NUTRITION NOTES
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BENEFITS OF BOVINE PLASMA IN CALF MILK REPLACERS

The purpose of this article is to reinforce the safety of the use of spray-dried bovine plasma in Kent milk replacers. The recent incidence of Porcine Epidemic Diarrhea (PED) led to some concerns that the use of porcine blood or plasma products in swine feeds might be contributing to the incidence of PED. Past and current tests indicate that spray dried porcine blood products do not play a role in spreading PED. In case the swine concerns may have spilled over into the calf area the following info will be helpful in dispelling those concerns.

Spray-dried bovine plasma is collected and processed under NASDBPP (North American Spray Dried Blood and Plasma Producers) manufacturing standards to ensure that it is collected in a hygienic manner and processed in a way to prevent contamination. These standards include:

- Blood is only collected from healthy animals fit for slaughter for human consumption in federally inspected slaughter facilities.
- During collection the blood is immediately pumped through a closed system to a processing room isolated from the slaughter area.
- The blood is then transported in dedicated tankers to a remote spray drying facility for processing. Bovine plasma is a concentrated source of protein obtained by removing the red and white blood cells from fresh whole blood from cows.
- After spray drying the finished bovine plasma product is then stored in new packaging material.

The use of bovine plasma protein has been exempt from the government ban on use of ruminant products associated with the BSE concerns. Bovine plasma products carry little or no risk to cattle due the processing methods described above (at slaughter the blood does not come in contact with the brains or spinal tissue of the animal-thought to be the source of BSE transmissions).

The bovine plasma used in Kent milk replacers is a soluble powder that has been properly processed to retain the biological functions of plasma. The proteins (e.g., tansferrin, loctoferrin, immunoglobulins and others) in plasma have been shown to inhibit bacterial growth, reduce the severity of diarrhea and improve overall animal performance.

Spray dried bovine plasma has been used in calf milk replacers for years without any evidence of harmful effects or transfer of disease. The benefits of bovine plasma in calf milk replacers can be observed in stressed (calves facing a greater pathogen load) and non-stressed calves. Benefits include increased gains, fewer scour days, better fecal scores, less dehydration, and reduced mortality.

Although the specific interactions of bovine plasma protein in calves are uncertain there are two apparent benefits.

- **First**, some the immunoglobulin G (IgG) in the plasma escapes gastric and intestinal degradation and remains in the digestive tract to ***help fight bugs such as salmonella, corona virus, and E. coli.***
- **Second**, use of plasma protein in pig prestarter diets has indicated the plasma ***promotes intestinal growth resulting in improved digestion and overall animal growth*** (animal plasma protein has been used in baby pig diets for years to improve performance).

continued

Tests with calves indicate bovine plasma protein is well utilized by the calf (similar to all milk protein). In addition to being an excellent quality protein that is highly digestible with excellent amino acid profile, bovine plasma also provides immunoglobulin and other beneficial (functional) factors.

Some typical research findings follow:

Morrill et al (1995) reported calves receiving bovine plasma in a 20/20 all milk protein milk replacer:

- Gained 4.2 lb more and ate 5 lb more starter by 6 weeks age
- Fecal scores did not differ.
- Mortality was similar

A 2002 study (Quigley et al, 2002) with barn sale calves that had not received an adequate colostrial feeding.

- Gained 4.9 lb more by 56 days on bovine plasma.
- No mortality in plasma fed calves versus 3.3% mortality in calves not getting bovine plasma.
- A 25% reduction in number of day calves had diarrhea.

Quigley et al (2003) reported barn sale calves (majority had not received adequate colostrum) a 20/20 milk replacer containing bovine plasma protein had:

- 3.0 lb more body weight gains by 42 days than calves not getting plasma.
- 7.5% mortality in plasma fed calves versus 25% mortality on calves not receiving plasma.
- A 30% reduction in number of day calves had diarrhea.

Seven studies involving 720 calves reported 4.6% less mortality in calves receiving bovine plasma in their milk replacer versus 11.1% mortality in calves not receiving bovine plasma.

In an E. coli challenge trial (Quigley et al, 2000) calves receiving bovine plasma in their milk replacer experienced 0% mortality while calves not receiving bovine plasma experienced 25% mortality.

Kent's Precision Formula Premium, Velocity Formula, and Milk Formula 1 Winterizer calf milk replacers contain bovine plasma. When fed as directed these premium milk replacers mix well and offer excellent nutritional and performance benefits.

References:

Morrill et al. 1995. Journal of Dairy Science. 78:902-907

Quigley et al. 2003. Journal of Daily Science. 86:586-592

Quigley et al. 2000. Food and Agricultural Immunology. 12:311-318.

Quigley et al. 2002. Journal of Dairy Science. 85:413-421