'Colostrum' the Cornerstone of Effective Calf Rearing

The importance of colostrum to newborn calves has been stressed for many years. However, recent work has shown that 40-70% of two-three day old calves in dairy situations do not receive ideal levels of protection from colostrum. The intestine of the calf, which absorbs the protective proteins in colostrum, is only able to achieve this in the first 24 hours after birth and absorption is greatly decreased after six hours from birth. Recommendations of feeding the calf colostrum at a rate of 10% of its body weight in the first 12-24 hours of life or 1.7 litres per feed for four feeds over the first 24-48 hours are designed to ensure that adequate levels of protection are acquired by the calf. If adequate colostrum is not received this is known as failure of passive transfer.

Failure of passive transfer can result from:

- Colostral production failure by the cow
  - Heifers have lower quality colostrum
  - Malnutrition in late pregnancy
  - Illness
  - Water deprivation
- Ingestion Failure by the calf
  - Poor mothering
  - Decreased suckling drive by the calf
  - Damaged teats
  - Bottle teats
- Absorption failure by the calf
  - Premature birth
  - Stress

If a failure of passive transfer is suspected calves should be stomach tubed with good quality colostrum (from older cows first milkings after calving, not induced) in the first 6-12 hours. There are inexpensive tests we can perform on colostrum to ensure it is of good quality. We can also inexpensively test calves in the first week of life to show whether they have received adequate colostrum. This may help in future management of calves.

Adequate colostrum, as well as protecting the calf from organisms that cause scouring and other illnesses, is also high in nutrient value. It contains greater levels of energy, protein, minerals and vitamins than milk. These are needed to 'kickstart' the calf's body functions. Studies have shown that calves that did not receive adequate colostrum in the first 24 hours of life were 9.5 times more likely to become sick and 5.4 times more likely to die before weaning than calves that received adequate colostrum. Even after the first 24 hours when gut absorption of protective proteins has stopped, colostrum remains locally in the intestines to help fight organisms which can cause scours. For this reason the feeding of colostrum to older milk fed calves still has both a protective and nutritional role.

Because of our seasonal situation and the ability of dairy cows to produce a large excess of colostrum, we have an excellent feed source for calves. It is important though that this colostrum is stored correctly to ensure it is not a source of infection for calves and the nutrient value is maintained to its highest level.

Recommendations on colostral fermentation storage include:

- Handle colostrum hygienically to prevent contamination by bacteria etc.
- Store colostrum in plastic lined containers or stainless steel vats (not metal containers).
- Do not use extremely bloody colostrum.
- Do not add milk from cows treated with antibiotics - these interfere with the fermentation process and should be fed separately.
- Stir colostrum daily to stop separation of solids - ideally before feeding to calves.
- Fresh colostrum can be added to stored colostrum with no change in nutritive value.
- Colostrum should be stored at cool temperatures (<25ºC) - if temperatures are greater than this preservative should be added.
- If preserving or chemical additives are used they should be added to fresh colostrum before it is added to the stored colostrum pool.
- Colostrum should be fed within a few weeks of collection as nutrient values continue to decline through out storage.

If colostrum is stored in this way at <20ºC, it allows natural fermentation to drop the pH down to 5-5.6 making it acidic after 3 weeks storage. This preserves colostrum for up to 12 weeks. Calf responses when fed stored colostrum are greater than those fed milk replacer and equal to those fed whole milk. Scour levels in calves fed stored colostrum have been reported to be lower or equal to that of calves fed whole milk. Because colostrum has a higher nutritive value than milk, lower levels of feeding may be required so either less can be fed or it can be diluted with warm water (not hot water). When colostrum milk starts to run out calves should be changed to whole milk slowly and not abruptly, so as to minimise checks to growth rates.

Colostrum is nature's ultimate feed source and is essential for newborn calves as well as being a valuable feed for older calves. **Are you using colostrum to its full potential?**