

Understanding Cache Valley Virus in Saskatchewan Sheep Flocks

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What Happened?

During November and December, sheep producers across Saskatchewan noticed an unusual number of stillbirths, abortions, and lambs born with skeletal deformities. Vets and producers suspected Cache Valley Virus (CVV), a mosquito-borne viral disease common in North America, as the cause.

In response, the Disease Investigation Unit at the Western College of Veterinary Medicine (WCVM) launched a project to encourage producers to send affected lambs for examination at Prairie Diagnostic Services (PDS). This project was funded by the Saskatchewan Ministry of Agriculture and the Sustainable Canadian Agricultural Partnership. An additional local disease investigation was led by Dr. Fritz Schumann (WCVM) and Dr. Kyla Cutts (Warman Veterinary Services) and focused on several affected flocks near Saskatoon.

What Did We Do?

A total of 29 lambs from 12 different flocks were sent to PDS between December and mid-February. Each lamb underwent a post-mortem by a veterinary pathologist. Tissue samples were sent to the Animal Health Laboratory in Guelph for PCR testing to detect CVV. Some samples were also tested at the Texas Veterinary Medical Diagnostic Laboratory for antibodies. Additionally, most lambs had their tissues examined for other potential causes of abortion.

What Did We Find?

Out of the 29 lambs, **20 (69%) tested positive or were suspected to have CVV**, affecting 8 out of the 12 flocks (67%).

Common Signs in Affected Lambs

- **Joint stiffness and fusion (arthrogryposis):** Found in **100%** of confirmed CVV cases but also appeared in 22% of negative cases.
- **Poor muscle development:** Seen in **75%** of CVV cases, but other conditions can also cause this.
- **Spinal deformities:** Almost all CVV-positive lambs (**95%**) had curved, bent, or fused spines, including conditions like kyphosis (humpbacked), lordosis (inward spine curve), or scoliosis (sideways spine curve).
- **Brain abnormalities:** **80%** had hydrocephalus or hydranencephaly, where parts of the brain were missing and replaced with fluid.
- **Shortened lower jaw:** Found in about **50%** of cases.

Confirming Cache Valley Virus

PCR testing at Guelph confirmed CVV in about **70% (14/20)** of suspected cases. Some lambs with typical CVV symptoms tested negative, likely because the virus was no longer present at birth.

In the 4 flocks where CVV was **not** confirmed:

- One had **Ureaplasma infection**.
- One had **Campylobacter fetus infection**.
- One had **goiter** in all submitted lambs.
- One was **undetermined**, as the only submitted lamb had been scavenged.
- One CVV-positive lamb also tested positive for **Q fever (Coxiella)**.

These results highlight why post-mortems are important—similar symptoms can have different causes, and proper diagnosis helps prevent future losses.

Why Was CVV So Widespread This Year?

While we can't say for sure, we do know CVV has been in Saskatchewan for over 10 years. A 2014 study by WCVN and the Saskatchewan Ministry of Agriculture found that **65% of sheep** and **94% of flocks** had exposure to the virus.

Like many mosquito-borne diseases, CVV may follow cycles based on mosquito infection rates and flock immunity levels. Since so many sheep were affected this year based on producer reports, flocks may now have higher immunity, reducing cases in the next breeding seasons. However, **how long immunity lasts is unknown**.

A similar virus in Europe, **Schmallenberg virus**, causes the same problems in sheep and goats and tends to reappear every **3-5 years**.

Can We Prevent CVV?

There is **no vaccine** for Cache Valley Virus. The only way to reduce risk is to **avoid exposing ewes to mosquitoes during the first 48 days of pregnancy**. Some strategies include:

- Adjusting the breeding schedule to avoid peak mosquito season.
- Keeping early-pregnancy ewes away from mosquito-heavy areas.

From our study, most affected lambs were born in **November, December, and January**, meaning their mothers were bred in **June, July, and August**—right when mosquitoes are most active.

What's Next?

Thanks partly to this project, Prairie Diagnostic Services **can now run PCR tests for CVV in Saskatchewan** instead of sending samples to Guelph.

This research was only possible because of the producers who submitted lambs for testing. Some flocks lost **up to 50% of their lambs** to CVV, so understanding the disease is critical for future prevention.

We sincerely thank all the producers and veterinarians who participated, the Saskatchewan Sheep Development Board for their hard work in promoting the project and recruiting producers, and Prairie Diagnostic Services for the diagnostic work. Thanks as well to the **Saskatchewan Ministry of Agriculture** and the **Sustainable Canadian Agricultural Partnership** for funding this important work.

Take-Home Messages for Producers

✔ **Cache Valley Virus (CVV)** caused severe lamb losses in Saskatchewan, with **69% of submitted lambs affected** during this specific time period.

✔ **Key signs in infected lambs:**

- **Stiff or fused joints** (100% of cases)
- **Spinal deformities** (95%)
- **Brain defects (hydrocephalus, hydranencephaly)** (80%)
- **Poor muscle development** (75%)
- **Short lower jaw** (50%)

✔ **Diagnosis is important!** Some cases were due to **other diseases** like Ureaplasma or Campylobacter, not CVV.

✔ **No vaccine available.** The best prevention is **avoiding mosquito exposure** during the first 48 days of pregnancy.

✔ **Adjust breeding schedules if possible** to limit exposure in June-August, when mosquitoes are most active.

✔ **Good news!** Prairie Diagnostic Services **can now test for CVV in Saskatchewan** thanks partly to this study.

If you suspect CVV in your flock, contact your vet for post-mortem testing to confirm the cause.