Muscle Weakness Update

- August, 08 2025

Since April 2024, Lactanet has published gene test results and haplotype Carrier Probability values for Muscle Weakness (HMW). After a review of the carrier probabilities assigned compared to later gene test results, Carrier Probabilities calculations have been modified to be more representative of the expected frequency of Muscle Weakness.

As a reminder, Carrier Probability values reflect the likelihood that an animal carries HMW and are reported as values ranging from 1%, meaning the animal is likely free of the haplotype, to 99% meaning the animal is likely a carrier. Such values are calculated for every animal in the Lactanet database utilizing gene test results, haplotype results from the Council on Dairy Cattle Breeding (CDCB) and pedigree data. The HMW results from CDCB are reported in the following manner:

0 = non-carrier
1 = carrier
2 = homozygous

3 = probable carrier
4 = probable homozygous

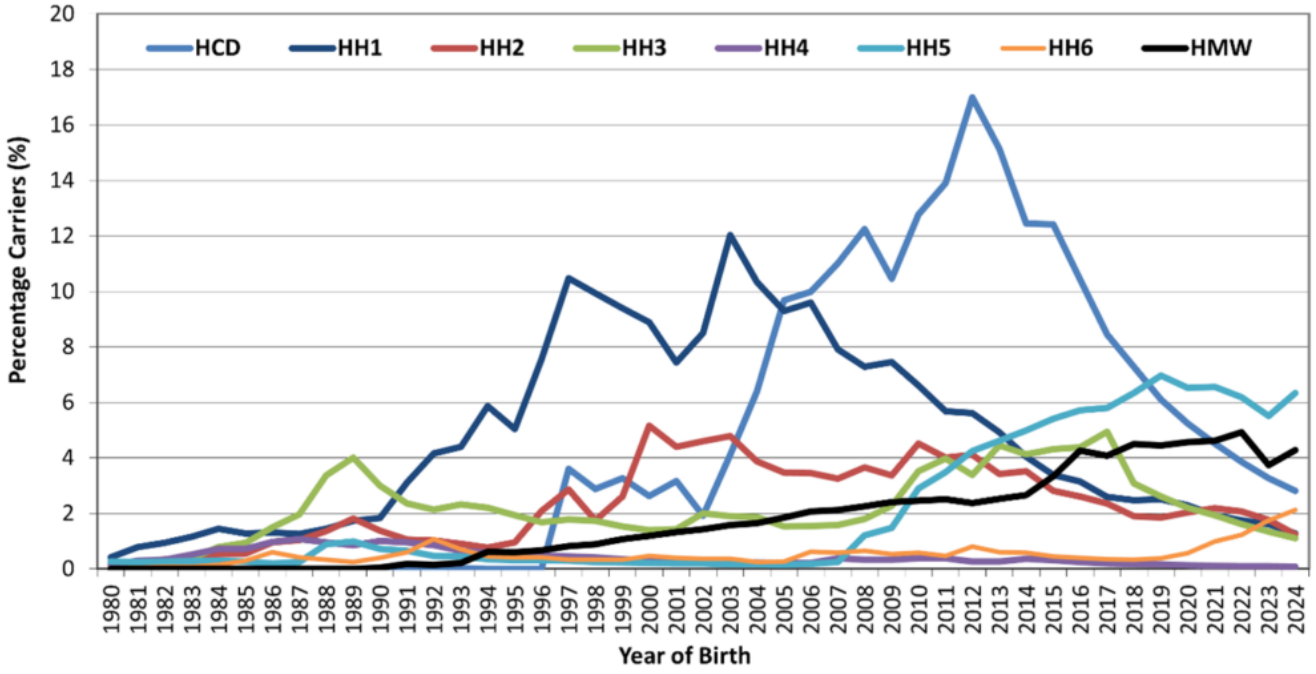
The CDCB uses “probable” to report status codes 3 and 4 due to the inability to confirm the presence of the mutated haplotype for MW through the available pedigree information. In the calculation of Carrier Probability values, “probable carriers” (Code 3) have been treated as carriers in the Lactanet calculations and therefore given a carrier probability of 99%. However, a review of gene test results from Lactanet’s A.I. partners showed around 40% of “probable carrier” animals were found to be “free” after being gene tested. Lactanet therefore now changed “Probable Carriers” of HMW to be designated with a 40% probably carrier instead of 99%. This change also lowers the Carrier Probability value for offspring. For example, if a “probable carrier” (Code 3) animal was mated to an animal that is free of HMW, the progeny will now have a HMW Carrier Probability of 20% instead of the previous 50%.

Figure 1 below shows the trend in percentage carriers for known haplotypes in Canadian Holstein females, including HMW. Compared to previous trends which showed the percentage carriers of HMW peaking at 6%, this recent change has resulted in a lower, more realistic percentage carriers of 4% for recent birth years. Lactanet has also received additional genetic trait data from the International Bull Evaluation Service (Interbull) which has led to a large number of results for bulls that were previously unknown.

Summary

In June 2025, Lactanet updated Carrier Probability calculations after a review of gene test results, changing probable carrier (Code 3) animals designated by CDCB from 99% to 40% Carrier Probability for HMW. This change is viewable for affected animals on the LactanetGen.ca website.

Figure 1: Trend in Percentage Carriers for Known Haplotypes in Canadian Holstein Females



Partager



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Allison enjoys sharing her knowledge of the dairy cattle genetic improvement landscape with all audiences from the technical to the end-user for the successful understanding and application of genetic selection tools.



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