
On-farm technologies. Challenges and opportunities for DHI and genetic improvement programs

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As dairy herd sizes increase so will the trend to increase use of automation and technology at the farm level. For milk recording (DHI) organizations and for genetic improvement (GI) programs, these trends will create opportunities but also challenges. Those opportunities and challenges can be addressed through effective business like strategies. Furthermore, a good understanding of the dairy herd of the future will be required for DHI and GI programs to be successful.

Key words: Strategy, Herd management software, Customers, Value added laboratory services, Quality, Genetic improvement.

Trends of increasing herd sizes and use of on farm technologies are occurring worldwide. Some of the technologies such as herd management software, electronic identification, electronic meters and robotic milking systems have been in use for decades. Emerging technologies such as cow side somatic cell count and component monitoring are being actively developed. Down the road it is conceivable that disease screening or pregnancy diagnosis will be possible cow side through automated milk sample collection and analysis.

The adoption of on farm analytical technologies and automation technologies will no doubt continue in the future.

For DHI and GI programs, the increased use of on farm technologies provides many opportunities. The obvious one is for access to more data. Farms with automated ID systems, electronic milk metering devices and current/future cow side analytical technologies can be a valuable source of data for industry programs, particularly GI programs.

Summary

Introduction

Opportunities

Through automation there is the possibility for improved quantity of data. Furthermore, accuracy and quality of cow information can be improved versus manual collection systems. Additionally, since labour is a significant component of DHI data collection, reduced cost for DHI services is possible through the automation of the collection process at the farm. Possibly, data on new traits could be collected routinely through the on farm technology systems (ex. lameness).

Finally, if data generated by the on farm technologies can be electronically and easily provided to DHI organizations, then data collection costs (ie. DHI fees) would be lowered and therefore more farms would participate in DHI and GI programs.

Challenges

Often, the belief is that DHI organizations just need to build an ‘electronic pipeline’ for data exchange. DHI staff would not even be required to go to the farm. Herds could just upload their on farm data to the central database, for use in industry programs. Unfortunately it is not that simple.

Even after decades of commercialization, significant data quality issues accompany on farm automated animal ID and electronic metering devices. Between read errors, ID reuse/misuse and metering equipment failure, a significant amount of data quality and completeness issues are common. These issues usually lead to the need for extensive data editing and outright discarding of data.

On the surface the principle of building an ‘electronic pipeline’ to exchange data between thousands of farms in the field and a central processing centre is appealing. However the cost to program and manage these data interfaces are significant, not to mention the practicality of keeping up with numerous on farm software manufacturers and DHI version updates.

However the biggest challenge is in the fact that if dairy farmers’ herd management information needs are being met by their on farm technologies, will they enroll on DHI services or even allow the use of their data for industry programs, even at no charge? The issue of ‘perceived value’ is not new, but as the use of on farm technology grows, so will the issue for DHI and GI programs. Dairy producers will increasingly ask... ‘What value do I get from central processing of my farm data?’

Strategy and key issues

For both DHI and GI programs, strategies can be developed to increase the perceived value of their services and to maintain relevance, even in the face of increased on farm technology adoption.

DHI - Milk recording

For profit culture and principles. It is imperative that DHI organizations operate in a ‘for profit’ culture. Most DHIs have originated from government run programs and many are still today, either formally or in the way they operate. Regardless of the legal entity (government, not for profit...etc) it is important that a business culture be present across the organization. Dairy producers are business owners and are operating in a business environment – so should DHIs.

It is important for DHIs to have a business plan and to apply sound business principles such as:

- Define the business you are in.
- Define the customer.
- Identify, leverage core competencies.

- Utilize economies of scale.
- Adopt appropriate technologies.
- Invest in innovative and new products.
- Identify key deliverable.
- Etc...

Without an effective business approach, DHI organizations will fail.

Be in the Herd Management Software business. Ultimately, all of the data from the on farm technologies resides in the herd management software of the farm (ie. Cow database). DHIs have experience and expertise in information management. Traditionally, software suppliers provide little data and herd management support and expertise – this is a strength of DHI which should be exploited.

Strategically, DHIs should be providing/selling herd management software, be the technical support for the customer and assist with on farm data management. This service is high value for dairy producers (larger ones in particular), and provides the opportunity for a common platform that makes data exchange between the farm, DHI and farm advisors, practical and cost effective (Figure 1).

Flexibility in service. The days of one size fits all are long gone. Most DHIs have adapted to that principle. With the advent of new on farm technologies, it will be important for DHIs to continue to be flexible and tailor the service offering based on changing customer needs.

Value added services. As more of the traditional milk recording services are being met by on farm technologies (ex. milk weights info), DHIs will be required to provide improved services to maintain value and relevance to the customer. Examples of such services are:

- 'Quality Control' for on farm data collection (ex. milk meters verification)
- Benchmarking services
- Records management for regulatory requirements
- Herdbook registrations assistance
- Forage, soil analysis services
- Feed management software
- Etc...



Figure 1. Common platform between the farm, DHI and Advisors makes electronic data exchange practical and cost effective.

Many opportunities exist to provide value added services. These should be proactively pursued.

