

# Study solves the bluetongue disease 'overwintering' mystery

September 12 2014

---

The bluetongue virus, which causes a serious disease that costs the cattle and sheep industries in the United States an estimated \$125 million annually, manages to survive the winter by reproducing in the insect that transmits it, report veterinary scientists at the University of California, Davis.

The findings solve a century-old mystery and are particularly significant as [global climate change](#) brings more moderate winter temperatures around the world. The new study appears Sept. 12 in the journal *PLOS ONE*.

"By conducting this epidemiological study on a commercial dairy farm in Northern California, we were able to demonstrate that the virus overwinters in female midges that had fed on an infected animal during the previous season," said lead author Christie Mayo, a veterinarian and postdoctoral researcher in the UC Davis School of Veterinary Medicine.

"This discovery has important ramifications for predicting the occurrence of bluetongue in livestock and, we hope, for eventually developing controls for the disease," said co-author James MacLachlan, a UC Davis veterinary professor and viral disease expert.

## About bluetongue

Bluetongue disease, first identified during the 1800s in southern Africa,

is transmitted by the *Culicoides* biting midge, a tiny gnat sometimes referred to as a "no-seeum."

The disease mostly sickens sheep but also infects cattle and goats, as well as deer and other wild ruminants. In the U.S., the virus' greatest economic impact is in the cattle industry, because it is bigger than the domestic sheep industry and most adversely impacted by international trade barriers related to bluetongue. The disease does not pose a threat to human health.

The name bluetongue derives from the swollen lips and tongue of affected sheep, which may turn blue in the late stages of the disease.

The virus that causes bluetongue was first isolated and identified in the Western Hemisphere in the early 1950s at the UC Davis School of Veterinary Medicine.

## **A seasonal mystery**

In California, bluetongue is most prevalent when midges are abundant in late summer and fall, but there has been speculation over how the virus survives through the winter. When temperatures turn cold and the biting-midge populations plummet, transmission appears to cease for more than six months, but the virus reappears when temperatures warm the following season.

## **Findings from California dairy**

The researchers monitored cows and midges on a Northern California dairy farm for more than a year. They documented, for the first time, the presence of genetic material for the [bluetongue virus](#) in female midges that were collected during two consecutive winter seasons.

The bluetongue virus was widespread in both the dairy cows and the midges from August to November. Surprisingly, however, the researchers discovered that the virus was also present in female midges captured in February of both 2013 and 2014. There was no sign of infection in the dairy cattle being studied.

The researchers concluded that those long-lived female midges had been infected with the bluetongue virus during the previous warm-weather season. They were carrying the virus through the winter months and would later in the season once again transmit it to cows on the dairy.

The research team notes that the bluetongue [virus](#) may also have additional, yet-to-be discovered, modes of overwintering in temperate regions.

Provided by UC Davis

Citation: Study solves the bluetongue disease 'overwintering' mystery (2014, September 12) retrieved 25 April 2024 from

<https://phys.org/news/2014-09-bluetongue-disease-overwintering-mystery.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--