Réseau laitier canadien
Canadian Dairy Network

On-Farm Data: Challenges & Opportunities

There is no doubt that new technologies are changing our lives... seemingly every day! While this is true in our personal lives it is also true in the barn. In an effort to improve herd management and profitability by making timely, accurate decisions, technologies now exist for monitoring several important variable including the feed intake, body temperature, heat detection as well as lying, sleeping, movement and pre-calving behaviours of each cow in the herd. In addition to these, significant advances have been made in terms of technologies for measuring variables associated with milking, which can vary from daily milk weights from automated milking systems in parlours to more comprehensive data gathered from each cow and milking with robotic systems.

Milking Systems in Canada

Table 1 provides herd and cow statistics from across Canada by the type of milking system based on herds enrolled on DHI, which represents nearly 75% of all herds. Currently, over two-thirds of the herds in Canada, representing almost half of all cows, have a tie-stall environment. Nearly 40% of all cows are milked in parlours even though these herds represent 22% of all herds. In terms of the adoption of robotic milking systems as a new technology on the farm, a total of 567 herds on DHI (6.6%) currently have at least one robotic installation, representing over 60,000 and 8.7% of the cows on DHI.

Table 1: Distribution of Herds and Cows on DHI by Milking System

	Canada			
	Herds		Cows	
	No.	%	No.	%
Tie-Stall	5,871	68.3	341,190	49.3
Milking Parlour	1,884	21.9	269,960	39.0
Robotic	567	6.6	60,565	8.7
Unknown Milking System	275	3.2	20,778	3.0
Total	**8,597**		**692,493**	

Looking at Table 2 shows the regional variation in terms of the percentage of cows enrolled on DHI by milking system. Obvious differences include the percentage of cows in tie-stall herds in Quebec (76.5%), Ontario (47.6%), Atlantic Canada (28.6%) and Western Canada (6%), which is generally offset by the proportion in herds with a milking parlour. Less regional variation exists in terms of cows milked with robotic systems, ranging from 10.6% in the West to 5.7% in Atlantic Canada.

Table 2: Distribution of Cows on DHI by Milking System Within Region

	Atlantic		Québec		Ontario		West	
	Cows	%	Cows	%	Cows	%	Cows	%
Tie-Stall	9,318	28.6	213,036	76.5	109,788	47.6	9,048	6.0
Milking Parlour	17,053	52.3	31,493	11.3	96,449	41.8	124,965	82.8
Robotic	1,848	5.7	22,396	8.0	20,304	8.8	16,017	10.6
Unknown Milking System	4,373	13.4	11,548	4.1	4,044	1.8	813	0.5
Total	**32,592**	**4.7**	**278,473**	**40.2**	**230,585**	**33.3**	**150,843**	**21.8**

On Farm Data

Considering the entire Canadian population on DHI, nearly half of the cows are housed in a free stall environment, based on statistics for milking parlour and robotic systems combined. With advanced parlour setups and robotic milking systems comes sophisticated technology, and with sophisticated technology, comes an abundance of data. This is especially true in the case of the ever-growing segment of herds with robotic installations. After each milk recording test day, routinely collected data flows to the Canadian DHI centralized database and onward to CDN. However, "non-routine" data such as daily milk weights, in-line measurements of milk components, somatic cell count and/or progesterone, milk conductivity, milking times and flow rates, etc. are not currently being transferred.

Most producers with this additional data have the opinion that it has important value to the industry, especially for genetic improvement, and should be collected and used. In some cases, this perspective becomes a source of producer frustration to a point where they question the value of participating in traditional programs such as registration, milk recording and/or conformation assessment. The reality, however, is that the accuracy and benefit of this additional data needs to be assessed and quantified. While daily milk weights for each cow from robotic and other automated milking systems are likely quite accurate, it becomes critical that the cow identification information is also correctly aligned with the animal's lifetime identification and registration number. More specific to assessing the value of on-farm technologies, the accuracy of in-line milk analysis of fat and protein components as well as somatic cell count needs to be validated. Even if the overall herd results for average fat and protein percentages as well as average somatic cell score line up well with results based on the milk shipped, this does not confirm that results for each cow are accurate. For such in-line results to be of benefit for genetic evaluation, in addition to herd management reports and benchmarking, the accuracy levels must be understood and validated. This type of validation research is an important topic here in Canada as well as several countries around the world.

Industry Initiatives

In early 2014, the Board of Directors of Canadian Dairy Network (CDN) appointed an ad-hoc committee to develop a plan to address the future needs of data collection in Canada. The final report, which was tabled in 2015, included recommendations associated with five specific strategies that were identified as important opportunities. One of these strategies focused on the growing adoption of robotic and other automated milking systems on dairy farms across Canada. The primary need is the development and implementation of an internet-based interface for the routine transfer of authorized data for loading into a national centralized database. In 2015, Holstein Canada also initiated a project to assess the on-farm data that currently exists and the opportunities for collecting it as a means of improving the efficiency of core services provided by Holstein Canada and potentially other benefits to the industry and Canadian producers.

In summary, on-farm technologies are creating new opportunities for the collection of data for both herd management and genetic improvement. Industry partners are in the process of assessing these opportunities, identifying which data has been validated to be of value, and considering technical solutions for efficiently retrieving data from on-farm systems in an automated manner and returning useful management information and/or genetic evaluations to producers. This will take some time and, as with many things, we need the best outcome not the fastest one!

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