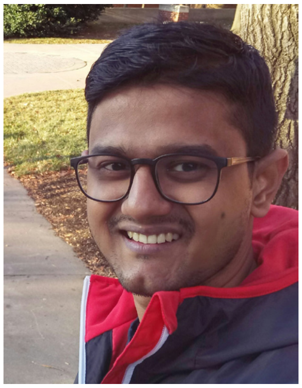
UT PARLOR

A publication for Tennessee's dairy producers and supporting industries
SPRING 2019

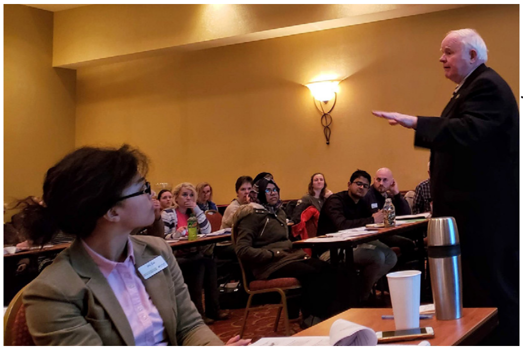
2019 Tennessee Dairy Producers Annual Meeting



Arup Sen, PhD student

This year, the Tennessee Dairy Producers Association Annual Meeting was held at the Embassy Suites Hotel in Murfreesboro, Tennessee, on Friday, January 25. Producers, representatives of the Tennessee Department of Agriculture (TDA) and Extension agents across Tennessee attended the meeting. Governor Bill Lee and Commissioner of Agriculture Charles Hatcher also spoke to the attendees, discussing the future and their commitment to agriculture. Keith Harrison, TDA, also discussed a new Tennessee Agriculture Enhancement Program herd health program for beef and dairy cattle. The meeting focused on three main topics: nutrition, farm insurance programs and fertilizer application.

Mike Hutjens, professor emeritus at the University of Illinois, discussed feed management during tough economic times. Focusing on "change ahead," he suggested that the right combination of ration, forage selection and processing, and using uNDF in ration evaluation could be the key for increasing production while minimizing cost. He had eight strategies for improving farm profitability including growing the milk check through fat percent, marginal milk and using forage tools. He suggested low lignin forages and shortening forage length could potentially increase feed intake and digestibility. He stated that ration benchmarks are useful to compare ration cost with various forage programs and suggested enrolling in Dairy Revenue Protection (DRP) or Dairy Margin Coverage (DMC) programs to minimize risk. Hutjens continued his talk with the use of feed additives. He stressed the importance of choosing the right feed additive for feed formulation. Hutjens suggested using the four R concept: 1) response, 2) return, 3) research and 4) records when choosing a feed additive. Hutjen's top three "recommended" additives were monensin, silage inoculants and organic trace minerals. He did stress that each farm is unique, and to determine the priorities on your farm before investing in additives.



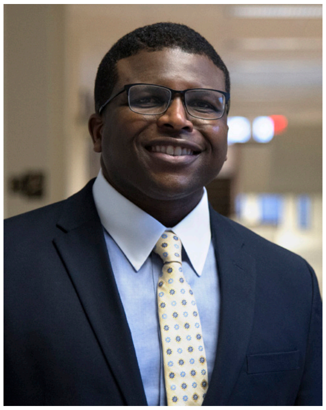
Liz Eckelkamp

Professor Emeritus Mike Hutjens, University of Illinois, teaches about feeding during low milk prices.

Take-home message: Choosing the right forages and using tools available for feed decisions and optimal heifer management are necessary for profitable dairy farming. Feed additives may potentially minimize feed costs and improve feed storage. However, always make sure an additive is backed by solid research.

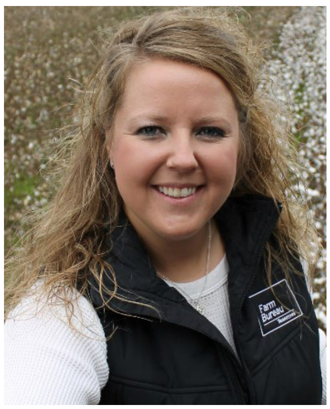
Shawn Hawkins, associate professor and Extension specialist in the UT Department of Biosystems Engineering and Soil Science, spoke about a recent study on corn silage growth response to nitrogen (N) application rate. Silage yield increased with the increasing N rate up to 180 lbs. N/acre. However, beyond this limit the silage yield did not change much. Potassium and phosphorus removal rate by corn silage was higher than the previous UT reference values and did not vary with the N-rate. Zinc, copper and sulfur removal rates increase as N application rate increased. So, long term N application might cause deficiencies in micronutrients and an increase in production cost. Hawkins suggested continuing the study two to three years to include changes during a dry year. He also demonstrated a new two-page worksheet to determine a farm's dairy manure land application rate. This worksheet can be used for dairies that do not require a Nutrient Management Plan (fewer than 700 milking cows).

