Animal and Dairy Science Department
Rhodes Center for Animal & Dairy Science

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GEORGIA DAIRYFAX

http://www.ads.uga.edu/extension/newsletters.html

APRIL MAY JUNE 2015

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.

INSIDE THIS ISSUE: April, May, and June 2015

Sincerely,

William M. Graves
Professor & Extension Dairy Scientist

County Extension Director or County Agent

Embryo Transfer: The Compromise between Reproduction and Summer Heat Stress

Dr. Jillian Bohlen, Assistant Professor
Ms. Lark Widener, Dairy Graduate Student

Many only think of embryo transfer (ET) as it relates to expanding the genetic elite. For those in the south, with daunting months of elevated temperatures, this advanced reproductive technique (ART) may provide an additional benefit. Collecting cows in cool months for transfer in hot may help bypass the debilitating stress of summer, when high humidity and ambient temperature wreak havoc on a producer's reproductive program. Proper cooling mechanisms can help offset some of the deleterious effects but most would agree that getting cows pregnant over summer is a considerable challenge. Pregnancies achieved over summer would help avoid long days in milk and reduce days of low income over feed costs.

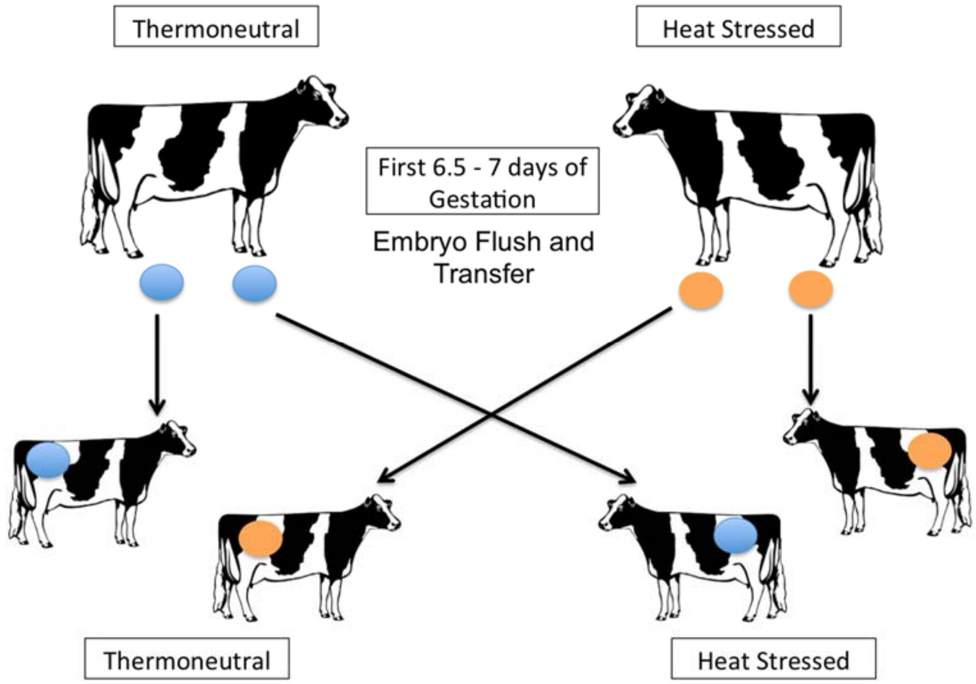
Dairy cows are amongst a larger cohort of species that suffer reduced reproductive success during times of heat stress. The lactating dairy cow is unique in that heat stress occurs at a much lower ambient temperature than for most other species. This is due in large part to the vast amounts of internal, metabolic heat she creates when converting large volumes of feed to milk. Knowing when cows are heat stressed is critical; however can be challenging because stress levels are dependent on both temperature and humidity. Most are familiar with the temperature-humidity-index (THI) for lactating dairy cows and now there is an "app for that." Purina Animal Nutrition, LLC offers an app called Purina Cool Cow™ that can help you track when animals in your herd are under various levels of heat stress.

Embryo transfer has the capability of providing more pregnancies over artificial insemination (AI) during the hot summer months where elevated THI numbers have cows feeling the stress. To begin to understand why, it is important to understand how reproduction is negatively impacted by heat stress. Heat stress hinders a number of critical control points for reproduction in hot summer months. These include reduced estrous expression (heats), changes in follicular development, reduced oocyte competency, decreased fertilization rates, and reduced embryonic quality. It is unlikely that these factors work independently to hamper reproduction but instead that the combination of events results in pregnancy failure. The first three factors mentioned (heats, follicular development, oocyte competency) all precede AI while the fourth (fertilization rate) occurs just hours after. If utilizing ET, these first four factors would have occurred in the donor cow, which was collected in cooler months and thus would not be impacted by the high THI environment the recipient cow is currently enduring. Interestingly, the effect of heat stress on the remaining factor (embryo quality) may also be circumvented with the use of ET. This piece of the puzzle is a more complicated to explain.

Early embryonic death (EED) is one of the leading reasons for reduction in pregnancy rates over the summer months. Early embryonic death is best defined as those embryonic losses that occur prior to maternal recognition of pregnancy, which occurs at approximately 14-17 days after fertilization. For the producer, these deaths are unrecognizable and pregnancy failure often misclassified because there is no disruption in cyclicity. Evidence of why heat stressed embryos undergo higher rates of EED is found abundantly in the literature. The basic concept is that heat stressed embryos exhibit retardation of development with a reduced developmental stage and alterations of morphological characteristics. Whether the embryo is developing in a heat stressed dam or exposed to elevated temperatures in culture, it is apparent that heat has a direct impact on embryonic development and its competency to establish pregnancy. The inability to establish pregnancy may be the direct result of embryonic death or the inability of the developmentally delayed embryo to signal for recognition by the dam. The complete cause of EED as a result of heat stress is likely multifactorial.

Numerous trials have directly demonstrated the impact of heat stress on early embryonic development and pregnancy rates. In these research trials, animals were kept at thermoneutral or "comfortable" conditions through breeding. After breeding, half of the animals had their environment changed to hyperthermic or "heat stressed" for approximately seven days with the use of environmental chambers. In both heifers and cows, pregnancy rates were greatly reduced in those animals that moved to hyperthermic conditions post insemination. Studies where hyperthermic conditions were induced later in embryonic development (after day 7) showed less impact on pregnancy rates. This latter piece of research evidence is where the promise of ET lies. As it happens, ET is capable of at least partially overcoming this final insult that heat stress plays on reproduction because as the embryo develops, its resistance to heat stress actually increases. Thereby, using ET would allow a more developed and more heat resistant embryo to be transferred into the heat stressed cow.

Further work to demonstrate the promise of using ET to combat developmental issues of the embryo caused by heat stress is provided by crossover trials. In these trials, standard embryo flush and recovery procedures were followed with embryo collection at approximately 6.5-7 days of age. Recipients, either in thermoneutral or heat stressed conditions were then assigned embryos from either thermoneutral or heat stressed donors. See figure below:



Embryos collected from a thermoneutral donor animals maintained a higher rate of successful pregnancies than those from a heat stressed donors regardless of the recipient's thermal environment. Additionally, heat stressed recipients of embryos from thermonetural donors had higher pregnancy rates than heat stressed animals bred with conventional AI. As a final piece, in vitro produced embryos transferred into heat stressed animals resulted in improved pregnancy rates when compared with AI during bouts of heat stress.

As a leaving note, ET is an alternative way to explore improving reproductive performance of cows during the battle of heat stress. As with AI, success with ET will rise when coupled with exceptional heat abatement practices. The embryos should be recovered from cows during periods without heat stress and stored for use in the warmer months. ET may also be important in the months coming out of heat stress as the effects of heat stress can stay with cows after the days of summer have passed. Evidence suggests that there is an impact on the developing follicular pool that may remain evident for approximately 2 months or 3-4 cycles after final heat insult. Only after this point might a producer reclaim the reproductive rates that he finds in the depth of winter.

In addition to ET, there are a number of other proven strategies to help offset the effects of heat stress on a reproductive program. These include forcing accessory corpora lutea (CLs), providing supplemental progesterone after AI, and the use of rBST. Using ET does require a higher investment and preplanning than traditional AI but offers the promise of paying back with interest in pregnancies during summer months.

2015 Corn Silage and Forage Field Day

The 2015 Corn Silage and Forage Field Day will be held on June 18 at the University of Georgia Tifton Campus Conference Center with registration beginning at 7:30 am and the program beginning at 8 am. The field day is co-sponsored by the University of Georgia and University of Florida and provides an opportunity for producers to see new varieties of corn and summer annual hybrids and get updates on forage production and feeding. The key note speaker is Dr. Zvi Weinberg, Volcani Institute in Israel, who will discuss the use of silage inoculants to minimize nutrient losses in stored forage. There will be two breakout sessions with talks on sugar cane aphid control by Dr. David Buntin; disease control in corn for silage by Dr. Bob Kemerait, and feeding management with low milk prices by Dr. Jose Santos. In addition to these topics, several companies will have exhibits for attendees to learn about the products they offer. After lunch, the attendees are invited to a field demonstration on baleage production. Dr. Hancock will discuss keys to making great baleage and various companies will demonstrate equipment used for making baleage. The University of Georgia Tifton Campus Conference Center is located adjacent to I-75 on exit 64. If you have any questions, please contact Dr. John K. Bernard at jbernard@uga.edu or 229-391-6856.

