Successful Ewe Lamb Development, Breeding, and Lambing
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Successful development, breeding, and lambing of ewe lambs is one of most important
tasks of the shepherd. Compared to mature ewes, ewe lambs require more management.
Specifically, proper management of replacement ewes from birth through first lambing
is critical to overall flock productivity and profitability. These proceedings will focus on
several areas of ewe lamb management.

**Ewe Selection**
In most breeding systems, replacement ewe lambs will be generated from within the flock.
Therefore, attention to maternal traits in the rams siring potential replacements is critical.
Additionally, preference should be given to crossbred ewe lambs. Crossbred animals have
two major advantages over straightbred animals: 1) Crossbred animals exhibit *heterosis*
(hybrid vigor), and 2) Crossbred animals combine the strengths of the breeds used to form the
cross (breed complementarity). Crossbred females are superior to straightbreds for
reproductive performance due to advantages received from heterosis. Crossbred ewes exhibit
significant advantages in fertility, prolificacy, and lamb survival resulting in advantages of up
to 18% in pounds of lamb weaned per ewe exposed compared to straightbred ewes. From the
existing pool of potential replacements, the following are important considerations for
selection:

1) **Performance Record:** Ewe lambs should be retained from highly productive dams.
   Identifying these dams through a record-keeping system is therefore the first step in
   identifying potential replacements. Dams that lamb early in the lambing season, produce
   multiple births, and excel in pounds of lamb weaned (reflective of milking ability) are the
   best candidates to produce replacements. In the absence of such records, identifying
   maternal potential in ewe lambs based solely on visual appraisal is difficult.

2) **Age:** Preference should be given to ewe lambs born early in the lambing season (first 50
days). These ewe lambs are more likely to reach puberty earlier, breed, and lamb early as
yearlings- thus keeping the subsequent lambing season short. Older ewe lambs are also
more likely to reach target body weight by their first breeding season than young ewe
lambs, and this coupled with age enhance their ability to breed as ewe lambs.

3) **Conformation/Soundness:** As previously discussed for rams, structural soundness and
   mouth soundness are also critical in ewe lambs. Additionally, ewes with adequate body
capacity and muscling are preferred. Appropriate frame size is important as it relates to
   mature size. As mature size increases, so do nutritional requirements and thus carrying
costs.

**Nutrition & Management**
Nutrition from birth to first lambing has an influence on the lifetime productivity of the ewe.
Ewe lambs should be in production by the time they are 12 to 14 months of age, as ewes that
lamb first as yearlings rather than two year-olds have higher lifetime production. Ewe
nutrition is a very important aspect of total flock management. Proper nutrition of ewe lambs
is necessary to optimize productivity. There are five factors that affect the nutritional needs of the ewe, specifically:
1. Age, because young ewes are still growing their requirement for certain nutrients is higher
2. Size, or more importantly, body weight
3. Body condition (amount of body fat)
4. Stage of production (maintenance, gestation, or lactation).
5. Level of production (how much milk, how many fetuses are carried, etc.)

Additionally, health status (including parasite load), activity level, weather, and other environmental factors may also influence nutritional requirements and management. Ewe lambs require special nutritional consideration during all stages of production. In addition to the requirements for pregnancy and lactation, ewe lambs also require additional nutrition as they have not yet reached mature body size and are still growing. Also, ewe lambs consume less feed per day than mature ewes of the same body weight.

To determine when and how much to feed the flock, we must know the animals' requirements for nutrition. These requirements are affected by the 5 factors listed above, and are found in Tables 1. There are 4 key nutrients of concern in feeding the ewe flock. Those are energy (expressed as TDN, which stands for Total Digestible Nutrients), protein, Calcium, and Phosphorous. Vitamins A & E are important, but as long as the ewe is eating green forage (hay or pasture) these vitamins are usually consumed in adequate amounts. In Table 1 are shown amounts of specific nutrients needed by an animal each day. Bigger animals need more than smaller animals, thus this table shows animals of different weights.