Take-home message: Increasing N application up to 180 lbs. N/acre could increase corn silage quality and yield. However, high N application long-term might result in micro-nutrient deficiencies and production cost increases. A new manure application worksheet can streamline putting the correct amount of manure on your fields.



Andrew Muhammad, Blasingame Chair of Excellence and professor, Department of Agricultural and Resource Economics

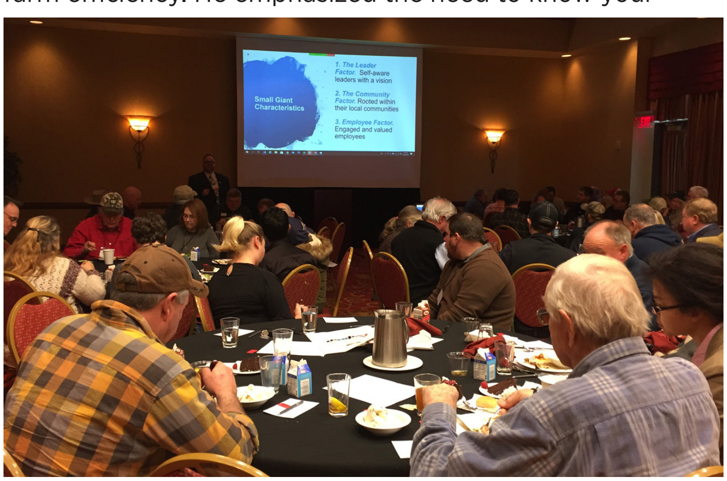
Andrew Muhammad, Blasingame Chair of Excellence and professor in the UT Department of Agricultural and Resource Economics, and Allison Ogle, Farm Bureau crop insurance agent, both spoke on insurance programs for dairy producers. Muhammad presented changes in the 2018 Farm Bill compared to the 2014 Farm Bill. The Dairy Margin Coverage (DMC) program under the 2018 Farm Bill includes lower premiums, a shorter calculation period (monthly instead of every other month), and can be done in conjunction with Livestock Gross Margin (LGM-Dairy) insurance. Ogle discussed the Dairy Revenue Protection (DRP) program, how it could be purchased, and some examples of when it would be useful on a dairy farm.



Allison Ogle, Farm Bureau crop insurance agent

Take-home message: The DMC program provides more flexibility for dairy producers with more opportunities for payouts during tough economic times. The DRP program may also be useful for some producers.

Jeffrey Bewley, dairy housing and analytics specialist at Alltech, presented strategies for small farms to keep pace with larger farmers and producers. His main focus was on what areas producers should be investing in/focusing on to make the most impact. Comparing with large farmers, he showed the similarities in farm operations and cost estimates. Bewley suggested putting more efforts into cow comfort and nutrition to increase production and farm efficiency. He emphasized the need to know your



Jeffrey Bewley of Alltech discusses small giants and lean farming.

cost-benefit ratio before investing in farm changes. Bewley ended with a reminder to control the controllable, i.e., milk yield, herd health, reproduction, feed cost and replacement heifer quality.

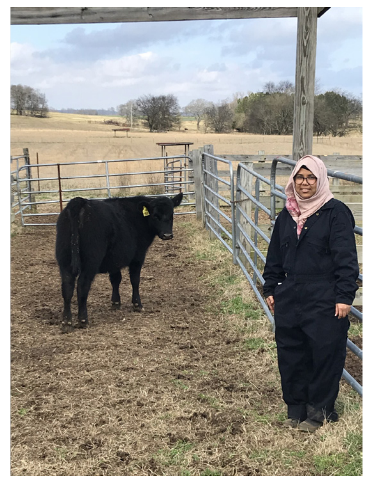
Take-home message: Small farms can still apply successful techniques from larger operations. Focus on the controllable on your farm to increase cow production and overall farm efficiency.

For more information, or to view recordings of the speakers, please visit UTDairyResources and select video resources. If you have any other questions or would like to see materials, contact Liz Eckelkamp at eeckelka@utk.edu or 865-974-8167.

