10-1-1972

Systems of Management for Ewes and Lambs

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WINTER LAMING

Most of the lambs produced in Indiana are born in the winter -- January through March. This is because late August to November is the period of greatest fertility in the ewe, and therefore, the traditional breeding season for most Indiana sheep flocks.

For many farmers, winter is the best time for lambing, since it does not interfere with crop production; pasture is available for finishing lambs; and early-born lambs can be marketed during the season of highest prices -- prior to July 1, when hot temperature reduces their gains.

Winter lambing does have some disadvantages, however. Lamb losses in January and February are usually greater because of the weather; shelter must be provided for both ewes and lambs; harvested forages must be provided during the period of greatest nutritional need; and the cost of feeding and storing of these forages together with removing manure produced, increases the direct costs of production. These increased costs must be recovered by higher lamb prices or the returns to labor and management will be reduced.

OUT-OF-SEASON LAMING

In an attempt to reduce some of the costs of housing, forage harvesting and manure handling and permit sheep to utilize pasture during periods of greatest nutritional needs, some sheep producers are considering other lambing periods. These include fall lambing (September-October) or spring lambing (March-April) on once-a-year basis and accelerated lambing every eight months (January-February, September-October, May-June). Under the accelerated system, two flocks can be alternated, producing lamb crops every 4 months. This gives more efficient use of rams, facilities and labor, a better flow of lambs to market and a more even distribution of income from the sheep enterprise throughout the year.

Any out-of-season lambing system requires breeds of sheep with a short anestrus that will mate other than during the fall months. Such breeds include the Rambouillet, Merino, Dorset and Tunis and usually their first-cross progeny. The Columbia, Corriedale, Targhee, Panama and Debouillet, which are related to the Rambouillet and Merino, tend to have the same breeding habits but to a lesser degree.

Many other breeds have individuals which have produced out-of-season lambs under natural conditions and may respond to selection for this trait; however, the progress will be slow. Ewes that do not respond should be given a second opportunity to mate during the normal breeding season to maintain a full production cycle.

Extending the breeding season by hormone treatment may have a practical use in promoting out-of-season breeding. The recommended procedure is 12-15 days exposure to progestogen followed by an injection of 500-700 IU of gonadotrophin at the end of progestogen treatment and then a second injection of gonadotrophin 16 days later with matings at both periods. This produces synchronization of estrus among ewes in the flock and normally results in shorter breeding and lambing periods.
NUTRITIONAL REQUIREMENTS OF EWES

The nutritional requirements of ewes that lamb at different times of the year are essentially the same, except for some variation in maintenance requirements, depending upon environmental temperature and housing. The primary difference is in the source of feeds available to them during gestation and lactation.

Table 1 gives the nutrient requirements of a 140-pound ewe, gaining 20 pounds during gestation, as recommended by the sheep nutrition subcommittee of the National Research Council, National Academy of Sciences (1), and a typical ration to meet these needs during the winter feeding period.

REDUCING FEED COSTS

Since 60-70 per cent of the direct yearly costs of keeping a ewe involve feed costs, considerable saving may result by utilizing less costly feeds during the last 6 weeks of gestation and the first 8-10 weeks of lactation, the two periods of greatest nutrient need.

VanKeuren and Parker (2) at the Ohio Agricultural Research and Development Center, Wooster, have shown that ewes lambing at different times of the year can make excellent use of pasture forages if properly planned and managed. They offer the following recommendations for different lambing times:

January Lambing

1. Creep feed lambs, wean at 60 days and finish in drylot.
2. Put dry ewes on pasture when available -- by mid-April.
3. Maintain a high stocking rate with rotational grazing and electric fencing.
4. Cut excess forage in spring for hay or silage.
5. Winter graze until lambing -- barn feed from January to April.

