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GEORGIA DAIRYFAX

Dear Dairy Producers:

The enclosed information was prepared by the University of Georgia Animal and Dairy Science faculty in Dairy Extension, Research & Teaching. We trust this information will be helpful to dairy farmers and dairy related businesses for continued improvement of the Georgia Dairy Industry.

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Sincerely,

Shea Tao

Associate Professor

UNIVERSITY OF GEORGIA EXTENSION

Dairy Dawg and Youth Updates

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Dairy Dawgs on the Moove

Seven delegates representing the University of Georgia Dairy Science Club attended the Southern American Dairy Science Association meetings in Nashville, TN on February 23rd – 25th. The group this year had the opportunity to network, to compete, and to visit a local farm in the area, Hatcher Family Dairy.

UGA ADSA-USD delegation with graduate student Sarah Johnson

A busy two days the students, the Dairy Dawgs represented UGA and Georgia well!

Mira Shaffer competed in the Original Research category with her work "Evaluating the influence of heritable metabolic and biological factors during the periparturient period on resumption of cyclicity postpartum" for which she **won first place**.

Renee Hutton competed in the Dairy Foods category with a presentation titled "The saturated fat content in dairy products: A controversial look into the low-fat dairy food group recommendations in the USDA Dietary Guidelines for Americans" for which she **won second place**.

Renee Hutton (left) and Mira Shaffer (right)

Additionally, the delegation was awarded **1st place Website** and Mira Shaffer was recognized as the **Outstanding Student** for the Southern Region.

Congratulations Dairy Dawgs and please visit their website (https://ugadsc.wixsite.com/ugadsc) and/or Facebook page (https://www.facebook.com/ugadairyscienceclub/) for pictures and additional updates. Also, a huge thank you to Sarah Johnson, a graduate student in the ADS department, for supervising the group while Dr. Bohlen was at State Livestock Show in Perry!

Upcoming Youth Events

There are numerous exciting youth events coming up so do not miss out! Please be on the lookout for additional information through your local extension offices as well as the Georgia Dairy Youth Facebook page (https://www.facebook.com/GA4Hdairyyouthprograms/).

<u>State 4-H Dairy Judging Contest</u>

April 14th at the UGA Teaching Dairy

Registrations due by noon on March 25th

<u>State 4-H Dairy Quiz Bowl Contest</u>

May 15th in Athens, GA

Southeast Dairy Youth Retreat

July 9th – 13th in Statesville, NC

All youth interested in agriculture and/or the dairy industry are strongly encouraged to attend this tremendous networking and educational opportunity. More information will be released as registration details are finalized.

Please check the facebook page for information on the retreat https://www.facebook.com/southeastdairyyouthretreat

as well as the Georgia Dairy Youth Programs for how Georgia delegates may register https://www.facebook.com/GA4Hdairyyouthprograms

or feel free to contact Dr. Jillian Bohlen directly at jfain@uga.edu / 706-542-9108 for more information

National 4-H Dairy Conference

October in Madison, WI

Held in conjunction with World Dairy Expo

This event is for youth with a sincere interest in the dairy industry as indicated by participation in dairy youth events. Annually a delegation of 3-4 youth is selected based on application materials that demonstrate activities in 4-H, the dairy industry, and leadership. Please watch for these applications to come out sometime in late June to early July. Selected delegates receive an expense paid trip to participate in the conference.

2023 Commercial Dairy Heifer Project

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Each year, the Commercial Dairy Heifer Project brings together a diverse group of young people with a common interest, the dairy heifer. During their time in the project, these youth grow, develop, and learn not just about their heifer but also about the industry and themselves. The number of lives this project impacts annually is amazing and the 2022/2023 show year was nothing short of wonderful. Though there are many shows throughout the state, a summary of the largest two is enclosed.

2023 UGA Dairy Science Club Commercial Dairy Heifer Show

As the trailers pull into Athens, the students in the University of Georgia Dairy Science Club set forth on a task that has been months in the making – The UGA Dairy Science Club Commercial Dairy Heifer Show. From seeking sponsorships, ribbons, creating the perfect t-shirt, locating worthy judges, these students take pride in every step of the process and in their ability to help serve the young people of Georgia through their show.

2023 UGA Dairy Science Club Commercial Dairy Heifer Show Committee

Friday, February 10th, were 172 heifers with 145 young people at the halter. It was another great year with quality heifers and young people crossing the scales and checking in. As weigh in came to a close, the barn was a bustle with friends catching up and heifers getting cleaned up!

In the midst of it all, 68 youth made their way to the arena for a practice Dairy Judging Contest. Some young people came to Athens just to participate in this judging contest! Many thanks are due again to Alyssa Rauton, a busy veterinary school student and dairy enthusiast, for helping pull this opportunity together.

Top Five Judging Contest:

	Contestant	County/Chapter
1st	Bailee Fair	North Hall
2nd	Bella Grier	Hall County
3rd	Ava Dunlap	Jones County
4th	Mason Taylor	Hall County
5th	Luke Huff	Oglethorpe County

Following the judging contest, the barn was welcomed to the Exhibitor's Dinner. Sponsored in part by the Georgia Dairy Youth Foundation and offering brisket from the UGA Meat Lab, this dinner is a time for youth, parents, teachers, and agents to fellowship.

Bright and early the next morning, Saturday, February 11th, Showmanship began in the two rings. Ring one hosted grades 4th – 8th with judge Gene Holcomb. Gene is a fixture for dairy youth in Florida and has made a name for himself beyond the state's border. Always willing to serve the dairy industry, Gene has helped coach youth teams, served on numerous dairy committees, organized dairy shows, and served as a judge at the state and regional level. Gene's investment in young people as well as service to this industry led to his induction into the Hall of Fame for Florida FFA and 4-H. Ring 2 welcomed grades 9th-12th with judge Chris Holcomb. Chris, like his father, has a known name for his commitment to dairy youth. He has served as Florida's Dairy Youth Specialist and coach to the University of Florida Dairy Judging Team. Although he now works for Endovac, his passion for dairy and youth is evidenced in his numerous committees at the national level to include World Dairy Expo Showmanship committee and judging national shows to include associate judge at the World Dairy Expo Guernsey Show. The club was certainly excited to have these excellent judges that have built careers on serving young people and identifying good dairy animals.

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First Place Showmanship Winners:

Grade	Showmanship Winner	County
4th	Shane Butcher	Coweta Co. 4-H
5th	Brooke Padgett	Hall Co. 4-H
6th	Maggie Moose	Hall FFA
7th	Colton Rousey	Elbert Middle FFA
8th	Peyton Clark	Madison Middle FFA
9th	Bailee Fair	North Hall FFA
10th	Bella Grier	North Hall FFA
11th	Mallory Kilgore	Hall Co. 4-H
12th	Jiles Coble	Burke Co. 4-H

The Junior Showmanship Champion (grades 4^{th}-8^{th}) was Peyton Clark while the Senior Showmanship Champion (grades 9^{th}-12^{th}) was Jiles Coble.

Peyton Clark, Junior Showmanship Champion, with judge Gene Holcomb

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Jiles Coble, Senior Showmanship Champion, with judge Chris Holcomb

The show rolled right into weight classes with the conclusion of showmanship. Judges switched rings and Chris Holcomb judged the lightweight classes (250-467 pounds) while Gene Holcomb judged the heavyweight classes (472-730 pounds).

First Place Weight Class Winners:

Class	Weight	Heifer #	Showman	County
1	250	1495	Jax Smith	North Hall FFA
2	289	9062	Shane Butcher	Coweta Co. 4-H
3	303	9967	Tucker Ewton	Whitfield Co. 4-H
4	333	1591	Daisy Newberry	Rutland Middle FFA
5	360	290	Landon Benitez	Gilmer FFA
6	368	9758	Sydney Coble	Burke Co. 4-H
7	382	1590	Peyton Hutchins	Rutland FFA
8	411	202	Lily Atkins	Newton Co. 4-H
9	432	1030	Casey Peters	Elbert FFA
10	455	287	Rydlee Ponder	Gilmer FFA
11	487	1479	Camden Huff	Oglethorpe Co. 4-H

12	514	1501	Mason Taylor	North Hall FFA
13	540	1532	Sarah Kimbrell	Habersham FFA
14	550	1500	Bailee Fair	North Hall FFA
15	558	9904	Maddox Pardue	White Co. FFA
16	578	1534	Joanna Kimbrell	Habersham FFA
17	586	6690	Madi London	White Co. 4-H
18	616	74	Maggie Harper	Morgan Co. 4-H
19	636	59	Jiles Coble	Burke Co. 4-H
20	730	8890	Luke Huff	Oglethorpe FFA

In the lightweight ring, Grand Champion was awarded to heifer 1502 exhibited by Bella Grier while the Reserve Grand Champion was awarded to heifer 287 exhibited by Rydlee Ponder.

Bella Grier with Lightweight Grand Champion heifer and judge Chris Holcomb.

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In the heavyweight ring, heifer 8890 exhibited by Luke Huff was named Grand Champion while heifer 1479 exhibited by Camden Huff was named Reserve Grand Champion.

Luke Huff with Heavyweight Grand Champion heifer and judge Gene Holcomb.

