



Choose Milk Replacer Carefully

Check the label for protein sources and fat content.

by **TROY SMITH**, *field editor*

They still exist, but nurse cows aren't as common as they once were. There was a time when many stock farms and ranches kept at least one gentle, good-milking cow that was none too particular about whose calf she suckled. Often of dairy breed extraction, a really good nurse cow might feed an assortment of milk-pen calves — orphans or calves split from sets of twins.

The decline in the use of nurse cows, of course, is owed to the convenience and affordability of commercial milk replacers. Most cattle folk find it much easier and cheaper to buy a bag of powdered product, which can be mixed with water and fed to calves by bottle or bucket. Mixed and fed properly, milk replacers can be an excellent source of nutrition for suckling calves. Many different brands are available. Like nurse cows, however, milk replacer products are not all alike.

To illustrate that point, let's consider a story shared by a producer unaware that milk replacer ingredients could make a big difference in product quality. The setting is a fairly large commercial operation, where calving season often produced a handful of calves that were bottle-fed with milk replacer. Then, for two consecutive years, all bottle calves became sick. Symptoms, including bloating and diarrhea, suggested infectious scours. Treatments were ineffective and most of the calves died.

Neither fecal sample testing nor

necropsies of dead calves pointed to any particular disease agents. However, after looking more closely at the milk replacer, an investigating veterinarian suggested that the problem was nutritional. While its label indicated adequate levels of essential nutrients, the milk replacer fed to the calves, during both years, had been formulated with plant-based protein sources. Sickness in calves, in this case, was resolved when the producer switched to a milk replacer formulated with animal-based protein sources.

Type of protein matters

The events related above probably provoke knowing nods among people having ample experience in the growing of dairy calves. Our story comes as no surprise to Ellen Jordan. The Texas A&M professor and Extension dairy specialist readily recommends milk replacers containing protein derived from animal sources, particularly when feeding very young calves.

"Calves under three weeks of age secrete lower levels of pancreatic enzymes, compared to older animals. These enzymes are important to digestion and especially for digestion of non-milk proteins," says Jordan. "Generally, there are fewer digestive problems when calves are fed a high-quality milk replacer containing protein from animal sources."

There was a time when nearly all milk replacers were formulated with

protein from animal sources — mainly milk. Today, commercial milk replacers commonly contain whey and whey protein concentrate, which are derived from milk. Some products may contain casein or even skim milk. Other high-quality animal

protein, derived from blood cells and plasma, are sometimes included in milk replacer.

However, as prices of protein from animal sources have increased, manufacturers have sought alternatives.

Does it have soy?

Brookville, Ohio,-based veterinarian and researcher James Quigley has written numerous short articles related to calf milk replacers, which are available at www.calfnotes.com. Quigley writes that because of newer technologies for reducing anti-nutritional factors associated with soy products, he believes soy proteins can be included in carefully formulated milk replacers in combination with animal proteins derived from milk. This does not change the fact that digestion of non-milk proteins is difficult for calves under 3 weeks of age.

To determine if a particular brand of milk replacer contains soy protein, Quigley tells producers to look at the product label.

"The feed tag will have a list of ingredients, which will include a listing of the soybean protein. If the tag includes terms like 'plant protein products,' then you may have soybean protein — or any of a number of other plant proteins, like cottonseed meal, wheat flour, brewer's yeast and others," says Quigley.

He notes that a tag listing for a crude fiber also may be an indication that the product includes plant protein. Soy may or may not be the source.

"Using crude fiber does not necessarily indicate the use of soy proteins. For example, soy isolate (or isolated soy protein) contains no measurable fiber," explains Quigley. "However, if your milk replacer contains greater than 0.2% (crude fiber), it will generally indicate the inclusion of some plant (fiber-containing) protein."

If crude fiber content of a particular milk replacer is greater than 0.5%, high levels of plant proteins are included.

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Using proteins from plant sources, including soy, wheat and potato, have helped control milk-replacer costs. Producers should be wary, though, of milk replacer formulations that rely heavily on plant proteins. In particular, protein sources derived from soy can pose problems.

Generally, soy products are considered to be good sources of protein, but digestibility can be variable. According to Jordan, soybeans contain anti-nutritional factors that may contribute to diarrhea, allergic reactions and generally poor performance in very young calves. These anti-nutritional factors include substances that inhibit a digestive enzyme, trypsin, which is involved in protein digestion. While milk replacer manufacturers have implemented “treatments” to mitigate soy’s anti-nutritional factors, Jordan says results have been varied.

An additional concern is soy’s deficiency, compared to milk protein, in the amino acid methionine. To provide a balanced amino-acid profile needed by young calves, a milk replacer formulated with soy proteins must also include added methionine.

Choosing a good one

Asked how to choose a suitable milk replacer, Jordan advises producers to look at the product’s label to evaluate both fat and protein content, but also to determine whether the protein was derived from animal or vegetable sources.

“The fat content of different milk replacers [varies]. Products with 10%, 15% or 20% fat probably are most common,” explains Jordan. “A higher level of fat means the milk replacer delivers more energy. That can be important in the winter, when it’s cold. While it’s not proven, some evidence suggests higher levels of fat also may help reduce the incidence of scours.”

Products with 20% protein content are common. However, Jordan says, milk replacers containing 26%, 28% and even 30% protein have been introduced in recent years. Accelerated calf growth rates have been associated with use of products offering higher levels of protein.

“I advise producers to choose a milk replacer that is 15% to 20% fat. If it’s cold, 20% is better. The product should be at least 20% protein, and I’d encourage the use of a product containing all animal-based protein sources,” offers Jordan. “Use a product from a reputable manufacturer whose product is backed by research — a manufacturer that has research data and can show it to you.”

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