



Concentrates at the Robot: Two is good, but three is better!

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There are different feeding strategies for robot milking. Dairy producers often ask if there is an advantage to using several different concentrates in the robot. And if so, what is the ideal number?

A preliminary report published by the University of Minnesota in 2019 demonstrated the advantage of using three concentrates in the robot instead of one or two. It found that cows produce an average of 36.0 kg of milk with one concentrate in the robot, 36.6 kg with two concentrates and 39.0 kg with three concentrates (Peiter et al., 2019).



A Similar Reality in Canada?

We wanted to see if we would have similar findings in Canada so in 2019, our Lactanet robot advisors collected information on the number and type of concentrates our clients were using at the robot. We compiled the data from 62 Quebec Holstein herds that were on milk recording.

Table 1. Influence of the Number of Concentrates at the Robot on Milk Production and Components

Number of Concentrates at the Robot	Number of Herds	Milk 12 months (kg)	Fat Test (%)	Protein Test (%)
Average	62	10,454	4.01	3.37
1	6	9,635	4.24	3.44
2	27	10,203	3.93	3.33
3	23	10,773	4.07	3.40

Number of Concentrates at the Robot	Number of Herds	Milk 12 months (kg)	Fat Test (%)	Protein Test (%)
4	6	11,173	3.96	3.33

We often assume that working with two concentrates at the robot is essential: one to supply energy and a second to give us the flexibility to adjust the protein level. The data we collected actually confirmed the same conclusions that were discovered by the University of Minnesota; there is a clear advantage to adding a third concentrate at the robot.

Although it is important to keep in mind that the results compiled from farms that offer one or four concentrates are made up of only six herds per group; the results from the farms that offer two or three concentrates seem to be more representative given the number of herds used. There was very little variation with regards to milk components.

We noted an average gain of 400 to 600 kg of milk production between each of the levels of the number of ingredients. The use of several concentrates at the robot increases the accuracy of nutritional intake at the robot and can allow more precise targeting of lactation periods, thus supporting higher levels of production.

More Milk with Targeted Feeds

We wanted to see what type of concentrates offer more significant results. By studying the different concentrates that were used by each farm, we observed that many used feeds that were specifically intended for their cows at the start of lactation. We isolated this practice from among the data set in order to evaluate whether the results were conclusive.

Table 2. Influence of the Strategy Used at the Start of Lactation on Milk

Production and Components

Type of Concentrates at the Start of Lactation	Numbre of Herds	Milk 12 monts (kg)	Fat Test (%)	Protein Test (%)	Transition Cow Index (yearly average)
Average	62	10,454	4.01	3.37	473
Do not use concentrates with glycerol or high in energy	32	10,109	3.97	3.37	378
Do not use concentrates with glycerol or high in energy	30	10,821	4.05	3.37	577

Using feeds that are rich in glycerol or energy at the start of lactation is a strategy used by about 50% of the farms that we sampled. Adding feeds that increase the cow's glucose levels with glycerol, chromium or other additives, and feeds that improve the quantity of energy ingested using protected fats is definitely worthwhile in terms of production. There is a difference of more than 700 kg of milk between the two strategies. We also observed a trend toward an improved fat test.

This same group also saw an improved Transition Cow Index. This is a sign that this strategy results in better milk starts and higher peak lactation levels.

Ketosis and Robot Milking

Recent research shows that the risk of ketosis is 1.45 times higher with robot milking as compared to other milking systems (Tatone et al. 2017).

The rapid increase in number of milkings at the start of lactation for cows using robot milking stimulates milk production and energy demands grow quickly as compared to systems with two milkings per day. This results in a higher number of ketosis cases. This phenomenon helps to explain the

success of adding feeds that are higher in energy and additives that provide more glucose at the start of lactation. Evidently, this strategy is much more important for the herds with high productivity.

Note that these results stem from the analysis of data from producers using robot milking across the various regions of Quebec and are not intended to be a substitute for scientific research.

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A graduate in agronomy from Université Laval, Gervais has over 22 years of experience in dairy cattle feeding before joining our team. As an expert in dairy production - milking robots, he actively contributes as a consultant and author to the advancement of the dairy production industry.

