L'Option

GenOvis

FALL 2020

SUMMARY:

- GenOvis moving to a rolling base
- Current research projects

IN THIS EDITION

NEW: GenOvis: moving to a rolling base - what are the advantages?

The basis of a genetic evaluation program is to compare the performance of animals against each other to determine which ones have the best genetic potential. To do this, a genetic program must utilize a reference population. This population will be the starting point (value 0) of the breeding values. This value can either be fixed in time or on a rolling base. Each of these types has its advantages and disadvantages.

A genetic program that always refers to the same animals to publish breeding values is called the fixed base. The reference base is usually set for a particular year (e.g. all animals born in 2010) and updated periodically (e.g. every 10 years). On the other hand, a genetic program that adds new or removes old animals at each evaluation or each year, is called the rolling base.

Since its creation in 2000, GenOvis has run as a fixed base. The reference base is currently fixed to 2010 and must be updated in 2021.

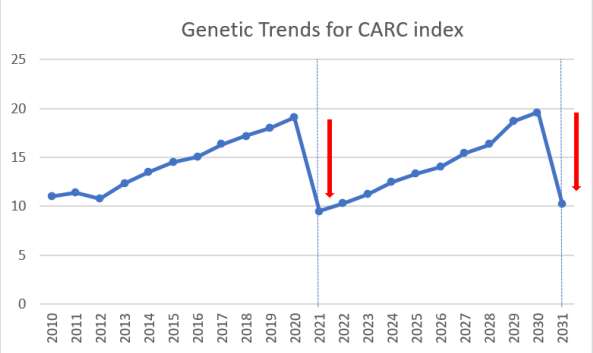
Fixed base

The fixed base shows the genetic progress made over a fixed period. The reference base is updated approximately every 10 years. The breeding values tend to increase over time since new animals, with better genetic potential, obtain better breeding values compared to the older animals in the database. Breeders and buyers can see the genetic progress made year after year by the increase in breeding values. When genetic selection is performed well, breeders can progress by about 1 index point per year. Over 10 years, this represents 10 index points.

The problem with a fixed base is that every 10 years, when the base is updated, large variations in breeding values of animals are observed due to the significant change in the reference population. If breeders increased 10 points in an index over 10 years, all animals would experience an average drop of about 10 points in their index value when the reference population is updated. These significant variations are difficult to understand for both breeders and buyers. The variations do not mean that the animals are less efficient. It is only that the index value decreases due to the fact that the animals are now compared to younger and better performing animals.

Moving to a rolling base starting January 2021

Graph 1: Simulation of significant variations in breeding values due to fixed base updated over a 10-year period.



The genetic gain trends show good improvement over 10 years, but the indexes and EPD values will be much lower when the reference population is updated. The decreases only happen at the time of the new reference population integration.

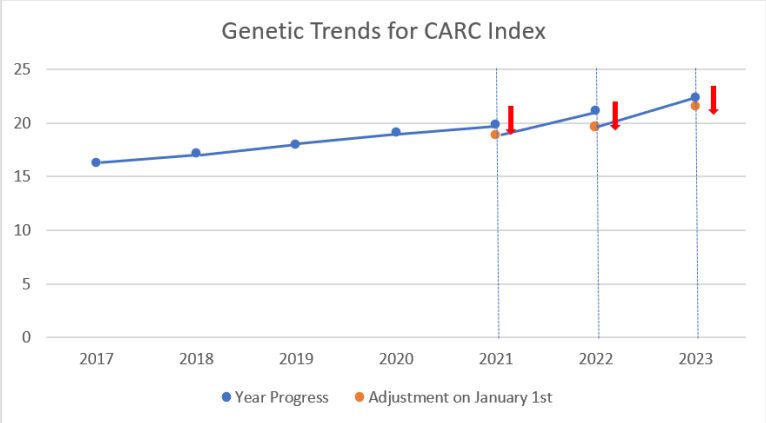
>>>

Moving to a rolling base

Rolling base

The rolling base allows comparison with more recent animals. The breeding values will increase slower, compared to the fixed base, as the reference population changes year after year to keep only the most recent animals. Although genetic gains are more difficult to observe on new animals when compared to a fixed base, the animals are compared to better performers since new animals are added and older animals are removed from the reference population each year. Breeders and buyers will not see the EPD and index values increase as much as with a fixed base; however, they have the great advantage of not experiencing large variations in breeding values every 10 years. Annual adjustment of the reference population will avoid large variation in the breeding values (e.g. avoid a 10 index points loss when updating the reference population when using a fixed base (**graph 2**)).

Graph 2: Simulation of variations in breeding values under rolling base



The genetic gain trends show good improvement over 10 years, but the indexes and EPD values are much more stable when the reference population is updated. These decreases happen every year, at the time of the new reference population integration, but are very small.

