

THE EFFECT OF WEANING AGE ON THE POST-WEANING PERFORMANCE OF ARTIFICIALLY REARED CROSS-BRED (KENANA X FRIESIAN)CALVES IN THE GEZIRA.

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SUMMARY

Four groups of Kenana X Friesian cross- bred calves were weaned at 6,8,10 and 12 weeks of age. Concentrate starters and supplements based on agro industrial by-products together with forage sorghum was offered ad libitum in the postweaning period from 12 to 26 weeks of age. The total dry matter, supplement, forage and liveweight gains were measured during this period. Feed conversion ratio was calculated. No significant difference in total dry matter intake was observed. Calves weaned at 12 weeks of age had a significantly ($P < 0.01$) higher supplement intake than the early weaned ones. Early weaned calves consumed more forage than late weaned calves. A highly significant ($P < 0.001$) liveweight gain and feed conversion ratio was shown by the six - week weaned calves. The results suggest that an early weaning system could be successfully adopted with a favourable post weaning performance.

INTRODUCTION

Early weaning of calves is widely practiced in developing countries as a tool for offering more milk for human consumption. A great deal of work has been carried out on its effect on the subsequent performance of the animal (Percival, 1951; Chambell, 1959; Aitken, Preston, Whitclaw, Macdearnid

and Challesen, 1963; Hamula and Morimoto, 1965; Economides and Georghiades, 1983). In the Sudan calf rearing is practiced more or less on a natural basis either in the form of suckle cows with calves under range conditions or in a form of restricted feeding. The former method is practiced in Western and Southern Sudan, in the Butana area in Eastern Sudan and to some extent in the southern parts of the Blue and White Nile Provinces. In these areas calves are weaned at the age of 6-9 months. Restricted suckling, on the other hand, is mainly practiced in small holdings and farms around big cities like Khartoum and Wad Medani, where dairying is achieving much popularity. Under this system calves are allowed to suckle for various lengths of time on limited amounts of milk. Generally this continues for 4 - 6 months of age. To our knowledge no information has been reported on investigations carried out on early weaning of calves in the Sudan. Under tropical conditions, Ogundola (1981) successfully weaned calves at 3, 5 and 7 weeks of age. It was reported that calves reared on larger amounts of milk gained more slowly after weaning due to their poorer reticulo-rumen development at weaning (Kaiser, 1976; Economides and Georghiades, 1983). For early weaning starters and supplements of concentrates are offered from one week of age completely replacing the milk by the third to fifth week (Roy, 1980). The objective of the study reported here is to give information on early weaning as a system to be adopted in farms and small holdings, to investigate the possibilities of using agro-industrial by-products and green forage as a substitute for milk and to look into the dry matter intake, liveweight gain and feed conversion ratio of crossbred calves weaned at 6, 8, 10 and 12 weeks of age and reared to 26 weeks.

MATERIALS AND METHODS

Sixteen cross-bred (Kenana X Friesian) calves were used in this study. All the calves (9 males 7 females) were born at the University Farm, Nisheishiba. Calving was prepared to be indoors and the dams were allowed to lick their calves clean and dry. The calves were then identified in sequence and

randomly allocated to four treatments. The treatments were weaning age of 6, 8, 10 and 12 weeks. The calves birth weights were taken. They were then transferred to individual feeding pens, constructed from bamboo shoots, where they received colostrum by nipple pail within one hour after delivery. The quantity of colostrum offered to each calf in the first six hours was 10% of its birthweight. Colostrum feeding at this rate continued for 48 hours. The calves were then bucket-fed for the following five days from their mothers milk. Later they were given milk from the farm pool. Milk was offered at the same rate as colostrum till weaning. The daily amount of milk was divided into two feeds given: at 6.0 a.m and 5.0 p.m. At the end of the first week the calves were provided with clean tap water. They were gradually introduced to cut forage sorghum (Kan 70) and a concentrate (starter) ration till the age of twelve weeks. Thereafter and up to 26 weeks of age all calves received a loose meal (supplement) containing the same ingredients of the starter. The composition of the starter and the supplements is shown in Table I. The ingredients were formulated to contain 175 and 155 g Crude Protein /kg DM for the starter and supplement respectively.

