The necessary foundation beneath new ag data

LET'S start this month's column by rounding up several buzzwords, namely artificial intelligence, data dashboards, carbon footprint, and sustainability. These topics each gather great attention in their own space. They stand alone with prominence, yet there's a common pain point underpinning each for dairy producers that needs to be alleviated. We'll uncover the common pain point among them in a moment, but let's first explore a bit of the history behind these concepts.

Goeser

Looking back

The dairy industry has been experimenting with data dashboards and visualization tools for well over a decade. The flash associated with user-interactive tools has caught the dairy industry's attention; however, powerful dashboard tools require a reliable data foundation and data from different sources.

What could be ahead?

Farm conservation efforts and sustainability are also relatively aged topics. New conservation programs and projects are rolled out each year, though there is a profound history of the dairy industry being a leader in adapting environmentally conscious practices. Commonly, new conservation practices are implemented from grant or cost-sharing programs. As part of the business arrangement associated with adapting the conservation practices, dairy producers are asked to supply farm data from different sources to advisers for verification purposes, documenting conservation practice adoption and impact.

Artificial intelligence (AI) is the next buzzword, and potentially the most intriguing. Rapid advances and news coverage with language learning models, insights derived from wearables or sensors, machine learning models, and new computer or smartphone hardware products featuring AI solutions are commonplace. I believe the dairy industry is on the cusp of applying machine learning and advanced artificial intelligence methods to uncover new indicators for dairy herd health or performance swings.

Beyond a doubt, there are unrecognized environmental, ingredient, and management factors that affect feed conversion efficiency, sustainability, and dairy economic performance. Artificial intelligence models present a path to uncover the relationships or signals that human intelligence, classical research, and statistical analysis cannot. For example, picture a notification system that could take into account weather, management, production, and intake data and accurately predict a herd health challenge or digestive challenge outbreak. This may be possible with the use of machine learning models.

However, to take the next step and transition from beyond human understanding to building models with AI methods, software engineers and scientists need large datasets from different sources. If we can pull the data together in a usable form, the sky's the limit.

Dial in on data

Our industry has limitless potential and drive. Those of you milking cows or advising dairies are impressively motivated. I'm often taken aback by new research, extension, and commercial programs geared toward taking the next step forward

with milk production efficiency and carbon footprint. We're entering an exciting period for our dairy industry as we now generate more data than we can possibly analyze with human intelligence.

While consultants and researchers routinely analyze and model data from a single source, such as a single farm's herd management data, it's more rare to aggregate data from multiple farms and different sources, such as feed and herd management data. Herein lies a tipping point for us, and the path to rapid advances in the areas described above. Different data sources and information from all of the important areas on dairy farms are not necessarily tied together as well as they could be. The first step toward addressing this gap is to raise our collective industry awareness.

Admittedly, this is a complex topic to discuss. Fancy data visualization tools or artificial intelligence models are easier to comprehend than a system built that pulls together data from herd health, feed management, nutrition analysis, bulk tank, financial, weather, and collars or other sensors. Yet, I contend we shouldn't give much further thought to these knowledge tools unless we address the common gap that hinders any of the buzzwords covered here.

Bringing these buzzword topics together, artificial intelligence, dashboards, dairy carbon intensity scoring, and sustainability projects probably didn't all fit together upon introduction. However, each of these compelling models and tools rely upon robust data tables collected from different sources on dairy farms. These data files need to be organized into one well structured database, and this is called a data

lake. A dairy data lake includes information from all the sources referenced above. I'm finding that a sound data lake for a farm, or multiple farms and sites, is still a major hurdle for us to clear.

Streamline the process

Bring this data lake topic up with your advisory team and identify areas that could be improved upon. The first step toward clearing the hurdle is uncovering the gaps between your data tables with your consultants. After the gaps are understood and discussed, find a way to implement a system to aggregate the data sources into a data lake. There are different solutions out there to accomplish this goal, but most have the same idea.

Lastly, after the data tables are flowing into a single data lake, then we can empower all of the buzzworthy tools discussed above. We can connect to data visualization dashboards or implement machine learning to develop new farm-specific predictive models. We can also use the data lake to provide information for carbon or sustainability projects and programs.

Think about the different data tables on your farm like segments of a secret map that shows the path to a big treasure. The data lake is the secret map, and the treasure is the margin and financial reward tied to improved herd performance and better efficiency. 🐄