

Nutrient Loading Calculator for Wintering Feeding Systems

A new nutrient loading calculator, designed to help livestock producers plan and manage their in-field winter feeding systems, is now available. The calculator is designed to estimate the amount of nutrients being added to the landscape by a winter feeding system that imports feed to a site, such as bale grazing. It can also be used to determine feed requirements to meet the needs of an identified number of animals for a designated number of feeding days.

Trevor Wallace, Nutrient Management Specialist with Alberta Agriculture and Rural Development, worked with Agriculture and Agri-Food Canada and technical experts from the other Prairie Provinces to develop this windows-based (Excel) program. He says, “When producers are importing feed onto the land, a lot of the imported nutrients are left behind on the land as manure and wasted feed. Excessive nutrient additions increase the risk of nutrient loss to the environment and can negatively impact the growth of subsequent crops.” This tool estimates the amount of nitrogen, phosphorus, potassium and sulfur that is being brought onto the site by the winter feeding system.

“By knowing the amount of nutrients being imported onto a site, a producer can better manage the feeding system and the animals to take advantage of those nutrients as well as reduce excessive nutrient loading and loss to the environment,” comments Wallace. The calculator can also be used as a record keeping tool of feed and cow management, and nutrient additions on specific sites.

The calculator can be used to run ‘what if’ scenarios comparing various winter feeding options. “At this time of year, the calculator can be used to help determine the amount of nutrients that your feeding system is leaving behind, and then allows the producer to plan spring operations to take advantage of those nutrients, says Wallace”. For example, this can help producers to save money on unnecessary fertilization applications.

By completing an assessment now the producer can start to evaluate the current feeding system and think of potential changes to the system that can be adopted to take advantage of these available nutrients.

The calculator only estimates the amount of nutrients that are added to the landscape when importing feed from offsite. It can be used to evaluate the impact of a variety of different feeds being fed through one of three different feeding systems: whole bales, windrows on the ground, and feeding in a movable trough. It was not designed to estimate nutrient loading for winter feeding systems where feed is generated on site such as swath grazing, corn grazing, grazing stockpiled forages, and annual crop residue grazing.

There are two versions of this calculator: a Feed to Cow version and a Cow to Feed version. The feed to cow version asks for feed management factors first and then cow management factors. The cow to feed version starts by inputting the cow management factors first and then the feed management factors. Both versions will provide the same outputs and information they just

approach the inputting of data from different angles. The feed to cow version is preferable to use if suitable fields have more than enough space to accommodate feed for one feeding season for the entire herd. The cow to feed version is preferable to use if there is a chance the field may not have enough space to accommodate feed for the entire herd over the full winter feeding season.

To access the calculator, click on the title [Nutrient Loading Calculator](#) or go to www.agriculture.alberta.ca and click on Decision Making Tools, then Livestock and the calculator will be on the right hand side. In addition, there is a pdf user manual available for download that walks the user through using both versions of the calculator. By completing an assessment now the producer can start to evaluate the current feeding system and think of potential changes to the system that can be adopted to take advantage of these available nutrients.

1. Cow Management Number of cows: 100 My Own Value Average cow weight (lbs): 1300 Daily feed requirement of cow (lb dry matter/day): 33.8 Area of land used for feeding (acres): 10.7 Number of feeding days: 120 Cow Days per Acre: 1121 Animal Unit Days per Acre: 1458 Net feed density (tons dry matter/acre): 18.9		4. Supplementary Feed Type <table border="1"> <tr> <td>Grain</td> <td>My Own Values</td> </tr> <tr> <td>Barley</td> <td></td> </tr> <tr> <td>Dry matter content of feed (%)</td> <td>89</td> </tr> <tr> <td>Protein content of feed (% dry matter basis)</td> <td>12.5</td> </tr> <tr> <td>Nitrogen content of feed (% dry matter basis)</td> <td>2.00</td> </tr> <tr> <td>Phosphorus content of feed (% dry matter basis)</td> <td>0.38</td> </tr> <tr> <td>Potassium content of feed (% dry matter basis)</td> <td>0.54</td> </tr> <tr> <td>Sulfur content of feed (% dry matter basis)</td> <td>0.14</td> </tr> </table>		Grain	My Own Values	Barley		Dry matter content of feed (%)	89	Protein content of feed (% dry matter basis)	12.5	Nitrogen content of feed (% dry matter basis)	2.00	Phosphorus content of feed (% dry matter basis)	0.38	Potassium content of feed (% dry matter basis)	0.54	Sulfur content of feed (% dry matter basis)	0.14														
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An example of the whole bale calculator screen in the Nutrient Loading Calculator