152 Getting inside their heads: Dairy farmers’ attitudes and behaviors that affect milk quality. S. M. Schexnayder* and P. D. Krawczel, University of Tennessee, Knoxville, TN.

Although some seasonal variation in milk quality markers such as bulk tank SCC and SPC is routine in the southeastern United States, there are dairy operations in all southeastern US states that produce high quality milk. However, among producers milk quality varies substantially: in 2012, ~25% of bulk tank samples had SCC > 400,000 cells/mL, and another ~25% of samples had SCC < 200,000 cells/mL (USDA-APHIS report #684.0713). Variability in adoption and successful implementation of mastitis management practices contributes to the variability in milk quality across farms. This research sought to identify farm/farmer characteristics and farmers’ attitudes and perceptions about mastitis and determine how they relate to mastitis management. A mail survey of dairy farms in 7 southeast states with a 29.9% response rate captured information about BTSCC levels, farm characteristics, operator characteristics, farm management practices, information sources accessed by the operators, and operators’ perceptions of and attitudes about mastitis. The same survey was administered also to dairy farms that had discontinued their permits in the previous 3 years. Regression analysis, with operator-reported current year BTSCC as the dependent variable, identified factors that explain 65% of the variation in BTSCC (Table 1) and shows that proactive producers—those who perceive they can control BTSCC, seek information from reliable sources, are directly engaged in dairy activities, and take mastitis management actions before BTSCC exceeds 300,000—have lower BTSCC.

Table 1 (abstract 152). Determinants of current bulk tank SCC on Southeastern US dairy farms

<table>
<thead>
<tr>
<th>Farm Structure Characteristics</th>
<th>Coefficient and significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>BTSCC one year ago</td>
<td>*</td>
</tr>
<tr>
<td>Has non-dairy farm operations</td>
<td>11,366*</td>
</tr>
<tr>
<td>Sole proprietorship or partnership</td>
<td>-15,258***</td>
</tr>
<tr>
<td>Operator in parlor during milking</td>
<td>-14,382**</td>
</tr>
<tr>
<td>Operator Characteristics</td>
<td></td>
</tr>
<tr>
<td>Plan to operate as dairy farm in 2019</td>
<td>-12,933***</td>
</tr>
<tr>
<td>Speaks same language as farm employees</td>
<td>11,646*</td>
</tr>
<tr>
<td>Farmers’ Attitudes and Perceptions</td>
<td></td>
</tr>
<tr>
<td>Responsible for mastitis on my farm</td>
<td>-19,167***</td>
</tr>
<tr>
<td>Worried about financial impacts of mastitis</td>
<td>10,548*</td>
</tr>
<tr>
<td>Anxiety about mastitis</td>
<td>17,706*</td>
</tr>
<tr>
<td>SCC threshold of &lt;300,000 for taking action</td>
<td>-57,012*</td>
</tr>
<tr>
<td>State Indicators (with regional avg. as base case)</td>
<td></td>
</tr>
<tr>
<td>North Carolina</td>
<td>-52,251*</td>
</tr>
<tr>
<td>Virginia</td>
<td>-23,322**</td>
</tr>
<tr>
<td>Information Sources</td>
<td></td>
</tr>
<tr>
<td>Veterinarian</td>
<td>-26,110**</td>
</tr>
<tr>
<td>Extension agent or other representative</td>
<td>-9,047***</td>
</tr>
</tbody>
</table>

The analysis found that dairy size, productivity, operator education level, and having off-farm income were not associated with BTSCCC. Comparison of operating and no-longer-operating dairy farms suggests some underlying issues relating to financial motivations and consequences. “Increasing net farm income” as a goal for the dairy operation was assigned greater importance by operators of active dairies than closed dairies (F(1, 574) = 4.177, P = < 0.041). Also, operators of closed dairy farms assessed their ability to afford actions to decrease SCC more negatively than did operators of active dairies (F(1, 585) = 3.970, \(P = 0.047\)) and evaluated the adequacy of their milk quality premiums more negatively than did active dairies (F(1, 1,569) = 4.834, \(P = 0.028\)). The survey of open dairies shows a correlation between producers’ confidence in their knowledge of mastitis management procedures and producers’ assessment of their ability to afford to treat mastitis (\(r, (607) = 0.379, P < 0.0005\)). This correlation bolsters the argument for Extension services and veterinarians to continue science-based training of dairy operators and dairy employees as a tool for supporting the sustainability of the dairy industry in the southeastern US.

