

UT PARLOR

A publication for Tennessee's dairy producers and supporting industries

October 2019

Summer Youth Highlights and Events

June Dairy Month was a great success this year! We had a wonderful kickoff at Battle Mountain Farms in College Grove, Tennessee. Tennessee Farm Bureau and the Dairy Alliance hosted the event, and we had roughly 200 attendees from across the state. The keynote speaker this year was Charles Hatcher of Hatcher Family Dairy, and he did a great job talking about dairy farming, reaching out to share their dairy story, and bottling milk on-farm.



June Dairy Month Kick-off with Charles Hatcher.

The 2019 State Quiz Bowl contest was held in conjunction with kickoff, and we had four junior high and four senior teams registered for the event. The Lincoln County Team coached by Dan Owens was the senior champion team. Maggie Dunivan, Colton Moorehead, Matthew George, and Alex Moore will be representing Tennessee at the National Quiz Bowl contest in Louisville, Kentucky.



Senior champion dairy quiz bowl team from Lincoln County.

Photo credits this page: Liz Eckelkamp

The Sumner County Team including Maddie Rippey, Corban Hurst, Ella Graves, and Abby Rippey (coached by Diane Vann) was the junior champion team.



Junior champion dairy quiz bowl team from Sumner County.

The 2019 State Dairy Project winner was Kendal Penick of Weakley County. Kendal's family raises dairy goats, and Kendal shared his experiences in the dairy project. Santana Bingham (Madison County) and Lindsey Hedrick (Sevier County) were both winners of the 2019 Food Science Project. Both taught youth about cooking and healthy lifestyles.

Thirty-four counties were represented by June Dairy Month chairpersons who were honored at the kickoff. Dairy Promotion winners from 2018 included Jenna Cantrell

June Dairy Month Chairpersons

Bayli Alley — Anderson County	Chloe Delk — Fentress County
Jessica Osterhaus — Bedford County	William Jarnigan — Hamblen County
Brilee Culbert — Carter County	Desha Wilkins — Hamilton County
Lillia Ann Ogle — Coffee County	Julianna Tunnell — Hawkins County
Brookelyn Hart — Crockett County	Sydney Page — Henderson County
Lily Martin — DeKalb County	Rebecca Finchum — Jefferson County
Jannan Wine — Dickson County	Cindy Jones — Johnson County
Elizabeth Kirby — Dyer County	Bonnie Claire Phillips — Knox County
Katie Halford — Fayette County	Alexis Paris — Lauderdale County
Laura Stewart — Lewis County	Madison Valentine — Sevier County
Elizabeth Bright — Loudon County	Gabriel Blessing — Sullivan County
Ja'Nay Montgomery — Madison County	Jacob Graves — Sumner County
Locke Collier — Marion County	Christin Lemons — Tipton County
Madison Webb — McMinn County	Meradeth Whitley — Union County
Danielle Pilkey — Meigs County	Will Prater — Warren County
Briley Trull — Perry County	Kyeler Penick — Weakley County
Analynn Jones — Robertson County	Leah Kennedy — Williamson County

(DeKalb County) for the media award; Hannah Brown (Sumner County) for best use of theme; Grace Rich (Clay County) for Division 1; Zoe Cowan (Lincoln County) for Division 2; and Hannah Brown (Sumner County) for Division 3. The Dairy Poster contest winners were Gabby Garcia (first place, Sumner County), Jessa Spears (second place, Macon County), and Blane Lafferty (third place, Madison County).



High Individual Overall and High Individual Reasons from 2019 State Dairy Judging - Rebecca Finchum of Jefferson County.

The 2019 State Dairy Judging contest was also a big success! We had 10 teams represented including Rutherford, Marshall, Lincoln, Cannon, Bedford, Jefferson, Macon, and Franklin counties. Rebecca Finchum from Jefferson County stole the show with the High Individual Overall and the High Individual Reasons. Micayla Hickman, Sammy Walter, Sarah Greenwood, and Harrison Falkofsky of Rutherford County were the first place team, and will



2019 State Dairy Judging contest first place winning team from Rutherford County.

Photo credits: Liz Eckelkamp

represent Tennessee at World Dairy Expo in October. Marshall County (second place) and Lincoln County (third place) will represent Tennessee at Harrisburg and Louisville. Keep an eye out for information on the 2019 State Dairy Show in October and for new information on our UT Dairy website!

