

Ewe Flock Nutrition

INTRODUCTION

Nutritional management is one of the most important aspects of sheep production. Ewes that are fed appropriately are more fertile, milk better and wean more lambs that grow faster (Figure 1). Not only do well-fed ewes wean more pounds of lamb per year, but they are healthier and more resistant to disease than ewes that are under nutritional stress. In fact, many production challenges for sheep producers are caused by inadequate nutrition, rather than disease.

Additionally, feed costs are the single largest expense on sheep farms in Ontario, accounting for approximately 41% of total expenses. The *2010 Ontario Sheep Enterprise Analysis Summary* (26 producers, representing 10% of the provincial flock) reported average feed costs of \$106.70 per lamb produced for the 10 least profitable flocks and \$69.00 per lamb (35% less) for the 10 most profitable flocks. [1] Appropriate feed management can be the difference between a profit or a loss for each lamb sold. Therefore, it is imperative that producers evaluate the feed resources they have and manage them carefully to maintain good ewe nutrition and the profitability of the flock.

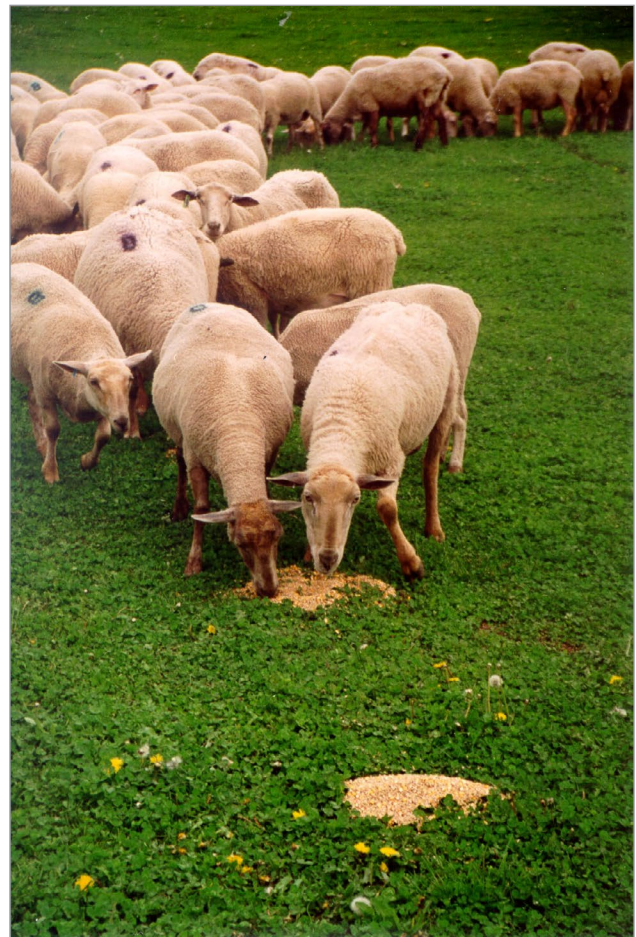


Figure 1. Prolific breed ewes eating supplemental grain at pasture, which has been delivered by a “snack wagon.”

DEVELOPING A FEEDING PROGRAM

There are several aspects that must be considered when developing an appropriate feeding program. Producers should work closely with their nutritionist to develop and improve their feeding program, continuously collect data to evaluate the success of their feeding program and consider their feeding program when designing facilities. Steps to developing a feeding program include:

- understanding changes in nutrient demand over the production cycle
- testing feed
- formulating rations
- body condition scoring
- designing facilities

UNDERSTAND CHANGES IN NUTRIENT DEMAND OVER THE PRODUCTION CYCLE

To manage sheep easily and according to their needs, it is critical to know where in the production cycle any group of ewes is, at any given time, so that they can be managed accordingly. Regardless of production system (annual or accelerated), the key to profitability is feeding to production, and minimizing feed costs by avoiding feeding more than the flock needs.

In a ewe's production cycle, it is generally considered that there are six important stages of production:

- maintenance
- flushing
- breeding
- early gestation
- late gestation
- early lactation [2]

Management, and nutrition specifically, must change for each of these stages if a producer is to have a successful lamb crop and, more importantly, good returns for lambs sent to market.

In terms of nutrition, requirements are least during maintenance (dry period) and early gestation. They are greater during late gestation and lactation (especially for ewes carrying multiple fetuses and nursing twins or more). [2] Figure 2 shows the changes in nutrient requirements as a ewe

goes through the various stages of production. Appropriate breeding management, including controlling the length of breeding periods, use of synchronization programs and pregnancy scanning, will make it easier to manage the ewe flock appropriately for its stage of production.

It is important to note that ewes managed on an accelerated production system should have less annual variability in body condition for the system to be successful. Ewes should not be allowed to lose too much body condition during lactation if they are expected to rebreed and perform well in terms of number of lambs born and weaned, and weight of lambs weaned in the following lambing.

