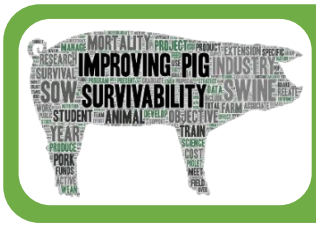

Season 4, Episode 1: PROSPER Grant

Dr. Daniel Linhares, Iowa State University, and **Dr. Edison Magalhaes**, Iowa State University, discuss the PROSPER grant and the process of integrating and interpreting big data for swine production systems.

Background

Commercial swine production systems are continuously collecting large amounts of data. This data includes information related to productivity, diagnostics, health status, management practices, antibiotic use, vaccination protocols and the list goes on. With such a wealth of data available, the PROSPER grant was created to streamline this information as well as use it to predict future mortality and productivity. Traditionally, information solely from the literature has been used to predict future performance outcomes based on type of disease challenge, management practices and others. However, the complexity of each individual system requires specific attention. The cyber infrastructure created through the PROSPER grant has now successfully collected and evaluated data from five separate commercial swine production systems.

Process

At first, a manual process was used to successfully develop a model that could intake such a wealth of data. Today, the team has generated an automated system using statistics to analyze the large volumes of data. Every time new information is available, the model can be updated with just the touch of a button. Large amounts of information can now be rapidly imported, integrated, cleaned, and analyzed. Future productivity can then be forecasted based on past performance. A master table is created, allowing each production system to dive deeper into identifying potential risk factors impacting performance.

Field conditions

Each swine production system is unique. The impact of disease on productivity is very system specific, dependent on co-infections, environmental factors, stocking density, ventilation, and many others. The team is focused on making use of what information is already being collected, integrating it, and utilizing outputs to help support producers with making management decisions. An important end goal of this grant and modeling system is to offer producers an opportunity to anonymously benchmark themselves against other production systems. This will allow producers to better understand where potential areas of improvement exist in mortality and average daily gain, for example. Through the use of this model, sow farm performance has been identified as a critical factor in predicting future wean to finish outcomes. For example, lower weaning age results in increased wean to finish mortality and increased likelihood of disease challenge such as mycoplasma and PRRSV.

Future

The team plans to continue data collection over the next two years. This will allow continuous training of the model, which is a dynamic process. The emergence of new diseases results in increased on farm mortality, however over time those drastic spikes in mortality diminish, all of this needs to be taken into account when fine tuning the model. Integrating complex data streams takes time and precise analysis, but it is an invaluable tool that will help producers better understand their production system and make management decisions.

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