— Arup Sen, UTIA PhD student in Dairy Systems Management

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

Student Spotlight — Afroza Akter



Afroza Akter, PhD student

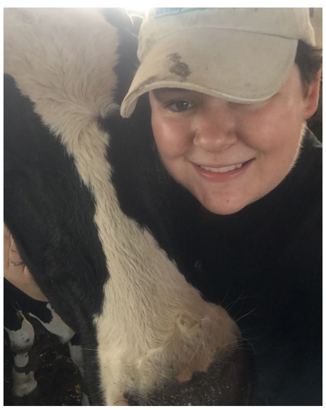
My name is Afroza Akter, a PhD student in the Department of Animal Science at the University of Tennessee Institute of Agriculture (UTIA). I was born and grew up in Bangladesh, a country in south Asia. My parents and three brothers have shown tremendous support to me throughout my life. From an early age, I have had a strong desire for higher education and learning. Along with this passion and the support of my family, I was able to obtain my doctor of veterinary medicine from Chittagong Veterinary and Animal Sciences University. During my undergraduate program, I earned the president gold medal award for outstanding performance. After finishing my undergraduate training, I pursued a master's degree in animal breeding and genetics from the same university. My research focused on the use of superovulation for improving reproductive performance in small ruminants. When I attended a conference in Linköping University, Sweden, I became inspired to achieve a PhD focusing on livestock health.

I started my graduate program in fall 2018 under the mentorship of Dr. Liesel Schneider, assistant professor in the Department of Animal Science. As my interest lies in epidemiology, my ongoing research focuses on the use of epidemiological diagnostic approaches for improving beef production by early detection of bovine respiratory disease (BRD). I am thankful to be a part of the Department of Animal Science, where students and faculty are progressively exceling in their work on animal health and well-being, nutrition, and reproductive physiology with applied research and extension. I am very optimistic that my research on early detection of BRD by utilizing biosensors will be helpful to improve economic efficiency and well-being for the dynamic multi-phased beef production system in the US.

As an international student I have been very pleased with the different opportunities provided by the Department of Animal Science. I have been so fortunate to meet good-hearted people who have helped me adapt to this new environment. The helpfulness and hospitality of other graduate students, faculty members and my mentor are so appreciated. Their daily motivation and assistance in times of need have made my transition much easier than I anticipated.

I have had the opportunity to work on a highly infectious disease-modeling tool as my faculty mentor, Dr. Schneider, collaborates with USDA-APHIS. The Animal Disease Spread Model is a strong modeling toolkit useful in simulating highly infectious disease such as foot and mouth disease, classical swine fever and highly pathogenic avian influenza. I was fortunate enough to attend the Conference on Research Workers in Animal Disease held in Chicago and to give an oral presentation of my abstract on the use of the Animal Disease Spread Model. In addition to this opportunity, I have enjoyed getting involved with a large research trial at the Middle Tennessee AgResearch and Education Center. My involvement has helped me to learn more about beef production in the US, heifer management and feeding in relation to production and disease prevention and control. Since arriving at UTIA, I have been inspired by the new ideas, approaches and applied work from the faculty and students. I hope that my research will improve food security throughout the world by combating animal and economic loss from diseases.

— Afroza Akter, UTIA PhD student in Animal Health and well-being



Amanda Lee, PhD student

When Should I Turn on the Fans?

Although we usually associate heat stress with the summer, Tennessee cows experienced heat stress conditions during every month in 2018. Heat stress occurs when the environment exceeds 65 degrees F and 40 percent humidity and can occur for a day (acute stress) or for multiple months (chronic). Acute heat stress is short periods of heat stress, including the single day of January 2019 when the max temperature was 71 degrees F. Chronic heat stress occurs when stress conditions last for multiple days with or without periods of relief. This means that even if heat stress conditions are present only for part of a day, cows can still experience chronic heat stress.

We use temperature humidity index (THI) as an indicator of when cows experience heat stress. Temperature humidity index is a combination of temperature and humidity that allows us to account for the effect high humidity has on dairy cows (Figure 1), even when temperatures still feel comfortable to us (Figure 2). Heat stress in dairy cows is usually determined at THI of 68 (65 degrees F and 40 percent humidity).

Heat stressed cows can reduce their heat load four ways: evaporation, convection (transferring heat to the air), conduction (transferring heat through physical contact) and radiation (transferring heat to the environment). The first indications of heat stress you can see are increased respiration rate (more than 60 breaths per minute; i.e. panting), increased standing time and decreased feed intake. Cows try to thermoregulate under heat stress conditions by changing their respiration rate (panting), standing to dissipate heat and eating less. When THI was greater than or equal to 68, cows spent 84 minutes more

