

Evaluating Farm Resources and Sheep Production Systems

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The use of imperial and metric measurement in this factsheet reflects the way information is reported by the original source for the sheep industry.

INTRODUCTION

When a new producer enters the sheep industry, or when existing producers contemplate a change in their farming enterprise, selecting a sheep production system is one of the most important considerations. The resources that are available to the farm (e.g., land, buildings, labour, machinery, available markets) must be evaluated and the proper production system used, to maximize the available farm resources.

This factsheet describes how to select the optimal sheep production system, given the impact of various farm resources, including land, buildings, labour, machinery and the available markets. The optimal production system will be the one that best utilizes available resources, thereby improving the profitability of the operation (Figure 1).

LAND

Land purchase is likely the largest start-up expense for most sheep operations. However, the extra debt load imposed on the farming business by purchasing the land may be enough to make the operation unsuccessful.



Figure 1. The optimal production system will be the one that best utilizes available resources.

Sheep can also be raised on rented land. Renting the land and buildings may make the farming enterprise more viable, unless other enterprises or employment pay for the farm mortgage. In some cases, it may also be possible to find innovative solutions to access more land resources, such as providing vegetation control services (e.g., silvopasture, solar grazing). OMAFRA has many financial planning factsheets that may be helpful, available at ontario.ca/agbusiness.

The productivity of the land must also be evaluated to determine the carrying capacity of pastures and the estimated yields from crop production. The available land and its expected yield will help determine the on-farm feed resources available and how much purchased feed will be needed. Consult

an agronomist and a nutritionist to evaluate the capacity for feed production and the feed resources required for a new or expanding enterprise. Most new or expanding operations will also need to develop a [Nutrient Management Strategy](#).

BUILDINGS

The farm buildings must be evaluated to determine:

- the space available for the sheep
- the space available for feed storage and handling
- the suitability of the building for winter lambing

The amount of space an animal needs will differ by age and stage of production. Failure to provide sufficient space will often lead to health challenges and loss of productivity.

Ewes and Lambs

Based on the recommendations in the [Code of Practice for the Care and Handling of Sheep](#), each ewe requires 0.7–6.5 m² (7–70 ft²) of floor space, depending on the stage of production and floor surface. Dry ewes need less space (0.93 m² (10 ft²) at minimum), whereas pregnant and lactating ewes require more space (1.4–1.5 m² (15–16 ft²) at minimum). Prolific and/or larger breeds of sheep will require more space than the minimum recommendations (1.86 m² (20 ft²)). Dry ewes are easier to house than lactating ewes. Dry ewes can be kept in open sheds, whereas lactating ewes require more protection. When lactating ewes are housed, pen space and feeder space become extremely important.

In most cases, sheep do not need to be kept warm, but at lambing time, a warm dropping or lamb area may be needed to reduce lamb mortality from hypothermia. An insulated area may be necessary for winter lambing. All lambing areas must be warm and dry, not humid and damp. Space for hospital pens, warming facilities and to artificially rear lambs may also be beneficial at lambing time.

Rams

Rams need a minimum of 1.0 m² (11 ft²) of space. It is important that there is a separate area available to house rams so they can be removed from the ewe flock when it is necessary to organize lambing groups.

Lambs

Space for weaned market lambs and breeding stock replacements should also be accounted for when determining the capacity of facilities. Feeder lambs can be housed in open front sheds or feedlots and require a minimum of 0.6 m² (6.5 ft²).

DESIGNING SHEEP FACILITIES

In many cases, it is the amount of feed space in the barn that determines the number of sheep that can be kept. Pens should be long and narrow to make efficient use of barn space. If 40.6 cm (16 in.) of head space per ewe is allowed and the pen depth is 3.5–4.7 m (11.5–15 ft), then the space provided to the ewe will be appropriate. Walk-through feeders are very useful when feeding lactating ewes. See the OMAFRA factsheets [Feeding Systems for Sheep](#) and [Low Labour Feeding Systems and Bunk Design for Sheep](#) for more information on the design of sheep feeding facilities for efficient management.

Figure 2 shows an example floor plan for a 19.5-m (64-ft) barn with recommended floor and bunk space for lactating ewes. In this figure, there are 4 areas where the ewes can eat so the barn will accommodate a ewe for every 10.2 cm (4 in.) of barn length. Therefore, a facility with this design would have the capacity to feed 192 ewes.

The calculated barn capacity assumes that the ewes will eat at the same time. Table 1 shows how floor space and feeder space needs can change at different stages of production. Dry ewes fed ad libitum hay only require 15.2 cm (6 in.) of head space, and floor space becomes the limiting factor with the result that 76 ewes can be put in a pen. Late pregnancy or lactating ewes fed twice a day require 40.6 cm (16 in.) of head space, and in this case, floor space and feed space both result in a pen capacity of 48 ewes. But if those same ewes are prolific, floor space becomes a limiting factor resulting in a pen capacity of 38 ewes.

