

OHIO STATE UNIVERSITY EXTENSION



# OHIO VETERINARY NEWSLETTER

October 9, 2015

Veterinary Extension

Vol 41, No 18

## In This Issue

### Research

- [Relationships among and variation within rare breeds of swine](#)
- [Effect of early pregnancy diagnosis by per rectum amniotic sac palpation on pregnancy loss, calving rates, and abnormalities in newborn dairy calves](#)
- [Behavioral and physiological changes around estrus events identified using multiple automated monitoring technologies](#)
- [Discrimination of healthy versus sick steers by means of continuous remote monitoring of animal activity](#)

### Calendar

- [ODHMCP](#)
- [Organic Livestock & Poultry Health Series](#)
- [Ohio Dairy Veterinarians](#)

## Research

Roberts, K. S., & Lamberson, W. R. (2015). **Relationships among and variation within rare breeds of swine.** *Journal of Animal Science*, 93(8), 3810-3813. doi: 10.2527/jas.2015-9001

**BACKGROUND:** Because raising pigs is more management intensive than other production systems there are less hobby breeders; thus, rare breeds of swine are at greater risk of being lost compared to other livestock. Breeds facing extinction typically share characteristics such as small size, slow growth rate, and high fat percentage, which limit them from contributing to current commercial production. **However, heritage breeds of pigs contain genetic material for traits such as disease resistance, forage utilization, and maternal abilities that could potentially be of future use.**

**PURPOSE:** The objectives were to determine the relationships among rare breeds of pigs, their relationships with common breeds, and estimate genetic variation within rare breeds through the use of SNP data. Endangered breeds included in this study were the Guinea, Ossabaw Island, Mulefoot, Red Wattle, and Saddleback.

**RESULTS:** Genotypes from the Illumina PorcineSNP60 BeadChip (GeneSeek, Lincoln, NE) were obtained for Guinea, Ossabaw Island, Red Wattle, American Saddleback, Mulefoot, British Saddleback, Duroc, Landrace, Large White, Pietrain, and Tamworth pigs. A whole-genome analysis toolset was used to construct a genomic relationship matrix and to calculate inbreeding coefficients for the animals within each breed. Relatedness and average inbreeding coefficient differed among breeds, and pigs from rare breeds were generally more closely related and more inbred. A multidimensional scaling diagram was constructed based on the SNP genotypes. Animals within breeds clustered tightly together except for 2 Guinea pigs. Tamworth, Duroc, and Mulefoot tended to not cluster with the other 7 breeds.

**CONCLUSIONS:** Genotyping with the PorcineSNP60 BeadChip offers the opportunity to estimate the inbreeding and relationship coefficients of animals within breeds with no pedigree information and to estimate the relationships across divergent breeds. Knowledge of relationships or divergence among breeds offers the opportunity to determine which rare breeds may be most critical for preservation. The authors concluded that the results from this study suggest that Tamworth pigs in particular cluster well away from other breeds and, thus, perhaps should be a priority for preservation. Red Wattle

[Click here to view archives](#)

## Location

[Department of Veterinary Preventive Medicine](#)

Interim Chair:  
Dr. Thomas E. Wittum  
A100S Sisson Hall  
1920 Coffey Road  
Columbus, Ohio 43210  
[wittum.1@osu.edu](mailto:wittum.1@osu.edu)  
614-292-1206

## Subscribe

Contact:  
Jeffrey D. Workman, PhD  
Extension Program Coord.  
[workman.45@osu.edu](mailto:workman.45@osu.edu)  
614-292-9453

<http://vet.osu.edu/extension>

pigs cluster away from Pietrain, Landrace, and Large White, which cluster together, but not far from Duroc.

[ACCESS THE ARTICLE...](#)

Romano, J. E., Bryan, K., Ramos, R. S., Velez, J., & Pinedo P. (2015). **Effect of early pregnancy diagnosis by per rectum amniotic sac palpation on pregnancy loss, calving rates, and abnormalities in newborn dairy calves.** *Theriogenology*. Advance online publication. doi: 10.1016/j.theriogenology.2015.09.004

**BACKGROUND:** New methods of pregnancy diagnosis are available or emerging; however, per rectum palpation remains the most frequent procedure used by veterinarians around the world. It is economical, does not require equipment or a laboratory, the results are almost immediate allowing for a rapid decision, and it is an accurate technique after Day 35 of breeding when performed by trained veterinarians. Few investigations have been designed to determine safety and accuracy of this practice and there has been conflicting evidence published.

**PURPOSE:** The objectives were to evaluate the effect of amniotic sac palpation for pregnancy diagnosis in lactating dairy cows during the late embryonic period on pregnancy loss, calving rates, and abnormalities in newborn calves.

**RESULTS:** A controlled randomized blocked blind experiment containing 680 lactating pregnant dairy cows (from two farms) with a viable embryo diagnosed by transrectal ultrasonography were used. Early pregnancy losses, late pregnancy losses, and calving rates were not significantly different between control groups and palpation groups. Two female calves with atresia coli were diagnosed in one control group.

**CONCLUSIONS:** The authors concluded that amniotic sac palpation during the late embryonic period for pregnancy diagnosis in lactating dairy cows did not increase the pregnancy loss, affect calving rates, or produce calves with atresia coli or jejuni in dairy cattle.

