

## Feed intake and growth of Saanen kids weaned at 42 and 70 days of age

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### Abstract

The effect of weaning age (42 vs 70 days) on the feed intake and growth performance from seven to 140 days of age was investigated, using 58 male Saanen kids. Final body weight, average daily gain and feed conversion efficiency did not differ significantly between weaning ages during the creep (days 7-80), growth diet (days 81-140) or the total (days 7-140) experimental periods. Only feed intake, cumulative feed intake, dry matter (DM) intake and cumulative DM intake differed significantly in the creep (days 7-80) period. The creep intake (days 7-80) of the 42 day weaning treatment was 48%, which was significantly higher than the 70 day treatment due to creep feed replacing milk intake. Corresponding with a feed intake of 240 g/day and a total metabolisable energy intake of  $295 \pm 1.4$  MJ/kid over the 7 to 42 day period, the kids underwent no post-weaning shock in terms of their growth performance and had the same final weight ( $29.9 \pm 2.0$  kg) as the 70 day weaning treatment at 140 days of age.

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**Keywords:** Saanen, kids, weaning age, intake

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### Introduction

Goats are found all over the world, whether it is mountainous, flat, hot, cold, wet or dry. They not only survive but also manage to generate products in the form of meat, fibre and milk (Haenlein, 1996). Goat milk is an important source for cheese and ice-cream. Feeding milk to kids would be an expensive practice when there is a great demand for milk. Thus, the weaning of the kids as early as possible would be beneficial provided that the growth performance and feed intake of kids are not affected in a negative way. Knowledge on the effect of weaning age on the performance of dairy goat kids is scarce when compared with dairy calves. Mowlem (1992) suggested that kids weaned at an early age will not undergo a post-weaning growth shock, provided their DM intake is sufficient. This study was conducted to determine the effect of weaning age (42 vs 70 days) of age of Saanen kids on their feed intake and growth performance from 7 to 140 days.

### Materials and Methods

A pelleted creep and growth diet (Table 1) was formulated according to the NRC (1985). At 7 days of age 58 male Saanen kids were randomly assigned to a 42 or 70 day weaning age treatment. Kids received 1200 mL of Saanen ewe milk per day (increased by 100 mL/day from 600 mL/day at 7 days) for either 42 or 70 days. The ewes' stage of lactation correlated with the age of the kids. Until 7 days of age the kids were grouped to prevent losses due to the cold. At 7 days of age the kids were individually penned, and feed and water were available *ad lib*. Kids received creep pellets *ad lib*. from day 7 to day 80 and growth pellets *ad lib*. from day 81 to day 140. Kids were fed twice daily and orts was collected daily, and the pooled weight determined weekly. Kids were also weighed weekly. Feed intake (creep and growth diet), DM intake (milk plus creep and/or growth diet), average daily gain and feed conversion efficiency (kg feed/kg weight gain) were calculated for each kid. The mathematical model for the analyses of feed intake, DM intake, daily gain and feed conversion included fixed effects due to weaning age (42 vs 70 days) and residual error (SAS, 1990).

### Results

The effect of weaning age on the performance of Saanen kids receiving a creep and growth diet is presented in Table 2. Final body weight, average daily gain and feed conversion efficiency did not differ significantly between weaning age in the creep diet (7-80 days), growth diet (81-140 days) or the total (7-140 days)

experimental period. Only the feed intake, cumulative feed intake, DM intake and cumulative DM intake differ significantly in the creep (7-80 days) period. The creep intake (7-80 days) of the 42 day weaning treatment was 48% higher ( $P < 0.05$ ) than the 70 day treatment. In the 42 day weaning treatment the kids were consuming 240 g creep diet per day at weaning. The total ME intake of this group over the 7 to 42 day period was calculated as  $295 \pm 1.4$  MJ/kid ( $26.1 \pm 0.2$  L milk/kid with 4% butter fat content and  $3.2 \pm 0.034$  kg creep/kid on a DM basis).

**Table 1** Physical (on an air dry basis) and chemical (on a dry matter basis) composition (g/kg) of the creep and growth diet

Item	Content	
	Creep	Growth
<b>Physical composition</b>		
Maize meal	205.6	323.4
Wheat bran		137.5
Groundnut oilcake (450 g/kg CP)	33.3	33.3
Sunflower oilcake (375 g/kg CP)	107.9	16.2
Soya oilcake (465 g/kg CP)	23.4	
Full fat soya	50.0	
Maize germ oil <sup>1)</sup>	100.0	100.0
Lucerne meal	300.0	220.0
Molasses meal	90.0	90.0
Supermax premix <sup>2)</sup>	68.1	54.6
Vit A,D,E premix	1.0	1.0
Eco oxytet 20 %	0.5	0.5
Salt	10.2	15.8
Sheep minerals <sup>3)</sup>	0.5	0.5
Ammonium chloride	5.0	7.5
Taurotec <sup>4)</sup>	0.3	0.3
Limestone	3.8	1.6
<b>Chemical composition</b>		
Dry matter (g/kg)	898.1	881.0
Organic matter (g/kg)	908.2	888.0
Crude protein (g/kg)	210.0	165.0
UDP <sup>5)</sup> (g/kg)	59.6	45.2
ME <sup>5)</sup> (MJ/kg)	11.6	11.6
Crude fibre (g/kg)	113.7	97.1
ADF (g/kg)	152.2	159.2
NDF (g/kg)	306.3	298.1
Fat (g/kg)	49.7	38.2
Ca <sup>5)</sup> (g/kg)	7.7	7.7
P <sup>5)</sup> (g/kg)	3.9	3.9
Na <sup>5)</sup> (g/kg)	2.3	3.4

