

A COMPARISON OF NORMAL, INDUCED AND CAESARIAN-DERIVED CALVES

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Glucocorticoids are used routinely by many dairy farmers to induce premature parturition in late-calving cows. When long-acting agents such as Opticortenol (Ciba-Geigy) are used, induced calves have been reported to have significantly lower serum immunoglobulin concentrations than normal full term calves (Bailey et al. 1973; Husband et al. 1973). The mechanisms for this are poorly understood. We have examined the effect of prematurity alone, as well as Opticortenol-induced prematurity, on the ability of calves to absorb colostral immunoglobulins.

Calves were removed from their dams soon after birth and before they had sucked. Twenty-three normal term calves were available. Twenty-six cows were treated with two 25 mg doses of Opticortenol given five days apart, and 22 induced calves were obtained with a mean prematurity of 19.4 days. Caesarian operations were performed on 18 cows, with 11 calves of mean prematurity 19.1 days surviving beyond 48 hours. Blood samples were taken by jugular venipuncture at 0,6,12,24 and 48 hours and then on days 3,5,7,10 and 14. The calves were fed one litre of a mixed colostrum pool at about one hour after birth, and then at 6, 12 and 24 hours. From then on they were fed whole milk twice daily. Serum concentrations of immunoglobulins were determined using the Zinc Sulphate Turbidity test with standards made of purified bovine gammaglobulin (Miles Laboratories) in foetal calf serum (Table 1).

TABLE 1 Mean serum immunoglobulin concentrations (mg/ml)

Age of calves	Normal calves	Induced calves	Caesarian calves
0 hours	2.4 a*	2.1 a	0 b
6 hours	14.5 a	9.8 b	0 c
12 hours	23.3 a	17.5 b	4.4 c
24 hours	28.8 a	23.2 b	15.0 c
48 hours	32.4 a	24.6 b	18.0 c
3 days	32.4 a	28.7 a	20.5 b
5 days	34.8 a	31.0 a	23.2 b
7 days	34.1 a	34.0 a	22.3 b
10 days	33.6 a	32.5 a	23.8 b
14 days	30.7 a	30.2 a	26.0 a

*Values in rows with different notations are significantly different ($P < 0.05$)

Induced calves had normal immunoglobulin levels by three days, whereas caesarian calves took 14 days to reach normal levels (Table 1). Thus, prematurity alone may be responsible for the slower and less efficient uptake of colostral immunoglobulins. The induced calves, of a similar prematurity, had significantly greater concentrations of immunoglobulins than the caesarian calves for nearly 14 days, suggesting that Opticortenol may enhance immunoglobulin absorption in premature calves.

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