FIRST COLOSTRUM PRINCIPLES

Summary

- The first colostrum Known as 'Gold Colostrum' feed is critical to a calf.
- Calves are born with no anti bodies.
- Colostrum provides antibodies which fight infections.
- Antibodies from colostrum are absorbed directly into the bloodstream.
- Antibodies can only be absorbed in the first few hours from birth.
- A calf which does not get these antibodies is ten times more likely to get sick or die.
- Colostrum management = lifetime consequences.
- Colostrum quality differs between cows.
- Testing with a refractometer determines quality.
- Colostrum can be stored but cleanliness essential
- Vaccinating cows with Rotovec or Scourguard will provide additional antibodies to help protect calves from common neonatal diseases.

What is Gold Colostrum?

Gold colostrum is defined as the first milking of colostrum from a healthy cow, with a Brix reading over 22%. Healthy cows produce antibodies to viral and bacterial diseases such as BVD, IBR, Rotavirus, Coronavirus, Leptospirosis, Salmonella, E.Coli, Clostridia, and many more environmental bacteria. These antibodies are concentrated in the colostrum at the first milking after birth. The concentration of antibodies in the colostrum is reduced to half by the second milking

The first colostrum feed is critical to a calf, lamb and kid goat's short- and long-term health. This is due mostly to the fantastic infection fighting antibodies found in this first milk. The high nutritional content is also important to kick start energy and growth requirements. Unlike most other animals, calves, lambs and kids are born with no antibodies, which is risky business because antibodies are essential for protecting the animal from infections. The newborn is constantly bombarded with new bugs challenging the immune system.

Very cleverly, antibodies are concentrated in the colostrum so when the calf, lamb or kid suckles this liquid gold the calf can absorb the antibodies from its gut into the blood stream where they wait to attack pathogens and protect the newborn. BUT there is a catch, the animal can only absorb these crucial antibodies in the first few hours after birth. After this it is game over, the ship has sailed, opportunity gone. A calf which missed the antibody boat is ten times more likely to get sick or die, and also has reduced reproductive and productive success as an adult cow. Colostrum management = lifetime consequences.

Yes calves, lambs and kids do, after a few weeks, make their own antibodies but they are left exposed until then and the development of antibodies is often too slow for an effective response, meaning the animal succumbs to infection and disease. Whereas the colostral antibodies are ready to defend immediately.

How to achieve the best antibody absorption for the best health of your calves and future herd. (From here we will use calves as the main example, but the principles apply to Lambs and kid goats also.)

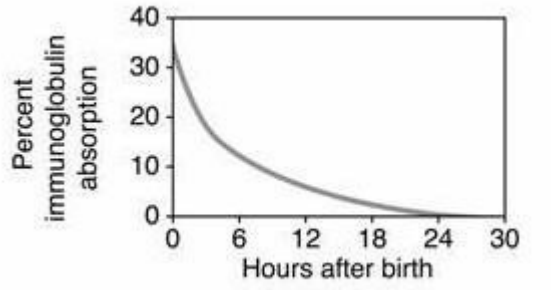
Colostrum management = the 3 Q's

- Quickly
- Quantity

- Quality

All of these three factors are important for successful colostral antibody transfer.

Quickly
Absorption of the antibodies declines rapidly after birth. Here is a scary graph representing how quickly absorption declines:



As you can see you have a very narrow window of opportunity where the calf can absorb these antibodies. The first hour = great! At 6 hours post birth = OK if the other Q's are on point. At 12 hours = the ship has mostly sailed and at 24 hours the doors are shut.

Quantity
Minimum 10% of the calf's bodyweight in the first 6 hours, within the first hour is best. For example, a 40 kg calf requires 4 litres for maximum benefit, often this is split into two 2 litre feeds a couple of hours apart. A lot right?! Looking at the graph, if you wait until after 12 hours, that calf will require around 15 litres of the same colostrum to supply the right amount of antibodies and this is clearly not practical or possible.

Another way of looking at it: the goal is to feed 100 to 150g of IgG as soon as possible after birth.

After this first critical feed, the calf will normally rest for hours. The next feed should be at around 12 hours and a minimum of 2 litres.

Quality
Quality refers mostly to the concentration of antibodies in the colostrum (over 50g/l IgG OR over 22% on the Brix test) and also contamination level. High quality colostrum is often referred to as 'gold' colostrum. These are the main factors affecting colostrum quality.