A SUMMARY OF THE GEORGIA STATE JUNIOR LIVESTOCK PROGRAM

R. E. SILCOX

SUMMARY

Animal and Dairy Science programs provide educational opportunities for youth in Georgia. During the 2014-2015 school year 2302 youth participated in state-wide 4-H/FFA livestock show projects. Participants in state livestock show projects in 2014-2015 included 870 4-H members and 1432 FFA members. There were 4565 animals entered as state livestock projects.

INTRODUCTION

Animal and Dairy Science educational programs cover the entire state of Georgia through 4-H junior livestock projects and events. Animal and Dairy Science faculty and staff work with 4-H staff in the development and implementation of these programs. Livestock show projects are conducted jointly with FFA and involve state department of education staff, as well as staff from the state department of agriculture and various commodity groups.

Junior programs provide youths with an awareness of animal products, economics of livestock production, methods of livestock production, and environmental issues involving animal agriculture. In addition, these programs encourage youth to develop important life skills including communication skills, leadership abilities, decision making skills, and a sense of responsibility.

RESULTS AND DISCUSSION

The numbers of animal entered in state projects and the numbers shown at state shows by 4-H and FFA members are presented in Table 1. State market lamb and market goat shows are held at the Georgia National Fair in October. State steer, beef heifer, dairy heifer, market hog and breeding ewe shows are held at the Georgia Junior National Stock Show in February. Entry deadlines for the various shows are 3-6 months before the state show. As shown in Table 1, there were 4565 animals entered as state projects in all shows and only 3256 (71%) were shown at the state level. Some of the animals entered do not make it to the state show for a variety of reasons, but most of those are shown at other local shows and fairs.

Many youth enter more than one project, so the total of the exhibitor columns in Table 1 is not the total number of individuals. During the 2014-2015 school year, 2302 youth entered animals in state 4H/FFA projects. Of these 870 entered as 4H and 1432 entered as FFA.

As shown in Table 1, there are more market hogs, steers, beef heifers and dairy heifers shown by FFA members than 4-H members and there are more market lambs, market goats and breeding ewes shown by 4-H members. One reason for this is that there is a difference in age requirements for the different shows. An exhibitor must be 9 years old or older to show market hogs, steers, beef heifers and dairy heifers. Exhibitors must be in the first grade or older to show sheep or goats. Sheep and goat shows attract young exhibitors who are not old enough to be in FFA.

Table 1. Georgia junior livestock show exhibitors and animals entered in 2013-2014.

	Animals				Exhibitors at Show		
	Entered	**Shown**	**4-H Shown**	**FFA Shown**	**Total**	**4-H**	**FFA**
Goat	1050	783	398	385	494	249	245
Lamb	312	249	183	66	118	85	33
Ewe	128	99	65	34	54	35	19
Hog	1977	1329	472	858	950	311	639
Steer	203	157	47	109	141	39	102
Heifer	508	360	121	239	268	93	175
Dairy	387	279	86	193	219	51	168
Total *	4565	3256	1372	1884	*	*	*

*Total numbers of animals are the sum of individual show totals. Many exhibitors compete in more than one show.

Table 2 contains the total number of animal entered in each show since 1990 when the Georgia National Fairgrounds opened and state livestock shows were moved to Perry. The first state breeding ewe show at the Georgia National Stock Show in February was held in 1995. The commercial dairy heifer show began in 1997 and the state market goat show was introduced in 2006.

Over the past seven years beef heifer and steer numbers have declined, probably due to economic conditions. Feed, fuel and cattle prices have gone up while disposable income has dropped. These have become much more expensive projects in the past few years.

The number of market goats has more than tripled since the project began in 2006, while the number of market lambs has declined over the past five years. Some of the decline in market lamb numbers is probably due to exhibitors getting involved in the goat show instead of the lamb show. During the first few years of the goat show, show goats were cheaper than show lambs and the goat project was not as competitive. This tended to draw new, young exhibitors into the goat project. As the goat project became more competitive and prices paid for show goats increased, the rate of increase in this project has slowed.

Entries in the state market hog, breeding ewe and dairy heifer shows have been fairly stable for the past ten years.

Table 2. Total number of animals entered in state shows by year of show.

Year	Beef Heifer	Dairy Heifer	Breeding Sheep	Market Goat	Market Hog	Market Lamb	Steer
1990	476				1504	550	510
1991	504				1869	664	442
1992	344				1948	954	381
1993	520				1838	864	412
1994	623				2347	807	398
1995	695		58		2518	727	419
1996	785		47		2384	609	470
1997	788	82	69		2281	553	459
1998	739	167	57		2297	516	478
1999	728	261	56		2070	548	421
2000	723	289	82		1850	523	401
2001	761	336	109		1887	521	396
2002	803	359	91		1885	530	383
2003	923	319	113		1919	528	383
2004	905	280	96		1966	452	393
2005	898	300	95		2014	524	413
2006	900	311	118	321	1955	464	414
2007	921	307	111	404	1953	444	415
2008	903	304	162	582	1973	500	396
2009	805	283	133	758	1835	418	364
2010	732	307	134	946	1932	378	324
2011	683	328	150	1061	2007	345	335
2012	644	340	116	1129	2006	316	308
2013	608	355	100	1102	2058	318	266
2014	535	389	139	1050	1992	312	252
2015	508	387	128		1977		203

How Should We Show Dairy Heifers?

By William Graves

Coming to Georgia over 14 years ago, it was exciting to be part of a very large and successful commercial heifer show program. Showing heifers by weight is still new to many. People outside Georgia are generally use to showing registered animals by birthdays. Goals for this program the last decade were made to increase participation during a slump in entries, develop enforceable rules, increase weight limits, better defined registered versus commercial heifers, develop a new scorecard that better fits commercial animals, train those involved (especially new agents and teachers) about the program, hire a new faculty member who has a deep interest in youth work and write new publications, all to make the show better for our youth involved.

Several years ago we were asked by dairy producers to look at the possibility of showing commercial heifers by average daily gain. Mathew London conducted a study at UGA working on his M.S. with 1744 Commercial Dairy Heifers shown from 2007-2010. His study was published in 2012 in the J. Dairy Sci. (95:986-996). Mean ADG for the dataset (0.65 kg or 1.4 lbs) was below industry guidelines of 0.7 to 0.8 kg (1.5-1.8 lbs). ADG and placing were virtually unrelated in the Commercial Dairy Heifer Shows. No strong correlations existed for weight, age, and ADG, when related to placing within a class. Wither height, compared to the other growth measurements, had the highest correlation to placing. For the Holsteins shown over the years 2007 and 2010, 36% of these heifers met industry guidelines. Several counties exceed this proportion greatly. Equally important, counties with low percentages of adequately grown heifers might need to reevaluate their heifer rearing programs to increase ADG in their Commercial Dairy Heifers.

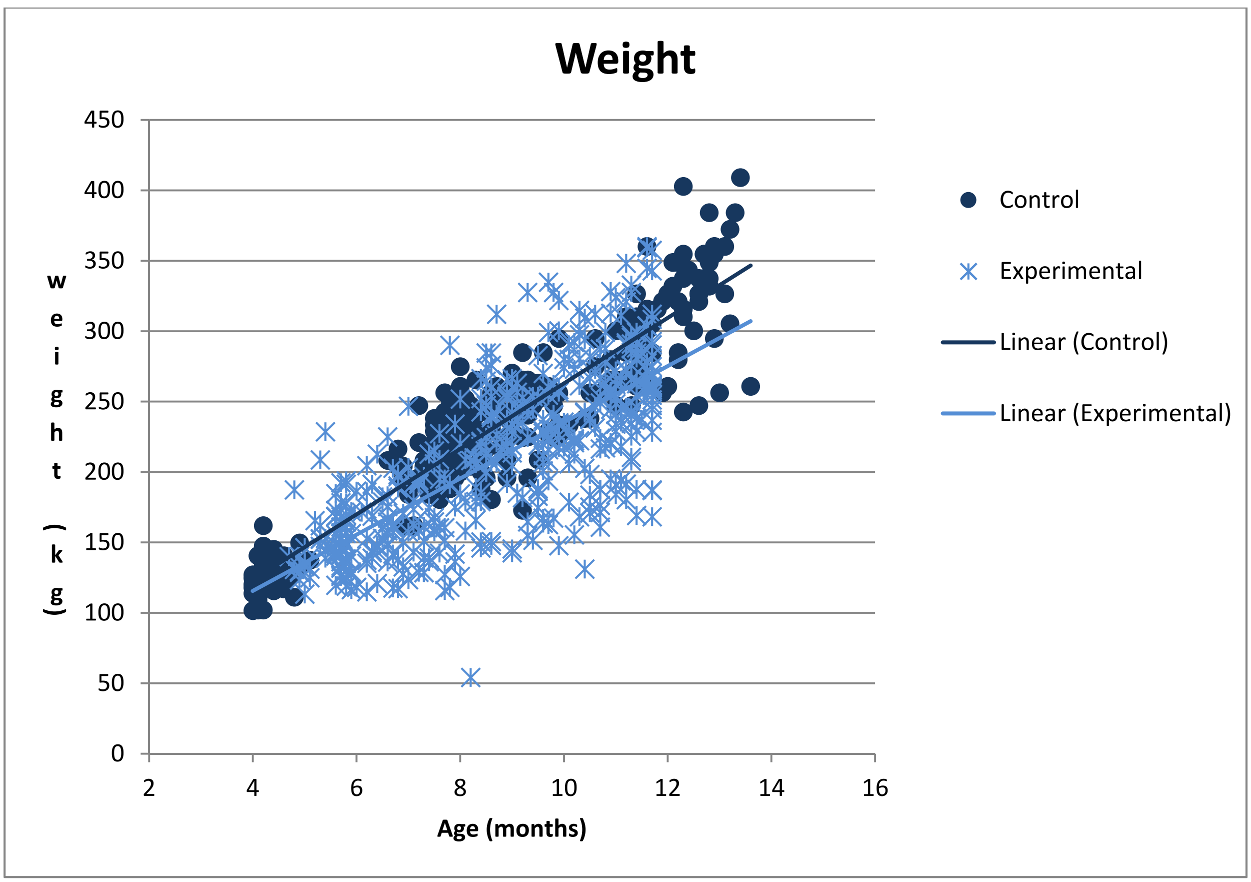
The next step was to compare show heifers to those from Georgia farms. This was part of a second study conducted by Deb Sires White working on her M.S. at UGA. From 2012 through 2014, a total of 494 Holstein heifers shown at Georgia Jr. National Livestock Show were evaluated for seven growth traits and two calculated indexes. These were compared to data from 293 Holstein heifers from 3 farms across Georgia that was evaluated for the same traits and indexes. One index was developed to look at mass. This did not use age, which is easily manipulated, as part of the formula (like ADG). Wither height was the most predictive of placing, followed by head length. The heifer mass index (HMI) was significant, but does not appear as predictive of placing. Show heifers have a lower HMI score than farm heifers of the same age. The thought of the absence of mass of commercial heifers is scary. A study following commercial heifers through calving and lactation would be interesting. Show heifers weigh less for their age than farm heifers. ADG for show heifers decreases as the heifer gets older, while ADG increases for farm heifers as age increases. Deb's study was published in 2014 in the J. Dairy Sci. (98:1345-1353).

