When clinical pneumonia is decreasing herd productivity, you might start looking for a single culprit, such as porcine reproductive and respiratory syndrome virus (PRRSV) or Mycoplasma hyopneumoniae (M. hyopneumoniae). But complex respiratory challenges are rarely caused by just one pathogen. Viral and bacterial infectious agents can open the door for one another when a pig’s immune system is compromised. These co-infections are referred to as porcine respiratory disease complex (PRDC) and can lead to decreased average daily gain (ADG), poor feed efficiency and extended time to market when herd productivity needs to be at its peak for operational success.

**M. HYOPNEUMONIAE AND PRRSV: A DANGEROUS COMBINATION**

Besides being economically devastating on their own, PRRSV and M. hyopneumoniae can result in losses of up to $10 per pig when co-infections occur. Because M. hyopneumoniae can last 15 to 30 weeks after initial exposure, it can allow PRRSV to infect when the pig’s immune system is compromised.

Timing is everything when it comes to managing PRDC — and M. hyopneumoniae can play a key role in the timeline of PRDC manifestation. Studies have shown that pigs infected with M. hyopneumoniae 21 days prior to being exposed to PRRSV developed severe interstitial pneumonia due to M. hyopneumoniae intensifying the effects of the PRRSV.

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**TABLE:**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3 WEEKS OF AGE</td>
<td>Vaccination is key to protect pigs from respiratory disease in finishing stage</td>
</tr>
<tr>
<td>14-20 WEEKS</td>
<td>Growing pigs most susceptible to M. hyopneumoniae</td>
</tr>
<tr>
<td>21 DAYS AFTER</td>
<td>M. hyopneumoniae infection, M. hyopneumoniae can open the door for PRRSV allowing PRDC to impact pig health and production input costs</td>
</tr>
</tbody>
</table>
COMPREHENSIVE M. HYOPNEUMONIAE SOLUTIONS FROM ZOETIS

PRDC can be hard to diagnose due to the intermingling of viral and bacterial agents. By the time a diagnosis is given, pig performance has likely decreased and input costs increased. That’s why it’s important to prevent and control *M. hyopneumoniae* before it allows PRDC to impact herd health.

With the right tools and expertise, Zoetis can help you manage *M. hyopneumoniae* and PRDC through the pig’s entire life cycle.

VACCINE PREVENTION

Fostera® PCV MH is the only porcine circovirus and *M. hyopneumoniae* combination vaccine to have demonstrated a 23-week duration of immunity (DOI) for both *M. hyopneumoniae* and PCV2, which is the longest on the market.6

Market pigs vaccinated with Fostera PCV MH had nearly an 8-lb. advantage over pigs vaccinated with Circumvent® PCV M G2.7,*

CONTROL AND TREATMENT

Technical manual and online resource with proven strategies and protocols for managing *M. hyopneumoniae* from seven industry experts. Learn more at Mhyo5step.com.

Long-lasting treatments designed with your complex respiratory challenges in mind.

Treatments with zero withdrawal time to help reduce the severity of *M. hyopneumoniae* and help keep pigs on track.

Caution: Federal law restricts medicated feed containing this veterinary feed directive (VFD) drug to use by or on the order of a licensed veterinarian.

SERVICES AND TRAINING

Technical service veterinarians with more than 300 years of combined experience.

Hands-on education and training program for proper vaccine administration.

Education and training program to help pig caregivers identify illness sooner to help improve treatment outcomes.

IMPORTANT SAFETY INFORMATION FOR DRAXXIN 25: Withdraw DRAXXIN 25 five (5) days prior to slaughter in swine. Do not use in animals known to be hypersensitive to the product. See full Prescribing Information, attached.

IMPORTANT SAFETY INFORMATION FOR LINCOMIX 20/50: Do not use in swine intended for breeding. Do not allow unapproved species access to feeds containing lincomycin.

*Study Design: Fostera PCV MH given in two doses — 1 ml at 3 weeks of age and 1 ml at 5 weeks of age. Circumvent® PCV M G2 given in two doses — 1 ml at 3 days of age and 1 ml three weeks following first dose.

REFERENCES:

Animal Weight Dose Volume

Table 1. Do not inject more than 4 mL per injection site.

