Efficacy of Ingelvac® PRRS MLV when rehydrated with a combination of Ingelvac MycoFLEX® and Ingelvac CircoFLEX®

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Introduction and Objectives
The objective of this study was to evaluate the efficacy of a lyophilized PRRS virus vaccine when rehydrated with a mixture containing both Mycoplasma hyopneumoniae and Porcine Circovirus Type 2 vaccines when the monovalent USDA licensed vaccines for the three agents are mixed and administered in a single combined injection.

Materials and Methods
The efficacy of the PRRS vaccine fraction was evaluated in the pig host animal efficacy model. This allowed for the evaluation of the PRRS-specific parameters in the appropriate host animal challenge model. The PRRS efficacy evaluation was performed in conventional pigs approximately 3 weeks old. Pigs were tested and determined to be seronegative for antibodies to PRRS virus by ELISA. At approximately 3 weeks of age, animals were vaccinated with a mixture containing Ingelvac MycoFLEX®, Ingelvac CircoFLEX® and Ingelvac PRRS MLV in a single 2 mL dose. The trivalent vaccine treatment was created by mixing equal volumes of the Ingelvac MycoFLEX and Ingelvac CircoFLEX products (each labeled as 1 mL/dose) and rehydrating Ingelvac PRRS MLV. The mixture was then administered as a 2 mL/dose vaccination. Twenty eight days after vaccination, animals were challenged with heterologous virulent PRRS virus isolate MN/01/A2. Animals were necropsied fourteen days after challenge and the lungs were removed and scored for percent lung pathology consistent with PRRS virus infection. To demonstrate efficacy of the Ingelvac® PRRS MLV vaccine in combination with the other two vaccines, total percent lung pathology was compared between the vaccinated and non-vaccinated challenge control pigs following a virulent heterologous challenge with PRRS virus.

Results
Percent lung pathology was significantly reduced by trivalent vaccination (Table 1).

Table 1. Efficacy of Ingelvac® PRRS MLV after mixing with Ingelvac® MycoFLEX and Ingelvac CircoFLEX® (Wilcoxon Rank Sum Analysis of lung scores).

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Number of animals</th>
<th>Group Average Lung Score (%)</th>
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<tbody>
<tr>
<td>M hyo-PCV2-PRRS</td>
<td>20</td>
<td>4.5a</td>
</tr>
<tr>
<td>Challenge Controls</td>
<td>20</td>
<td>32.9b</td>
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a,b: P < 0.0001

There was no injection site or other adverse reactions that could be attributed to the vaccine mixture in any of these studies. Separate single agent challenge studies were also performed to evaluate M hyo and PCV2 protection. Statistically significant differences between trivalent vaccinates and controls for outcomes relevant to each specific agent were observed.

Discussion and Conclusions
The mixture of Ingelvac PRRS MLV rehydrated with Ingelvac MycoFLEX and Ingelvac CircoFLEX delivered in a single combined 2.0 ml intramuscular injection was safe and effective against a heterologous PRRS virus challenge. The trivalent vaccine mixture also induced protection against virulent challenges with M. hyo and PCV2 in separate studies. The ability to confidently mix and administer these three single-dose products reduces the number of injection sites, animal stress, time and labor, yet provides confirmed efficacy and safety as demonstrated by these controlled studies.