Findings in both studies indicate a difference in management and nutritional programs of show heifers versus farm heifers. ADG would have some of the same problems as registered heifer shows manipulating birthdays to get a bigger animal in a younger class. Strength of front end, width of rump and thurls with depth of body should place over older heifers that appear sharper with less body condition. They should look commercial and have the potential to make a milk cow.

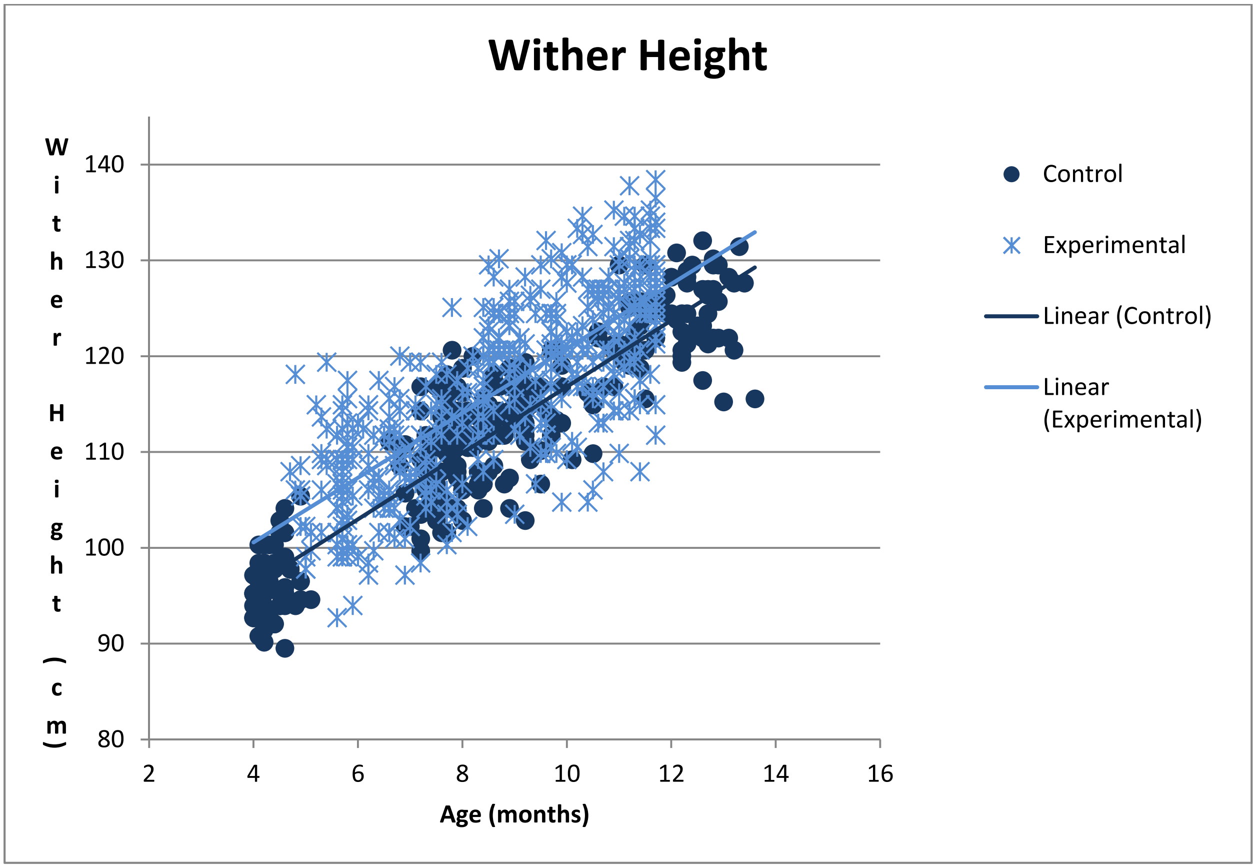
In both studies, wither height is the most predictive of placing. If we take a look at the scatter plots from the second study, how we choose to assign heifers to classes may be clearer. There appears to be quite a diversity of ages in the current weight classes being used for years in Georgia.

A scatter plot is a type of graph that is used to display data from two variables. Each observation (or heifer in our case) is shown by determining the position of one on the horizontal axis and the second on the vertical axis. These plots are helpful in seeing what is happening at our shows.

It is easy to look at the weight versus age graph for the heifers in our second study and see what is happening with age in our classes at the show. Notice when you pick a specific weight, let's say 150 kg (330.7 lbs), the number of X's (or show heifers) on that line are distributed from a little over 4 up to 10 months. Farm heifers have less variation than show heifer. Also note the differences between the two lines (which represent an average of the each group) tend to get further apart as animals get older. Over 25% of the heifers on this graph jump out because they are less than 200 kg (441 lbs) and over 200 days in age. The HMI graph (not shown) looks a lot like the weight graph below.



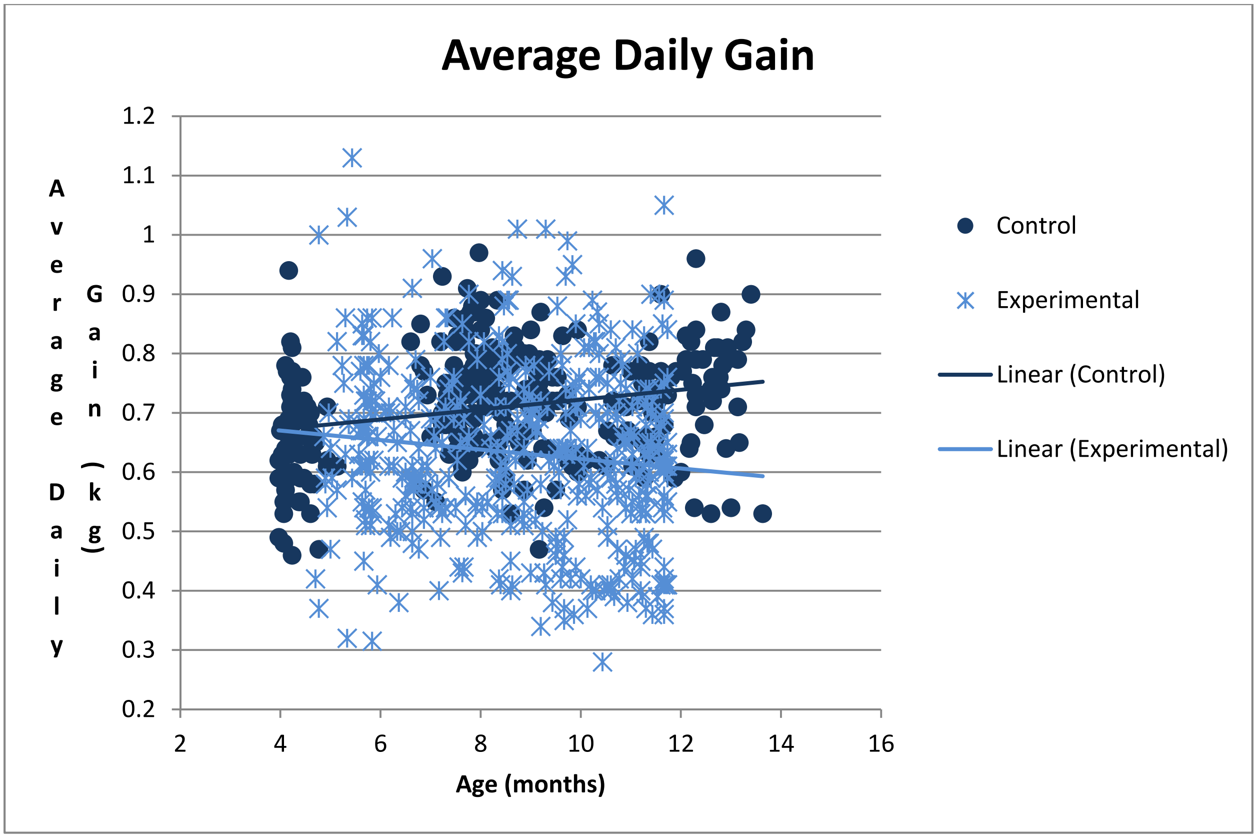
The next plot shows wither heights in relation to age. Note the number of animals at any given height is less variable for age than the weight graph. The groups are tighter and more uniform. The angle of the dots from the top to bottom are about half of the weight data. The group is not as spread out. Also, the slope of the two lines was greater than the last graph and they are similar in direction for both groups. This indicates the two groups (show heifers versus heifers from farms) are growing similarly. Finally, the line for the show heifers was greater than the farm heifers. Farm heifers were higher in all the other graphs but this graph and the one for head length (graph not shown and harder to measure).



