

# Let data driven decisions put you in the driver's seat with your clients

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## Abstract

Cattle facilities make decisions on a daily basis that have huge economic and animal health impacts. By incorporating dedicated data analysis and utilization as part of your practice model, you can drive better decision making that can improve animal health outcomes and production efficiencies. This process has the ability to improve the economic viability of your client's business, as well as your own practice, and makes you indispensable to your clients.

**Key words:** data, veterinarian, data analysis

## Résumé

Les fermes d'élevage de bovins prennent quotidiennement des décisions qui ont de grandes retombées sur la santé animale et sur le plan économique. En incorporant l'analyse et l'utilisation des données dédiées dans votre plan de pratique, votre prise de décision sera meilleure ce qui va améliorer les résultats en santé animale et l'efficacité de la production. Ce processus permet d'accroître la rentabilité des entreprises de vos clients de même que celle de votre propre pratique et vous rend indispensable auprès de vos clients.

## Introduction

According to the National Animal Health Monitoring System (NAHMS) Dairy 2014 report, a record-keeping system of some kind is used on 95% of all dairy operations and on 100% of large (500 or more cows) dairy operations. When considering large dairy operations, 94% used an on-farm computer record-keeping system. Since we know data is being recorded on nearly all dairy operations, we can infer that the majority of dairy operations find some value in having the data collected. As veterinarians, we can play a role in helping to make the facilities' on-farm data more valuable by reviewing, analyzing, interpreting, and implementing the information that can be gathered from the data collected.

Yet, based on the NAHMS 2014 report, only 29.5% of operations utilized the records evaluation and consultation service of a veterinarian, while 84.6% of operations utilized the drug sales service of veterinarians. The majority of dairies buy their drugs from a veterinarian, but few employ their veterinarian for records evaluation. If you as the veterinarian are not already involved in record analysis and data interpretation

with your clients, you should consider making that a routine service that you provide.

As veterinarians we frequently have access to, or can at least gain access to not only on-farm data, but data provided in a plethora of publications. But as veterinarians, we also do not have a monopoly on analyzing and interpreting this data for our clients. There are many other industry affiliates who can and will analyze and interpret data for your clients, in ways that may or may not be accurate or relevant to that facility. We must always keep in mind the motives behind data provided by outside sources. It is our responsibility as the veterinarian to be familiar enough with our client's facilities that we can provide them with the most accurate, unbiased information, and be the filter to all the additional data and information that is provided to them daily.

## Where Veterinarians Can get Involved

We know that many cattle facilities are collecting some data, so it is often easy to start with what data they have and go from there. The client already has some motivation to collect that data and it offers you a window into what the producer values and prioritizes. Evaluate the data that is collected, get a sense for the quality, consistency and accuracy of the data, and then how well that data lends its self to further evaluation. This gives you a great starting point, and an idea of what needs to be accomplished before you get started evaluating on-farm records.

To get an idea of the quality of the data, it is best to look at the raw data input. The commonly used data management software systems in dairy allow you to generate a report that contains the raw data that was inputted. Does this seem accurate? Gather any paper records and compare them to the input in the computer. Has the data been recorded and does the manner in which it was recorded accurately reflect what happened? Ask yourself if the data that you are looking at make sense for this facility. If there is 1 retained placenta recorded for the month and you just walked through the hospital and saw 3 cows with a retained placenta, then you should have some concerns with the accuracy. This also provides a great opportunity to improve the recording of retained placentas. Is the data recording consistent? Is the data recorded in the same manner using the same abbreviations? If the treatment crew does not have a clear definition of metritis and retained placenta, maybe those are recorded interchangeably. When metritis is occurring at 1 or 2 days-

in-milk, that is a great indication that some work needs to be done on disease definition. The abbreviations used for the disease and for the treatments are critically important if further analysis is going to be done. Just like anything else done on a cattle facility, a protocol can be created to help ensure consistent data recording.

One area of particular importance when evaluating data quality, when it comes to health data, is the difference between a record of treatments and a record of diseases. Is the data you are looking at a record of treatments administered, or is it a record of diseases that occur on the facility and the treatment administered? If a dairy utilizes cultures to help guide mastitis treatments, are the no-treatment cases recorded? If the treatment for a cow that has mastitis 4 times is to send her to beef, is that fourth mastitis episode recorded? With many facilities this requires a paradigm shift and takes some time before disease recording is done accurately and consistently.

Regardless of how good you think the data is, it is always worthwhile to start at the beginning with data collection. Go out and observe the hospital crew record data, walk with the breeders, stand in the parlor and watch them write down the new mastitis cows. It is amazing what you find out when you observe data collection in the field. Then follow the data and trace the path data takes from the cow to the computer. Consider each of these steps and discuss with management if all of those steps are necessary. It is not uncommon for a data transfer step to be taking place that is really not necessary.

When evaluating data collection, start with the end in mind. What does this data need to do and what do you want it to do? Data recorded on-farm can have several important uses. Consider how this data is used on-farm on a daily basis. For treatment records, be cognizant of what is required and then how you, as the veterinarian, want to use the resulting data. In many cases, you will be changing or adding something to what data is already being collected. This means you may need to change people's habits, so do not make it overwhelming. There are a lot of good pieces of information that can be collected, but do not overdo it and collect data that will not be used. Of course, not all data is recorded by on-farm personnel. As technology advances, more and more data are automatically collected electronically. This is very convenient, but that does not by default make it good data. Critically evaluate how and what is being collected.