**Pre-Breeding:** Ewe lambs should be targeted to reach 70% of their mature weight at breeding. Therefore, most ewe lambs should weight 100-150 pounds at breeding. Winter born ewe lambs generally have early rapid growth resulting from creep feeding and grain diets prior to forage being available. Winter born ewe lambs that will be kept for flock replacements should be prevented from becoming excessively fat. Excess fat deposition has been shown to reduce future milk production. Development of these winter-born ewe lambs is best accomplished through pasture grazing and additional grain supplementation as needed to enhance gains. Early and late spring born lambs traditionally are developed primarily through forage-based systems. Potential replacements should be identified and weaned so they may be properly grown and managed. These ewe lambs may need to receive supplemental corn or barley (.5-1.5 lb./head/day) to achieve daily gains needed to reach target body weight prior to breeding. The amount of supplement needed will vary with forage quality and availability, as well as anticipated breeding date. As forage quality and availability declines during the summer, supplemental grain feeding will become necessary if breeding dates are early. Shearing of replacement ewes will enhance growth rates during the hot summer months. An effective deworming program is also crucial for optimum gains.

**Breeding:** Flushing is the practice of increasing energy intake, and therefore body condition, during the 10-14 days prior to breeding. This practice has been shown to be effective in increasing ovulation rates, and thereby increasing lambing percentage by 10-20%. With ewe lambs, flushing is most easily accomplished through providing .75 to 1.25 lb. corn or barley per head per day from 2 weeks pre-breeding through 4 weeks into the breeding season. Since corn grain is approximately 80% TDN, providing 1 lb./day would provide .8 lb. of additional
energy to the ewe (1 lb. corn x 80% TDN = .8 lb. TDN). Additionally, ewes that become very fat and then are placed on a lower plane of nutrition following flushing may be subject to increased prenatal mortality and lower lambing rates.

**Early Gestation:** Table 1 shows that there is a relatively small increase in ewe nutrient requirements for the first 15 weeks of gestation compared to maintenance. It is during this time that winter and spring-lambing ewes will make the transition from pasture to a diet of harvested feedstuffs. While on fall pastures, ewes should consume enough forage to meet their nutritional requirements during this early gestation stage. When feeding hay becomes necessary, it is important that the quality and quantity of hay being fed be closely considered. Assuming the available hay is 50% TDN and 12% crude protein on an as-fed basis, a 130 lb. ewe lamb eating 3.5 lbs./day of this hay would consume 1.75 lb. TDN and .42 lb. crude protein. The requirements for this ewe in Table 1 are 2.0 lb. TDN and .35 lb. protein daily (57% TDN and 10.0% protein). Note that she requires .25 lb. more TDN than supplied, and her protein intake exceeds the requirement. This shortage in TDN can be supplied by .30 lb. of corn (.30 lb. x 80% TDN = .24 lb. TDN). Additionally, a ewe given the opportunity to consume as much of this hay as she desired may consume considerably more than 3.5 lb. per day (ewes can consume 3.5% of their body weight), and easily meet her requirements for both energy and protein. This emphasizes the importance of utilizing poorer to average quality hays during the early gestation period, when ewe nutrient requirements are low compared to late gestation and lactation. If high quality hays, such as alfalfa, are fed during this period it is important to limit intake. Overfeeding during this period is costly, and may also result in over-conditioned ewes leading to complications later in the production cycle.

**Late Gestation:** Approximately 2/3 of the birth weight of a developing fetus is gained during the last six weeks of pregnancy. This means a ewe will gain from 10 to 20 pounds during this time period. As a result, the nutritional requirement of the ewe for both energy and protein increases. Table 1 shows that TDN requirements increase to 65%, compared to 57% for early gestation. Similarly, protein requirement increases to around 11.5% compared to 10%. The most critical difference is the increase in energy requirement. Inadequate nutrition during this period may result in pregnancy ketosis, light birth weights, weak lambs, and lower milk production. Supplemental feeding of 1 to 2 lb. corn/ewe/day, in combination with average to good quality hay (> 11% CP) should provide adequate nutrition. An important consideration during this period is the number of fetuses the ewes are carrying (see Table 1). As the ewes approach lambing, the size of the uterus increases and limits intake. Therefore, feeding nutrient-dense rations is important to ensure adequate nutrition. Since ewe lambs are frequently managed as a separate group from the mature ewes, providing extra nutrition during gestation is easily attainable.