- Liz Eckelkamp, UTIA Assistant Professor & Dairy Extension Specialist eeckelka@utk.edu

Behavior as an Integral Component of Animal Welfare

The American Dairy Science Association Meeting was held in Cincinnati, Ohio, from June 23 to 26, 2019. Researchers and students from around the world presented on many topics including animal welfare and behavior. Throughout their talks, presenters explained the importance of welfare and the need to use behavior assessments to determine animals' welfare. Through daily management practices and the innovation of precision dairy technology, producers and researchers can explore new ways to improve animal welfare.

Defining Behavior in Animal Welfare

Researchers from University of British Columbia opened by defining behavior's role in understanding animal welfare and meeting consumer demands. Surveys suggest that the public is especially worried about dairy cows' ability to perform their natural behavior within their housing system. They suggested that welfare can provide insight into an animal's health and feelings. Assessing both positive emotions (motivation and optimism) and negative emotions (pain and fear) may lead to a better understanding of animals' true mood and the true effects of stress.

Take-home message: Behavior measurements including behavior at the feedbunk, stereotypic behaviors (repetitive behaviors with no physiological benefit, such as tongue rolling and head pressing), or facial expression changes that can be seen without intensive monitoring may be useful to assess if cows are experiencing stress.

Managing Housing to Improve Animal Welfare

Similar to some producers in Tennessee, many producers in Canada house their cows in tiestalls. Researchers from McGill University assessed the relationship between tiestall length, brisket board height, and bedding type on body lesions and hock injuries. Cows were exposed to a 14-week crossover design, analyzing the differences between combinations of low and high brisket boards (2 versus 8 inches, respectively), long and short stalls (74 versus 70 inches, respectively), and increased bedding (extra 3 inches of straw) on body lesions and hock injuries. Continuous lying behavior was recorded using leg mounted accelerometers. The researchers found that within the 14 weeks, hock lesion scores decreased by 45 to 63 percent. However, cows were unable to grow hair back over lesions with missing hair within the same time period. Cows



with more bedding spent more time lying, suggesting comfortability increased with increased bedding.

Researchers from UC Davis studied disbudding with cauterization to determine if calves experience evoked (short term) and ongoing pain response even when provided with a lidocaine cornual nerve block and oral meloxicam during the procedure. When calves were given an evoked pain through the application of a pressure source (algometry), calves with scabbed spots responded more than calves not disbudded. To assess ongoing pain, calves' behavior and rumination were also assessed. Disbudded calves laid still with their heads down more than non-disbudded calves, suggesting disbudded calves are less likely to move their head due to pain. Disbudded calves also ruminated less than non-disbudded calves. Providing pain management for calves for multiple days after disbudding or dehorning may help to reduce evoked and ongoing pain. However, producers should consult with their veterinarians before starting any pain management regime.

Researchers from the University of British Columbia explored if deep bedded pack barns help cows express their natural behaviors equally to outdoor spaces. Cows were assigned to an indoor bedded pack barn only or indoor bedded pack barn and outdoor open pack. Cows were monitored with leg tags and continuous observation. Although treatment did not affect lameness score, cows showed a preference for displaying estrus in the outdoor open pack over the indoor bedded pack. If outdoor space can be provided, producers may have an easier time visually observing estrus behavior more than an indoor facility alone.

Take-home message: Management decisions such as increasing bedding, providing pain management post disbudding and dehorning, and making outdoor space available to cows in estrus can improve animal welfare.

Using Precision Dairy Technology to Assess Behavior

Behavior can also be monitored using precision dairy technologies and automated learning. University of Wisconsin—Madison researchers have used automated computer vision systems to identify individual calves and their behavior. Through advanced artificial intelligence programming, the researchers trained a computer system to recognize five calves by the calves' face, body color and body pattern. Then, the system was trained to recognize four behaviors: drinking, lying, walking and eating. The system was able to recognize the calf with about 80 percent accuracy and behaviors with greater than or equal to 90 percent accuracy. The system could be used to identify behavioral concerns related to disease or stress in groups of calves without continuous observations of a single pen.

