saanen	12	32.4	36	31.0	48	31.4
Crossbred	17	30.9	17	19.8	34	24.1
Three-quarter Saanen	11	61.1	6	23.1	17	38.6
South African Indigenous	2	28.6	7	28.0	9	28.1
Total	42	35.3	66	26.1	108	29.0

Table 3 Goat kid mortality from coccidiosis and pneumonia

Reason	No.	Days (mean \pm s.e)
Coccidiosis	53	86 \pm 79
Coccidiosis with pneumonia	14	94 \pm 28
Pneumonia (<35 days)	18	13 \pm 11
Pneumonia (>35 days)	13	102 \pm 30
Pneumonia (> 35 days; incl. coccidiosis)	27	95 \pm 31

In the early years, limb fractures were a problem with young kids; but the incidence was generally low. Exact statistics were not recorded, but were of the order of two to four kids a year (approximately 1% to 4%). Initially, orf was not apparent in the herd. However, in later years outbreaks occurred sporadically in kids of about three months of age. The lesions contributed to mortality, by making the drinking of milk or eating of other food difficult. Generally the orf cleared up after a few weeks, and was not considered to be a major problem.

Table 4 Goat kid post-mortems: 1988 to 1994

Reason for death	Number of kids
Pneumonia	54
Coccidiosis	53
Enteritis/diarrhoea	9
Cachexia	15
Puerperal infections*	15
Neonatal mortality **	10
Miscellaneous***	9
Total	150

Notes: * Includes: septicaemia (8), *E. coli* (3), myocarditis (1), pericarditis (1) arthritis (1), pyogenic bacterial embolism (1).

** Includes: stillborn (4), born weak (5), hypothermia (1)

*** Includes: cerebrocortical necrosis (1), vitamin E/selenium deficiency (1), ataxia (1), renal dysplasia (1), *Monezia* (1), asphyxiation (stuck in feed bin) (2), 'concentrate overload' (2)

Conclusions

The high kid mortality was the most significant syndrome affecting the goats. The main losses occurred in the first three months of life. The main reasons were coccidiosis (presumably resulting from overcrowding and poor hygiene), and pneumonia associated with the coccidiosis, but related to poor mothering ability, pendulous udders, overcrowding, and lack of close attendance by the staff responsible. This was a management problem related to the political turmoil at that time.

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