

Developing a Reporting System for Developmental Complications in Calves

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Key Points

- Incidences of pregnancy loss and calf developmental complications are increasing in Canada's dairy population, raising animal welfare, herd productivity, and farm profitability concerns.
- Reporting incidences of pregnancy loss and developmental complications in calves is essential for their management. Through reporting and genetic testing, researchers can identify if genetic links to the complication exist, allowing for proper management that can limit future occurrence of these complications through the population.
- Current Challenges:

1. Lack of a well-implemented reporting system for documenting incidences of developmental complications and pregnancy losses.
2. Pregnancy loss and developmental complications often go unreported
 - Complete the survey to provide invaluable feedback that will shape the design of a reporting system and ultimately reduce the frequency of genetic conditions: [Here](#)

What are “Pregnancy and Developmental Complications”?

Pregnancy Loss • Embryonic Loss • Stillbirths • Abortions	Diseased Young Stock • Any disease of unknown origin in calves and young stock <3 years of age.	Malformed Calves • Extremity deformities • Organ development deformities
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Modern Breeding Programs and Homozygosity in Canadian Dairy Cattle

Genetic selection has led to significant advancements in Canadian dairy production efficiency, health, and welfare. However, the intense use of elite sires has resulted in higher genetic relationships between animals, reducing overall genetic diversity. Although the long-term consequences of this remain unclear, current concerns include the spread of undesirable genetic conditions through the inheritance of undesirable genes

How do genetic pregnancy and development complications occur?

Genetic related pregnancy and calf developmental complications usually occur when a calf inherits the same copy of an undesirable gene or DNA segment from each parent. Some can be lethal, resulting in pregnancy

loss, and some impede normal calf development, leading to developmental deformities and reduced viability. When undesirable conditions aren't identified and managed early, they can quickly spread through the dairy population.

To date, the dairy industry has made great strides in identifying and managing genetic conditions but as the frequency of unknown abnormalities increases, we must remain diligent.

Important: Not all Pregnancy and Developmental Complications are Genetic!

Identifying the root cause of a pregnancy or developmental complication can be challenging. More commonly, these complications are linked to environmental factors such as nutritional imbalances, stress, temperature extremes (like heat stress), toxins, and disease and infection prevalence within the herd. However, testing for undesirable genes is important for uncovering genetic links to these complications and developing practices to prevent them in the future.

Current Reporting in Canada

Canadian dairy farmers do not have a centralized system for reporting pregnancy and developmental complications. While some organizations offer company-specific reporting platforms, these systems are rarely used. As a result, there is little reporting of these incidents, leading to a significant gap in valuable data that could otherwise help address and mitigate these issues. To date, no research has been conducted to identify the barriers that might prevent Canadian producers from reporting or how to increase accessibility of current platforms. Understanding these factors is key to improving both herd health and industry practices.

The Impact

Animal Welfare: Genetic conditions can affect calf survival and quality of life. Some conditions are lethal, leading to early mortality. The delayed onset of certain disorders complicates early detection and can lead to a gradual or rapid decline in the calf's health and wellness status.

Reproductive Disorders in Dams: Stillbirths, abortions, and developmental malformations, increase the dam's susceptibility to reproductive disorders and birthing complications, including dystocia, retained placenta, metritis, endometritis, and mastitis.

Reduced Productivity & Profitability: Costs of calf loss and developmental challenges include veterinary expenses, pharmaceutical costs, increased labor fees, decreased milk production, replacement heifer fees, etc., significantly reducing annual farm profitability.

Disease in Future Generations: When undesirable genes go undetected, breeding management becomes increasingly difficult, as these genes will spread across generations, increasing the prevalence and likelihood of pregnancy and developmental complication in future herds.

Why is Reporting Important?

- Understanding the underlying genetic cause of pregnancy and developmental complications requires detailed examination.
- Reporting and genetic testing allows us to pinpoint any genetic causes to these complications.
- Reporting is essential for the development and implementation of preventative measures to minimize future incidences of complications and fatalities in dairy herds.
- When cases go unreported, valuable opportunities to prevent future occurrences are lost.

How Can Reporting and Genetic Selection Help?

Reporting incidences of pregnancy and gestational complications, and receiving genetic testing, is important for identifying and managing genetic conditions in the dairy population.

As an example, Brachyspina was first documented in 2007, a lethal defect marked by low birth weight (~ 10kg), shortened spine, and elongated limbs in calves. Through farmer reported cases and genetic testing, Brachyspina was identified as a hereditary disease resulting from the inheritance of two copies of an undesirable gene. Once a gene test was developed, breeders could manage its presence in breeding programs by avoiding mating potential or known carrier animals together, limiting the spread to future generations.

What Can You Do?