Many people want to skip evaluating data quality and go straight to data analysis, without having an understanding of what the data actually is or what it represents. This is a dangerous step to skip, because it can send you and your client in the wrong direction or allow you to draw the wrong conclusions later. The benefit of completing this step and improving data quality will be realized with the greater utility of the data in the future.

Once you have figured out what pieces of data you want to collect and how that will be collected, consider how that data will be stored. Paper records certainly have value, and

are the starting place for many clients, but in many cases the data needs to be converted to an electronic format so that further analysis can occur. For data collected electronically, the format of recording may already be set, but do not think you are stuck with that format. It is amazing what can happen if you talk to the developers of that software! Any data moving from paper to electronic format needs special attention to make sure that data is being recorded in a manner that makes it easy to evaluate. The 3 most important aspects to consider when trying to make data easy to evaluate are consistency, consistency, consistency. Consistently record the data in the same manner with the same abbreviations every time. This is another good place to have a written protocol that outlines how and what is recorded into the electronic format.

At least in the dairy world, when I say data evaluation, most people think of the various data-management software programs. Although those programs are excellent for some things, do not restrict your data analysis to those programs. Sometimes you need to get creative and find new ways to collect and store data that have value to you and your clients. Although production, reproduction, and disease data provide us with a lot of information, sometimes we need to branch out. For example, if you have identified a mastitis problem in a free-stall barn, maybe you need to collect some data on stall cleanliness and usage over time to help you further define and track the problem. Or another example could be, you have identified a bloat problem in calves and you need to collect and analyze data on feeding times and temperature of the milk. Necropsy data can be extremely valuable, but it is often not obtained or not recorded and used to evaluate the cause of death in the herd and make future management decisions. This may be non-traditional data, but it can be extremely important.

Now that you have the groundwork done, you can figure out what you want to analyze and how you want to present the data. Many of the software programs provide very nice outputs of data, but you as the veterinarian still provide value to your client by presenting and interpreting this data. Just because data output may be easy to obtain, does not mean that the information is being utilized at all or utilized correctly. Then, there is the data that a data software program is not set up to create a nice output for. For example, how are you going to analyze and present necropsy data? Or if you want to know if there is a difference in fresh-cow milk quality when using selective dry-cow therapy, this will require some additional work for analysis and display. Do not be afraid of this data. Although it is often ignored because it is not as easy as a click of a button, this data can provide so much value. You may simply need to use Excel® or delve into some more advanced programs like Tableau®, SAS® or R® to perform the analysis. If you are not comfortable with using these programs, you can always learn, or commonly a younger associate or office member may know how to use these programs. The internet is full of helpful tutorials and step-by-step videos. Help is also available at many of the

universities, and there are for-profit organizations that can do some of the heavy lifting for you. If you do not personally create the data outputs, do not think you are not involved. You still know the herd and you still need to be doing the interpretation of this information.

Much of what has been discussed thus far is on-farm data evaluated by you the veterinarian, but there is a notable amount of data brought to the attention of the owners and managers from external sources as well. You want to be in a position that you can help the facility interpret this data correctly. There are many industry affiliates, drug companies, milk equipment suppliers and the like, that will bring in data about products or equipment, and you as the veterinarian are well positioned to help determine the external validity of this data. Just because the neighbor's dairy thought something was great, or a study conducted in Europe shows positive results, does not mean that is relevant to this facility. Outside companies will sometimes evaluate data from a facility you work with. This can be very useful, but you also must be cautious of what is being presented. As the veterinarian, your knowledge of the facility and animal health can position you to critically assess third-party analyses, ask the germane questions, and interpret the validity of the data and analysis for your clients. There is a lot of misuse and abuse of data that occurs, and veterinarians can serve as a barrier to that misinformation for your clients.

#### *Data-driven Decision Making*

Veterinarians are professionals, and as such we should have data, not just perceptions. Perception can be the thing that leads you to investigate a question or problem, but do not stop there. Sometimes you need to use outside data, such as research trials, because it is not possible to generate that data on farm. Other times we can generate or utilize on-farm data to answer questions or track changes over time. Nothing drives me crazier than hearing the owner or manager ask the crew how a new product, protocol, procedure or management practice is going. Perceptions are dangerous and should be substantiated or refuted with data. Use data as much as possible, because the more you do, the more your clients will want it, and will want to use it to help inform their decisions. At the same time, be honest with yourself about the utility of the data you have on farm. Know the data's limitations. If you

did not use 2 treatments in an equal and fair manner, then you cannot compare those 2 treatments.

#### **How Do I Get Involved?**

If you are waiting to be asked to do data analysis for a client, quit waiting and be proactive! There are always questions that come up that you can help answer with some simple data. Perhaps the hospital crew is complaining about metritis cases or you are out on farm and you see a lot of lame cows. These are all great opportunities to show that you have interest in data analysis and how helpful data analysis can be. Another way is to offer to host or be a part of management meetings. Management meetings are great places to hear about the challenges the facility is facing, what topics are important to ownership and where you can offer to take on a task for the facility. Your clients need to know how much you care before they care how much you know. Become involved, even if that means you might have some non-billable hours to start with. Data analysis does not always provide answers; sometimes it prompts additional questions or moves you in another direction where you can do further investigation.

#### **Conclusion**

Data analysis is an excellent service to provide your clients. It allows you to provide unbiased informed data to your clients, which in turn can help your clients make better decisions. Once your clients realize what you as the veterinarian can provide via records analysis, you will become indispensable because there is no one else positioned as well as you are to provide this service.

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#### **Reference**

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