



# Merrick's **TECH BULLETIN**

## Milk Replacer Additives

*The following additives can be included in milk replacer during manufacturing*

**BIG CALF** – Big Calf Technology utilizes natural immunoglobulin proteins to minimize unnecessary intestinal inflammation in baby calves. Most immunoglobulin products target specific challenges such as salmonella, clostridia, and *E. coli*, and are effective only if the pathogen is present. BIG CALF patented technology supports gut health by targeting a specific inflammatory enzyme in the digestive tract. This unique approach reduces inflammation in the gut, allowing for better utilization of nutrients and energy consumed – and does not require the presence of a specific pathogen to be effective. BIG CALF can be used in combination with medications and/or other additives. No withdrawal period. Available only at Merrick's Inc.

**BIO-MOS** - Mannan oligosaccharides (MOS) contain cell wall fragments of the yeast, *Saccharomyces cerevisiae*. These cell wall fragments provide antigenic binding sites that can bind pathogens such as *E. coli* and *Salmonella*. Since MOS is not digested by the animal, the attached pathogen likely passes from the small intestine without doing any further harm. MOS may also enhance health by stimulating antibody production.

**Celmanax** – a combination of yeast culture and yeast extract. In addition to Mannan oligosaccharides (MOS) from yeast extract, Celmanax also provides yeast culture.

**APEX** - a blend of specific plant extracts formulated to encourage feed intake and improve performance in calves. The botanical ingredients in Apex enhance digestion by stimulating appetite and gastric secretion. Specific ingredients provide antimicrobial action against pathogenic bacteria and fungi, optimizing gut flora balance. Apex also has antioxidant activity which can help improve cellular function and reduce the negative physiological effects of stress conditions.

**E-guard** – provides a blend of specific plant extracts and direct-fed microbials. Allicin (garlic extract) is a non-antibiotic sulfur-containing plant ingredient proven to inhibit the growth of pathogenic bacteria, viruses and protozoa (such as cryptosporidia). FOS (fructooligosaccharides) are special sugars, indigestible by the calf, that provide a nutrient source for beneficial bacteria in the large intestine. Direct-fed microbials provide a source of live, beneficial organisms and are the third component in this trio of ingredients designed to optimize gut flora balance.

**Inulin/FOS (fructooligosaccharides)** – are complex sugars that nourish beneficial bacteria in the gut, such as *Bifidobacteria*, allowing them to out-compete potential detrimental organisms. Health benefits ascribed to *Bifidobacteria* include the following: inhibiting the growth of harmful bacteria, stimulating of components of the immune system and aiding the absorption of certain ions and the synthesis of B vitamins. Inulin/FOS is not digested by the calf and is poorly utilized by major intestinal pathogens.

**Lactobacillus** – Lactobacillus are beneficial organisms that rapidly colonize the young calf's digestive tract and become the predominant microorganisms in the young calf's small intestine. Lactic acid lowers the intestinal pH to create an environment unsuitable for harmful organisms. Lactic acid bacteria secrete hydrogen peroxide and bacteriocins that restrict bacterial growth and compete with pathogens for nutrients and colonization sites. Lactobacilli are especially effective competitors with *E. coli*.

**Chelated Minerals** - Mineral chelates are organic trace minerals that enhance mineral absorption and improve bioavailability. Research with organic trace minerals shows improvements in production characteristics such as feed efficiency, growth, breeding, body composition and hoof integrity. Calf research shows better retention of minerals during stress and improved response to vaccines when organic trace minerals are fed. Organic forms of zinc, copper and manganese are provided. Organic selenium is already included in all of our milk replacer products.

**Vitamin E** – an antioxidant that helps protect cells and improve both cellular and humoral immune responses. Vitamin E supplementation of calves has been shown to increase dry matter intake and growth rate. Calves fed 125 or 250 IU/d of vitamin E gained significantly more body weight compared to non-supplemented calves. The optimum inclusion level in milk replacers is 150 IU/lb.

**Vitamin C** (ascorbic acid) – cannot be synthesized by calves until they are about 3 weeks old, and is therefore considered an essential nutrient for calves less than three weeks of age. Ascorbic acid is an antioxidant and is found in high concentrations in steroid secreting cells. The concentration of ascorbic acid in plasma is lower in stressed calves than non-stressed calves. Oral supplementation of ascorbic acid elevates the ascorbic acid level in plasma of preruminant calves.

**Acidification** - Organic acids can be added to milk replacers. Lowering the pH of milk replacers helps them stay fresher longer when reconstituted. A lower pH in the upper digestive tract may enhance the growth of beneficial bacteria and suppress the growth of pathogenic bacteria.

**Gel** – A gelling agent is available for inclusion in milk replacer. When reconstituted with water the milk replacer will have a somewhat thicker consistency than regular milk replacer.

*The following additives can be added to reconstituted milk replacer on the farm*

**Super Guard & Super Guard Plus** – Type B Medicated Feeds containing a 1:1 combination of Oxytetracycline and Neomycin sulfate that can be added to non-medicated milk replacer for treatment of scours and pneumonia.

**Plas/Magic** – combines the power of E-guard (described on the previous page) with the unique combination of proteins in plasma. Animal plasma contains active albumin and globulin proteins such as IgG and IgM. In the digestive tract, immunoglobulins have a direct effect against pathogens and may also have a direct beneficial effect by improving villi growth. Plas/Magic also provides an additional source of vitamins and minerals to help support the calf during stress and optimize intestinal health.

**Brelactis** – Merrick's new generation of microbials provides a unique, patented blend of lactic acid bacteria found only in this new product. The six strains of bacteria in BRELACTIS are normal inhabitants of the small intestine of young calves. These six bacterial strains were originally isolated from the calf's digestive tract and were selected because of their superior performance. Other microbial products use bacteria derived from yogurt and cheese manufacturing. These off-the-shelf microbial collections are not specific to the unique conditions in the young calf's digestive tract. BRELACTIS, on the other hand, targets this dynamic, changing environment

**Super Calf-Kit** – increases the caloric density in milk replacer or whole milk. Newborn calves have limited body fat as energy reserves, a sparse hair coat and a high energy need relative to their body weight. Stress and cold weather significantly increase their need for energy. A calf's survival in cold weather depends on its ability to generate and maintain a constant core body temperature. To maintain normal body temperature in cold weather, calves need a high energy feed -- calves need Super Calf-Kit.

**MERRICK'S, INC.**

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