

A NOTE ON INTENSIVE WEANER CALF PRODUCTION FROM DAIRY COWS

J. Reyneke

Agricultural Research Institute, Potchefstroom

Receipt of M.S. 14.5.76

In the Highveld region dairy farming is characterised by a wide spectrum of systems, the intensity of which varies from semi-intensive to intensive. The continuously changing profitability pattern of dairy products relative to grain and beef, as well as a temporary flooding of the liquid market in the past, gave rise to a considerable degree of instability. In fact, a noticeable switchover pattern from dairying to beef production and back to dairying has been observed. Due to this switchover process, valuable genetic material from both beef and dairy animals was sacrificed.

The need was felt to gain information on the performance of Friesland cows when managed similarly to beef cow herds. The possibility of applying a multiple suckling system on veld and the envisaged advantages of creep feeding under these conditions demanded attention. Naudé (1964) reported that out of a total of 91 dairy herds investigated in the Republic of South Africa, only 31% of the herds suckled calves. In 86% of the cases only one calf per cow was suckled. This differs completely from the practice in Britain where more than one calf per cow is raised in 90% of the cases (Jobst, 1964). Although it was also anticipated that Friesland cows would possibly experience a considerable mass loss during lactation on summer veld, no evidence to substantiate this postulate could be found from available literature.

In an experiment carried out at the Bethlehem Research Station sixty Friesland cows were mated annually for three years to Friesland bulls during the period 15 November to 31 January. Heifer calves were removed immediately after parturition and replaced with male calves obtained elsewhere. In order to allow foster dams to accept strange calves, cows were kept individually in small paddocks. Some cows had to be tethered in order to allow calves to suckle. The sixty cows were divided at random into two main treatment groups namely double (D) and single suckled (S) which respectively consisted of 20 and 40 cows. These groups were again divided into two sub-groups one of each of the D and S groups receiving creep feed (CF) and the other receiving no creep feed at all (OCF).

Immediately after cows had settled after parturition and calves had been accepted by their foster dams, they were put on the veld during early spring. Calves were weaned annually on 20 April at an average age of 210 days. At weaning the 20 calves in each sub-group were divided into the following additional groups.

Group	No. of calves	Treatment
A	4	Slaughtered at weaning
B	8	Fattened intensively to 350 kg on high concentrate ration
C	8	Fattened extensively to 430 kg on maize silage <i>ad lib.</i> plus concentrates at a rate of 1% of body mass.

Cows and calves were mass measured at fortnightly intervals after feed and water had been withheld for 14h. A dicalcium phosphate plus salt lick in the ratio 1 : 1 was provided *ad lib.* Experimental animals were treated against internal and external parasites according to State Veterinarian instructions. On reaching slaughter mass animals were slaughtered and carcasses were mass measured after they had been kept at -3°C for 24 hours. The area of *Musculus longissimus thoracis* was determined after a clean cut had been made between the 12th and 13th vertebra. Fat covering was measured on two sites i.e. on a height of $1/4$ and $3/4$ of the dorsal arch of *M. longissimus thoracis*.

The experimental design was a 2^3 factorial design with unequal numbers of replicates per treatment (Snedecor, 1957).

During the 1970/71 season differences in weaning mass between single- and double-suckled calves were not statistically significant. However, during the 1971/72 and 1973/74 seasons single suckled calves in some cases achieved a significant ($P < 0.05$) and highly significant ($P < 0.01$) greater weaning mass compared to double-suckled calves. The effects of creep feeding were slight and significant differences ($P < 0.05$) were observed in two out of three years. No consistent trend in respect of a differential response by double- or single-suckled calves to creep feed was observed.

Excellent average daily mass gains over all treatments of 895 g from birth to weaning were recorded in this trial. These compare favourably with mass gains obtained under intensive feeding conditions by Preston, Whitelaw, Aitken, MacDearmid & Charleson (1963). In the USA Plum & Harris (1971) evaluated Holstein cows under a beef management system in which calves achieved a mass of 245 kg at 205 days of age. This figure corresponds fairly well to the overall average weaning mass of 224.4 kg obtained in the present study. The weaning mass over three years of single suckled calves (233.1 kg)

exceeded that of double-suckled calves (215,8 kg) by 17,3 kg. This difference is slightly lower than the values of 20 to 35 kg reported by Joblin (1969).

Table 1

Weaning mass of calves at 210 days of age

SEASON	1970/71	1971/72	1973/74
n	80	80	80
	Weaning Mass	Weaning Mass	Weaning Mass
	(kg)	(kg)	(kg)
S-OCF	227,2	238,0	202,9
S-CF	249,6	249,3	231,1
D-OCF	223,3	213,0	186,4
D-CF	249,7	224,3	194,8
Main Effects	CF > OCF*	S > D*	CF > OCF*
	249,6 : 225,2		
Cal. F	4,33	4,85	4,57
Tab.F.			
	(P=0,05)	4,01	4,02
	(P=0,01)	7,10	7,12
LSD (P=0,05)	19,99	23,43	16,41
			S > D**
			217,0 : 191,7
Cal. F			8,81
Tab.F			
	(P=0,05)		4,02
	(P=0,01)		7,12

