



What's New for Ayrshire Evaluations?

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Canadian Dairy Network (CDN) is responsible for the calculation of genetic and genomic evaluations for dairy cattle in Canada. Significant time and effort is continually invested to ensure the highest accuracy possible as well as the development of evaluations for new traits of importance. Ayrshire breeders can expect to see the following improvements implemented by CDN for genetic and genomic evaluations released before the end of 2014.

Mastitis Resistance

Starting August 2014, CDN will publish genetic evaluations for a new trait, named Mastitis Resistance. This new evaluation system uses health data provided on a voluntary basis since 2007 by 40% of producers on DHI across the country, including herds on the DSA program offered by veterinarians in Quebec. Bulls with sufficient clinical mastitis data recorded on their first lactation daughters will receive an official Mastitis Resistance proof, which combines clinical mastitis and somatic cell score into a single evaluation. Mastitis Resistance is therefore highly related to Somatic Cell Score with a correlation of 80%. Producers will have a new tool for selecting sires that improve resistance to mastitis in their herd.

Genotyped Cows in Reference Group for Genomics

In the fall of 2013, CDN collaborated with Ayrshire Canada, Holstein Canada and Semex Alliance on a project funded by Zoetis Canada that resulted in genotyping 580 Ayrshire cows. As a consequence, CDN recently conducted an analysis to quantify the increase in accuracy of genomic evaluations when cows are included in the reference population in addition to proven sires. Starting in December 2014, both cows and proven sires will be used as the base for estimating genomic evaluations in Ayrshires. CDN research has shown that genomic evaluations for young bulls and heifers will then see greater gains in prediction accuracy. Ayrshire breeders will realize more benefits of genotyping their heifers and cows compared to the current situation.

Only Genotyped Cows and Heifers Included on Top Lists

Also effective December 2014, CDN will produce top lists of cows and heifers including only genotyped animals. The official Top LPI Cow list will no longer include non-genotyped cows so it will be important for breeders to have the most elite Ayrshires genotyped prior to October 2014. The same will be true for non-genotyped heifers being excluded from the top list by GPA LPI.

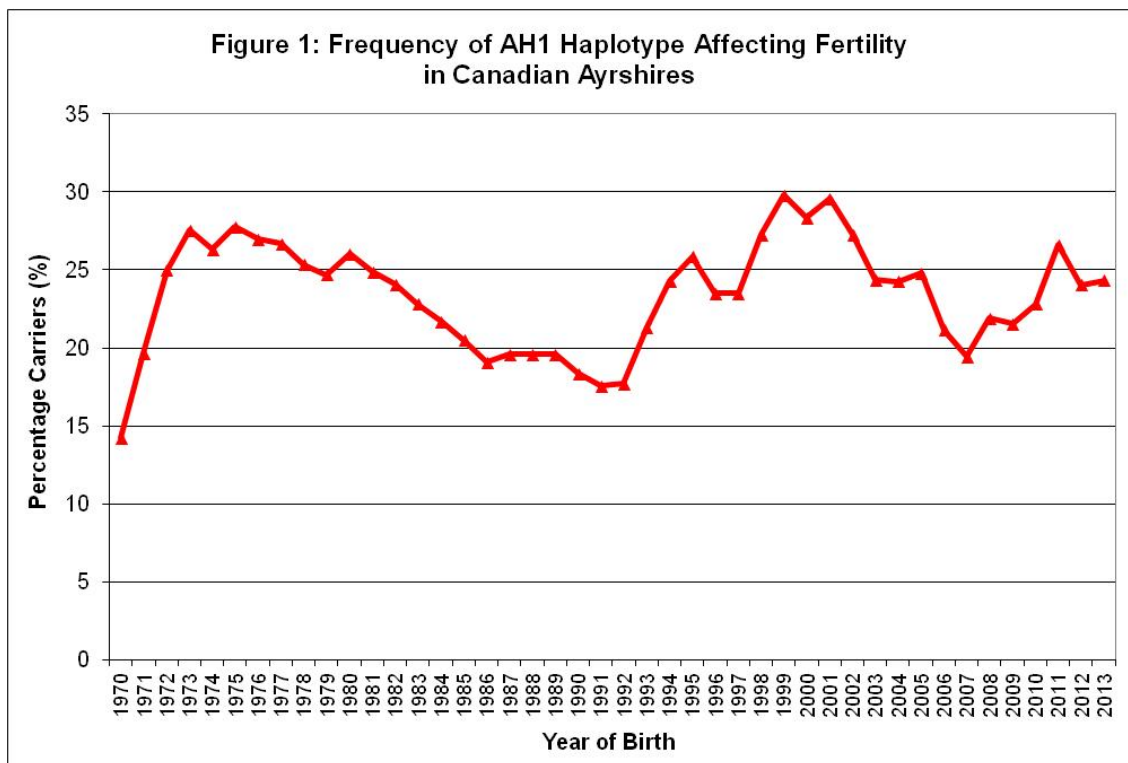
Extended Genotyping Effort

CDN recently identified a list of 167 proven sires with an official LPI in Canada that have not yet been genotyped. Using this list, Semex Alliance and the other A.I. member organizations of CDN will attempt to track down semen from these bulls with the goal of genotyping them to continue to improve the accuracy of Ayrshire genomic evaluations. Ayrshire breeders may have such semen available in their on-farm inventory.

Managing the Ayrshire Haplotype Affecting Fertility

Ayrshire breeders may not be fully aware of the benefits associated with genotyping their heifers and cows, outside of the well known gain in accuracy of each animal's genetic evaluation. One very important benefit of genotyping is the identification of animals that are carriers of the

“Haplotype Affecting Fertility” that has been identified in the Ayrshire breed. This genetic characteristic is known to be associated with early embryonic mortality and therefore lowers the reproductive performance in the breed. It is labelled simply as “AH1”, meaning Ayrshire Haplotype number 1, but none others have yet been identified. Since the exact biological mechanism affected by this genetic characteristic has not been clearly identified, scientists cannot give it an exact name at this time. Figure 1 shows the estimated frequency of the associated gene/haplotype in the Canadian Ayrshire population by year of birth.



The most striking reality of this graph is the fact that AH1 has been present in the breed in Canada for more than 40 years with a frequency between 15 and 30% within each birth year, which is quite significant. Since it was not known to exist, there was no possible way to eradicate it or to even attempt to reduce its frequency. With genotyping, every animal is identified to be a carrier of AH1 or not. For non-genotyped animals, CDN calculates a “Carrier Probability”, which is displayed for each animal and their ancestors on the link to the animal’s “Pedigree” page on the CDN web site (www.cdn.ca). Animals known to be a carrier of AH1 are assigned a Carrier Probability of 99% whereas a value of 1% is displayed for animals considered to be free. Mating a known carrier sire to a heifer or cow that is a carrier will lead to embryonic mortality in 25% of the resulting pregnancies. In these cases, the female may have been confirmed pregnant but would then be found to be open later on in lactation, therefore extending the resulting calving interval.

The ideal way to manage the frequency of AH1 in your herd and in the Canadian Ayrshire population in general, is through the use of a mating program that uses the Carrier Probability values from CDN, which is currently offered by some but not all A.I. organizations. It is not recommended to totally exclude carrier bulls from your sire selection program since that would sacrifice many other important qualities they offer. Herd owners that genotype all heifers and cows will be in the ideal position for controlling the impact of the AH1 haplotype affecting fertility and immediately eliminating the negative effect it has on reproductive performance.