

OHIO STATE UNIVERSITY EXTENSION



# OHIO VETERINARY NEWSLETTER

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## Research

Basler, C., Nguyen, T. A., Anderson, T. C., Hancock, T., & Barton Behravesh, C. (2016). **Outbreaks of human *Salmonella* infections associated with live poultry, United States, 1990–2014.** *Emerging Infectious Diseases*. Advanced online publication. doi: 10.3201/eid2210.150765

**BACKGROUND:** Backyard poultry flocks have increased in popularity concurrent with an increase in live poultry-associated salmonellosis (LPAS) outbreaks. Better understanding of practices that contribute to this emerging public health issue is needed. Most chicks sold for backyard flocks are produced by a network of mail-order hatcheries. Disease control guidance for hatcheries is provided by the US Department of Agriculture National Poultry Improvement Plan, which is a voluntary state, federal, and industry cooperative program aimed at eliminating certain diseases from poultry breeding flocks and hatcheries.

**PURPOSE:** To review outbreak reports from 1990–2014 to describe the epidemiology of LPAS outbreaks in the United States, to identify changes in trends, and to identify practices of concern among case-patients to better inform future prevention campaigns.

**RESULTS:** LPAS outbreaks were defined as  $\geq 2$  culture-confirmed human *Salmonella* infections linked to live poultry contact. Outbreak data were obtained through multiple databases and a literature review. During 1990–2014, a total of 53 LPAS outbreaks were documented, involving 2,630 illnesses, 387 hospitalizations, and 5 deaths. Median patient age was 9 years (range <1 to 92 years). Chick and duckling exposure were reported by 85% and 38% of case-patients, respectively. High-risk practices included keeping poultry inside households (46% of case-patients) and kissing birds (13%).

**CONCLUSIONS:** The authors concluded that poultry are acquiring a new position in many households. Instead of being treated as production animals, they are increasingly being considered household pets. However, recurring LPAS outbreaks highlight the need for strategies to prevent human illnesses associated with live poultry contact through a comprehensive One Health approach involving human, animal, and environmental health. To prevent future outbreaks, the general public needs to be educated about the risk for LPAS. Persons need to be aware that healthy poultry can shed *Salmonella* intermittently, that persons need to wash their hands after contact with live poultry, that young children

- [Poultry Medicine Workshops](#)

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## Location

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are at an increased risk for salmonellosis, and that poultry should never be allowed inside the house. Mail-order hatcheries, agricultural feed stores, public health officials, local and federal departments of agriculture, pediatricians, and veterinarians can all help to spread awareness about the association between live poultry and *Salmonella* infections.

[ACCESS THE ARTICLE...](#)

Foster, D. M., Poulsen, K. P., Sylvester, H. J., Jacob, M. E., & Casulli, K. E. (2016). **Effect of high-pressure processing of bovine colostrum on immunoglobulin G concentration, pathogens, viscosity, and transfer of passive immunity to calves.** *Journal of Dairy Science*. Advanced online publication. doi: 10.3168/jds.2016-11204

**BACKGROUND:** High-pressure processing (HPP) is a nonthermal technology that provides a promising alternative to traditional thermal pasteurization. Although expensive for large-scale production, HPP provides a viable processing alternative for high-value, low-volume products. Few studies have evaluated the use of HPP for maintaining high levels of immunoglobulins while reducing microbial contamination in colostrum.

**PURPOSE:** The goal was to determine whether HPP could be used as a viable alternative to thermal pasteurization of bovine colostrum. The objectives were to determine the effect of HPP on native bacteria, *Escherichia coli*, *Salmonella* Dublin, MAP, bovine herpesvirus type 1 (BHV1), and feline calicivirus (FCV; as a model for other nonenveloped viruses) while also determining its effects on colostrum viscosity, IgG concentration, and transfer of passive immunity to calves.

**RESULTS:** In the pilot study, *S. aureus* was effectively reduced with pressure treatment at 300 and 400 MPa (0, 5, 10, 15, 30, and 45 min), with 2 treatments at 400 MPa (30, 45 min) determined to be inappropriate for use with bovine colostrum due to viscosity and IgG changes. High-pressure processing at 300 MPa (30, 45, and 60 min) and 400 MPa (10, 15, and 20 min) was shown to effectively reduce total native aerobic bacteria, *E. coli*, *Salmonella* Dublin, bovine herpesvirus type 1, and feline calicivirus populations in bovine colostrum, but no decrease occurred in *Mycobacterium avium* ssp. *paratuberculosis*. All inoculation study pressure treatments insignificantly decreased IgG content of colostrum. Treatment of colostrum at 400 MPa for 15 min during the calf trial decreased IgG content of colostrum. Treatment at 400 MPa for 15 min increased colostrum viscosity, with 2 of 14 samples requiring dilution with water for calf feeding. Calves fed pressure-processed colostrum had similar serum IgG but lower efficiency of absorption than calves fed heat-treated colostrum.

**CONCLUSIONS:** High-pressure processing of colostrum is effective in the reduction of native aerobic bacteria, *E. coli*, *Salmonella* Dublin, and both enveloped and nonenveloped viruses, but MAP was resistant to the effects of HPP. Microbial reductions occur alongside variable increases in viscosity, and reductions in IgG content for high quality colostrum, with these changes still allowing for calf feeding in the majority of samples. Calves fed HPP colostrum had a significant reduction in apparent efficiency of IgG absorption compared with calves fed heat-treated colostrum. Additional research is needed to optimize HPP of colostrum for farm use as this may provide an additional avenue for prevention of diseases spread through colostrum.

