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Benchmarking health

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Ask the basic question...

"What causes a bad group of pigs to be so BAD?" The answer is, with rare exception, infectious disease (PRRS, Myco, Strep, HPS, Salmonella, E. coli, etc.). The effect of poor management on performance is readily manifested as some unchecked disease (via inappropriate/inadequate ventilation, immunization, diet, or treatment). Situations such as water deprivation, power outages and suffocation, or mycotoxicity occur with some regularity across the country, but it is a safe assumption that almost all disastrously rotten groups of pigs were very "sick" at some point. In an industry that has become very proficient at monitoring, measuring, and comparing performance variables; standardized health measurement continues to be enigmatic. The principles of benchmarking can be applied to health; especially in a world where most diseases are controlled rather than eradicated.

Before going any further, it is important to define what "benchmarking" is. First off, it is an active process like any continuous improvement method. The steps of benchmarking have been defined:[1]

- Identify problem areas
- Identify leaders in that area
- Study their practices
- Implement practices
- Repeat process

Three key principles[2] to focus on when approaching a practical production setting are:

- Identify the parameters that drive production
- Set realistic expectations for improvement
- Use accurate records and methods for fair comparison

Swine industry benchmarking

Historical efforts at benchmarking in the pork industry include two primary examples- PigCHAMP and Agrimetrics. Agrimetrics[3] offers products in the broiler, catfish, turkey, and pork industries. In the pork production category, measurements cover cost, performance, and feed details. Over the years PigCHAMP has been a useful tool for understanding the behaviors and capabilities of sow herds. Multifarm comparison and version 4.22 offer the ability to compare many farms to each other in a consolidated format. However, in both of the above examples there is very little that allows us to directly define health.

History of health benchmarking

Perhaps the only systematic effort to systematically monitor health across the swine industry is NAHMS (National Animal Health Monitoring System).[4] The past and present publications from USDA in this program have given at least some description of swine disease broken down by different subpopulations (age of pig, size of farm, region, etc.). This information is interesting, but doesn't lend itself fully to the benchmarking process. Which diseases are truly significant? What is special about one subpopulation of farms that results in more or less disease? How accurate is the reporting? In general, the information presented does not allow a farm or farm system to take action on an improvement process.

Another example of a centralized health data process is the diagnostic lab. Diagnostic labs across the country have accumulated disease data from submissions for many years. This information is usually detailed and electronically available for analysis. However, without the full context of time, space, animal, and circumstance, there is little potential to use this raw information in a systematic improvement program.

Health proxy

Since accurate, direct measurement of health is difficult, indirect measurements are often employed. These include mortality, feed and water consumption, daily weight gain, feed conversion ratio, medication costs, and rejected pig counts. These measurements are usually not very specific for any disease, but they can be good indicators of disease differences between groups (retrospective analysis). Some measurements could also function as real-time indicators of disease, possibly early enough to allow intervention.

Tools for direct measurement of health

Beyond the clinical/field assessment, there are only two ways to define the health status of pigs- serology and tissue diagnostics. Many of the tests are standardized from lab to lab and incorporate built-in pos/neg controls. This allows a user to incorporate results from different labs at different times into single system for understanding disease on an individual farm. Furthermore, most lab data is available in electronic format,[5,6,7,8] so most issues of data re-entry are reduced or eliminated.

A tool to capture and store health data is essential and relationship databases are well suited to this task. As complex data is assembled, the data tool should allow you the user to "drill-down" into the details to extract very specific data. A database can readily export this data in simpler formats for processing and analysis. In simpler formats, the data can be charted and displayed more easily.

New questions?

If we apply benchmarking principles, then we walk through a series of new questions. How much is Disease-X being experienced? How much Disease-X are other enterprises measuring (intra-system farms, other systems, allies/competitors, etc.)? What are they doing to address it? What will our expectations be if we alter our processes? A classic example of this approach can be seen with Salmonellosis.

Process layout

- Identify problem- Pigs are dying and diagnostic results indicate Salmonella cholerasuis.
- Determine impact- How much is this costing us?
- Identify drivers of the problem- Flow source issues, transportation contamination, vaccination, treatment.
- Identify leaders- Who else has dealt with this and how did they do it?
- Expected results- If we did the same, what do we really think will happen?
- Implement change- Add vaccine protocol, change sanitation protocol, etc.
- Monitor- % of submissions submitted for enteric disease. % of submission positive for salmonella. Absolute number of salmonella cases through time.
- Correlate disease monitoring with pig performance to validate the cost of disease.

Developing a system to track the occurrence of disease in full context of production methods and constraints is challenging, but presents the user with a valuable tool. We know that disease can be expensive and demoralizing, but this is usually as deep as we think into the issue. When the combined pressures of poor performance and politics hit critical mass, a visceral decision is usually made. Life goes on and maybe the problem gets better, but without a structured disease information management system, little institutional knowledge will be gained.

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