Temperature		% Relative Humidity																		
°F	°C	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
72	22.0	64	65	65	65	66	66	67	67	67	68	68	69	69	69	70	70	70	71	71
73	23.0	65	65	66	66	66	67	67	68	68	68	69	69	70	70	71	71	71	72	72
74	23.5	65	66	66	67	67	67	68	68	69	69	70	70	70	71	71	72	72	73	73
75	24.0	66	66	67	67	68	68	68	69	69	70	70	71	71	72	72	73	73	74	74
76	24.5	66	67	67	68	68	69	69	70	70	71	71	72	72	73	73	74	74	75	75
77	25.0	67	67	68	68	69	69	70	70	71	71	72	72	73	73	74	74	75	75	76
78	25.5	67	68	68	69	69	70	70	71	71	72	73	73	74	74	75	75	76	76	77
79	26.0	67	68	69	69	70	70	71	71	72	73	73	74	74	75	76	76	77	77	78
80	26.5	68	69	69	70	70	71	72	72	73	73	74	75	75	76	76	77	78	78	79
81	27.0	68	69	70	70	71	72	72	73	73	74	75	75	76	77	77	78	78	79	80
82	28.0	69	69	70	71	71	72	73	73	74	75	75	76	77	77	78	79	79	80	81
83	28.5	69	70	71	71	72	73	73	74	75	75	76	77	78	78	79	80	80	81	82
84	29.0	70	70	71	72	73	73	74	75	75	76	77	78	78	79	80	80	81	82	83
85	29.5	70	71	72	72	73	74	75	75	76	77	78	78	79	80	81	81	82	83	84
86	30.0	71	71	72	73	74	74	75	76	77	78	78	79	80	81	81	82	83	84	84
87	30.5	71	72	73	73	74	75	76	77	77	78	79	80	81	81	82	83	84	85	85
88	31.0	72	72	73	74	75	76	76	77	78	79	80	81	81	82	83	84	85	86	86
89	31.5	72	73	74	75	75	76	77	78	79	80	80	81	82	83	84	85	86	86	87
90	32.0	72	73	74	75	76	77	78	79	79	80	81	82	83	84	85	86	86	87	88
91	33.0	73	74	75	76	76	77	78	79	80	81	82	83	84	85	86	86	87	88	89
92	33.5	73	74	75	76	77	78	79	80	81	82	83	84	85	85	86	87	88	89	90
93	34.0	74	75	76	77	78	79	80	80	81	82	83	85	85	86	87	88	89	90	91
94	34.5	74	75	76	77	78	79	80	81	82	83	84	86	86	87	88	89	90	91	92
95	35.0	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93
96	35.5	75	76	77	78	79	80	81	82	83	85	86	87	88	89	90	91	92	93	94
97	36.0	76	77	78	79	80	81	82	83	84	85	86	87	88	89	91	92	93	94	95
98	36.5	76	77	78	80	80	82	83	83	85	86	87	88	89	90	91	92	93	94	95
99	37.0	76	78	79	80	81	82	83	84	85	87	88	89	90	91	92	93	94	95	96
100	38.0	77	78	79	81	82	83	84	85	86	87	88	90	91	92	93	94	95	96	98
101	38.5	77	79	80	81	82	83	84	86	87	88	89	90	92	93	94	95	96	98	99
102	39.0	78	79	80	82	83	84	85	86	87	89	90	91	92	94	95	96	97	98	100
103	39.5	78	79	81	82	83	84	86	87	88	89	91	92	93	94	96	97	98	99	101
104	40.0	79	80	81	83	84	85	86	88	89	90	91	93	94	95	96	98	99	100	101

Figure 1: Heat stress calculator for dairy cattle. Adapted from Nickerson (2014). Mild heat stress 68 to 72 THI; Moderate heat stress 72 to 79 THI; Severe heat stress 80 to 89 THI.

Temperature (°F)

Relative Humidity (%)	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

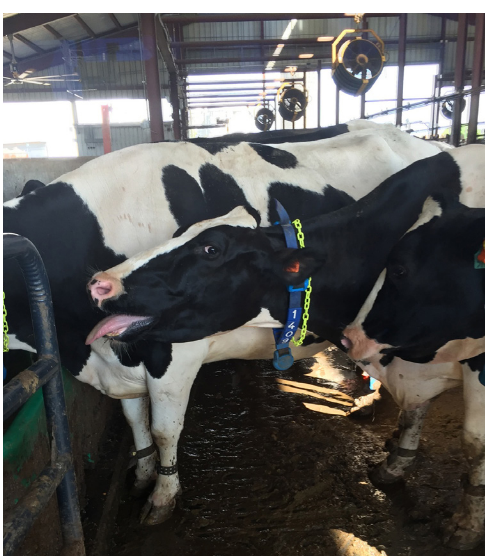
Caution — Extreme Caution — Danger — Extreme Danger

Figure 2: Heat stress calculator for humans. Adapted from NOAA (2016) Mild heat stress 80 to 90 THI; Moderate heat stress 91 to 102 THI; Severe heat stress 103 to 124 THI.

time standing than when THI was less than 68. In addition to increasing standing to get better air flow and dissipate heat, cows will modify their daily schedules to eat and ruminate during the coolest part of the day, while increasing their water intake throughout the warmest part of the day.

