Sponsors

University of Minnesota
College of Veterinary Medicine

College of Agricultural, Food and Environmental Sciences

Extension Service

Swine Center

Editors
W. Christopher Scruton
Stephen Claas

Layout
David Brown

Logo Design
Ruth Cronje, and Jan Swanson;
based on the original design by Dr. Robert Dunlop

Cover Design
Shawn Welch

Criteria for when and how we intervene

Chris Rademacher, DVM

New Fashion Pork, Inc., Jackson, Minnesota

Intervention protocols are defined here as a combination of vaccination and strategic medication programs in order to control pathogens that affect the health of our swine herds. Our approach to disease control for New Fashion Pork, Inc. (NFP) is in line with our overall company philosophy of controlling costs while maintaining profitable production. Our current intervention protocols are a blend of past experience, scientific and diagnostic data, along with trial and error.

NFP is basically comprised of 8 different production "flows." A flow is defined as the production from a single sow herd through the finishing phase. Because of the acquisitional nature of our growth, we have tremendous diversity among our flows. We have a variety of genetics, endemic disease patterns, and facilities. Each flow has its own unique endemic pathogens. Therefore, each flow has its own health program. There are some fundamental tenets in the different health programs among our flows. We chose early on not to commingle sow farms into our growing herd. This is due to the constant and uncontrollable fluctuations in herd stability to a variety of pathogens, particularly PRRSV. While we believe that this practice allows us to better control the health of the growing pigs, it does have its disadvantages. For example, although we practice three-site production, the size of our sow farms prohibits us to capture all the benefits of true all-in—all-out on a site basis.

The health budget is compiled from a computer model that predicts vaccine and medication usage along with diagnostics on a per unit basis (weaned pigs, growing herd) along with the associated costs. The budget is set by health services in collaboration with the production staff directly involved with that flow. Monthly compliance reports look at usage based on health products ordered for specific sites within a flow. Each month, the production staff is responsible for analyzing and reporting variances to budget. These reports can also be used to gauge compliance for a flow. For example, vaccine costs that are consistently below budget may indicate problems with compliance on a vaccination protocol. This may warrant additional follow-up with serological monitoring if an appropriate test is available. An antibiotic that is consistently over their budgeted dollar amount may signal a problem with dosage compliance.

The most difficult intervention dilemma that we face is exactly *when* to intervene. Most of the pathogens we wrestle with today display a variety of clinical signs. The unknown quantity is exactly how much damage is being done and whether the benefit of the intervention will outweigh the cost. There are a number of metrics that we monitor in order to aid our decision to intervene. Percent mortality and morbidity are common ones we use. We have developed flag levels for intervention based upon mortality and morbidity on a weekly basis in our growing herd (Table 1). When the morbidity or mortality exceeds the flag level for that week, the site/farm manager is instructed to notify the service staff or health services with a description of the problem. The service staff will then do a site investigation, which includes a "walk-through" of the pigs, post-mortems, and a review of current records. Some of the things they are trained to look at include:

- type of clinical signs present
    - diarrhea
    - pneumonia
        - coughing
        - dyspnea
        - lethargy
    - CNS disorders
    - skin lesions

Table 1. Weekly flag levels for intervention based upon group size

	number of pigs			
	500	**1000**	**1250**	**2000**
2% morbidity	10	20	25	40
0.5% mortality	2	5	6	10

- current age of pigs
- length of time pigs have been displaying clinical signs
- current morbidity and mortality
- number of pigs individually treated with antibiotics
    - response to antibiotics chosen
- daily water consumption (total gallons/day)
- environmental controller settings
    - daily high/low readings
    - set point
    - minimum ventilation rates

After performing a walk-through, the service staff will perform post-mortems on any recently dead pigs representative of the problem. If an initial diagnosis is unclear, they will then euthanize 2–3 untreated pigs displaying clinical signs representative of the problem. Tissue samples are collected and sent off for a thorough diagnostic workup. Digital cameras are used to collect images of potential lesions, which are subsequently sent off daily to health services for aid in diagnosis. A reference manual is available in order to support the service staff in developing the correct list of differential diagnosis. The manual consists of protocols for post-mortems and sample collection, and descriptions of different pig disease syndromes. Each syndrome details clinical presentation along with post-mortem images of potential lesions seen. A list of approved antibiotics with correct dosing procedures is also included. Based upon observations made clinically and by post-mortems, an initial diagnosis is made and an appropriate treatment is prescribed. The service staff follows up with the site manager over the next few days to ensure that the treatment plan is working. The pathologist makes the final confirmation of diagnosis. Diagnostic data is cumulated by flow and used to determine the most cost-effective means to deal with the pathogen in question.

When looking at changing interventions, we prefer to run statistically significant field trials. These experiments enable us to determine if the proposed change would benefit our system. After determining the metrics to be measured, the trial is run. Once the data is collected, it is put into a cost:benefit model. This model merges our production and financial data from farrow to finish to look at the overall effects of a proposed change. It enables us to understand how changes in growth pattern or sow efficiencies affect our overall cost of production.