Take-home message: In the future, video cameras and artificial intelligence may be useful in continuously monitoring animal behavior without hiring additional staff.

—Amanda Lee, UTIA PhD student in Dairy Cattle Welfare

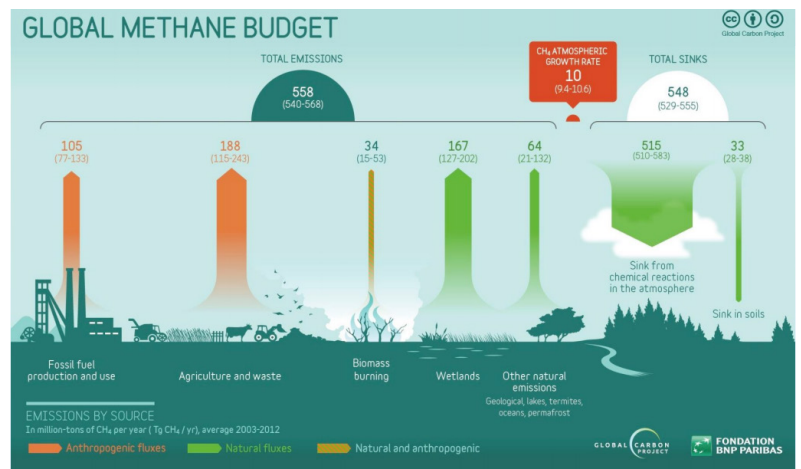
For more information or to read the full abstracts, follow this link: adsa.org/Portals/0/SiteContent/Docs/Meetings/2019ADSA/2019ADSA_Abstract_Book.pdf?v20190715

Greenhouse Gases in Agriculture: What do we contribute?

The Dairy Alliance's annual meeting in Stone Mountain, Georgia, featured several great speakers. Frank Mitloehner, UC Davis professor and air quality Extension specialist, dove in to everyone's favorite topic: greenhouse gases (GHG) and the impact of animal agriculture.

The first thing to know about GHGs is that all gases are not created equal. They each hold heat in different amounts (known as global warming potential—GWP₁₀₀) and exist in the atmosphere for different lengths of time. Mitloehner used the example of a Styrofoam cup and a china coffee cup. Carbon dioxide (CO₂) has a GWP₁₀₀ of 1 (Styrofoam cup), but can last in the atmosphere for 1,000 years. Methane (CH₄) has a GWP₁₀₀ of 28 (china coffee cup). Although this is 28 times that of carbon dioxide, methane only lasts in the atmosphere for 10 years.

When we hear about methane, another thing often left out is the global methane budget. This shows the cycle of methane emissions and the loss of methane from the atmosphere (methane sink). On average, the total methane emitted (globally) is equal to roughly 558 tera-grams (insert global methane budget here – credit global carbon project). All agriculture and waste products contribute 32 percent of that. However, the total methane lost from the atmosphere is equal to 548 tera-grams. On average, the methane budget is balanced every year, so the atmospheric level stays fairly stable.



Global Carbon Project



Another thing to remember about agriculture, and in particular animal agriculture, is the carbon cycle. Methane produced by ruminates will persist in the atmosphere for 10 years before being turned in carbon dioxide through oxidation. That carbon dioxide is then used by plants through photosynthesis to create carbohydrates that can be used by animals. The issues with excess carbon dioxide in the atmosphere occur when excess photosynthetic carbon (like fossil fuels) are burned, releasing additional carbon dioxide into the atmosphere. This carbon dioxide is no longer included in the carbon cycle, because the carbon cycle that produced it may be 100 to 200 million years old.