During chronic heat stress, cows tend to stand in tight groups (clumping) and decrease milk production. In natural environments, cows will stand in a tight group as a defense mechanism, despite increasing their heat load, suggesting that even in confinement, heat stress is causing a stress response. Consider starting heat abatement when cows first start experiencing heat stress (more than 60 breaths per minute) to prevent things like clumping from occurring. These methods include providing shade, fans or some type of cooling (sprinklers, misters, foggers, drenches or conductive cooling within a mattress). Each method has proven advantageous in different heat stress situations.

Shade lowers direct heat load from the sun by up to 50 percent with a well-designed structure. Arizona researchers suggest a lactating mature cow needs 11.5 to 14.8 square feet each beneath a shade structure of at least 14.1 feet high. Cows tended to prefer shade over sprinklers when THI was between 66 and 76. Additionally, rectal temperature and respiration rate both decreased and milk returned to non-heat stress yields when cows were provided with shade. Consider using shade structures for dry cows and heifers if they are housed on pasture. However, when humidity increases to greater than 50 percent, as is typical in Tennessee, shade alone may not be enough.



Amanda Lee

Cow panting to dissipate heat during heat stress.

Fans and sprinklers may help to cool cows, especially when humidity is high. Fans should be placed over the feed alley and within the inner and outer row of stalls. Fans should be spaced one in front of the other at a maximum of 10 times the blade diameter at a 15 to 20 degree angle to effectively push air onto the cow. While some research suggests fans should not be initiated until 70 to 75 degrees F, fans can be activated at the first signs of increased respiration rate. Turning on fans earlier may prevent acute heat stress from progressing to chronic heat stress and provide more benefit for your cows through decreased respiration rate and body temperature as well as steady milk production.

When sprinklers are paired with fans (evaporative cooling), cows are cooled faster than with shade or fans alone. Combining 0.5 to 3 minutes of sprinklers (during every 15 minutes) and forced air from fans will increase evaporative cooling and lower cows' body temperature quickly. Cows in Florida cooled with fans and sprinklers for 1.5 minutes on during every 15 minutes, had 11.6 percent greater milk production. However, Georgia researchers report using fans without sprinklers or sprinklers without fans will not cool cows enough in a high humidity environment.

Cow cooling does not need to be limited to housing environment alone. Including fans and sprinklers in the holding pen and exit-lane may help to cool cows quickly and effectively. Because cows spend a substantial time each day in the holding pen and close together, heat stress can occur quickly within the space. Installing fans at a 30 degree angle between 6 and 8 feet apart can help to push cooler air on top of cows. Water can be sprayed on a cyclical scale – 1 minute on and 6 minutes off, to ensure conductive cooling is effective.

When cows begin to show signs of heat stress, heat abatement strategies should be implemented. Whether adding moveable shades on pasture or turning on fans, heat abatement is critical to preventing physiological changes and maintaining milk production.

— Amanda Lee, UTIA PhD student in dairy cattle welfare under Peter Krawczel, associate professor

If you would like to learn more, please check out the following resources:

Collier, R. J., G. E. Dahl, and M. J. VanBaale. 2006. Major advances associated with environmental effects on dairy cattle. J. Dairy Sci. 89(4):1244-1253.

Gooch, Curt A. Fan cooling dairy cows. Cornell University, Mar. 2015, https://cpb-us-e1.wpmucdn.com/blogs.cornell.edu/dist/8/4308/files/2015/03/Fan-Cooling-Dairy-Cows-2jg9okh.pdf.

Nickerson, S. C. 2014. Management strategies to reduce heat stress, prevent mastitis and improve milk quality in dairy cows and heifers. in UGA Extension. Vol. January 2014. University of Georgia. http://extension.uga.edu/publications/files/pdf/B%20 1426_1.PDF, University of Georgia Extension.

NOAA. 2016. What is the heat index? National Oceanic and Atmospheric Administration, National Weather Service.

Polsky, L. and M. A. G. von Keyserlingk. 2017. Invited review: Effects of heat stress on dairy cattle welfare. J. Dairy Sci. 100(11):8645-8657.

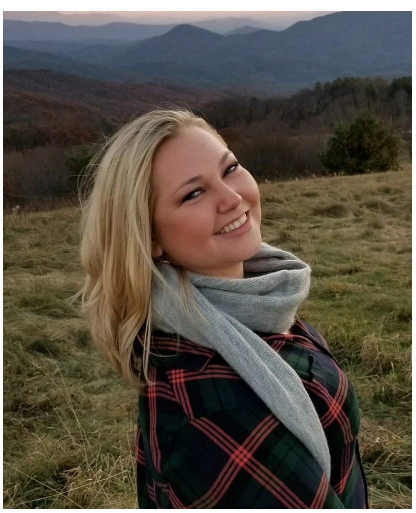
Schutz, K. E., A. R. Rogers, N. R. Cox, J. R. Webster, and C. B. Tucker. 2011. Dairy cattle prefer shade over sprinklers: Effects on behavior and physiology. J. Dairy Sci. 94(1):273-283.