View advisors as customers. Developing a pipeline of data for advisors (veterinarians, nutritionists) is as important, if not more, than the pipeline of data for industry programs. Advisors have the ability to tremendously increase the value of DHI services, through the use of the DHI information at the farm level.

By providing meaningful information and services to advisors (ex. herd management software), DHI then becomes indispensable to them and their advisory services. It not only increases the value of DHI at the farm but also enhances the profitability of the dairy industry through improved advisory services. Advisors should be viewed as a specific market segment for DHI services.

Value added laboratory services. The development of new analytical technologies is not limited to on farm applications. Much research and development is being done from a traditional central laboratory perspective. Opportunities currently exist for value added lab services (ex. disease screening) using the routinely collected DHI sample. No doubt additional opportunities will emerge. DHIs must proactively search and implement those opportunities.

Pursuit of service quality and value. DHIs are service organizations and as such must pursue service quality and excellence. Many DHIs are also not for profit, producer owned organizations operating under low cost principles. At the end of the day, dairy producers will judge relevance based on value and quality, not low cost. DHIs must be cautious of constant cost cutting and the lowering of the bar on service quality.

Sales and marketing principles. The dairy industry, like most agricultural industries is still very much a people business and professional sales and marketing matters to dairy producers. The days of dairy producers initiating the discussions regarding the need for milk recording services are over. DHI organizations need to proactively implement and practice field sales and marketing principles.

By following the principles outlined, DHI in the province of Ontario (Canada) has been able to grow the market share of herds on milk recording, simultaneous to the increased use of on farm technologies (Figure 2).

Genetic Improvement (GI)

For GI, certain strategies can also be implemented to help optimize the effectiveness of programs in light of the increased use of on farm technologies.

Data quality. With the possibly very large amount of data that can be generated from on farm technologies, GI programs will need to carefully understand and differentiate the quality of data and account for the variability.



Figure 2. Percent of herds enrolled on milk recording in the province of Ontario, Canada.

GI as Research and Development. The Artificial Insemination industry should consider their Progeny Testing program as their 'Research and Development' (R and D) division, and as such, like any other company, should manage it based on strong business principles. Benefits could be gained by concentrating efforts on the farms providing the best return on investment ie) quality data.

Concept of data farms. The idea of dairy producers being paid for their data is not new. It has been raised by dairy producers in the past... how much are you willing to pay for my data? GI should consider 'high tech' farms as specialized data providers and approach them with a business transaction in mind ie) we buy data, do you want to sell?

Too many traits? Even with new technologies, GI industry should be cautious about adding too many traits to improvement models. Often new traits have low economic impact, low heritability and therefore require a large amount of data collection for effective improvement. Dairy producers already complain about data collection 'fatigue', so the industry must proceed cautiously on new traits.

Technology to it's advantage. The development of new technologies is not limited to on farm applications. Much development has occurred in the field of sexed semen and genomics just to name two. No doubt additional opportunities will emerge. GI must proactively search and implement those opportunities to its advantage.

Technology and the herd of the future

Things will continue to change. A decline in herd numbers and an increase in average herd size will continue to be a fact of the dairy industry worldwide. Large operations will be the common practice. With that, the adoption of automation and technology at the farm will continue. As DHI and GI organizations plan for the future, we need to consider certain practical key issues surrounding these trends. These may appear self evident, but are often overlooked.

Dairy farms are independent businesses and making money is and will be the priority. Additionally, on a dairy farm time is money (Thomson, 2007). When asked what is the one thing they wish they had more of, dairy farmers never reply 'more data'! Invariably, what they wish for is more financial resources, time, quality of life and reliable, quality labour.

One of the key issues with some of the technology at the farm is that it does not always result in greater profits or time savings (Thomson, 2007). In some cases, because of the high cost (capital and maintenance) as well as being impractical (i.e. the parlour cannot be stopped while I wait for repairs to be made on some of the components), some of the technology options have a poor cost benefit or are simply not implemented. For example, many large farms have opted not to invest in auto parlour ID and electronic metering devices. They simply do not see a return on investment.

For many years, larger herds have been telling us that they really are not concerned about information on individual animals, since they manage by groups. Their data need is for groups of animals (focusing on early lactation) and on identifying problem cows. In addition they require data on how well their equipment and employees are performing (Thomson, 2007). They are not interested in information on the well performing animals. These trends are directly opposite to the GI approach of identifying superior performers and using them as the basis for future improvements.

No doubt that time savings, labour and quality of life considerations will play a key role in the adoption of future technologies. Technologies and automation that provide benefits in these areas will have the greatest chance of success.

Conclusion

As average dairy herd sizes increase so will the trend to increase use of automation and technology at the farm level. For DHI organizations and for GI programs, these trends will create opportunities but also challenges. Those opportunities and challenges can be addressed through effective business like strategies.

A good understanding of the dairy herd of the future will be required for DHI and GI programs to be successful. The large commercial herds of the future will question the value of having their herd information sent to DHI and GI databases. DHI organizations and GI programs have gone through significant changes and adaptation in the past and will be required to continue to do so in order to remain relevant to dairy producers.

List of references

Thomson, R., 2007. American Dairy Science Association symposium, San Antonio, Texas, USA.