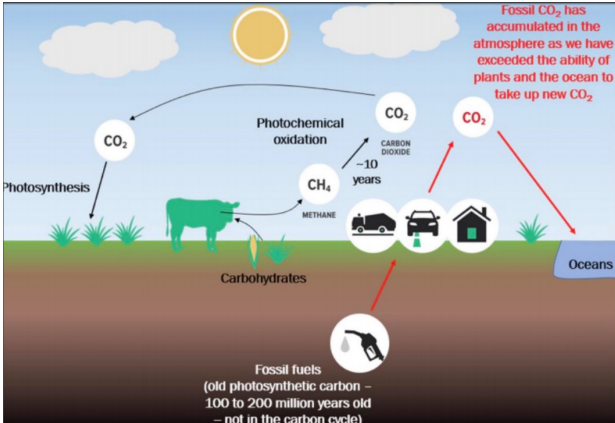
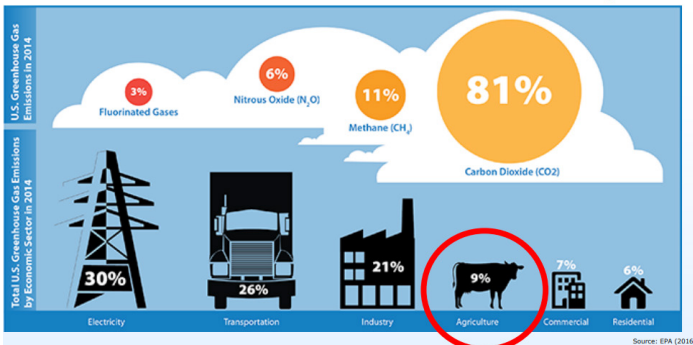


Photo credit: Frank Mitloehner

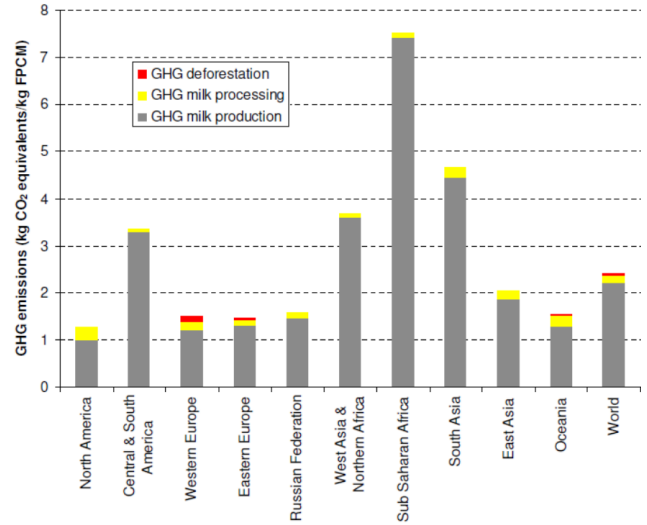
If we narrow our focus to the United States, we see a different agricultural contribution to GHGs. All agriculture (animal *and* plant) contributes 9 percent of the total US GHG inventory. All animal agriculture contributes 4 percent of the total US GHG inventory. Compared to developed countries (like the US), developing countries contribute more overall GHGs to the global budget. This is because their overall agriculture production is less efficient than

National-Level U.S. GHG Inventory



Source: EPA 2016

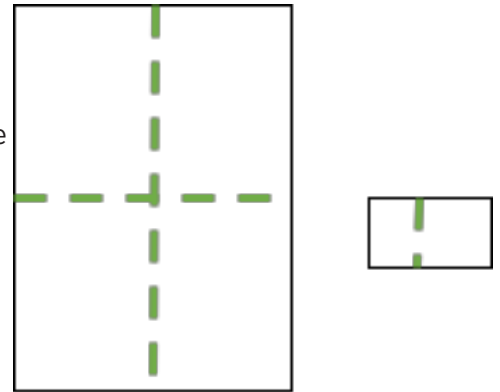
developed countries. Developing countries are the ones expected to see the most population growth from now to 2050, requiring more agricultural inputs. As an example, in 1950 the US had 25 million dairy cows versus 9 million in 2018 and milk production has increased by 60 percent nationally. This means the carbon footprint of a single glass of milk is 2/3 of what it was 70 years ago.



Source: FAO 2010

Efficiency in production is important for other reasons besides GHG emissions. We often hear that if we switch to plant-based protein and vegan diet, GHG emissions will be reduced. This was advocated by a recent Lancet report (Food in the Anthropocene: the EAT-Lancet Commission on healthy diets from sustainable food systems).

