Sheep are ideally suited to small-scale and part-time farming operations in Pennsylvania due to their adaptability and nutritional versatility. Sheep can be fed a diet high in concentrates (similar to swine) or solely a forage diet. Furthermore, marketing opportunities are plentiful in the northeastern United States. Lambs can be marketed at any age and often vary in weight from 40 to 160 pounds, depending on the time of year and market demand. This publication will focus on accelerated production practices to take advantage of both off-season and holiday markets.

There are about 3,800 sheep producers in Pennsylvania with around 80,000 ewes, rams, and replacement lambs in their breeding inventory. They produce around 65,000–70,000 lambs annually, with about 55,000–60,000 marketed worth an estimated $10 million. Although most ewes produce lambs in the spring, lambs can be born from September through May. An effective method for increasing revenue from a lamb-production enterprise is to increase the number of lambs produced per ewe each year. With high-level management and production skills, it is possible to produce three lamb birthing cycles per ewe every two years. This technique is called accelerated lambing, which combines spring, off-season, and holiday lamb production into one enterprise. It also allows for increased efficiency in use of labor, land, equipment, and buildings.
Marketing

Lambs are marketed through auctions, slaughterhouses, brokers, specialty stores, and direct-to-consumer sales. Regardless of market strategy, the quality of the lambs and proper size for the season have a dramatic impact on the final price received for your lambs. The ideal market weight is 110 to 160 pounds for spring and off-season lambs and 40 to 60 pounds for holiday lambs.

The following table contains time schedules for optimal breeding, lambing, and marketing for both off-season and accelerated lamb production. Many religious and ethnic groups serve lamb for special traditional meals. These groups comprise a major market for lamb, which is important for producers to keep in mind when planning production cycles to maximize profit.

### Table 1. Breeding, lambing, and marketing schedules for off-season and accelerated lamb production.

<table>
<thead>
<tr>
<th>Production Method</th>
<th>Breeding Months</th>
<th>Lambing Months</th>
<th>Marketing Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off-season</td>
<td>May–June</td>
<td>October–November</td>
<td>December–January</td>
</tr>
<tr>
<td>Accelerated</td>
<td>May–June</td>
<td>October–November</td>
<td>December–February</td>
</tr>
<tr>
<td>First lambing</td>
<td>January–February</td>
<td>June–July</td>
<td>August–October</td>
</tr>
<tr>
<td>Second lambing</td>
<td>September–October</td>
<td>February</td>
<td>April–May</td>
</tr>
</tbody>
</table>

Getting Started

A variety of production and management strategies can be used in a lamb enterprise. Before starting to raise sheep and lambs commercially, you should develop a marketing plan and make an inventory of your available land, labor, and capital resources. The smallest production unit to consider for lamb enterprises is a flock of around thirty to thirty-five ewes serviced by one ram. Breeding ewes usually costs at least $200 per head and a good ram costs at least $500. Ewes usually produce one to three lambs annually (gestation period of five months). Lambs are ready for market anytime from weaning up to six months after birth; therefore, it is possible to receive a return on your initial investment rather quickly.

If you have little or no previous experience with sheep, starting with a few bred ewes and going through a lambing season could be a valuable experience. It may help you decide whether you want to be in the sheep business, while you develop husbandry skills, investigate markets, and test profitability. Also, you may want to investigate the Penn State Extension Sheep Management and Production online course for additional helpful information (https://extension.psu.edu/sheep-management-and-production).

It is possible to breed ewes more often than once a year when a number of factors are favorable. The ewes must be capable of breeding in the spring, fall, and winter. Adequate buildings, equipment, and feed must be available to handle ewes and lambs during the entire year. High-level management, marketing, and production skills are critical to operate spring, off-season, and holiday lamb production enterprises consecutively.

The following are the most significant advantages of an accelerated lamb-production program:
- Market prices are higher during the off-season.
- Premium prices are paid for the smaller holiday lambs.
- Holiday lambs are marketed after weaning to reduce feed costs.
- Increased market options are available.

Before deciding to use an off-season or accelerated lambing program, you should consider these important management concerns:
- Lambing rates are approximately 25 percent lower than in a spring lamb enterprise.
- Breeding is more difficult than with spring lambs.
- Lambing may interfere with the harvesting of some crops.
- Ewes must be replaced more frequently.
- Parasites and diseases must be monitored more carefully.
- Incidence of mastitis is increased, and more careful monitoring is needed.
- Labor is required year-round.
Breeding and Nutrition

A well-planned reproductive management program is important to maximize profitability. Sheep are seasonal breeders and are most fertile during September, October, and November.

