CalfCare leaflet series

AHI
Animal Health Ireland.ie

ANIMAL HEALTH IRELAND

Contributing to a profitable and sustainable farming and agri-food sector through improved animal health

Technical notes on calf milk replacers (CMR) for rearing dairy replacement heifer calves

CalfCare Leaflet Series, Vol 1, Ver 1, January 2016

CALF HEALTH PROGRAMME

CalfCare
Animal Health Ireland.ie

Animal Health Ireland, 4-5 The Archways, Carrick-on-Shannon, Co. Leitrim, N41 WN27

AHI gratefully acknowledges the financial and other contributions of our stakeholders.

CALF HEALTH PROGRAMME

Animal Health Ireland, 4-5 The Archways, Carrick-on-Shannon, Co. Leitrim, N41 WN27

Please refer to the disclaimer on the last page regarding information in this leaflet.

Advantages of feeding CMR

- Lower Cost (if compared to saleable milk, and depending on the milk price)
- Biosecurity (reduced risk of transmission of infection, e.g. Johne's disease, when compared to unpasteurised milk)
- Consistency of composition (when compared to transition milk mixed from cows in different stages after calving)

Disadvantages of feeding CMR

- Lower energy density than whole milk (due to lower fat content; this has to be taken into account when planning the feeding strategy)
- Lower digestibility (irrespective of ingredients used, CMR will always be inferior in digestibility to whole milk)
- Higher labour input

Declaration of ingredients:

- The only legal requirement for declaration in a CMR is that ingredients have to be listed in descending order of inclusion. It is therefore, almost impossible to accurately assess the quality of a CMR from the label.
- The user can only get a rough idea of the suitability of a given milk replacer for the purpose of rearing heifers from the oil, protein, fibre, and ash content.
- In general, higher quality ingredients are more expensive; good performance can therefore not be expected on an inexpensive CMR.

Protein sources:

- From a young age, CMR for rearing replacement heifers should preferably contain milk-derived proteins.
- Milk-derived proteins sources are skim milk powder (by-product of butter production) and whey powder (by-product of cheese production). The quality of whey protein sources varies depending on the manufacturing process used.
- The main protein sources for CMR used in young calves should be skim milk powder or whey protein concentrate.

- Some manufacturing processes lead to a high mineral content in the whey protein product (e.g. delactosed whey), which increases the risk of diarrhoea. The ash content should therefore not be higher than 8%.
- Vegetable proteins: Commonly used vegetable proteins are soy protein, wheat gluten, and pea protein.In general, digestibility, subsequent calf growth and feed efficiency are lower with vegetable proteins than with milk derived proteins. Digestibility is particularly reduced in the first 3-4 weeks of life, with improved utilisation in older calves. In addition, soy protein products may contain a variety of anti-nutritional factors that further decrease the digestibility in young calves. Advancements in processing of soy protein have improved the quality of soy-protein products in recent years, likely due to removal of some of these anti-nutritional factors. Pea proteins have the disadvantage of rapid sedimentation.
- Crude fibre content over 0.15% indicates inclusion of plant proteins, however, low crude fibre does not rule out inclusion of plant proteins (soy protein concentrate is low in fibre).

For further information on dairy heifer nutrition, see AHI leaflet: "Early Nutrition and Weaning of the Dairy Calf"

Oil and fat:

Fats used to replace butter fat are invariably vegetable fats such as coconut and palm oil and are not of nutritional concern. They have a similar digestibility to milk fat: approximately 96%.

Appearance:

Milk replacer powder should be easily dissolved, and not leave any sediment at the bottom of the feeder. Even though the colour and odour is not necessarily a guide as to its quality, CMR should not have any unpleasant, burnt or other off-odours.

Nutritional level and growth

There is growing evidence that high growth rates in early life (600 to 800 g/d; achieved by feeding 750g to 900g CMR per day) promotes better health in calves and increased productivity in their adult life.

To achieve lean tissue growth to that degree CMR must contain 23 – 26 % crude protein.

Young calves need additional energy to keep warm if the environmental temperature is below 15°C. (Rule of thumb: at 0°C calves need about 50 % more energy just for maintenance and keeping warm)

Practical considerations:

- Start feeding CMR once the calf has received adequate colostrum and transition milk (generally at 3 to 4 days of age).
- Reconstitute CMR at a concentration of 125 g/litre of mixed milk (this results in a milk replacer with the same dry matter content as whole milk). Add 125g of powder to 875 ml of water to give one litre of mixed milk at 12.5% milk solids. Use scales to measure the powder correctly and ensure consistency.
- Most milk replacers can be fed at a concentration of up to 150 g/litre (for example to adjust for cold weather) without causing problems.
- Reconstitute by adding the total amount of powder required to half the measured volume of water, mix thoroughly (use a mixer or whisk) and then add the balance of warm water (ideally 40 C; never greater than 45C) to make up the correct volume. Feed calves at body temperature (37-39C).
- Maintain a high standard of cleanliness throughout the preparation and feeding process, otherwise the advantage of superior biosecurity will be overcome by secondary contamination.
- Consider CMR as a feed, not a drink. Ad-lib clean water is essential from day 3 for proper rumen development and feed intake. Access to water is especially important when CMR is fed in higher concentrations.

Conclusion

The above information is only a very limited guide for a basic assessment of CMR, and is not meant to replace the advice of a nutritionist. In the absence of any other management, husbandry or health issues impacting calf development, calf performance is the best criterion for the evaluation of CMR.

For further information on dairy heifer nutrition, see AHI leaflet:
"Early Nutrition and Weaning of the Dairy Calf"

NOTES

TECHNICAL WORKING GROUP

Ingrid Lorenz - (Chair) University College Dublin, Charles Chavasse - Zoetis, Muireann Conneely - Teagasc, Bernadette Earley - Teagasc, John Fagan - DAFM, Richard Fallon, Liam Gannon- Volac, John Gilmore - Vet Practitioner, Ian Hogan - DAFM, Emer Kennedy - Teagasc, John Mee - Teagasc, Cindy Todd - Teagasc.

TECHNICAL WORKING GROUP RAPPORTEUR

Grainne Dwyer - Technical Group Rapporteur.

4-5 The Archways, Carrick-on-Shannon, Co Leitrim N41 WN27.
Phone 071 9671928
Email nmorgan@animalhealthireland.ie
Web www.animalhealthireland.ie