Land that can be used for agriculture is a highly limited resource. Think of it this way, take this sheet of paper you are reading, and fold it in half, then fold it in half again. This quarter



sheet of paper is ALL the land on the earth. The rest is covered by water. Now think about a business card, that is ALL the land that can support animal OR plant agriculture. Now, rip off 1/3 of that business card. That 1/3 is ALL the land that is considered arable, i.e., able to bear crops. The remaining 2/3 of that land is marginal land, land that can only be utilized for animal agriculture. We know animals are able to eat byproducts and plant material that we as humans cannot use. Without animal agriculture, that 2/3 of agricultural land will not be efficiently used, negatively contributing to feeding the 9 billion people we expect the world to have by 2050.

Mitloehner wrapped up with a direct response to the EAT-Lancet report with a slide titled "Can we eat our way out of climate change?" This was the overall suggestion of the report, to reduce protein and reduction of demand for animal-sourced foods. Mitloehner stated that if a person



switched from an omnivore diet (meat and plants) to a vegan diet (plant only), global GHGs would only be reduced by 0.8 tons of carbon dioxide. In contrast, a single trans-Atlantic flight (per passenger) creates 1.6 tons of carbon dioxide. To further drive home the point, if everyone in the US observed meatless Monday, we would reduce GHGs by 0.3 percent. If everyone in the US went vegan, we would reduce GHGs by 2.6 percent.

Eating our way out of climate change is not feasible, but we can work together to improve agricultural efficiency globally. We can also work together to reduce food waste and improve food use globally. Globally, 40 percent of all food is wasted. If we could adjust these two things, we could reduce agriculture’s GHG impact even more. Looking at the US, animal agriculture already contributes the smallest percentage of GHGs. Let’s keep making the best better, share our story, and be proud of our success!

For more information, follow Mitloehner on Twitter (@ghgguru) or contact Liz Eckelkamp at eeckelka@utk.edu or 337-718-9764.

—Liz Eckelkamp, UTIA Assistant Professor and Dairy Extension Specialist eeckelka@utk.edu

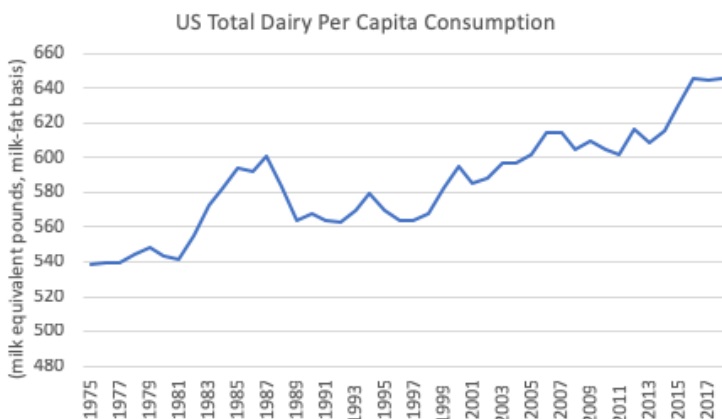
Southeast Dairy Producers Could Consider Options

**by Sara Dorland
Managing Partner for Ceres Group**

US dairy producers have weathered a five-year price downturn, which has resulted in the loss of 16 percent of the nation’s farms between 2014 and 2018. During that time, the number of Tennessee dairy farms has declined by one-third. These facts are devastating to the entire industry, especially to those who have had to walk away from their family farms because they were unable to maintain profitability during one of the most prolonged downturns in history. The events over the past five years have left industry, government, and farms searching for solutions to help the nation’s remaining farms.

Fluid milk is essential to the dairy industry in the Southeast because it is the most widely produced product in the region, with more than 80 percent of the region’s milk typically ending up in the bottle. By comparison, 85 percent of milk in the Upper Midwest typically heads to cheese and whey production. Domestic fluid milk consumption has been trending lower since the 1970s, declining at an average annual compound rate of 1.2 percent between 1990 and 2016. Over the same time, cheese consumption has expanded by 1.5 percent. In September, USDA’s Economic Research Service (ERS) released 2018 per-capita dairy

product consumption at 646 pounds — matching the all-time high set in 2016. That same dataset showed per-capita consumption of fluid milk dropping to 146 pounds, the lowest level since 1975, the first year of the dataset, and nearly 41 percent less than four decades ago.