Tao, S., J. W. Bubolz, B. C. do Amaral, I. M. Thompson, M. J. Hayen, S. E. Johnson, and G. E. Dahl. 2011. Effect of heat stress during the dry period on mammary gland development. J. Dairy Sci. 94(12):5976-5986.

Worly, J. W. 2009. Cooling systems for Georgia dairy cattle. https://athenaeum.libs.uga.edu/bitstream/handle/10724/12111/B1172.pdf?sequence=1&isAllowed=y

Zimbelman, R. B., R.P. Rhoads, M.L. Rhoads G.C. Duff, L.H. Baumgard, and R.J. Collier. 2009. A re-evaluation of the impact of temperature humidity index and black globe humidity index on milk production in high producing dairy cows. Pages 158-169 in Proc. Southwest Nutrition Conference, Tempes, Arizona.

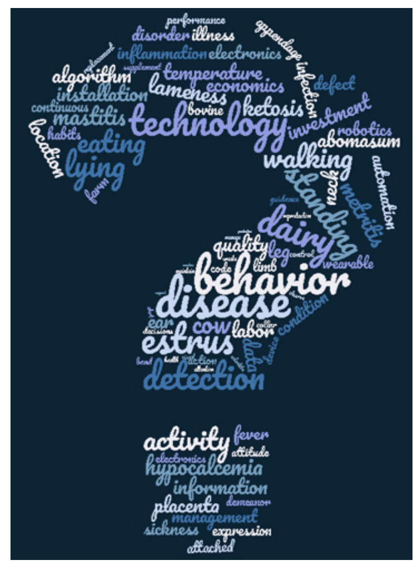
Precision Dairy That Pays



Liz Eckelkamp, UT Extension Dairy Specialist

Precision livestock technologies' purpose is real-time monitoring of animals to enhance the "eyes and ears of the farmer" (Berckmans, 2015). Precision livestock farming manages a livestock production system according to "the principles and technology of process engineering." Individual management is especially important for high-value animals, such as sows and dairy cows (Wathes et al., 2008). Precision technologies designed specifically for dairy applications are called precision dairy technologies (Bewley, 2010). Variables measured by technology can be related to several health, management and production characteristics. However, technology must fill an on-farm need and be economically feasible.

Technologies can be wearable, part of the milking system, standalone, or part of the management software (Bewley et al., 2017). Technology development stages are divided into four categories: 1) measurement (quantification), 2) interpretation of measurements (classification), 3) combination of interpretation with other information, and 4) decision support or creation (Rutten et al., 2013). As technologies become more sophisticated, they should be able to move from a standard report (i.e., number of steps taken) to an alert (i.e., cow is in heat). In the future, technologies may be able to predict diseases, calving and even optimize an entire farm operation based on individual animals and farm management practices. In order to achieve this, multiple technologies must be able to integrate and analyze data in a familiar platform for the end-user, the dairy farmer.



Liz Eckelkamp

Even though many technologies currently exist and more are being developed, adoption by farmers has been slower than expected The main reasons for this? Unfamiliarity with technology, undesirable (or unknown) cost-to-benefit ratio, information overload, not enough time to spend on technology, and lack of perceived economic value (Russell and Bewley, 2013). Especially in tough economic times, investment in an additional tool may not make sense. If you are considering investing in a technology, think about the following wish list:

1) Does the technology explain an underlying biological process, i.e., a reason behind a change?

2) Can information be translated into a meaningful action?

3) Is it cost-effective?

4) Is the technology flexible, robust and reliable?

5) Does the technology provide information in a simple and solution focused way?

6) Is the information readily available?

Keep in mind, this is a wish list. A technology may provide all or a portion of these things.

From a financial standpoint, technologies can pay for themselves in a variety of ways. They may increase milk production, decrease labor costs (fewer employees or fewer hours), improve animal health, improve heat detection, or reduce cull rates (van der Voort et al., 2017). From an investment standpoint, consider what the largest need is on your farm. If you have excellent heat detection, investing in a heat detection technology may not be economically feasible. Similarly, if labor is difficult to find or keep, investing in something like an automated feed pusher or automated milking system may make economic sense. Ask your neighbors what technology they have used and how they like it. Consider who has a good service team in your area. An excellent technology with a poor service team will be less beneficial to you than an adequate technology with an exceptional service team. Technologies can and will have issues, and you will want a service team who will be there to help you when those issues happen. Finally, consider if, financially, a technology is your best option. Can you achieve the same results with something like heat detection patches or following protocols in the parlor or for your fresh cows? Have clear discussions with all farm partners, and get the opinions of industry people and Extension agents you trust.