<table>
<thead>
<tr>
<th>Animal Weight (Pounds)</th>
<th>Dose Volume (mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>0.2</td>
</tr>
<tr>
<td>10</td>
<td>0.5</td>
</tr>
<tr>
<td>15</td>
<td>0.7</td>
</tr>
<tr>
<td>20</td>
<td>0.9</td>
</tr>
<tr>
<td>22</td>
<td>1.1</td>
</tr>
<tr>
<td>25</td>
<td>1.1</td>
</tr>
<tr>
<td>30</td>
<td>1.4</td>
</tr>
<tr>
<td>40</td>
<td>2.3</td>
</tr>
<tr>
<td>50</td>
<td>3.2</td>
</tr>
<tr>
<td>70</td>
<td>5.7</td>
</tr>
<tr>
<td>100</td>
<td>11.5</td>
</tr>
</tbody>
</table>

Do not inject more than 11.5 mL per injection site.

Comparison Bioavailability Summary

Despite slightly lower peak concentrations with Draxxin Injectable Solution, a single IM dose of 2.5 mg tulathromycin/kg BW of either Draxxin Injectable Solution (100 mg/mL) or Draxxin Injectable Solution (25 mg/mL) resulted in comparable total systemic tulathromycin exposure. Therefore, Draxxin Injectable Solution is considered to be therapeutically equivalent to Draxxin Injectable Solution when administered to swine by IM injection at a dose of 2.5 mg tulathromycin/kg BW.

Comparative Bioavailability Summary

Despite lower peak concentrations with Draxxin Injectable Solution, a single SC dose of 2.5 mg tulathromycin/kg BW of either Draxxin Injectable Solution (100 mg/mL) or Draxxin Injectable Solution (25 mg/mL) resulted in comparable total systemic tulathromycin exposure. Therefore, Draxxin Injectable Solution is considered to be therapeutically equivalent to Draxxin Injectable Solution when administered to calves by SC injection at a dose of 2.5 mg tulathromycin/kg BW.

Swine

Following intramuscular (IM) administration to feeder pigs at a dosage of 2.5 mg/kg BW, tulathromycin is nearly completely absorbed, with peak plasma concentrations achieved within ~0.25 hr. The volume of distribution exceeds 15 L/kg, which is consistent with extensive tissue binding. This large distribution volume results in a long terminal elimination half-life (60 to 90 hours) despite a rapid systemic free drug clearance (170 mL/hr/kg). No pharmacokinetic differences are observed in castrated male versus female calves.

Comparative Bioavailability Summary

Despite lower peak concentrations with Draxxin Injectable Solution, a single SC dose of 2.5 mg tulathromycin/kg BW of either Draxxin Injectable Solution (100 mg/mL) or Draxxin Injectable Solution (25 mg/mL) resulted in comparable total systemic tulathromycin exposure. Therefore, Draxxin Injectable Solution is considered to be therapeutically equivalent to Draxxin Injectable Solution when administered to calves by SC injection at a dose of 2.5 mg tulathromycin/kg BW.

Clearance and volume estimates are based on intersubject comparisons of 2.5 mg/kg BW administered by either subcutaneous or intramuscular injection.

**ADVERSE REACTIONS**

**Swine**

In one field study, one out of 40 pigs treated with Draxxin Injectable Solution (100 mg/mL) at 2.5 mg/kg BW exhibited mild salivation that resolved in less than four hours.

**Calves**

In one BRD field study, two calves treated with Draxxin Injectable Solution (100 mg/mL) at 2.5 mg/kg BW exhibited transient hypersalivation. One of these calves also exhibited transient dyspnea, which may have been related to pneumonia.

**Post Approval Experience**

The following adverse events are based on post approval adverse drug experience reporting for Draxxin Injectable Solution (100 mg/mL). Not all adverse events are reported to the FDA CVM. It is not always possible to reliably estimate the adverse event frequency or establish a causal relationship to product use based on these data. The following adverse events are listed in decreasing order of reporting frequency in cattle: Injection site reactions and anaphylaxis/anaphylactoid reactions. For a complete listing of adverse reactions for Draxxin Injectable Solution or Draxxin Injectable Solution reported to the CVM see: http://www.fda.gov/AnimalVeterinary/AdverseDrugEffects/.
Table 4. Taltomycin minimum inhibitory concentration (MIC) values* for indicated pathogens isolated from field studies evaluating BRD in the U.S.