Key Words: mastitis, attitudes, farm structure

153 Considerations for managing mastitis and milk quality on organic dairy farms. K. A. E. Mullen*, North Carolina State University, Raleigh, NC.

Organic dairy farms in the United States face a unique challenge when it comes to mastitis management, as synthetic antibiotics are not allowed for use in organic production. However, if a cow is sick and organic therapies do not work, antibiotics must be used to treat disease. Organic regulations in the United States mandate that any organic cow that receives antibiotic therapy forfeits her organic status. Many different mastitis mitigation strategies on organic dairy farms have been reported in the scientific literature but most studies were completed in the Midwest and Northeast. In the South, especially the Southeast, dairy farmers must contend with high heat and humidity for a longer period of the year and the consequent effects that heat stress has on dairy cattle. I will discuss the current scientific literature evaluating organic dairy farms in the South, from mastitis prevalence to breeding for a more mastitis resistant cow. Organic dairy farmers can follow most of the National Mastitis Council’s 10-point control plan; this and other considerations unique to organic dairy farms will be covered during this session.

Key Words: organic, mastitis, management

154 The role of housing facilities and management in improving milk quality. A. E. Stone*1 and P. D. Krawczel*2, 1Mississippi State University, Starkville, MS, 2University of Tennessee, Knoxville, TN.

Milk production is forecasted to decline in the Southeastern United States in coming years whereas overall US production will increase. Additionally, the Southeastern US historically maintains a greater SCC than the rest of the nation. These factors decrease the competitiveness of the southeastern dairy industry. Southeastern dairy producers have different management challenges compared with the rest of the nation. Loss of infrastructure and poor housing environments create large
areas for potential management deficiencies. The overall objective of this presentation will be to address the challenges and opportunities of housing and facility management in the southeastern United States and their potential effect on milk quality. Topics will include: a review of freestall design recommendations compared with what is common in the SE, how overstocking negatively affects herds, why heat stress abatement techniques are important, the pros and cons of pasture as a management style, how general welfare parameters (e.g., lameness and hygiene) hold up to industry recommendations, and the relationship among welfare parameters and housing management present in the SE. Commonly used milk quality measures like SCC and SPC will be used as a focal point on reasons to implement these management strategies, but the effects on animal welfare and behavior will also be discussed. Results of applied housing research studies will be presented, particularly those of the Southeast Quality Milk Initiative, a 6-state applied research and extension project aimed at helping producers find cost-effective and science-based ways to improve milk quality. This project was supported by Agriculture and Food Research Initiative Competitive Grant number 2013–68004–20424 from USDA National Institute of Food and Agriculture.

Key Words: dairy housing, milk quality, dairy management

The role of technology in quantifying mastitis-related decisions. J. M. Bewley*, University of Kentucky, Lexington, KY.

Given the economic importance of both clinical and subclinical mastitis, early detection of mastitis is one of the most exciting Precision Dairy Farming applications. Early detection of mastitis may increase the likelihood of bacteriological cure; thus, the economic losses associated with a case of mastitis may be reduced. Reductions in the duration of pain associated with mastitis may also improve animal well-being. Potential also exists to separate abnormal milk automatically. These tools may also help reduce the likelihood of transmission of mastitis between cows and prevent the infection from becoming chronic. Mastitis changes the concentration of anions and cations in milk. Adoption of electrical conductivity systems has been limited because of sensitivity and specificity limitations; however, new algorithms and quarter based measurement systems hold potential for improved results. Thermography and milk temperature have also been proposed; however, both tools are limited because not all causes of mastitis result in a temperature response. Color variation (red, blue, and green) sensors have been included in some automatic milking systems to detect blood in milk and color pattern changes in infected quarters. In-line sensors that essentially automate the California Mastitis Test or Wisconsin mastitis test have been commercialized. These systems could provide valuable herd management information for identifying cows contributing to changes in bulk tank SCC. Image analysis may potentially differentiate between changes in the physical content in milk (i.e., flakes and clots) and other foreign materials (i.e., bedding and manure particles (Brandt et al., 2010). Spectroscopy (visible, near-infrared, mid-infrared, or radio frequency) has been applied in commercial sensors systems to identify changes in milk constituents including SCC and mastitis-causing pathogens. Biosensors designed to detect a specific biological component of milk may also be used for mastitis detection. For example, the enzyme, L-Lactate dehydrogenase (LDH), is released because of the immune response and changes in cellular membrane chemistry and has recently been commercialized as a mastitis detection tool.

Key Words: mastitis, data

155 J. Dairy Sci. Vol. 100, Suppl. 2