The UGA Dairy Science Club would like to thank all of our financial supporters that contributed to another great year and made this show possible for all of these young people. Platinum sponsors of the show ($500) were Southern Swiss Dairy, LLC, Dairy Alliance, Georgia Dairy Youth Foundation, Mountain Fresh Creamery, Trans Ova Genetics, Rider Transport, Inc., White County Farmers Exchange, Georgia Milk Producers, and Premier Select Sires. Gold sponsors ($250) this year included Bagwell Insurance Group c/o Matt Adams, Eatonton Feed Co. Inc., Cavaliers by Crumley, and London Farms, Inc. THANK YOU as this show would not be possible for all of these young people without you! Please visit the UGA Dairy Science Club Facebook page for a link to view and download show photos.

2023 State Commercial Dairy Heifer Show

Heifers for the State Commercial Dairy Heifer Show in Perry, GA weighed in on February 22nd with 238 heifers crossing the scales and 196 young people proudly at the halter. Showmanship was a daylong event that began bright and early on February 23rd. Serving as judge for both showmanship and weight classes was Kelly Reynolds of New York. Kelly was on the national winning dairy cattle judging team from Cornell in 2011. She currently farms with her husband and his family at Reyncrest farm, which has been named Premier Exhibitor and Premier Breeder at numerous national shows. Having judged both state shows and national showmanship, Kelly was a top notch judge for this year's show.

First Place Showmanship Winners:

Grade	Showmanship Winner	County
4th	Rydlee Ponder	Gilmer Co. 4-H
5th	Brooke Padgett	Hall Co. 4-H
6th	Cecelia Miller	Clear Creek Middle FFA
7th	Emma Wiley	North Hall Middle FFA
8th	Peyton Clark	Madison Co. FFA
9th	Leah Higginbotham	Elbert Co. FFA
10th	Bella Grier	North Hall FFA
11th	Avery Allen	Houston Co. FFA
12th	Justin Buchner	Houston Co. FFA

Taking the top placing 4-H members in 6th-12th grades, the judge named the Master 4-H Showman as Sydney Coble of Burke Co. 4-H (11th grade). Following this the judge then evaluated the top placing FFA member from 6th-12th grades to name Bella Grier (10th grade) as Supreme FFA Showman.

Weight Classes were up the next day with heifers weighing 250-756 pounds.

Division Placings:

Division 1 (250-384 pounds)

Class	Weight	Heifer number	Showman	County
Champion	356	1591	Daisy Newberry	Rutland Middle FFA
Reserve	376	290	Landon Benitez	Clear Creek Middle FFA

Division 2 (388-488 pounds)

Class	Weight	Heifer number	Showman	County
Champion	444	287	Rydlee Ponder	Gilmer 4-H
Reserve	432	1583	Kaitlynn Whitten	Rutland High FFA

Division 3 (490-574 pounds)

Class	Weight	Heifer number	Showman	County
Champion	508	281	Cecelia Miller	Clear Creek Middle FFA
Reserve	492	1479	Camden Huff	Oglethorpe Co. 4-H

Division 4 (576-756 pounds)

Class	Weight	Heifer number	Showman	County
Champion	636	286	Jack Keener	Gilmer Co. FFA
Reserve	658	237	Kiley Padgett	North Hall FFA

The Overall Top Five for the Show:

	Weight	Heifer number	Showman	County
Champion	444	287	Rydlee Ponder	Gilmer 4-H
Reserve	508	281	Cecelia Miller	Clear Creek Middle FFA
3rd	636	286	Jack Keener	Gilmer Co. FFA
4th	492	1479	Camden Huff	Oglethorpe Co. 4-H
5th	658	237	Kiley Padgett	North Hall FFA

The Overall Top Five County Groups:

	County
Champion	Gilmer Co.
Reserve	Rutland Middle FFA
3rd	Putnam Co. FFA
4th	Hall Co. FFA
5th	White Co. FFA

Congratulations to everyone that completed another great year as part of the Commercial Dairy Heifer Project!

Student Highlights – Thiago N. Marins

Ph.D. student and Graduate Research Assistant, tnmarins@uga.edu

Department of Animal and Dairy Science

(In this new section, we will highlight the graduate and undergraduate students in our dairy science program at the University of Georgia. It will allow the student to show case their efforts and achievement in dairy research. The first student we are going to highlight is Thiago N. Marins, a Ph.D. student at the Department of Animal and Dairy Science of the University of Georgia.)

I am from Rio de Janeiro, Brazil, and obtained my DVM degree at Fluminense Federal University, Brazil. Upon my graduation, I was accepted by the Veterinary Medicine Residency Program at the Large Animal Hospital of the Federal University of Goiás, Brazil, with major in large animal medicine, more specifically, in clinical and surgical treatments of large animals. Following my residence, I joined the master program in animal production at the Department of Animal Science of the Federal University of Goiás, Brazil. My research project focused on the effect of heat stress on metabolism and physiology during the transition period of dairy cows. On the last year of my master program, I had the opportunity to come to U.S and participate in an internship program at UGA Tifton campus in Dr. Sha Tao's lab to further study heat stress in dairy cattle. Shortly after my master's graduation, I accepted the invitation from Dr. Tao to work with him as a Research Professional. During this period, I conducted several projects related to metabolism, physiology, and behavior of dairy cattle, and developed my own research interests. Currently, I am working on my doctoral degree in the Department of Animal and Dairy Science at the University of Georgia, Athens. During the Ph.D. program, my interest is to develop research and extension projects related to management, metabolism, health, and behavior of dairy cows. I believe that the acquired results from these studies will provide valuable data for a better understanding of the impacts of heat stress on physiology and behavior of dairy cattle, which will allow dairy producers to make effective decisions to mitigate the negative impact of heat stress, thereby improving animal health and well-being.

Below, I summarized some of the projects in my Ph.D. program.

- ***Impact of heat stress and a feed supplement on hormonal and inflammatory responses of dairy cows***

The aim of this research project was to evaluate the effects of an immunomodulatory supplement and heat stress on hormonal, inflammatory, and immunological responses of lactating dairy cows. For 8 weeks, multiparous Holstein cows (n = 60) were randomly assigned to 4 treatments in a 2 × 2 factorial arrangement using 2 environments: cooled using fans and misters, or noncooled, and 2 top-dressed feed supplements: an immunomodulatory supplement or a placebo. Blood was drawn to analyze stress hormones (cortisol and prolactin) and circulating inflammatory cytokines. Peripheral blood mononuclear cells were isolated and stimulated with hydrocortisone (cortisol analog), prolactin, or lipopolysaccharide (a mitogen derived from gram negative bacteria), individually or in several combinations, to assess induced proliferation and cytokine production. At d 52, cows were injected i.v. with a lipopolysaccharide bolus to assess hormone and cytokine responses. In this study, we found that the immunomodulatory supplement enhanced cortisol release under basal condition and induced inflammation with cooling compared with those fed the placebo. This suggests that heat stress inhibits immunomodulatory-mediated cortisol release. Heat stress seems to enhance the inflammatory responses of circulating immune cells isolated from lactating cows; however, the immunomodulatory supplement promoted circulating immune cells' proliferation under heat stress condition, or in the presence of the stress hormone, such as cortisol.

- ***Behavioral responses of lactating dairy cows challenged with intramammary lipopolysaccharide infusion with or without evaporative cooling.***

The objective of this research project was to examine the impact of evaporative cooling on feeding and lying/standing behavior of lactating dairy cows before and after an intramammary lipopolysaccharide infusion (imLPS) under heat stress conditions. Multiparous cows (n = 12/treatment) were randomly assigned to: evaporatively cooled or not cooled for 36 d. The cooling system included misters installed on the face of fans over the feed bunk and free stalls. On d 31, the left rear quarters of a subset of cows (n = 7/treatment) were challenged with 10 μg of lipopolysaccharide derived from Escherichia coli. Before the challenge, compared with cooled cows, the lying time of cows without was only lower on d 2 and from d 9–11 of the experiment. Eating and ruminating time of the non-cooled cows decreased likely due to the reduced feed intake by heat stress impact. The mammary inflammation induced by lipopolysaccharide did not affect the behavioral response, and the ruminating and eating times of non-cooled cows remain lower than cooled cows after challenge. In this study, we concluded that feeding and lying/standing behaviors are disturbed by lack of evaporative cooling during summer, but the behavior was not significantly altered by mammary inflammation induced by lipopolysaccharide.

- ***Heat audit: evaluation of efficiency of cooling systems adopted in Georgia grazing dairy farms during summer.***

The objective of this research/extension project was to identify correlations among vaginal temperature, lying/standing behavior, and environmental parameters. In addition, the other objective was to evaluate efficiency of cooling systems in grazing dairy farms in Georgia during summer. Four different grazing dairy farms were visited during a summer. Each farm had different milking schedules and cooling facilities in holding pens and feed pads. All farms had center pivots equipped with spray nozzles for evaporative cooling on the pasture during the day, but it was turned off at night. The heat audits were performed on 120 lactating dairy cows (30 cows/farm) and body temperature and standing/lying behaviors of were collected for 6 consecutive days. In the correlation analyses, we found that, at day under pivots, the cows' temperature had strongest correlation with air temperature, but black globe temperature (solar radiation) better explained lying time and standing time. At night, the temperature humidity index was a better variable to predict vaginal temperature, lying time, but standing time was highly associated with air temperature. The heat audit provided useful information for produces to be aware of locations and managements that need improvements on cooling efficiency with the aim to enhance the heat abatement of cows during summer. For example, in one farm, we found that the cooling system in the holding area (mister + fans), parlor (fans), and feeding area after milking (mister) were effective to decrease the body temperature; however, the body temperature was not effectively maintained when the cows were on pasture under pivot, demonstrating the nozzles on the center pivot cannot effectively cool cows and need improvement. Following the heat audit, we revisited all farms and provided similar recommendations to each producer according to data we collected.

