

KNOW THE FACTS

CONSISTENCY
MATTERS: THE IMPACT
OF VACCINATION ON
HERD VARIABILITY

FLEXcombo[®]



INTRODUCTION

Beyond natural variability caused by genetics, disease is the primary cause of variability in swine production and one of the most significant destroyers of profitability. While there will always be some natural variation, even among healthy pigs, disease can increase the range by which performance statistics like average daily gain and finishing weights vary. Because optimizing these types of performance metrics is a key goal for many producers, disease prevention, often through vaccination, is a critical component of achieving them.

When measuring the effectiveness of a vaccine, or comparing one protocol to another, research trials have traditionally focused on average outcomes for an entire herd or trial group. And these studies typically assume all the pigs in the group go to market at once. The fatal flaw with this approach is that it doesn't reflect how pigs are actually brought to market, and therefore doesn't account for differences in the health and performance of individual pigs or the impact of pig variability. Looking at trial data through a lens that reflects the reality of how pigs go to market can reveal significant differences between two protocols that might otherwise appear to be equal when considering only group averages.



KEY POINTS

- 1** The studies outlined here are among the first real-world economic modeling studies to account for variability within groups of pigs, and to address deficiencies in evaluation methods that rely on group averages.¹
- 2** Compared to a competitor vaccine, FLEXCOMBO helps reduce variability in swine herds and increase the profitability of pigs in the closeout load.^{1,2,3}
- 3** Using real-world data in a bioeconomic profit-optimization model, researchers found FLEXCOMBO has an \$0.89/head profit advantage over a competitor vaccine, which equates to nearly \$900 for a 1,000-head herd.^{1,3}

CONSISTENCY IS KEY WHEN MARKETING PIGS

Meat packers in the United States set target weights for pigs, with penalties or fees assessed for pigs that come in either above or below the target weight. Sending a herd to market in three “cuts” (topping load, middle loads and closeout load) based on pig weights helps producers send as many pigs to market as close to the target weight as possible.

Disease can slow the marketing process by prolonging the amount of time it takes for pigs to make weight, particularly those in the closeout load. This reduces a producer’s profitability, because many operating costs remain constant whether there are 10 or 1,000 pigs in a barn. Disease also delays a producer’s ability to turn the barn and bring in a new group of pigs.

The typical marketing pattern of pigs highlights why consistent weight gain is of such critical importance for producers: The more pigs they can take to market at the ideal weight and at the ideal time, the more profitable they’ll be.



AN ECONOMIC VIEW OF TRIAL DATA

Two recent head-to-head studies compared the efficacy of FLEXCOMBO, a one-dose bivalent vaccine that protects against porcine circovirus Type 2 (PCV2) and *Mycoplasma hyopneumoniae* (Mhp), to a split-dose competitor vaccine that protects against the same diseases. When looking at traditional performance metrics, the studies found no significant differences between the two protocols.^{2,3}

But to measure how the vaccines compared to one another from a profitability standpoint, researchers took the raw trial data and evaluated it with a stochastic, bioeconomic profit-optimization model that simulates the typical marketing pattern of a herd of pigs. The model also optimizes the sale dates for the pigs, and incorporates historical ranges for production costs and pig market prices to arrive at profit-and-loss estimates for the topping, middle and closeout loads.¹

STUDY 1

Researchers took raw data from one study and evaluated it with a bioeconomic model, extrapolating it out to mimic a 1,000-head herd.^{1,3} The model determined that 16.67% of the herd (165 head) would be sold in the topping load, 66.67% (670 head) would be sold in the middle loads, and the remaining 16.67% (165 head) would be sent to market in the closeout load. Taking into account real-world feed costs and pig market prices, the model then determined the following differences in return on investment for each load:

Figure 1. Estimated difference in return over cost of feed for FLEXCOMBO and competitor vaccine^{1,3}

	TOPPING LOAD (165 HEAD)	MIDDLE LOADS (670 HEAD)	CLOSEOUT LOAD (165 HEAD)
FLEXCOMBO Average return over cost of feed/head	\$68.30	\$62.64	\$53.44
COMPETITOR VACCINE Average return over cost of feed/head	\$67.96	\$61.74	\$52.02
FLEXCOMBO Difference in return over cost of feed cost/head (total load difference)	\$0.34 (\$56.10)	\$0.90 (\$603.00)	\$1.42 (\$234.30)
FLEXCOMBO Difference in return over cost of feed/1,000 head (per-head weighted average difference)	\$893.40 (\$0.89)		

As depicted in *Figure 1*, pigs in the topping and middle loads vaccinated with FLEXCOMBO had a marginal profit advantage over the competitor vaccine. In the closeout load, however, pigs vaccinated with FLEXCOMBO had a dramatic advantage over the competitor vaccine at \$1.42/head.^{1,3}

This is because a greater number of the pigs vaccinated with FLEXCOMBO in the closeout load were heavier (or closer to the target weight), thus escaping the more extreme lightweight penalties from the packer, while pigs vaccinated with the competitor vaccine in the closeout load tended to be lighter, resulting in more of these penalties.

