

March Sheep Health

AHWNF Flock Health Focus- Colostrum- The 'Liquid Gold' of the Agricultural Industry

The Power of Colostrum

Colostrum- often referred to as 'liquid gold'- is an essential factor contributing to health and lifetime performance of lambs. As lambs are born with no antibodies, they rely on passive transfer of these from colostrum from the ewe. Antibodies are proteins circulating in the blood that protect against infections, (such as watery mouth and joint ill), providing immunity to the lamb. Therefore, a lack of colostrum increases the risk of infectious diseases occurring in lambs.

Colostrum is a vital source of nutrients, containing a mixture of compounds such as proteins, fats, vitamins, lactose, minerals, hormones and enzymes. It also has antimicrobial and anti-inflammatory properties and contains growth factors which contribute to early gastrointestinal development. Colostrum is an excellent source of energy for newborn lambs allowing them to keep themselves thermoregulated.

Colostrum also has the potential to improve lifetime productivity, promoting development of the reproductive tract, therefore allowing lambs to reach puberty earlier. Studies in heifers and cows have shown that it can also result in higher milk yields as adults.

Quality is Essential

If a good pre-lambing nutrition plan has been followed, then there should be minimal issues with colostrum quality and quantity. However, other factors influence quality, such as: age, breed (genetics), time of colostrum collection, health status, environmental factors and Body Condition Score at parturition. Just because a ewe has a good quantity of colostrum, this does not guarantee that it is good quality.

The better the colostrum quality, the higher the concentration of antibodies and nutrients which will lead to healthier lambs throughout their whole lifetime. This tends to look thick and yellow. However, the physical appearance is not always an accurate indicator to determine good colostrum quality, and of course the factors as mentioned above can all have an effect. Therefore, doing a physical test for colostrum quality can be beneficial.

Testing Colostrum- The Brix Refractometer

An optical refractometer is a cost effective, convenient, hand held and sheep-side device that can be used to measure colostrum quality. The use of this has been measured and used extensively in the dairy industry, and has been found to be very effective. There is a lack of research on the use of a refractometer in the sheep industry, but the principles are effectively the same.

A refractometer measures the total solids content of the colostrum, which correlates with total immunoglobulin (antibody) content. Immunoglobulin G (IgG) is the most abundant and crucial antibody, and its content represents the amount of immunity that the colostrum contains and will pass to the lamb after ingestion.

The following are simple steps for using a refractometer:

- Calibrate using water and according to the instructions before the first use.

- Lift the cover, place a couple of drops of colostrum onto the glass surface.
- Lower the cover gently over the surface to allow the colostrum to spread across the surface.
- Give it 15 seconds.
- Hold the refractometer up to natural light and look down the eyepiece.
- The colostrum should ideally read 26.5% or higher on the scale, this means it is excellent quality.
- If taking another sample, make sure that the glass is completely clean.

It is unlikely to be practical to use this method on every ewe on your farm, however, **taking a few samples from representative groups of your flock could be useful in assessing what your flock's average colostrum quality looks like.** This could give insight into whether your nutrition is adequate, allowing adjustments to be made next year if necessary. Some studies in cattle have found that colostrum quality (IgG) content and yield may be heritable, therefore measuring colostrum could also work as part of an effective breeding strategy, however good management is of paramount importance.

Using frozen or thawed colostrum and measuring using a refractometer can result in a weaker result not fully representative of the actual amount of IgG (so it is better to measure quality before freezing).

The ideal reading for cattle colostrum is 22%, which is lower than sheep. Therefore, if you are using cattle colostrum as an alternative, slightly more (approximately 30%) would need to be fed to gain sufficient antibodies, which may not be ideal for a small lamb.

What If Colostrum Is Poor Quality?

If you find that your colostrum is poor quality, it may be necessary to supplement the lamb with an alternative that is of better quality. This can be done via:

Another ewe in the flock- gold standard

Build a reserve of colostrum from other ewes with high quality colostrum in the flock and freeze it. Typically ewes that are twin bearing and aren't first time lambers tend to have better quality, this could be due to the level of feeding that twins get compared to single bearing ewes. Older ewes usually have more antibodies in their colostrum due to having encountered more viral or bacterial challenges.

Colostrum can be kept in the fridge for up to seven days at 4 degrees celsius. If it has been frozen, care must be taken when defrosting colostrum- heating above 40 degrees celsius can destroy the antibodies. Heating the colostrum in a warm water bath to defrost is a much better method than using boiling water or the microwave, as you are much less likely to destroy the antibodies.

Pooled cows' colostrum

Colostrum fed to the lamb from a cow should be handled with care. In some cases, cow colostrum has been found to contain antibodies which cause a red blood cell breakdown in sheep, which can cause anaemia. A method to reduce this risk if a cow's colostrum needs to be fed is to pool the colostrum using a number of different cows. Colostrum should have come from low risk cows regarding Johne's disease, as the disease can transfer between cattle and sheep.

If you are using colostrum from your own cows, this will contain IgG that is specific to your on farm pathogens, therefore it can sometimes be a better alternative to artificial colostrum. This should be discussed with your vet.

Artificial colostrum

Artificial colostrum can be used to supplement the ewe's colostrum. If there is some colostrum from that ewe available to the lamb, it may be beneficial to supplement with artificial colostrum rather than allowing the ewe's colostrum to be the lamb's only feed. This is because the ewe's colostrum will still contain some farm specific antibodies that artificial colostrum wouldn't contain.

When choosing an artificial milk replacer to buy, it's essential to take into account the IgG and fat content of these replacers, and whether they are made of mainly whey protein or natural colostrum.

The standard antibody level (IgG) in a ewe's colostrum is 50g/L; artificial colostrum will never be able to meet this level, but it's important to try and purchase a colostrum replacer that has as high an IgG concentration as possible. The following are some tips for choosing a good quality colostrum replacer:

- The first ingredient on the list should be colostrum- meaning the protein source is from natural colostrum.
- Choose a replacer with an IgG level over 30g/L if possible.
- Fat content should be 15-22%.

Correct Quantity and Quickness- Key for Lamb Survivability

Even if colostrum is excellent quality, enough of it still must be fed in order for its full benefits to be provided to the lamb. It is recommended that lambs have received 50ml/kg liveweight of colostrum within two hours of birth (to benefit from best quality colostrum), and that further small doses such as this are received every few hours. This is because after six hours, the lamb's gut begins to close, meaning they can't absorb as many immunoglobulins into their bloodstream (it closes to large particles- such as immunoglobulins). Furthermore, IgG begins to decrease in concentration in milk from time of birth onwards.

Lambs must be fed 200ml/kg of their body weight in colostrum in the first 24 hours of their life, so for example a 5kg lamb needs to receive 1 litre of colostrum in their first day of life. Receiving the sufficient amount within 2 hours ensures that they receive colostrum at its best quality.

Other Factors to Consider- Vaccinations

Where vaccinations have been administered, it is important to use a ewe's own colostrum. Vaccinations given 6-4 weeks pre-lambing will produce antibodies in the ewe's colostrum against specific diseases. Lambs will then absorb these antibodies when they drink the colostrum, providing them with immediate immunity. Therefore, if vaccination timing is wrong or if lambs do not receive sufficient colostrum, then this vaccine will have been a waste of time and money.