In addition to the three projects listed above, I performed several projects that will not be mentioned, and I am currently working on the other two projects. Time at UGA is fruitful and up to date, I have published 15 peer-reviewed articles and 21 meeting abstracts. Additionally, I have participated and talked in several Extension events, such as Sunbelt Expo, First grader field, and heat stress workshop.

In the future, after the completion of my Ph.D. degree, I will keep working to contribute to the scientific community and to help produces achieve their best productivities in order to build a stronger and more sustainable dairy industry.

The Uterine Microbiome

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Why is the Uterine Microbiome Important?

Assistive reproductive technologies are the greatest tool available to the producer to rapidly make genetic progress in the herd. The success of these tools relies on the proper management of both recipient and donor cows in order to maximize fertility. There is some evidence to suggest that the uterine microbiome may help explain some observed differences in fertility in beef and dairy herds.

Estrus Expression Effects on Fertility

Females that display behavioral signs of estrus have higher pregnancy rates and lower pregnancy loss in both fixed time artificial insemination and fixed time embryo transfer settings. The physiologic reason behind this phenomenon remains unclear. In addition, estrus expression is directly related to circulating concentration of estradiol in the blood immediately prior to ovulation. Even so, traditionally animals with high levels of estradiol but low levels of progesterone during this time see reduced fertility. Therefore, the expression of estrus is a critical event that improves the probability of a successful reproductive event.

Is Failing to Display Estrus a Disease?

Our current research shows that cows who fail to display estrus have microbiomes that may indicate the presence of a disease state in those animals. Cows that did not display estrus had decreased diversity in the uterine horn, which in the bovine is often considered a sign of disease. In addition, they had greater relative abundance of known pathogenic organisms. *Actinobacillus Semenis* was a particular species identified from a cow that did not display estrus and was present at over 70% relative abundance in both uterine horns. This species of bacteria has been known to cause vesicular seminitis and orchitis in rams and abortion in ewes. The extremely high relative abundance in that particular animal is likely indicative of subclinical disease.

It has been well established that the effects of metritis and endometritis on fertility last well beyond the time when the initial infection is cleared and clinical signs disappear. These altered microbiomes of cows failing to display estrus may be lingering evidence of previous disease, and may contribute to the lack of estrus display. Following this line of thinking one can conclude that failing to display estrus is a disease in itself as it is associated with lower fertility and is a ripple effect of previous disease.

Establishment of the Uterine Microbiome

Though the exact role of the microbiome in bovine reproduction is still unclear, the origin of it is noteworthy. Nearly all the organisms identified in the uterus are organisms that are predominantly found in the rumen and hind gut of cows. This is interesting as it suggests that the two locations are in some way linked to each other. Most likely the microbes from the gut are colonizing the uterus in a combination of ways. The first being through the feces and traveling up through the vagina, and the second being via the hepatic portal vein.

Further research is needed to associate the gut microbiome of individuals with their reproductive microbiome and refine our ideas of how nutrition affects fertility. No longer will simply supplying enough energy to have animals on a positive plane of nutrition during the breeding season be all that reproductive physiologists think about nutrition. We will need to begin considering how a diet is affecting the gut microbiome and how these shifts could in turn alter the uterine microbiome. The most promising aspect of this correlation however is that it opens the door for dietary interventions (e.g., probiotics, enzymes, prebiotics) to help improve fertility.

Conclusions

In conclusion, there is still a wealth of information to be gathered about the uterine microbiome, what things affect it, and its effects on fertility in the bovine. This research has generated more questions than answers, but producers should remain optimistic that in the coming decades improvements in fertility are going to be made possible through avenues which are now unknown.

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Prototheca, a non-bacterial cause of mastitis: How do we prevent, treat, and control it?

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Most of our conversations surrounding causes of mastitis are focused on bacteria, and with good reason because most of the causative microbes for mastitis in dairy cattle are in fact bacterial. Bacterial causes of mastitis include:

- *Staphylococcus spp*. such as *Staph. aureus* and other non-aureus staphylococci
- *Streptococcus spp*. such as *Strep. uberis*, *Strep dysgalactiae*, and *Strep. agalactiae*
- Streptococci-like organisms like *Lactococcus spp.*, *Enterococcus spp.*, *Aerococcus spp.*, *Micrococcus spp.*
- Gram-negative organisms such as *Escherichia coli*, *Klebsiella spp.*, *Salmonella spp.*
- Other bacterial organisms such as *Trueperella pyogenes*, *Corynebacterium spp.*, *Bacillus spp.*, *Nocardia spp.*, and *Mycoplasma spp.* (we will revisit this one even though it is a bacteria)

However, there are non-bacterial causes of mastitis that can be extremely problematic for herds of all types, sizes, and location. These non-bacterial causes of mastitis, particularly *Prototheca spp*. have recently received increasing attention given the possibility for outbreaks, difficulty in rapidly identifying problem animals, and the lack of "antibiotics" to aid in curing infections.

Source of exposure or infection

Prototheca spp. are algae and are generally considered to be environmental, surviving optimally in warm and wet locations, such as stagnant ponds. These algae have also been isolated from manure, soil/mud, slow-moving streams, drinking water in unclean holding containers, and floors of alleyways and holding pens. Originally, *Prototheca spp.* were commonly associated with pastured cattle (lactating or dry) and dry lot cattle; however, it is now widely found in confined barns such as free stalls that are well-managed and in theory should have less risk of *Prototheca spp.* overall. Though risk of environmental exposure may be reduced in these situations, *Prototheca spp.* have also been identified as being contagious, being able to spread cow to cow primarily in the parlor. In fact, it is believed that this characteristic is what contributes, in part, to outbreaks on some operations. Additionally, full insertion of teat cannulas during lactating or dry cow antibiotic administration can also be associated with protothecal infections.

Identification

Prototheca spp. can be identified utilizing laboratory microbiological techniques conducted by a trained technician, by PCR, or with MALDI-TOF. A trained technician is required to differentiate *Prototheca spp*. on blood agar primarily from staphylococci and some yeasts, but also streptococci, which can look similar to the inexperienced plate reader. Additional stains can be utilized for confirmation in the laboratory setting. In some laboratories, *Prototheca spp.* isolation medium can aid in identification, but is not commonly used, especially with the availability of PCR and MALDI-TOF. Though *Prototheca spp.* will grow on most commercially available on-farm "mastitis" agars (without selective components added to the media such as a streptococci-selective media) or standard blood agar, it is recommended to confirm protothecal infections with a trusted laboratory. These labs may also have the capabilities of utilizing MALDI-TOF for confirmation as well, which may expedite identification and confidence in the diagnosis.

Figure 1. *Prototheca zopfii* growth on blood agar
Source: [*https://amjcaserep.com/abstract/full/idArt/933694*](https://amjcaserep.com/abstract/full/idArt/933694)

PCR assays which detect *Prototheca spp.* can be more straightforward and useful, and though PCR has drawbacks for usage in dairy herds (i.e., detection of DNA from live and dead microbes, requirement for pathogen-specific assays), any DNA detection (live or dead) suggests an animal exposed to and most likely still infected with *Prototheca spp*. On-farm PCR systems are available for detection of *Prototheca spp.* and can be utilized with more confidence than on-farm milk culture identification of *Prototheca spp*. A positive diagnosis for a protothecal infection should be viewed with concern and a plan should be in place to address these events as discussed below.

Prevention

Given the source of exposure and/or spread of this microbe, the following are brief items to focus on in reducing risk of exposure or infection with *Prototheca spp.*

1. Decreased access to standing water or slow-moving streams and areas with high levels of mud and will reduce the risk of protothecal infections
2. Frequent cleaning of water troughs and containers both in pastures and in barns
3. Keeping alleyways and holding pens dry and free of accumulated manure through either grooved concrete and/or frequent flushing of pens
4. Frequent grooming of stalls and re-bedding as necessary to prevent accumulation of urine-soaked or manure-laden bedding
5. Proper pre-milking germicidal application (pre-dip) with full coverage of the teat and contact time of a minimum of 30 seconds.
6. Proper post-milking germicidal application (post-dip) with full coverage of the teat, dip left on the teat
7. Partial insertion of the antibiotic cannula during lactating and dry cow antibiotic therapy.

Treatment

Since *Prototheca spp.* are not bacteria, there is no intramammary antibiotic treatment. *Prototheca spp.* will not respond to antibiotic infusion. Also, little anecdotal reports exist demonstrating spontaneous cure (i.e., cow is able to cure on her own). Treatment is not recommended.

Control

Current recommendations for a positive *Prototheca spp.* result are to isolate and cull. Continued presence is a risk to herd mates' udder health and milk quality because outbreaks have occurred as a result of contagious spread in milking systems. *Prototheca spp.* can shed at very high numbers and be found in the bulk tank even with a few culprits and result in significantly elevated somatic cell counts, jeopardizing quality premiums.

Recent trends in the national dairy herd

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The USDA NASS collects and publishes data on a monthly and yearly basis on milk production, cow numbers, and herd numbers in the United States. These data are publicly available through their website at www.nass.usda.gov as well as through a website run by the Cornell Mann Library (https://usda.library.cornell.edu).

In this review, we will present recent data on dairy herd numbers, milking herd inventories, heifer inventories, annual herd turnover rate, and their interactions. Although the management decisions that impact these numbers over the entire US are highly complex, a few implications can be drawn from the recent trends that may be helpful for producers to make decisions on their own operations. We challenge you to discuss the trends presented here with your farm management team and farm advisors, and how they could affect your business and decisions in the next few years.

