



# OHIO VETERINARY NEWSLETTER

June 30, 2017

Veterinary Extension

Vol 43, No 5

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## Research

Paixão, M. G., Abreu, L. R., Richert, R., & Ruegg, P. L. (2017). **Milk composition and health status from mammary gland quarters adjacent to glands affected with naturally occurring clinical mastitis.** *Journal of Dairy Science*. Advance online publication. doi: 10.3168/jds.2017-12547

**BACKGROUND:** Previous research suggests that composition and quality of milk from mammary glands adjacent to affected quarters is likely altered in response to infection in a single quarter; however, associations between a single quarter affected with clinical mastitis (visual abnormalities of milk and udder) and milk composition in adjacent quarters have not been previously reported.

**PURPOSE:** The objective was to compare composition [fat, total protein (TP), lactose, chloride, and SNF] and health status [SCC, differential leukocyte count, and lactate dehydrogenase (LDH)] in milk samples from unaffected mammary glands of an udder with a single clinically inflamed quarter to results of milk samples from healthy mammary glands of healthy cows.

**RESULTS:** A total of 170 quarters were enrolled per group. Milk obtained from adjacent quarters of cases contained a lesser concentration of total protein, lactose, and solids-not-fat, but had a greater concentration of fat and chloride. The somatic cell count, total leukocyte count, and absolute numbers of neutrophils, lymphocytes, and macrophages were all increased in milk obtained from adjacent quarters of case cows compared with milk obtained from quarters of control cows. The relative proportion of neutrophils was increased, whereas the proportion of macrophages was decreased in milk obtained from cases. Approximately 30% of milk samples obtained from adjacent quarters of cases had a somatic cell count  $\geq 150,000$  cells/mL compared with 12% of milk samples obtained from quarters of control cows. The position of the mammary gland was not associated with any outcomes.

## Calendar

- [ODHMCP](#)
- [Poultry Medicine Workshops](#)
- [Ohio Dairy Veterinarians Meeting](#)

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## Location

[Veterinary Extension Unit](#)

housed within the

[Department of Veterinary Preventive Medicine](#)

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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>

**CONCLUSIONS:** The authors concluded that the results suggest that a single quarter with clinical mastitis affected the overall immune status of the udder, altering milk composition and health status in adjacent quarters.

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Petry, A., McGilvray, W., Rakhshandeh, A. R., & Rakhshandeh, A. (2017).

**Technical note: Assessment of an alternative technique for measuring body temperature in pigs.** *Journal of Animal Science*.

Advance online publication. doi: 10.2527/jas2017.1566

**BACKGROUND:** Rectal temperature (RT) is assumed to be the best indicator of core body temperature (CBT); however, it can be time consuming and stressful for the animals and may generate inaccurate results due to the presence of feces in the rectum. Infrared imaging (IR) techniques reduce the risk of spreading infection from one animal to another, are quick and less variable, and do not require restraining the animal. Despite these potential advantages, the efficacy of IR for accurately measuring CBT has not yet been established, to the author's knowledge.

**PURPOSE:** The objective was to evaluate the efficacy of IR as an alternative to RT for accurately monitoring core body temperature in pigs.

**RESULTS:** Relative to time 0 h, LPS increased the eye temperature, CBT, and RT by 0.92, 1.32, and 1.48°C, respectively ( $P < 0.01$ ), but had no significant effect on ear temperature. Eye temperature, RT, and CBT, but not ear temperature, were highly correlated ( $r \geq 0.96$ ) during the course of the study ( $P < 0.01$ ). Estimated regression parameters ( $\alpha$  and  $\beta$ ) for predicting CBT using eye temperature were  $-28.2 \pm 8.70$  and  $1.76 \pm 0.221$ , respectively, and for RT were  $-24.5 \pm 7.69$  and  $1.65 \pm 0.196$ , respectively ( $R^2 \geq 0.96$ ; 95% confidence interval).

**CONCLUSIONS:** Collectively, these results indicated a strong relationship between IR of the eye, core body temperature, and rectal temperature in pigs in different physiological status. Therefore, IR of the eye can be used as a precise, noncontact alternative to rectal temperature measurements for monitoring core body temperature in swine and possibly other species including wildlife.

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Puls, C. L., Rojo, A., Matzat, P. D., Schroeder, A. L., & Ellis, M. (2017).

**Behavior of immunologically castrated barrows in comparison to gilts, physically castrated barrows, and intact male pigs.** *Journal of Animal Science*. Advance online publication. doi: 10.2527/jas2016.1335

**BACKGROUND:** Intact males (IM) have greater feed efficiency and produce leaner carcasses than physically castrated barrows, but are commonly castrated soon after birth to reduce the risk of producing pork with boar taint. Improvest (gonadotropin releasing factor analog diphtheria toxoid conjugate; Zoetis, Parsippany, NJ) has been approved for use in a number of countries for the immunological castration of IM. Prior research has been limited in comparing genders, and not conducted under US production practices.

**PURPOSE:** The objective was to evaluate the general, aggressive, and sexual behaviors of IC relative to the other genders before and after the second Improvest dose to establish how quickly changes occur in behavior as animals transition from being an IM to becoming a castrate.

