

EFFECT OF RESTRICTED SUCKLING AND BUCKET FEEDING ON THE GROWTH RATE OF CALVES AND ON MILK YIELD¹

H Gaya, J C Delaitre and T R Prestor²

Animal Production Division, Ministry of Agriculture, Natural Resources and the Environment, Reduit, Mauritius

The effect of the restricted-suckling versus the bucket-feeding of calves on calf growth, and on the total and saleable milk yield from their dams, was measured for a period of 90 days in two experiments involving two herds of cows. Herd A was of Creole cows (10 cows/treatment) milked twice daily, and the calves allowed to suckle for 30 minutes immediately after milking. Herd B (8 cows/treatment) was of Hereford-Friesian cross-bred cows, which were milked once daily, the calves were allowed to suckle after the morning milking, and for a second time in the afternoon. In both herds, there were no significant differences between the two groups of cows in the amount of milk taken by milking, the means $\pm$ SE being: 673 ± 72 & 751 ± 41 litres (Herd A), and 383 ± 34 & 420 ± 27 litres (Herd B) for the restricted suckled and non-suckled cows respectively. Since the milk for the bucket fed calves was from the milk taken by milking, the net effect was a large difference in the amount of saleable milk ($P < 0.01$) in favour of the cows which restricted-suckled their calves (646 ± 71 & 408 ± 43 litres, Herd A and 377 ± 36 & 89 ± 30 litres, Herd B). The restricted-suckled calves were estimated to take an additional 254 ± 29 (Herd A) and 336 ± 11 (Herd B) litres of milk from their dams. The total milk yield of the cows which restricted-suckled their calves was therefore greater than that of the cows which did not. The growth of the restricted-suckled calves of Herd B (once-daily milked) was better ($P < 0.01$) than that of the bucket-fed calves (0.50 ± 0.03 kg/d vs 0.35 ± 0.01 kg/d). In Herd A (twice milked), the growth of the restricted suckled calves was worse ($P < 0.05$) than that of the bucket fed group (0.32 ± 0.05 vs 0.43 ± 0.02 kg/d). This was attributed to the lower milk intake of the former. It is concluded that the system of restricted-suckling has the clear advantage that more saleable milk is produced, and that this is well suited to once-daily milking systems. If twice daily milking is practised, then the calves must be allowed more access to the cow.

Key words: Restricted suckled, milk yield, calf growth.

In the system of milking and rearing feedlots for cattle as proposed for Mauritius, the management system to be employed will be once daily milking with restricted suckling for the calves after milking. The proposal to use restricted suckling is based on Cuban experience (Ugarte and Preston 1972, 1975), which showed higher milk yields and better calf health and performance when milking was combined with restricted suckling than with artificial rearing.

This paper will report two trials which were carried out in Mauritius to compare the two systems of restricted suckling and bucket feeding.

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² Centro Dominicano de Investigación Pecuaria con Caña de Azúcar, CEAGANA Apartado 1258 Santo Domingo, Dominican Republic

Materials and Methods

Animals: Cows from two herds were used. Twenty Creole cows from the Curepipe Livestock Breeding Station (Herd A) were allocated alternatively to restricted suckling or bucket feeding as they calved. Sixteen Hereford Friesian cross-bred cows from the New Zealand importation at the Palmer Livestock Breeding Station (Herd B) were also allocated to the two treatments in the same way.

Management: In the bucket feeding system the calves of herd A were separated from their dams at birth and bucket fed with colostrum and then with cows' milk. In herd B the calves were suckled for four days before bucket feeding. From the fifteenth day the calves from both herds also received a concentrate feed. The calves of herd A were weighed twice weekly and those of herd B once weekly.

The bucket fed calves were rationed as follows. They received 0.9 kg milk the first day which was increased by 0.45 kg daily until it was 3.6 kg daily, at which level it was kept until the beginning of the thirteenth week when it was reduced by 0.5 kg daily and the calves weaned at the end of the week (91 days). Concentrate feeding was started at the beginning of the second week at 115 g daily and was increased 115 g every two weeks to 690 g daily at weaning.

The restricted suckling groups of both herds were treated similarly. They were allowed to suck their dams for 30 minutes in the morning immediately after milking (7:00 am herd A; 9:00 am herd B). The cows of herd A were milked again at 2:30 pm, and the calves suckled again after milking. Where necessary the time the calf had with its dam was increased so as to ensure a daily intake of 2 kg milk. The cows of herd B were not milked in the afternoon, but the calves were suckled at about 3:00 pm. Calves of both herds were weighed before and after suckling in order to measure their milk intakes. Calves of herd A were bucket fed for the first five days at the same rate as the other group and then suckled. Calves of herd B suckled from birth. The restricted suckled calves of both had free access to a mixture of fish meal and ground maize (1:2) from the tenth day, and molasses containing 5% urea from the 15th day.