Day length is the key environmental factor affecting reproduction in ewes. However, certain breeds of sheep seem to be less affected by day length than others. These breeds do well in an accelerated lambing program because a large percentage of their population will breed through the winter and into the spring. Crossbred ewes developed from these breeds will often breed better out of season. In addition, crossbred ewes tend to reach sexual maturity earlier. Table 2 contains a list of sheep breeds recommended for an accelerated lambing program.

Table 2. Sheep breeds available in Pennsylvania that are recommended for an off-season and holiday lamb meat-production enterprise.

<table>
<thead>
<tr>
<th>Breed</th>
<th>Classification</th>
<th>Approximate Mature Weight*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dorper</td>
<td>hair</td>
<td>150</td>
</tr>
<tr>
<td>Dorset</td>
<td>medium wool</td>
<td>140</td>
</tr>
<tr>
<td>Finnsheep</td>
<td>medium wool</td>
<td>120</td>
</tr>
<tr>
<td>Katahdin</td>
<td>hair</td>
<td>135</td>
</tr>
<tr>
<td>Polypay</td>
<td>medium wool</td>
<td>150</td>
</tr>
<tr>
<td>Rambouillet</td>
<td>fine wool</td>
<td>150</td>
</tr>
<tr>
<td>Romanov</td>
<td>black wool</td>
<td>130</td>
</tr>
<tr>
<td>St.Croix</td>
<td>hair</td>
<td>130</td>
</tr>
<tr>
<td>Targhee</td>
<td>medium wool</td>
<td>150</td>
</tr>
</tbody>
</table>

*This weight is for ewes; ram body weight is 1.55 to 1.75 times higher.

Several factors must be considered when developing an accelerated lambing program. Providing ewes with proper nutrition at all stages of their lives will optimize reproductive performance by reducing the age of sexual maturity and the interval between pregnancies. Ewes should be well identified, and records should be maintained on their breeding activity, including which ewes are bred to which rams and the number and weight gains of the resulting lambs.

A veterinarian should check rams for fertility before they are used for breeding. During the breeding season, rams should be fitted with marking harnesses or have their chests painted so that they leave clear, visible marks on the ewes they have bred. Observe breeding tendencies carefully and cull any rams that are not effective.

During the fall when the mature flock is reproductively active, all ewes exposed for breeding should be bred in about seventeen days. In a spring breeding season, it is unlikely that all exposed ewes will be bred. This is due to several factors, including lower libido and fertility of rams, as well as seasonal anestrus (lack of estrus and ovulation) in some ewes. Selecting replacement ewes from animals that breed in the spring will increase the percentage of animals in the flock that will most benefit the accelerated breeding program.

Certain management practices will induce ewes to breed out of season. One is to separate rams and ewes completely for sixty days prior to breeding. Complete separation means no contact, sight, sound, or smell for the entire isolation period. This technique increases the number of ewes bred and lambs conceived during the first week of the breeding season.

The nutritional needs of ewes should be monitored closely during the reproduction phase. Using feeds high in energy and protein approximately two weeks before breeding can increase the ovulation rate and increase the chance of multiple births. It is important to maintain good body condition throughout the gestation period and carefully monitor health during lactation. Although ewes often lose weight during lactation without affecting future lamb crops, proper body condition should be maintained at all times. Nutritional requirements are reduced following lactation.

A way to lower costs and extend the pasture season is to grow winter wheat, barley, rye, and brassicas. These crops are grown during fall, winter, and spring months and provide good pastures in the spring and fall if adequate moisture is available. There is no loss in grain yield if sheep are taken off small grain pastures by mid-April. Besides quality feed, sheep require some free-choice minerals for normal growth and maintenance.

An excellent source of sheep nutrition information is the National Research Council’s (NRC) book, Nutrient Requirements of Small Ruminants. This information is published by the National Academies Press and can be purchased at [https://www.nap.edu/catalog/11654/nutrient-requirements-of-small-ruminants-sheep-goats-cervids-and-new](https://www.nap.edu/catalog/11654/nutrient-requirements-of-small-ruminants-sheep-goats-cervids-and-new).
Health Program

A thorough preventive health program, rather than a treatment plan, is strongly recommended in an accelerated lamb-production system. A vaccination program to prevent diseases known to occur in your flock and local area is critical. Your veterinarian should be consulted to help you develop a health program.

