Effects of Poisonous Plants on Reproduction

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Locoweeds
Locoed ram
Abnormal sperm
Sperm cells
Reazurin red dye reduction
Pathology of the seminiferous tubules
Pig uterus comparison
Estrous cycle of locoed cows
Ultrasound—control ovary
Ultrasound—low dose locoweed ovary
Ultrasound—high dose locoweed ovary
Sheep ovary—control
Sheep ovary—locoweed, 14 days
Loco eaters

Fed locoweed for 30 days at 20% of the diet
(1.2 mg/kg/day swainsonine)

179  Bred 7 days; conceived
153  Bred 25 days; conceived
178  Bred 13 days; rebred 18 days; conceived
156  Bred 11 days; 20 days; 21 days; conceived
Loco eaters

Fed locoweed for 30 days at 20% of the diet (1.2 mg/kg/day swainsonine) starting at 7 months gestation

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<tbody>
<tr>
<td>179</td>
<td>Control</td>
<td>80 lb calf, 32 lb fluid/placenta</td>
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<tr>
<td>178</td>
<td>Control</td>
<td>58 lb calf, 75 lb fluid/placenta</td>
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<tr>
<td>156</td>
<td>Loco</td>
<td>65 lb calf, 101 lb fluid/placenta</td>
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<tr>
<td>153</td>
<td>Loco</td>
<td>43 lb calf, 121 lb fluid/placenta; aborted</td>
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Aborted fetus
Fetal heart rate

Heart rate (beats/min)

Day Gestation
Hydrops calf in uterus
Locoweeds
Caruncular vasculature
Effects of Pines and Related Species on Reproduction in Cattle
Effects of pine needle consumption
B/M mode blood flow
Proposed mechanism for ICA abortion
Plants that Cause Birth Defects
Veratrum and Solanum spp.

Veratrum californicum  
Solanum spp.
Veratum Insult Periods

Cyclopic Defect
14\textsuperscript{th} day

High Embryonic Death Losses
14-19 days
Veratrum Insult Periods

Tracheal Stenosis
31-33 days

Limb Defects
27-32 days
Prolonged Gestation/Narrow Insult Period
Human Anomalies
Over Expression or Ectopic Signaling of SHH
Conium, Nicotiana, and Lupinus spp.

Poison-hemlock (Conium maculatum)

Lupines (Lupinus spp.)

Nicotiana spp. (Nicotiana tabacum, N. glauca)
Historical Aspects

Poison-hemlock:
Cleft palate/
MCC pigs

Nicotiana spp.:
Cleft palate/
MCC pigs

Lupine-induced
Crooked Calf Disease
Teratogenic Effects

Arthrogryposis

Scoliosis
Mechanism of Action

Alkaloid-induced reduction in fetal movement

Blocks neuromuscular junction
Goat Model

- Developed to study mechanism of action of lupine-induced Crooked Calf Disease
- Utilizes *Nicotiana glauca* (anabasine)
- Cleft palate induced during days 32-41 of gestation

Anabasine

![Chemical Structure of Anabasine](image)
Cleft Surgery