**Lactation:** Growth rate of lambs from birth to weaning is largely determined by milk production of the ewe, which emphasizes the importance of good nutritional management during this period. Lactation is also a period in which there is an opportunity to control feed costs by feeding ewes according to the number of lambs nursing. During lactation, the ewe’s nutritional requirements for both energy and protein are at the highest level of the whole production cycle of the ewe. As mentioned previously, the highest quality hays should be utilized during this time. Alfalfa hay is an excellent feedstuff during lactation due to its
relatively high energy and protein density relative to other forages. In most cases, a grain-protein supplement (such as corn-soybean meal) will also need to be fed in addition to the highest quality hay available. The needed protein content of this grain mix will vary depending on quality of the hay utilized. Generally, total rations should be formulated to contain 70% TDN and 14% protein for lactation. Table 1 demonstrates the significant differences in nutrient requirements of ewes nursing single vs. twins vs. triplets. Feeding ewe lambs by number of lambs nursing is an excellent management technique to minimize feed costs. Ewes rearing single lambs will require less grain supplementation than twin-rearing ewes. Similarly, triplet-rearing ewes could be provided the extra nutrition needed, if separated from other ewes. Maintaining ewe lambs as a separate management group from mature ewes during lactation is critical. This is especially important for ewe lambs nursing multiple births so they can receive proper nutrition to maintain adequate body condition for future growth and productivity. Of course, facilities and labor will dictate feasibility of this management practice. As mentioned previously, milk production of the ewe is influenced by nutrition. Research conducted at Michigan State University by Dr. Margaret Benson showed that feed intake was the most important nutritional factor affecting milk production. Therefore, diets that are nutrient-dense and highly palatable will enhance milk production. High quality grass-legume pasture can satisfy the requirements for both energy and protein of ewes in early lactation. Management to ensure adequate forage availability is crucial, along with free-choice availability of a properly formulated free-choice mineral supplement.

**Forage Quality:** An important aspect of nutritional management is knowing the quality of forages that will be utilized, most importantly hay. To properly balance rations and formulate diets, an accurate forage analysis should be conducted on all harvested feeds (hays and silage). There can be significant variation in hays harvested from the same field from one year to the next, and from one cutting to another. Having accurate feed analysis will may save feed costs and will certainly improve the ability to adequately manage the nutrition of the flock.
Table 1. Daily Nutrient Requirements of Ewe Lambs<sup>a</sup>

<table>
<thead>
<tr>
<th>Stage of Production</th>
<th>Body Wt. (lb.)</th>
<th>Wt. gain or loss (lb.)</th>
<th>DM Intake/day&lt;sup&gt;b&lt;/sup&gt; (lb.)</th>
<th>Energy TDN (lb.)</th>
<th>Protein (lb.)</th>
<th>Ca (g)</th>
<th>P (g)</th>
<th>Vit. A (IU)</th>
<th>Vit. D (IU)</th>
<th>Vit. E (IU)</th>
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<td>Pre-breeding</td>
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<td>.39</td>
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<td>3.3</td>
<td>1.9</td>
<td>.30</td>
<td>4.8</td>
<td>2.4</td>
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<td>.22</td>
<td>3.3</td>
<td>1.9</td>
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<td>4.5</td>
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<td>1&lt;sup&gt;st&lt;/sup&gt; 15 wk. gestation</td>
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<td>.30</td>
<td>3.3</td>
<td>1.9</td>
<td>.35</td>
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<td>(100-120% lamb crop)</td>
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<td>34</td>
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<tr>
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<td>.68</td>
<td>7.1</td>
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<td>5950</td>
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<td>Nursing twins</td>
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<td>8.7</td>
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<sup>a</sup>Values adopted from National Research Council for Sheep, 6<sup>th</sup> Ed.

<sup>b</sup>To convert dry matter to an as-fed basis, divide by percent dry matter.
**Ewe Lamb Vaccination Program**

**Prepartum vaccines**
1. Ewes should be vaccinated 3 to 4 weeks prior to the time of parturition in order to provide colostral immunity to the neonates.

   a) *Clostridium perfringens* type C and D
      - vaccine will cross protect against *Cl. perfringens* type B
      - vaccine prevents hemorrhagic enteritis and overeating disease

   b) *Clostridium tetani*
      - protects neonates from tetanus
      - especially important if horses have been/are on the premise
      - neonates at risk because of tail docking, castration, and dehorning

Note: the *Cl. perfringens* C and D and tetanus come in a combination vaccine

   c) *Parainfluenza 3*
      - protects against parainfluenza 3, a viral disease that predisposes neonate to pneumonia
      - the product contains both PI3 and Infectious Bovine Rhinotracheitis Virus
      - the product is given intranasally, 1/2 of the cattle dose – 1 ml in one nostril
      - reduces the shedding of PI3 by dams and provides good colostral immunity to neonates

**Optional vaccine**
1. *Clostridial 8 way vaccine*
   - I don’t recommend because of the reaction that this vaccine causes, eg. abscesses, fever, malaise. This may cause the dam to go off feed and develop pregnancy toxemia.
   - vaccine contains *Cl. chauvei, septicum, novyi, hemolyticum, perfringens* C and D, and tetani
   - except for *perfringens* C and D, and tetanus the other agents rarely cause problems in sheep and goats. One may encounter *Cl. novyi*, Black’s Disease or Necrotic Hepatitis, if animals are infected with flukes.
   - vaccine should be given in the axillary space because of tissue reaction.