WHAT THIS MEANS FOR PRODUCERS

FLEXCOMBO contributed to more consistent weight gain, resulting in more pigs closer to the target weight in the closeout load.^{1,3} When combined with the topping and middle loads, FLEXCOMBO had a net advantage of \$0.89/head over the competitor vaccine. This equates to nearly \$900 for a 1,000-head herd of pigs (Figure 1).^{1,3}



STUDY 2

In another study, researchers again evaluated raw trial data using a bioeconomic model and had similar results.^{1,2} In that study, the most notable difference between the two protocols was again in the closeout load, where FLEXCOMBO had a \$2.70/head advantage over the competitor vaccine and a net advantage of \$0.81/head when all three loads were combined.^{1,2}

Figure 2. Estimated difference in return over cost of feed for FLEXCOMBO and competitor vaccine^{1,2}

	TOPPING LOAD (165 HEAD)	MIDDLE LOADS (670 HEAD)	CLOSEOUT LOAD (165 HEAD)
FLEXCOMBO Average return over cost of feed/head	\$80.47	\$68.52	\$60.24
COMPETITOR VACCINE Average return over cost of feed/head	\$80.63	\$67.93	\$57.54
FLEXCOMBO Difference in return over cost of feed cost/head (total load difference)	-\$0.16 (-\$26.40)	\$0.59 (\$395.30)	\$2.70 (\$445.50)
FLEXCOMBO Difference in return over cost of feed/1,000 head (per-head weighted average difference)	\$814.40 (\$0.81)		

SUMMARY

Consistent growth is key to a producer's bottom line. The more pigs they can take to market at the right weight and at the right time, the more profitable they'll be. By helping pigs grow at a more consistent rate compared to a competitor vaccine, FLEXCOMBO can help increase producers' profitability.¹

¹DiPietro D, Mulberry L, Fano E. Exploring profitability differences when average wean-finish production metrics are essentially equal between groups. In *Proceedings*. Allen D. Lemán Swine Conf. 2017;27. ²Fano E, Schaefer N, Schmalting E. Comparison of efficacy between two PCV2 vaccination protocols under PCV2d field exposure. In *Proceedings*. Amer Assoc Swine Vet 2017;95-97. ³Boehringer Ingelheim, data on file.

CONSISTENCY MATTERS: THE IMPACT OF VACCINATION ON HERD VARIABILITY

There's more to a vaccine than what it costs. There's also what it gains. A vaccine's price per head and its impact on average daily gain are important, but so is herd consistency. A new economic model shows the whole story:

AVERAGE VARIABILITY

Here's how the average group of pigs goes to market: Some go in the topping load, others go in the closeout load, and the majority go in the middle loads.

CLOSEOUT LOAD

This load is the **costliest**. Whether a barn is full of pigs or it's waiting for the last few to reach market weight, most fixed and operating costs will remain constant.

PRODUCT COMPARISON

Product choices can impact variability and thus the average weights of each market load. The chart below is a representation by product of when pigs in each group went to market.

MORE PENALTIES IN CLOSEOUT LOADS, HIGHER COSTS

With fewer packer penalties from closeout load pigs, your profits are increased and the barn gets turned over faster.

FLEXCOMBO produces fewer penalty pigs*

MEASURING PROFITABILITY

Whole-group consistency nets whole-herd profitability. When more pigs in the closeout load are nearer to the target weight, producers reduce packer penalties, and increase their turnover rate and profit margin.

89¢

Groups vaccinated with FLEXCOMBO achieve an average of \$0.89/head more than competitor vaccine at market.*

\$900

That's nearly a \$900 difference for every 1,000 pigs.*

FLEXCOMBO CONTRIBUTES TO MORE CONSISTENT WEIGHT GAIN, HELPING MORE PIGS GO TO MARKET AT THE RIGHT TIME AND AT THE RIGHT WEIGHT.



¹ DiPietro D, Mulberry L, Fano E. Exploring profitability differences when average wean-finish production metrics are essentially equal between groups. In *Proceedings*. Allen D. Leman Swine Conf. 2017;27. ² Fano E, Schaefer N, Schmalzing E. Comparison of efficacy between two PCV2 vaccination protocols under PCV2d field exposure. In *Proceedings*. Amer Assoc Swine Vet 2017;95-97. ³ Boehringer Ingelheim, data on file. *The value of loads is determined by which matrix you sell in.

