

Calf Notes.com

Calf Note #53 – Milk replacer ingredients and labels

Introduction. Milk replacers are expensive feeds that are fed to young animals prior to weaning. Many dairy calves are fed milk replacers prior to weaning to reduce costs to the dairy producer and make whole milk available for sale. According to the USDA National Dairy Heifer Evaluation Project (NDHEP) conducted in the United States in 1991-1992, most producers (>60%) fed milk replacer for at least some of the preweaning period. The nutritional quality of protein and energy are of paramount importance to the performance of a milk replacer. This is especially true for calves less than 3 wk of age, when digestive function is less well developed than older calves (1).

Common ingredients in commercial milk replacers include whey, whey protein concentrate, animal and vegetable fat, vitamins, minerals, and amino acids. Alternative proteins, including soy, wheat, and potato proteins may be utilized sometimes. More recently, high quality animal proteins include red blood cell protein and plasma proteins have been used in some formulations.

A common practice by some manufacturers is to include ingredients on their label that are included at very low levels for the purpose of implying a high quality product. This is called "tag dressing". For example, many milk replacer manufacturers include "skim milk protein" and "butter milk" among ingredients in their products. Usually, these ingredients are included at < 1% of the formula, but can be included in the list of ingredients. Additionally, in most states, the list of ingredients do not have to be in order of precedence (ingredients in the largest percentage listed first), but can be in any order. Therefore, the ingredients "skim milk" might be prominently displayed on the label, although it comprises less than 1% of the formulation.

An article in the Journal of Dairy Science (2) gave an indication of the proportion of milk replacers that actually contain significant skim milk, whole milk, or butter milk. All of these milk ingredients contain significant amounts of casein and will form a clot in the presence of rennet. The procedure of determining "rennet coagulation" was used many years ago as an indication of milk replacer quality. However, because of today's improved manufacturing methods, most high quality milk replacers contain little casein, and therefore will not clot in the presence of rennet. However, the researchers performed rennet coagulation tests on milk replacers as part of the NDHEP to evaluate ingredient formulation in commercial milk replacers. The results (Figure; reference #2) indicate that the overwhelming majority (83 to 90%) of the milk replacers formed no clot in the presence of rennet. This indicates that these milk replacers do not contain significant skim milk, butter milk, or other casein-containing products. Another 6 to 10% formed a soft clot in the presence of rennet, which indicates that about 5% of the total protein in the milk replacer was derived from casein. On the average, 3.5% of the milk replacers tested formed a firm clot. Interestingly, there was regional variation in these data - more milk replacers from the Western U.S. formed firm clots compared to the Northeast U.S. Another interesting observation in this study was the variation due to time. That is, 82% of milk replacer samples in the first quarter did not clot in the presence of rennet; by the fourth quarter, this had increased to 97%. Clearly, many milk replacer manufacturers vary their formulations to take advantage of ingredient markets.

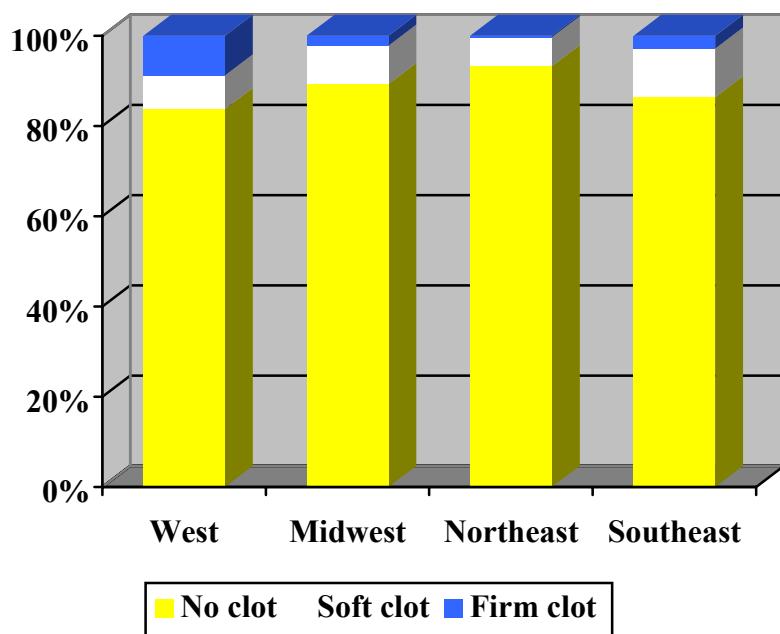
Skim milk and butter milk are not usually included in milk replacer formulations due to their cost. These proteins are typically used for human consumption, and are too expensive for most commercial milk replacers.

The primary protein source of most milk replacers is whey, which is well digested and utilized by calves. Alternative proteins, including animal (red blood cell, plasma, fish) and vegetable (soy, wheat, potato) proteins contribute a smaller proportion of the total protein in some milk replacers.

Use of "tag dressing" for milk replacer labels (and other manufactured feeds as well) as a method of promoting the "quality" of milk replacers is deceptive and unacceptable. As a practice, it should stop. Ingredients should be included in formulations that contribute to the overall nutrition of the product - not to give the impression of quality. If an ingredient is included only to be displayed on the tag, then the manufacturer has engaged in deceptive advertising.

References

1. Silva, A. G., J. T. Huber, and R. M. DeGregorio. 1986. Influence of substituting two types of soybean protein for milk protein on gain and utilization of milk replacers in calves. *J. Dairy Sci.* 69:172.
2. Heinrichs, A. J., S. J. Wells, and W. C. Losinger. 1995. A study on the use of milk replacers for dairy calves in the United States. *J. Dairy Sci.* 78:2831-2837.



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