# Genetic Selection for Fat Production to Meet Market Needs

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The milk payment method for Quebec dairy producers will be modified in the summer of 2021 to adapt to the needs of the internal market: there will no longer be an economic advantage to producing milk with a SNG\Fat ratio above 2.20. This means that a higher fat content in the bulk tank, higher than 4.1 kg\hl, will be favorable to maintaining an ideal ratio.

Photo: Guillaume and René Bessette with their Lactanet strategic advisor, Annick Desjardins.

One possible solution for increasing milk fat levels is focusing efforts on genetic selection, with heritability being 50% for fat content, and 26% for fat yield.

Although changes to selection objectives can take several years to appear in the bulk tank, it is never too late to start. There are good opportunities to select for improved fat in your herd, starting with the sires on the proof sheets at the AI centres: offering sires at more than 80 kg of fat and +0.20% fat differential has never been more significant.

## Genetic Selection at Ferme Bessette et Frères (Waterville) Inc.

Owners:  René and Guillaume Bessette
Herd Composition: 130 Holstein cows in milk, annual production of 11,376

kg at 4.25 kg\hl 3.40 kg\hl true protein
Housing: New free stall barn built in 2019 equipped with three robot milkers.

Ferme Bessette et Frères has prioritized selection for fat index for several years now, and the bulk tank results are a clear reflection of this: fat levels are stable at around 4.30 kg\hl and the SNF\fat ratio is generally below 2.20.  Both the owners, Mr. René Bessette and his son Guillaume, and their Lactanet strategic advisor, Annick Desjardins will confirm: there are no palm oil derivatives used in the ration. According to René, « for about 10 years now, we have mainly selected sires with strong fat levels and the results have come quickly despite our history of selecting for milk. We also pay a lot of attention to the rations we feed: our cows are fed a simple good quality ration, with well-fermented forages all year round, that promote a stable microbial flora and good rumen health ».

There are many, easily accessible, tools available to producers  that can help them to monitor the genetic evolution of their herds. The *Genetic Herd Inventory*  report can provide an initial assessment: at the bottom of the inventory of the females that are active on milk recording, you will find the calculated herd averages according to two categories, the cows and the heifers. The genetic index of Ferme Bessette et Frères shows a percentile of 78 % for cows and 87% for heifers. It is also important to note the enviable average fat percentages:  +0.12 % for the cows and +0.19 % for the heifers.

The Compass software is another useful tool that uses graphs to demonstrate the genetic progression of a herd. The graph below depicts the evolution of the fat indexes for the registered heifers at Ferme Bessette et Frères according to year of birth for their prefix: PAVICO. The red line represents the average genetic evolution of all Canadian herds and the blue line represents the average fat indexes for the PAVICO

heifers every year. It sits above the dotted line, indicating that the PAVICO prefix has ranked in the top 10% of Canadian herds for several years.