If we look at the wither height measurements from 2012 to 2014, heifers ranged from 92.72 (36.5 in) to 138.43 cm (54.5 in). With 12 animals per class, animals would be about 2 cm different (less than an inch) per class. The first and last class may vary a little more. Hopefully if age is still an issue, uniformity will be closer.

Wither heights can be done anywhere in the barn, does not require a scale, and there would be no thoughts to withhold feed or water prior to weigh in. Animals are halter broke and stand well. Also, the pressure to get them to drink to make weight is gone.

In case you are curious, Average Daily Gain heifers were the most dispersed across age. The lines go in two different directions although they start off close. Heifers range from 4 to 12 months from 0.4 to 1.0 kg (0.88 to 2.2 lbs). Not only is the data dispersed across a wide range of the area, these numbers would have to calculated after weigh in, birthdays could be easily manipulated and impossible to monitor state wide. Grouping animals in classes by ADG would result in the most variation and would lack consistency in classes at the show.



So what does all this mean about our program after examining three completely different scatter plots? We need to do better growing our heifers so they go back to the farm more correctly grown. Our newest faculty member, Dr. Bohlen, was primary author of a new extension publication entitled "Is your heifer fit to show?" that provides excellent information on getting your show heifer cared for properly (http://extension.uga.edu/publications/detail.cfm?number=B1427). Weights, heights and mass should be monitored closely in all commercial dairy heifers.

We need to educate those involved on things to do better to make this happen. We need to improve group uniformity to reduce wide ranges of age within each class. We need our judges to recognize strength of front end, width of rump and thurls with depth of body should place over older heifers that appear sharper, but lack mass. Finally, we need to evaluate if there is a better way than weight to group our classes. Wither height appears to be the best choice of the measurements and indexes we have looked at. There is a new, very nice Aluminum Horse Measuring Stick sold by Jeffers Livestock (http://www.jefferspet.com/products/alum-measuring-stick-horse) that is considerably cheaper than the Nasco wooden stick (that tends to bend on its latch with use) and much less than the Ketchum device used by classifiers (flexible metal tape did not hold up as well in our studies). Our heifers ran from 92.7 to 138.3 cm at the withers our last two years. This pole measures from 110 to 180 cm. There would be about 10 below 100 cm. We would need to measure them with something else, or just put anything below 100 cm in Class 1. Would measuring withers be faster than weighing? It could be. In the past they would stand pretty well on halter on a flat surface. We would want to have the feet fairly correct (front together and back up under). Maybe this is worth a try?

Herd it Through the Bovine

Youth Corner

Dr. Jillian Bohlen and Dr. William Graves

Telephone: (706)-542-2581
Fax: (706)-542-9316

Animal and Dairy Science Department
Rhodes Center, 425 River Road
Athens, GA 30602

May 22nd, 2015

TO: All County Extension Coordinators and 4-H Agents

RE: **National 4-H Dairy Conference Application**
Conference Dates: September 27th – 30th. Madison, WI

APPLICATION DUE:
July 15, 2015

We are asking for applications for delegates to the 61st National 4-H Dairy Conference. A committee will select up to three delegates from the applications. These delegates will receive an expense paid trip to the conference in Madison, Wisconsin.

The National 4-H Dairy Conference is one of the most outstanding educational events sponsored by 4-H. More than 200 delegates from throughout the United States and Canada will participate in this week long event that includes educational workshops, tours and motivational speakers. It is an opportunity of a lifetime to meet many current leaders of the dairy industry and many future leaders.

The conference begins Sunday, September 27th and concludes Wednesday, September 30th. Travel plans will be arranged after delegates have been selected. Obtaining permission to be absent from school for these dates will be necessary. More information will be forwarded to the successful applicants as the final plans are developed.

Enclosed is an application. Please have each 4-H'er, who is interested in applying complete the application. **Applicants must be between the ages of 15 and 18 as of January 1, 2015.** They cannot be members of the judging team that is participating in the National 4-H Dairy Cattle Judging Contest. Return the completed application to Dr. Jillian Bohlen at the address above by July 15, 2015. County agents should include a letter of recommendation indicating why they feel this individual should be selected to represent Georgia 4-H. If interested in reading more about the conference, visit:

http://national4hdairyconference.org

Thank you very much for your cooperation in identifying and recruiting youth who are worthy of the honor. This is truly an outstanding conference which will be a highlight of their 4-H career. If you have any questions, please feel free to contact us.

Sincerely,

W. M. Graves

Dr. William Graves
Professor and Extension Coordinator

Dr. Jillian Bohlen
Assistant Professor and Dairy Specialist

cc: Heather Shultz
Arch Smith
Dr. Keith Bertrand

National 4-H Dairy Conference Application

Name: ______________________________ Date: _________________________
Address: ______________________________ Birth Date: ____________________
____
______________________________ Grade in School: ________
Age: ___________ Years in Dairy Project: _______
Years in 4-H: ________________

Use **Additional Sheets as Necessary**

4-H Dairy Activities:
Other Dairy Activities (Breed organizations, etc.)
Other 4-H Activities:
Other Activities (School Community, etc.)
Special Honors:

Write a brief essay on “Why I would like to attend the National 4-H Dairy Conference

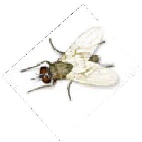
Please include signatures from each of the following:

4-H’er : ________________________________

Parent or Guardian: __________________________

County Extension Agent: __________________________

County Agent – please remember to write a letter of support for your applicant as part of the application process



Fly Season Is Here: Protect Your Heifers!

Stephen C. Nickerson

Mastitis control during the hot summer months is important to the health of mammary glands and milk quality. In northern Europe, summer mastitis, occurring during July, August, and September, is associated with an increase in biting flies that carry bacteria. This type of mastitis, caused by *Trueperella pyogenes*, is typically controlled using insecticidal sprays.

Don't overlook fly control: In the US, fly season begins as early as April and lasts through September or early October, especially in the Southeast. Following the "5-point plan" for mastitis control has led to a reduction in the level of intramammary infections; however, the importance of fly control in reducing cases of mastitis has been overlooked. Many producers implement fly control techniques to reduce insect populations on the farm premises (barns, hutches, etc.) and on animals; however, insect pest control techniques are not applied to specifically prevent mastitis among dairy cows and heifers.

With the temperature and humidity steadily rising in recent months, numbers of blood-sucking horn flies (*Haematobia irritans*) will increase. This species is commonly found on the backs of dairy animals (Figure 1), but will also attack the teats, leading to the development of mastitis, especially among dairy heifers. Research has identified a greater prevalence of mastitis caused by *Staphylococcus aureus* in dairy heifers that had teat ends covered in scabs caused horn flies. Additionally, studies have shown a lower prevalence of mastitis caused by *Staph. aureus* among heifers in herds using fly control compared to herds not using a fly control program.

Figure 1. Horn flies on the back of heifer.

So, how is *Staph. aureus* spread from fly to animal and from animal to animal? Horn flies carrying *Staph. aureus* zero in on the teat ends of dairy heifers and suck blood from vessels below the teat skin, causing the formation of abscesses and scabs with their invasive mouth parts, subsequently depositing *Staph. aureus*. This places these bacteria in an opportune position to enter the teat canal and cause an intramammary infection. Flies then serve as vectors and carry the bacteria from animal to animal, resulting in an increased prevalence of *Staph. aureus* mastitis.

Horn flies damage teat ends: In an ongoing trial at UGA, teat ends of heifers were monitored before, during, and after fly season. At the beginning of fly season and before application of a control program, teats were populated with blood-sucking flies (Figure 2) and many were covered with bloody scabs (Figure 3) associated with *Staph. aureus* intramammary infections. Less than 48 hours after pour-on repellent administration, fly populations were drastically decreased, and less than 2 weeks later, teats were healed and free of scabs. However, the damage had been done and *Staph. aureus* infections were established, which were subsequently cured with dry cow antibiotic therapy. Overall, the prevalence of *Staph. aureus* intramammary infections among quarters of dairy heifers was 30% (Figure 4); not that uncommon in GA dairy herds. The rest of mammary quarters were infected with the coagulase-negative staph, also known as CNS (27%), and the streptococci (3%); only 40% of quarters were uninfected. Interestingly, prevalence of mastitis caused by *Staph. aureus* was greater

Figure 2. Front teat ends covered in horn flies compared to rear teats generally free of flies.

Figure 3. Teat end covered in bloody scabs caused by horn flies.

in front quarters compared to rear quarters. Horn flies are attracted to the navel area of heifers, which is in close proximity to the front teats. Also, the tail switch may be more effective in repelling flies from biting the rear teats. Not only do these flies provide a vector for the spread of *Staph. aureus*, but they are also a nuisance to the already stressed animals during hot weather.

