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Benchmarking reproductive performance within production systems

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> Quality is never an accident; it is always the result of high intention, sincere effort, intelligent direction and skillful execution; it represents the wise choice of many alternatives (source unknown).

Introduction

Production systems with standardized inputs and processes have an inherent advantage over systems without standardization. As commonality in genetics, health status, nutrition, replacement source, and environment increases, it becomes easier to compare processes between farms. Within production systems, it is common for farms to have a number of similarities, particularly on matters of consequence. Still, optimizing sow reproduction within systems is challenging because of the plethora of factors that must be managed for success. Management is further challenged because many factors are interrelated, at times compounding negative effects. Gap analysis has been proposed as a means of creating an organized, systematic means of identifying factors within systems. This paper describes gap analysis techniques we have used to continuously improve performance. Gap analysis has allowed us to refine and focus analytic efforts in a manner that optimizes management time.

Fundamentals

Gap analysis is guided by four quintessential questions:

- What's comparable?
- What's not comparable?
- What's the effect? and
- Why the difference (or lack thereof)?

The first three steps quantify differences. They help focus management onto matters of greatest importance. The fourth step allows management to qualify why differences exist.

Quantifying and representing differences

Quantifiable comparisons are done sequentially, examining:

- within peer group comparisons, such as agrimetrics;
- within system farm-level mean measures;
- within system measures of variance; and
- within production flow measures using descriptive measures.

In particular, the following are effective for representing comparable effects within systems:

- linear time charts that examine continuous (weekly) outcomes;
- radar charting of mean outcome values; and
- coefficient of variation charting for farm-level variance estimation.

Based upon discoveries using this approach, outcomes are subsequently quantified for their effects on the system as a whole and then on each individual farm. Using system-level measures and farm-level outcomes, relative risk, attributable risk, and cost estimates can be generated. This continued refinement of analysis further guides management activity to those areas of greatest potential impact.

Process qualification

With risk and cost estimates in hand, the process of analysis continues by qualifying between-farm process differences. The intent is

- to find what works,
- to find what doesn't work,
- to standardize optimum processes across farms, and
- to communicate these processes effectively to process-level workers.

When farm workers are first shown opportunity/risk/cost guidance information gleaned from production data inputs, they are usually very approachable and helpful in qualifying processes. Comprehensive evaluation of farms is important. Sow, boar, health, nutrition, environment, inventory, and process defects are each common on farms. However, as health, nutrition, and environment effects are minimized, inventory character becomes a common cause of poor quality reproductive performance.

Once process qualification is complete we then return to the farms to communicate what has been learned. In our hands, process control charting has been an effective means of communicating expectations.

Summary

We have found that as systems compare across herds (quantification) and then observe within herds (qualification), opportunities for continuous improvement are identified. This approach has been very valuable for analyzing and correcting deficits that exist. Our experience suggests that quality reproduction can be attributed to sow health and survival, estrus detection, timing and quality of insemination, semen quality, sow feeding, and inventory attributes (parity, gilt pool size, etc.).