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Kohler, P., Alsaad, M., Dolf, G., O'Brien, R., Beer, G., & Steiner, A. (2016). **A single prolonged milking interval of 24 h compromises the well-being and health of dairy Holstein cows.** *Journal of Dairy Science*. Advanced online publication. doi: 10.3168/jds.2015-10839

**BACKGROUND:** Cows at national and international dairy cow shows are often presented with extremely filled udders in order to attain a better show placing. This “over-bagging” of the udder might be painful, and therefore an animal welfare issue. In a preliminary study, assessment of well-being by veterinarians and show judges, using

visual analog scales to describe well-being and udder fill, proved to be very subjective and not a feasible tool for monitoring an animals' well-being.

**PURPOSE:** The objectives were to investigate the effect of a sudden change to a prolonged milking interval (PMI) of 24 hours in early and mid-lactation, and to investigate the effect of NSAID administered before the PMI on several variables of animal health and well-being. They hypothesized that during the last 6 h of the PMI, behavior would be different, and that udder firmness, udder surface temperature, edema in the subcutaneous udder tissue and milk leakage would be increased compared with the control period. Additionally, they expected an increase in SCC after a single PMI of 24 h.

**RESULTS:** Compared with that of a cow in the last 6 h of a 12-h milking interval, the behavior of cows in early lactation (saline group) changed during the last 6 h of the PMI: they observed decreased eating time (22.4 vs. 16.2 min/h), increased ruminating time (13.3 vs. 25.0 min/h), and increased hind limb abduction while walking (score 41.7 vs. 62.6) and standing (31.2 vs. 38.9 cm). Udder firmness was increased (2.9 vs. 4.5 kg) during this period and more weight was placed on the hind limbs (46.4 vs. 47.0%). They also found pathological signs at the end of the PMI: all cows showed milk leaking, and 10 of 15 cows developed edema in the subcutaneous udder tissue. Somatic cell count was significantly increased from 12 h to 72 h after the PMI. Administration of an NSAID had no influence on measured variables, except that the occurrence of edema was not significantly increased during PMI in the flunixin group (10 of 15 and 6 of 15 cows for the saline and flunixin groups, respectively respectively). In the cows in mid-lactation, different variables were not significantly changed in the PMI compared with baseline values (e.g., eating and ruminating time, occurrence of edema, and abduction).

**CONCLUSIONS:** The authors concluded that the well-being of cows during a PMI of 24 h is disturbed, because they found changes in behavior, increased udder firmness, weight shifting from front to hind limbs, and increased abduction of the hind limbs. Cows also underwent non-physiological processes: they found edema in the subcutaneous udder tissue (late in the PMI), increased milk leaking, and non-physiologically increased SCC.

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Pomeroy B., Gurjar, A., Sipka, A., Klaessig, S., Salmon, S., Quesnell, R., & Schukken, Y. H. (2016). **Intramammary immunization with ultraviolet-killed *Escherichia coli* shows partial protection against late gestation intramammary challenge with a homologous strain.** *Journal of Dairy Science*. Advanced online publication. doi: 10.3168/jds.2016-11149

**BACKGROUND:** The incidence of clinical mastitis peaks on most farms immediately following parturition, although several observational and experimental challenge studies indicate the presence of the mastitis-causing bacteria isolated from the dry gland before parturition without clear inflammatory indicators of mastitis. The late gestation challenge study using *Escherichia coli* ECC-Z showed that cows in late gestation respond to challenge with an IL-10 dominated response and a minimal response of proinflammatory cytokines, such as IFN- $\gamma$  and IL-1 $\beta$ .

**PURPOSE:** The objective was to evaluate the efficacy of intramammary immunization with UV-killed *E. coli* ECC-Z on prevention of intramammary colonization after a challenge with a dose of the homologous *E. coli* ECC-Z bacterium prepartum, a period of heightened susceptibility to IMI. The *E. coli* ECC-Z strain used for this study has been used in previous challenge trials in both the dry period and lactation, is well characterized, and known to cause mild clinical mastitis. The effect of immunization on clinical signs, milk production, SCC, and cytokine profiles was also evaluated.

**RESULTS:** The results of these 10 cows showed partial protection of intramammary immunization on the outcome of a subsequent homologous intramammary challenge. Immunization resulted in a lower probability of infection, a lower bacteria count, lower somatic cell counts and milk conductivity, a lower clinical mastitis score, and increased milk production compared with unimmunized control quarters. Once the analysis was

corrected for immunization, parenteral J5 vaccination had no significant effect on any of the measured parameters.

**CONCLUSIONS:** Intramammary immunization at the time of dry-off with UV killed *E. coli* bacterin without addition of adjuvant proved to be partially effective in preventing subsequent IMI after a homologous live *E. coli* challenge. Immunization also resulted after calving in a lower linear score, lower electrical conductivity, and a higher milk production. The small size of the study warrants careful conclusions and further studies on intramammary immunization to show efficacy with heterologous challenge and eventually efficacy and safety under field conditions.

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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/>

### Farm Science Review

Sept 20-22, 2016

Molly Caren Agricultural Center, London, Ohio

Please stop by and visit the College of Veterinary Medicine tent and the “Ask the Experts” program (formerly “Question the Authorities”) in the OSU Central Area.

### Poultry Medicine Workshops

Veterinary practitioners will develop knowledge & skills to receive poultry clients and provide individual bird treatment. (Registration deadline is Sept 23<sup>rd</sup>)

- Oct 4, 2016; Cleveland Area – OARDC FAHRP, Wooster OH
- Oct 5, 2016; Columbus Area – ODA ADDL, Reynoldsburg OH
- Oct 6, 2016; Cincinnati Area – Brown Mackie College, Cincinnati OH

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*Roger Rennekamp, Ph.D., Director, Ohio State University Extension.*

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