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The First Week Counts: Understanding Newborn Care Decisions and Educational Needs of Sheep and Goat Enterprises

Abstract

Newborn lamb and kid mortality remains a challenge for sheep and goat enterprises, with many losses occurring during the first week of life. This study assessed newborn care practices, timing of management decisions, and educational needs among small ruminant producers. A cross-sectional online survey was administered during the 2024–2025 lambing and kidding season, yielding 171 usable responses. Results indicated frequent monitoring and widespread use of lambing and kidding pens; however, substantial variation existed in the timing and sequencing of practices. Reported mortality causes were diverse. Producers identified needs related to emergency newborn care, nutrition, and intervention skills. Findings support Extension programming focused on decision timing and applied management skills.

Keywords: Sheep, Goat, Neonatal, Needs Assessment, Skills, Survey, Agricultural Extension, Hands-on Learning, Management, Ewe, Doe

Introduction

Newborn care in sheep and goats is a critical determinant of enterprise profitability, animal welfare, and long-term production efficiency (Held, 2021). Each newborn loss represents the loss of a sale animal and the unrecovered fixed and variable costs associated with feed, labor, veterinary inputs, and genetic investment in the dam. Industry level losses have been documented in the sheep and goat enterprises in the millions of dollars due to lost animals and reduced future returns (USDA APHIS, 2020). Research consistently indicates that a large proportion of lamb and kid mortality occurs within the first days of life and is closely related to management during the neonatal period, particularly nutrition intake, body temperature, and early dam/offspring bonding (Dwyer et al., 2015; Van Saun, 2020). Studies evaluating neonatal survival show that inadequate or delayed nutritional intake increases illness and mortality, reduces growth performance and lifetime productivity, and directly affects the economic sustainability of sheep and goat operations (Farooq et al., 2024).

While the biological importance of newborn care is well established, research indicates that producer practices related to neonatal management vary widely across farms. This highlights the disconnect between scientific knowledge and on-farm application of recommended newborn care practices. Surveys and applied research show that many livestock producers rely primarily on visual assessment of vigor and nursing behavior rather than objective measures of nutrient intake, and intervention practices such as assisted nursing, or tube feeding are inconsistently implemented (Van Saun, 2020). Production studies further indicate that producers often recognize the importance of newborn care but differ substantially in how they respond to weak, hypothermic, or slow-to-nurse lambs and kids, with decisions influenced by labor availability, experience, and perceptions of control over neonatal losses (Dwyer et al., 2015). Although studies document the pivotal role of timely, adequate nutrient intake in survival and productivity, management practices related to timing, quantity, and quality remain unevenly adopted across sheep and goat operations (Farooq et al., 2024; Van Saun, 2020). These findings indicate that many losses attributed to environmental conditions

or animal factors are closely tied to modifiable management decisions made during lambing and kidding.

This gap underscores the necessity for Extension education to extend beyond the dissemination of biological research and to examine the decisions producers make under practical conditions. This study's primary research question is to evaluate the newborn care decisions producers make under real-world conditions. This study assessed common management practices of newborn care and common timing of management practices of newborn care.

Methods

To assess producer practices and educational needs related to newborn care in small ruminants, a cross-sectional needs assessment survey was conducted with sheep and goat producers. Content validity was established through an expert panel review of Ohio Sheep Team members, assessing survey relevance, clarity, and connection to study objectives. The survey was pilot tested with local Delaware County producers. The target population consisted of small ruminant producers; Ohio producers were targeted but the survey was available to any producer regardless of location. Participant recruitment occurred through the OSU Small Ruminant Team electronic newsletter, which has 859 subscribers, and through nine sheep and goat production-focused social media groups as well as the Delaware County's social media pages to broaden outreach to active producers.

The study employed a self-selected, voluntary sample. This type of sample could overaccentuate the highly connected and successful producers, thus could inflate potentially produce bias results. All research procedures were reviewed and approved by the Ohio State University Institutional Review Board, ensuring ethical conduct and protection of human subjects. Participants were informed that their responses were anonymous and would not be connected to their identity.

Data was collected using an online questionnaire comprised of 17 questions administered through the Qualtrics survey platform. Questions began with select all that apply and multiple choice with follow up open ended questions collecting demographic information. Questions asking about lambing pens, duration, and observations were multiple choice and ranking questions with another- write-in option. Process was the topic of the next section with a multiple-choice question and a select all that apply with a write in other option. Death rate questions were multiple choice. The final topic of training/educational need was an open-ended response.

The survey was available from February 2025 through June 2025, focusing producers on the 2024–2025 lambing and kidding season. The data that was collected represented the 2024-2025 lambing and kidding season. Producers were asked to respond based on their management practices during the first seven days of life of lambs and kids. Distribution through social media was scheduled for reminders every two to three weeks.

