



## Prevention/Control of Disease

### Understanding the Process

Disease prevention and control is crucial in animal agriculture. Lack of a sound health program can bring economic devastation. Sanitation and the advent of vaccines have greatly diminished the intensity and widespread disease threat.

To further control spread of disease and resulting economic losses, producers have employed numerous management techniques such as production of specific pathogen-free pigs, segregated early-weaned pigs, closed-farm policy, and serological profiling of herds. Even with the many vaccines available and implementation of disease prevention management strategies, disease can still cause severe economic losses. Producers simply cannot afford to neglect prevention strategies. Even the best health regimes cannot guarantee total avoidance of disease.

### The Disease Process

Understanding the disease process helps facilitate development of treatment protocols. Lack of understanding may result in futile attempts to prevent/control disease. Of utmost importance is to determine the cause of disease, which can be infectious, non-infectious, or parasitic. Non-infectious diseases are caused by mechanical injuries (examples include dystocia, broken bones, intestinal impaction), poisons (plants or chemicals), nutritional deficiency or toxicity, genetics, or changes in the functioning of hormones or enzymes. Parasitic diseases are primarily caused by intestinal parasites, lice, and mites. Infectious diseases are caused by microorganisms – bacteria, virus, rickettsia, protozoa, and fungi. Some infectious diseases are non-contagious, such as tetanus; however, most infectious diseases are contagious.

The mere presence of a disease-causing organism does not necessarily result in an animal succumbing to disease. Also, the spread of disease within a herd will vary due to each animal's ability to resist disease. Numerous factors are involved in the development of disease. First, the animal must be susceptible. Healthy pigs can withstand disease challenge better than pigs whose health has been compromised. The environment plays a key role in disease transmission and exposure of pathogenic organisms to pigs. Sanitation, pig density, airflow, floor surface type, vaccinations, social hierarchy, and nutrition impact a pig's susceptibility to disease.

Second, the degree to which pathogenic organisms are present in the environment or shed by animals has an influence on the probability of pigs becoming diseased. The susceptible animal exposed to infectious organisms is a likely candidate for disease. The third factor is stress. Add stress to the susceptible animal exposed to sufficient levels of pathogens and disease will occur (see Figure 1).



### Disease Threshold

The disease threshold is that point at which an animal becomes diseased (exhibits symptoms and/or performance is affected). The threshold will vary depending on susceptibility of the animal and stress placed on the animal. Obviously, disease will occur when the organism exposure level is beyond that for which the animal can withstand (threshold). Effective sanitation products and techniques can help decrease the number of pathogenic organisms spread via environmental contact (contaminated equipment, floors, manure, human and/or animal traffic patterns) – lowering the number of infectious organisms present in the environment. Conversely, vaccination, antibiotics (therapeutic feed levels or injectables), and management can elevate an animal's disease threshold.

### Transmission

Disease-causing organisms can be transmitted by direct contact (animal to animal), aerosol, contaminated equipment or clothing, or carrier animals (humans, rodents, birds, cats, or pigs that shed the organism without having symptoms of disease). Determination of the disease-causing organism is vital to controlling disease transmission and locating point of origin of the infectious organism. For instance, infectious organisms could be carried to the farm from newly purchased gilts; therefore, the gilt source should be secured to prevent introduction of infectious organisms not already present on the farm.

## **Diagnosis**

Disease control entails correct and timely diagnosis. Many diseases possess similar symptoms, yet require different treatment protocols. Mistaken diagnosis can create greater economic losses. The disease continues, possibly worsening, more pigs become infected and money is spent needlessly on ineffective treatments. An accurate diagnosis requires a detailed health history. Once this information is gathered and provided to the consulting veterinarian, a more reliable diagnosis can be made.

## **Medication**

The method of administering medications is dependent on the incidence and severity of disease. The use of injectable medications assures targeted pigs receive needed levels of medication. This method is labor intensive, may require repeated injections, and, while initially gives higher blood levels of the drug, the drug is not present at a constant level. Injectables are commonly used when the disease is acute and the animal can immediately benefit from a high level of the drug. The use of medicated feed offers an easy method of drug administration and provides constant levels of the drug in the blood. Unfortunately, feeders must be almost

empty before feed containing a different level of the drug or a medication change can be placed in the feeder for consumption. When pigs are not consuming feed this method provides no treatment value.

Water administration of drugs is also convenient and easily provided via a water proportioner. Like feed drug therapy, administration of drugs via water can provide continuous blood levels of the drug. When medicating via water, it is easy and quick to change drug levels or the kind of drug. A distinct advantage to water medication is pigs will usually continue to consume water even when they are consuming little, if any, feed.

## **Conclusion**

Understanding how disease occurs is crucial to preventing and treating disease. Management factors aimed at decreasing exposure to infectious organisms (isolation, clean source herd, sanitation, etc.), minimizing stress, vaccination, and raising healthy pigs are key components of a successful health program. If disease symptoms occur, obtain an accurate diagnosis promptly and implement control/treatment strategies based on diagnosis and management capabilities.