Dramatic reductions of in feed medication via immunization against enteric pathogens

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Summary: The use of in-feed antimicrobials is coming under increased pressure in food animal production. Five field studies examined the impact of vaccines to stimulate protective immunity against pathogens commonly controlled with in-feed antimicrobials (Lawsonia intracellularis, a common enteric pathogen causing ileitis). Grow-finish pigs were immunized and various levels of in-feed antimicrobials used to control or prevent Lawsonia were removed. Performance was compared between vaccinated and matched, continuously medicated barns. Performance was improved in vaccinated/reduced medication pigs while allowing for a 50% or greater reduction in in-feed antimicrobials targeting ileitis. More than six grams of tylosin and 20 grams of tetracycline per pig were removed from finishing feeds. Up to 50% of the time period in vaccinated finishing pigs occurred without any medications in feed. Large amounts of in-feed antimicrobials were successfully removed while improving growing and finishing pig performance.

Keywords: vaccination, antimicrobials, Lawsonia, Salmonella, grow-finish

Introduction: Use of in feed antimicrobials in pork production is a controversial activity. Historically, in feed antimicrobials have been used to treat and prevent disease, as well as promote growth in normal, healthy pigs. A large percentage of pigs have typically received some type of medication for either disease treatment or growth promotion at some point in the production phase (Dewey et al., 1999). However, the continuous feeding of in-feed antimicrobials may contribute to the development of resistance in swine pathogens, a potential risk for animal and human health (Mathew et al., 2002). Active immunization against enteric pathogens may offer producers the chance to reduce in feed antibacterials while maintaining or improving production.

Materials and Methods: A common enteric pathogen of swine, Lawsonia intracellularis, the causative agent of ileitis, recently has had a first of its kind oral vaccine approved. Common antibacterials such as tylosin, tetracyclines and lincosin are frequently used in in-feed, water and injectable formats to treat and prevent disease associated with Lawsonia. Five large scale field experiments using immunization to prevent disease were performed to evaluate both the impact of vaccination on biologic performance and assess the ability to reduce the reliance of producers on in-feed antimicrobials to control a common enteric disease.

Barns of pigs were vaccinated late in the nursery phase or at placement to the finishing phase with Enterisol® Ileitis (Boehringer Ingelheim Vetmedica, GmbH.), or remained as non-vaccinated, continuously medicated control groups. Enterisol Ileitis is first and only vaccine to protect pigs against ileitis which is administered orally. A total of 55 barns and approximately 46,900 pigs were immunized. There were a similar number of non-vaccinated control barns. A complete description of the study format has been described elsewhere (Kolb,2003).
**Results:** Growth rate (gm/day), feed efficiency (kg gain/kg feed) and mortality were significantly improved (p<0.05) for groups of pigs vaccinated with Enterisol Ileitis and using reduced amounts of in-feed medications, as compared to barns receiving conventional regimens of continuous medications throughout the finishing phase. An average of more than 6 grams of tylosin were removed per pig receiving vaccination. Additionally, more than 25 grams of tetracycline were removed, per pig, in two of the five trials utilizing this antimicrobial. Performance was improved while simultaneously reducing the amount of in-feed antimicrobials.

**Discussion:** In this study, immunization against *Lawsonia* improved performance as compared to matched non vaccinated, continuously medicated barns of pigs. Additionally, there were large periods of time where medication free feeds were used during the finishing phase, predominantly in later finishing where the majority of feed, and thus feed medications, are consumed. This may allow for more strategically placed therapeutic medications, whether directed at enteric or respiratory disease (Walter et al., 2000). This reduction of medication use with improved performance is in contrast to those efforts where medications have been removed without immunization to address enteric pathogens remaining in the environment (Nielsen, 2002).

Immunization against *Lawsonia* may allow pork producers and veterinarians to significantly reduce the use of in-feed antimicrobials in disease preventive and growth promoting roles. This would thus reduce overall reliance on antimicrobials in pork production. The potential impact on human health of such a reduction has yet to be ascertained. However, improving production and reducing the amount of in-feed antimicrobials would provide an economic incentive for producers to reduce use of medications in feeds and improve welfare for livestock.

**References:**