**Methodology to Analyze Real World Data to Promote Better Decision Making**

Jose A. Linares, Mathilde Lecoupeur, Higor Cotta

In medicine, real-world data (RWD) consists of data relating to patient health status, collected from multiple sources outside the context of a non-randomized controlled trial setting and generated during the routine execution of medical evaluations. Real-world evidence (RWE) is clinical evidence regarding how a product is used and its potential benefits/risks, derived from analyzing RWD. In poultry medicine, this concept applies to the evaluation of vaccination programs via analysis of real-world poultry health data.

Since 2017, our veterinary services and data analysis teams initiated an RWE initiative by applying professional statistical analysis to poultry health, performance, and diagnostic data. In poultry production, RWD originates from multiple sources such as breeders, hatcheries, live production, and processing plants. In our experience, data is collected using a variety of platforms and the data itself could be in a variety of formats. In this inherent complexity, data should be an asset, but we run into various scenarios such as:

* Large amounts of existing data not leveraged across an organization
* Data visibility is not optimal for decision makers
* Data is siloed between departments
* It takes too long to gather data for simple troubleshooting
* Large amounts of data but statistics are not applied
* Only a few data analyst that understand/work on poultry data

Our goal is to help promote fact-based decisions through professional statistical analysis. We work with existing data shared by our customers, or design field trials to generate the needed data. Comprehensive field trials to evaluate the value of a vaccine/vaccination program require the generation and analysis data on health parameters (livability, condemnations, medication costs), disease surveillance (isolation, detection, serology) and performance (body weight, average daily gain, feed conversion). Subsequent economic analysis helps to determining the benefit of changes/interventions to the customer. Sometimes data analysis could help quantify the cost of subclinical disease. Ultimately, we aim to extract the unrealized added value of data in decision making.

The data analysis process begins with data cleaning/homogenization, followed by merging/consolidation. Python software is used to analyze the data, generate visualization of the data (boxplots, correlation matrix, contingency table, scatterplots, etc.) and conduct statistical analysis. Several kinds of data analysis have been conducted over the past 5 years: 2 or 3 group comparisons, repeated measures ANOVA, correlations, confusion matrix (sensitivity, specificity), kappa agreement and so on.

In this presentation we will share real-world examples of data analysis for improved decision making.