Numbers of licensed dairy herds

Since 2003, the USDA has published the number of licensed dairy farms, and this number has seen a steady decline over time, with around 3-8% loss each year (Figure 1). This proportion of annual losses seems to have increased in the last 5 years, for a multitude of reasons.

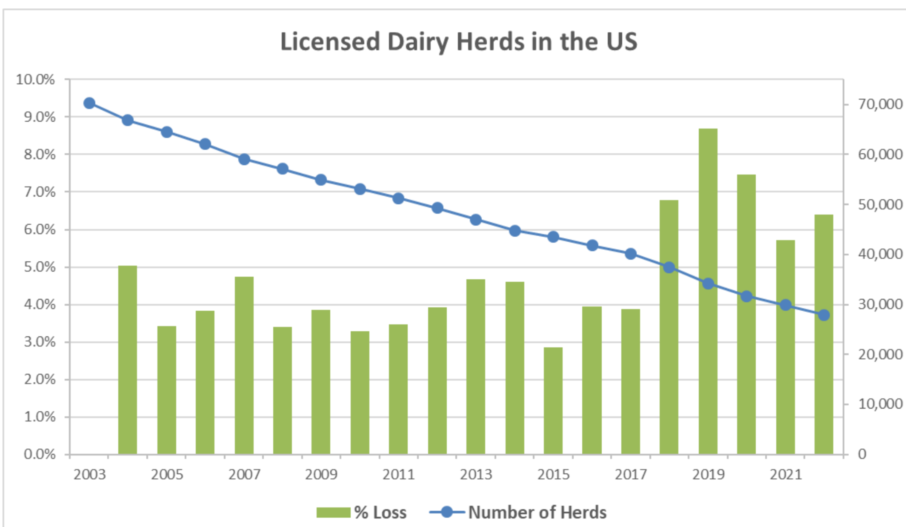

Figure 1. USDA licensed dairy herds in the United States by year

Milking cow and replacement heifer inventory

USDA publishes the inventory of milk cows (milking and dry cows together) on a monthly basis, and also annually publishes the inventory of dairy replacement heifers that are greater than 500 pounds and heifers that are greater than 500 pounds and expected to calve during the year.

Below is a graph of the inventory counts since 2000; milk cow numbers have been climbing from just above 9 million to 9.4 million, and heifer numbers climbed similarly, but have started falling since 2016 (Figure 2).

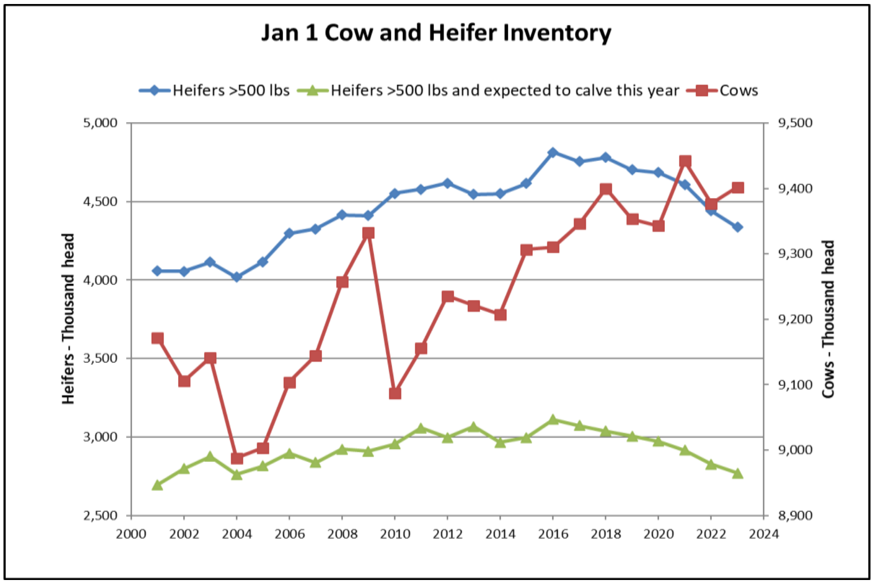

Figure 2. January 1 Inventory of milk cows (milking and dry), replacement dairy heifers greater than 500 lbs., and replacement dairy heifers greater than 500 lbs. and expected to calve this year 2000-2022

If we divide the inventory of each heifer category above (remember this is not total replacement heifers) by the number of milk cows, we can see a trend from 1987 to 2016 of an increase in the proportion of heifers, followed by a steady decrease from 2016 to 2022 (Figure 3). The correction since 2016 can probably be attributed to rising feed costs, an increase in the use of beef semen, and an increase in the use of genomic testing. This reduction of available heifers, along with high raising costs, will likely lead to an increase in the market price for quality replacement heifers in the near future.

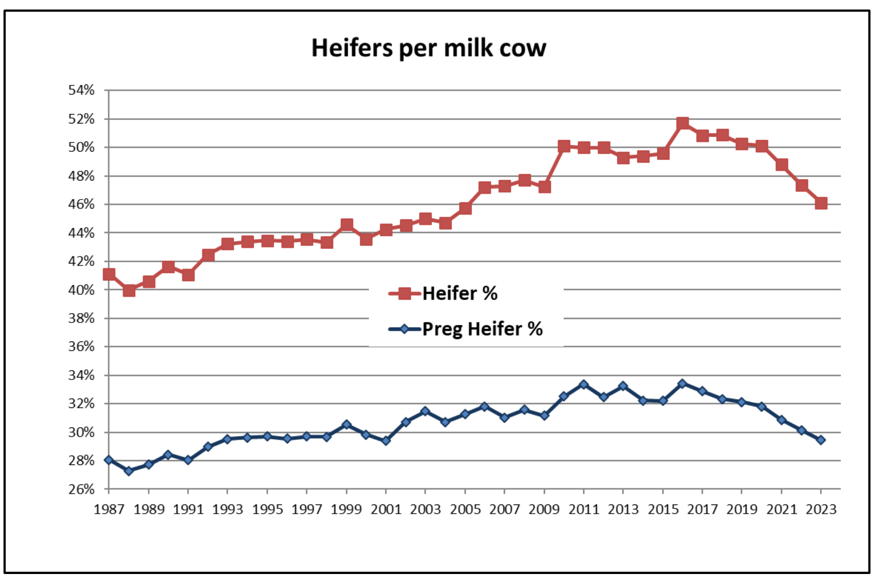

Figure 3. Proportion of heifer inventories to milk cow inventories 1987-2022

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Herd Turnover Rate

By comparing the heifers that are expected to calve in the next year to the change in milking cow inventory, we can estimate the animals that left the milking herd during that time. For example, if 30 heifers are expected to enter a herd of 100 cows, and the inventory of cows the next year is 110, then 20 cows must have left the herd. The average inventory over those two years would be 105, so the annual herd turnover rate would be 20 divided by 105, or 19%.

In 1986, a herd buyout program skewed the trend, so we will present the data from 1987 to 2022 (Figure 4). During that time, the US annual herd turnover rate averaged 31%, with a range from 29% to 34.3%. There are a few years with sudden changes, but there seemed to be a general increase from 1987 to 2016, and a decrease from 2016 to 2022.

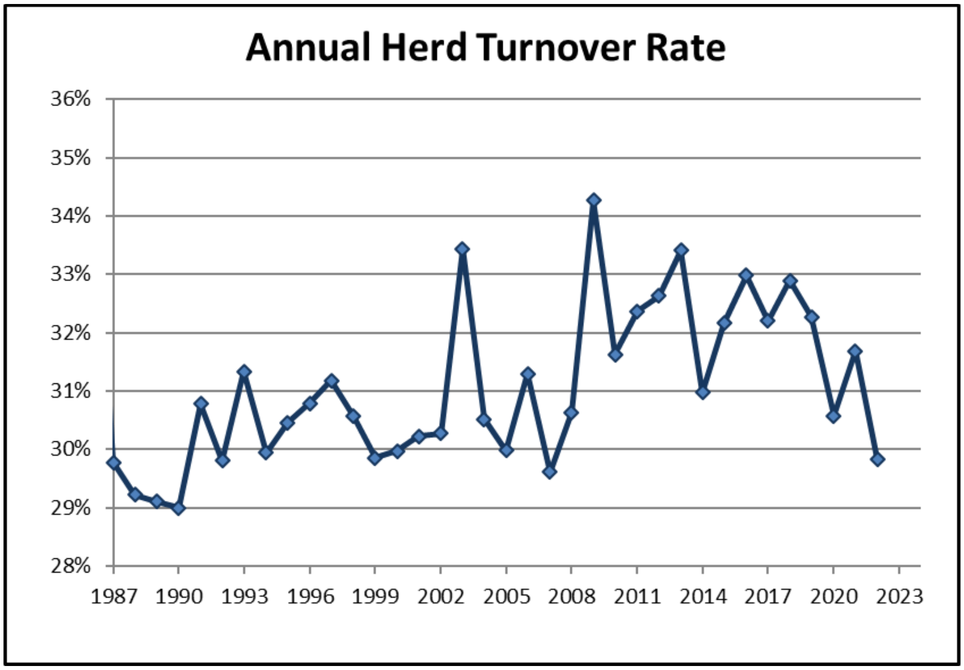

Figure 4. Annual United States herd turnover rate calculated from cow inventory changes compared to heifer inventory 1987-2002

The annual herd turnover rate is driven both by heifers entering the herd and the inventory of milking cows in the herd. In a stable herd with small changes in inventory, the number of heifers entering the herd will be equal to the number of cows that leave the herd. In an expanding herd, the annual herd turnover will always be lower than the numbers of heifers entering the herd. If we graph the relationship between the numbers of heifers expected to calve as a proportion of the milk cows by the annual US herd turnover rate, we see a fairly strong positive correlation; more heifers lead to higher turnover and fewer heifers leads to lower turnover (Figure 5). Since 2016, we have seen both herd turnover rate and heifer inventories drop, and if the reduction in heifer inventory continues, then the US herd turnover rate will continue to decrease, unless we see a decrease in the milking cow inventory.