Space for feed storage must also be adequate. A ewe lambing in the winter will consume approximately 340 kg (750 lb) of hay and 54.5 kg (120 lb) of mixed grain during the winter. Round bales of hay could be stored outdoors to reduce building storage costs. Handling facilities are essential for sheep operations, and adequate space must be available for the handling equipment.

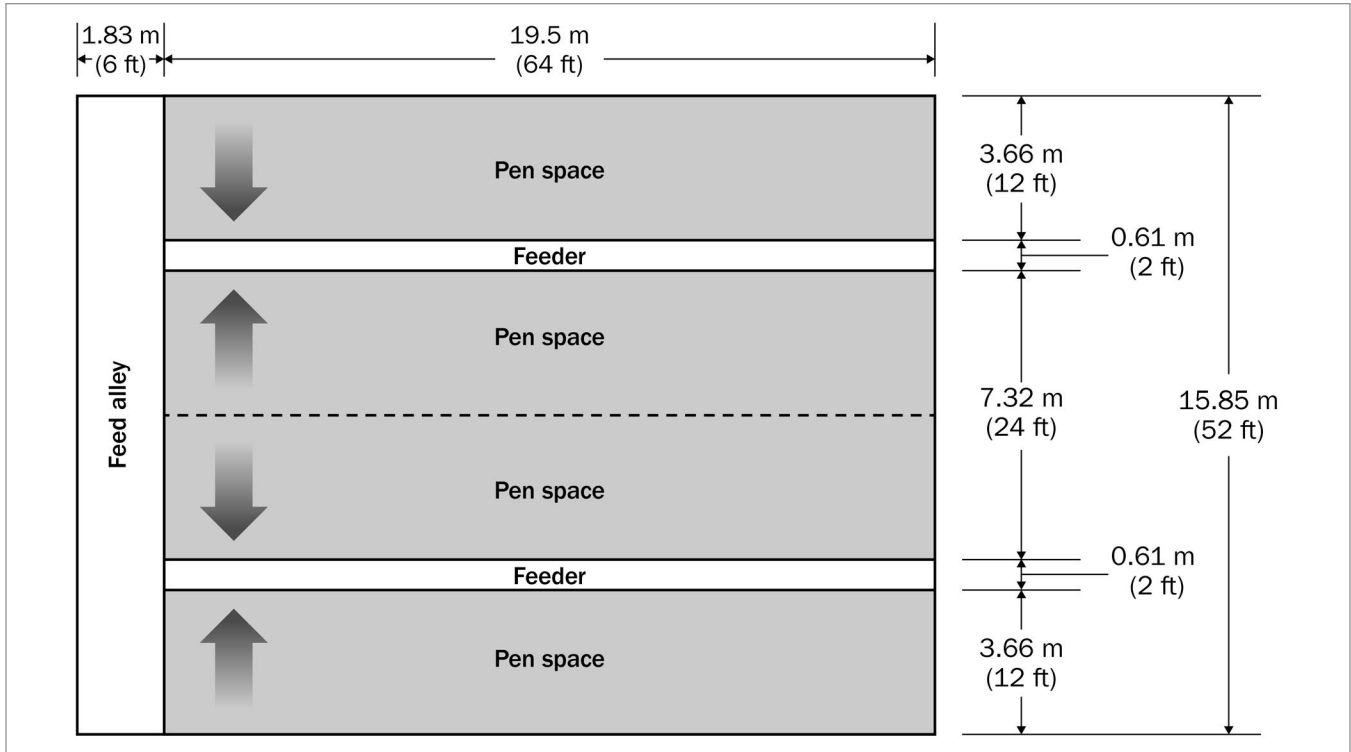


Figure 2. Schematic of a barn plan with appropriate bunk and floor space for ewes.

Barn capacity = barn length/space per ewe

64 ft (768 in.) of barn length x 4 pens/16 in. feeder space per ewe = 192 ewes

19.5 m (1,950 cm) of barn length x 4 pens/40.6 cm feeder space per ewe = 192 ewes

