

Efficacy of feeding First Day Formula® CR versus maternal colostrum on calf serum immunological parameters

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Introduction

Commercially available colostrum replacers (CR) are commonly used for convenience when maternal colostrum (MC) is unavailable, of questionable quality or in disease control programs. The objective was to determine the efficacy of a colostrum-derived CR, First Day Formula® CR (Accelerated Genetics, Baraboo, WI), vs raw MC on immunological parameters.

Materials and Methods

A total of 1,220 female and male Jersey and crossbred calves born in a California Central Valley dairy were systematically assigned to either CR or MC based on birth order. Calves assigned to CR were tube fed the CR product, reconstituted with 1.9 liters of water and calves assigned to MC were tube fed 2.8 liters of MC at 1 h ± 5 min after the calf was born. Every sixth calf born between 1:00 to 7:00 and 9:00 to 15:00 h that was enrolled was weighed and bled before first feeding, and all calves born during those time intervals were bled at 22 to 28 h after birth. Immunoglobulin G (IgG) concentration was determined in serum samples using a radial immunodiffusion kit (Triple J Farms, Bellingham, WA). IgG was also measured in MC fed to every sixth calf born during

the previously mentioned time intervals. The CR provided ~150 g IgG/dose and MC contained an average of 63.6 mg/mL of IgG. Outcome variables included serum IgG at 22 to 28 h after birth (n=592), failure of passive transfer (FPT) defined as serum IgG <10 mg/ml (n=592), and apparent efficiency of absorption (AEA) (n=96), calculated as grams of IgG absorbed into blood circulation.

Results

Only one calf in each treatment group (CR and MC) experienced FPT. The mean serum concentration of IgG was 19.8 mg/mL for calves fed CR and 23.4 for MC (P<0.05). However, AEA of IgG did not differ between treatments, and was 34.4% for CR and 35.9% for MC (P=0.52). Therefore, the slightly higher mean blood concentration of IgG for calves fed MC was due mainly to a higher IgG intake. Overall, IgG absorption and serum concentration of calves were within acceptable ranges when fed either CR or MC.

Significance

In this study the parameters measured indicated that the CR was comparable to MC in eliciting passive transfer.