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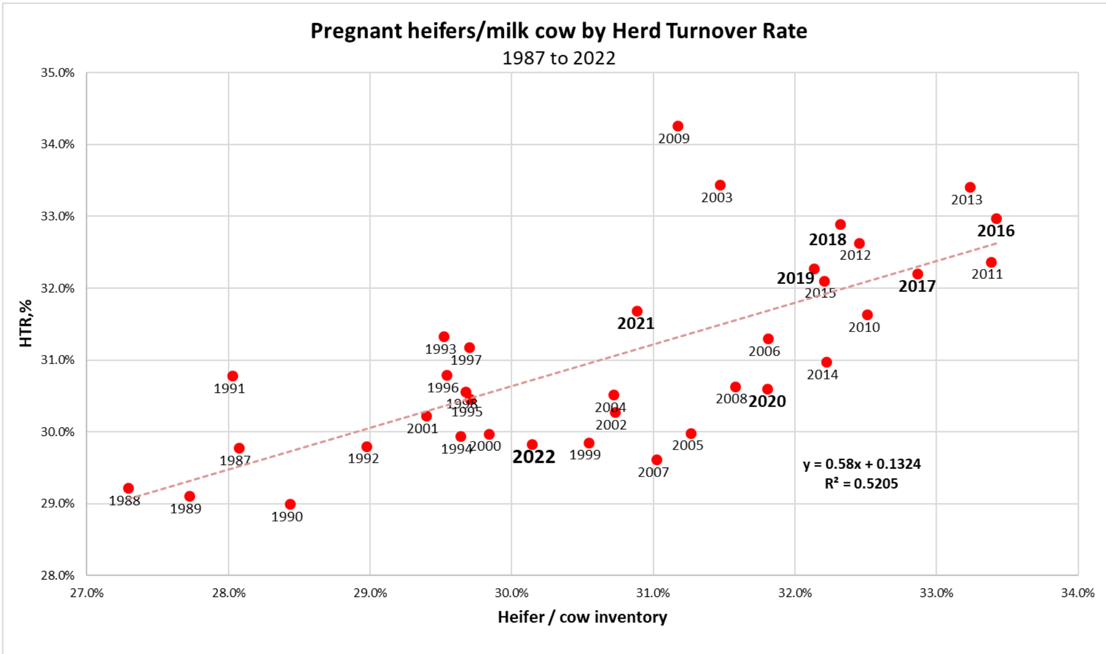

Figure 5. Correlation between calculated US annual herd turnover rate and the proportion of pregnant heifers to milk cows 1987-2022

A decrease in herd turnover could be a result of needing fewer heifers because cows are staying profitable longer (less "pull" for replacements), but this lower replacement rate could also result in keeping unprofitable cows in the herd longer because fewer heifers are available to enter the herd (less "push" by replacements). Navigating this balance within a herd is difficult; producers must balance the quantity and the quality of incoming heifers (and the cost to raise or purchase them) with the quantity and quality of cows in the milking herd and the value of cull cows. Although beef prices are projected to remain high in the near future, high feed prices will probably also influence culling decisions.

<u>Conclusions</u>

The structure of the US dairy industry is rapidly changing, and the number of milking cows, milk production per cow, herd size, and replacement heifer programs are constantly adapting to changing market conditions to stay profitable and meet consumer demands. The trends presented here are overall US herd trends that represent the average; individual herds may or may not be following the same trends. But these trends will impact each and every herd by changing the market for milk products and replacement heifers and cull cow prices.

How forage gets degraded in the rumen of cattle?

Andrea M. Osorio-Doblado., Katie P. Feldmann, Graduate Students

and **Todd R. Callaway**, Ph.D. Associate Professor

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Ruminants like cattle, sheep, and goats are important to our food production system, and they are unique because they possess the rumen, an organ in the gastrointestinal track which is home to a wide variety of microorganisms. Ruminal microorganisms have the ability to degrade forage, while monogastric animals such as poultry and swine cannot degrade plant fiber. Microbes from different kingdoms (fungi, eubacteria, and archaea) work together as a group to break down the plant cell wall and produce volatile fatty acids (VFA) which are the main source of energy for the host animal. Although it is known that ruminal microorganisms produce end products for our livestock to maintain and be productive, our knowledge about their interactions remains limited.

Knowledge about ruminal microorganisms remains scarce because microorganisms live in selective conditions that cannot be easily replicated under lab conditions. Ruminal microorganisms' role in fiber degradation has been studied extensively since the early 1960's (Hungate, 1966; Bryant, 1973; Russell and Hespell, 1981). However, new technologies like Next Generation Sequencing (NGS) has allowed a deeper understanding of ruminal microorganisms. NGS evaluates the genetic sequences of the different microbes that are present in the rumen, and provides information about the microbial relationships in the rumen and how microbes break down forage, which provides opportunities to improve forage utilization as a feed source for ruminants. For this article, forage degradation will be described as follows: fibrolytic and carbohydrate-fermenter microorganisms, followed by dextrin fermenters and degraders, cellulolytic, hemicellulolytic, and pectinolytic microorganisms. An overall view of how fiber degradation occurs in the rumen can be observed on figure 1.

Forage degradation begins with physical attachment of ruminal microorganisms to the cell wall of the plant, while this occurs different groups of microorganisms release enzymes to further continue this degradation process (Akin and Amos, 1975). Microbes from different kingdoms of life work cooperatively to degrade fiber, with microbial attachment being critical to initiation. Both fungi and bacteria are crucial because they begin the colonization of the plant surface and penetrate the cuticle of the plant which has a hard structure. Fungi have the ability to completely degrade cellulose and hemicellulose from the plant cell wall, and they can also degrade lignified plant tissues that can be toxic to ruminal bacteria. Also, mastication of plant material by the host cattle aid fungi to efficiently colonize the surface of fiber.

Forages are made of carbohydrates, which are a great source of energy for ruminants, ruminal carbohydrate fermentation produces VFA, hydrogen, and carbon dioxide. Hydrogen and carbon dioxide are utilized by methanogens which produce methane, a greenhouse gas. Carbohydrate degradation is performed by bacteria, protozoa, fungi, and archaea.

Forage is primarily composed of cellulose, hemicellulose, and pectin (Dehority, 1973). For degradation of these structures to occur, secretion of several enzymes is crucial from different ruminal microorganisms. Forages are mainly degraded by cellulolytic bacteria, followed by protozoa, and fungi (Hungate, 1966). The most prominent cellulolytic bacteria is *Fibrobacter* *succinogenes*, which uses a combination of hemicellulose degrading enzymes to remove hemicelluloses from forage. One of the most resistant plant structures to degrade is cellulose and microorganisms such as *Bacteroides succinogenes* and *Ruminococcus flavefaciens* can produce high concentrations of cellulase, the enzyme that degrades cellulose. However, non-cellulolytic microorganisms like *Selenomonas ruminantium*, *Bacteroides ruminicola*, and *Streptococcus bovis* can utilize cellodextrins, which are small fragments of cellulose. This could explain the high numbers of non-cellulolytic bacteria in cows fed with poor-quality forage, and cross-feeding of cellodextrin between cellulolytic and non-cellulolytic bacteria. Usually, fiber degrading bacteria will provide non-cellulolytic microorganisms with cellodextrins (intermediates of forage degradation); which can increase fiber digestion by feeding other microbes in the rumen that help in the degradation process.

Hemicellulose can only be partially degraded because of its complex structure. The bacterium *Butyrivibrio fibrisolvens* is known for its hemicellulose degrading capacity in the rumen; however, its ability to degrade it is very low. Hemicellulose is essential for ruminal bacterial growth of cellulolytic species like *Butyrivibrio fibrisolvens*. In addition, *Butyrivibrio fibrisolvens* can also utilize hemicellulose end products for growth. Hemicellulose is mainly degraded by the enzyme celloxylanase, which degrades celluloses and xylans structures in plants. Celluxylanases perform the initial breakdown of fiber in the plant cell wall.

In the rumen, pectin is the only plant structure that is completely degraded (Chesson and Monro, 1982; Nagaraja, 2016). The most common ruminal pectinolytic microorganisms are *Prevotella sp*., *Lachnospira multiparus*, *Streptococcus bovis*, and *Treponema sp*. (Nagaraja, 2016). Some cellulolytic microorganisms such as *Ruminococcus albus* and *Fibrobacter succinogenes* can degrade pectin. Although pectin is rapidly degraded in the rumen, ruminal microorganisms that degrade pectin produce as a byproduct acetate and low concentrations of butyrate without producing lactate despite of rumen pH.