[ACCESS THE ARTICLE...](#)

Dolecheck, K. A., Silvia, W. J., Heersche Jr., G., Chang, Y. M., Ray, D. L., Stone, A. E., ...Bewley, J. M. (2015). **Behavioral and physiological changes around estrus events identified using multiple automated monitoring technologies.** *Journal of Dairy Science*. Advance online publication. doi: 10.3168/jds.2015-9645

**BACKGROUND:** Most estrus detection is currently by visual observation, but the mean yearly estrus detection rate of US Holstein herds is low (44.9%). Also, the length and intensity of estrus expression is decreasing and can be negatively affected by various factors. Automated estrus detection (AED) technologies are an available alternative to supplement or replace visual estrus detection. The estrus-detection accuracy of a technology depends on 3 factors: (1) how strongly and closely the measured parameters are associated with estrus, (2) how accurately the technology is measuring those parameters, and (3) if the technology manufacturer algorithm is accurately processing the data to create useful estrus alerts.

**PURPOSE:** The first objective was to describe estrus-related changes in neck activity, ear activity, leg activity, step count, lying bouts, lying time, rumination, feeding time, reticulorumen temperature, and ear surface temperature as measured using 5 AED technologies on the same cows (CowManager SensOor [Agis Automatisering, Harmelen, the Netherlands], DVM bolus [DVM Systems LLC, Greeley, CO], HR Tag [SCR Engineers Ltd., Netanya, Israel], IceQube [IceRobotics Ltd., Edinburgh, UK], and Track a Cow [Animart Inc., Beaver Dam, WI]). The second objective was to explore the estrus-

detection potential of machine-learning techniques using parameters collected by AED technologies.

**RESULTS:** OBJ 1: Differences between estrus and nonestrus were observed for CowManager SensOor minutes feeding per hour, minutes of high ear activity per hour, and minutes ruminating per hour; twice daily DVM bolus reticulorumen temperature; HR Tag neck activity per 2 h and minutes ruminating per 2 h; IceQube lying bouts per hour, minutes lying per hour, and number of steps per hour; and Track a Cow leg activity per hour and minutes lying per hour. No difference between estrus and nonestrus was observed for CowManager SensOor ear surface temperature per hour. OBJ 2: Three machine-learning techniques (random forest, linear discriminant analysis, and neural network) were applied to automatically collected parameter data from the 18 cows observed in standing estrus. Machine learning accuracy for all technologies ranged from 91.0 to 100.0%. When we compared visual observation with progesterone profiles of all 32 cows, we found 65.6% accuracy.

**CONCLUSIONS:** Neck activity, ear activity, leg activity, step count, lying bouts, lying time, rumination, feeding time, and reticulorumen temperature may be useful as predictors of estrus. Ear surface temperature, as monitored in this study, holds less potential for detecting differences between periods of estrus and nonestrus. Additionally, applying machine-learning techniques to automatically collected technology data shows potential for estrus detection.

[ACCESS THE ARTICLE...](#)

Smith, J. L., Vanzant, E. S., Carter, C. N., & Jackson, C. B. (2015). **Discrimination of healthy versus sick steers by means of continuous remote monitoring of animal activity.** *American Journal of Veterinary Research*, 76(8), 739-744. doi: 10.2460/ajvr.76.8.739

**BACKGROUND:** Disease detection in feedlot cattle in the United State is performed by trained employees who observe behavior and activity of cattle. Historically, evaluation of an animal's health through observation of behavior has been considered subjective and prone to error, but specific training and clearly defined clinical criteria reduce error. If cattle are removed from feedlot pens, examined, and treated as soon as signs of health-related behaviors are detected, health outcomes can be improved and costs related to health care decreased.

**PURPOSE:** The purpose was to evaluate a unique electronic ear tag designed to collect movement data to determine whether it could be used in the assessment of physical activity of sick and healthy steers.

**RESULTS:** Steers that became sick had significantly fewer activity counts (approx 25% fewer), compared with the activity counts of steers that remained healthy the entire time.

**CONCLUSIONS:** The authors concluded that automated detection of health status in growing cattle was feasible through remote monitoring of animal activity. Early identification of sick animals should lead to improved health outcomes, increased marketability, and improved animal well-being and help to minimize the use of antimicrobials that could contribute to resistant bacteria.

[ACCESS THE ARTICLE...](#)

---

## Calendar



A full calendar of all upcoming events and continuing education opportunities offered by the College of Veterinary Medicine is available on the website at <http://vet.osu.edu/>

### Ohio Dairy Health and Management Certificate Program

Module 6 – Milk Quality & Udder Health  
December 3-5, 2015  
Hilton Garden Inn, Columbus, Ohio  
*Spots are always available for specific module plan.*

### Organic Livestock and Poultry Health Series

*This series provides veterinary CE at no-cost.*

#### **Upcoming webinars:**

Organic Livestock Inputs  
October 22, 2015 (1-2 p.m.)

Nutritional Management of Lactating Dairy Cows  
November 9, 2015 (12-1 p.m.)

### Ohio Dairy Veterinarians

2016 Annual Meeting  
Social Media Communications and Interaction of Reproduction, Nutrition, & Genetics  
January 7-9, 2016  
The Fawcett Center & Hilton Garden Inn, Columbus, Ohio

---

*Information presented above and where trade names are used, they are supplied with the understanding that no discrimination is intended and no endorsement by Ohio State University Extension is implied.*

*Ohio State University Extension embraces human diversity and is committed to ensuring that all research and related educational programs are available to clientele on a nondiscriminatory basis without regard to race, color, religion, sex, age, national origin, sexual orientation, gender identity or expression, disability, or veteran status. This statement is in accordance with United States Civil Rights Laws and the USDA.*

*Greg Davis, Interim Director, Ohio State University Extension.*

**Access to full-text journal articles may require individual subscriptions.**

---



**THE OHIO STATE UNIVERSITY**

---

**COLLEGE OF VETERINARY MEDICINE**



**COLLEGE OF FOOD, AGRICULTURAL  
AND ENVIRONMENTAL SCIENCES**