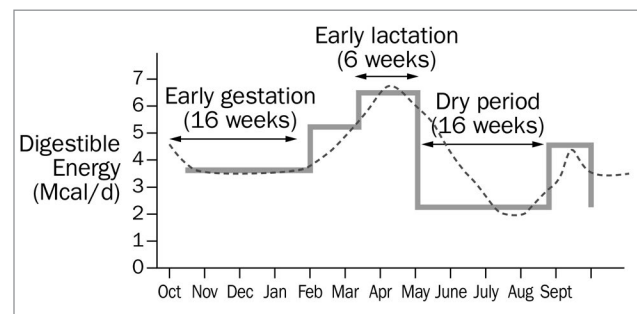


Figure 2. Approximate daily digestible energy (DE) requirements of 65–70 kg (144–156 lb) breeding ewes at various production stages, demonstrating the varying relative nutritional needs of ewes over a typical production cycle. Adapted from NRC, 1985 [2].

Maintenance (0–16 weeks)

The animal's only nutritional needs are those to maintain desired body weight. No form of production is occurring (i.e., the animal is not growing, lactating or pregnant). Requirements for all other stages, therefore, are always higher than that for maintenance. [2] Duration is dependant on production system, being next to zero days in some accelerated lambing programs, and up to 16 weeks in annual lambing situations. Because ewes are only maintaining their weight, no grain feeding is required during this period.

Breeding and Flushing

The practice of increasing nutrient intake and condition prior to and during breeding is called flushing. Its purpose is to increase the rate of ovulation and, consequently, lambing rate. [2]

The response to flushing is affected by the age of the ewe (mature ewes show a greater response than yearlings), its breed, body condition and the stage of the breeding season. [2] The greatest response is seen early and late in the breeding season; with flushing during the seasonal peak being least effective in increasing lambing percentage. Flushing is especially beneficial for thin ewes that have not recovered from previous lactation stress.

Flushing is generally accomplished by providing ewes with fresh pasture, supplemental harvested forage, or up to 0.45 kg (1 lb) of grain per ewe, depending on time of year, availability of forage, temperature and body condition of the ewes. Supplemental feeding usually begins around 2 weeks prior to breeding and continues at least 2–4 weeks into the breeding season. This ensures good embryo attachment to the uterus wall, reducing early embryonic death. [2] Flushing should not be continued too long, because an extended period of excessive feeding is costly, and over-conditioning during pregnancy should be avoided, as should drastic or severe decreases in the level of nutrition. Typical grain feeding would be in the range of 0.23–0.45 kg (0.5–1 lb) of grain per ewe per day.

Early Gestation (15 weeks)

In early pregnancy, fetal growth is very small with less than a quarter of the fetus's total growth occurring before 100 days. [3] As a result, the total feed requirement is similar to the maintenance period, and ewes should be fed a similar ration with a slight increase in the amount offered. It is unusual that grain feeding is necessary during this time unless forage is exceptionally poor or ewes are underconditioned.

Late Gestation (final 4 weeks)

Next to lactation, this period has the greatest nutrient demands for fetal growth and the development of the potential for high milk

production. Over 70% of fetal growth occurs in the last six weeks of pregnancy. [3] Inadequate nutrition during this time will have detrimental effects on milk production of the ewe, birth weight of the lambs, lamb vigour and lamb survivability. [2] Ewes should be fed at least 0.34 kg (0.75 lb) of grain per day if lambing percentage is expected to be average, and up to 0.68–0.79 kg (1.5–1.75 lb) of grain per day if lambing percentage is expected to be above 200%.

Lactation (6–12 weeks)

Lactating ewes normally reach their peak milk production around 3–5 weeks after lambing, and milk production is minimal beyond 12 weeks of age. [4] A ewe nursing twin lambs produces 20%–40% more milk than a ewe nursing one lamb. [2]

Because lamb growth is of primary importance and is dependent on the milk production of the ewe, optimizing milk production is critical. Too often, we see flocks where ewes are not being fed high enough levels of feed for the number of lambs they are nursing. In most cases, this is due to inadequate grain being fed during the first 4–6 weeks of lactation providing inadequate energy, but often not enough protein as well. Milk production in the ewe responds to nutrient intake just as it does in dairy cattle. With average-to-good quality hay, ewes nursing singles will need about 0.68 kg (1.5 lb) of grain per day, and those nursing twins may require 0.90 kg (2 lb) or more per day.

FEED TESTING

Identifying the feed resources available and the level of nutrients that they provide is the first step in developing a nutrition program. The nutrients in feedstuffs will vary considerably from year to year and field to field, so feed testing is critical to developing an appropriate nutrition program. Nutritionists use the information provided in feed tests to balance rations appropriately. Failure to provide accurate feed testing information may lead to rations being formulated with excess nutrients, which is both costly and wasteful, or inadequate nutrients, which may reduce productivity and lead to health problems. Additional information is provided in the OMAFRA factsheets [Take an Accurate Hay Sample](#) and [Feed Analysis Reports Explained](#).

