THE PRE-WEANING GROWTH OF THAI NATIVE KIDS

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ABSTRACT

Fifty mature Thai native (TN) does (29 suckling singles and 21 suckling twins) were studied. The purpose of the study was to monitor the growth rate and factors affecting the growth of TN kids raised under improved management at the Prince of Songkla University (PSU), Thailand. The growth rate of single kids were significantly better than that of twin kids. Males had significantly higher growth rates than did females. Estimated daily milk yields from week 1 to weaning (week 12) for does suckling single and twin kids showed the same trend. The peak milk yield of the does occurred over in weeks 5 and 6 of lactation. There was no significant correlation between milk available (ml/day) and growth rate of the kids from 1 to 6 weeks of age.

INTRODUCTION

Studies on goat production in Thailand are scarce but, recently, interest in goat research has increased. Saithanoo and Milton (1989) reported some preliminary data on the pre-weaning growth of Thai native (TN) kids, but definitive information is required.

Field studies with Australian cashmere (AC) does and their kids have shown that kid growth rate is often poor. Beicher (1986) proposed that the lower kid growth rates are associated with the low milk production of their dams. Devendra (1966) reported that birth weight for Kambing Katjang (KK) goats was 1.5 kg and the growth rates from birth to 3 months of age for males and females were 16.9 and 20.1 $g/kg \cdot ^{75}/d$, respectively. Saithanoo et al (1985) stated that TN goats are phenotypically similar to KK goats of Malaysia. They are small with average mature body weights of 22-23 kg. The growth rates up to 6 months of age are low (approximately 62 and 47 g/day in males and females, respectively).

After birth, the growth rate of the kid is determined by both environmental and maternal effects. For some time during post-natal growth, kids depend

entirely on nutrients from milk for its growth, and limitations in both quantity and quality of milk will markedly depress the growth of kids up to weaning.

The present experiment was designed to study the pre-weaning growth of TN kids raised under improved management at pasture in southern Thailand. Doe milk production was measured to assess the extent to which maternal factors limited the growth of the kids.

MATERIALS AND METHODS

Location and Climate

The study was conducted at the Goat Research and Development Unit, the Faculty of Natural Resources, PSU, Hat Yai, Thailand. The facility was established as part of the Thai-Australian PSU Project and is situated 7° N, 100° 30' E. The region has an annual rainfall of 1,120-2,800 mm with a dry period extending from mid January to March/April with marked increases in rainfall in May/June and October/November. The area is 20 m above sea level with temperatures of 20-35°C, relative humidity of 63-88 % and has 50 minute difference in daylength between solstices (Milton et al 1987).

Animals and Management

Village female goats were introduced to the campus farm from June to September 1984 (110) with further introductions during 1985 (60) with males introduced as sires (12). All does were joined in October, 1985 and 80 does kidded in March 1986. At kidding, 50 mature does (29 suckling singles and 21 suckling twins) were selected. The pregnant and lactating does were raised under the grazing and feeding management system described by Milton et al (1987).

Experimental Design

The design was a 2x2 factorial in completely randomized design. Factors were birth type (single and twin) and sex (male and female).

Measurements and Sampling Procedures

Milk yield (volume) was measured on one day each week from weeks 1 to 12 after does had kidded. The does and their kids were individually weighed on the days their dam were milked.

For milking, each doe was suspended in a sling with holes for the animal's legs and udder. Immediately before milking each doe was given an intravenous injection of 7.5 I.U. of oxytocin (General Drugs House, Co., Ltd., Thailand), and quickly hand milked. Time of milking was recorded at the completion of this initial milking. After the initial milking, does were separated from their kids for about 4 h, during which time they had access to pasture. They were then milked a second time and the time of milking and

the volume produced was recorded. Daily milk secretion was calculated as the amount of milk produced over the time between the initial and second milking and the rate was adjusted for expression as milk secretion over a 24 hr period.