March Lambing

1. Ewes and lambs graze pasture together.
2. Market lambs from pasture by late June.

Table 1. Daily Nutrient Requirements of Ewes


<table>
<thead>
<tr>
<th>Body-weight</th>
<th>Total feed*</th>
<th>Digestible protein</th>
<th>Total digestible nutrients</th>
<th>Digestible energy</th>
<th>Typical ration</th>
</tr>
</thead>
<tbody>
<tr>
<td>lbs.</td>
<td>lbs.</td>
<td>lbs.</td>
<td>lbs.</td>
<td>Kcal</td>
<td></td>
</tr>
<tr>
<td>Non-Lactating and First 15 Weeks of Gestation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>140</td>
<td>3.4</td>
<td>0.15</td>
<td>1.7</td>
<td>3400</td>
<td>3-4 lbs. good quality legume hay or equiv.</td>
</tr>
<tr>
<td>Last 6 Weeks of Gestation</td>
<td>160</td>
<td>4.8</td>
<td>0.20</td>
<td>2.5</td>
<td>5000</td>
</tr>
<tr>
<td>First 8-10 Weeks of Lactation</td>
<td>140</td>
<td>5.5</td>
<td>0.24</td>
<td>3.1</td>
<td>6200</td>
</tr>
<tr>
<td>Last 12-14 Weeks of Lactation</td>
<td>140</td>
<td>4.6</td>
<td>0.20</td>
<td>2.4</td>
<td>4800</td>
</tr>
</tbody>
</table>

* Total air dry feed containing 90 per cent dry matter.
3. Ewes remain on maintenance pasture until breeding.
4. Use winter pasture until February -- barn feed from February to April.

**Lambing on Pasture (April–June)**

1. Requires little or no housing and limited amount of stored feed.
2. Use rotational grazing to control parasites and pasture stand.
3. Wean lambs by mid-July, drench and feed separately.
4. Move ewes to maintenance pasture until breeding.
5. After breeding, utilize winter pasture without housing.
6. Rotationally graze round bales on pasture.

**Winter Pasture (Tall Fescue)**

1. Reduces harvesting, storage and handling costs of winter forage.
2. Eliminates manure handling.
3. Provide shelter from snow and wind.
4. Harvest excess growth in May and June if not grazed.
5. Round-bale regrowth in July and August and leave in field.
6. Save late summer regrowth for winter grazing.
7. Rotationally graze round bales in winter.
8. Stimulate spring growth with nitrogen fertilizer in March–April and fall regrowth in August.

**GROWTH PATTERN OF FORAGES**

Figure 1 illustrates the growth pattern of tall grass in Ohio, which is similar to Indiana conditions. Van Keuren and Parker (2) report that the excess growth in May and June will produce 71 per cent more than needed for maintenance of a dry ewe or 41 per cent above the requirements for lactation for a constant flock size. This excess must be harvested for silage or hay to properly manage the pasture. Adequate nitrogen fertilization in March and August is necessary to stimulate proper growth.

L. H. Smith (3) has reported the yield of dry matter, digestible protein and total digestible nutrients (TDN) per acre of various forages in Indiana. He has developed a grazing calendar for sheep utilizing both permanent and temporary crops for a full year as follows:

a. Early spring grazing -- wheat or oats grazed before jointing.
b. Spring pasture -- Kentucky bluegrass and orchardgrass.
c. Early summer -- Bromegrass and timothy grazed 1 week and rested 3 weeks.
d. Summer -- Birdsfoot trefoil (north) or lespedeza (south).
e. Mid-summer -- Sudangrass in 14-inch rows as a temporary pasture.
f. Early fall -- Kentucky bluegrass or wheat during breeding season.
g. Late fall and winter -- tall fescue with excess growth in spring round baled and left in the pasture for winter feed.

