



Understanding calf milk replacers

Modern milk replacers can be used to successfully rear healthy calves. Before deciding to use a milk replacer you should weigh up the advantages and disadvantages for your calf rearing system. Ease of handling with automated calf feeding systems, high milk prices and minimal waste milk are reasons why they are favoured on some farms. Only high quality reputable products should be used otherwise health problems and poor growth rates may result.

Advantages

- Consistency of product (when mixed correctly) – less risk of digestive upsets and scours
- Can be stored and handled more easily than liquid foods
- Easily fortified with additional vitamin, minerals and medicines if necessary
- A potential cost benefit over saleable whole milk
- Less risk of disease transfer from cow to calf
- Well suited to automated calf feeding systems

Disadvantages

- Cost compared to feeding unsaleable/waste milk
- Labour required to mix
- Need space and facilities for dry storage
- Risk of spoilage by rodents

Composition of milk replacers

Clot-forming or non clot-forming

Traditional milk replacers are made from downgraded skim milk powders, and are digested like whole milk, forming a clot in the abomasum. Early products varied in quality - mostly due to the processing of casein - and sometimes caused scouring. The majority of milk replacers sold in Australia still contain significant percentages of skim milk powder.

Whey proteins are digested in the small intestine and do not form a clot in the abomasum. The increasing value of casein and improvements in filtration and purification methods have seen whey based milk replacers that can produce average daily weight gains and performance comparable to casein based products.

Modern whey based milk replacers lead the market in the US and Europe and are gaining share in New Zealand.

Protein

A newborn calf is better able to digest milk protein than plant protein sources. Milk proteins are the best sources for growth and development of calves and should provide most of the protein in a milk replacer. With increasing age, calves develop better capacity to digest other proteins and so milk proteins become less important. Other protein sources have been used in milk replacers with varying success (see Figure 1).

Soy protein is the most commonly used alternative to milk protein in milk replacers. Processing of soy protein is required to make it more digestible and remove factors which may inhibit calf growth. Wheat based proteins may also support adequate calf growth rates and may mix better than soy proteins.

Optimum	Acceptable	Questionable/ not recommended
Skim milk powder	Chemically modified soy protein	Fish protein concentrate
Buttermilk powder	Soy concentrate	Soy flour
Dried whole whey	Soy isolates	Dried distiller's soluble
Delactosed whey		Dried brewer's yeast
Casein		Oat flour
Milk albumin		Wheat flour

Table 1: Suitable protein sources for a milk replacer

Crude protein levels in milk replacers commonly range from 18-25%. High levels of non-milk proteins are often used to compensate for low protein digestibility. The sources of protein should be listed in the product ingredients, but the actual percentage each contributes to the overall protein content may not be listed.

Fat

Fat can be derived from animal based products such as tallow, or cheaper sources such as palm or coconut oils, all of which are highly digestible and suitable if properly dispersed into the milk replacer. Levels between 10 and 20% are suitable for calf growth.

Additives

Vitamin, minerals and animal health medications are commonly added to milk replacers. Ionophores such as lasalocid and monensin help control coccidiosis, and may also have a growth promotant effect. The use of coccidiostats in calves less than 2-3 weeks is of questionable value, and lasalocid is potentially toxic when given to calves less than 24 hours old.

Mixing of milk replacers

Consistency is the key. Always read the label and mix according to the manufacturer's directions. Many automated calf feeders are designed to handle powdered milk, making it easier to transport food to the calf shed.



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