Time for Technology

In-Line Fat and Protein Testing has Arrived . . . . . so GoodBye DHI ?

Jack Rodenburg, DairyLogix

For the last 100 years, the routine measurement of milk components from individual cows has supported a substantial infrastructure of “milk recording” throughout the developed world. On the farm I grew up on, I still recall the monthly overnight visits from travelling “ROP inspectors” in the sixties. While the Babcock centrifuge no longer makes its monthly appearance on the kitchen table today, Canwest DHI and similar companies elsewhere still employ a large team of field staff to collect milk samples and direct them to laboratories for analysis. But as technology for in-line milk testing is adopted on the farm, DHI supervisors might very well join ROP inspectors and the Dodo on the extinct species list.

The Lely robotic milking company has just released a new version of its MQC in line milk monitoring system. This version estimates and reports milk fat and protein content from each milking using infra red technology as the milk from each quarter flows through the device. It is standard equipment on the “A3 Next” version of their robot and available as a $3600 add-on for the earlier A3 version. In the company literature the emphasis for using this information is correctly placed on the day to day management of the herd. For the first time, farmers will have up to date information on fat protein inversions at their fingertips. This will be useful in identifying individual cases of rumen acidosis, as well as monitoring herd level responses to changes in feed quality and intake and changes in ration formulation. At the other extreme, high fat and low protein, especially coupled with weight loss which is also monitored in milking robots, can be a warning flag for ketosis. Daily fat and protein information can also be used to increase the accuracy of feed allocation, and help determine the ideal milking interval for busy robotic milking systems. There will be several presentations on using this technology at the Precision Dairy Management Conference in Toronto next March.

Other companies are developing similar capabilities. The Afimilk company in Israel is commercially marketing its Afilab system and they have several on-farm installations in Israel and Europe and in research stations in North America. This in-line sensor estimates fat, protein, lactose, SCC and the presence of blood in the milk, by assessing the pattern of light scattering as it passes through milk flowing into the receiver. At present, there is only limited data on the accuracy of these systems, and while they may not meet “official milk recording standards”,

they will definitely be useful in day to day management. Information on the Afilab suggests that between 50 and 80% of observed variation in in-line results is common with variation in lab test results on the same samples. In-line systems will have to be calibrated with samples of known composition. The Lely equipment has to be calibrated at least once every 6 months with samples from 90 identified milkings, for which lab test results are available.

Of course the software that comes with these technologies also calculates lactation totals and averages, giving the farmer all the tools for culling as well as management right in his own computer . . . . . and that will surely cause him to question whether he can justify continued enrolment in DHI. From the perspective of the individual herd, if milk weights, milk composition and data analysis are all available instantly at home, no service that sends historical data back to the farm a week later will be able to compete. Producers that have these tools will rely on labs and service agencies for calibration tests every six months and perhaps for specialized testing such as Johne's or Staph mastitis, but they will not enrol in traditional programs.

But on an industry basis, we need individual cow data primarily for sire proving, but also for research and industry governance. Ever since the introduction of milk metering and on farm computers, the balance between the relative value of this information at the farm level vs at the industry level, has been shifting away from the individual farm. While individual farms continue to pay most of the costs, incentives from AI companies have kept the wheels on traditional milk recording to this point. But data generated by on-farm systems has been essentially ignored. In theory, every parlour with automatic ID and milk metering collects information at every milking and is capable of producing a more accurate lactation record than we can ever hope to get from "10 official tests". The same will now be true for farms with A3Nexts or Afilab with regard to milk components.

With respect to potential for sire proving, there is also a large and growing body of valuable data from on-farm sensors related to traits that we have never been able to consider before. For example, on farm pedometers can show us the degree to which heat signs are expressed in individual cows and if this were found to be an inherited characteristic, we could improve conception rates by direct selection for stronger heats. New pedometry data on lameness could be used to select for better hoof health. A German study has already looked at how often cows visited robotic milking stalls and established that the heritability of this trait was 0.18. This is clear evidence that it would be feasible to prove sires for their daughters' suitability for robotic milking, and to identify bulls whose daughters are least likely to require fetching.

With modern communication technology, systems can easily be devised to access data from on-farm sensors electronically anytime and anywhere in the world. Yet none of it is being used for any applications off the farm. Admittedly, using such data will not be without challenges and problems. Initially, much of it will not link to a unique animal identification, some of it will be

inaccurate because of poor calibration, and there will be a substantial cost involved in setting up the mechanisms to transfer and clean up the data. Of course, there will also be endless political discussions about who owns what information, and who should have access to who's secret software configurations and who should pay, etc. but there is little doubt that at the end of the day, there are tremendous benefits waiting to be reaped from sharing the data from on farm systems. When it comes to new information, the importance of this may go unrecognized because we do not value what we have never had, but when in-line milk composition systems start to decrease the enrolment in traditional milk recording to the point that there is insufficient data for sire proving, the need to develop mechanisms to use data from on-farm sensors will undoubtedly lead to major changes in how milk recording information is captured and analysed. And the sooner we initiate projects to explore how to do this, the more likely we are to get it right.