

# Corn silage affects herd productivity

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The popularity of corn silage as a constituent in the rations of Quebec's dairy cows shows no signs of waning. An analysis of data collected from more than 500 dairy farms confirms that the use of corn silage has a favourable effect on milk yield and composition as well as on the feed profit margin. Further research is needed, however, to determine the overall impact of corn silage on the health and fertility of both soils and herds in addition to the environmental footprint linked to its production.

From a feeding standpoint, corn silage is valued for its palatability, consistent nutritional quality and high energy content. Likewise, from a crop perspective, silage corn provides high yields, is easy to produce at a lower cost per tonne of dry matter, and requires only one harvest per year.

To evaluate the effect of using corn silage to feed dairy herds, let's take a look at the production statistics and economic data of the more than 500 farms for which Lactanet advisers monitor feeding and ration formulation.

## A positive impact on production and components

The analysis indicates that farms feeding forage composed of more than 40 per cent corn silage, on average, produce about 100 kilograms more milk (Table 1) than farms using less than 40 per cent corn silage or those using none at all. Higher production on farms using more than 40 per cent corn silage is also associated with higher fat and protein levels, which may be attributable to the higher energy density of rations containing more than 40 per cent corn silage.

## ... and on the feed profit margin

The annual feed profit margin per cow increases as the proportion of corn silage in the ration increases

(Figure 1). Using less than 70 per cent forage in the ration has no effect on milk production or protein content, with an average yield of 9,813 kilograms of milk/cow/year and 394 kilograms of protein/cow/year. Annual fat yield and feed profit margin per cow are also unaffected by the proportion of forage included in the ration.

## More work to do

The findings of the study are limited by the fact that the analysis is based solely on annual averages compiled over a four-year period, and focuses exclusively on the relationship between the ration and herd productivity. The analysis does not take into account the effect of corn silage or forage intake on herd health and reproduction, nor

does it consider the impact of corn silage production on health, soil fertility and the environment.

Unlike perennial forage crops, silage corn grown under conventional tillage and without a cover crop leads to a decrease in the organic matter content of the soil, making it more vulnerable to drought.

To evaluate the overall impact of corn silage, a wider range of factors needs to be considered, not only production and feeding data, but also data for soil fertility and forage management, from seeding to harvest and storage. It is thus important to continue collecting relevant and high-quality data with a view to developing a more environmentally conscious dairy industry.

**Table 1: Annual averages per cow for production, components and feed profit margin in relation to the proportion of corn silage included in the forage and the proportion of forage in the ration**

	% Corn silage/Total forage			% Forage/Ration		
	0%	0-40%	Over 40%	Less than 65%	65-70%	Over 70%
Milk (kg)	9 723	9 783	9 889	9 865	9 813	9 717
Fat (kg)	389.3	394.4	397.6	395.5	394	391.9
Fat (%)	4.01	4.03	4.02	4.01	4.02	4.03
Protein (kg)	320.8	325.3	329	327.1	325.5	322.5
Protein (%)	3.30	3.33	3.33	3.32	3.32	3.32
Feed profit margin (\$/cow)	4 612	4 731	4 799	4 697	4 730	4 715

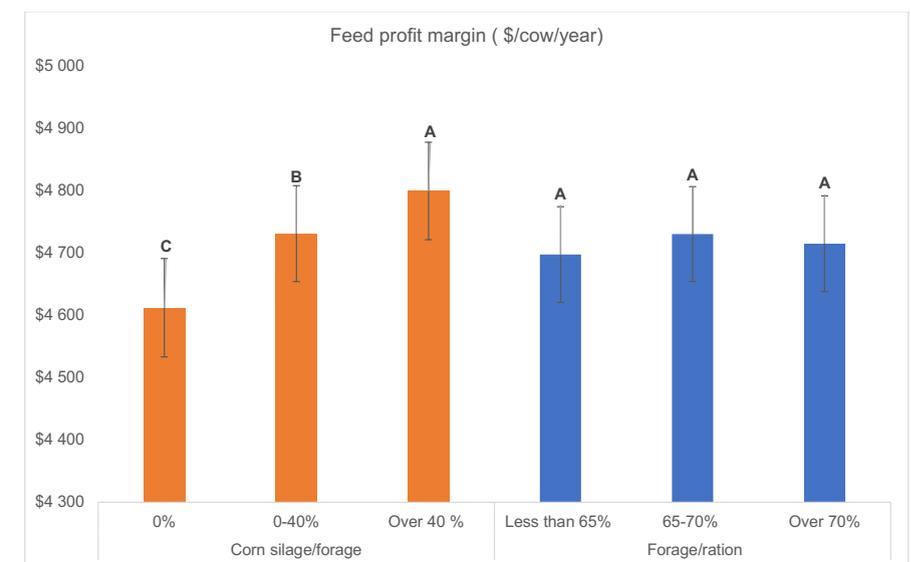
## An overview of the analysis

- 543 Holstein herds in Quebec
- 9 administrative regions
- 2015 to 2018
- September to August (to coincide with the harvest of fresh silage)
- 3 categories
  - based on the proportion of corn silage included in the forage component of the ration:
    1. 0%
    2. less than 40%
    3. over 40%
  - based on the proportion of forage (grass silage, legume silage, corn silage and haylage) in the ration:
    1. less than 65%
    2. 65-70%
    3. over 70%, dry matter basis

The average daily feed intake of the herds included in the study gives a general idea of what the different categories represent in terms of quantity:

Type	Category	Daily feed intake (kg DM)	
		Corn silage	Forage
Corn silage / total forage	0%	0	14.2
	0-40%	4.3	15.3
	Over 40%	7.8	15.2
Forage / ration	Less than 65%	2.3	13.5
	65-70%	3.5	14.7
	Over 70%	5.5	16.4

**Figure 1: Annual feed profit margin averages per cow in relation to the proportion of corn silage included in the forage (0, 0-40 and over 40%; orange) and the proportion of forage (grass, legume, corn and hay silages) in the ration (less than 65, 65-70 and over 70%; blue) from 543 non-grazing Quebec Holstein farms that used Lactanet's ration formulation services from 2015 to 2018**



A, B, C Significant difference ( $P < 0.05$ ) between categories.