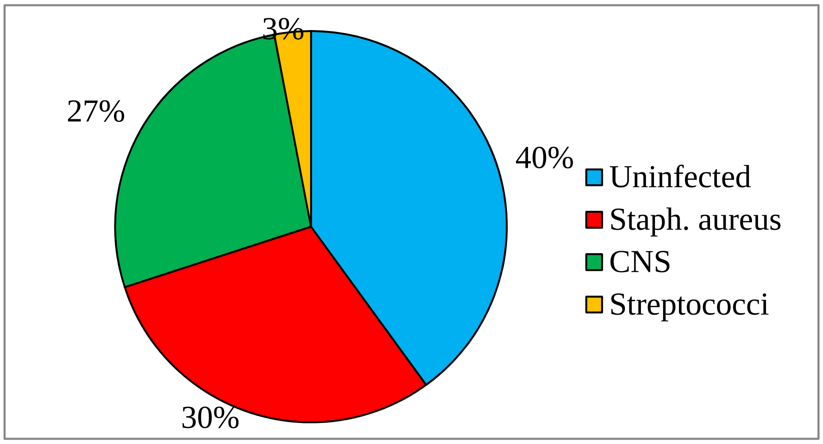


Figure 4. Prevalence of mastitis among quarters of bred dairy heifers.

What you can do to protect your heifers: Sanitation is key in reducing farm populations of different types of flies. Proper management of manure, water troughs, and left-over feed and hay reduce fly numbers, and may reduce the mastitis cases caused by these flies. However, maintaining a sanitary environment may not be effective in reducing all insect populations of concern to a desirable level. Several different fly control techniques exist such as aerosols, baits, strips, foggers, dust bags, traps, oilers, insecticidal ear tags, insecticidal pour-on solutions, and feed supplementation with insect growth regulators. The use of an insecticidal pour-on every 2 wk for 6 wk followed by placement of insecticidal ear tags was found to reduce fly populations and decrease the incidence of new *Staph. aureus* infections in heifers by 83% in a 6-month efficacy trial at LSU. At UGA, the use of a pour-on every 2 to 4 wk was found to drastically reduce fly populations, allowing teats to heal, and reducing two important sources of *Staph. aureus*: flies and scabs.

While there are no techniques that are 100% effective, the use of some type of fly control is important in reducing mastitis cases in dairy heifers, and in turn, decreasing SCC when they freshen. With milk buyers' current demand for low herd SCC, all feasible methods that lead to improvements in milk quality are essential to consider. Don't let flies cost you money due to increased mastitis, elevated SCC, and loss of quality product premiums when your heifers enter the milking herd.

Forage Sorghum for Lactating Dairy Cattle

John K. Bernard and Sha Tao

Forage sorghum is frequently grown on dry land or as a second crop following corn on many dairies because of its lower water requirement for growth and greater disease resistance compared with corn. However, forage sorghum provides less energy than corn silage and has typically been used primarily for feeding heifers, dry cows, or lower producing cows. Newer varieties have been developed with the brown-midrib (BMR) gene that has been shown to support milk yield similar to diets based on corn silage. The BMR gene reduces the lignin content of the forage allowing greater fiber digestibility. Lodging is another problem with forage sorghum that makes harvest challenging after a tropical storm or a strong wind blows the forage over. Brachytic dwarf varieties have shorter internodes resulting in greater leaf to stem ratios. Yield of the brachytic dwarf varieties has been equal to normal varieties in many cases. Newer BMR brachytic dwarf varieties have captured the attention of many dairy producers in the Southeast.

We recently completed a second trial comparing the performance of lactating cows fed diets based on either forage sorghum silage produced from a brachytic dwarf BMR variety or corn silage. After the first harvest in July, we fertilized the stand and harvested the ratoon growth in the fall. Corn silage was produced from two crops planted back to back. Forages were harvested, stored in plastic bags, and allowed to ferment before beginning the trial in January. Diets based on forage sorghum silage contained more ground corn so that the diets contained similar concentration of energy and fiber. Within silage treatments, no adjustments were made to diets for any differences in first or second crop.

Similar to our first trial, no differences were observed in DMI or milk yield. In contrast with the first trial, milk fat percentage and yield were higher for cows fed diets based on forage sorghum. The higher fiber content of forage sorghum has been observed to support higher milk fat percentage, but this has not been consistent across trials. No differences were observed in concentrations of milk protein, lactose or SNF. Energy-corrected milk yield and dairy efficiency were similar among treatments; however, MUN concentrations were higher for the diets based on forage sorghum in agreement with the results of the first trial. The increased MUN may be related to higher soluble protein concentration in forage sorghum silage compared with corn silage and/or more extensive ruminal fiber digestion.

The results of these trials suggest that forage sorghum silage can be fed to lactating cows without reducing potential milk yield. The quality of forage sorghum regrowth supports similar performance and the first harvest. Brachytic BMR forage sorghum varieties provide dairy producers additional options for forage production to optimize forage yield and water utilization. While forage sorghum has better resistant to most diseases compared with corn, producers should be aware of the potential damage from sugar cane aphids and take steps to minimize damage from this new pest if they choose to plant forage sorghum.

Critical Control Points for Colostrum Handling

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INTRODUCTION

Colostrum is one of the most potent substances that we have on the dairy. When properly utilized it can set off a chain of events that lead to the lifelong health and productivity of the animal receiving it. This is, of course, dependent on whether we handle and administer it correctly. Unfortunately, there are many potential problems that can occur during the colostrum handling process that can negate its positive effects, and even create some very harmful consequences. Having a colostrum quality management program in place can help to maximize consistency and enhance calf health.

QUALITY CONTROL

To evaluate the outcome of the colostrum program on a farm, there are several measures that can be used. These measures are referred to as quality control, since they are measured at the end of the process. These are like the quality control stickers on consumer goods: if the product is acceptable, it gets a sticker and is moved to the customer. If the product does not pass quality control, it is rejected. If too many do not pass the quality control, then the process itself may need improving.

The standard measure of the outcome of a colostrum program is to measure the passive transfer of immunity to calves. This can be done by measuring IgG concentrations in calf serum by radial immuno-diffusion, but is more commonly estimated using calf serum total protein concentrations. If calves are above our cutpoint, then they "pass" the quality control; if too many are below our cutpoint, then we may re-evaluate the function of our colostrum program. Some farms aim to have more than 80% of calves with a serum total protein above 5.5 g/dl, while others aim for 90% of calves above 5.2 g/dl. Both are good monitors of the colostrum program.

Another useful quality control measure is the level of bacterial contamination in colostrum when it is fed to the calf. Most farms want the total bacteria count to be below 100,000 cfu/ml and the total coliform count to be below 10,000 cfu/ml. This does not tell us much about when or how those bacteria got to such a high level, but it is a useful starting point.

Quality control tells us if the system is working by measuring its outcomes

QUALITY ASSURANCE

Quality assurance is similar to quality control, but it aims to ensure that each step along the process is performed correctly, so that we know that the end product will be of high quality. For instance, to assure that the bacteria count in colostrum that is fed to calves is below our cutpoint, we would collect data on each of the steps where bacteria could be introduced to the colostrum, or when its temperature would allow bacteria to replicate in the colostrum. This may involve collecting samples for bacterial culture, collecting temperature data, or evaluating the cleaning process (physical, thermal, and chemical) of the equipment. These data would help us to refine the standard operating procedures for prepping the udder before collection, cleaning the collection equipment, cooling the colostrum, heat treating the colostrum, and feeding the colostrum to minimize bacteria counts.

If we want a high percentage of calves to pass our quality control measure of passive transfer of immunity by measuring serum total protein, we need to assure that the steps are performed correctly. We cannot expect good results if we are not measuring or estimating the colostrum IgG concentration with a colostrometer of refractometer. Most farms use a cutoff of 50 g/l of immunoglobulin, which coincides with the green mark on the colostrometer, or 22% on a Brix refractometer. Our quality assurance plan also must include a way to monitor and minimize the time between birth and colostrum feeding.

Quality assurance is the plan that ensures quality outcomes

CRITICAL CONTROL POINTS

The colostrum itself needs to be of **adequate immunoglobulin content and have low bacteria counts.**

IgG content: Measure or estimate IgG content with colostrometer or refractometer

Goal: Greater than 50 g of immunoglobulin per liter of colostrum

- Ensure dry cow nutrition is adequate
- Ensure dry period length is adequate
- Prevent dry cow mastitis
- Collect colostrum quickly after calving

Bacteria counts: Measure bacteria counts during various steps of colostrum handling and feeding

Goal: Total bacteria count < 100,000 cfu/ml and total coliform count < 10,000 cfu/ml

- Properly prepare udder before collection
- Collect colostrum in equipment that has been properly cleaned
- Chill colostrum quickly and maintain low temperature until feeding
- Heat treat colostrum to reduce bacteria counts

The feeding of the colostrum needs to be done with an **adequate volume of colostrum and in a timely manner.**

Goal: Feed 10% of calf body weight within 2 hours of birth

- Monitor and record calving and feeding times
- Record volume fed and the technician responsible for feeding

The calf must have the **ability to absorb the immunoglobulins** and digest the nutrients. This can be affected by the environmental temperature: cold stress after birth and heat stress to the dam before birth and to the calf after birth. The other major critical control point is the cleanliness of the calf environment: if the calf is ingesting anything before colostrum (especially manure), this can have a large impact on IgG absorption.

- Maintain calving pen hygiene
- Remove calves from contaminated environment quickly
- Dry calves quickly in cold environments

CONCLUSIONS

The colostrum program can have great positive impacts on calf health and the future productivity of those calves when they enter the milking herd. However, there are many ways in which this critical process can have less than optimal outcomes.

