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Contact: Sydney Brooks, U.S. Marketing Manager

[sydney.brooks@smaxtec.com](mailto:sydney.brooks@smaxtec.com)

## New study finds: smaXtec bolus detects bird flu up to one week before symptoms appear

Research reveals the impact of early detection via smaXtec bolus on health, productivity and economic effects of bird flu in U.S. dairy herds.

MADISON, WI [May 12, 2025] [A newly released study published in the \*Journal of Dairy Science\*](#) sheds light on the significant toll the highly pathogenic avian influenza (HPAI) H5N1, commonly known as bird flu, has taken on a 500-cow Michigan dairy. Affecting nearly a third of one herd over a 45-day span, the virus caused steep milk losses, health setbacks and financial strain. Many dairies are facing similar hardship. However, smart technology holds the key to fighting back.

Michigan State University (MSU) researchers found smaXtec boluses triggered fever alerts **up to one week before** cows showed visible symptoms. This early warning window gives producers critical time to intervene – allowing time to initiate proactive treatment and ultimately reducing financial and health impacts significantly.

“Continuous internal monitoring is essential for smarter, more proactive herd health and biosecurity management,” says Dr. Louisa Koch, Feeding and pH Specialist at smaXtec. “We’re helping move dairy farmers from reactive to proactive herd health management.”

This is the future of successful dairy herd health management.

### Internal body temperature: the most valuable health insight, from the inside

The smaXtec bolus sits inside the cow’s reticulum, where it continuously measures internal body temperature with the accuracy of  $\pm 0.018^{\circ}\text{F}$ . When temperature deviates from baseline, real-time alerts (triggered by artificial intelligence) are flagged well before the cow begins to show signs of distress.

This study validated this impact:

- Internal temperature monitoring enabled significantly earlier intervention
- Health alerts spiked before HPAI confirmation, aligning with the outbreak timeline
- Using smaXtec boluses granted greater control and faster containment

## Financial and operational impact

The study also underscored the high cost of delayed detection. Infected cows produced 2,235 pounds less milk, feed intake declined, somatic cell counts tripled and full recovery took 132 days. The average loss per cow reached \$504, amounting to over \$79,000 on a 500-cow farm. This is a costly loss for dairy farmers.

Diseases like HPAI can be financially devastating to dairies. It's clear early detection via the smaXtec bolus is the gold standard in dairy herd health management, enabling future-proof protocols, early treatments and faster recovery timelines. Technology like smaXtec allows farmers to take preemptive steps to mitigate long-term damage. A healthy herd ensures a healthy business and future-proofs operations.

## smaXtec – The gold standard in health management

Apart from internal body temperature, smaXtec's unique features include recording of water intake and drinking cycles, rumination and activity. Due to the bolus's location inside the cow, these parameters are measured directly – not calculated – allowing for the most precise data and early health alerts that lead to faster decision making and better results.

This information was crucial in MSU's recent study that concluded:

- **Biosecurity is critical:** The study reinforced the need for robust biosecurity measures to prevent outbreaks, given the virus's rapid spread and severe economic consequences.
- **Early detection tools are key:** smaXtec's bolus with continuous temperature measurement is the key player in early disease identification and mitigation.
- **Prepare for long-term recovery:** Farmers should be ready for prolonged recovery periods, as milk yield and feed intake may take months to normalize post-outbreak.

However, proactive measures, including enhanced biosecurity and investment in health management technologies, are essential to safeguard herd health and economic stability. "The sooner you know, the better you can respond," added Dr. Koch. "That's the simple truth this study confirmed and smaXtec technology is making it possible."

## About smaXtec

smaXtec is a global leader in advanced dairy health monitoring, offering dairy farmers cutting-edge technology and premium support. The intraruminal bolus continuously measures internal body temperature, rumination, water intake and drinking cycles and activity with unmatched precision and reliability. By delivering actionable insights based on alerts from artificial intelligence called TruAdvice™, smaXtec enables earliest-possible disease detection, reducing the need for antibiotics as well as supporting proactive herd health management.

For more information, please visit us at [smaXtec.com](https://smaXtec.com).

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