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Wireless Vaginal Temperature Sensor for Domestic Animals

A long-lasting, real-time, multifunctional wireless sensor monitors animal internal temperature and physiological indicators, allowing for improved livestock management decisions.

Researchers at Purdue University have developed a wireless sensor to determine the internal temperature of an animal. Current devices are either not continuous or require removal to access the data. Monitoring the internal body temperature of lactating sows is particularly important because heat stress is typically remedied by reducing high-energy bodily functions such as milk production. In swine, reduced milk production leads to lower piglet quality. The Purdue researchers' device transmits data at regular intervals to an external device. This allows real-time decision-making as to the care of the animal. The device also has other sensing capabilities, including: an acoustic sensor for sensing the pulse, respiration rate, blood pressure, and digestive tract activity, a light emitter and sensor to determine the blood oxygen content, and a viscosity sensor for determining the onset of estrus of the sow. Additionally, heat generated by the device is quickly dispersed. In testing, the temperature of the device was only 0.0005 0C greater than the internal temperature of the animal. Finally, the estimated battery life of the device is 26 days, 2 hours, allowing the device to be inserted soon after farrowing and remain in place throughout the duration of the 21-day lactation cycle in swine.

Related Publication:

Development of a Real Time Internal Temperature Monitoring Device for Sows

2022 ASABE Annual International Meeting

DOI: 10.13031/aim.202200204

Technology Validation: The researchers tested the signal transmission through pork cuts over distances ranging to 30 meters; reliable transmission occurred throughout all the distances.

Technology ID
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Category
Agriculture, Nutrition, & AgTech/Livestock & Animal Health Solutions

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Advantages

- Real-time

- Internet of Things (IoT)

- Multifunctional

- Long battery life

- Does not cause animal discomfort

Applications

- Measuring internal temperature of an animal

- Measuring other common physiological indicators, such as pulse, respiration rate, and blood oxygen level

TRL: 4

Intellectual Property:

Provisional-Patent, 2022-07-12, United States | Utility Patent, 2023-07-12, United States

Keywords: wireless sensor, internal temperature monitoring, lactating sows, heat stress, milk production, piglet quality, real-time decision-making, physiological indicators, acoustic sensor, blood oxygen content, estrus detection, long battery life, animal discomfort, IoT, Agriculture, Domestic livestock, Food and Nutrition, Internal temperature sensor, Internet of Things, Real-time sensing, Vaginal probe