You also need to be very aware of the technology's sensitivity (number of true events correctly identified) and specificity (number of false events correctly identified). Why? Because false positives and false negatives are both costly. If a technology incorrectly tells you a cow is in heat, you will pay for the labor, semen costs and compounded cost to keep a non-pregnant cow on your farm. This can easily cost $100-plus dollars per false positive. Similarly, if technology incorrectly tells you a cow is not in heat, you will pay for the compounded cost to keep a non-pregnant cow on the farm. Ideally, a technology should be upward of 90 percent sensitive and specific. However, these two measures constantly fight each other and current technology may not be able to meet these demands. This does not make a technology useless or unprofitable, but it should be taken into consideration.

Technology can do amazing things and can be a profitable part of your farm. To make sure it is, keep these things in mind.

- Choose a technology that fills a need on your farm.
- Choose a technology with proven success and a good service team.
- You must be a good manager without technology.
- You must be willing to use the technology and incorporate it into your farm.

If you have any questions, please contact your local Extension agent or myself at 865-974-8167, or eeckelka@utk.edu.

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

For more information, check out these resources:

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Vet Check

Heat Stress and Flies Affect Calves Too!

Lew Strickland, UT Extension

When the summer months turn up the heat, we typically focus on keeping the milking herd cool, but heat stress in dairy calves is a concern that should be addressed as well. Heat stress can be very detrimental in young calves by causing dehydration, weakened immune systems and overall poor health. Reduced feed intake and increased maintenance energy needs coupled with lowered immunity can lead to poor growth, higher susceptibility to disease and, in extreme cases, death.

There are many complications that can arise on farms, particularly with young calves. Two of the main issues affecting health and comfort are heat stress and fly control. Flies are not only a nuisance, but they can bite the teats, causing an irritation with the formation of scabs on the teats. These scabs provide a place for bacteria to colonize and grow and potential mastitis or a blind quarter.

By keeping calves cool and comfortable, we can minimize morbidity (disease) and mortality (death) rates, economic losses, as well as time and labor spent treating sick calves. Planting crops, cutting and baling hay and the two-to-three-times daily milking makes this a challenging time of the year. However, adjusting some management strategies can provide some relief for you as well as your calves. There are many options, including ventilation, increased air flow to hutches, keeping bedding dry, shade cloth and much more that can be managed to try to keep young stock cool.

Housing Shade and Air Flow

If calves are housed in individual hutches, try placing a block 6 to 8 inches high under the back of the hutch to allow more air flow into the hutch. Orient hutches to catch summer breezes, and avoid direct sunlight into the hutches during the hot afternoon hours. For individual calf hutches, ideally there should be one hutch width between hutches for adequate airflow and to decrease nose-to-nose contact. In a Missouri study (Spain and Spiers, 1996), 80 percent shade cloth positioned about 3 feet above plastic hutches reduced the temperature inside the hutch by 4 degrees F. Another potential heat reduction tool is covering calf hutches with reflective materials to deflect some of the sun's radiation. Ted Friend, retired faculty fellow, Texas A&M AgriLife Research, has done extensive research in reducing heat stress in plastic calf hutches. Some of the results using reflective hutch covers included decreased temperatures inside the hutch, lower respiration rates, less treatment rates and improved average daily gains (Tucker, 2016). Calves housed in barns with solid roofs have built-in shade, but depending on the layout, some pens may experience more direct sunlight than others. If calves do not have the ability to move out of direct sunlight, consider the addition of shade curtains to provide some relief. Increased ventilation in any of these housing types can also be beneficial for helping to control the flies that gather on the calves and their environment. The area surrounding calf housing should be dry, free of tall grass and weeds, and adequately spaced apart.

Water

Another important component is water, water, water. All calves should have access to fresh, clean drinking water at all times, both winter and summer months. As the summer heat rises, a calf must have access to water in order to prevent dehydration and to cool body temperatures to a manageable level. While we know that calves need to increase their water consumption to replenish the water lost to cooling functions, there is little data available to estimate exactly how much water is needed as temperatures rise. Calves less than 2 weeks of age are the most vulnerable to diarrhea, which can lead to rapid dehydration, and an increased risk of heat stress. Again, this emphasizes the importance of providing fresh water to calves in the first week of life. Water buckets also may need to be filled more frequently (or switched to a larger size) in the summer, particularly for calves nearing weaning and those who have recently been weaned.