A healthy flock should be the goal of every sheep producer. A flock health program is essential, and the following considerations are critical:

- Check animals for signs of illness, external and internal parasites, and contagious diseases before buying them.
- Quarantine newly purchased animals for at least twenty-one days in a dry, well-ventilated area.
- Maintain clean, fresh water.
- Provide uncontaminated feeding areas.
- Trim hooves, when necessary, to avoid lameness problems.
- Use vaccines, antibiotics, and mineral supplements as needed.
- Identify ewes previously vaccinated for clostridium types C and D and give them a booster shot four to six weeks before lambing season begins.
- Identify ewes not vaccinated for clostridium types C and D before lambing. Vaccinate their lambs when they are ten to twenty days old and give them a booster injection three weeks later.

Ewes should be sheared in early spring. At that time, they also should be evaluated for both internal and external parasites. Internal parasites should be evaluated using the FAMACHA program to assess anemia and thus only treat animals requiring treatment. Internal parasites may also be a problem for lambs, especially during wet seasons. Lambs cannot be dewormed before six to eight weeks or thirty-five pounds (always consult your veterinarian prior to deworming young lambs). You should take precautions to reduce the possibility of lambs acquiring worms by always providing clean water, keeping all feed in feeders, and minimizing crowding and stress.

Docking of tails of all healthy lambs at four to seven days is generally recommended for most operations. Docked tails are more sanitary than undocked tails and provide a more desirable appearance when showing animals. However, you must understand your market because some consumers want lambs with undocked tails.

Fencing and Housing

An accelerated lamb production system requires more investment in fencing, housing, lambing, and animal-handling facilities than most other lamb enterprises. However, housing and equipment for sheep do not have to be expensive and can be very minimal. Ideally, existing barns and sheds can be adapted for sheep, or adequate shelter can be provided for about $50 to $75 per ewe. The Sheep Housing and Equipment Handbook from the Midwest Plan Service is a useful reference for buildings and animal-handling facilities.

Adequate shelter for sheep can be provided by small, open sheds located on a well-drained site, preferably on a south-facing slope with shed openings facing away from prevailing winds. This type of site helps the lot to dry faster and makes it easier to maintain. Consider grading and filling low spots with shale-like material to achieve desired slopes as sheep do not tolerate mud. Locate handling facilities so sheep can be sorted easily and provided routine care with minimal effort.

Perimeter fencing for sheep must serve two primary purposes: (1) keep the sheep inside the pasture, and (2) keep potential predators out of the pasture. Costs vary considerably for fencing due to curves and land contours that will require additional posts. Perimeter fencing for sheep ranges from about $3 to $8 per linear foot. High-tensile fencing is commonly used for sheep production, but woven wire and wooden fences are other alternatives. Select the best alternative for your operation based on price, longevity, maintenance, vegetation, animal pressure, and climate.

Regulations

All agricultural producers in Pennsylvania, including small-scale and part-time farms, operate under Pennsylvania’s Clean Streams Law. A specific part of this law is the Nutrient Management Act, portions of which (e.g., Act 38) may pertain to you depending on the mix of enterprises you have on your farm (in particular, animal operations). Because all farms are a potential source of surface or groundwater pollution, you should contact your local County Conservation District to determine what regulations may pertain to your operation. You should also check your local zoning regulations to make sure that your intended business activities are permitted in your location.
Sample Budgets

The sample budgets included in this publication provide examples of the costs and returns for accelerated and off-season lamb production and guidelines for initial resource requirements. Your initial resource requirements will vary if you have existing equipment or structures that can be adapted for use in your enterprise. This sample budget should help ensure that all costs and receipts are included in your calculations. Costs and returns are often difficult to estimate in budget preparation because they are numerous and variable. Therefore, think of the data in these budgets as approximations and make appropriate adjustments using “Your Estimate” column to reflect specific situations.

You can make changes to the interactive PDF budget files for this publication by inputting your own prices and quantities in the green outlined cells for any item. The cells outlined in red automatically calculate your revised totals based on the changes you made to the cells outlined in green. You will need to click on and add your own estimated price and quantity information to all of the green outlined cells to complete your customized budget. When you are done, you can print the budget using the green Print Form button at the bottom of the form. You can use the red Clear Form button to clear all the information from your budget when you are finished.

Risk Management

There are several risk-management strategies you may want to employ for your farm. You should insure your buildings and equipment, and you may want to insure your crops and income as well. Insuring your farm may be accomplished by consulting your insurance agent or broker.

You can also use federally subsidized crop insurance for individual crops or your whole-farm income through a program called Whole-Farm Revenue Protection (WFRP). WFRP insures the revenue of your entire farm (including livestock) by guaranteeing a percentage of your approved farm revenue. WFRP uses information from the past five consecutive years of your Schedule F tax records to calculate the policy’s approved revenue guarantee. The sign-up deadline for WFRP is March 15 for calendar year and early fiscal year tax filers and November 20 for late fiscal year tax filers.

