

SheepSense:

an applied research brief

The Role of Colostrum during Lambing Season

What is Colostrum?

Colostrum is thick yellowish milk rich in nutrients and immunoglobulins (antibodies) that are vital for newborn lamb survival. It is also packed with protein, fats, vitamins, lactose, minerals, hormones, enzymes, and peptides that are vital for the lamb. These components are significantly higher in colostrum compared to milk produced later in the lactation cycle. Other bioactive components aid in the development of the lamb's digestive and immune systems.

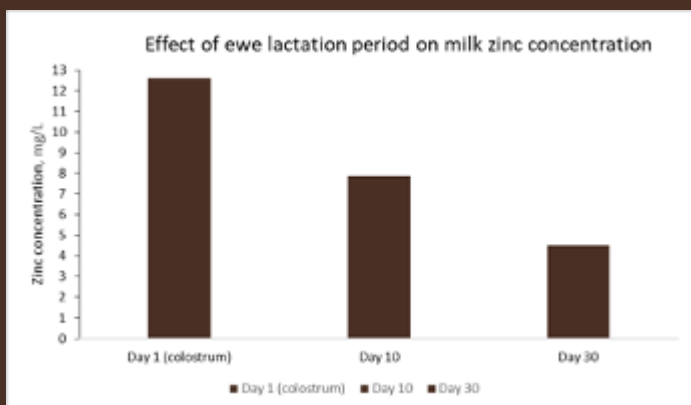
Research by Page et al. (2020) at the University of Wyoming highlights that macrominerals like zinc, which are essential for immune system function in both ewes and lambs, are more abundant in colostrum but decrease throughout lactation. Zinc, along with other trace elements, plays a role in enzyme function and cellular defense mechanisms crucial for lamb survival.

Colostrum & Lamb Survival

Ensuring lambs have immediate access to colostrum is vital for survival and longevity. Passive immunity, the transfer of maternal antibodies for short term protection from disease, helps protect lambs from infections in their early days of life. This is especially important since lambs are born with underdeveloped immune systems.

Colostrum also supplies energy required for thermoregulation, helping lambs maintain body heat in challenging environmental conditions. Since many Wyoming lambs are born in harsh winter conditions, this attribute is critical to prevent hypothermia. In addition, early colostrum intake facilitates the ewe-lamb bond, improving nursing success and ensuring ongoing access to milk. Without this bond, lambs may struggle to thrive and be more vulnerable to environmental stressors. Failure to consume sufficient colostrum leads to a much higher incidence of lamb mortality compared to lambs that consume high quality colostrum at the appropriate rate.

Zinc Concentration in Milk



Colostrum Intake

Generally, lambs should receive their first colostrum feeding within 4 hours of birth and should consume 10% of their body weight in colostrum within the first 12-18 hours. Lambs that have not nursed within this time frame may require intervention. For example, a 10-pound lamb would need 16 ounces (2 cups) of colostrum spread out over this time period.

Smaller, frequent feedings help ensure adequate consumption, rather than feeding this all at once. If a lamb cannot nurse directly, colostrum can be delivered via bottle or feeding tube.

Importance of early Interaction

The bond between the ewe and her lamb is crucial for the lamb's long-term survival. Colostrum consumption is a key factor in forming this bond, as it ensures the lamb's energy needs are met, allowing it to remain active and nurse effectively.

Lambs' ability to absorb immunoglobulin G (IgG), a key antibody in colostrum, diminishes significantly after 12 to 18 hours. This highlights the importance of early interaction between the ewe and lamb to ensure colostrum intake. Producers should monitor ewe-lamb interactions closely during this time if possible and intervene if necessary to facilitate nursing.

Long-Term Effects on Production

Colostrum consumption has profound long-term effects on lamb development. Bioactive factors in colostrum, such as insulin-like growth factors (IGFs), promote the development of the digestive system and the reproductive tract. These factors support lamb growth rates, eventual reproductive performance in breeding animals, and overall health. Lambs that receive adequate colostrum in their first hours of life are significantly more likely to become productive members of the herd as adults or develop into suitable market animals.