Statistical Analysis

The significance of differences between treatment means was calculated by analysis of variance (Steel and Torrie 1960).

RESULTS AND DISCUSSION

Effect of Birth Type and Sex on Weights and Pre-weaning Growth of Kids

Figure 1 shows the mean live weights change with age of kids of 2 birth types (singles and twins) (a) and of male and female of kids (b). Single and male kids gained more weight from birth to weaning at 12 weeks of age than did twin and female kids, respectively.

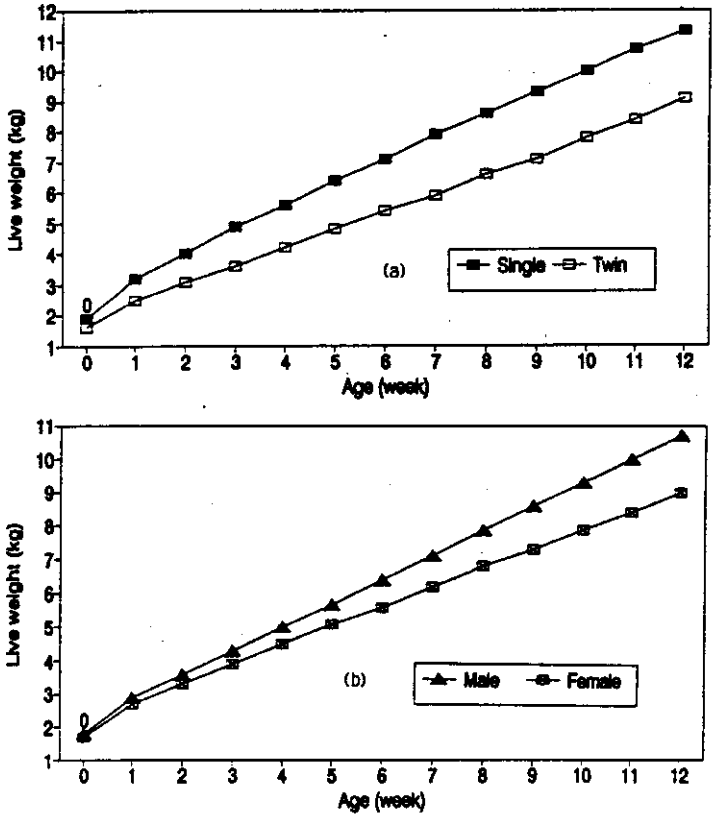

Figure 1 Relationships between age and changes in liveweight of single and twin (a) and of male and female (b) kids

Table 1 shows mean values with standard errors (SEM) for birth weights, weights at 6 and 12 weeks of age and live weight gain. Single kids had significantly higher (P<0.01) weights and growth rates than did twin kids. This finding is in agreement with those of Singh (1973), Ruvuna et al (1988) and Bajhau and Kennedy (1990).

Males had significantly higher (P<0.01) weights and growth rates than did females, but there was no significant difference between sexes for birth weight. Generally, males are 15 to 20% heavier and grow faster than females (Louca and Hancock 1977; Pym et al 1982; Beischer 1986). In the present study, male kids also had higher (17%) growth rates to weaning than did females.

Table 1 Least squares means with SEM for birth weight, weights at 6 and 12 weeks and growth rates of Thai native kids

	Birth type		Level of	Sex		Level of	SEM
	Single	Twin	significance	Male	Female	significance	
Number of animals	29	42		40	31		
Birth weight (kg)	1.9	1.6	**	1.8	1.7	NS	0.03
Weight at 6 week	7.0	5.3	**	6.5	5.9	*	0.12
Weight at 12 week	11.2	9.0	**	10.8	9.4	**	0.18
Growth rate (g/d)							
1-6 week	108.0	80.8	**	100.8	88.0	*	2.36
6-12 week	99.5	87.3	*	103.8	83.0	**	2.32
1-12 week	103.3	84.3	**	102.4	85.2	**	1.84

*(P<0.05); **(P<0.01); NS, not significant

Doe Weight Change

Mean live weights of does suckling either single or twin kids increased slightly from week 1 to 12 of lactation (24.1 to 25.4 and 24.2 to 25.4, respectively).

