

Implementing a Systematic Approach to Disease Control and Prevention

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Introduction

As our industry has become increasingly complex and integrated, I find it fascinating to observe the evolving thinking and process development toward disease control and prevention. As swine production grew away from localized, smaller herds to large and very mobile populations, the list of “diseases of the moment” certainly changed. This presentation is not, however, about the specific pathogens of the day. Rather, it is focused on how we as the human decision-makers and operators deal with disease control and prevention in the business planning and operation of pork production. At the outset we have to admit that detecting illness in individual animals, providing individual care, and even group-by-group mass therapy in response to illness, are not very effective and are costly. Clearly we are dealing with systems.

Sometimes the perspective of people outside our industry provides special, new insight. My 13-year-old grandson, never having visited a farm, traveled with me this summer and was fascinated with pork production, the pigs, the people and the process. After some days he observed that “...*a farm is just like a little civilization...*” then wondered “...*who is really in charge of this civilization???*” Reflecting on his comments, I would propose that we are yet to clearly define a business plan and responsibilities for these “civilizations” we care so much about.

It does not appear that there is a consensus in the industry as to how best to approach disease in a business sense or even a mechanistic method. As a participant and observer in our industry I see a variety of approaches to the topic. Interestingly, these approaches do not appear to be driven by operation size or complexity.

Passive/Reactionary Approach

The Passive/Reactionary Approach is an outgrowth of the old “wait until it happens and then respond” school of health management. With this approach the impact of disease cost on the bottom line is widely variable over time as crises come and go. There is little business energy invested in the process, however, and the crisis intervention is essentially outsourced to veterinarians and animal health product application. Before this is discarded as the “outmoded” or “wrong” approach, realize that in high health systems without much challenge it may be a cost effective model!

Product-Based Approach

The Product Based Approach liberally employs well-marketed “tools” of the pharmaceutical and biologics industry. Operations justify this approach as the

implementation of 'preventive medicine'. Left unstated, but implied when disease does appear, is the self-justification that "...I did everything I could to prevent this but..." As an advisor, this approach is the most frustrating to try and change. The enormous amount of product used should be accounted in the Cost of Disease column in my view. More often the old sales pitch of "insurance logic" (without a claim check) is presented to explain this approach. A critical evaluation of efficacy is hard to accomplish. Most importantly, the psychological cycle of drug dependency is very hard to break whether the decisions are individual or company wide. The boilerplate approach to routine in-feed antimicrobials and vaccination schedules I believe runs counter to the clear signals we are getting from our customers.

Systematic Approach

A Systematic Approach is evolving, but is yet to be a part of the business plan or budget for most operations. Relying on objective veterinary information, education of workers in the system and effective biosecurity, this approach consciously minimizes interventions to give a predictable economic and production response. This approach, in more detail, is our topic.

The Changing Concept of "Disease"

The Systematic approach applies the pragmatic definition of "disease" as a cost or inefficiency on the production system, a much broader concept than just a bug causing infections. Whether the loss is ulcers, tail-biting, viral infections, or huge drug bills, the net effect is excess cost and/or diminished production. It does not stop there, either, as the hygienic concerns for final product (i.e. Salmonella) and the well-being of animals during production (i.e. 'stress') are also accounted as part of the loss due to "disease" that the desired system is to help manage.

A Diagnosis is a Matter of Fact, Not a Matter of Opinion

Before any problem can be controlled or prevented, it must be defined and measured. Today, objective diagnostic data is more rapidly available, more accurate and statistically validated. Instead of "...I think App is your biggest problem..." the data is used to validate the observation and to track it over time, weighting losses in animal and economic terms. To get to this level of process control, system investments and commitments must be made:

- **Education** of the workers, field care personnel and veterinarians is critical. Which samples need to be taken and how? Where are they sent? Which information must be kept to actually measure the impact of disease now and in the future?
- **Definition** of the background disease status of a population or system is critical, baseline information. Eradication of diseases such as PRRS and mycoplasmal pneumonia is not just a dream any longer. The investment in and monitoring of production systems for specific pathogens should have the goal of at least minimizing the impact, with eradication the sought-for gold standard.
- **Information Management** is becoming much easier, thanks to the advances in communications and computing power. Web based results reporting, advanced

database software, video and verbal communications via Internet can allow experts distant to the sites to “see and interact” thus enhancing diagnostic accuracy.

- **Decisions and Actions** using process control and other statistical methods improve the predictability of the long-term outcomes and guide the operation as conditions change.

“For each mistake you make by not knowing, you will make ten mistakes by not looking” (Plaque on the wall of a veterinary classroom.)

Analogous to the necessity of education investment across the production system is the awareness that constant vigilance for new risks, and a plan to deal with them as they arise, is a responsibility of Systematic disease control and prevention. An excellent example is PMWS with the variable pathology seen around the world; is it worth investing in advanced information even if your system is unaffected? Should best biosecurity practices be in place?

Forget Philosophy – Where is the Payout?

All these ideas result in the development of a whole new cost center for production. As a producer, I don’t want new costs, but new investments are another matter. As the health of populations varies so widely, the need to individualize and customize the management to specific farms and systems is reality. “Standardized” health programs that migrate across systems do not appear to work very well. So, for the investment in veterinarians and technical specialists, what is the payback and where does the money come from?

- **Elimination of excess costs and unnecessary drug use** is the first goal. One example would be the common practice of adding tetracyclines to feed when the pigs begin coughing in a barn. The 440ppm for 10 days doesn’t look like much cost on a per pig basis, 30¢US per head. But is it logical and is it needed? Pharmacologically it makes little sense if the cough is driven by swine influenza. The active medication and blood levels are delayed just due to feed management. The animals receiving full doses, because of normal appetite, didn’t need the drug in the first place while the truly afflicted are inadequately medicated due to anorexia. And, because of the duration of medicated feed (often determined by batch size) the total medication used exceeds that needed for effective therapy. The “only 30¢ per pig” argument needs to be stated as the reduction in profit margin, not at the increased overall cost of production. What many view as a 0.28% *increase* in the cost of production is actually a 4% *reduction* of profit. Viewed in this fashion, unnecessary biologics, interventions and therapeutics erode profits.

- **Decreased vulnerability to the impact of pathogens** both inside the system and outside it develops as biosecurity, animal flow and population matching information is employed. The net is consistency, not the reoccurring battles of unexpected illness.

- **Globalization** has had an impact on all markets, with ‘process’ becoming a point of concern with buyers that is on a par with the ‘product’. An objective, verified

system that can assure customers of the process of production, not just the product is about market access and loyal customers. Examples of buyer concerns include antibiotic use, animal housing and care issues, freedom from specific threats of disease (see 'Mad Cow') and no needles in the meat!

Conclusion

The swine industry is moving, I believe, from one era of disease control that depended heavily on products toward a targeted, minimal-use-only-when necessary approach. New technology allows very precise delivery of medications through water, along with real-time documentation of use. The risk/benefit evaluation of biologics is reducing, not increasing their utility in production. This move is not being done with blind luck, however, and has required a new vision of the costs and implementation of disease control and prevention. Obviously there is real tension that this builds into the traditional relationship between products sellers and the industry they depend on for continued economic success. In the end, economics and good science will drive the change.

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