Gras
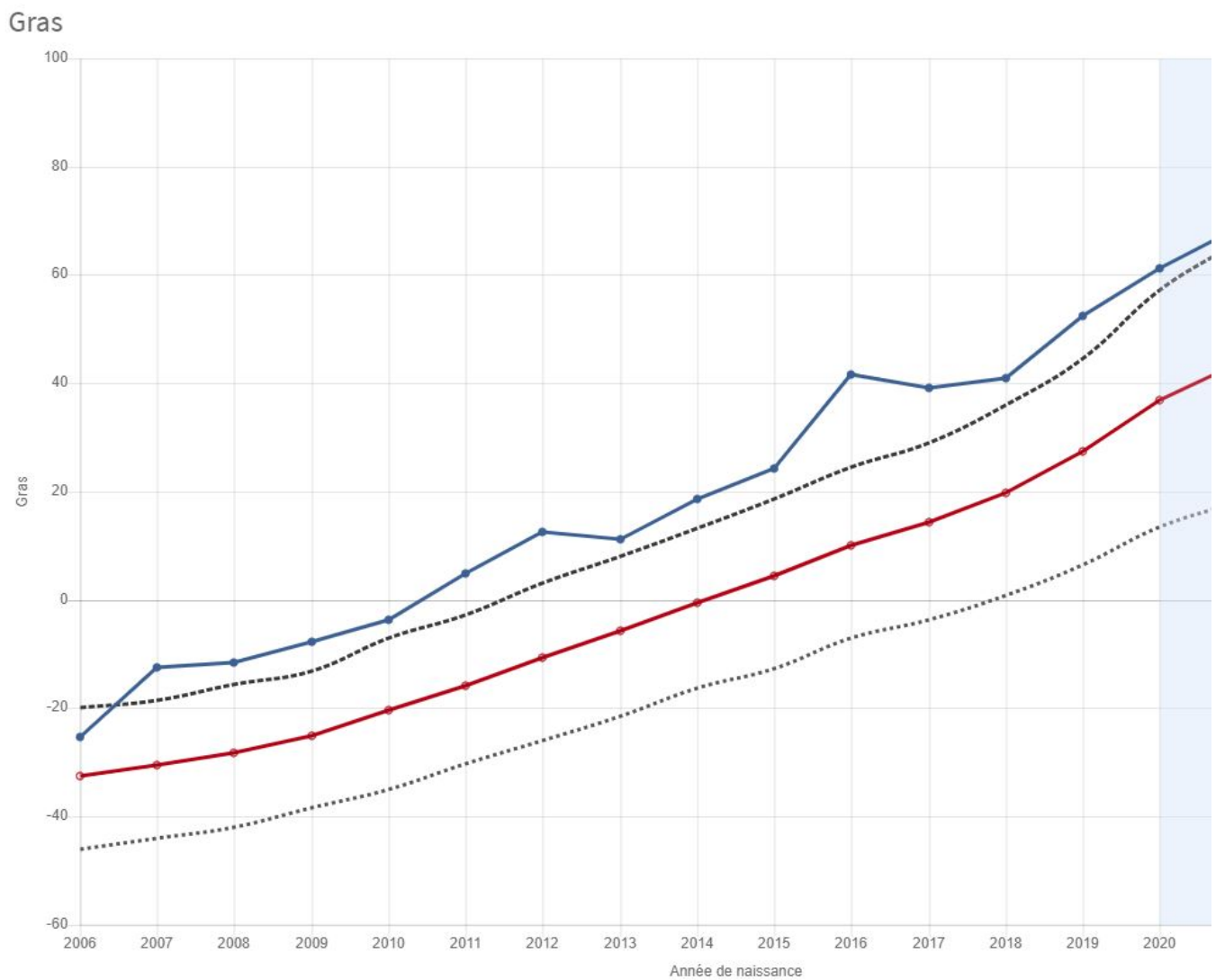
| | Moyenne | Nbre de génisses |
|------|---------|------------------|
| 2021 | 58 | 16 |
| 2020 | 61 | 87 |
| 2019 | 52 | 87 |
| 2018 | 41 | 79 |
| 2017 | 39 | 66 |
| 2016 | 42 | 67 |
| 2015 | 24 | 61 |
| 2014 | 19 | 60 |
| 2013 | 11 | 58 |
| 2012 | 13 | 59 |
| 2011 | 5 | 67 |
| 2010 | -4 | 55 |
| 2009 | -8 | 51 |
| 2008 | -12 | 52 |
| 2007 | -12 | 61 |
| 2006 | -25 | 55 |

By clicking on the number of heifers in the above graph, you will see the 10 sires that had the most registered heifers for each year of birth. The very high sire indexes explain why the genetic averages are higher: the table below shows these indexes for the 10 sires with the most registered heifers in 2020 with the PAVICO prefix:

Registrations per Sire – 2020    Number of Daughters

| Sire Name | Fat (kg) | Fat Deviation (%) | Number of Daughters |
|---|---|---|---|
| TROPIC | 113 | 0.55 | 5 |
| HORIZON | 75 | 0.43 | 5 |
| COBALT | 89 | 0.21 | 4 |
| DUKE | 132 | 0.19 | 4 |
| REDCARPET | 92 | 0.53 | 4 |
| IMPERIAL | 107 | 0.21 | 3 |
| HASHTAG | 70 | 0.07 | 3 |
| MIRAND-PP | 43 | -0.04 | 3 |
| DIGITAL | 88 | 0.11 | 3 |
| OTHELLO | 76 | 0.30 | 3 |
| ACTION | 56 | 0.26 | 3 |
| ADAGIO | 56 | 0.06 | 3 |
| ALCOVE | 150 | 0.54 | 3 |
| SWINGMAN RED | 50 | 0.06 | 3 |

In addition to selecting for fat, Guillaume, who is responsible for choosing the bulls, would also like to improve the position of the rear members, milking speed, daughter fertility, and lactation persistency.

# Selection for Improved Fat: Available Tools

Market needs in Quebec demand that the milk produced on the farm be above 4.1 kg/h fat. One way to achieve this is to focus efforts on this criterion through the genetic selection of sires that are strong for fat. Producers that have adopted this strategy are getting results. The *Herd Genetic Inventory* report and Compass are two tools that can be used to take stock of selection and compare with other Canadian herds.

By Mario Séguin, agr.

Mario is committed to improving dairy herds. A graduate in Animal Science from McGill University and a member of L'Ordre des agronomes du Québec, he contributes to the development and enhancement of the management tools offered by Lactanet.