The questionnaire gathered information including farm location, type of small ruminants raised, use and number of days of lambing and kidding pens, observed neonatal factors and frequency, newborn processing timing and practices, mortality percentage rates and perceived causes of death, and producer-identified educational needs related to newborn care. A total of 171 usable surveys were included in the analysis, this represented 90% of total survey responses. The survey's demographic questions ensured the target audience would be represented.

Survey data was exported and summarized using Microsoft Excel. Descriptive statistics, including percentages, were calculated to characterize current producer practices. Open ended responses were sorted into theme to identify areas of educational need relating to small ruminant newborn care.

Results

The results of this needs assessment provide insight into both current newborn management practices and the timing of these practices among small ruminant producers and identify specific areas where small ruminant newborn educational programming is needed.

A total of 171 sheep and goat producers completed the survey, representing 10,993 small ruminant females, including 9,618 ewes and 1,375 does. Respondents represented 26 U.S. States and the United Kingdom, indicating broad geographic participation (Table 1).

Table 1. Respondent and operation characteristics of small ruminant producers participating in a newborn care management survey.

Characteristic	Number Reported
Total Respondents	171
Small Ruminant Females Represented	10,993
Ewes	9,618
Does	1,375
Geographic Representation	26 U.S. States and the United Kingdom

Housing and observation frequency

Most respondents answering housing questions (84.4%) reported using lambing or kidding pens, while 15.6% did not (Figure 1).

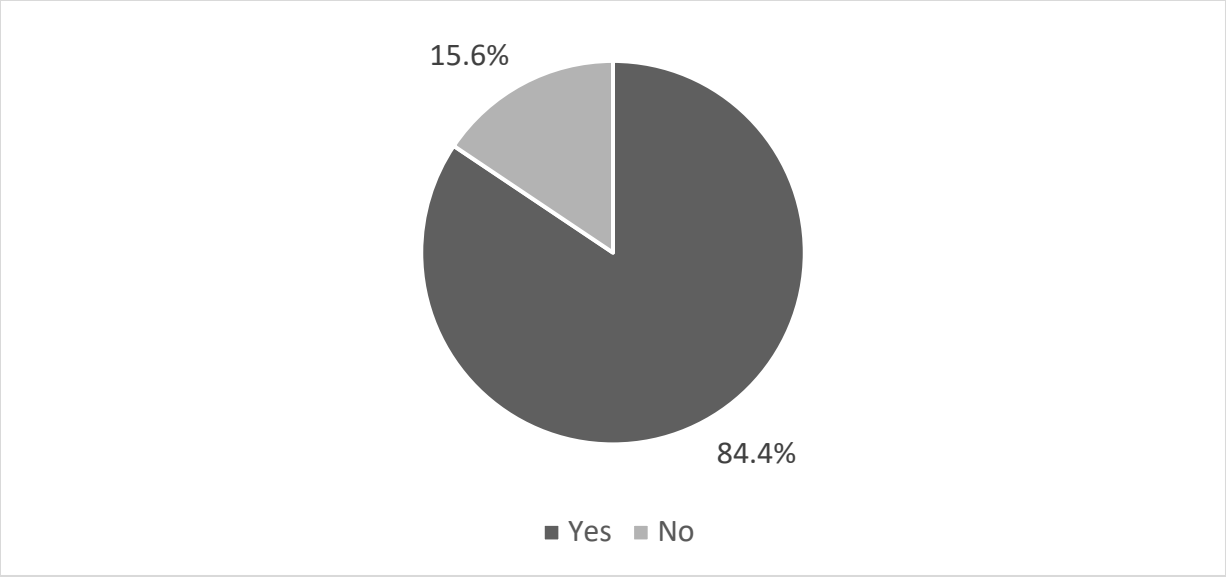

Figure 1. Use of Lambing and Kidding Pens (*n* = 160)

The producers reported high observation frequency during the neonatal period. Among respondents providing observation data (*n* = 145), nearly two-thirds (64.8%) reported observing dams and offspring four or more times per day, whereas 29.0% reported observing two to three times per day and 6.2% reported observing once per day (Figure 2).

