



TO TREAT OR NOT TO TREAT

Targeted metaphylaxis saves money, safeguards current treatment options.

by *Miranda Reiman, senior associate editor*

No matter how good the cattleman, it's still impossible to look at a pen and predict exactly which ones will get sick later on and which won't.

That's why metaphylaxis, or the process of treating an entire group of cattle with preventative antimicrobials on arrival, has been such an important tool to keep high-risk cattle healthy, says John Richeson, animal scientist at West Texas A&M University.

Feeders often use history and information to evaluate commingled cattle, but must assume the entire load carries the same probability for sickness.

"We know that even if a group of animals is classified as high-risk, almost never would every single animal become ill with BRD (bovine respiratory disease)," he says. Some animals need an antimicrobial on arrival, and

others in the same pen would remain healthy without it.

"Are there different things we can do to take a look within that high-risk population or scrutinize the individual

animals?" Richeson asks.

He and his colleagues are trying to find out, but the research is not without challenges.

"You're trying to predict health risk. You're not necessarily trying to diagnose disease," he explains.

"We want to determine whether that animal is likely to become sick four, five, six, seven days down the road."

There's ongoing work across the industry, encompassing everything from nasal swabs and blood tests to quantifying lung sounds and DNA tests.

Economics, efficacy and consumer perceptions

"Even with antibiotics, we lose 20% of what we produce globally

Above: Ongoing research in the area of antimicrobial treatments on arrival at a grow yard or feedlot has given way to commercially available technology, such as the Whisper on Arrival paddle shown here.

to death and disease," says Joy Parr Drach, president of Advanced Animal Diagnostics, a company testing and marketing QScout® BLD, a chuteside blood assay. "So the idea or threat of having to do what we do in animal agriculture without antibiotics was very scary to me."

That's why this CEO by day, beef producer by night, partnered with scientists from human medicine to work on solutions.

"It helps us be more proactive in telling our story to the consumer that we're being really precise and responsible with our antibiotic use, but it also makes us a better steward of our resources," she says, suggesting that about one-third of each high-risk pen, on average, needs treatment.

"It's just that before we've never



been able to know which 30%, so we've had to treat all of them to make sure we didn't lose our shirt on that load," Drach says. "Meanwhile we're just throwing away \$20 bills or more on that 70% that didn't really need to be treated."

It might seem counterintuitive that a company like Merck Animal Health would be looking for a solution in this space, but their director for insights and outcomes says their work is a natural fit.

"Long-term, we see the value in leveraging information to make more informed decisions, and our customer base is desiring more and more information to make those business decisions," Jason Nickell says.

They've introduced a technology to use biometric measures to give objective data for a "treat or not" decision.

"The immediate value is to the producer — the cost savings," he says.

There is policy discussion and consumer sentiment to consider, and researchers want to make sure today's products continue to work when cattlemen need them.

"The less antimicrobial pressure that we put on a population, the less antimicrobial resistance, in theory, that we have," Richeson says. "So hopefully it's another avenue to maintain efficacy of our antimicrobials."

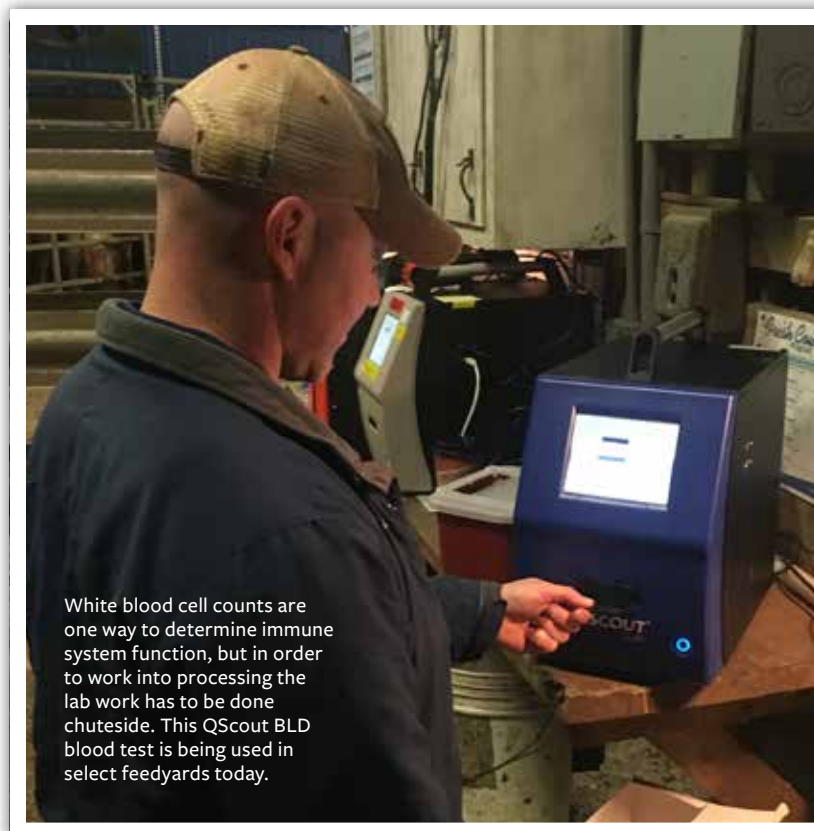
There are two commercially available technologies already being used in select feedyards across the United States.

