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FACT SHEET

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FEEDING GRAIN TO MARKET LAMBS

Feed makes up a significant portion of farm costs on Nova Scotia sheep farms. While feeding sheep will look different on every farm, forage (specifically pasture) will almost always be the cheapest feed option. However, other factors must be considered when deciding how to feed market lambs. Internal parasites often make it difficult to intensively rear lambs on pasture. Feeding hay or silage indoors is a good alternative. Silage requires greater management than hay in order to prevent spoilage and risk of listeriosis. You must be sure you are feeding enough animals to clean up silage rapidly; a rule is not to feed silage unless you have 50 ewes, or an equivalent number of animals to feed. Do not feed more silage than can be eaten in under 48 hours (much less in hot weather).

Forages should always be the basis of a profitable ruminant-based operation.

Although forage options are most economical, they are typically low in energy and require some grain supplementation for efficient growth. Raising market lambs is a fine balance between feed costs, growth rates and animal health. Grain-based diets are often fed to feedlot lambs to improve weight gain and reduce time to market. In fact, a trial done at the University of Guelph found that 100% grain diets are the most economical diet to feed market lambs-- in Ontario. In the Maritimes, feeding high amounts of grain to finishing lambs can be an expensive venture as our grain costs are higher than the rest of North America. However, it can be difficult to finish lambs quickly and efficiently without the use of some grain supplementation, especially during times when forage quality or quantity is lacking. The use of grain is also helpful to encourage rapid growth the take advantage of high value markets at different times in the year.

A follow-up study from of the U of Guelph fed varying amounts of grain and hay to finishing lambs and monitored performance of the animals. The researchers found that lambs fed 40% grain or more grew relatively similarly. However, animals fed more than 60% grain were at an increasing risk of acidosis. (Table One lists the production results across different test diets.)

Data logger used to record rumen pH

Acidosis, also known as grain overload, happens when large amounts of carbohydrates are eaten over a short period of time. Too much grain at once causes the rumen pH to drop too quickly and kills off the "good" rumen bacteria and allows "bad" bacteria to grow in its place. Acidosis can range from severe, which can kill the animal, or less severe, which can cause decreases in production over time but has no noticeable impact. Supplying enough fibre helps prevent acidosis by triggering the animal to chew their cud. This mixes saliva into their feed. Saliva contains sodium bicarbonate, which will help keep the pH stable. 40%-60% grain inclusion in diets proved to be the ideal balance between growth and health.

When costs of hay and grain were considered ($340/tonne for corn mix, $220/tonne for 2nd cut alfalfa hay), and compared to the amount of lamb produced, the cheapest option was feeding lambs 40% grain and 60% hay. (The difference between this figure and the original study which claimed that 100% grain diets were most economical is the bedding supplied to the lambs. In the study which measured hay/grain ratios, the lambs were bedded on shavings, rather than straw like the first study. This prevented lambs from eating any fibre outside of their test diets).

The most profitable diet was 60% hay and 40% grain, with a price per kg of gain of $1.61. The next most economical option was 100% grain at $1.70 per kg of gain; a nine cent price difference. It cost an average of $29.94 to feed 60%H/ 40%G lambs and $32.13 to feed 0%H/ 100%G lambs for the duration of the study, which amounts to a savings of $2.20 If you market 100 lambs a year, that results in at least $220 in savings between the two most economical options!

To calculate your own costs per kg or lb of lamb grown, start by determining the amount of feed consumed by a lamb for a defined period of time (for example, from weaning to marketing). Divide this by the amount of weight gained during the same period. This will be your feed to gain ratio. For example, if a lamb ate 400 lb of feed between weaning and marketing, and gained 50 lbs, he would have a feed conversion ratio of 8 (400 divided by 50). 8 pounds of feed would be required to gain 1 pound of lamb. You can then determine the cost associated with that 1 pound of gain by taking the price of feed into account. Let's imagine our lamb ate a diet that was 25% corn and 75% silage: he would be eating 2lbs of corn and 6lb of silage for each pound he grows. The price of corn was $400 per tonne and silage was $100 per tonne. On a per pound basis, corn would be roughly $0.18 per pound ($400/2205 lbs per tonne) and silage would be roughly $0.05 per pound ($100/2205 lbs per tonne). This would mean 2 lb of corn costs $0.36 and 6 lbs of silage costs $0.30, meaning a feed cost per pound of gain would be $0.66. Using these step, but with your own costs, will allow you to determine your own cost of production numbers and compare over time.

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Table One: Lamb performance across diets with different hay and grain inclusion rates.

	100% hay, 0% grain	80% hay, 20% grain	60% hay, 40% grain	40% hay, 60% grain	20% hay, 80% grain	0% hay, 100% grain
Initial bodyweight, kg	29.5[a]	31.4[a]	31.3[a]	30.6[a]	29.8[a]	29.1[a]
Final bodyweight, kg	32[a]	44.6[ab]	49.8[b]	47.4[b]	45.9[b]	48.0[b]
Total weight gain, kg	2.5[a]	13.2[ab]	18.6[b]	16.8[b]	16.1[b]	18.9[b]
Average daily feed intake, kg	0.86[a]	1.21[ab]	1.44[b]	1.34[ab]	1.14[ab]	1.18[ab]
Average daily gain, kg	0.04[a]	0.19[ab]	0.27[b]	0.24[b]	0.23[b]	0.27[b]
Feed:gain ratio, kg	15:1[a]	8:1[a]	6:1[a]	6:1[a]	6:1[a]	5:1[a]
Feed cost per kg of gain	$3.30	$1.95	$1.61	$1.75	$1.90	$1.70

*Different superscripts denote statistically significant differences.

While the guidelines from the study are useful, it is impossible to correctly balance a ration without testing your forages. The best option for feeding market lambs it to collect samples from your forage options, send them to the lab for analysis, sort your forages based on their best use, and then supplement with grains, by-products, salt or minerals as required to fill in any nutritional gaps. For example, energy can be increased in a ration by feeding corn, wheat, barley, or oats. Each of these grains offers a slightly different nutrient profile as well as price. Both should be considered. Protein can be increased by feeding soybean meal or even wheat. There are often deficiencies in important vitamins and minerals in forage-based diets as well. Perennia offers ration formulation or consultation to registered or new sheep producers in Nova Scotia. While there is a nominal lab fee for testing your forage, it is the best way to ensure you are feeding an economical and balanced ration that promotes efficient growth.

Testing your forages is the first step to providing a balanced and economical ration.

For more information, contact: **Katie Trottier (ruminant livestock specialist)**

Works Cited: Trottier, K. (2020) "Determining the ideal forage:concentrate ratio for finishing lambs: assessing fibre levels and their impact on animal performance and rumen health."

Available online at: **https://atrium.lib.uoguelph.ca/xmlui/handle/10214/17763**