Fixed Base vs Rolling Base

Fixed base	Rolling base
• Animal performance is compared to animals born in 2010. • As long as the reference population remains 2010, the average breeding values of new lambs tend to increase. • When updating the base, breeding values of each animal will decrease significantly. • Updated every 10 years.	• Animal performance is compared to animals born 10 years ago. • When updating the base, breeding values will decrease a bit. • Genetic gain will be less noticeable when looking at the individual breeding values. • Updated every year.

In order to prevent breeders and buyers from being disappointed by large variations in their animal breeding values every 10 years, the **GenOvis program will move to a rolling base starting January 2021.**

Thus, every January 1st, the reference population used in the calculation of breeding values will be moved by one year to always use animals born 10 years ago as a reference point. A variation in breeding values will be observed once a year in January, when the update is done, but the magnitude of change will be much less than updating the fixed base every 10 years. In addition, animals will now be compared with newer animals and genetic evaluations will better reflect the genetic potential of lambs born during the year. This will be a great improvement for users.

Reference population in rolling base to be implemented in GenOvis

Year	Reference population
2020	2010
2021	2011
2022	2012

Simulation of EPD Values Related to the Reference Population

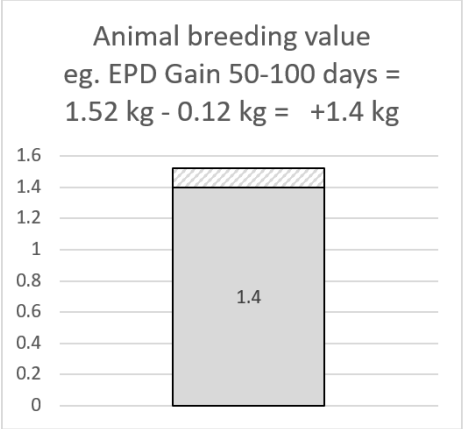
Breeding value mechanics

Let's look at a concrete example to understand how it works. For instance, the GenOvis program might estimate that the breeding value of an animal is + 1.52 kg for EPD Gain 50-100 days when this animal is compared to the entire GenOvis database. To display this value as a concrete value for breeders, GenOvis must use a reference population to express the genetic potential of this animal.

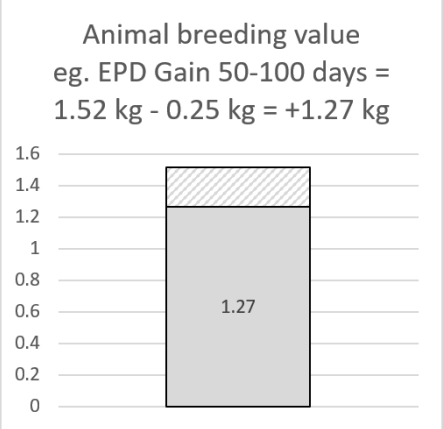
If the **reference population (2010)** has an average of + 0.12 kg for the same EPD, then the EPD of this animal will be **+ 1.4 kg** (1.52 - 0.12). On average, this animal will produce lambs that will weigh at 100 days 1.4 kg more than 100 day old lambs born in 2010. **This is the value you see in GenOvis.**

When updating the **reference population to 2011**, if the new average value is + 0.25 kg, the EPD value displayed after the update will be **+ 1.27 kg** (1.52 - 0.25). On average, this animal will produce lambs that will weigh at 100 days 1.27 kg more than 100 day old lambs born in 2011. **This will be the new value that will be displayed in GenOvis after the reference base update.**

"The animal's genetic potential remains the same (1.52kg), but by moving the reference population, the EPD value displayed will move from 1.4kg to 1.27kg."



Reference population (2010)



Reference population (2011)

The changes in breeding values do not mean the animals are less efficient. **The breeding values decrease a bit as animals are now compared to younger and more efficient animals.**

What will happen on January 1st, 2021?

We can expect minimal changes in breeding values, which may not even be noticed by breeders. Possible changes that may be noticed:

- Breeding values will tend to very slightly decrease (as animals will now be compared to younger and more efficient animals)
- Genetic indexes will tend to slightly decrease too, in the same manner as breeding values
- Genetic indexes will no longer increase as they did on a fixed base, year by year, for breeds having high genetic progress (as breeding values will now be adjusted each year).

The genetic team will monitor, and closely follow, the impacts related to the reference population as it moves to a rolling base next January. The team will be here to answer all of your questions.

Many research projects related to genetics are in progress at CEPOQ and through our partners.

Quebec Genetic Research Projects - in progress

Quebec Sheep Expertise Center Project (CEPOQ)

- Development of reports adapted to commercial farms in order to improve technical and economic performance.

  This project aims to develop new reports adapted for use on commercial farms. Among the reports targeted: reports facilitating selection of unproductive ewes, selection of breeding stock and monitoring flock performance.