**Preweaning vaccines**
1. Lambs need protection against *Cl. perfringens* C and D because of feed changes and introduction to concentrates
2. Lambs need a series of 2 injections given approximately 2 to 4 weeks apart.
3. Lambs receive the first vaccine 2 weeks prior to weaning and the second vaccine, booster, at the time of weaning or shortly afterwards.
4. The combination *Cl. perfringens* C and D and tetani vaccine is used.
Prebreeding vaccines
1. Vaccine is used to protect dams from aborting so need to administer 30 days prior to introduction of the males and 60 to 90 days later.

a) Campylobacter fetus subsp. intestinalis and jejuni vaccine (Vibrio vaccine)
   - Vaccinate 30 days prior to introduction to rams. ewe lambs need a booster 3 weeks after the first injection and then again
   - Booster al females 60 –90 days later first injection, a total of 3 vaccinations fro ewe lambs

b) Chlamydia psittaci vaccine
   - ewe lambs and ewes vaccinate 60 days and 30 days prior to introduction of males.
   - vaccine has variable results and periodically goes off the market.

c) Clostridium 8 way for the ewe lambs and doelings 60 and 30 days prior to breeding if this vaccine is used.
   - booster ewes and does 30 days prior to breeding

Rams— CD and T yearly booster
   - Foot Rot vaccine at the time administered to adult females

Other vaccines used in small ruminants
1. Foot Rot vaccine
   a) can be used as a preventive as well as part of the treatment protocol.
   b) should be given prior to the time of year in which foot rot prevalence is the highest.
      This is usually during wet times of the year – eg. late winter/spring.
   c) use the foot rot vaccine for sheep (FootVax)– contains strains against
      *Dichelobacter nodosus* (Bacteroides nodosus)
   d) vaccine administration
      - Initially vaccinate and then repeat in 6 to 8 weeks
      - Does cause a high rate of abscessation

2. Contagious echthyma or Orf vaccine
   a) do not use unless orf is on the property
   b) vaccinate replacement animals around 8 months of age, immunity lasts approximately 3 years so may need to revaccinate older animals
   c) is a live vaccine that is infectious to humans, wear gloves
   d) vaccine administration
      - must disrupt the skin surface
      - scarify the skin in the axillary space
      - paint vaccine on with a cotton swab
   e) some recommend vaccinating neonates at 2 –3 days of age in the axillary space if a real problem in neonates
3. K 99 E. coli vaccine
   a) vaccinate with the same schedule as CD and T prelambing
   b) use if problem with E. coli scours

4. Rabies
   a) expensive but may be indicated in areas endemic for rabies or in high value animals
   b) there is a 3 year vaccine

**Parturition/Lambing**

- 1st stage of labor the ewe will often paw the ground, separate themselves from the rest of the flock, bloat and try to turn around to smell vaginal area. First time lambers the 1st stage of labor will last up to 12 hours, ewes have a shorter period. The purpose of this stage of labor is to dilate the cervix and the surrounding tissues to allow for the passage of the lamb. The lamb also becomes engaged in the pelvis.

- 2nd stage of labor lasts about an hour or less. This phase is what most people consider “labor”, straining by the ewe and expulsion of the lamb. Ewe lambs may push for an hour prior to presentation of the feet. If after an hour of straining no fetal parts are seen, a vaginal exam should be performed. Once fetal parts are seen, the lamb should be born within 30 – 45 minutes. If the lamb is not born within that time, assistance is indicated. Twins are born 20 to 30 minutes after the first lamb. Ewes will get up and down a lot during this stage of labor, and some may deliver by lying on their sides with their heads lifted off the ground.

- 3rd stage of labor consists of the expulsion of the placenta, usually within 4 hours of the birth of the lambs. The placenta is considered to be retained if it is not passed within 8 hours of birth. Ewes that retain the placenta are at increased risk of developing metritis, a uterine infection. The most common signs of metritis are depression, lack of appetite and a smelly vaginal discharge. Lochia or uterine discharge may be passed for several days. As long as the discharge does not smell bad, the discharge is considered normal.

