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Benefits of Bovine Colostrum on Fecal Quality in Recently Weaned Puppies[1]

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EXPANDED ABSTRACT

KEY WORDS: • bovine colostrum • dogs • feces • diarrhea

Diarrhea is a common problem in recently weaned puppies. Changes in diet and separation from the dam occur at a time when the immune system is not fully competent, and passive immunity is waning. This combination of events increases the susceptibility of the puppy to a variety of infections and gastrointestinal disturbances.

Viruses such as canine parvovirus, coronavirus, and rotavirus are the most common infectious agents associated with acute diarrhea in puppies around the time of weaning (1–4). Bacterial pathogens, such as enteropathogenic *Escherichia coli* and enterotoxigenic *E. coli*, are also associated with enteric disease in young dogs (5).

Colostrum, the secretion produced by the mammary gland for the first few days after parturition, provides the neonate with both nourishment and passive protection from disease. The nutrients and growth factors in colostrum also have local effects on the gut epithelium, helping to ensure proper gut development, nutritional uptake, and growth in the neonate (6).

Bovine colostrum is rich in bioactive compounds and peptide-based nutrients, including growth factors, immunoglobulins, and other immune factors that can neutralize viruses, and inhibit the colonization of the gut and production of biological toxins by harmful microorganisms (7–10). Moreover, substantial amounts of orally ingested bovine colostrum concentrate survive their passage through the stomach to remain intact and active in the lower parts of the bowel (11).

A number of studies showed bovine colostrum powder is beneficial in the prevention and treatment of gastroenteritis in young mice (12), piglets (13), human infants (14–16), and HIV-infected adult patients (17), however, little is known of the potential benefits of bovine colostrum in companion animals.

Therefore the aim of this trial was to evaluate the effect of a bovine colostrum protein concentrate on fecal quality in puppies during a period of environmental change.

MATERIALS AND METHODS

A randomized placebo-controlled trial was carried out in Japan with 70 puppies of predominantly toy breeds (aged 40–50-d old) to determine the impact of an oral bovine colostrum supplement on fecal quality over a 10-d period. Standard puppy food, to which was added either 0.5 g of bovine colostrum powder (Intact®, Numico Research Australia Pty Ltd, Oakden, South Australia) daily ($n = 37$), or 0.5 g of skim milk powder daily ($n = 33$) was fed, for 10 d, starting on the second day after their arrival at one of two pet shops. Individual puppies were assigned to treatment A or B as they arrived. This ensured that puppies arriving from one breeder were in equal numbers in each treatment group. The dogs were fed individually. Individual fecal scores were recorded daily using the WALTHAM fecal scoring system (18). The mean daily fecal score was calculated for each group. Data were analyzed via ANOVA with an interaction between treatment and time using the statistical packages S-PLUS (6.1) and GENSTAT (&.1). $P < 0.05$ was considered to be significant.

RESULTS AND DISCUSSION

Fecal quality tended to improve in both groups during the course of the trial but the colostrum-supplemented group showed a greater improvement in fecal quality. The puppies fed the bovine colostrum supplement had significantly lower average fecal scores ($P < 0.05$) for d 6–9 compared with the placebo group. The differences between the groups remained statistically significant until d 9 of the trial (**Fig. 1**).

The results of this trial indicate that oral supplementation with bovine colostrum can improve fecal quality in puppies subject to the stresses of changing both diet and environment. Bovine colostrum supplementation may be an aid in reducing the rates of recurrent gastroenteritis and improving the vitality of puppies in early life.

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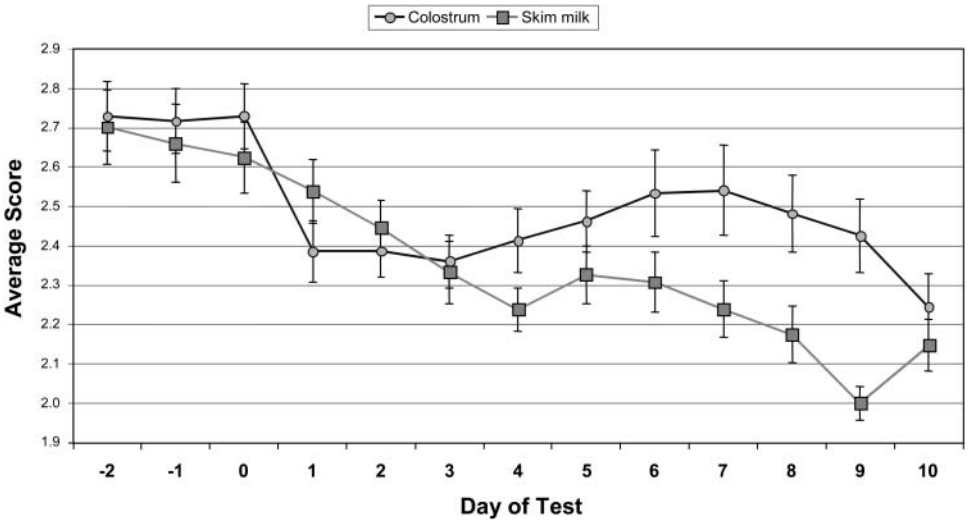

FIGURE 1 The effect of daily oral supplementation with 0.5 g bovine colostrum powder ($n = 37$) or 0.5 g skim milk powder ($n = 33$) for 10 d on the fecal score of recently weaned puppies from the second day of arrival at a pet shop in Japan. Values are mean fecal scores with least significant differences ($P < 0.05$) indicated by vertical bars. Data were analyzed via ANOVA with a significant interaction between treatment and time ($P = 0.033$)

A second study was conducted to determine the impact of the pet shop environment on the feces quality of puppies in the absence of nutritional supplementation. An average fecal score of 3.10 ± 0.29 (mean ± SD) was recorded for a group of 89 puppies over a 21-d measurement period. No significant trend for mean feces score or variability was observed over time. These observations suggest that the addition of skim milk powder to the diet of the placebo group in the first study may have had a beneficial effect on fecal scores. An additional trial is required to confirm the effect of skim milk powder on fecal quality, by comparison with an untreated group.

It would also be useful to investigate whether the beneficial effect of bovine colostrum on fecal quality in recently weaned puppies persists beyond the 10-d time period monitored in this study. Further investigation is also required to identify which components of bovine colostrum are efficacious in improving fecal quality, and explore their mechanisms of action in the gastrointestinal tract of young dogs.

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