Table 1 :Feed ingredient and chemical composition of starter and supplement diets offered to early weaned calves.

	Starter	Supplement
Ingredients (g/kg)		
Cottonseed cake	350	190
Wheatbran	550	650
Molasses	090	150
Oyster shell	005	055
Common salt	005	005
Chemical Composition (g/kg DM)		
Crude protein	175	154
Crude fibre	122	123
Ether Extractives	038	033
Nitrogen Free Extractives	605	625
Ash	060	065

The chemical analysis was done according to the standard methods adapted by the A.O.A.C.(1975). Both the forage and the concentrates were

offered ad libitum. The daily dry matter intake was recorded. Fortnightly weights of the calves were also recorded. After weaning, the calves were removed from the individual pens to larger pens accommodating the four calves of the same treatment. The calves were vaccinated against anthrax, haemorrhagic septicaemia, and rinderpest. They were sprayed with an acaricide every two weeks. The data statistically analysed by analysis of variance according to steel and Torrie (1960).

RESULTS AND DISCUSSION

The performance of the calves weaned at 6, 8, 10 and 12 weeks of age during the post-weaning period from 12 to 26 weeks of age is shown in Table 2. No significant difference was observed between the daily total dry matter intake by the calves in the four groups. However, there was a significant ($P < 0.05$) difference in the dry matter intake of the concentrate supplement. Calves weaned at 12 weeks of age had a higher ($P < 0.01$) supplement intake than those weaned at 6, 8 and 10 weeks of age, but not significantly different from the other two groups. The forage sorghum intake by all groups was not significantly different but there was a tendency for the early weaned calves (6 and 8 weeks) to consume more forage

Table 2. The Effect of weaning age on the Performance of cross - bred calves reared to 26 weeks of age on agro - industrial concentrate supplements and forage sorghum.

	weaning age (weeks)				S.E.	Level of significance
	6	8	10	12		
Total Dry matter Intake (kg/day)	2.23	2.26	2.27	2.27	0.009	N.S
Supplement Intake (kgDM/day)	0.97	1.02	1.04	1.05	0.004	*
Forage Sorghum Intake (kg DM/day)	1.24	1.24	1.23	1.22	0.002	N.S.
Liveweight gain (kg/day)	0.58	0.56	0.57	0.52	0.006	***
Feed Conversion Ratio (kg DM Intake/kg gain)	3.83	4.07	3.95	4.39	0.001	***

S.E. Standard error of means

N.S. Not significant.

* Significant at $P < 0.05$

*** Significant at $P < 0.001$

then the late weaned calves. Calves weaned at 6, 8 and 10 weeks of age had a significantly ($P < 0.001$) higher growth rate than those weaned at 12 weeks. The highest liveweight gain during the 14 - week period of study was shown by the group of calves weaned at 6 Weeks of age. Feed conversion ratio (kg DM intake/kg gain) followed a similar trend as the liveweight gain. Calves weaned earlier (6 weeks) were significantly ($P < 0.001$) more efficient in converting the feed to body gain than the late weaned calves. The high forage intake by the early weaned calves could be explained by the fact that these calves developed the capacity to handle bulky feeds earlier than the late weaned ones. This is attributed to an earlier rumen development (Hamula and Motilal, 1965). The higher liveweight gain and feed conversion ratio shown by the early weaned calves in this study is in agreement with that reported by Perival (1951) who found that early weaned calves made a good recovery at 12 weeks of age with a subsequently better growth rates than late weaned calves. The poor growth rates by the late weaned calves may be due to the high quantities of milk consumed thus resulting in a limited rumen development (Economides and Georgiades, 1983). The results of this

study suggest that a six - week weaning system for calves based on starters and followed by supplements of agro-industrial by products could be adopted. This will reduce the amounts of milk offered to calves and will successfully prepare the calves for a better utilization of feeds and a high production in the post - weaning period. The economics of this system needs further detailed studies.

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