Tall fescue furnishes the longest grazing period -- 1225 ewe days per year under normal

![TALL GRASS GROWTH PATTERN](image)

*Figure 1. Growth pattern of forages showing the surplus production during the early season. (Source: "Sheep Research and Development -- 1971, "Res. Sum. 53, July 1971, Ohio Agr. Res. & Dev. Cent., Wooster, O.)
stocking rates. A high level of management of both sheep and pastures, coupled with an adequate fertilization program, is needed to realize the greatest benefit from the above program. However, it will permit maximum use of forages from pastures with little need for harvested feeds, if the lambing programs can be adjusted to fit the normal pattern of forage production. For the most part, only shelled corn, and possibly some protein supplement with lower quality roughage, will be needed to meet the nutritional requirements of the ewe flock at the critical periods of their reproductive cycle. Additional energy is needed for "flushing" at breeding time, during the last 6 weeks of pregnancy and during the first 8 weeks of lactation. Specific recommendations are given in the Sheep Production Calendars prepared for the 1972 Purdue Area Sheep Day programs (4).

INTENSIFICATION OF SHEEP OPERATIONS

Traditionally, sheep have been raised on an extensive basis in Indiana, with a relatively low stocking rate per acre of land. In many cases, they are forced to utilize unimproved pastures or serve as weed killers. Under these conditions, their productivity and eventual profits are low compared to other livestock enterprises. A comparison of returns for sheep and beef cattle, presented by Clay Cundiff, Extension Area VII Farm Management Agent, at Purdue Farm Science Days, January 13, 1972 (5) shows that under the present average level of production of 120 per cent lamb crop and 80 pounds market weight per lamb, ewes are returning $2.78 to labor and management per year. If productivity can be increased to 160 per cent lamb crop with lambs marketed at 100 pounds, the return to labor and management can be increased to $19.29 per ewe, illustrating the profit potential of the sheep enterprise.

To compete economically with other enterprises on productive Indiana farms, sheep operations must be intensified to increase the return per acre of land used. This can be accomplished in the following ways:

1. Increase the stocking rate up to 8 or 10 ewes and their lambs per acre.
2. Rotationally graze ewes and lambs on a complete pasture program using electric fencing.
3. Co-graze sheep and cattle at the ratio of three sheep to one cow or steer.
4. Separate ewes with single lambs from those with twins, and creep feed the twin lambs on pasture.
5. Separate ewes and lambs daily, and allow the lambs to graze a clean pasture daily with creep feeding.
6. Use a semi-confinement system of only grazing the ewes and feeding the lambs in confinement.
7. Use a complete confinement system for both ewes and lambs.

The complete confinement system offers possibilities on highly productive farms because sheep and lambs cannot utilize the rapid growth of forage in the spring. It therefore can be harvested, stored and fed throughout the year. If forage is not raised, corn silage and corn grain can be substituted. Such a system requires greater investment in housing, storage facilities and automated equipment, but will maximize the return per acre from sheep.

Successful confinement systems for sheep are now in operation. Research in this area at the Dixon Springs Agricultural Center in Illinois (6) and at Virginia Polytechnic Institute (7) indicates the following advantages:

1. Harvesting and feeding forage from highly productive tillable land will result in more complete utilization and greater production per acre than when pastured.
2. Internal parasites will be more easily controlled.
3. Ewes can be fed according to need
rather than appetite, particularly during
given stages of the production cycle when
proper nutrition may be more critical.
4. Losses to predators can be more eas-
ily controlled.
5. Automation of the feeding program is
more practical.
6. Sheep numbers can be expanded with-
out an increase in acreage available for pas-
turing or forage production.
7. Some of the operations used in many
of the accelerated lambing operations are
more easily managed.

The degree of intensification depends up-
on the type of farming operations, available
housing, investments in capital and equipment,
willingsness to provide increased management,
and the desire to increase returns from the
sheep enterprise. Sheep producers with
farms adapted to forage production and with
limited housing and capital can probably best
increase returns by adjusting their lambing
programs to available forage production and
intensify the pasture phases of management.
Those with limited forage acreage should con-
sider the semi-confinement or complete con-
finement systems, using complete forage-
concentrate rations that can be fed with auto-
mated equipment.