Source: ERS, Dairy Products: Per capita consumption, United States

The 2013 ERS study “Why Are Americans Consuming Less Fluid Milk?” concluded that while promotion has helped to encourage more consumption of dairy products, Americans are less likely to drink milk with a meal than they once were, and most people across all age groups fall short of the government’s daily recommended allowance. Today’s consumers have a wider variety of beverages to choose from, and that is challenging not only fluid milk but other beverage products as well.

In addition, fewer babies are being born in the United States. For the fourth consecutive year, the number of babies born in the United States declined, reaching a 32-year low last year, according to the National Center for Health Statistics. Children between 2 and 12 years of age consume more milk than those in all of the other age groups. So not only are there fewer children drinking milk compared to three decades ago, but today’s children are also consuming less milk overall.

While Americans are consuming more dairy products, they are drinking less milk, and that has negatively affected dairy markets like the Southeast that rely heavily on fluid milk sales. USDA’s milk production data appears to support that assertion. Between 2000 and 2017, the US milk supply grew by 48 billion pounds. At the same time, output in the Southeast declined by 2.15 billion pounds. (insert milk production picture near here; photo credit under picture – see last 2 pages) Georgia was the state in the Southeast to increase output, with a 407-million-pound increase over that same time span. Declining output in the Southeast could suggest that regions that diversified into cheese and butter production were better positioned to take advantage of shifting consumer preferences, but that does



not mean that the Southeast is ill-equipped to make similar adjustments in the future.

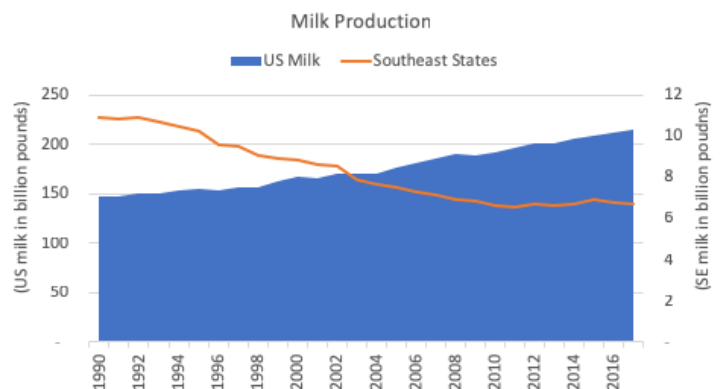
At the same time demand for fluid milk is declining in the United States, USDA's Agricultural Marketing Service (AMS) reported that Louisville, Florida, and Southeast Federal Orders needed more milk for fluid bottling than the market could supply in 2017. This data suggest that all the milk produced in the Southeast should be able to find a home with regional bottlers. But matching milk off the farm with bottling plant needs is difficult. For one, milk production reaches its seasonal peak in the spring at the same time schools let out for spring break, which is soon followed by summer break — events that reduce fluid milk sales. As a result, the local market tends to have more milk than it needs in the spring, requiring surplus milk to move to manufacturing uses outside of the region. In the fall, when Southeast milk production reaches its low, demand for milk increases as school is in session and holiday baking increases, forcing cooperatives and processors to import milk from outside the market to meet processing requirements. That said, more milk has been coming from outside the Southeast market, according to data reported by the Southeast Milk Market Administrator office. During the first quarter of 2019, out-of-area packaged milk accounted for 26 percent of total sales in the region, up from 23 percent two years earlier. Moreover, raw milk from outside the area continues to increase. This begs the question of whether outside milk deprives local farms of a market or is demand for outside milk to backfill the shortage the result of local farms exiting the business.