Without **quality control**, we have very little knowledge of whether our program is functioning correctly. Regular quality control is a must; if we are satisfied with the trend and variation of these results, then spending time, money, and effort on more advanced testing may not be worthwhile. If the results of our quality control are not acceptable, then we need to evaluate our quality assurance plan.

Without **quality assurance**, there may be lots of variability of quality across time and across employees. Quality assurance is not just about having standard operating procedures (SOPs) on paper. It also includes frequent employee education, monitoring compliance to the SOPs, and monitoring of the efficacy of each step in the process.

The level of detail and frequency of monitoring in the quality control and quality assurance plans will be highly dependent on the goals of the dairy operation and the number of employees. It is best to put together a plan with input from dairy management, employees, the veterinarian of record, the nutritionist, and any other farm consultants that work with calves.

2015 Georgia 4-H State Dairy Judging Contest Results
By Drs. Bohlen & Graves

The 2015 Georgia 4-H State Dairy Judging Contest was held at the UGA Livestock Arena on Friday, March 27th in conjunction with the 52nd UGA Spring Dairy Show. A total of 29 Juniors (6 Teams) and 19 Seniors (5 Teams) participated in this year's contest.

The results from the Junior State Dairy Judging Contest for the top 5 Junior individuals were (out of 300 maximum points):

1. Lawton Harris, Morgan Co. (279 points)
2. Tate Hunsinger, Oconee Co. (265 points)
3. Addalyn Steinseifer, Burke Co. (262 points)
4. Holden Driggers, Burke Co. (256 points)
5. Neely McCommons, Oconee Co. (247 points)

The top 5 Junior teams were:

1. Burke Co. (763 points)
2. Morgan Co. (760 points)
3. Oconee Co. (742 points)
4. Gordon Co. (680 points)
5. Coweta Co. (661 points)

The first place Junior Burke County Team members were Addalyn Steinseifer, Holden Driggers, Mary Helen Coble and Abby Joyner. Morgan County placed second and team members were Lawton Harris, Rachel Wood, Catlyn Johnson and Nicholas Cagle. Oconee County placed third and team members were Tate Hunsinger, Neely McCommons, Reilly Christie.

The results from the Senior State Dairy Judging Contest for the top 5 Senior individuals were (out of 400 maximum points):

1. Mady Hillebrand, Coweta Co. (371 points)
2. Constance Johnson, Morgan Co. (367 points)
3. Alice Kirby, Gordon Co. (360 points)
4. Brantley Saye, Oconee Co. (356 points)
5. Michaela Pollex, Burke Co. (355 points)

The top 5 Senior team results were:

1. Oconee Co. (1013 points)
2. Gordon Co. (1003 points)
3. Burke Co. (1002 points)
4. Franklin Co. (993 points)
5. Coweta Co. (898 points)

The first place Senior Team from Oconee Co. has the opportunity to represent Georgia at the National 4-H Dairy Judging Contest in Madison, WI this fall. Oconee County Team members were Brantley Saye, Jared Daniel, Godfrey Hendrix and Andy Kate McCannon. Gordon Co. Team placed second. Their team members were Alice Kirby, Kam Childers, Caleb Carr and Nathan Ryan. They have the option of representing Georgia in Harrisburg, PA or Louisville, KY. Burke Co. Team members were Micaela Pollex, Taylor Mizelle and Deysi Morales.

Cooling Dry Cows: Benefits and Considerations

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Introduction

It is well studied that thermal stress decreases feed intake, alters metabolism, compromises lactation performance, increases disease incidence and impairs reproductive performance during lactation (Fuquay, 1981; Kadzere et al., 2002; West, 2003). Compared with lactating cows, dry cows generate less metabolic heat (West, 2003) and have a higher upper critical temperature (Hahn; 1997). Thus, heat stress abatement in the dry cow management is always overlooked in the summer, although it substantially influences future performance of the cow. Due to the large amount of Extension and research articles published before with similar topics, this article will briefly introduce the benefits of cooling dry cows and focus on some considerations of prepartum cooling. The impact of late gestation on the offspring will not be included here, but will be presented in the following article.

The benefit of cooling dry cows

In addition to lactating cows, dry cows suffer from heat stress, and cooling during the dry period can have several improvements in cow's performance. One significant benefit of dry cow cooling is the increase in subsequent milk production. Studies conducted in different countries around the world during the last 30 years have concluded that providing cooling during the dry period can increase subsequent milk yield by 3-5 kg/d (Figure 1), and this improved lactational performance derived from dry cows cooling is consistent during the entire lactation (Figure 2).

Heat stress during the dry period also affects the immune function of the animals during the transition period. The immune system includes the non-specific innate immune function that is the first line of defense to pathogens in the body and the specific adaptive immune function that generates memory of pathogen exposure. Both arms of immune function are affected by the thermal status of the animals during the dry period. Recent studies from University of Florida provide evidence that cooling during the dry period enhances the proliferation of peripheral blood lymphocyte when encounter with mitogen in vitro and the ability of neutrophils to phagocytize and destroy pathogens in early lactation (do Amaral et al., 2009; 2010; 2011). The enhanced immunity of cows during the transition period by dry cow cooling may indicate lower disease incidence and enhanced animal health.

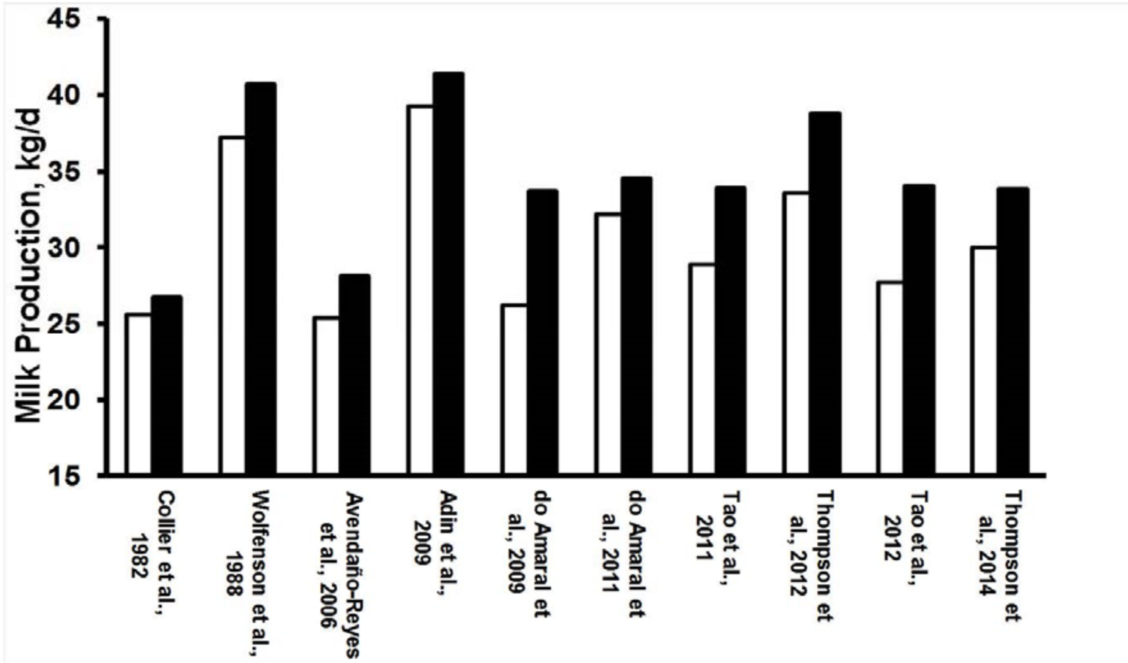

Figure 1. Summary of studies on effects of supplemental cooling (solid bars) in late gestation heat-stress (open bars) cows on subsequent milk production (Adapted from Tao and Dahl., 2013).

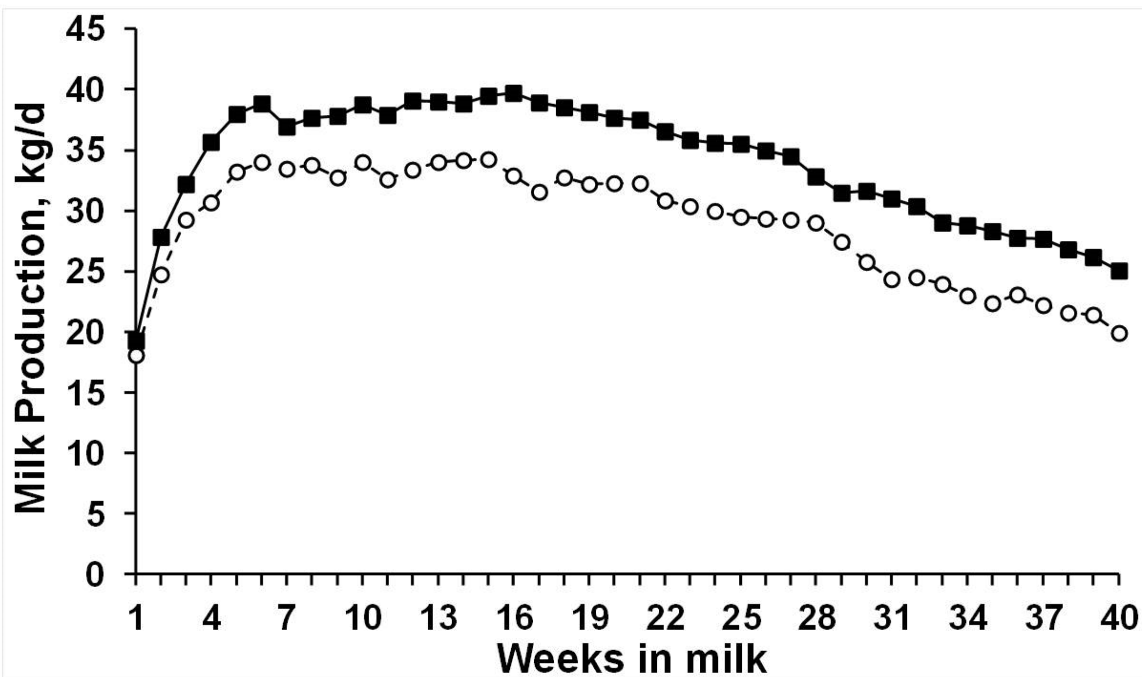

Figure 2. Milk yield of cows exposed to heat stress (○) or cooled (■) during the dry period. Dry period cooling increased yield relative to heat stress. Cows were managed identically, including cooling during lactation. Tao et al., 2011.