After weaning in April 1972 when calves were fattened on either a high concentrate ration to a live mass of 350 kg or a silage plus concentrate ration to a live

mass of 430 kg, double-suckled calves took 35 and 23 days longer on the two feeding systems respectively to reach slaughter mass compared to single suckled calves. This could possibly be ascribed to the slightly smaller weaning mass of double-suckled calves. During 1974 double-in comparison with single-suckled calves took 24 and 18 days longer to reach slaughter mass on the two feeding systems respectively. No effects of previously imposed treatments such as either the provision of creep feed or method of suckling were reflected at slaughter by the different carcass parameters. Carcass mass, grading, area of *Musculus longissimus thoracis* per unit carcass mass and fat covering of *M. longissimus thoracis* were implemented as parameters of comparison.

Considering that mass at weaning represents approximately 50% of the final slaughter mass, it follows that any improvement in efficiency of weaning mass, demands attention. In this context Joblin (1969) reported an average annual production of 158 and 197 kg of beef per acre for single and double calves respectively. In present study relatively small differences in weaning mass were observed between double- and single-suckled calves. It would thus appear that average quality Friesland cows could sustain an excellent growth rate of double-suckled calves on natural veld. The fact that creep feeding did not necessarily improve the weaning mass of double-suckled calves supports the evidence that these calves were not subjected to a significant shortage of nutrients through a lack of milk. This could possibly have resulted from an increased milk production of the dam due to double-suckling. In fact, Drennan (1971) reported increased milk yields of double-suckled cows in comparison with single-suckled cows during early lactation.

Table 2

Mass changes of cows during lactation and percentage reconception

	1970/71		1971/72		1973/74	
	Mass change	Recon-ception	Mass change	Recon-ception	Mass change	Recon-ception
	kg	%	kg	%	kg	%
S-OCF	- 16,6	80	+ 26,1	81	+ 3,2	80
S-CF	+ 30,0	81	+ 17,5	74	- 10,8	85
D-OCF	+ 23,3	78	+ 19,2	79	- 0,3	70
D-CF	+ 23,6	76	- 9,9	78	- 0,1	80

It was anticipated that Friesland cows would experience severe mass losses during suckling due to a potential high milk production and the generally poor nutritive value of the veld. From Table 2 it is evident that no consistent trend in respect of mass changes were observed. In this context Joblin (1969) obtained a post-calving mass change of -34 kg. for single and a mass increase of 20 kg for double suckled cows. Drennan (1971) reported lower mass gains for double-suckled cows during two seasons, but in the third season there were no significant differences between single- and double-suckled cows.

In the present investigation calving percentage was not influenced by method of suckling or the provision of creep feeding. Joblin (1969) working with limited numbers concluded that a prolongation of calving interval arose as one of the major problems under their specific conditions. In contradiction, Plum & Harris (1971) with a 42 cow herd, observed that the calving interval for Holstein cows, managed similarly to beef cows and bred naturally, did not differ from that of the same cows when managed as dairy cows and bred artificially.

Contrary to expectations, calf scouring was not experienced in the case of healthy calves suckling dams with excessive milk. However, scouring presented serious problems in respect of calves brought in from surround-

ing dairy farms. A similar observation was reported by Plum & Harris (1971).

A high percentage of cows without pigment on the teats suffered from cracked teats and severe lesions due to sharp calf incisors. On the other hand no lesions were observed on cows with pigmented teats. This phenomenon could possibly present a problem where Friesland cows without pigment on the teats are required to suckle calves.

From the discussion of results it may be concluded that Friesland cows can be incorporated successfully in a weaner calf production system when managed similarly to a beef cow herd. In view of the fact that the slightly lower weaning mass of individual double suckled calves is not reflected in post weaning gains or carcass characteristics, a considerable improvement in beef production per unit area may be affected by implementation of a double-suckling system.

Acknowledgements

The author wishes to express his sincere gratitude to messrs A van Niekerk and H J Howell of the Bethlehem Agricultural Research Station for assistance with care of experimental animals and analysis of data.

References

- DRENNAN, M.J., 1971. Single-suckled beef production. *Ir. J. agric Res.* 10, 287.
JOBLIN, A.D.H., 1969. Baby beef without concentrates—A Feasibility study. *Proc. N.Z. Soc. Anim. Prod.* 29, 137.
JOBST, D., 1964. The Charolais trials. Br. Cattle Breeders Club. Mimeograph, 9 pp.
NAUDÉ, R.T., 1964. Beef from the dairy herd. Master programme Anim. Husb. and Dairying, Irene Project No. 13.
PLUM, M. & HARRIS, L., 1971. Holstein cows and calves under beef cattle management. *J. Dairy Sci.* 54, 1086.
PRESTON, T.R., WHITELAW, F.G., AITKEN, J.N., MACDEARMID, A. & CHARLESON, Euphemia B, 1963. Intensive beef production. 1. Performance of cattle given complete ground diets. *Anim Prod.* 5, 47.
SNEDECOR, G.W., 1957. *Statistical Methods*, 4th Ed Ames : Iowa State College Press.