LAMB MANAGEMENT AND NUTRITION

The growth of a young nursing lamb is
highly correlated with the milk production of
the ewe. Since the lamb will eat very little
solid food until 2 or 3 weeks old, the cheap-
est way to promote lamb growth is to feed
the ewe for adequate milk production. Here
are facts concerning milk production in the
ewe to keep in mind:

1. Milk secretion increases to about the
4th week of lactation, then declines rather
steadily until the 10-12th week.
2. Ewes with twins will produce more
milk than those with singles, but not enough
to promote the same rate of growth in twins
as with a single lamb.

3. Twin lambs usually need to be penned
with the ewe longer than a single lamb to as-
sure proper nursing.
4. Nutritional requirement of the ewe is
greatest during the first 8 weeks of lactation.
5. Mastitis will reduce milk flow and
cause lambs to steal from other ewes, thus
spreading the disease to healthy udders.
Wean lambs and raise them artificially.
6. The more aggressive lamb in a pair
of twins may deprive the other lamb of ade-
quate milk.
7. Twin lambs will consume more creep
feed than singles to satisfy their energy needs.

In light of these facts, ewes with twins
should be separated from those with singles
and fed a higher level of concentrates during
lactation. A creep should be provided for
all lambs, both twins and singles, at about
2 weeks of age to meet the nutritive require-
ments of the lambs when the ewe's milk se-
cretion begins to decrease at 4 to 6 weeks.
The creep mixture should be high in energy,
palatable and contain from 15-20 per cent
protein. Here are examples of creep rations:

1. Without hay
   Ground or crushed corn 55.0%
   Alfalfa meal 30.0%
   Soybean meal 10.0%
   Molasses 4.0%
   Salt 0.5%
   Antibiotic supplement 0.5%

2. With hay
   Ground or crushed corn 60.0%
   Oats 20.0%
   Wheat bran 10.0%
   Soybean meal 10.0%
   Ground limestone 1.0%
   Trace mineral salt 0.5%
   Alfalfa hay - free choice

FEEDING ORPHAN LAMBS

Orphan lambs -- lambs from ewes with
an inadequate milk supply due to mastitis or
extra lambs from triplets or multiple births
can be artificially raised on liquid milk replacer diets after they are 24 hours old. They should obtain some of the first colostrum milk of a ewe, if possible. Milk replacers containing 30 per cent fat and 25 per cent milk protein give best results and should be fed cold. Multi-nipped containers can be used for large numbers of orphan lambs. After 2 weeks of age, the milk replacer should be restricted to encourage consumption of dry creep feed. Lambs should be vaccinated against the enterotoxemia before consuming the dry feed.

The following ration has proven satisfactory for encouraging young lambs to eat:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground shelled corn</td>
<td>45.0%</td>
</tr>
<tr>
<td>Ground alfalfa hay</td>
<td>20.0%</td>
</tr>
<tr>
<td>Soybean meal</td>
<td>25.0%</td>
</tr>
<tr>
<td>Molasses</td>
<td>8.0%</td>
</tr>
<tr>
<td>Steamed bonemeal</td>
<td>1.5%</td>
</tr>
<tr>
<td>Trace mineral salt</td>
<td>0.5%</td>
</tr>
<tr>
<td>Aureomycin or Terramycin</td>
<td>2.5 gm/100 lb.</td>
</tr>
</tbody>
</table>

As soon as the lambs are eating dry feed well, change them to a high quality finishing ration and manage them as early-weaned lambs. They can be weaned from liquid milk replacers at 25-30 pounds bodyweight or when they are 30-45 days old.

WEANING THE LAMBS

At 8 weeks, milk secretion of the ewe is half or less the amount produced at 4 weeks, and most lambs can be weaned at this time. The lambs should be vaccinated against enterotoxemia 2 weeks before weaning.