As mentioned previously, the development of NGS has allowed us to take a "Microbial census" in a way we never could before, which has allowed us to understand the bacterial diversity and understanding the interactions within the rumen. Over the past decade, microbiome analyses have become more accessible in terms of cost and technology (Henderson et al., 2015; Henderson et al., 2019). While we now have access to this technology, many ruminal microorganisms remain unknown, to the point that we only know less than 4% of the total microbes present in the rumen. As we mentioned, forage degradation is a complex process that every day with the help of new technologies a better understanding of microbial populations in the rumen is obtained. Understanding the rumen microbiome is imperative to improve forage utilization and efficiency in cattle.

We at UGA Animal and Dairy Science are working to understand which microbes are most involved in degradation of your forages, and how your cows convert the forage into milk. If we can deepen our understanding of which microbes perform which task in the forage degradation cascade, then we can develop approaches to adjust the ruminal microbial population to enhance forage degradation. As we improve the degradation of forage, we can reduce the amount of forage that is lost as methane and increase the amount that goes to VFA which gives more energy to your cows. This benefits you as the producer at your farm bottom line and improves sustainability of milk production.

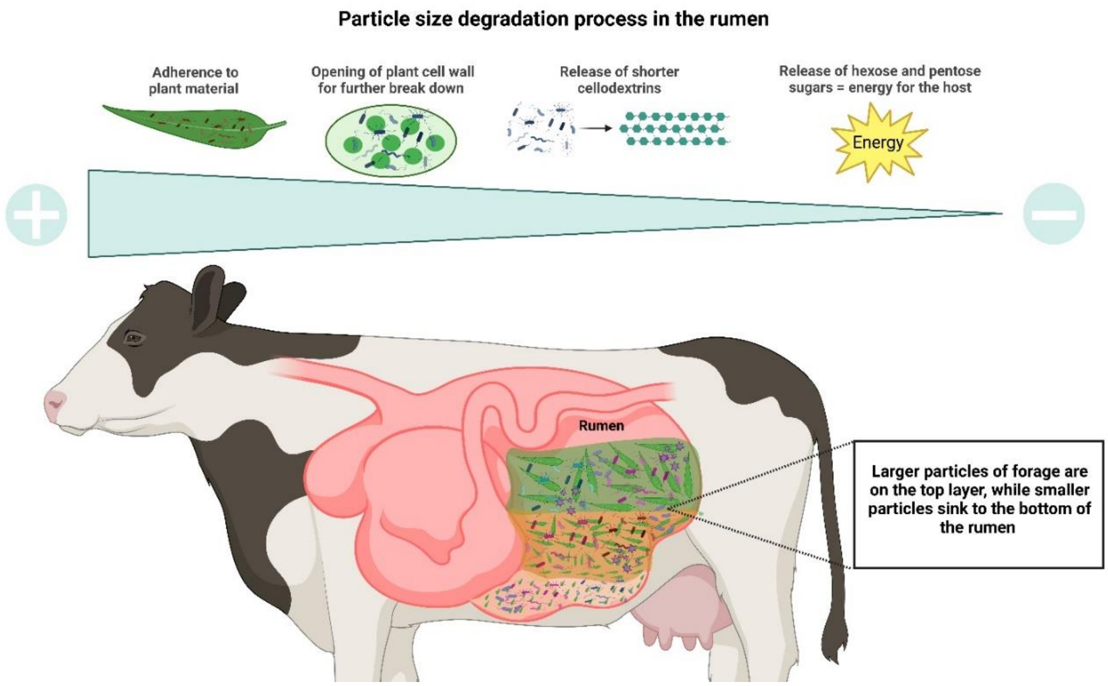

***Figure 1*.** Process of forage degradation in the rumen and changes of particle size through degradation by ruminal microorganisms and view of different particle sizes of forage inside the rumen.

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Important Dates

2023

Heat stress workshop

- May 2^{nd}, 2023
- Morgan County Extension office, 440 Hancock Street Madison, GA 30650
- Hosted by UGA Dairy Extension Specialists and County agents
- Lunch will be provided

UNIVERSITY OF GEORGIA EXTENSION

Top GA DHIA By Test Day Milk Production – December 2022										
					Test Day Average				Yearly Average	
Herd	County	Br.	Test Date	[1]Cows	% in Milk	Milk	% Fat	TD Fat	Milk	Lbs. Fat
DANNY BELL*	Morgan	HO	11/29/2022	337	90	96	4.1	3.56	29523	1189
GODFREY DAIRY FARM*	Morgan	HO	11/28/2022	1254	89	94.4	3.9	3.16	32311	1288
SCHAAPMAN HOLSTEINS*	Wilcox	HO	12/10/2022	724	89	94.4	3.7	3.11	29941	1095
WDAIRY LLC*	Morgan	XX	12/19/2022	2011	87	90.1	4.4	3.41	28883	1281
SCOTT GLOVER	Hall	HO	12/6/2022	145	88	86.3	3.9	2.97	27997	1068
ARROWHEAD DAIRY LLC	Burke	HO	12/13/2022	1156	89	85.9	4	3	27581	1022
MARTIN DAIRY L. L. P.	Hart	HO	12/20/2022	318	89	82.3	4.2	2.81	26534	1132
A & J DAIRY*	Wilkes	HO	12/8/2022	386	93	81	0	0	29106	
DOUG CHAMBERS	Jones	HO	12/20/2022	435	89	79.1	3.9	2.71	26383	962
TROY YODER	Macon	HO	12/7/2022	321	88	77.8	4.1	2.85	25986	950
OCMULGEE DAIRY	Houston	HO	11/30/2022	341	87	70.2	4	2.37	23778	858
JERRY SWAFFORD	Putnam	HO	12/12/2022	178	90	69.8	3.9	2.48	23355	877
UNIV OF GA DAIRY FARM	Clarke	XX	12/26/2022	126	84	66.8	4.5	2.51	19575	794
RYAN HOLDEMAN	Jefferson	HO	12/14/2022	120	88	65	3.8	2.06	22106	853
W & R FARMS, LLC	Burke	XX	12/13/2022	227	90	64.5	4.3	2.5	17491	743
ALEX MILLICAN	Walker	HO	12/14/2022	84	71	63.9	3.3	1.25	16192	545
BOB MOORE	Putnam	HO	12/5/2022	418	91	63.8	4.1	2.01	21232	862
JAMES W MOON	Morgan	HO	12/8/2022	128	87	63.3	4	1.96	19425	734
BERRY COLLEGE DAIRY	Floyd	JE	12/8/2022	32	83	61.2	5	2.77	18267	882
W.T.MERIWETHER	Morgan	HO	12/6/2022	70	82	60.9	4.2	1.86	18604	657

[1]Minimum herd or permanent string size of 20 cows. Yearly average calculated after 365 days on test. Test day milk, marked with an asterisk (*), indicates herd was milked three times per day (3X). Information in this table is compiled from Dairy Records Management Systems Reports (Raleigh, NC).

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Top GA DHIA By Test Day Fat Production – December 2022										
					Test Day Average				**Yearly Average**	
Herd	**County**	**Br.**	**Test Date**	**[1]Cows**	**% in Milk**	**Milk**	**% Fat**	**TD Fat**	**Milk**	**Lbs. Fat**
DANNY BELL*	Morgan	HO	11/29/2022	337	90	96	4.1	3.56	29523	1189
WDAIRY LLC*	Morgan	XX	12/19/2022	2011	87	90.1	4.4	3.41	28883	1281
GODFREY DAIRY FARM*	Morgan	HO	11/28/2022	1254	89	94.4	3.9	3.16	32311	1288
SCHAAPMAN HOLSTEINS*	Wilcox	HO	12/10/2022	724	89	94.4	3.7	3.11	29941	1095
ARROWHEAD DAIRY LLC	Burke	HO	12/13/2022	1156	89	85.9	4	3	27581	1022
SCOTT GLOVER	Hall	HO	12/6/2022	145	88	86.3	3.9	2.97	27997	1068
TROY YODER	Macon	HO	12/7/2022	321	88	77.8	4.1	2.85	25986	950
MARTIN DAIRY L. L. P.	Hart	HO	12/20/2022	318	89	82.3	4.2	2.81	26534	1132
BERRY COLLEGE DAIRY	Floyd	JE	12/8/2022	32	83	61.2	5	2.77	18267	882
DOUG CHAMBERS	Jones	HO	12/20/2022	435	89	79.1	3.9	2.71	26383	962
UNIV OF GA DAIRY FARM	Clarke	XX	12/26/2022	126	84	66.8	4.5	2.51	19575	794
W & R FARMS, LLC	Burke	XX	12/13/2022	227	90	64.5	4.3	2.5	17491	743
JERRY SWAFFORD	Putnam	HO	12/12/2022	178	90	69.8	3.9	2.48	23355	877
OCMULGEE DAIRY	Houston	HO	11/30/2022	341	87	70.2	4	2.37	23778	858
RODNEY & CARLIN GIESBRECHT	Washington	XX	12/27/2022	412	93	60.4	4.3	2.24	21717	867
BUDDHA BELLY FARM LLC	Brooks	XX	12/16/2022	761	87	57.8	4.2	2.2	17131	678
HORST CREST FARMS	Jenkins	HO	11/30/2022	143	87	59.6	4.2	2.13	19523	759
RYAN HOLDEMAN	Jefferson	HO	12/14/2022	120	88	65	3.8	2.06	22106	853
GRASSY FLATS	Brooks	XX	12/7/2022	771	87	57.6	3.9	2.05	17291	684
BOB MOORE	Putnam	HO	12/5/2022	418	91	63.8	4.1	2.01	21232	862

[1]Minimum herd or permanent string size of 20 cows. Yearly average calculated after 365 days on test. Test day milk, marked with an asterisk (*), indicates herd was milked three times per day (3X). Information in this table is compiled from Dairy Records Management Systems Reports (Raleigh, NC).