Potential limitations?

Although it improves subsequent milk production, several studies (do Amaral et al., 2009; 2011; Tao et al., 2011; 2012; Thompson et al., 2014) indicate that cooling during the dry period has no impact on cows' dry matter intake in early lactation (i.e. first 3 weeks postpartum). In order to support higher milk production, prepartum cooled cows have higher feed efficiency (do Amaral et al., 2009; 2011; Tao et al., 2012) relative to non-cooled cows in early lactation and develop higher peripheral tissue insulin resistance and stronger ability to mobilize adipose tissue, which are reflected by lower plasma glucose concentration and higher NEFA and BHBA concentrations compared with non-cooled cows. Although the increase in blood NEFA and BHBA during early lactation of prepartum cooled cows still fall within the normal physiological range (do Amaral et al., 2011), the cows still need extra attention regarding the onset of metabolic diseases, such as ketosis and fatty liver in early lactation. Indeed, a recent study (Thompson et al., 2014) suggests that prepartum non-cooled cows have slightly lower ketosis incidence compared with cooled herdmates in the early lactation. However, as the lactation advances, prepartum cooled cows will consume more feed relative to non-cooled cows in order to meet the nutrient demand of higher milk production. The possible increase in ketosis incidence by cooling during the dry period seems a side effect of cooling dry cows. However, the other way to understand this is that the heat stressed cows have lower ketosis incidence because they produce less milk and don't need much energy to support their lower milk production compared with prepartum cooled cows.

Although it enhances cow's immune function, a study (Thompson et al., 2014) suggests that prepartum cooling seems not to influence the disease incidence in early lactation. In contrast, prepartum cooled cows have a slightly higher incidence of metritis in the early lactation (Thompson et al., 2014; Santos, unpublished) compared with those non-cooled when dry. The increase in metritis incidence is a surprise because it has been shown that neutrophils, which are the key immune cells to prevent uterine infection, have increased killing capacity of bacteria by cooling dry cows (do Amaral et al., 2011).

Commonly Asked Questions

1. How long to cool? Entire dry period vs. Close-up only.

Most dairies have facilities to house the close-up dry cows with cooling. However, is the 2-3 weeks prepartum cooling enough to elicit the enhanced milk production as observed when cooling the entire dry period? Indeed, cooling during the close-up period (last 3-4 wks of the gestation) improves the subsequent lactation performance by 1.4-2 kg/d relative to those cows which don't receive cooling (Urdaz et al., 2006). In contrast, cows that are cooled during the whole dry period produce ~4-5 kg/d more milk during the next lactation compared with those without prepartum cooling (Tao et al., 2011, 2012; Figure 1, 2). Thus, if facility allows, it is recommended to cool during the entire dry period, starting right after dry-off. Additionally, if cooling during the whole dry period, its length seems not to affect the effects of prepartum cooling on future milk production. For cows with short dry period (<40 d), prepartum cooling during the entire dry period still significantly improved subsequent milk production (5.2 kg/d, Thompson et al., 2014).

2. How to cool?

Within different management systems, shade should be considered the first to be implemented for cooling. An early study (Collier et al., 1982) suggests that providing shade only to late gestation cows on pasture can dramatically decrease cows' body temperature (39.2 vs. 40.0 ºC, respectively) and respiration rate (63.3 vs. 87.4 breaths/min, respectively) compared with those without shade. Further, if resources allow, housing dry cows under a barn with active cooling should be utilized beyond shade. A recent study (Gomes et al., 2013) compared different housing conditions of close-up dry cows on body temperature and respiration rate, and found that housing in a free stall barn with sprinklers and fans for cooling further dropped cow's body temperature (38.9 vs. 39.1 ºC, respectively) and respiration rate (43 vs. 69 breaths/min, respectively) relative to those raised on pasture with shade. Thus, the more cooling setting is used; the better a cow can maintain her thermo balance.

3. What is the expected body temperature difference?

Even if active cooling including sprinklers and fans is used widely, it is almost impossible to completely abate heat stress during the summer. However, successful decrease in body temperature and respiration rate of dry cows by cooling could result in a huge return. Table 1 summarizes the physiological responses of cooled and non-cooled heat-stressed cows during the dry period from different studies. For example, as shown in most studies conducted in free stall barns (Adin et al., 2009; Avendaño-Reyes et al., 2006; do Amaral et al., 2009; 2012; Tao et al., 2011; 2012b; Wolfenson et al., 1988), successful decrease in the rectal temperature by 0.3 °C and respiration rate by ~25 breaths/min of heat-stressed dry cows can dramatically enhance subsequent milk production (Figure 1).

4. How about pregnant heifers?

The impact of heat stress on pregnant heifers is a missing area in research but deserves further study. Compared with dry cows, cooling late gestation heifers doesn't result in a significant increase in milk production, which may be related to smaller body size and lower metabolic heat production, or other physiological reasons. However, cooling heifers may benefit other perspectives of her performance, such as fetal growth. From the animal well-being standpoint, it is also important to consider cooling heifers for their best welfare. Thus, it is also recommended to provide cooling for pregnant heifers if resources allow.

Table 1. Summary of studies on effects of late gestation heat stress (**HT**) on physiological parameters.

Time of measurement	Rectal Temperature, °C			Respiration Rate, Breaths/min			Reference
	HT	CL	Diff.	HT	Con.	Diff.	
1430h	40.0*	39.2	0.8	87*	63	24	Collier et al., 1982
1400h	39.2*	38.8	0.4	---	---	---	Wolfenson et al., 1988
1400h	39.3*	39.0	0.3	74*	67	7	Avendaño-Reyes et al., 2006
1500h	38.8*	38.5	0.3	57*	45	12	Adin et al., 2009
1430h	39.2*	38.8	0.4	---	---	---	do Amaral et al., 2009
1430h	39.4*	39.0	0.4	78*	56	22	do Amaral et al., 2011
1430h	39.4*	39.0	0.4	78*	46	32	Tao et al., 2011
1430h	39.3*	39.0	0.3	69*	48	21	Tao et al., 2012

*$P < 0.05$; †$P < 0.10$

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Impact of feeding betaine to transition and lactating dairy cows during summer on milk production

A.P.A. Monteiro, J.K. Bernard, and S. Tao.

Heat stress negatively impacts the health and productivity of dairy cattle. Many studies have examined different management and nutrition strategies for mitigating heat load in livestock. Recently, it has been proposed that the damage to gut tissues as a consequence of the reduction in blood supply during heat stress has a major role in the cascade of events observed prior to heat stroke. The damaged gut tissue would allow endotoxins to enter the body leading to multiple organ injury. Betaine (Tri-methyl glycine) is an organic osmolyte secreted or absorbed by a wide variety of cells including those of the gut. This compound is also found in sugar beets and serves as a methyl donor when fed to animals. Under heat stress conditions, betaine can act as an osmolyte, reducing dehydration, and recent studies suggest that it also has beneficial effects on damaged cells.

Under the light of this new paradigm, two studies were performed to evaluate the effect of feeding betaine-containing molasses on performance of transition and lactating dairy cows during late summer. In both studies cows were randomly assigned to either Control or Betaine groups. All cows were fed a common diet and cows from Betaine group were supplemented with 28% CP liquid supplement made of molasses (Quality Liquid Feeds, Dodgeville, WI) from sugar cane (67%) and condensed beet solubles containing ~30% betaine (33%), while the control group was supplemented with a 28% CP molasses-based liquid supplement made from sugar cane only. The liquid supplement was fed at a rate of 2.5 and 3 lbs DM/d for dry and lactating cows, respectively. The first study was conducted with lactating cows in a commercial dairy located in Arcadia, FL from Aug to Sep, 2014. Cows in two pens were assigned to Betaine group (n = 100) and cows in two additional pens were assigned to the Control group (n = 100) and averaged 154 and 187 days in milk, respectively. Cows were cooled with fans and sprinklers located over the feed alley and milked twice daily. Milk production was recorded before the treatments started and then at 25 and 35 d after the start of the trial (Figure 1). During the course of this trial, cows were exposed to significant level of heat stress as indicated by the high temperature humidity index (Figure 1).

However, cows supplemented with betaine produced 2.7 lb/d more milk on average compared with the control cows (Figure 2).

