



MLV or Killed: Which is Better at Pre-Breeding?

Here's how you can ramp up your pre-breeding vaccination program.

by **Burt Rutherford**

Want to start a discussion with the world affairs experts at the corner table in the sale barn cafe? Ask their thoughts about when you should vaccinate your cows before breeding and whether you should use a modified-live virus (MLV) shot.

Opinions will abound. But casting eyeballs at some recent research might shed light on the subject and give you the advantage of facts when you stir the coffee club a little.

It is widely recognized by researchers and veterinarians that MLV vaccines are better because they create a more robust immune response in the animal. But MLVs come with some considerations.

If not handled correctly by keeping them cool and using everything in the bottle in a timely manner, MLVs can lose their effectiveness; plus, MLVs have always received a rap for causing abortions if given to naive, or unvaccinated, heifers or cows.

According to research conducted by George Perry and researchers at South Dakota State University (SDSU), MLVs can be used on cows pre-breeding if some management considerations are kept in mind. Perry, formerly with SDSU, is an associate professor and reproductive physiologist at the Texas AgriLife Extension and Research Station in Overton, Texas.

In an earlier study, Perry and others vaccinated a group of naive heifers.

“What we found in that study was that the modified-live virus vaccines disrupted reproductive performance, not only with the dominant follicle, but we had poor conception rates after the synchronization protocol (using timed AI with CIDRs).”

What's more, a few of the heifers short cycled again on the next breeding.

“We know that for at least two cycles we were having problems, especially in naive animals. By staying away from modified-lives at the start of a breeding season or close to the start of the breeding season, even when we're using synchronization protocols, we get better control of follicular growth. Fertility was increased,” he says.

Then the question became what happens in a cow herd or in animals that have been well vaccinated? By well vaccinated, Perry means animals that were vaccinated as calves and then given an annual booster every year.

Perry and crew compared an inactivated or killed vaccine with an MLV and a control group receiving a saline solution.

“What we saw is even in animals that had previously been vaccinated, if we gave a modified-live 30 days prior to the start of the breeding season, we had a negative impact on AI conception rates.”

The researchers followed that with a similar on-ranch study and saw similar results. Between the two studies, they evaluated results on more than 3,000 head from nearly 20 herds.

“Across both of those studies we've done, we have seen differences in AI conception rates if they're given a modified-live pre-breeding,” Perry says.

In the second study, instead of giving the shots exactly 30 days pre-breeding, as they did in the first study, vaccinations ranged from 27 to 89 days pre-breeding.

“We saw the negative effects across that whole time period. And so we know something is going on there.”

However, the effects decreased as the days between vaccination and pre-breeding extended beyond 45 days.

“If somebody said to me, ‘Well, I really want to use a modified-live right now,’ I look at the data and say, ‘OK, but we probably need to get it into them at least 45 days pre-breeding and get those two extra cycles out of the way,’” Perry says.

Consider a 1-2 punch

Given that conclusion, Lee Jones, DVM, looked at additional research and related a 1-2 vaccination strategy at a Cattlemen's College session during the 2021 Cattle Industry Convention

in Nashville, Tenn. Jones is an assistant professor and clinical veterinarian with the University of Georgia's Investigative and Diagnostic Laboratory in Tifton, Ga., and a cow-calf producer.

Looking at research from Auburn University, Jones showed data on heifers given an MLV at five to seven months of age, another MLV six months after that and then bred with timed AI and bulls. At pregnancy check, the heifers were vaccinated again with either an MLV or killed vaccine.

The heifers were re-vaccinated a year later. In short, the results showed that the heifers given MLV shots before breeding and a killed shot at pregnancy-check developed a strong immune response, and abortions attributed to MLV vaccinations weren't an issue.

“We know that modified-live vaccines provide a quicker, stronger, longer, more robust immunity,” Jones says. “So, a modified-live still needs to be considered in a herd health program, but how and where we use that will take some serious thought.”

According to Perry, “Vaccination programs can be designed to maximize immunity and minimize risks associated with modified-live vaccines. I think we can do that if we give two or three doses of MLV with the last dose at least 45-60 days pre-breeding. That way I think we get the best of both — good immune stimulation and optimum fertility in our heifers.”

Perhaps, then, a long-term vaccination strategy is to use the 1-2 punch of MLV and killed in heifers, then revaccinate lactating cows annually with a killed vaccine pre-breeding.

Talk to your vet and don't short the groceries

Jones emphasizes you should consult with your herd health veterinarian at least annually, whether or not you're considering a change in your vaccination strategy. Remember, he says, that a vaccination program is only part of your overall herd health efforts.

In fact, in his mind, vaccines are third in importance. The first two priorities are nutrition and biosecurity, respectively.

“It's the animal that makes the vaccine work,” Jones says.

By that, he means that if the animal is undernourished, in poor body condition or unhealthy, loading it up with vaccines is akin to fighting a brush fire with a squirt gun. It flat out won't work very well.

“Hippocrates said about 2,500 years ago that all disease begins in the gut,” Jones told the crowd. Given what we know now that Hippocrates could only guess at, Jones modifies that wisdom to “All health begins in the gut, all production begins in the gut, and all fertility begins in the gut.”

Twisting the knob to the aforementioned observation, if your cattle aren't on a proper plane of nutrition it's ... well ... like fighting a brush fire with a squirt gun. Your cattle flat out won't work for you very well.

“Nutrition plays a key role in vaccine response and immunity in cattle,” Jones says.

In fact, researchers at the University of Georgia-Athens saw a large difference in vaccine response in calves supplemented with trace minerals versus those that weren't.

That's because the immune system uses a lot of nutrients as it responds to a vaccination challenge — minerals, vitamins, protein and energy. This explains why an undernourished cow or calf can't mount a proper immune response when it's vaccinated.

Said another way, “Where my cattle are with their circulating mineral status really influences whether or not my cattle respond to a vaccine,” Jones says. “So, circulating minerals matter, and it's important that we supplement our cattle appropriately.” **HW**

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