The Federal Milk Marketing Order (FMMO) system was conceived in the 1930s, when the country consumed 70 percent of the nation's milk in a bottle, on-farm refrigeration was inadequate, and shelf life was less than seven days. Since implementation, the FMMO system has remained mostly unchanged, which underestimates the impact of technology that's capable of producing milk products that can last between 20 and 180 days at retail. These advancements allow for milk to travel greater distances than in the past, which can create issues for local markets that compete with less costly milk. Farms in the Southeast tend to be smaller than those in other regions of the country, which can drive up the cost of production. In 2018, Southeastern states received an average uniform, or blend, price of \$17.71/cwt., compared to \$14.75 in Wisconsin. Interestingly, the Southeast mailbox price, a milk price net of authorized deductions like promotion, cooperative fees, and hauling, was \$16.18/cwt., only 9¢ less than Wisconsin's mailbox price. Although Southeast states have a much higher gross milk check, the net milk check is competitive with surrounding states, suggesting that if farms can maintain profitability given milk prices over time, they should be poised to expand to meet the processing demand in their

region, reducing the need for outside milk. The region could also contemplate expanding into other types of processing, like what other dairy-producing regions have done.

Structural differences between the Southeast federal order and elsewhere in the country also play a role, particularly component milk pricing. Most federal orders pay dairy producers based on Class III milk components plus a producer pay price differential, which is a calculation that allocates the difference between the blend price and Class III milk components to all milk in the order. Milk is approximately 87 percent water and 13 percent components. Transporting and handling water in the supply chain can be expensive. For instance, cheese is typically 38 percent moisture; therefore, processors must remove water and pay for its disposal. When milk moves to bottlers, farm compensation is based on skim milk and butterfat — the products used to produce bottled milk. But when milk moves to other uses like yogurt, cheese, or butter, compensation is most often based on components because higher-than-average protein and butterfat levels can increase processing yields. In the Southeast, a tiny percentage of milk moves to manufacturing, but producers with milk above the standard component levels do not receive additional revenue like dairies in federal orders with component-based pricing. Federal Order 7 reported the simple average protein at 3.14 percent in 2017 — that slight difference from the standard 3.1 percent could have added 1.1¢/cwt. to the average milk check assuming a 15 percent utilization of Class III.

What does this all mean for the Southeast dairy market? There a lot of things to consider, but most importantly, when benchmarking against other regions, Southeast dairy producers are competitive, opening the door to possibilities.



Source: NASS, Milk Production

For more information, check out American Farm Bureau Federations Federal Milk Marketing Order Reform information here (fb.org/issues/farm-policy/federal-milk-marketing-order-reform) or contact Liz Eckelkamp at eckelka@utk.edu or 337-718-9764.



Vet Check

Regulations Concerning Over the Counter Medications

On January 1, 2017, new regulations were enacted concerning over the counter (OTC) feed additive antibiotics (currently known as VFD). As we prepared for this change, I informed multiple producers through Master meetings that OTC injection and intramammary antibiotics would be next on the list. The Food and Drug Administration (FDA) has now published a report that during the fiscal years of 2020-2021 that OTC antibiotics will become prescription items as well. With this announcement, your veterinarian will become increasingly important in developing prevention protocols and diagnosing and treating disease in your herd. Selecting the proper treatment depends on accurately diagnosing the problem, so work with your veterinarian to develop a health care program designed to fit your specific needs. If you have not established a veterinary client patient relationship (VCPR), I strongly recommend that you consider establishing this relationship as soon as possible.



Photo credit: Lew Strickland

An appropriate veterinarian/client/patient relationship will exist when:

- The veterinarian has assumed the responsibilities for making clinical judgements on your farm.
- The veterinarian has examined your animals within the past 12 months, or made annual visits to the premises where the animals are kept.
- The veterinarian is readily available or has arranged for emergency follow up evaluation in the event of an adverse reaction to the medication.

Extra-Label Drug Use

Currently, using any medication in a manner other than listed on the label is considered extra-label drug use. This will still be applicable under the new regulations. Always make sure to use any medication prescribed by a veterinarian in the manner in which instructed. Extra-label drug use can only be prescribed by a veterinarian, and these requirements must be met:

- A VCPR must exist between the veterinarian and producer
 - The veterinarian and producer must make sure the animal is properly identified, assign meat and milk withdrawal times, and abide by these withdrawal times to ensure no illegal residues occur.
- A cattle/dairy producer cannot use drugs (including OTC drugs) in an extra-label manner without a veterinarian's prescription. This is **off-label** and **illegal**.
- Administering products according to label directions includes dosage, route of administration, reason for administration, adhering to proper withdrawal times, etc.
- Veterinarians are even prohibited from using some antibiotics/medications in an extra-label manner.
- Extra-label use of feed medications is prohibited.
- Use of any estrogenic compound in a food animal is prohibited.