The grid-based Rainfall Index Pasture, Rangeland, and Forage (PRF) policy available throughout Pennsylvania may be a good choice for insuring your hay crops and pastures. Advantages of this coverage include flexibility of when to insure during the year and how much to insure (you are not required to insure all your acreage). You can also adjust coverage to better match the value of your crop and the productive capacity of your land.

A price protection program for lamb producers is also available through crop insurance agents that insures against declines in slaughter lamb prices. The Livestock Risk Protection (LRP) for lamb policy (for animals expected to weigh between 50 and 150 lb. at the end of the insurance period) can be purchased weekly and the length of insurance can be set for 13, 26, or 39 weeks. You can select coverage prices ranging from 80–95 percent of the expected ending value. An indemnity will be paid if the actual ending price you obtain is below the coverage price at the end of the insurance period.

For more information on agricultural business insurance, please see Agricultural Alternatives: Agricultural Business Insurance. More information on crop insurance for livestock producers can be found in the publication Crop Insurance for Pennsylvania Field Crops (https://extension.psu.edu/crop-insurance-for-pennsylvania-field-crops).
Sample Accelerated Lambing Budget (two-year estimate)
Assumes lambing three times in two years with an average of 1.65 lambs born per ewe each lambing and
Replacements kept at rate of 16% or 0.16 ewe lambs per ewe.
Marketing 4.63 lambs per ewe at 60 lbs.

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Unit</th>
<th>Price</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reciepts</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lambs (95.4 lb/ewe sold @ $2.75/lb.)¹</td>
<td>277.8</td>
<td>pounds</td>
<td>$2.75</td>
<td>$763.95</td>
</tr>
<tr>
<td>Wool (including government payment: 8 lbs. X $0.40/lb.)</td>
<td>16</td>
<td>pounds</td>
<td>$0.40</td>
<td>$6.40</td>
</tr>
<tr>
<td>Cull ewe (15 lb. sold/ewe @ $1.00/lb)²</td>
<td>30</td>
<td>pounds</td>
<td>$1.00</td>
<td>$34.00</td>
</tr>
<tr>
<td>Cull ram</td>
<td>0.004</td>
<td>ram</td>
<td>$500.00</td>
<td>$2.00</td>
</tr>
<tr>
<td><strong>Total receipts</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>$804.35</strong></td>
</tr>
</tbody>
</table>

Variable Costs
Feed for Lambs and replacements
Starters grain                                        | 16.5     | pounds | $0.19 | $3.14   |
Starter hay                                            | 8.25     | pounds | $0.15 | $1.24   |
Finishing grain                                         | 92.6     | pounds | $0.10 | $9.26   |
Finishing hay                                           | 46.3     | pounds | $0.15 | $6.95   |
Replacements grain                                      | 38.4     | pounds | $0.15 | $5.76   |
Replacements hay                                        | 19.2     | pounds | $0.15 | $2.88   |
Feed for Ewes                                           |          |       |       |         |
Grain                                                   | 397.5    | pounds | $0.13 | $51.68  |
Hay                                                     | 600      | pounds | $0.10 | $60.00  |
Minerals                                                | 12       | pounds | $0.80 | $9.60   |
Pasture maintenance                                     | 0.34     | acre   | $50.00 | $17.00 |
Health program                                          | 1        | ewe    | $30.00 | $30.00 |
Shearing                                                | 1        | ewe    | $10.00 | $10.00 |
Marketing                                               | 1        | ewe    | $30.00 | $30.00 |
Supplies, miscellaneous expenses                        | 1        | ewe    | $30.00 | $30.00 |
Labor                                                   | 20       | hours  |       |         |
Interest on operating costs                             | 1        | ewe    | $9.06  | $9.06   |
**Total variable costs**                                |          |       |       | **$276.55** |

Fixed Costs
Repairs                                                 | 1        | ewe    | $14.54 | $14.54 |
Ram replacement                                         | 1        | ram    | $20.00 | $20.00 |
Depreciation                                            | 1        | ewe    | $7.90  | $7.90  |
Equipment and fence                                     | 1        | ewe    | $7.90  | $7.90  |
Building charge                                         | 1        | ewe    | $27.50 | $27.50 |
Interest charge                                         | 1        | ewe    | $7.90  | $7.90  |
Land charge                                             | 0.17     | acre   | $42.00 | $7.14   |
**Total fixed costs**                                   |          |       |       | **$92.88** |