UNIVERSITY OF GEORGIA EXTENSION

Top GA DHIA By Test Day Milk Production – January 2023										
					Test Day Average				Yearly Average	
Herd	**County**	**Br.**	**Test date**	**[1]Cows**	**% in Milk**	**Milk**	**% Fat**	**TD Fat**	**Milk**	**Lbs. Fat**
SCHAAPMAN HOLSTEINS*	Wilcox	HO	1/22/2023	736	89	101.5	3.9	3.53	30091	1099
GODFREY DAIRY FARM*	Morgan	HO	1/2/2023	1275	89	96.4	4	3.38	32147	1279
DANNY BELL*	Morgan	HO	1/3/2023	338	90	96.1	4.1	3.51	29868	1194
WDAIRY LLC*	Morgan	XX	1/23/2023	2032	87	92.8	4.6	3.74	28765	1281
SCOTT GLOVER	Hall	HO	1/10/2023	139	87	88.9	4.3	3.33	27861	1062
A & J DAIRY*	Wilkes	HO	1/12/2023	383	93	83.8	0	0	29321	
MARTIN DAIRY L. L. P.	Hart	HO	12/20/2022	318	89	82.3	4.2	2.81	26534	1132
ARROWHEAD DAIRY LLC	Burke	HO	1/11/2023	1163	89	81.2	4	2.89	27724	1035
DOUG CHAMBERS	Jones	HO	1/24/2023	441	89	81.1	3.7	2.61	26362	963
VISSCHER DAIRY LLC*	Jefferson	HO	12/28/2022	773	86	80.1	0	0	25021	57
OCMULGEE DAIRY	Houston	HO	1/26/2023	333	86	78.4	3.6	2.38	23499	860
TROY YODER	Macon	HO	1/5/2023	327	88	76.6	4	2.67	26052	962
JERRY SWAFFORD	Putnam	HO	1/16/2023	170	90	73.7	3.8	2.64	23481	882
DONALD NEWBERRY	Bibb	HO	1/4/2023	94	81	72.9	3.4	2.22	17837	594
UNIV OF GA DAIRY FARM	Clarke	XX	1/25/2023	129	83	67.5	4.3	2.41	19736	805
HORST CREST FARMS	Jenkins	HO	1/26/2023	170	87	67.4	4.1	2.47	19486	771
RYAN HOLDEMAN	Jefferson	HO	1/18/2023	117	90	66.7	3.7	2.34	22652	881
BOB MOORE	Putnam	HO	1/9/2023	428	91	66.3	4.5	2.56	20851	843
ALEX MILLICAN	Walker	HO	1/25/2023	81	71	65.9	3.3	1.58	16188	545
JAMES W MOON	Morgan	HO	1/12/2023	127	86	64.3	4	2.09	19283	728

[1]Minimum herd or permanent string size of 20 cows. Yearly average calculated after 365 days on test. Test day milk, marked with an asterisk (*), indicates herd was milked three times per day (3X). Information in this table is compiled from Dairy Records Management Systems Reports (Raleigh, NC).

UNIVERSITY OF GEORGIA EXTENSION

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SCHAAPMAN HOLSTEINS*	Wilcox	HO	1/22/2023	736	89	101.5	3.9	3.53	30091	1099
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GODFREY DAIRY FARM*	Morgan	HO	1/2/2023	1275	89	96.4	4	3.38	32147	1279
SCOTT GLOVER	Hall	HO	1/10/2023	139	87	88.9	4.3	3.33	27861	1062
BERRY COLLEGE DAIRY	Floyd	JE	1/10/2023	31	84	63.4	5.3	3.14	18682	911
ARROWHEAD DAIRY LLC	Burke	HO	1/11/2023	1163	89	81.2	4	2.89	27724	1035
MARTIN DAIRY L. L. P.	Hart	HO	12/20/2022	318	89	82.3	4.2	2.81	26534	1132
TROY YODER	Macon	HO	1/5/2023	327	88	76.6	4	2.67	26052	962
JERRY SWAFFORD	Putnam	HO	1/16/2023	170	90	73.7	3.8	2.64	23481	882
DOUG CHAMBERS	Jones	HO	1/24/2023	441	89	81.1	3.7	2.61	26362	963
W & R FARMS, LLC	Burke	XX	1/17/2023	225	90	63.3	4.6	2.6	17862	756
BOB MOORE	Putnam	HO	1/9/2023	428	91	66.3	4.5	2.56	20851	843
HORST CREST FARMS	Jenkins	HO	1/26/2023	170	87	67.4	4.1	2.47	19486	771
UNIV OF GA DAIRY FARM	Clarke	XX	1/25/2023	129	83	67.5	4.3	2.41	19736	805
OCMULGEE DAIRY	Houston	HO	1/26/2023	333	86	78.4	3.6	2.38	23499	860
BUDDHA BELLY FARM LLC	Brooks	XX	1/16/2023	762	87	57.3	4.3	2.35	17350	692
RYAN HOLDEMAN	Jefferson	HO	1/18/2023	117	90	66.7	3.7	2.34	22652	881
RODNEY & CARLIN GIESBRECHT	Washington	XX	1/24/2023	426	93	62.6	4.2	2.34	21560	865
DONALD NEWBERRY	Bibb	HO	1/4/2023	94	81	72.9	3.4	2.22	17837	594

[1]Minimum herd or permanent string size of 20 cows. Yearly average calculated after 365 days on test. Test day milk, marked with an asterisk (*), indicates herd was milked three times per day (3X). Information in this table is compiled from Dairy Records Management Systems Reports (Raleigh, NC).

Top GA DHIA By Test Day Milk Production – February 2023										
					Test Day Average				Yearly Average	
Herd	County	Br.	Test Date	[1]Cows	% in Milk	Milk	% Fat	TD Fat	Milk	Lbs. Fat
SCHAAPMAN HOLSTEINS*	Wilcox	HO	2/25/2023	748	89	101.9	3.9	3.67	30415	1113
DANNY BELL*	Morgan	HO	1/31/2023	338	91	96.6	4	3.6	30114	1199
GODFREY DAIRY FARM*	Morgan	HO	1/30/2023	1271	89	95	4	3.43	31993	1261
WDAIRY LLC*	Morgan	XX	2/20/2023	1992	87	93	4.4	3.61	28763	1285
MARTIN DAIRY L. L. P.	Hart	HO	2/23/2023	302	89	90.7	4	3.24	26961	1142
A & J DAIRY*	Wilkes	HO	2/8/2023	392	93	83.7	0	0	29259	
DOUG CHAMBERS	Jones	HO	2/21/2023	436	88	83.4	3.8	2.74	26197	961
SCOTT GLOVER	Hall	HO	2/6/2023	112	87	82.1	4.4	3.26	27700	1057
TROY YODER	Macon	HO	2/23/2023	315	88	82.1	4.1	3.06	25767	971
OCMULGEE DAIRY	Houston	HO	2/23/2023	328	86	81.3	3.5	2.46	23483	860
ARROWHEAD DAIRY LLC	Burke	HO	2/8/2023	1189	90	79.2	3.8	2.75	27622	1034
JERRY SWAFFORD	Putnam	HO	2/13/2023	161	90	74.4	3.6	2.6	23419	880
UNIV OF GA DAIRY FARM	Clarke	XX	2/23/2023	135	84	72.5	4.1	2.6	20020	818
RYAN HOLDEMAN	Jefferson	HO	2/15/2023	115	91	69.6	3.7	2.51	22758	881
HORST CREST FARMS	Jenkins	HO	1/26/2023	170	87	67.4	4.1	2.47	19486	771
DONALD NEWBERRY	Bibb	HO	2/1/2023	97	83	67.2	3.4	2.07	18809	625
JAMES W MOON	Morgan	HO	2/8/2023	121	86	66.3	4.1	2.45	19149	726
ALEX MILLICAN	Walker	HO	1/25/2023	81	71	65.9	3.3	1.58	16188	545
BOB MOORE	Putnam	HO	2/6/2023	428	91	65.3	4.4	2.6	20876	850
RODNEY & CARLIN GIESBRECHT	Washington	HO	2/21/2023	410	93	65.1	3.9	2.31	21512	863

[1]*Minimum herd or permanent string size of 20 cows. Yearly average calculated after 365 days on test. Test day milk, marked with an asterisk (*), indicates herd was milked three times per day (3X). Information in this table is compiled from Dairy Records Management Systems Reports (Raleigh, NC).*