There is also evidence that keeping fresh water in front of calves can improve performance. In a Utah study, calves were fed and managed identically except for the frequency of rinsing water buckets, which was done daily, weekly or every two weeks (Wiedmeier et al., 2006). Calves whose buckets were rinsed daily gained 1.55 pounds/day prior to weaning, compared to 1.48 pounds/day for calves with buckets rinsed weekly and 1.40 pounds/day for buckets rinsed every 14 days. In addition, calves whose water buckets were rinsed less frequently required more treatments for illnesses than calves with buckets rinsed daily or weekly.

Also, it is important to provide a barrier or some degree of separation between food and water buckets. When calves can play between the two buckets, they will have a greater tendency to make their bedding as well as their feed wet, creating a favorable spot for flies to congregate.

Bedding

Bedding is also a key player in both heat stress and fly control. Ensuring that a calf's bedding is dry helps to decrease the incidence of flies gathering in the damp conditions and laying their eggs. Dry bedding reduces the amount of ammonia the calf is breathing and helps to keep the calf's coat clean and dry, also eliminating a favorite spot for flies to rest. While straw is a favorable bedding for winter months, sawdust or sand is more beneficial in the summer as it is less effective at insulating the calf. However, regardless of the preferred bedding, ensuring that there is adequate, dry bedding is what makes the difference. To understand the moisture level of the bedding in the calf housing, use the knee test to see how you are doing. Simply enter the calf's pen and drop to one or both knees. If your knees are damp or wet, the bedding needs replaced or replenished.

Fly Control Management

There are insecticides and other additives that can be used to cut down on fly numbers. Options are available to spray insecticides throughout calf housing to decrease populations. These methods generally have to be repeated on a regular basis. In addition to sprays, effective insect growth regulators are available that can be incorporated into dry feeds as well as milk replacers that harmlessly pass through the digestive system and are excreted into the manure. When eggs are laid in the manure, the life cycle of the fly is interrupted, preventing the larvae from maturing into an adult fly. Environmental management is becoming increasingly important as flies are developing resistance to chemicals. Ensuring that the environment around our calves is kept as clean and dry as possible is a great step in control. Haul the old bedding material to a location as far away from the calf housing as possible.

When summer months bring an excess amount of rain and heat, keeping your calves dry and comfortable will provide both immediate and long-term results that will have been well worth the extra effort. Consider implementing management practices to lessen the severity of these conditions. If you have any questions, please contact your local veterinarian, Extension agent, or myself at 865-974-3538, or lstrick5@utk.edu.

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

For more information, check out these resources:

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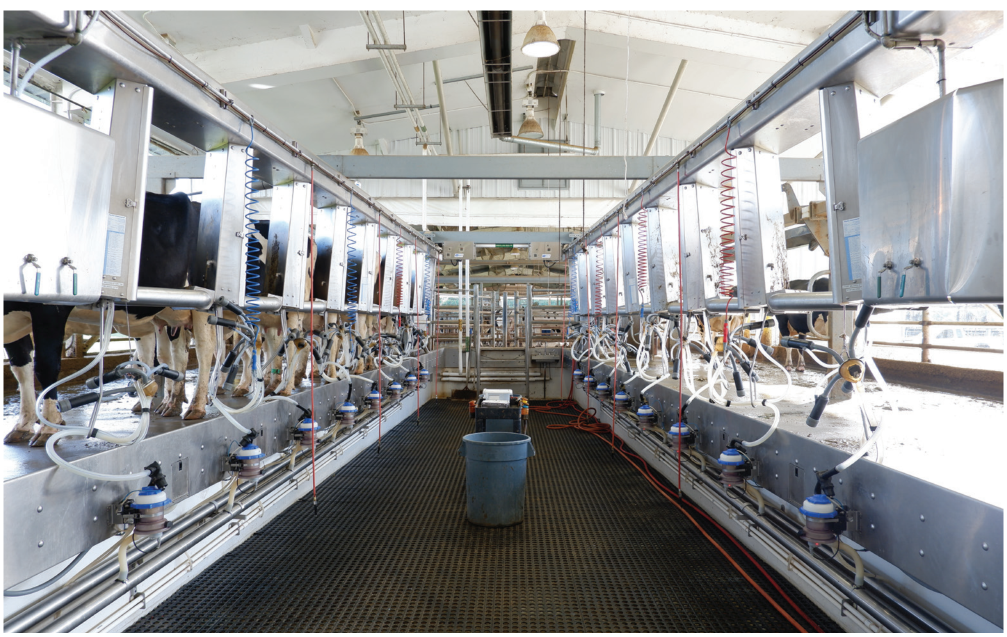
Department of Animal Science
2506 River Drive
Knoxville, TN 37996



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