

Dairy Research Supported by the Ohio Dairy Research Fund since 2008 (partial list)

Animal Health

Dairy sustainability and collaborative learning following on-farm research and Extension programming focusing on small dairy producers. Through collaboration with practicing veterinarians and Extension educators, dairy producers with less than 100 cows were identified. Five educational workshops were developed: 1) milk quality and mastitis control, 2) dairy cattle reproduction, 3) dairy cattle nutrition, 4) record-keeping and economics, and 5) on-farm manure management. The program reached approximately 650 dairy cows in 12 herds. Evaluation suggested that the workshops were relevant and effective, offering information with immediate field application.

Research-based knowledge can be delivered through on-farm collaborative learning. (Dr. Gustavo Schuenemann)

Survey of Ohio dairy producers and their bulk tank milk to identify factors contributing to contagious mastitis pathogens. Overall, 69.4% of the responding dairy herds were found positive for *S. aureus*. This is comparable to a Canadian study where *S. aureus* was found in 74% of herd bulk tanks, based on culturing of 3 consecutive milk samples and a USDA study which reported *S. aureus* in 43% of US bulk tanks. None of the studied herd characteristics or management practices were significantly associated with the likelihood of a herd being positive for *S. aureus* in the current study, but certain trends were observed. Herds that used pre- and post-milking teat dipping, single-use towels in cleaning udders for milking, and herds that pre-stripped appeared to be less likely to be positive for *S. aureus* than herds where these practices were not applied. [However, no differences were observed in *S. aureus* prevalence among herds using different drying-off practices. Different drying-off practices were associated with herd size (large herds more likely to use total dry cow therapy, internal teat sealants, and abrupt cessation of milking than smaller herds). Some heifer raising practices and behaviors, such as cross-suckling, and allowing calves to nurse after birth, appeared to be associated with the likelihood of a herd being *S. aureus* positive. (Dr. Päivi Rajala-Schultz)

Methicillin-resistant *Staphylococcus aureus* (MRSA) in dairy herds - anything to worry about? Antimicrobial resistance among the tested isolates was found to be relatively low, with 76% of the isolates being susceptible to all tested antimicrobials. Thus, 24% of the isolates were resistant to at least one antimicrobial. Resistance against penicillin was most frequently found (13% of isolates resistant). Only 9.1% of the isolates were resistant only against erythromycin, 4.7% against streptomycin, 2.4% against tetracycline, 1% against ampicillin, and 0.5% against ceftiofur. A small percentage of the isolates were resistant to more than 2 classes (5.7%) or 3 classes of antibiotics (2.4%). Only two isolates, from same farm but at distinct times, were found to carry the gene coding MRSA in Ohio bulk tank milk. As we expected, overall resistance to antimicrobial drugs among *S. aureus* isolates was low, and MRSA was found in bulk tank milk but with a very low frequency (0.3% of farms tested). (Dr. Päivi Rajala-Schultz)

Effect of farm-level factors on the prevalence of mastitis pathogens in bulk tank milk. The prevalence of mastitis pathogens in bulk tank milk was found to be related to several farm-level factors. The prevalence of *S. aureus* was higher in herds that used pre- and post-milking teat dipping, single-use towels in cleaning udders for milking, and herds that pre-stripped. The prevalence of *S. aureus* was also higher in herds that used total dry cow therapy, internal teat sealants, and abrupt cessation of milking. The prevalence of *S. aureus* was lower in herds that used heifer raising practices and behaviors, such as cross-suckling, and allowing calves to nurse after birth. The prevalence of *S. aureus* was also higher in herds that used total dry cow therapy, internal teat sealants, and abrupt cessation of milking. The prevalence of *S. aureus* was also higher in herds that used heifer raising practices and behaviors, such as cross-suckling, and allowing calves to nurse after birth. (Dr. Päivi Rajala-Schultz)

Manure Utilization

Extension and Research on Dairy Manure Storage Covers that Reduce Air Emissions, Collect Biogases, and Create Carbon Credits.

Methane gas production potential of a covered dairy lagoon in Ohio, its seasonal variations, and characterization of biogas emitted from the covered dairy manure storage were determined. This information is crucial for potential on-farm energy use of the methane gas generated and the nutrient conservation benefit of manure in a covered storage is important for proper manure application. Extension workshops and a field day on Dairy Manure Storage Cover educated about 100 Ohio dairy producers, professionals and other farmers on this important manure management technology. This education potentially is expected to enable producers to make wise decision to take advantage of this technology and benefits of carbon credit program to make economical and environmental impact on their operations. A web-based, multimedia distance Extension program was developed, which will extend the impact of the above workshop and field day to educate dairy producers. (Dr. Lingying Zhao)

Manure Science Review: Integrating Forage Production, Soil Health, and Dairy Manure Management. The Ohio Manure Science Review was held at the Rupp View dairy farm in Wayne County on August 14, 2014. Approximately 180 persons attended the event and funding from the Ohio Dairy Research Fund was used to establish: 1) a manure side dress application rate demonstration plot on corn, 2) a cover crop demonstration plot, and 3) cover the cost for analyses of cover crop forages. (Mr. Rory Lewandowski)

Herd Management

Dairy management decisions based on milk composition. A 700-cow Holstein farm in Ohio was used for collecting samples at 7 and 14 DIM (n=204 cows). Composite milk samples and right-front (RF) quarter strip samples were collected and analyzed for milk components. Two cow-side test strips were used to measure ketones in milk and urine. The correlation coefficient between LactiCheck (LIC; on-farm milk component tester) and DHI composite milk fat percentage was highly positive, indicating that the LIC is a reliable on-farm milk component analysis tool. The average fat concentration from LIC composite samples was 5.36 + 2.05% and 5.15 + 1.90% from DHI, with the RF stripplings having a lower milk fat (3.17 + 1.88%). Monitoring milk fat concentration of individual cows using on-farm milk component analysis holds promise for the diagnosis of ketosis. (Dr. Kristy Daniels)