<sup>1)</sup> Supplied by Cape Oil (Berkley road, PO Box 16, Maitland, South Africa); <sup>2)</sup> Rumen inert fat, supplied by marine Oil (Division of Tiger Brands, Main road Didovalley, Simons Town, South Africa); <sup>3)</sup> A standard macro- and micro mineral supplement formulated according to the NRC (1985) (Meadow Feed; Mills, South Africa); <sup>4)</sup> Growth promoter supplied by Roche (Wycroft road, PO Box 13167, Mowbray, South Africa); <sup>5)</sup> Chemical composition as calculated by Meadow Feed mills Cape (Paarl, South Africa)

Morand-Fehr (1976) reported that there was no detrimental influence due to weaning when Alpine kids were consuming 30-50 g dry feed per day. As seen from Table 2, the Saanen kids had, due to their normal growth pattern, a faster growth rate between 81 and 140 days on the growth diet, than between 7 and 80 days on the creep diet. In addition, the results of the present study associated with live weight values are consistent with those reported in the literature (Morand-Fehr *et al.*, 1982).

**Table 2** The effect of weaning age on the performance (mean  $\pm$  s.e.) of male Saanen kids from 7 to 140 days of age

Measurement	Weaning age (days)	
	42	70
No. of kids	30	28
<b>7-80 days: Creep diet</b>		
Initial body weight (kg)	6.4 $\pm$ 0.17	6.4 $\pm$ 0.18
Final body weight (kg)	15.9 $\pm$ 0.57	15.4 $\pm$ 0.60
Cumulative feed intake (kg)	24.9 $\pm$ 1.32 <sup>a</sup>	16.8 $\pm$ 1.39 <sup>b</sup>
Feed intake (g/day)	395 $\pm$ 20.9 <sup>a</sup>	266 $\pm$ 22.0 <sup>b</sup>
Cumulative dry matter intake <sup>1</sup> (kg)	27.6 $\pm$ 1.18 <sup>a</sup>	22.7 $\pm$ 1.24 <sup>b</sup>
Dry matter intake <sup>1</sup> (g/day)	437 $\pm$ 18.7 <sup>a</sup>	361 $\pm$ 19.7 <sup>b</sup>
Average daily gain (g/day)	150 $\pm$ 8.1	142 $\pm$ 8.6
Feed conversion efficiency <sup>1</sup> (kg feed/kg weight gain)	3.0 $\pm$ 0.13	2.8 $\pm$ 0.14
<b>81-140 days: Growth diet</b>		
Initial body weight (kg)	15.9 $\pm$ 0.57	15.4 $\pm$ 0.60
Final body weight (kg)	29.9 $\pm$ 1.95	29.9 $\pm$ 2.05
Cumulative feed intake (kg)	50.6 $\pm$ 3.21	51.9 $\pm$ 3.38
Feed intake (g/day)	904 $\pm$ 57.2	927 $\pm$ 60.3
Cumulative dry matter intake (kg)	45.2 $\pm$ 2.86	48.1 $\pm$ 3.02
Dry matter intake (g/day)	807 $\pm$ 51.0	858 $\pm$ 53.8
Average daily gain (g/day)	250 $\pm$ 23.9	259 $\pm$ 25.2
Feed conversion efficiency (kg feed/kg weight gain)	3.3 $\pm$ 0.25	3.4 $\pm$ 0.25
<b>7-140 days: Total period</b>		
Initial body weight (kg)	6.4 $\pm$ 0.17	6.4 $\pm$ 0.18
Final body weight (kg)	29.9 $\pm$ 1.95	29.9 $\pm$ 2.05
Cumulative feed intake (kg)	75.5 $\pm$ 5.30	68.7 $\pm$ 5.59
Feed intake (g/day)	634 $\pm$ 44.6	577 $\pm$ 46.9
Cumulative dry matter intake <sup>2</sup> (kg)	72.7 $\pm$ 4.73	70.8 $\pm$ 4.99
Dry matter intake <sup>2</sup> (g/day)	610 $\pm$ 39.8	594 $\pm$ 41.9
Average daily gain (g/day)	197 $\pm$ 15.6	198 $\pm$ 16.5
Feed conversion efficiency <sup>2</sup> (kg feed/kg weight gain)	3.2 $\pm$ 0.14	3.0 $\pm$ 0.14

<sup>a,b</sup> Values within a row not followed by the same superscript letters differ ( $P < 0.05$ )

<sup>1</sup>) Milk plus creep diet intake <sup>2</sup>) Milk plus creep and growth diet intake

## Conclusions

In this trial weaning at 42 days of age has proven to be effective. Kids underwent no post-weaning shock and had the same final weight as the 70 day weaning treatment at 140 days of age. There were no problems associated with health and mortality in reared kids.

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