Currently in the United States, about 110 million hogs are raised and slaughtered on an annual basis. Of that number, roughly 5% are raised on farms that produce 1000 or less pigs per year. An even smaller number of pigs are raised on farms that produce 100 or less pigs per year. Farms of this size, termed small-scale, are likely to use alternative methods of production and may constitute a minority that is underserved by the veterinary community. Some alternative production criteria that may be employed on small-scale farms are:

- Farrowing in bedded pens instead of crates on slatted floors
- Group gestation without the use of crates
- Group nursery: pigs and sows mix together for 4 to 6 weeks or longer
- Finishing pigs in deep bedding or on pasture - buildings such as hoop structures provide natural ventilation
- Access to outdoors at any or all phases of production
- Restricted use of certain classes of drugs, including antibiotics

Contrary to popular belief, regardless of how swine are raised, whether intensively in indoor systems or extensively in outdoor systems, the basics of herd health are the same. This includes the need for regular veterinary care of the animals. Therefore, there are opportunities for mixed animal practitioners to provide needed veterinary services to small-scale farms. The objective of this presentation is to lay the foundations of herd health and provide a basic understanding of the key components of an effective herd health plan in order to help small scale producers, including those individuals simply raising one or two pigs a year for their own consumption, maintain healthy animals.

Veterinarians can be of tremendous help in establishing health programs. Knowledge and experience of host-pathogen interactions and pharmacology enable veterinarians to assist in tailoring health programs that are based on the goals, capabilities, and situations present on given farms. The following fundamentals can be scaled up or down according to the size of the herd, the experience of the producer, and the resources available. Effective programs integrate medicine and management to prevent disease. Three major factors, focused on prevention of disease, should be considered when developing a herd health plan:

1. **Prevent Exposure to Disease.** Purchase and quarantine procedures should be employed to decrease the likelihood of disease introduction into the existing herd. Preventative programs are very important in extensive production since exposure to disease-causing organisms that exist in all groups of animals is possible and many of the niche marketing programs require production protocols that restrict commonly used treatments, such as the use of antibiotics to treat disease.

2. **Keep Disease Resistance High.** Nutrition, management, and housing programs should be designed to keep resistance to disease high at all times. Preventing or minimizing
animal stress is a necessity for maintaining good resistance. In addition to these measures, resistance to specific diseases can sometimes be accomplished by vaccination.

3. **If Disease Occurs, Prevent its Spread.** Animals should be observed frequently. Segregate affected animals immediately. A quick diagnosis and treatment can help prevent further losses.

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**Key Components of a Herd Health Plan**

**Biosecurity**

Biosecurity is defined as actions taken to prevent the introduction of disease agents into a specific area. These are rules or practices that are put in place in order to reduce the risk of disease in the herd. Biosecurity protocols should include a focus on the external environment as well as the environment on the farm. A biosecurity program will provide protection from the transmission of disease by limiting exposure to infectious agents or containing any diseases that are already present in the herd. It is designed to maintain the healthiest swine herd possible.

A comprehensive biosecurity program should address all potential entry routes for disease agents, as well as risks of spreading disease agents within the herd. It is important to keep in mind that anything that comes in contact with the animals has the potential to spread disease including people, outside pigs, and birds or other wildlife.

Most diseases are brought into herds through new animal introductions; therefore all biosecurity programs must take this area into serious consideration. There are two important principles to preventing disease entry when new stock is brought into the herd. First, know the health status and biosecurity program of the herd from where animals are coming. Second and more importantly, institute and enforce a quarantine procedure before introduction to the herd takes place. Once in isolation, blood samples should be taken to verify the serological status of new animals. Furthermore, a few herd pigs can be mixed with new pigs to act as sentinels. These animals can be carefully observed for clinical signs of disease. Ideally, an isolation program should allow a 60-day period for testing, detection, and control of problems. This time period limits the interaction between incoming, recently stressed pigs, and the existing herd. Also, it allows acclimatization of the new stock to any diseases that are already present in the herd.

No single biosecurity plan can meet the needs of all farms and all production systems. A veterinarian can assist a producer to assess the potential risks and develop a practical biosecurity plan tailored to his individual needs. The following list, though not comprehensive, are the major control points that should be incorporated into a biosecurity program:
Potential points of entry:
- New animal introductions
- Semen
- People: caretakers/visitors/deliveries
- Disposal of dead animals
- Pests or other animals
- Transportation

On the farm:
- Sanitation
- Specific clothes/footwear
- Movement between pens/pastures
- Movement between age groups
- Equipment/supplies
- Isolation for sick animals

Vaccination program

Many herd health programs fail in their objectives because too much reliance is put on vaccinations without attention to other aspects of biosecurity. A comprehensive herd health program recognizes vaccination as an important tool, but it is not a silver bullet. Vaccines are used to minimize the severity of clinical disease and boost the pig’s immune system. Knowing what vaccination protocols to use is highly dependent on each farm’s health status, farm type (breeding herd versus growing herd), location, and production system. However, there are some basic vaccines that should be considered on most any farm. The important thing to note is that a vaccination program is meant to optimize a farm’s health program, not replace it.

