Duration of efficacy of EXCEDE versus Baytril® was determined in an Actinobacillus pleuropneumoniae (APP) challenge model study in swine. Animals were assigned to receive EXCEDE, Baytril®, or saline. Each treatment arm included subgroups of 20 pigs that were administered one type of treatment 7, 5, or 3 days before being challenged with APP. The goal of the study was to analyze and compare survivability and lung lesions 5 days following APP exposure.

EXCEDE significantly improved survival vs Baytril®:
Mortality reduction compared with controls (%)

<table>
<thead>
<tr>
<th>Day</th>
<th>EXCEDE</th>
<th>Baytril*</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>100%</td>
<td>50%</td>
</tr>
<tr>
<td>-5</td>
<td>100%</td>
<td>7%</td>
</tr>
<tr>
<td>-7</td>
<td>92%</td>
<td>0%</td>
</tr>
</tbody>
</table>

EXCEDE provided significantly better protection against lung lesions vs Baytril®:
Lung lesion reduction compared with controls (%)

<table>
<thead>
<tr>
<th>Day</th>
<th>EXCEDE</th>
<th>Baytril*</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>45%</td>
<td>99.9%</td>
</tr>
<tr>
<td>-5</td>
<td>0%</td>
<td>99%</td>
</tr>
<tr>
<td>-7</td>
<td>0%</td>
<td>92%</td>
</tr>
</tbody>
</table>

IMPORTANT SAFETY INFORMATION
People with known hypersensitivity to penicillin or cephalosporins should avoid exposure to EXCEDE. Do not use in swine found to be hypersensitive to the product. Pre-slaughter withdrawal time is 14 days following the last dose.

REFERENCE
**DESCRIPTION**

For intramuscular administration in the post-auricular region of the neck of swine.

**INDICATIONS**

EXCEDE FOR SWINE Sterile Suspension 100 mg/mL is indicated for the treatment of swine respiratory disease (SRD) associated with Actinobacillus pleuropneumoniae, Pasteurella multocida, Haemophilus parasuis, and Streptococcus suis, and for the control of SRD associated with Actinobacillus pleuropneumoniae, Pasteurella multocida, Haemophilus parasuis, and Streptococcus suis in pigs where SRD has been diagnosed.

**DOSEAGE**

Administer by intramuscular (IM) injection in the post-auricular region of the neck as a single dosage of 2.27 mg CE/lb (5.0 mg CE/kg BW) weight body weight (BW). This is equivalent to 1 mL, sterile suspension per 4.4 lb (2.0 kg) BW. No more than 2 mL should be injected in a single injection site. Injection volumes in excess of 2 mL per injection site may result in residue violations. Pigs heavier than 4.4 lb (2.0 kg) will require more than one injection.

**PRECAUTIONS**

All animals should be treated at least 10 days prior to the estimated start of the study.

**ADMINISTRATION**

Shake well before using. EXCEDE FOR SWINE Sterile Suspension 100 mg/mL is to be administered by intramuscular injection in the post-auricular region of the neck.

**CONTRAINDICATIONS**

The use of this product, use of EXCEDE FOR SWINE Sterile Suspension 100 mg/mL, is contraindicated in animals previously found to be hypersensitive to the drug.

**WARNINGS**

For use in swine only.

Perinatal and early postnatal life can cause allergic reactions in sensitive individuals. Topical exposure to such antimicrobials, including ceftiofur, may elicit mild to severe allergic reactions in some individuals. Repeated or prolonged exposure may lead to sensitization. Avoid direct contact with the skin, eyes, mouth, and clothing. Sensitization of the skin may be avoided by wearing protective gloves.

**ANIMAL SAFETY**

Artificial tears are recommended for the treatment of dry eyes due to the inactivation of the tear film in cattle, sheep, and pigs.

**ANIMAL STUDIES**

Five barrows and five gilts per group were administered ceftiofur sodium IM at 0, 2.27, 6.81 and 20.6 mg CE/lb (5.0, 15.0 and 50.0 mg CE/kg BW) for five consecutive days. Clinical observations were made daily. At 3, 7 and 10 days post-injection, pairs of animals were euthanized and the neck injection sites were harvested for histopathological examination. The injection sites were harvested for histopathological examination at 6–8 weeks post-injection.

**HUMAN SAFETY**

As with all antimicrobial agents, the potential exists for the selection of resistant bacteria in the environment, especially in the treatment of infections caused by sparsely distributed organisms. The potential for the transmission of these organisms to humans and the spread of resistant bacteria is a concern.