Table 1. Barn Capacity at Different Stages of Production and Feeding Systems

Stage of Production	Feeder Space ¹	Floor Space ²
Dry ewes eating at same time (40.6 cm (16 in.) head space and 0.93 m ² (10 ft ²) floor space per ewe)	1,950 cm/40.6 cm (768 in./16 in.) = 48 ewes	71.37 m ² /0.93 m ² (768 ft ² /10 ft ²) = 76 ewes
Dry ewes with feed at libitum (15.2 cm (6 in.) head space and 0.93 m ² (10 ft ²) floor space per ewe)	1,950 cm/15.2 cm (768 in./6 in.) = 128 ewes	71.37 m ² /0.93 m ² (768 ft ² /10 ft ²) = 76 ewes
Late pregnancy or lactating ewes eating at the same time (40.6 cm (16 in.) head space and 1.48 m ² (16 ft ²) floor space per ewe)	1,950 cm/40.6 cm (768 in./16 in.) = 48 ewes	71.37 m ² /1.48 m ² (768 ft ² /16 ft ²) = 48 ewes
Prolific late pregnancy or lactating ewes eating at the same time (40.6 cm (16 in.) head space and 1.86 m ² (20 ft ²) floor space per ewe)	1,950 cm/40.6 cm (768 in./16 in.) = 48 ewes	71.37 m ² /1.86 m ² (768 ft ² /20 ft ²) = 38 ewes

¹ Linear feeder space for a 19.5 m (64 ft) pen is equivalent to 1,950 cm (768 in.).

² Floor space area for a 19.5 m x 3.66 m (64 ft x 12 ft) pen is equal to 71.37 m² (768 ft²).

LABOUR

Labour is essential and an important input in a sheep enterprise. The amount of labour required will depend on the individual farm set-up and the degree of mechanization. Caring for the sheep is the most important job, and observation time is critical. Sheep show few signs of sickness, so subtle changes in behaviour may indicate a more serious issue. It is important to allocate time and labour resources to observe and handle sheep to assess their condition and changing needs. When evaluating labour requirements, consider the distribution of the labour required throughout the year. Lambing time requires considerably more labour. Plan the farm's labour requirements so that lambing times do not compete for labour when another farm enterprise, such as cropping, has a high need for labour.

MACHINERY

Machinery can be a large capital cost. It is important to be realistic about how much capital cost the sheep operation can support. Many Ontario sheep operations are only large enough to support a limited amount of equipment. Using OMAFRA's [Budgeting Farm Machinery Costs factsheet and worksheet](#) will help you determine whether your operation can support the equipment being considered. Choose equipment carefully and balance the cost against usage, labour, convenience, return on investment and possibilities of renting, borrowing or using custom operators. Handling equipment is crucial to success and must be available on farm. More information on handling facilities is available in the OMAFRA factsheet [Use Sheep Behaviour to Your Advantage When Designing Handling Facilities](#).

MARKETS

Sheep producers in Ontario are fortunate to have several markets available. Most market lambs are sold by live auction at the 16 [markets available](#) in Ontario. Sheep producers can sell lambs from 40–120 lb at auction, categorized into the following six weight classes:

- under 50 lb
- 50–64 lb
- 65–79 lb
- 80–94 lb
- 95–109 lb
- 110 lb or more

Auction prices fluctuate throughout the year and producers often plan their production cycle to take advantage of typical peaks in sale prices. Auction prices are quoted on a price per hundred weight (\$/cwt) basis (1 cwt = 100 lb). To determine the price per pound, divide the price per hundred weight by 100. To calculate the average gross revenue per lamb for a group of market lambs, first determine the price per pound and then multiply this by the average weight of animals in the group. For example, if the auction price for a group of 80–94-lb lambs was \$225/cwt — equivalent to \$2.25/lb ($\$225/100 \text{ lb} = \$2.25/\text{lb}$) — and the average weight of lambs in this group was 85 lb, the average gross revenue per lamb is equal to \$191.25 ($\$2.25/\text{lb} \times 85 \text{ lb per lamb} = \191.25).

Although the auction system accounts for most lamb sales in Ontario (80%–85%), some lambs are marketed directly to processors. Direct to processor marketing allows producers to negotiate a premium market price and may offer more predictability in revenue than marketing lambs on the free market, however, it can also be time-consuming to find buyers and market product. Lambs marketed directly to processors may be sold on either a liveweight basis, where animals are weighed prior to slaughter to determine the price paid to the producer, or on a dressed-carcass weight basis after slaughter. It is important to understand the specifics of the pricing formula that will be applied to determine the profitability of marketing directly to a processor.

Farm-gate sales directly to consumers offer another marketing opportunity for Ontario lambs. This option may achieve the highest sale prices, however, marketing product and maintaining customer relationships will require significant time. Additionally, it can be more challenging to produce lambs that meet each individual customer's needs. It is important to note that all meat sold through farm-gate sales must be slaughtered and inspected in a licensed abattoir. See [Ontario's Meat Inspection System](#) for more information.

Proximity to markets and the cost of shipping lambs are other aspects to consider when evaluating marketing options. A constant supply of high-quality lambs available from the production sector could expand the market for Ontario lamb.