<table>
<thead>
<tr>
<th>Indicated pathogen</th>
<th>Date isolated</th>
<th>No. of isolates</th>
<th>MIC of ** (µg/mL)</th>
<th>MIC of *** (µg/mL)</th>
<th>MIC range (µg/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mannheimia haemolytica</td>
<td>1999</td>
<td>642</td>
<td>2</td>
<td>2</td>
<td>0.5 to 64</td>
</tr>
<tr>
<td>Pasteurella multocida</td>
<td>1999</td>
<td>221</td>
<td>0.5</td>
<td>1</td>
<td>0.25 to 64</td>
</tr>
<tr>
<td>Histophilus somni</td>
<td>1999</td>
<td>36</td>
<td>4</td>
<td>4</td>
<td>1 to 4</td>
</tr>
<tr>
<td>Mycoplasma bovis</td>
<td>1999</td>
<td>48</td>
<td>0.125</td>
<td>1</td>
<td>≤ 0.063 to &gt; 64</td>
</tr>
</tbody>
</table>

* The correlation between in vitro susceptibility data and clinical effectiveness is unknown.
** The lowest MIC to encompass 50% and 90% of the most susceptible isolates, respectively.

### EFFECTIVENESS

#### Swine

Plasma concentrations of taltomycin administered as DRAXXIN Injectable Solution (100 mg/mL) or as DRAXXIN 25 Injectable Solution were demonstrated to be therapeutically equivalent (see CLINICAL PHARMACOLOGY, Comparative Bioavailability Summary). Therefore effectiveness studies conducted with DRAXXIN Injectable Solution support the effectiveness for DRAXXIN 25 Injectable Solution.

A safety study was conducted in feeder calves receiving DRAXXIN Injectable Solution (100 mg/mL) as a single subcutaneous dose of 25 mg/kg BW, or 3 weekly subcutaneous doses of 2.5, 7.5, or 12.5 mg/kg BW. In all groups, transient indications of pain after injection were seen, including head shaking and pawing at the ground. Injection site swelling, discoloration of the subcutaneous tissues at the injection site and corresponding histopathologic changes were seen in animals in all dosage groups. These lesions showed signs of resolving over time. No other drug-related lesions were observed macroscopically or microscopically.

An exploratory study was conducted in feeder calves receiving DRAXXIN Injectable Solution (100 mg/mL) as a single subcutaneous dose of 10, 12.5, or 15 mg/kg BW. Macroscopically, no lesions were observed. Microscopically, minimal to mild myocardin degeneration was seen in one of six calves administered 12.5 mg/kg BW and two of six calves administered 15 mg/kg BW.

A safety study was conducted in prepubescent calves 13 to 27 days of age receiving DRAXXIN Injectable Solution (100 mg/mL) at 2.5 mg/kg BW or 7.5 mg/kg BW once subcutaneously. With the exception of minimal to mild injection site reactions, no drug-related clinical signs or other lesions were observed macroscopically or microscopically.

Sixteen growing cattle were injected with either saline (eight animals) as a single injection of 11.5 mL or DRAXXIN Injectable Solution (eight animals) as a single injection of either 2.5 mg/kg BW or a dose volume of 11.5 mL (whichever volume was higher). One calf in the DRAXXIN 25-treated group was observed to have firmness at the injection site for a single day. Two DRAXXIN 25-treated calves exhibited injection site swelling. In one calf, the swelling resolved within 48 hours. In the other calf, the swelling was observed over a three-day period, after which the calf underwent a scheduled necropsy, preventing further injection site observations. No injection site swelling was observed in saline-treated animals. At necropsy, three of the saline-treated calves and five of the DRAXXIN 25-treated calves had altered tissue present at the injection site. The gross and microscopic findings in the DRAXXIN 25-treated group were consistent with inflammatory changes induced by injections, were considered to be mild to marked, and progressed to macroscopic resolution and microscopic resolution by Day 42 post-injection.

### STORAGE CONDITIONS:

Store at or below 25°C (77°F). Use within 90 days of first vial puncture.

### HOW SUPPLIED

DRAXXIN Injectable Solution is available in the following package sizes:

- 50 mL vial
- 100 mL vial
- 250 mL vial

NADA 141-349. Approved by FDA

### Distributed by:

Zoetis Inc.
Kalamazoo, MI 49077

To report a suspected adverse reaction or to request a safety data sheet call 1-888-963-8471. For additional information about adverse drug experience reporting for animal drugs, contact FDA at 1-888-FDA-VETS or online at http://www.fda.gov/AnimalVeterinary/SafetyHealth.