**STORAGE CONDITIONS**

Store at controlled room temperature 20° to 25°C (68° to 77°F). Shake well before using. Contents should be used within 12 weeks of the first dose is removed.

**SUPPLIED**

EXCEDE FOR SWINE Sterile Suspension 100 mg/mL is available in the following package size: 100 mL vial.

**EFFECTIVENESS**

The effectiveness of a single dose of 2.27 or 3.18 mg CE/lb BW (5.0 or 7.0 mg CE/kg BW) EXCEDE FOR SWINE Sterile Suspension 100 mg/mL, for the treatment of SRD was confirmed in a well-controlled, multi-location field study. A total of 756 pigs with clinical signs of bacterial respiratory disease were enrolled and treated with a placebo injection or EXCEDE FOR SWINE Sterile Suspension 100 mg/mL, as administered at a single IM injection in the post-auricular region of the neck. Clinical observations were performed 24 hours and 7 days. Hematology and biochemistry were not re-evaluated. There were no statistically significant differences in clinical or hematologic parameters when EXCEDE FOR SWINE was compared to the placebo-treated control group (17%).

**CLINICAL PHARMACOLOGY**

Ceftiofur administered as a sterile oil solution (EXCEDE FOR SWINE Sterile Suspension 100 mg/mL) is not metabolized rapidly to desacetylcephalosporin, the primary metabolite. Administration of ceftiofur sodium IM at 0.062 (125 mg/kg) BW provides concentrations of ceftiofur and desacetylcephalosporin in plasma that are in millions above the MIC50 for the SRD pathogen Actinobacillus pleuropneumoniae. Platelet aggregation, Haemophilus parasuis and Streptococcus suis was not extended beyond time point (Table 2). The area under the plasma concentration vs. time curve (AUC 0-LOQ) = the area under the plasma concentration vs. time curve from time of injection to the limit of quantitation of the assay. Cmax = maximum plasma concentration (in μg CE/mL), tmax = the time after injection when Cmax occurs (in hours).

**EFFECTIVENESS**

The effectiveness of a single dose of 2.27 CE/lb BW (5.0 mg CE/kg BW) EXCEDE FOR SWINE in the control of SRD was evaluated in a multi-location natural infection field study. At each site, where least 10% of the study candidates in a pen showed clinical signs of SRD, 5 pigs in the pen were enrolled and treated with EXCEDE FOR SWINE (2.27 mg CE/lb) or saline (2.27 mg CE/lb). Treatment was performed on days 1 and 2 post-injection. There was a statistically significant (p<0.05) improvement in clinical cure rates for the EXCEDE FOR SWINE-treated groups compared to the placebo-treated control group (17%).

**ANIMAL SAFETY**

After parenteral administration, CEFALOXIN sodium and CEFALOXIN are metabolized in the same principal metabolic pathways, desacetylation/acetolysis. Plasma levels achieved are similar after recommended dosing (Table 2). Therapy, studies conducted with ceftiofur sodium are adequate to evaluate the systemic safety of CEFALOXIN. Results from a 5-day bioavailability study in normal fecal pigs indicated that ceftiofur sodium is not substantially absorbed from the gastrointestinal tract. The pharmacokinetics of ceftiofur were determined using methods recommended by the Clinical and Laboratory Standards Institute (CLSI). The pharmacokinetics were determined using methods recommended by the Clinical and Laboratory Standards Institute (CLSI).

**PRECAUTIONS**

The use of CEFALOXIN sodium IM or SC for the treatment of SRD should not be administered to swine that are allergic to penicillin or cephalosporins. Persons with a known hypersensitivity to penicillin or cephalosporins should avoid exposure to this drug. The potential for allergy to such antimicrobials, including ceftiofur, may elicit mild to severe allergic reactions in some individuals. Sensitization of the skin may be avoided by wearing protective gloves. Sensitization of the skin may be avoided by wearing protective gloves.

**ANIMAL SAFETY**

After parenteral administration, CEFALOXIN sodium and CEFALOXIN are metabolized in the same principal metabolic pathways, desacetylation/acetolysis. Plasma levels achieved are similar after recommended dosing (Table 2). Therapy, studies conducted with ceftiofur sodium are adequate to evaluate the systemic safety of CEFALOXIN. Results from a 5-day bioavailability study in normal fecal pigs indicated that ceftiofur sodium is not substantially absorbed from the gastrointestinal tract. The pharmacokinetics of ceftiofur were determined using methods recommended by the Clinical and Laboratory Standards Institute (CLSI). The pharmacokinetics were determined using methods recommended by the Clinical and Laboratory Standards Institute (CLSI).