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Optimizing Colostrum Quality

The quality of colostrum depends on several factors, including the ewe's age, nutrition, and health status. Younger ewes and those on poor body condition tend to produce lower-quality colostrum and in smaller amounts. Mature ewes on a good nutritional plane provide richer, more abundant colostrum. Producers should ensure that ewes are in optimal condition before lambing by providing balanced nutrition during pregnancy and addressing any health concerns ahead of time. Young ewes and those that go into lambing in poor condition should be monitored to ensure the whole herd is able to provide for their lambs as much as possible without intervention.

Vaccination of ewes with clostridial vaccines increases the antibody content of colostrum, offering lambs enhanced protection against diseases. Research shows that ewes vaccinated in early pregnancy and given a booster in late pregnancy had significantly higher levels of immunoglobulins than those not vaccinated or boosted. Additionally, supplementing the diet of pregnant ewes with vitamins and minerals can further improve colostrum quality.

Considering Environmental Factors

Environmental conditions play a significant role in determining lamb survival and colostrum requirements. In cold or wet weather, lambs require more energy to maintain body heat, increasing their need for colostrum. If lambing in a barn, producers should ensure lambing pens are clean, dry, and well insulated to protect lambs from the elements to maximize the colostrum's efficacy.

Hypothermic lambs must be warmed before they can nurse effectively. Warming boxes or heat lamps can be used to raise the lamb's body temperature. Once warmed, lambs should be offered colostrum promptly to replenish energy reserves and boost immunity.

Monitoring

Regular monitoring of colostrum availability and lamb intake is essential to ensure lambs receive the nutrition they need within the previously stated timeframe. Some studies have shown that up to 38% of lambs in a management group failed to achieve passive transfer of antibodies due to insufficient colostrum intake.

If a lamb is too weak to nurse, producers should attempt bottle feeding first. If this is unsuccessful, tube feeding may be necessary. Properly cleaned and sanitized equipment is crucial to prevent introducing pathogens during feeding. Additionally, producers should learn how to administer colostrum safely and effectively via tubing to avoid injury or stress to the lamb.

Colostrum Sources

In an ideal situation, if a lamb is unable to nurse, colostrum should be collected directly from the ewe and bottle or tube fed. This, however, can be challenging in range settings when the herd may be spread over a large area, especially if the ewe cannot be identified. In these situations, producers benefit from storing colostrum from other ewes who have lost lambs in the freezer and reheating when needed. Colostrum collected from other ewes should be obtained within several hours of her lambing to be sure it is still bioactive and contains the full quality of nutrients and IgGs.

Colostrum should be frozen in airtight containers, such as ziplock bags, in small enough quantities to be consumed at once, as stored colostrum should not be refrozen once thawed. Stored colostrum can be thawed slowly in warm water. Colostrum should not be boiled or microwaved, as this can damage immune properties. Cow colostrum can also be used, but some research shows that bovine antibodies can cause the breakdown of the lamb's red blood cells. Pooling colostrum from multiple cows can mitigate this, but a veterinarian should be consulted first.

Commercial colostrum replacers should be considered a last resort if no true colostrum is available. While commercial replacers do contain immunoglobulins, these are often bovine IgGs, and are not as effective, but can serve as a viable alternative if no other options are available. It should be noted that colostrum supplements are also available, and unlike replacers, these are designed to be used alongside colostrum, and do not contain IgGs for immune development.

Conclusion:

By understanding the importance of colostrum and implementing effective management practices, producers can significantly enhance lamb survival, health, and long-term productivity. Proper care during the early hours of a lamb's life sets the foundation for success in the herd and the overall productivity of the operation.

This brief was created by UWyo Sheep Task Force

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