



SMARTBOW[®]

**PUT SMARTBOW[®]
TO WORK
ON YOUR DAIRY**

zoetis

D
The Free
Assessment

SMARTBOW® — THE MOST ADVANCED DAIRY COW MONITORING SYSTEM

With the SMARTBOW® system, you can achieve better outcomes through early detection backed by the unmatched support of Zoetis. SMARTBOW delivers individual dairy cow data to solve challenges you face around animal health, productivity and labor through three key features — rumination monitoring, heat detection and truly real-time localization.





**97%–99%
MONITORING
ACCURACY**

INDUSTRY-LEADING RUMINATION MONITORING

Rumination monitoring is a powerful tool for early detection of health issues. Early detection can lead your dairy to better outcomes.

STUDY RESULTS

Multiple studies proved ruminant monitoring with SMARTBOW® is 97% to 99% accurate.^{1,2} A study¹ conducted at the University of Kentucky in 2014 compared visual ruminant observations with data collected by SMARTBOW® and found:

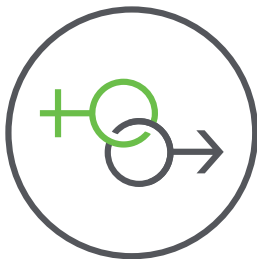
- Strong correlations between human observations of ruminant and SMARTBOW data
- Calculated ruminant accuracy with SMARTBOW® at 97%

An additional study² was conducted at the University of Veterinary Medicine, Vienna, in 2015. This study:

- Collected 50 hours of video footage of cows ruminating
- Compared the results with SMARTBOW data for the same time frame
- Found the SMARTBOW system matched ruminant observations at 99% accuracy

How does SMARTBOW monitor ruminant so effectively?

A proprietary artificial intelligence system – Animal Pattern Recognition IntelLigence (APRIL) – learns and adapts to individual cow behavior and activity patterns. When pattern deviations occur, the SMARTBOW system alerts users of urgent and long-term declines in ruminant.



**97% DETECTION
ACCURACY**

UNPARALLELED HEAT DETECTION

The SMARTBOW® system analyzes measurements of activity and ruminant to detect when a cow is in heat with 97% accuracy. SMARTBOW is a reliable tool for the early detection of estrus in cattle and, as proven in a study, outperforms other, similar precision livestock systems used in dairy cattle to deliver better outcomes.

STUDY RESULTS

A study at the University of Veterinary Medicine, Vienna, evaluated the SMARTBOW system on five measurements of heat detection.³

- Observed 2,700 cows over the course of 21 months
- Measured correlation statistics with SMARTBOW® for detecting estrus events demonstrated on sensitivity, specificity, positive predictive value, negative predictive value and accuracy
- Determined error rate of heat detection with SMARTBOW® was just 2.3%



**LOCATES WITHIN
1.8 METERS**

TRULY REAL-TIME LOCALIZATION

SMARTBOW provides truly real-time localization. The proven accuracy of this function can help reduce the time required to find and treat or breed an animal.

STUDY RESULTS

A University of Kentucky study⁴ found that **SMARTBOW identifies where cows are within three steps of their actual location.**

- Four-part study evaluated SMARTBOW ear tags in multiple groups of cows for up to three days
- Results showed localization accuracy within 1.2 to 1.8 meters
- Considering the approximate size of a cow is 1.2 to 1.6 meters, the results confirm SMARTBOW can accurately track your cows' location



Put SMARTBOW® to work on your dairy and see the benefits of early detection for better outcomes.

Contact your Zoetis representative to learn more about SMARTBOW.

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¹ Borchers MR, Chang YM, Tsai IC, Wadsworth BA, Bewley JM. A validation of technologies monitoring dairy cow feeding, ruminating, and lying behaviors. *J Dairy Sci.* 2016;99(9):7458-7466.

² Reiter S, Sattlecker G, Lidauer L, et al. Evaluation of an ear-tag-based accelerometer for monitoring rumination in dairy cows. *J Dairy Sci.* 2018;101(4):3398-3411.

³ Schweinzer V, Lidauer L, Berger A, et al. Evaluation of the ear-tag sensor system SMARTBOW for detecting estrus events in indoor housed dairy cows, in *Proceedings*. 14th Intl Conf Precision Ag 2018.

⁴ Wolfger B, Jones BW, Orsel K, and Bewley, JM Technical note: Evaluation of an ear-attached real-time location-monitoring system. *J.Dairy Sci.*, 2017; 100 (3): 2219-2224

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