Summary of Studies Supporting USDA Product Licensure

Establishment Name	Zoetis Inc.
USDA Vet Biologics Establishment Number	190
Product Code	8601.02
True Name	Tetanus Toxoid
Tradename(s) / Distributor or Subsidiary (if different from manufacturer)	Zoetis (Thailand) Limited Zoetis Mexico
Date of Compilation Summary	May 26, 2023

Disclaimer: Do not use the following studies to compare one product to another. Slight differences in study design and execution can render the comparisons meaningless.

Study Type	Efficacy
Pertaining to	Tetanus Toxoid
Study Purpose	Efficacy against *Clostridum tetani* in cows, horses, pigs, and sheep
Product Administration	
Study Animals	Guinea pigs
Challenge Description	NA
Interval observed after challenge	NA
Results	Efficacy requirements were evaluated by USDA-APHIS prior to product licensure and met regulatory standards for acceptance per 9 CFR 113.114.
USDA Approval Date	04/19/1984

Study Type	Safety
Pertaining to	All fractions
Study Purpose	To demonstrate safety under field conditions.
Product Administration	
Study Animals	
Challenge Description	
Interval observed after challenge	
Results	Study data were evaluated by USDA-APHIS prior to product licensure and met regulatory standards for acceptance at the time of submission. No data are published because this study was submitted to USDA-APHIS prior to January 1, 2007, and APHIS only requires publication of data submitted after that date.
USDA Approval Date	November 19, 1992

Study Type	Safety
Pertaining to	All fractions
Study Purpose	To demonstrate safety under field conditions.
Product Administration	
Study Animals	Swine and Sheep
Challenge Description	
Interval observed after challenge	
Results	Study data were evaluated by USDA-APHIS prior to product licensure and met regulatory standards for acceptance at the time of submission. Study data, however, are no longer available.
USDA Approval Date	12/10/1992

<table>
<tr><td>Study Type</td><td>Safety</td></tr>
<tr><td>Pertaining to</td><td>ALL</td></tr>
<tr><td>Study Purpose</td><td>To demonstrate safety in pregnant mares in the third trimester under field conditions.</td></tr>
<tr><td>Product Administration</td><td>Single dose administered intramuscularly during the third trimester of pregnancy.</td></tr>
<tr><td>Study Animals</td><td>A total of 282 healthy pregnant mares in their third trimester were enrolled in one of two treatment groups in two distinct geographical locations. The animals were distributed as follows: Controls, n = 57, Vaccinated, n = 225.</td></tr>
<tr><td>Challenge Description</td><td>N/A</td></tr>
<tr><td>Interval observed after last treatment</td><td>Clinical observations were performed on all mares for at least 30 minutes following vaccination. Pregnant mares were also observed at least once daily for general health for 21 days following vaccination and at least once weekly until foaling.

Mares were observed during foaling and foals were observed at least once weekly for general health until they were at least 21 days of age.</td></tr>
<tr><td>Results</td><td>
Mare Abnormal Health Events
<table>
<tr><th colspan="2">Number of Mares</th><th rowspan="2">Mares with no AE* (%)</th><th rowspan="2">Mares with AE* (%)</th></tr>
<tr><th>Total Enrolled</th><td>282</td></tr>
<tr><td>Controls</td><td>57</td><td>54 (94.7%)</td><td>3 (5.3%)</td></tr>
<tr><td>Vaccinated</td><td>225</td><td>214 (95.1%)</td><td>11 (4.9%)</td></tr>
</table>
*AE= Adverse Events
<table>
<tr><th>Treatment / Number of Vaccinations</th><th>Mare Abnormal Health Events</th><th>Number of Mares / Percent of Vaccinations</th></tr>
<tr><td rowspan="4">Controls (57 animals)</td><td>Agalactia</td><td>1 / 1.75%</td></tr>
<tr><td>Death[1]</td><td>1 / 1.75%</td></tr>
<tr><td>Dystocia</td><td>1 / 1.75%</td></tr>
<tr><td>Fracture</td><td>1 / 1.75%</td></tr>
<tr><td rowspan="11">Vaccinated (Product Code 48R5.20; 225 animals)</td><td>Abdominal Pain</td><td>1 / 0.44%</td></tr>
<tr><td>Decreased Appetite</td><td>1 / 0.44%</td></tr>
<tr><td>Dystocia</td><td>3 / 1.33%</td></tr>
<tr><td>Fracture</td><td>1 / 0.44%</td></tr>
<tr><td>Injection Site Swelling</td><td>1 / 0.44%</td></tr>
<tr><td>Laceration</td><td>1 / 0.44%</td></tr>
<tr><td>Lameness</td><td>2 / 0.89%</td></tr>
<tr><td>Nasal Discharge</td><td>1 / 0.44%</td></tr>
<tr><td>Placental Abnormality</td><td>1 / 0.44%</td></tr>
<tr><td>Retained Placenta</td><td>1 / 0.44%</td></tr>
</table>
[1] Mare died due to septic shock as a result of a difficult foaling.
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</table>

<table>
<tr><td></td><td>There was only one adverse event that was attributable to IVP which was an injection site reaction in a vaccinate that was observed the day after vaccination and resolved the following day.

Birth Outcome Summary from Vaccinated Mares
<table>
<tr><th colspan="2">Number of Foals</th><th>Live Foals</th><th>Foal died during or immediately post-parturition</th></tr>
<tr><td>Total Foals</td><td>280[1]</td><td>273 (97.50%)</td><td>7 (2.50%)</td></tr>
<tr><td>Controls</td><td>56</td><td>53 (94.64%)</td><td>3 (5.36%)</td></tr>
<tr><td>Vaccinated</td><td>224</td><td>220 (98.21%)</td><td>4 (1.79%)</td></tr>
</table>
[1] Two mares (one vaccinate and one control) were removed prior to foaling due to fractured legs.</td></tr>
<tr><td>USDA Approval Date</td><td>March 02, 2022</td></tr>
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