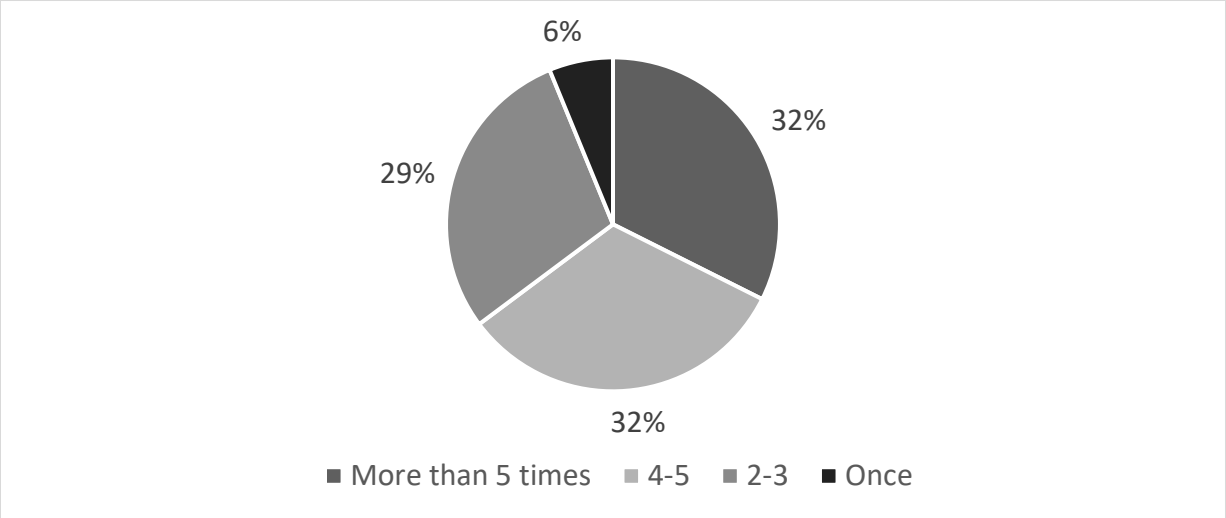

Figure 2. Frequency of Neonate Observation Per Day (*n* = 145)

When asked to rank factors they observed during these visits, producers consistently prioritized indicators directly related to neonatal viability and early maternal performance during lambing and kidding observations. Offspring vigor and offspring nursing behavior received the highest frequency of first-place rankings, followed closely by mothering acceptance; respondents place primary emphasis on behaviors and conditions most immediately associated with offspring survival. While still identified as important to observe, factors such as offspring body temperature, maternal health condition, and milking ability were less frequently ranked as the top priority. These factors are viewed as secondary for the producer rather than part of the primary assessment. Overall, the rankings reflect a management focus on rapid visual and behavioral cues that inform timely intervention decisions during the periparturient period.

Extent of housing

Length of stay in lambing or kidding pens varied among producer respondents. The respondents reported pen stays ranging from one to seven days. The most common producer reported length of stay in a pen was three days (26.1%), followed by two days (20.1%) and more than seven days (12.7%) (Table 2).

Table 2. Duration of stay in lambing or kidding pens following parturition (*n* = 134)

Duration of Stay	*n*	%
1 Day	10	7.5
2 Days	27	20.1
3 Days	35	26.1
4 Days	16	11.9
5 Days	14	10.4
6 Days	3	2.2
7 Days	12	9.0
More than 7 Days	17	12.7
Total	134	100

Offspring processing, timing, and practices

Processing generally occurred within the first week. Respondents reported 42.9% processed offspring on Day 1 or Day 2, and 60.0% reported processing within the first 3 days. Smaller proportions reported processing on later days, with very few respondents indicating processing occurred after the first week (Table 3a).

Table 3a. Age of offspring at time of processing (*n* = 106)

Age	%
Day 1	14.3
Day 2	28.6
Day 3	17.1
Day 4	9.5
Day 5	8.6
Day 6	0.0
Day 7	20.0
After 7 days	1.9

Most producer respondents (78.5%) reported processing offspring within the first seven days of life. Among respondents who processed offspring, a select all that apply listing indicated common processing tasks included identification/tagging, tail docking, vaccination, and vitamin or mineral injections, with fewer respondents reporting castration or dehorning. (Table 3b).

Table 3b. Processing tasks performed within the first seven days (*n* = 108)

Processing Task	*n*
Tag/ID	92
Tail Docking	73
Vaccination	63
Vitamin/Mineral injection	56
Castration	27
Dehorning	13
Other (e.g., Weighing, oral supplement)	2

Mortality

Reported mortality within the first week of life among offspring surviving birth was low. Among producers providing mortality estimates, 64.9% reported mortality below 1%, and 29.9% reported mortality between 2% and 5%. No respondents reported mortality greater than 10% (Table 4a).

Table 4a. Reported mortality within the first week of life (*n* = 128)

Mortality	n	%
Less than 1%	87	64.9
2–5%	40	29.9
6-10%	7	5.2
Greater than 10%	0	0.0

Reported reasons for the first-week death loss were distributed across several categories. When asked “What is your greatest cause of death from babies that survived birth and are 7 days or less old?”, the most frequently reported causes included lack of nutrition, temperature stress, and offspring being crushed or laid on, while the majority of respondents selected other, which included disease, dystocia, and congenital deformities. 10% of producers reported not losing offspring in the first seven days after birth (Table 4b).