For the breeding herd, a combination leptospirosis/parvovirus/erysipelas vaccine should be given to all incoming breeding animals. It should also be given to all sows at weaning and to boars twice annually. Pigs should receive erysipelas vaccine at weaning. *E.coli* and *Clostridium* can cause significant diarrhea in neonatal pigs and are common on all types of farms. Vaccination of gilts and sows prior to farrowing increases antibody production in the colostrum and helps protect piglets from these bacteria. Other vaccines that could be used are Atrophic Rhinitis (*Pasturella and Bordetella*), *Mycoplasma hyopneumoniae*, and Ileitis.

Vaccination for these diseases is recommended because of the prevalence of the organisms, the relatively inexpensive cost of the vaccines, and the relative effectiveness of the vaccines. Other vaccines must be evaluated on the criteria of risk of disease, cost and effectiveness. For the growing herd, the number of vaccinations may be fewer but is highly dependent on the health status of the pigs, the vaccination program of their source farm, and the pressure of the individual disease in the herd. Some potential vaccines that could be used in the growing herd are Ileitis, *M. hyopneumoniae*, and Porcine Circovirus Type 2.

Disease Surveillance and Diagnosis

Losses caused by disease represent a major obstacle to the profitability of many swine operations. This is especially true of small scale farms. Disease results in animal death, failure or decreased efficiency in reproduction, and decreases in growth and productivity. Disease
treatments are another area that producers may prioritize too highly without proper attention to prevention. It is widely agreed that prevention rather than treatment is the most economical approach to keeping disease losses low. Treatment of a disease after its onset is not always effective and is often costly. Production losses often occur before diagnosis and treatment can be instituted. The best herd health programs are designed to provide routine, planned procedures which will prevent or minimize disease. Therefore, understanding what is normal and what is abnormal is the first step in managing health. Producers should be encouraged to regularly inspect their animals for subclinical signs of disease. Daily observations are critical to catch abnormalities early, making treatments less costly and more effective and recovery faster while reducing the potential for the transmission of disease. Healthy pigs are active, curious, and have good appetites. Their hair and skin are clean and dry. Sick pigs are dull and listless with reduced feed intake. Their hair may be rough and dirty.

Serologic tests should be done for diseases commonly observed in swine. Diseases that can be monitored routinely include serology for Transmissible Gastroenteritis (TGE), Actinobacillus pleuropneumoniae, and Mycoplasma hyopneumoniae. Nasal turbinate swabs can be taken and cultures done for the presence of Pasteurella multocida and Bordetella bronchiseptica. Positive serologic or culture results must be correlated with clinical signs and/or post-mortem lesions before specific recommendations can be made concerning the significance of the findings. Veterinarians can help producers understand the inherent limitations of serologic testing. Most serologic tests do not have a level of titer response that is "black and white". Results of most serologic tests require some interpretive skills, including an awareness of the clinical signs present in the herd. In many cases it is a difficult matter to differentiate vaccine titers from titers to the "field" organism.

Internal and external parasite control

All incoming breeding stock should receive two treatments, two weeks apart, with external and internal parasiticides. Fecal samples monitored quarterly from each production area to determine the presence of internal parasites allow further refinement of the deworming program. An external parasite control program can be designed based on the results of the monitoring.

Other Monitoring

Quarterly slaughter checks for the presence of gross lesions of ascarid migrations in the liver, pneumonia in the lungs, and atrophic rhinitis in the nasal turbinates are recommended. The skin and joints and intestinal and reproductive systems can also be observed during slaughter checks. Findings can be used to estimate the presence of disease in the herd and to refine health management procedures.

Feed samples should be checked at least every six months for proper mixing, particle size and the presence of the major nutrients in the amounts calculated in the ration formulations. Samples should be held back and saved from each major shipment of grain for mycotoxin
testing if clinical signs indicate the need. However, because mycotoxins occur predominantly in "hot spots", routine testing for their presence probably is not necessary unless a problem is suspected.

**Treatment Plans**

In small-scale, often alternative, production systems healthy pigs are the key to a successful operation. Healthy pigs grow faster, convert feed more efficiently, and result in fewer cull or dead pigs. Further, in alternative systems, niche marketing programs typically restrict the use of antibiotics to “rescue” sick animals. Therefore, early detection of clinical signs is of utmost importance. Regardless, small-scale farms need to have some protocols in place for treatment when pigs get sick and for the prevention of predictable diseases. One common preventative treatment is the use of injectable iron at birth to prevent piglet anemia and the use of topical iodine at castration to prevent wound infections. The use of hospital pens to segregate sick animals is one way to control the spread of disease. Hospital pens allow sick pigs to get the additional care they need while slowing the transmission of disease to other animals.

**Summary**

A comprehensive herd health plan incorporating these components can help small scale farms optimize their profits and succeed in the marketplace. Veterinary input in developing a herd health plan will keep animals healthier, more productive, and improve overall welfare on small scale farms.

*References available upon request.*