The calves on both treatments in both herds received forage ad libitum from the 10th day of age. Forage was given to the cows of both treatments at the rate of 40 kg/day herd A, and 30 kg/day herd B. The forage was given half in the morning and half in the afternoon. The cows of both herds also received a concentrate supplement. The rates of concentrate feeding were as follows. The cows of herd A received 5 kg/day for the first week and thereafter 1.4 kg $\pm$ 340 g per litre of milk. The cows of herd B also received 5 kg/day for the first week, but 2 kg $\pm$ 350 g thereafter.

Results and Discussion

Cow performance: With both herds there was no significant difference in the amount of milk taken at milking (table 1). However, the calves which were suckled took additional milk from the cows, whereas those which were bucket fed were given the greater portion of the milk which had been taken by milking. The net effect of this was that the amount of saleable milk was substantially greater ($P < .01$) from the cows which were restricted suckled by their calves. This is in agreement with the results

Table 1:

Effect on cow performance of rearing the calf by restricted suckling of bucket feeding ($\bar{x} \pm SE \bar{x}$)

	Herd A (Creole)		Herd B (Hereford x Friesian)	
	Restricted suckling	Bucket rearing	Restricted suckling	Bucket rearing
No of cows	10	10	8	8
Milk Production/consumption kg/d				
At milking	7.92 $\pm$.80	8.82 $\pm$.48	4.50 $\pm$.38	4.94 $\pm$.29
Consumed calf	2.66 $\pm$.34	4.02	3.95 $\pm$.12	3.91
Total	10.6 $\pm$.57	8.82	8.39 $\pm$.43	4.94 $\pm$.29
Saleable	7.92 $\pm$	4.80	4.50	1.03
Change in live weight				
g/d	-274 $\pm$ 86	-308 $\pm$ 53	Data not available	

of Ugarte and Preston (1975). There were no detectable differences between the two management systems in the weight changes of the cows in the 90 days of the experiment.

Growth of Calves: This is shown by table 2. The differences in growth rate between calves under the two systems differed significantly. In herd B (cows milked once daily), the restricted suckled calves made better growth ($P < .01$). In herd A, the restricted suckled calves (cows milked twice daily) had a lower milk intake and a lower growth rate than those of the bucket fed group ($P < .05$). In this context it is of interest that it was noted that the calves of this herd suckled for the full 30 minutes allowed after milking (morning and afternoon), whereas the calves of herd B suckled for 30 minutes in the morning (after milking), but only for about 10 minutes in the afternoon (no milking). This would suggest that they satisfied themselves more quickly than when suckling followed milking. It emphasises that in twice daily milking systems, more attention must be paid to the health and growth of the calves. It was noted in both

Table 2:

Effect on calf performance of restricted suckling compared with bucket feeding ($\bar{x} \pm SE \bar{x}$)

	Herd A		Herd B	
	Restricted suckling	Bucket rearing	Restricted suckling	Bucket rearing
No of calves	10	10	8	8
Live weight, kg				
At birth	30.7 $\pm$.89	30.4 $\pm$ 1.14	26.6 $\pm$ 1.6	26.9 $\pm$.78
At weaning (90 d)	59.2 $\pm$ 4.3	69.4 $\pm$ 2.3	71.3 $\pm$ 4.1	58.6 $\pm$ 1.8
Daily gain	.317 $\pm$.05	.433 $\pm$.02	.497 $\pm$.10	.353 $\pm$.02
Feed intake, kg/d				
Milk	2.66	4.02	3.95	3.91
Molasses	.22	-	.49	-
Concentrate	-	.72		.74
Maize/fish meal	not measured	-	.14	-
Conversion, kg milk/kg gain in live weight	8.4	9.3	7.8	11.4

herds that diarrhoea was common among the suckled calves. This was attributed to the molasses, and was controlled by restricting access to the molasses.

Conclusion

A restricted suckling system works well, and results in better milk yields by the cow, and more saleable milk, than with traditional bucket rearing systems. It is particularly well suited to once daily milking/ twice daily suckling systems. If the cows are milked twice daily, then the calves must be allowed more access to the cow.

References

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