Listening for clues

Whisper® on Arrival, an 8-inch flat paddle with six sensors in a hard plastic shell, is placed on the right side of an animal's chest and listens for lung and heart sounds.

"In a matter of seconds, it gives the user information to decide if that animal needs metaphylaxis, or if it can be withheld," Nickell says.

The algorithm uses the biological data in concert with information the feeder has already entered related to animal history and their own tolerance for risk.



White blood cell counts are one way to determine immune system function, but in order to work into processing the lab work has to be done chuteside. This QScout BLD blood test is being used in select feedyards today.

Think of it like a stress test in humans, Nickell says. "They put you on a treadmill and determine your risk of a heart attack. They stress you constantly to elicit a response," he notes.

Cattle entering the feedyard have been tested with some stressors — going through an auction market, traveling long distances, maybe an abrupt weaning or weather.

"We capture the data after that," he says.

Within seconds it will give a "treat" or "don't treat" reading.

"The whole goal of this is to reduce antibiotics, but we don't want to reduce antibiotics and cause a negative health outcome," he says.

The objective is to withhold antimicrobials from the right animals.

Early data show that using Whisper On Arrival reduces antibiotic use by around 50%, with a range of 10% to 70%. The initial cost is \$1,600 for the equipment and then \$2.29 per head for each animal scanned. That includes access to the software and 24/7 tech support.

Blood counts add up

The QScout BLD blood test takes

a different approach to get to a similar outcome.

"We focused on the earliest response we can get. We need something that very quickly after exposure gives us information that we can make decisions on," Drach says.

"The first responders in the immune system are white blood cells," she notes. "They're designed to fight infection, so our system is about taking information from those first responders and making better decisions because of it."

It relies on a drop of blood gathered in a "QDraw," or a slim vial that allows for a quick stick, and then the processor pops the needle off and clicks the top (similar to a ballpoint pen) to insert the blood onto a slide. The machine then takes 30 seconds to analyze it.

"You get a full white blood cell differential, just like what you would get when you go to the doctor for your annual physical, but you don't have to decode that chuteside because we turned it into a colored light system," she explains.

Green means no treatment.

"Red means that calf is either fighting an infection right now or we think their immune system

isn't going to respond well to an infection," Drach says.

Recently they've added a third category, where their survivability index will trigger a purple color to flag cattle at the highest risk for death loss. They've found they can be up to nine times more likely to die than their cohorts.

"If I know that animal is at a greater risk of dying, can I manage them differently to reduce my loss?"

Old-fashioned measures

Richeson has recently noticed the presence of a preexisting ear tag is a real-time indicator of lower-risk cattle.

"It's simply a proxy for previous management, right?" he observes.

If they come from an auction market with a tag, he can make some assumptions.

"I know that the cow-calf producer that originally owned that calf has at least taken the time to tag it, and therefore, it's probably more likely that animal's been vaccinated," Richeson says. "It's probably more likely that the animal has been on a better nutritional program and maybe had a mineral program."

Early data show morbidity rates are half that of groups with no ear tags.

Yet, he looks forward to widespread application of some of these advanced technologies.

"If a system works, I don't think you'll have to convince many producers to use it," Richeson says. "Let's say only half those cattle really need [metaphylaxis], that's obviously a very substantial savings in drug costs for the producers. There's quite a bit of money on the table to pay for both the test and capture savings."

Plus, it's for the greater good, he notes.

"It's also great for our industry from a sustainability standpoint and efforts to show our consumers that we are trying to find ways to reduce antimicrobial use in beef cattle production," Richeson says. "It's a win-win for everyone as this concept becomes further developed and used more widely." |