**Ringwomb** – failure of the cervix to dilate. This condition occurs more in first time lambers but is certainly seen in older animals. The cause of this condition is unknown but a genetic component is suspected and some have suspected chlamydia infection. Others feel that it may be related to improper hormone signals due to placental abnormalities. No specific treatments exist. The ewe presents as straining but no fetal parts appear. The water bag may or may not be passed. The ewe appears to be in labor but the cervix fails to dilate. Some veterinarians have tried hormonal therapy but results are not consistent and have not been rewarding. Manual dilation of the cervix may work but the cervix may tear. If one attempts to dilate the cervix, the cervix must be massaged and dilated slowly, 20 – 45 minutes. C-section is often indicated especially if the placenta is visible. Many times the lambs are dead in spite of surgery.

**Pregnancy Toxemia** – is a condition that occurs usually in ewes that are either over or under conditioned that are carrying twins or triplets. The major sign of pregnancy toxemia is the ewe is off feed and depressed. Eventually the ewe may stagger or go down and drift off into a coma. This condition occurs because the ewe is deficient in glucose as all of the glucose she produces is taken up by the fetuses. Medical treatment consists off administration of intravenous glucose and oral administration of propylene glycol, vitamin B complex and
increase the energy of the diet by feeding grain. A c-section or induction of parturition is indicated if the ewe does not respond to medical treatment. Prevention of this condition can be accomplished by feeding 1 1/2 – 2 lbs of grain during the last 6 weeks of gestation.

Prolapsed vagina There are several causes as to why a ewe may prolapse her vagina.
- Causes – poor quality feeds, have increased rumen fill to meet energy demands and the vagina is pushed out due to intraabdominal pressure. Phytoestrogenic forages such as legumes may cause laxity of the vaginal supportive structures resulting in prolapse. Body condition score less than 2 and above 3.5. Overcrowding at the feed bunk which causes increased abdominal pressure. Previous history of vaginal prolapse or previous trauma during parturition.
- Treatment – replace the vagina after cleaning with a mild soap. An epidural is helpful in replacing and keeping the vagina in place. Administration of a drug such as Banamine® for pain and inflammation is helpful. Antibiotics may be indicated depending on the integrity of the cervix and vaginal wall. After replacing the vagina one can place a purse string suture around the vulva. The suture should be placed under the skin out where the woolless and wool areas meet. Another means to keep the vagina “in” is to use a “ewe saver”. The “Ewe saver” is a plastic spoon shape blade that is placed in the vagina and the ends of the retainer are tied to tags of wool. The ewe can lamb over the retainer.

Prolapse Truss. Using a harness method, a piece of twine or small rope is doubled over. The midpoint of the rope is placed on top of the neck’s base. The ends of the rope are crossed over and passed between the two front limbs. The ends are brought up under the elbows, over the ribs and then crossed over the back of the ewe. The ends are then passed between the udder and the hindlimbs and carried back up and crossed over in the area of the vulva. The two ends of the rope are then tied to the rope where it crosses the back. The pressure that the rope applies to the back and the area of the vulva will prevent the ewe from straining, keeping the vagina in place.

I feel it is very important to break the cycle of straining with epidurals or pain medications. Some ewes will continue to strain resulting in death of the lambs and absorption of toxins. These ewes need a c-section and the prognosis is guarded to poor.

Milk fever or hypocalcemia – hypocalcemia usually seen in ewes 2 to 3 weeks prior to lambing. Ewes will stagger or be unable to rise. In severe cases, the ewe may be comatose, Ewes with hypocalcemia may experience a prolonged 1st stage of labor. Treatment consists of giving calcium borogluconate 60 – 100 ml SQ. Can give intravenously but it should be administered very slowly with extreme caution.

Uterine prolapse – may occur at the time of lambing or several days after parturition. The uterus is cleaned off and the ewe/doe’s hindquarters are raised and the uterus replaced. Pouring 5 gals of water into the replaced uterus will help ensure the tips of the horns are unfolded. Antibiotics should be given as well as 20 IU of oxytocin; that is only 1 cc. Oxytocin is a powerful drug and a ewe never needs more than 1 cc at a time. Purse string suture around the vulva is optional. Check tetanus status and booster if necessary.