Fill out the survey: To address challenges surrounding pregnancy and developmental complications, and the lack of reporting, the Centre for Genetic Improvement of Livestock (CGIL) at the University of Guelph has partnered with Holstein Canada, Lactanet, and Semex to develop an improved reporting system tailored for Canadian dairy producers to document these incidences in their herds.

To ensure this system meets the needs of ALL Canadian dairy producers and maximizes future use, we need your help! By completing the [survey](#), you can anonymously participate in this research project (REB #64) and provide invaluable feedback that will shape the design of the reporting system and ultimately reduce the frequency of genetic conditions.

Our Goal

We aim to design a reporting system that can be easily integrated into dairy farming practices and widely accessible to all Canadian producers.

The system will allow you or your veterinarian to submit a picture, description, and a blood or tissue sample from the calf and its dam for analysis.

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References:

1. Bicalho, R. C., Galvão, K. N., Warnick, L. D., & Guard, C. L. (2008). Stillbirth parturition reduces milk production in Holstein cows. *Preventive Veterinary Medicine*, 84(1-2), 112-120. <https://doi.org/10.1016/j.prevetmed.2007.11.006>
2. De Vries A. (2006). Economic value of pregnancy in dairy cattle. *Journal of dairy science*, 89(10), 3876-3885. [https://doi.org/10.3168/jds.S0022-0302\(06\)72430-4](https://doi.org/10.3168/jds.S0022-0302(06)72430-4)
3. Mahnani, A., Sadeghi-Sefidmazgi, A., & Keshavarzi, H. (2018). Performance and financial consequences of stillbirth in Holstein dairy cattle. *Animal*, 12(3), 617-623. <https://doi.org/10.1017/S1751731117002026>
4. Mee, F. (2013). Why do so many calves die on modern dairy farms and what can we do about calf welfare in the future? *Animals*, 3(4), 1036-1057. <https://doi.org/10.3390/ani3041036>
5. Sigdel, A., Bisinotto, R. S., & Peñagaricano, F. (2022). Genetic analysis of fetal loss in Holstein cattle. *Journal of Dairy Science*, 105(11), 9012-9020. <https://doi.org/10.3168/jds.2022-22000>
6. Smolec, O., Kos, J., Vnuk, D., Stejskal, M., Brkljaca Bottegaro, N. (2010). Multiple congenital malformation in simental female calf: a case report. *Veterinarni Medicina*, 55(4), 194-198. [10.17221/95/2010-VETMED](https://doi.org/10.17221/95/2010-VETMED)
7. Sweett, H., & Fleming, A. (2024). Trends in haplotypes and genetic recessives. *Lactanet*. <https://lactanet.ca/en/trends-in-haplotypes-and-genetic-recessives/>
8. Whitlock, B. K., Kaiser, L., & Maxwell, H. S. (2008). Heritable bovine fetal abnormalities. *Theriogenology*, 70(3), 535-549. <https://doi.org/10.1016/j.theriogenology.2008.04.016>
9. Windsor, P., & Agerholm, J. (2009). Inherited diseases of Australian Holstein-Friesian cattle. *Australian Veterinary Journal*, 87(5), 193-199. <https://doi.org/10.1111/j.1751-0813.2009.00422.x>

Partager





By Hannah Sweett, Ph. D.

Hannah discovered her passion for agriculture during her undergraduate degree at the University of Guelph and through work experience in the dairy industry. She holds a B.Sc. in Molecular Biology and Genetics and a Ph.D. in Animal Genetics, focusing on the genetic improvement of dairy cattle fertility.



By Filippo Miglior Ph.D

DAIRY FARMERS ...

WE NEED YOUR HELP!

The Centre for Genetic Improvement of Livestock (CGIL) at the University of Guelph has partnered with Holstein Canada, Lactanet, and SEMEX, to develop a reporting system tailored to Canadian Dairy farmers to document incidences of pregnancy loss and calf developmental complications in their herds.

To ensure this system fits the needs of ALL Canadian Dairy FARMERS and maximizes future use...

WE NEED YOUR HELP!

YOU'RE INVITED TO PARTICIPATE IN OUR RESEARCH PROJECT

By filling out our survey you will anonymously share your:

- Platform preferences
- Knowledge and outlook on genetic testing for health traits
- Experience with pregnancy loss and developmental complications
- Experience reporting

WHAT ARE PREGNANCY AND DEVELOPMENTAL COMPLICATIONS?

- Embryonic Loss
- Abortions
- Stillbirths
- Malformed/Deformed Calves
- Diseased young stock (< 3 years of age)

Help us make a system for Farmers, **By Farmers.**

**FILL
OUT
OUR
SURVEY**

Today

YOUR PARTICIPATION TODAY ENSURES A HEALTHIER, MORE RESILIENT FUTURE FOR DAIRY FARMING.

SCAN ME



RESEARCH PROJECT: SURVEY
REB #64

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