Quebec Swine Development Center Projects (CDPQ)

- Creation of a national accreditation program for ultrasound measurement on sheep

  This project's main objective is to develop a national accreditation program, in order to establish national standards for ultrasound measurement methods and data recording in GenOvis.

Quebec Purebred Sheep Breeders' Association Projects (SEMRPQ)

- Fresh semen harvest and insemination pilot project for the Quebec breeders
- Development of a simple application to support farmers in effective neonatal sheep mortality data collection.
- Study aimed at knowing the needs of the lamb market and making them match up with the breeding stock available in Quebec. *(applicant: SEMRPQ, for the Quebec sheep industry)*
- Training for Quebec sheep breeders on animal capacity measurement and ewes' mammary gland conformation evaluation quality.
- Determination of accurate time of heat onset using CIDR in different pure breeds, in order to improve fertility success in AI and the efficiency of genetic dissemination.

Click on the projects to access more information (in French).

New Quick Access to Top Ram and Improver Ram Lists

As requested by GenOvis members, new quick access buttons have been added on our website genovis.ca to facilitate browsing between lists and from the home page.

There are some improvements to coming on next week as rams having less than 10 progeny evaluated on GenOvis have been removed from the lists.

A special thanks to breeders who share improvement suggestions for our website.

TOP RAMS (NO PROG.) | TOP RAMS (PROGENY) | IMPROVER RAMS

NOTICE

Weighing must be performed within the authorized weighing periods to be considered in breeding values.

Reminder: Allowed Weighing Periods

50 day weight: from 28 to 72 days

100 day weight: from 73 to 135 days

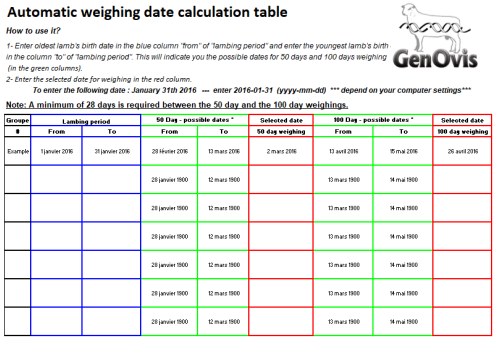
To be considered in breeding values, **lamb weights must be taken within the allowed periods.** The weight of a lamb younger than 28 days or older than 72 days at 50d weighing will not be included in EPD calculations even if the weight is recorded within GenOvis. Consequently, its breeding values will be calculated using its relatives' records (parents, brothers/sisters, ancestors, progeny…).

The same rule applies for lambs younger than 73 days or older than 135 day at the 100d weighing. Please note that **when the 50d weight is missing or cannot be used in the EPD calculation**, because it is out of the allowed period, **the 100d weight cannot be used in the breeding value calculation either.**

Automatic weighing date calculator available on our website.

Please find an automatic weighing date calculator on our website to assist you in planning your weighing.

If you need help to plan your weighing, please contact us.



Automatic weighing date calculation table

How to use it?

1- Enter oldest lamb's birth date in the blue column "from" of "lambing period" and enter the youngest lamb's birth in the column "to" of "lambing period". This will indicate you the possible dates for 50 days and 100 days weighing (in the green columns).

2- Enter the selected date for weighing in the red column.

*To enter the following date : January 31th 2016 — enter 2016-01-31 (yyyy-mm-dd) *** depend on your computer settings****

Note: A minimum of 28 days is required between the 50 day and the 100 day weighings.

Groupe	Lambing period		50 Day - possible dates *		Selected date	100 Day - possible dates *		Selected date
#	From	To	From	To	50 day weighing	From	To	100 day weighing
Example	1 janvier 2016	28 janvier 2016	28 février 2016	13 mars 2016	2 mars 2016	13 avril 2016	15 mai 2016	26 avril 2016
			28 janvier 1900	12 mars 1900		13 mars 1900	14 mai 1900	
			28 janvier 1900	12 mars 1900		13 mars 1900	14 mai 1900	
			28 janvier 1900	12 mars 1900		13 mars 1900	14 mai 1900	
			28 janvier 1900	12 mars 1900		13 mars 1900	14 mai 1900	
			28 janvier 1900	12 mars 1900		13 mars 1900	14 mai 1900	
			28 janvier 1900	12 mars 1900		13 mars 1900	14 mai 1900	

Contact us:

✉ CEPOQ, 1642, rue de la Ferme

Ste-Anne-de-la-Pocatière (Qc) G0R 1Z0

☎ 418 856-1200, extension 221

@ : genovis@cepoq.com

Editors:

Cathy Thériault-Landry, APT

Users' support and development – Quebec

Amélie St-Pierre, AHT

Users' support and development – out of Quebec