**Total costs**                                         |          |       |       | **$369.43** |

**Returns**
Returns over variable costs                             |          |       |       | **$527.80** |
Net returns                                             |          |       |       | **$434.92** |

1. Assumes 1.65 lambs per ewe per lambing and includes a 3% death loss. For two years this is 4.95 lambs.
2. Assume a culling rate of 10% per year and 150 pounds per cull ewe.
3. A higher quality hay is required for starting lambs than maintenance for ewes and rams.
   You should monitor local markets and contact suppliers to determine current prices for all items contained
   in this sample budget.
Sample Holiday Lamb Budget (annual estimate)
Replacements kept at rate of 16% or 0.16 ewe lambs per ewe
Marketing 1.59 lambs per ewe
Marketed November through May. 1.65 lambs born per ewe marketed at 60 pounds

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Unit</th>
<th>Price</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Receipts</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lambs (95.4 lb/ewe sold @ $2.75/lb.)¹</td>
<td>95.4</td>
<td>pounds</td>
<td>$2.75</td>
<td>$262.35</td>
</tr>
<tr>
<td>Wool (including government payment: 8 lbs. X $0.40/lb.)</td>
<td>8</td>
<td>pounds</td>
<td>$0.40</td>
<td>$3.20</td>
</tr>
<tr>
<td>Cull ewe and ram (15 lb. sold/ewe @ $1.00/lb) + $2/ram²</td>
<td>15</td>
<td>pounds</td>
<td>$1.00</td>
<td>$15.00</td>
</tr>
<tr>
<td>Cull ram</td>
<td>0.004</td>
<td>ram</td>
<td>$500.00</td>
<td>$2.00</td>
</tr>
<tr>
<td><strong>Total receipts</strong></td>
<td></td>
<td></td>
<td></td>
<td>$280.55</td>
</tr>
</tbody>
</table>

**Variable Costs**
Feed for Lambs and replacements
- Starter grain: 17.5 pounds @ $0.19/pound = $3.33
- Starter hay³: 8.75 pounds @ $0.15/pound = $1.31
- Finishing grain: 31.8 pounds @ $0.15/pound = $4.77
- Finishing hay: 15.9 pounds @ $0.15/pound = $2.39
- Replacements grain: 19.2 pounds @ $0.15/pound = $2.88
- Replacements hay: 9.6 pounds @ $0.15/pound = $1.44

Feed for Ewes
- Grain: 132.5 pounds @ $0.13/pound = $17.23
- Hay: 480 pounds @ $0.15/pound = $72.00
- Minerals: 6 pounds @ $0.80/pound = $4.80
- Pasture maintenance: 0.17 acre @ $50.00/acre = $8.50
- Health program: 1 ewe @ $15.00/ewe = $15.00
- Shearing: 1 ewe @ $5.00/ewe = $5.00
- Marketing: 1 ewe @ $15.00/ewe = $15.00
- Supplies, miscellaneous expenses: 1 ewe @ $15.00/ewe = $15.00
- Labor: 8 hours
- Interest on operating costs: 1 ewe @ $2.00/ewe = $2.00

**Total variable costs** $170.64

**Fixed Costs**
- Repairs: 1 ewe @ $7.00/ewe = $7.27
- Ram replacement: 1 ram @ $10.00/ram = $10.00
- Depreciation: 1 ewe @ $3.95/ewe = $3.95
- Equipment and fence: 1 @ $3.95 = $3.95
- Building charge: 1 @ $13.75 = $13.75
- Interest charge: 1 @ $3.95 = $3.95
- Land charge: 0.17 @ $21.00 = $3.57

**Total fixed costs** $42.87

**Total costs** $213.51

**Returns**
- Returns over variable costs
- Net returns

$109.91
$67.04

1. Assumes 1.65 lambs per ewe per lambing and includes a 3% death loss. For two years this is 4.95 lambs.
2. Assume a culling rate of 10% per year and 150 pounds per cull ewe.
3. A higher quality hay is required for starting lambs than maintenance for ewes and rams.
You should monitor local markets and contact suppliers to determine current prices for all items contained in this sample budget.
Initial Resource Requirements

• Land: 25 acres

• Labor: 8 hours x 36 head (1 ram and 35 ewes) = 280 hours

• Capital: Livestock
  $200 x 35 ewes, $7,000–$8,000
  1 ram $500–$600
  Fencing $3–$8 per linear foot
  Hoof-trimming equipment
  Handling facilities (gates or chutes)
  Feeding and watering equipment
  Pickup and livestock trailer

This publication was developed by the Small-scale and Part-time Farming Project at Penn State.

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