Milk Yield

Figh ure 2 shows the estimated daily milk yields for does rearing single and twin kids from week 1 to week 12 (weaning). In general, milk yields from week 1 to weaning for both groups showed the same trend. The peak of milk yield for does rearing single kids occurred at week 5 of lactation (950 ml/d) while that of does rearing twin kids occurred at week 5 (1190 ml/d). The daily milk yields for does suckling single kids sharply declined after week 7 and the milk for does rearing twin kids declined after week 8. Significant amounts of milk (>700 ml/d) were still being produced by all does 12 weeks after parturition, indicating that Thai native does do have a good potential for milk production under the improved management conditions imposed.

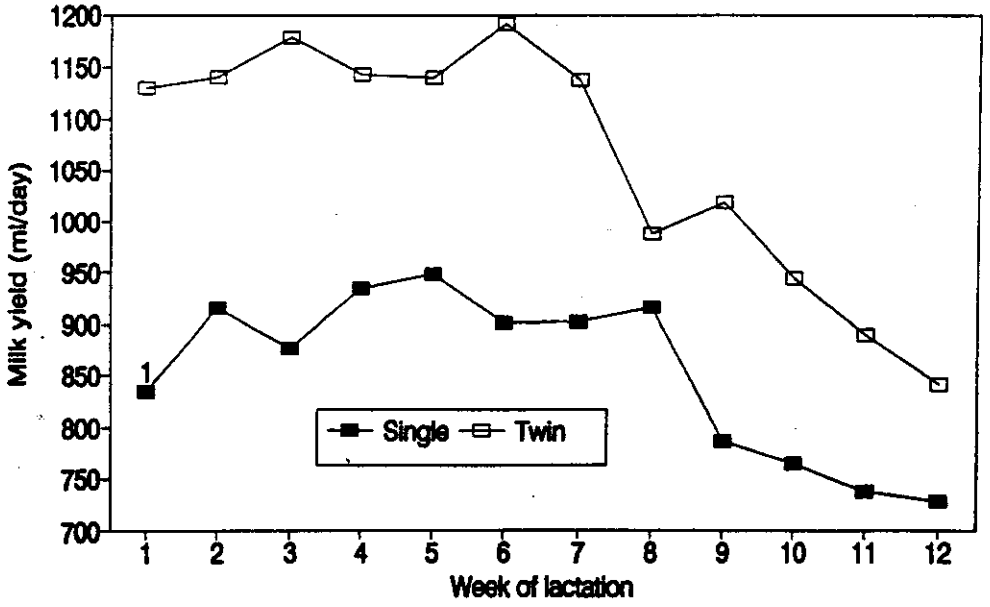

Figure 2 Estimated daily milk yields of does suckling singles and twins

The weight of the does increased slightly during lactation suggesting that the nutritional status of the does during lactation was good. Estimated daily milk yield of other unselected goats such as Australian cashmere goats (Beicher 1986) were higher than that of TN does.

Does rearing twins had significantly higher milk yields than did does rearing a single kid. However, there was no significant difference between these two groups for milk yield at week 8, 11 and 12 weeks.

The Relationship between Milk Availability and Kid Growth

There was not a significant correlation between milk available (ml/day) and kid growth rate (g/day). Parry (1986) and Beischer (1986) found significant relationships between milk available and growth rate of Australian cashmere kids during the first 4 weeks of lactation ($r = 0.74$ and 0.67, respectively) but the correlation became lower as lactation progressed. The results of our study suggest that either the milk available was in excess of the kids consumption or other factors such as climate and mothering ability had major effects on kid growth.

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