Off-label use of vaccines is not illegal, but such use will reduce the efficacy of the vaccine, as well as release the manufacturer from any product liability. In other words, if a vaccine is stored and administered according to all label directions and supported by proper documentation, then in the case of an adverse event related to the product, the manufacturer might be liable. If you choose to use a vaccine in an off-label manner, then the manufacturers are released from all product liability. So, to maintain maximum product efficacy and product liability it is strongly recommended to use all vaccines according to label directions.

Treatment Decisions

The new regulations do not require you to call your veterinarian just to administer an antibiotic. When you are visited by your veterinarian to establish a VCPR, you should be instructed on how and when to treat. It will be up to you and your veterinarian how much antibiotics and refills will be given to you to treat in the future if needed. If you are not certain about the most effective treatment options at the time of administering medications, consult with your veterinarian.

The decision to treat should be based on certain criteria:

- Will the animal return to a healthy, productive state without treatment?



- Will treatment return the animal to a healthy, productive state?
- What treatment best fits the disease and herd management?
- What are the withdrawal times once the animal is treated?
- Should the animal be sold?
- Would culling/euthanasia be a better option?

Storing Drugs on Your Operation

I've had several questions concerning stocking up on medications prior to the regulations starting. There are some problems with this plan. Medications require certain guidelines for storage, and drug performance declines if the expiration date has passed. Improper temperature and exposure to air or light will affect drug efficacy. Additionally, it is considered extra label use if the product is administered past the expiration date. All the information you need to properly store any animal health product should be on the label of the drug container.

1. Always check the expiration date/lot number on the label at purchase.
2. Do your homework when purchasing vaccines. Only purchase the amount needed to work the cattle you have available. Especially when using modified live vaccines. Once mixed, they need to be used and not stored for later use.
3. Some drugs, and all vaccines, need to be refrigerated at 40 F to 50 F and must not be frozen. Keep an accurate thermometer in your refrigerator to monitor the temperature.
4. When vaccinating, mark syringes to identify which syringe is for which vaccine. Never mix

killed vaccines with modified live. This will render the vaccines useless. Use disposable syringes for medications, and properly dispose of these syringes when finished. Use clean needles to draw contents from multi-dose bottles. Change needles every animal to minimize disease spread and drug contamination. Do not store medication in syringes.

5. Avoid exposing vaccines and other medicines to direct sunlight. This may degrade the product. Use an insulated cooler for storing syringes and drugs while working on cattle to avoid sunlight and maintain the proper temperature.
6. Collect used needles in a rigid plastic container. Dispose of them by returning them to your veterinarian. Destroy disposable syringes so they cannot be reused or misused. Read labels! Some drugs and vaccine containers require incineration before disposal. Used needles, scalpels, etc. are considered medical waste and must be handled and disposed of in accordance with laws which govern them. (See safeneedledisposal.org.)
7. Consult your local veterinarian regarding any questions on proper use of medications.

Proper handling and administration of medications is critical in the efficacy of that medication. If you have any questions concerning the new regulations or administration of medications, please contact your local veterinarian, Extension agent, or myself at, lstrick5@utk.edu, or 865-974-3538.

—**Lew Strickland, UTIA Associate Professor and Extension Veterinarian** lstrick5@utk.edu

To read the full FDA document, follow this link [fda.gov/files/animal%20&%20veterinary/published/Supporting-Antimicrobial-Stewardship-in-Veterinary-Settings--Goals-for-Fiscal-Years-2019-2023.pdf](https://www.fda.gov/files/animal%20&%20veterinary/published/Supporting-Antimicrobial-Stewardship-in-Veterinary-Settings--Goals-for-Fiscal-Years-2019-2023.pdf). Specific information regarding OTC can be found on pages 6 and 7.



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