For additional DRAXXIN 25 product information call: 1-888-DRAXXIN or go to www.DRAXXIN.com

Made in Brazil

Revised: September 2014

ANIMAL SAFETY

Swine

Plasma concentrations of taltomycin administered as DRAXXIN Injectable Solution (100 mg/mL) or as DRAXXIN 25 Injectable Solution were demonstrated to be therapeutically equivalent (see CLINICAL PHARMACOLOGY, Comparative Bioavailability Summary). Therefore systematic target animal safety studies conducted with DRAXXIN Injectable Solution support the systemic safety for DRAXXIN 25 Injectable Solution.

Safety studies were conducted in pigs receiving a single intramuscular dose of 25 mg/kg BW, or 3 weekly intramuscular doses of 2.5, 7.5, or 12.5 mg/kg BW (both studies utilized DRAXXIN Injectable Solution (100 mg/mL)). In all groups, transient indications of pain after injection were seen, including restlessness and excessive vocalization. Tremors occurred transiently in one animal receiving 7.5 mg/kg BW. Discoloration and edema of injection site tissues and corresponding histopathologic changes were seen in animals at all dosages and resolved over time. No other drug-related lesions were observed macroscopically or microscopically.

Sixteen growing pigs were injected with either saline or DRAXXIN 25 Injectable Solution as a single injection of 4 mL. Injection site observations included two instances of erythema in the DRAXXIN 25-treated group on Day 1 post-injection. No heat, sensitivity, firmness, necrosis, drainage, or swelling was observed at any injection sites in either treatment group. The gross and microscopic findings in the DRAXXIN 25-treated group were consistent with inflammatory changes induced by injections and were considered to be mild or moderate with progression to macroscopic resolution by Day 28 post-injection and microscopic resolution by Day 42 post-injection.

**Calves**

Plasma concentrations of taltomycin administered as DRAXXIN Injectable Solution (100 mg/mL) or as DRAXXIN 25 Injectable Solution were demonstrated to be therapeutically equivalent (see CLINICAL PHARMACOLOGY, Comparative Bioavailability Summary). Therefore effectiveness studies conducted with DRAXXIN Injectable Solution support the effectiveness for DRAXXIN 25 Injectable Solution.

A safety study was conducted in feeder calves receiving DRAXXIN Injectable Solution (100 mg/mL) as a single subcutaneous dose of 25 mg/kg BW, or 3 weekly subcutaneous doses of 2.5, 7.5, or 12.5 mg/kg BW. In all groups, transient indications of pain after injection were seen, including head shaking and pawing at the ground. Injection site swelling, discoloration of the subcutaneous tissues at the injection site and corresponding histopathologic changes were seen in animals in all dosage groups. These lesions showed signs of resolving over time. No other drug-related lesions were observed macroscopically or microscopically.

An exploratory study was conducted in feeder calves receiving DRAXXIN Injectable Solution (100 mg/mL) as a single subcutaneous dose of 10, 12.5, or 15 mg/kg BW. Macroscopically, no lesions were observed. Microscopically, minimal to mild myocardin degeneration was seen in one of six calves administered 12.5 mg/kg BW and two of six calves administered 15 mg/kg BW.

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Sixteen growing cattle were injected with either saline (eight animals) as a single injection of 11.5 mL or DRAXXIN Injectable Solution (eight animals) as a single injection of either 2.5 mg/kg BW or a dose volume of 11.5 mL (whichever volume was higher). One calf in the DRAXXIN 25-treated group was observed to have firmness at the injection site for a single day. Two DRAXXIN 25-treated calves exhibited injection site swelling. In one calf, the swelling resolved within 48 hours. In the other calf, the swelling was observed over a three-day period, after which the calf underwent a scheduled necropsy, preventing further injection site observations. No injection site swelling was observed in saline-treated animals. At necropsy, three of the saline-treated calves and five of the DRAXXIN 25-treated calves had altered tissue present at the injection site. The gross and microscopic findings in the DRAXXIN 25-treated group were consistent with inflammatory changes induced by injections, were considered to be mild to marked, and progressed to macroscopic resolution and microscopic resolution by Day 42 post-injection.