

# Transferring Diseases: Biosecurity from the "Down and Dirty" Perspective

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In the previous two installments of this series, we discussed disinfecting equipment and preventing employees and farm visitors from carrying or spreading diseases. Let's conclude the discussions by covering the really critical aspect of biosecurity, the animals themselves.

In a perfect world, we would all have closed, disease-free herds that required no vaccinations and carried no disease organisms. Obviously, that is not the case as we move great numbers of cattle from place to place and many different disease-causing organisms are present in the U.S. cattle population. Excellent herd health requires management, a good understanding of the **probabilities** and **vulnerabilities** present in our operations, and the **consequences** of a disease outbreak or incursion. Let's look at it in a slightly different way. If a manager was making a decision to purchase a specific lot of animals based on the risk to his/her herd, I would ask him/her to consider the following equation.

$$\text{Risk} = \text{probability} + \text{vulnerability} \times \text{consequences}$$

This formula can be used for anything - from thinking about the insurance policy on the farm to purchasing collision coverage for a truck or in trying to convince your kids they need to wear seatbelts. It is a way of putting the dangers you face in some sort of perspective.

The equation can be applied to biosecurity on your farm. For a given disease the **risk** to your farm is the **probability** the animals in question have the disease, plus your herd's **vulnerability** to that disease, multiplied by the **consequences** to you and your herd if the disease is introduced. Notice the consequence is a multiplier; high consequences will greatly magnify your final risk. One does not need to put numbers in this formula; it is just a way of getting your head around the ultimate risk to your farm. Let's look at a couple of examples.

## Example One

You are buying a group of 700-pound heifers. They have not been tested for persistent Bovine Virus Diarrhea (BVD) infection and, once purchased, will be housed in a building that shares equipment and personnel with the milking herd. Your herd is well vaccinated, but they will be due for a booster in two months. Is this purchase a risk to you? In this situation the probability is fairly low as the number of persistent carriers is low and your herd is up to date on vaccines (your vulnerability), but the consequences of a persistent carrier introduction is moderately high. Some of these animals can shed the BVD virus in enormous quantities; large enough to overwhelm some vaccine

immunity and cause an abortion "storm" in the herd. Therefore, the final risk is a couple of low numbers multiplied by a larger one, so the risk is moderate.

### Example Two

In another example, you are buying a couple of older cows due to freshen. They have not been tested for Johnes. Since they are already bagging up, you offload them in the bedded pack of the calving area and intend to leave them there until they freshen.

Going through the formula again, your probability of Johnes is high as it is fairly common in the population and older cows will be more likely to shed the organism. Your vulnerability is also very high as newborns are the most susceptible to the disease. I would argue the consequences are also high, as Johnes is a disease we, as an industry, need to control over the long run for both animal and human health concerns. Here then, there is a moderate probability, a very high vulnerability and a high consequence. Obviously, the risk is high. Rethink through the purchase or consider housing the animals somewhere else until they are tested.

### Passing the Test

Pre-purchase or pre-movement testing can help lower your risks by giving you the animal's actual status for a tested disease. If the test is a good one and the animal tests negative, the probability number in the equation would then be zero. One point to remember is no test is completely absolute; some tests are better than others and some need multiple tests to statistically prove "freedom from disease." Ask your veterinarian to help you make wise testing choices.

From a biosecurity viewpoint, your veterinarian is your best resource in helping you determine your relative probabilities and vulnerabilities. As a minimum, you should be thinking about mastitis organisms (including Mycoplasma), Mycobacterium (Johnes disease), persistent BVD carriers and Leptospirosis. In certain parts of the country, we should add Brucellosis and Tuberculosis to the "worry" list. It is much better to test **before we buy** a group of animals than to deal with the consequences after we have brought an unexpected disease onto our farms. We are rarely given animal diseases; we usually have to buy them.

Author Bio **Dr. Roger Weigle** graduated from Kansas State College of Veterinary Medicine and gained industry experience at the Kansas Artificial Breeding Service Unit. After 25 years of private veterinary practice, Dr. Weigle now leads the cooperative's animal health programs.