PRODUCTION SYSTEM

Once the land, buildings, labour, machinery and available markets have been evaluated, the production system that most efficiently utilizes these farm resources can be determined. In general, production systems can be divided into annual lambing systems, with one lambing each

year, or accelerated systems, where breeding groups are planned to lamb several times a year. Table 2 describes some of the advantages and disadvantages of the different systems. The production system best suited to the farm resources available will usually be the most efficient.

Table 2. Advantages and Disadvantages of Various Sheep Production Systems

Production System	Advantages	Disadvantages
Annual spring lambing (April to May)	<ul style="list-style-type: none"> • lower lamb mortality • lower labour requirements • lower housing costs • lower feed costs • lambs need very little, if any, extra feed to be finished on grass • highest period of nutritional demand for the ewe is satisfied by the pasture 	<ul style="list-style-type: none"> • higher parasite burden • market prices may be lower • higher risk of predation • lambing may occur during periods where labour requirements for other enterprises on the farm are high • higher susceptibility to adverse weather conditions (e.g., hypothermia from cold weather during lambing, reduced carrying capacity during droughts)
Annual winter lambing (January to February)	<ul style="list-style-type: none"> • lower parasite burden • higher revenue potential • lambs grow faster in cooler temperatures • lower risk of predation of newborn lambs 	<ul style="list-style-type: none"> • higher lamb mortality • higher feed costs for lactating ewes • market lambs raised on stored feed • more health problems • greater management and labour required • less ewes can be handled per person • higher housing costs
Accelerated lambing	<ul style="list-style-type: none"> • year-round supply of lambs • more market price stability because of increased number of marketing dates • lambs can be marketed during seasonal peaks • lower lamb mortality (e.g., 2 warm season lambings and 1 cold season lambing per year) • more lamb marketed per ewe • less lambing barn space needed 	<ul style="list-style-type: none"> • management is more intensive • insulated lambing areas needed for winter lambing • higher feed cost/ewe/year • potentially more health problems (e.g., udder issues)

Table 3. Comparison of Three Lamb Market Scenarios

Market Period	March to April	July to August	September to October
Target markets	light lambs (50–64 lb) for Easter	moderate to heavy (80–94 lb) lambs for Eid-al-Adha ¹	heavy (95–109 lb) lambs
Price per hundred weight (\$/cwt) ²	\$363.55	\$260.99	\$226.41
Average weight for target class	58.2 lb	87.0 lb	101.4 lb
Gross revenue per lamb ²	\$211.59	\$227.06	\$229.58
Production considerations	<ul style="list-style-type: none"> winter lambing higher lamb mortality higher feed costs 	<ul style="list-style-type: none"> winter/early spring lambing higher feed costs 	<ul style="list-style-type: none"> spring lambing lower lamb mortality lower feed costs

¹ The Eid-al-Adha holiday shifts about 11 days earlier each year so peak sale prices will also be expected to move earlier.

² Calculated using weighted average prices reported in the Ontario Sheep Farmers' monthly market summaries for the months in each market period from 2017 to 2020.

When selecting a production system and budgeting for the sheep enterprise, it's critical to weigh the opportunities for revenue from the market lamb crop relative to the costs of production. Keep in mind that auction prices fluctuate both within the year and over time. Table 3 compares three scenarios for target markets using average Ontario auction prices from 2017 to 2020. The three scenarios compared were:

- marketing light lambs (50–64 lb) in March and April for the Easter market
- marketing moderate to heavy lambs (80–94 lb) in July and August for the Eid-al-Adha market
- marketing heavy lambs (95–109 lb) in the Fall

Although a higher price per hundred weight is observed for lighter lambs around Easter, the gross revenues per lamb are similar between the three scenarios. Thus, it may be more important to consider the relative costs of producing lambs for each of the target markets when determining the profitability of each option. The [OMAFRA Lamb Finishing and Ewe Flock Cost of Production](#) tools can assist with budgeting.

BREEDING STOCK

Once the farm resources have been evaluated and the production system that best uses those farm

resources is chosen, the next step is to determine what breeding stock is available that matches the production system selected. All dam lines should exhibit good fertility, prolificacy, longevity, mothering ability and milk production. They should also be of a medium size, be easy to feed and give birth to lambs with good liveability. When lambing on grass, a dam line that exhibits hardiness may be desired and when lambing every 7.2–8 months, ewes that breed out of season and exhibit early sexual maturity would be optimal. Selecting the proper breeds to fit the production system is extremely important. See the OMAFRA factsheet [Choosing Breeds for Producing Profitable Market Lambs](#) for more information.

CONCLUSION

Selecting the right production system is an important decision for commercial sheep producers. The best management decisions can be made if the resources are evaluated first and the production system is selected to fit the farm and the resources, instead of the farm and the resources being adapted to fit a production system or a breed of sheep.

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Published by the Ontario Ministry of Agriculture, Food and Rural Affairs

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ISSN 1198-712X

Également disponible en français (Fiche technique 22-014)

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