Table 4b. Perceived reasons for death loss within the first week (*n* = 126)

Cause	n	%
Lack of Nutrition	29	22.3
Temperature Stress	29	22.3
Crushed/laid on	28	21.5
No Deaths Reported	13	10.0
Other*	44	23.9

*Other responses included disease (e.g., E. coli, pneumonia), dystocia, and deformities.

Educational needs

Eighty producers who responded to the open ended questions identified several newborn care education topics. After summarizing the responses, common themes

included immediate and emergency newborn nutritional care, management of weak or chilled offspring, maternal nutrition, tube feeding techniques, vaccination timing and options, offspring nursing behavior, processing timing, and lambing/kidding pen management.

Discussion

The results of this needs assessment provide insight into both current newborn management practices among sheep and goat producers and the specific areas where targeted educational programming is warranted. Respondents represented a diverse population of small ruminants across a broad geographic area, suggesting that the findings capture practices used in diverse production contexts. However, the recruitment method, distribution through an Extension newsletter and through small ruminant–focused social media groups, likely reflects a population that is already engaged with information sources and Extension programming. This context is important when interpreting the relatively high adoption of recommended management practices observed in the data.

A notable strength revealed by the survey is the widespread reported use of lambing and kidding pens and the high frequency of observation during the immediate postnatal period. More than 80% of respondents reported using individual pens, and the majority observed dams and offspring four or more times per day. These findings suggest that producers recognize the importance of intensive monitoring during the neonatal period and are actively investing labor to support offspring survival. The factors producers reported monitoring most closely, offspring vigor, nursing behavior, and mothering acceptance, are well aligned with established indicators of neonatal viability and maternal success (Dwyer et al., 2015). This alignment indicates that producers' observational priorities are generally appropriate and provides a strong foundation upon which educational programming can build.

Despite these positive indicators, the data also reveal areas where producer management decisions are inconsistent and may be guided more by tradition than by a

clearly defined management system. Duration of stay in lambing or kidding pens varied widely, ranging from one day to more than seven days, and these timeframes were not consistently aligned with the reported processing schedules. Aligning these timeframes would allow for easier management and reduced handling, as well as decreased stress on the dam and offspring. This inconsistency represents an opportunity for education that moves beyond what to do and focuses instead on when and why specific practices are most effective. Reported processing tasks varied with dehorning having a very low rate of inclusion. This is most likely due to the nature of the task being associated with goat producers; given the respondent population of more sheep producers than goat producers, this may explain the skew in this data.

Reported first-week mortality among respondents was less than 1% which is lower than commonly cited expectations in the literature. Literature reviews indicate that the majority of lamb and kid losses occur during the first week of life and that total lamb or kid mortality frequently exceeds 8% in many production systems (Ehrhardt, 2020; USDA APHIS, 2012; USDA APHIS, 2020). Due to the limitations of the self selected population, this outcome may reflect effective management among a highly engaged producer population, the reasons cited for death loss were diverse and included nutrition, temperature stress, crushing, and disease, as well as a substantial proportion of respondents reporting no deaths at all. The absence of a single dominant cause of mortality suggests that no one intervention is sufficient to address neonatal loss. Instead, effective educational programming must emphasize timely assessment, rapid decision-making, and appropriate intervention across multiple risk factors.

An interesting finding from this assessment are the topics producers explicitly identified as educational needs. Requests clustered around immediate and emergency newborn nutritional care, management of weak or chilled offspring, maternal nutrition, tube feeding techniques, vaccination timing and options, offspring nursing behavior, processing timing, and lambing/kidding pen management. These needs closely mirror the management challenges reflected elsewhere in the survey and suggest that producers are seeking practical guidance that supports confident, timely intervention

rather than introductory information. The alignment between what producers are monitoring, where losses still occur, and the topics they wish to learn more about strengthens the validity of these priorities for program development.

Conclusion

In conclusion, these results indicate that future newborn care programming for small ruminant producers should be structured to enhance decision quality and technical skill rather than to promote basic awareness. A modular or tiered curriculum that integrates assessment, intervention techniques, nutritional strategies, health protocols, and management timing would directly address the needs identified in this survey. Such an approach would also allow educators to tailor content to producers with varying levels of experience while remaining grounded in real-world management scenarios. Overall, this needs assessment provides a roadmap for Extension and outreach efforts aimed at improving neonatal outcomes and producer confidence in sheep and goat enterprises

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