

Cost minimization analysis of intradermal and intramuscular administration of vaccines in Brazil

Derald J. Holtkamp^{*1}, Felipe Ibanez², Lucas Peixoto², Cesar Ferronato², Leonardo Rossi², Stephan von Berg²

¹Department of Veterinary Diagnostic and Production Animal Medicine, Iowa State University, Ames, Iowa. ²MSD Animal Health, Munich, Germany

*Corresponding author: holtkamp@iastate.edu

Background and Objectives

Intradermal (ID) administration of vaccines is an alternative to traditional routes of administration, such as intramuscular (IM) and oral that may result in lower costs for producers. Cost minimization analysis (CMA) is frequently used in human medicine to measure and compare the costs of different medical interventions when the efficacy of the outcomes is the same. The aim of this study was to apply CMA to compare ID and IM administration of three vaccines in growing pigs in a hypothetical 38,000 sow production system in Brazil.

Material and Methods

Data to estimate the cost of vaccine storage, vaccination equipment, waste disposal and carcass trim loss was obtained from various sources and was representative of conditions in Brazil. It was assumed that three vaccines were administered. For the IM scenario, pigs were vaccinated intramuscularly with commercially available vaccines against porcine circovirus, *Mycoplasma hyopneumoniae* and orally against *Lawsonia intracellularis*. For the ID scenarios, pigs were intradermally vaccinated with all three vaccines.

Results

Fewer resources were required under the ID scenario due to the smaller doses, vial sizes and packaging, and the elimination of needles and syringes. The cost of electricity to store the vaccines declined from US\$3,773 annually with IM to US\$1,078 with ID as fewer refrigerators were required. The amount of glass, plastic and cardboard waste generated declined from 16.5 metric tons annually with IM to 1.1 metric tons with ID. Pork trim loss declined from 26.8 metric tons with IM to 9.4 metric tons annually for the ID scenario. The total cost savings associated with the ID scenario compared to IM was US\$65,776 annually or US\$0.06 per pig marketed.

Discussion and conclusion

The CMA analysis demonstrates the magnitude of resource and cost savings associated with ID administration of vaccines. The cost savings for individual producers will depend on the specific circumstances that vary between countries and producers. Other costs that may be relevant include the cost of the vaccine, labor for administration and medical insurance and lost workdays. Differences in the economic value of productivity differences may be relevant if data to support differences is available.

Keywords: Cost minimization analysis, vaccines, intradermal