- Time from calving – antibody concentration reduces with every hour from calving, even if the cow has not been milked, her quality will be much lower 12 hours after calving than 2 hours after.
- Volume – a high producing cow will typically have a lower colostrum quality than a lower volume cow. This can be variable.
- Leaking udders – poor quality in cows which have leaked milk prior to calving, similarly with cows milked prior to calving.
- Cow health – a sick cow has poorer quality colostrum e.g. mastitis, .

- Storage – Refrigeration will maintain antibody levels and adequately limit bacterial growth for 3 days (or 7 days if pasteurised), beyond that freezing will adequately preserve colostrum quality for 12 months.
- Vaccination – vaccinated cows will have higher levels of the associated antibodies, this is the basis of scour vaccinations – vaccinate the cow then feed the antibodies to the calves.
- Contamination – bacterial load will negatively affect the ability of your calf to absorb these precious antibodies. Be scrupulous with hygiene, harvesting methods and storage of colostrum. Cool colostrum asap after harvesting to minimise bacterial growth
- Pasteurisation of colostrum will kill most bacteria. Care must be taken to not heat colostrum too high as this will denature the precious antibodies. 59-60 celcius for 60 minutes is recommended for maximum bacterial kill and minimum antibody damage.

However, there is a large amount of variation. Cows which fit the high-quality criteria from above may still have poor quality colostrum, and a large producer may well have top quality colostrum. Practically what does this mean? Always TEST the quality with a refractometer before feeding. Testing takes only a few seconds. Over 22% brix reading is considered good concentration of antibodies. Colostrum below this should be used for 2nd and 3rd day feeding.

Cleanliness is also a very important component of quality. The longer colostrum sits around and the less clean your equipment, the more bacterial growth and the larger the bacterial challenge for the calf. Careful storage will reduce bacterial load and still maintain antibody levels for a certain period of time. Many farms also need to consider potential transfer of diseases such as Johnes therefore it is recommended to avoid pooling this first colostrum. Always be clean with equipment. A higher pathogen load will occur with unclean feeders. Always wash your feeders adequately and have separate feeders for sick calves and new-borns.

If that isn't enough to consider, cold calves or ambient temperatures under 10 degrees Celsius result in a slower antibody absorption rate.

Putting extra effort into colostrum management is well worth it for the extra benefits for your herd. You have one opportunity for each calf to get it right and the benefits are life-long! Ideally calves would naturally source enough from their mother however this scenario consistently shows a very low success of antibody transfer, so a more hands on approach is much more successful. Depending on your farming system, this normally means changing just a few steps at a time to be manageable. This is something your vet can help you with, by gathering all the information on your system and seeing where the most effective and practical improvements can be made.

Failure of Passive Transfer

If calves don't receive sufficient colostrum in the first day of life, and hence their blood antibody (Immunoglobulins/IgG) levels are low, they are said to have Failure of Passive Transfer of Immunity (FPT).

This can be caused by:

- Colostrum with poor levels of antibodies – a cow leaking milk, been milked out already, poor quality colostrum.

- Delayed ingestion of colostrum e.g. not receiving colostrum for 18 to 24 hours, being born weak/cold, poor mothering, recumbent cow or poor udder conformation.
- Calves left on cows for more than 12 hours have a high rate of FPT and are at a high risk of neonatal disease, ill-thrift and mortality.

In recent studies around 50% of dairy calves had FPT when left on their mothers for 24 hours, compared to less than 6% of calves having FPT in a trial where they were collected from the paddock twice a day and given 4 litres of Gold Colostrum in the first 24 hours.

I can hear you saying "that's a lot of extra work" but to ensure you rear calves that have the ability to fight neonatal disease and ill-thrift and become your future herd, this is the best policy. The cost of extra labour at this early stage far outweighs the cost and time of rearing and treating unhealthy calves.

From a health and welfare perspective, we must ensure that ALL calves-irrespective of their destination – receive Gold Standard care.

Getting it right

To ensure calves are getting adequate colostrum, they can be blood tested at 2 to 7 days of age to check antibody levels. This can be done 2 or 3 times through the season to ensure colostrum management and calf feeding systems are continuing to work as the season progresses.

Abbreviations

You may have come across these abbreviations or terms relating to calves and colostrum:

PT = passive transfer. This means antibodies transferred to the calf i.e. successfully absorbed from quality colostrum.

FPT = failure of passive transfer. Transfer failed, calf low on antibodies due to either poor quality, low quantity or not quickly. Simple bloods tests will indicate transfer level.

Gold Colostrum = high quality or high antibody level colostrum (over 50g/l IgG or 22% Brix) so suitable newborns.
IgG = Immunoglobulins, otherwise referred to as Antibodies, a critical part of the immune defence.

Source: Antahi Innovations. https://antahi.com