**RESULTS:** There was no difference ( $P > 0.05$ ) between the genders for lying, sitting, or drinker-related behavior. For the 4-wk period prior to second dose, a greater percentage of PC and G were at the feeder ( $P < 0.05$ ) than IC or IM (8.0%, 7.4%, 10.2%, and 9.3% for IC, IM, PC, and G, respectively; SEM = 0.44). However, after the second dose, the percentage of pigs at the feeder was similar ( $P > 0.05$ ) for IC, PC, and G and was greater ( $P < 0.05$ ) for those genders than IM (10.1%, 7.1%, 10.0%, and 8.8%, respectively; SEM = 0.50). Prior to the second dose, the incidence of aggressive behaviors was generally

greater for IC and IM compared with PC and G; however, after the second dose, the incidence of aggressive behaviors was similar for IC and PC and lower ( $P < 0.05$ ) for those genders than for IM. The frequency of mounts for IC was greater ( $P < 0.05$ ) than for PC before (25.5, 27.3, 2.5, and 1.5 total mounts/pen, respectively; SEM = 4.37) but not after ( $P > 0.05$ ; 3.3, 33.3, 0.25, and 0.25 total mounts/pen, respectively; SEM = 1.15) the second dose.

**CONCLUSIONS:** Collectively, the results suggest that the behavior of IC is generally similar to that of IM prior to the second Improvest dose. However, after the second dose, the behavior of IC becomes more similar to that of PC, as the animal transitions from being an IM to becoming a castrate. This study also confirms that immunological castration is effective at reducing the sexual and aggressive behaviors associated with raising IM.

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Potts, S. B., Shaughness, M., & Erdman, R. A. (2017). **The decline in digestive efficiency of US dairy cows from 1970 to 2014.** *Journal of Dairy Science*, 100(7), 5400-5410. doi: 10.3168/jds.2017-12641

**BACKGROUND:** Between 1976 and 2016, milk production per cow more than doubled in the United States. It is important to consider whether intense selection for production over the last 4 decades has resulted in changes in the ability of dairy cows to digest feed, which could have implications for improving the cow's biological efficiency in the future.

**PURPOSE:** The objective was to determine whether changes in digestive efficiency occurred between 1970 and 2014 and, if changes occurred, whether these changes were associated with increases in feed intake.

**RESULTS:** Based on regression analysis, mean milk yield and dry matter intake (DMI) between 1970 and 2014 increased by 19.7 and 10.3 kg/d, respectively. Temporal effects on digestibility [dry matter (DM), crude protein (CP), and NDF] were determined using the regression model  $Y_i = \text{YEAR}1970_i + \text{CP}_i + \text{NDF}_i + e_i$ , where YEAR1970<sub>i</sub> is the publication year minus 1970, CP<sub>i</sub> and NDF<sub>i</sub> are diet constituents (% of diet DM) that were included to account for their known effects on digestibility, and  $e_i$  is the residual error. Dry matter digestibility decreased 0.07 percentage units/yr for a total reduction of 3.08 percentage units since 1970. Furthermore, CP and NDF digestibilities decreased 0.04 and 0.17 percentage units/ yr, respectively. To account for the potential effect of feed intake on digestibility, DMI as a percentage of body weight was added to the regression model. With DMI as a percentage of body weight in the model, temporal changes in DM, CP, and NDF digestibilities were no longer significant.

**CONCLUSIONS:** The authors concluded that findings suggest that the apparent decline in DM digestibility could be mostly accounted for by simultaneous increases in level of feed intake. Despite the decline in apparent total-tract digestibility of DM between 1970 and 2014, the modern dairy cow still achieves greater levels of production per unit of DM consumed and digested.

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Jacobs, C., Orsel, K., Mason, S., Gray, K., & Barkema, H. W. (2017). **Comparison of the efficacy of a commercial footbath product with copper sulfate for the control of digital dermatitis.** *Journal of Dairy Science*, 100(7):5628-5641. doi: 10.3168/jds.2016-12257

**BACKGROUND:** The experimental product (QAC, DeLaval Manufacturing, Kansas City, MO) is a formulation containing quaternary ammonium compounds, specifically didecylmethylammonium chloride and alkyl (C12–C16) dimethylbenzylammonium chloride, acting as broad spectrum bactericidal and fungicidal disinfectants for the prevention of digital dermatitis. Further testing on dairy farms was required, as in vitro models cannot replicate the complexity of situations in the field.

**PURPOSE:** The aim was to evaluate the efficacy of QAC for decreasing the prevalence of active digital dermatitis lesions.

**RESULTS:** Noninferiority of QAC (1% solution, once a day for 5 d) compared with CuSO<sub>4</sub> (5% solution, once a day for 5 d) for reducing the prevalence of active DD lesions could not be demonstrated, and QAC was inferior to CuSO<sub>4</sub> in decreasing the proportion of cows with active DD lesions. On farms using CuSO<sub>4</sub> or noninterference (no change in footbath protocol), farms experienced a decrease in active digital dermatitis lesions compared with QAC.

**CONCLUSIONS:** The authors concluded that at the manufacturer-recommended protocol, QAC should not be considered as a replacement for CuSO<sub>4</sub> footbaths.

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## 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 11 – "Dairy Cattle Welfare Assessments"

- August 17-18, 2017
- Hilton Garden Inn; Columbus, Ohio

*Spots are always available for specific module plan*

### **Poultry Medicine Workshops**

- October 3<sup>rd</sup>, 4<sup>th</sup>, & 5<sup>th</sup>, 2017

*Details and registration information to be forthcoming.*

### **Ohio Dairy Veterinarians Meeting**

- January 3-5, 2018

*Save the date – details coming this fall.*

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*Roger Rennekamp, Associate Dean and Director, Ohio State University Extension*

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