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Top GA DHIA By Test Day Fat Production – February 2023										
					Test Day Average				Yearly Average	
Herd	**County**	**Br.**	**Test Date**	**[1]Cows**	**% in Milk**	**Milk**	**% Fat**	**TD Fat**	**Milk**	**Lbs. Fat**
SCHAAPMAN HOLSTEINS*	Wilcox	HO	2/25/2023	748	89	101.9	3.9	3.67	30415	1113
WDAIRY LLC*	Morgan	XX	2/20/2023	1992	87	93	4.4	3.61	28763	1285
DANNY BELL*	Morgan	HO	1/31/2023	338	91	96.6	4	3.6	30114	1199
GODFREY DAIRY FARM*	Morgan	HO	1/30/2023	1271	89	95	4	3.43	31993	1261
SCOTT GLOVER	Hall	HO	2/6/2023	112	87	82.1	4.4	3.26	27700	1057
MARTIN DAIRY L. L. P.	Hart	HO	2/23/2023	302	89	90.7	4	3.24	26961	1142
TROY YODER	Macon	HO	2/23/2023	315	88	82.1	4.1	3.06	25767	971
ARROWHEAD DAIRY LLC	Burke	HO	2/8/2023	1189	90	79.2	3.8	2.75	27622	1034
DOUG CHAMBERS	Jones	HO	2/21/2023	436	88	83.4	3.8	2.74	26197	961
BOB MOORE	Putnam	HO	2/6/2023	428	91	65.3	4.4	2.6	20876	850
JERRY SWAFFORD	Putnam	HO	2/13/2023	161	90	74.4	3.6	2.6	23419	880
UNIV OF GA DAIRY FARM	Clarke	XX	2/23/2023	135	84	72.5	4.1	2.6	20020	818
RYAN HOLDEMAN	Jefferson	HO	2/15/2023	115	91	69.6	3.7	2.51	22758	881
W & R FARMS, LLC	Burke	XX	2/13/2023	222	90	63.3	4.3	2.49	18127	767
HORST CREST FARMS	Jenkins	HO	1/26/2023	170	87	67.4	4.1	2.47	19486	771
OCMULGEE DAIRY	Houston	HO	2/23/2023	328	86	81.3	3.5	2.46	23483	860
JAMES W MOON	Morgan	HO	2/8/2023	121	86	66.3	4.1	2.45	19149	726
BERRY COLLEGE DAIRY	Floyd	JE	2/7/2023	31	84	56.4	4.7	2.39	18915	923
RODNEY & CARLIN GIESBRECHT	Washington	HO	2/21/2023	410	93	65.1	3.9	2.31	21512	863
BUDDHA BELLY FARM LLC	Brooks	XX	2/19/2023	715	88	54.7	4.2	2.26	17573	705

[1]***Minimum herd or permanent string size of 20 cows. Yearly average calculated after 365 days on test. Test day milk, marked with an asterisk (*), indicates herd was milked three times per day (3X). Information in this table is compiled from Dairy Records Management Systems Reports (Raleigh, NC).***

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Top GA Low Herds for SCC – TD Average Score – December 2022									
Herd	**County**	**Test Date**	**Br.**	**[1]Cows**	**Milk-Rolling**	**SCC-TD-Average Score**	**SCC-TD-Weight Average**	**SCC-Average Score**	**SCC-Wt.**
SCOTT GLOVER	Hall	12/6/2022	HO	145	27997	1.5	87	1.6	94
DANNY BELL*	Morgan	11/29/2022	HO	337	29523	1.6	111	1.9	149
BERRY COLLEGE DAIRY	Floyd	12/8/2022	JE	32	18267	2	86	1.7	80
W & R FARMS, LLC	Burke	12/13/2022	XX	227	17491	2.1	92	2.6	216
WDAIRY LLC*	Morgan	12/19/2022	XX	2011	28883	2.1	127	2.3	186
GODFREY DAIRY FARM*	Morgan	11/28/2022	HO	1254	32311	2.2	200	2.2	203
ARROWHEAD DAIRY LLC	Burke	12/13/2022	HO	1156	27581	2.4	204	2	154
MARTIN DAIRY L. L. P.	Hart	12/20/2022	HO	318	26534	2.6	201	2.4	164
DOUG CHAMBERS	Jones	12/20/2022	HO	435	26383	2.7	212	2.7	244
UNIV OF GA DAIRY FARM	Clarke	12/26/2022	XX	126	19575	2.7	229	2.3	200
W.T.MERIWETHER	Morgan	12/6/2022	HO	70	18604	2.8	287	3.2	334
TROY YODER	Macon	12/7/2022	HO	321	25986	2.9	212	2.6	174
RYAN HOLDEMAN	Jefferson	12/14/2022	HO	120	22106	2.9	289	2.6	284
JAMES W MOON	Morgan	12/8/2022	HO	128	19425	2.9	319	2.9	286
ROGERS FARM SERVICES	Tattnall	11/29/2022	XX	170	16632	3	179	3.4	365
RODNEY & CARLIN GIESBRECHT	Washington	12/27/2022	XX	412	21717	3	264	2.7	282
ALEX MILLICAN	Walker	12/14/2022	HO	84	16192	3	295	2.4	220
JERRY SWAFFORD	Putnam	12/12/2022	HO	178	23355	3.1	383	2.8	227
HORST CREST FARMS	Jenkins	11/30/2022	HO	143	19523	3.3	324	2.9	253
AUSTIN WALDROUP	Troup	12/15/2022	XX	122	10780	3.3	403	3.2	412

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Top GA Low Herds for SCC –TD Average Score – January 2023									
Herd	**County**	**Test Date**	**Br.**	**[1]Cows**	**Milk-Rolling**	**SCC-TD-Average Score**	**SCC-TD-Weight Average**	**SCC-Average Score**	**SCC-Wt.**
BERRY COLLEGE DAIRY	Floyd	1/10/2023	JE	31	18682	1.8	62	1.7	71
SCOTT GLOVER	Hall	1/10/2023	HO	139	27861	1.8	125	1.6	99
DANNY BELL*	Morgan	1/3/2023	HO	338	29868	1.8	126	1.9	145
WDAIRY LLC*	Morgan	1/23/2023	XX	2032	28765	2.1	140	2.3	184
GODFREY DAIRY FARM*	Morgan	1/2/2023	HO	1275	32147	2.1	141	2.2	200
ARROWHEAD DAIRY LLC	Burke	1/11/2023	HO	1163	27724	2.1	147	2	154
W & R FARMS, LLC	Burke	1/17/2023	XX	225	17862	2.3	157	2.5	207
UNIV OF GA DAIRY FARM	Clarke	1/25/2023	XX	129	19736	2.4	203	2.3	195
DONALD NEWBERRY	Bibb	1/4/2023	HO	94	17837	2.5	167	2.8	220
TROY YODER	Macon	1/5/2023	HO	327	26052	2.5	208	2.6	179
RYAN HOLDEMAN	Jefferson	1/18/2023	HO	117	22652	2.5	226	2.7	288
JERRY SWAFFORD	Putnam	1/16/2023	HO	170	23481	2.5	231	2.8	229
ALEX MILLICAN	Walker	1/25/2023	HO	81	16188	2.6	198	2.5	231
MARTIN DAIRY L. L. P.	Hart	12/20/2022	HO	318	26534	2.6	201	2.4	164
DOUG CHAMBERS	Jones	1/24/2023	HO	441	26362	2.6	230	2.7	241
W.T.MERIWETHER	Morgan	1/10/2023	HO	70	18258	2.7	163	3.2	329
SCHAAPMAN HOLSTEINS*	Wilcox	1/22/2023	HO	736	30091	2.8	246	2.5	217
HORST CREST FARMS	Jenkins	1/26/2023	HO	170	19486	2.9	246	3	259
JAMES W MOON	Morgan	1/12/2023	HO	127	19283	2.9	248	2.9	284
RODNEY & CARLIN GIESBRECHT	Washington	1/24/2023	XX	426	21560	3	319	2.7	285

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Top GA Low Herds for SCC –TD Average Score – February 2023									
Herd	**County**	**Test Date**	**Br.**	**[1]Cows**	**Milk-Rolling**	**SCC-TD-Average Score**	**SCC-TD-Weight Average**	**SCC-Average Score**	**SCC-Wt.**
SCOTT GLOVER	Hall	2/6/2023	HO	112	27700	1.7	106	1.6	101
BERRY COLLEGE DAIRY	Floyd	2/7/2023	JE	31	18915	1.9	77	1.7	72
WDAIRY LLC*	Morgan	2/20/2023	XX	1992	28763	1.9	133	2.3	181
DANNY BELL*	Morgan	1/31/2023	HO	338	30114	1.9	154	1.8	146
ARROWHEAD DAIRY LLC	Burke	2/8/2023	HO	1189	27622	2.1	161	2.1	155
GODFREY DAIRY FARM*	Morgan	1/30/2023	HO	1271	31993	2.1	163	2.2	192
UNIV OF GA DAIRY FARM	Clarke	2/23/2023	XX	135	20020	2.1	164	2.3	190
W & R FARMS, LLC	Burke	2/13/2023	XX	222	18127	2.2	107	2.5	195
DONALD NEWBERRY	Bibb	2/1/2023	HO	97	18809	2.4	150	2.8	222
TROY YODER	Macon	2/23/2023	HO	315	25767	2.5	164	2.6	178
DOUG CHAMBERS	Jones	2/21/2023	HO	436	26197	2.5	215	2.7	244
RYAN HOLDEMAN	Jefferson	2/15/2023	HO	115	22758	2.6	195	2.7	275
ALEX MILLICAN	Walker	1/25/2023	HO	81	16188	2.6	198	2.5	231
MARTIN DAIRY L. L. P.	Hart	2/23/2023	HO	302	26961	2.6	233	2.5	167
W.T.MERIWETHER	Morgan	2/7/2023	HO	70	18254	2.8	189	3.2	318
JERRY SWAFFORD	Putnam	2/13/2023	HO	161	23419	2.8	274	2.8	239
RODNEY & CARLIN GIESBRECHT	Washington	2/21/2023	HO	410	21512	2.8	274	2.8	294
HORST CREST FARMS	Jenkins	1/26/2023	HO	170	19486	2.9	246	3	259
JAMES W MOON	Morgan	2/8/2023	HO	121	19149	2.9	290	2.9	284
ROGERS FARM SERVICES	Tattnall	1/31/2023	XX	161	16550	3.3	217	3.4	353

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