LAMBS have been successfully weaned at 5-6 weeks old, but if the ewe is still milking well up to 60 days, there appears to be no advantage in earlier weaning. A minimum weaning weight of about 40 pounds is desirable. The lambs should be separated from the ewes and placed in drylot or on a clean pasture that has not been grazed by sheep for 4 weeks. Since the lambs become infect-
ed with internal parasites by grazing with the ewes, early weaning at 60 days will reduce parasite infestation from pasture. For best results, lambs should be drenched shortly after weaning.

To reduce milk secretion in the ewe, the concentrates in the ration should be eliminated 2 days before weaning and the water supply held off for 1 day. The feed and water intake should be restricted following weaning until the udder shrinks and milk flow ceases. Only ewes in discomfort should be milked out, as the pressure in the udder is largely responsible for terminating milk secretion.

LAMB NUTRITION AND MANAGEMENT AFTER WEANING

Following weaning, the lambs should be placed on a finishing or growing ration containing from 12-15 per cent protein. The energy level of the ration will depend upon performance or feeding program desired. Lambs being finished for market will need a high energy ration of 60-75 per cent concentrates and a limited roughage. Those grown as replacements should be limited to 40-50 per cent concentrates.

Following are examples of lamb finishing rations which can be fed ground and/or pelleted:

1. **High Concentrate**
   - Alfalfa meal: 30.0%
   - Shelled corn: 60.0%
   - Soybean meal: 10.0%
   - Trace mineral salt: 0.5%
   - Antibiotic: 0.5%
   - Vitamin supplement

2. **High Roughage**
   - Alfalfa meal: 55.0%
   - Shelled corn: 35.0%
   - Soybean meal: 5.0%
   - Molasses: 5.0%
   - Trace mineral salt: 0.5%
3. Purdue 58 Pellet

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground corn cobs</td>
<td>39.5%</td>
</tr>
<tr>
<td>17% alfalfa meal</td>
<td>20.0%</td>
</tr>
<tr>
<td>Ground shelled corn</td>
<td>27.0%</td>
</tr>
<tr>
<td>Soybean meal</td>
<td>7.0%</td>
</tr>
<tr>
<td>Molasses</td>
<td>5.0%</td>
</tr>
<tr>
<td>Steamed bonemeal</td>
<td>1.0%</td>
</tr>
<tr>
<td>Trace mineral salt</td>
<td>0.5%</td>
</tr>
<tr>
<td>2000 IV vitamin A and 212 IV</td>
<td>0.075%</td>
</tr>
</tbody>
</table>

The roughage portion can be obtained from pasture fed as hay or silage or mixed with the concentrates. Mixtures should be pelleted to reduce dust and prevent the lambs from sorting out the ingredients. These rations may be self-fed if the lambs have been vaccinated against enterotoxemia and have been creep-fed prior to weaning. An excellent complete pellet containing both roughages and concentrates is the Purdue 58 pellet (8) containing 60 per cent roughage and 40 per cent concentrates. If more energy is needed, the proportion of ground shelled corn can be increased. Additional rations are listed in The Sheepman's Production Handbook prepared by the Sheep Industry Development Program (9).

CONFINEMENT FEEDING OF LAMBS

Many sheep producers favor finishing lambs in confinement, either in drylot or on slotted floors. Generally, only lambs born in March and April should be finished on pasture. Confinement feeding as such may not increase gains, but it does increase ease of handling and feeding, removes many factors associated with weather, and reduces internal parasite infestation and loss from predators. Lambs tend to finish more evenly and sick or "poor doing" lambs can be identified more quickly. Confinement feeding lends itself to automation, thus reducing labor costs connected with feeding.

Most lambs weaned at 60 days will need another 60 to 90 days to reach a market weight of 100 pounds. Spring lambs not marketed by July 1 should be shorn and kept in confinement during the hot summer period. High concentrate rations will produce less internal heat than high roughage rations. Keep plenty of fresh water and a salt-mineral mixture available at all times.

Remember that 80 per cent of the income from the sheep enterprise is derived from the sale of lambs produced. After the lambs have been weaned, the major effort should be devoted to the finishing and marketing of the lamb crop.

REFERENCES