Forages

Forages, such as hay, are the most variable feed source on the farm. It is very difficult to assess their quality without detailed analysis. Hay quality depends on many things, including species composition (% grass, % legume), time of cutting (maturity) and soil fertility.

The stage of growth is the primary determinant of TDN (total digestible nutrient) a proxy for energy, digestibility as well as protein. The species will also have some effect, especially on crude protein (CP) with legumes typical boosting CP. Grass hay will range in crude protein content (% CP) from 17%–8% and in total digestible nutrients (% TDN) from 65%–50%. Alfalfa will decrease from 20%–12% CP and 66%–59% TDN, with these values decreasing as cutting time is delayed from the late vegetative to the mature stages of growth.

Since forage quality is highly variable, yearly feed testing is essential. At minimum, forages should be tested for the following nutrients:

- digestibility/energy (e.g., TDN)
- crude protein
- acid detergent fibre (ADF)
- calcium
- phosphorus
- magnesium
- potassium
- possibly the trace elements (copper, manganese and zinc)

Proper forage sampling is critical to accurate feed testing results, with procedures usually available from [feed labs](#).

Grains

Homegrown grains should be tested to check nutrient quality compared to expected (book) values, as well as to check for anomalies such as mycotoxins. Frequent testing of the energy and protein ingredients used in diets is necessary to optimize formulation.

RATION FORMULATION

A properly formulated ration provides the ewe flock with adequate levels of nutrients (energy, protein, minerals, vitamins) to achieve a desired level of production. Generally, producers should feed forage to satisfy the flock's appetite, adding grain to

obtain the desired body condition score and feed trace mineralized (TM) salt and/or sheep mineral premix. As part of developing a feed program, producers will have to consider whether the ration will be fed as individual components or as a total mixed ration (TMR). See the OMAFRA factsheet [Total Mixed Ration \(TMR\) Use in the Ewe Flock](#) for more information.

The National Research Council (NRC) publishes guidelines for the nutritional requirements of specific life stages of livestock. Nutritionists use these guidelines along with feed testing results to design balanced rations that will meet the nutritional needs of the flock for their production stage. Trained nutritionists are a valuable resource to your flock care team, and it's recommended that you work closely with one to develop and continually adjust your feeding programs.

BODY CONDITION SCORING

One step that is often overlooked is body condition scoring. Producers should body condition score (BCS) the flock to determine how the ewes are responding to their nutritional program. It's impossible to properly assess BCS by eye, so a proper hands-on approach is necessary.

Body condition scores should be measured and recorded at various stages of the production system (i.e., breeding, scanning, lambing, weaning) to observe how the flock is responding to your feeding program. [5] The average BCS of the group relative to their stage in the production cycle will indicate whether nutrients are being fed adequately or below or above the needs of the group. The BCS can also be used to separate the flock and feed them according to their condition. [5] This ensures that the ewes with a BCS below the target for their stage of production can be managed to reach the appropriate BCS, without wasting feed resources by over-feeding ewes that are above the BCS target.

FEEDING FACILITIES

Designing appropriate feeding facilities contributes to the nutrition of the ewe flock.

Feeders

It's important that facilities have 40–46 cm (16–18 in.) of feeder space per ewe if all the ewes are to eat at once. Adequate feeder space will ensure that all ewes will have equal opportunity to eat. See the OMAFRA factsheets [Feeding Systems for Sheep](#) and [Low Labour Feeding Systems and Bunk Design for Sheep](#) for more information.

If adequate feeder space is not provided, younger and more prolific ewes that require more feed will lose body condition and become less productive. As a result, producers may gradually cull the most productive ewes from the flock because of their inability to maintain BCS.

Water

The flock should always have a clean source of water available. Ontario producers will need to consider how they will keep water available in the winter, which is particularly important for lactating ewes and young lambs. Lactating ewes require more water for milk production, while dry ewes require less water and it may be supplied by snow, if necessary. It is recommended that one square foot of water surface be provided for every 40 ewes. See the OMAFRA factsheet [Water Requirements of Livestock](#) for more information.

CONCLUSION

Feed costs are the number one expense on Ontario sheep farms, representing over 40% of total expenses, and the efficient use of feed resources can be the difference between profitable and unprofitable flocks!

To provide the flock with proper nutrition, producers must:

- assess feed inventories
- test the feeds
- formulate rations for expected production
- provide adequate feed and watering facilities to deliver the resources and
- routinely BCS to assess the flock's nutrition program.

Each of these steps is important and they must be used together to optimize nutrition of the ewe flock.

REFERENCES

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This factsheet was originally written and has been updated by OMAFRA Sheep Specialists.