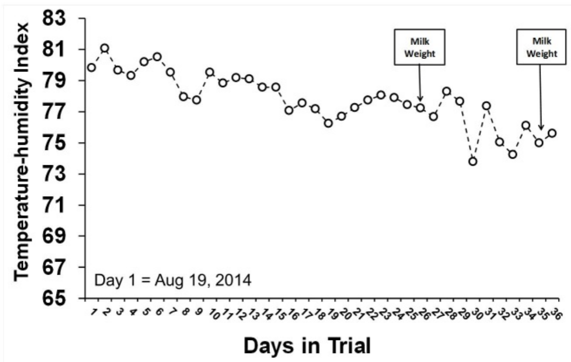

Figure 1

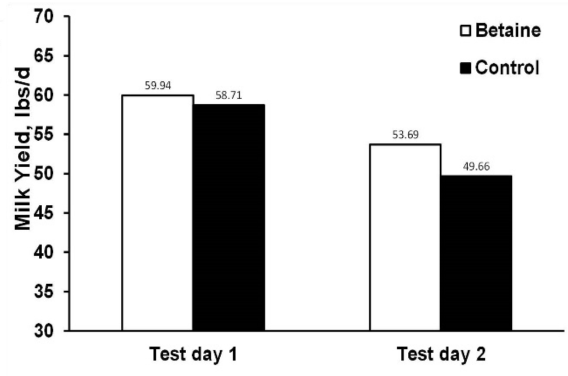

Figure 2

The second study was performed at the Dairy Research Center of the University of Georgia, Tifton, GA, with transition cows during late summer of 2014. Starting in early September, cows were randomly assigned to Betaine or Control groups either at dry off (n=10/treatment) or 24 days before expected calving (n=8/treatment), based on their previous mature equivalent milk yield, and were kept in the study until 60 days in milk. All cows were housed in the same free-stall barn and individually fed during the entire experimental period. Before calving cows didn't receive supplemental cooling, whereas all lactating cows were cooled by misters and fans and milked thrice daily. The calving period started in late Sep and lasted until early in Dec, thus, the heat stress was not as severe as in the first study during the majority of the trial (average THI = 62). Regardless of the time cows were exposed to treatments, cows supplemented with betaine tended to produce 6 lb/d more milk and 6.6 lb/d more 3.5% FCM compared with Control. No differences in milk composition or feed intake were observed.

Since both groups of cows received a 28% protein liquid supplement, any difference in animal performance observed between them would be due to betaine. The results of these studies indicate that feeding supplemental betaine to transition and lactating dairy cows has the potential to improved milk yield to cows exposed to heat stress conditions. Longer term research trials are needed to determine the potential of betaine to mitigate the negative effects of heat stress on milk production and other parameters such as health and reproduction.

Effects of heat stress on calves and management strategies during summer

A.P.A. Monteiro, and S. Tao.

Heat stress represents a huge economical loss to the dairy industry every year. During hot months lactating cows experience a decrease in milk production in addition to an increase in diseases incidence, such as mastitis. Heat stress also decreases fertility and increases embryo loss, such that its effects can be seen for months after the exposure. Although calves may be better able to cope with warmer temperatures than adult and lactating cows, they also suffer from heat stress. During summer, calf growth and health can be negatively affected by the hot weather and mortality rate can dramatically increase if no management interventions are taken in order to cope with heat stress. For every 10 °F increase in air temperature in the calf nursery, it was demonstrated a decrease of 5% in average daily gain and 1 % decrease in starter intake. This data suggests that during periods of heat stress, calves direct more energy towards heat loss than growth. A study performed in Florida evaluated the serum protein concentration in calves born throughout a year and found that serum protein concentration was lower in calves born during the summer. Serum protein concentration is highly correlated with blood IgG concentration, thus these data indicate a compromised passive transfer during summer. Another study evaluated cellular immunity on calves after two weeks of exposure to a hot or thermoneutral environment and the researchers observed that calves exposed to the hot environment had a lower response after a *Mycobacterium tuberculosis* challenge compared with calves exposed to the thermoneutral environment. Combining the results of all these studies, we can conclude that calves exposed to heat stress at an early age have compromised performance and a greater chance of getting sick and dying before weaning. However, proper management strategies can be adopted during the hot months in order to help calves cope with heat stress. Simple environmental improvements, such as providing calves with shade, has been proven to be of a great impact on calves' performance. A study showed that providing shade to calves increased serum IgG concentration at 2 and 10 days of age and also decreased mortality rate from 25 to 2.8% during the first 20 days of age. Bedding quality is very important throughout the whole year, but during summer is especially important to assure a good drainage in order to keep the beds clean and dry. Another important factor that needs attention is to keep a good air flow inside the hutches and within the calf barn, as it helps to decrease the air temperature and also decrease the pathogen load in the air. During hot months buildings should have all vents and doors open, as well as sidewall curtains. Also, it has been demonstrated that elevating the back end of the hutches by 4 cm (1.6 inches) using concrete or wood blocks, significantly improves the air quality, as the concentrations of airborne bacteria is reduced inside the hutch. Additionally, air temperature is lower inside the hutches than outside at the hottest time of the day, while the opposite happened when hutches were not elevated. When resources permits, the use of fans to improve air flow should be considered. A recent study conducted in Ohio evaluate the effects of the use of fans during daytime on preweaned calves. Although no differences were observed in milk and starter intake, calves that were cooled with fans had 8.7 pounds increase in body weight gain before weaning. However it is important to assure that there is no air drafts on the calves, as it would also negatively impact performance. Providing free choice of fresh water during the whole day is a must. If feeding water two times a day is not enough, a third water feeding is highly recommended in order to keep calves properly hydrated. The calf grain also needs to be kept fresh, otherwise mold growth can occur, which decreases calf grain intake and weight gain. Placing a physical separation between the water and grain buckets can avoid water spill to the grain bucket. During hot months calves need more energy for maintenance for cooling. In addition to adopting management strategies to decrease the heat load on the calves, we should increase energy intake during this period. Although calves usually have a decrease in appetite during summer, they usually don't refuse milk or milk replacer if extra amount is offered. So, feeding more liquid feed will provide calves with extra energy that will go towards growth. Stressful activities, such as grouping, vaccination, castration and dehorning, are preferred to be conducted during the early hours of the day instead of in the afternoon, when the temperature raises. It is also important to pay extra attention on calves with scours. The ideal situation would be providing electrolytes to calves as soon as scours occurs, what will help the calves to keep hydrated and recover faster. The administration of IV fluids may be necessary if the calf gets to a higher level of dehydration and the crew working in the calf unit needs to be trained and able to recognize dehydrated calves.

In addition to the heat stress after birth, calves also suffer with prenatal heat stress. Cows that are under heat stress during the dry period not only have compromised productivity, but their offspring's performance is also affected. Several studies show that calves from heat-stressed dams are up to 11 pounds lighter at birth compared with calves born to cows cooled during the dry period. This difference in birth weight can be explained in part by the fact that heat stressed cows have a shorter gestation length than their cooled counterparts. The researchers also believe that placental growth and function are compromised, which decreases the availability of nutrients to the fetus and impairs its growth. Moreover, calves born to heat stressed dams displayed compromised humoral and cellular immunity, which are the two arms of the immune system. Specifically, calves exposed to heat stress in utero were less efficient on absorbing IgG from colostrum than calves from cooled dams. IgG are antibodies that protect a young calf from disease causing pathogens. Thus, a decrease in the efficiency of IgG absorption from colostrum increases the risk of failure of passive immune transfer and hence the risk of disease and death at a young age. Moreover, the heat stress imposed on the fetus during the final stage of gestation may also alter its metabolism. Indeed, a recent study suggests that calves born to cows heat-stressed during late gestation are better able to absorb glucose and hence are more likely to have increased fat deposition later in life compared with calves born to cooled dams. As demonstrated in other studies, increased fat deposition, in other words, a high body condition score, translates in lower reproductive performance and milk production. With the aim to investigate possible carryover effects of prenatal heat stress on calves' future performance, data from several studies performed at the Dairy Unit of the University of Florida were pooled and analyzed. During five consecutive summers cows were dried off 46 before expected calving and housed in the same free stall barn, but only half of the cows were provided with additional cooling, which consisted of sprinklers over the feed line and fans over the feed bunks and free stalls. Calves received 1 gallon of colostrum within 4 hours after birth and were individually housed in hutches. Data from 146 calves, including male and female, confirmed that calves born to heat stressed dams were about 12 pounds lighter at birth compared to calves from cooled dams. When tracking on the heifer's body weight, data shows that the difference in birth weight persists throughout the prepuberal period, although all heifers displayed similar growth rate. Additionally, heifers heat-stressed in utero were more likely to leave the herd during the first year of life due to sickness, malformation and growth retardation, and less likely to complete first lactation. This data clear shows the negative impact of maternal heat stress on calves' survival and health. Analyses of the reproductive performance didn't show differences between treatments in age at first service and age at first calving. However, heifers born to heat stressed cows required a greater number of services to be confirmed pregnant at day 30 after insemination. The difference in fertility could be related to differences in body weight, as several studies demonstrate that heavier heifers are more likely to start cycling at an earlier age. Regarding milk yield in the first lactation, heifers that experienced maternal heat stress produced about 10 pounds/day less milk during the first 35 weeks of lactation compared with control, with no differences in milk composition observed. This piece of data suggests that the hyperthermia imposed to those calves in utero during late gestation altered calves' metabolism and probably altered mammary gland development, resulting in less productive cows.

Although furthers studies with a larger number of animals are necessary to fully understand the effects of maternal heat stress on calves' health, this study provided with further evidence of the negative effects of heat stress during the dry period on the offspring and that providing additional cooling to dry cows is of major importance not only for the future production of the cows, but also for their offspring.

Top GA DHIA By Test Day Milk Production – March 2015										
				Test Day Average				**Yearly Average**		
Herd	**County**	**Br.**	**[1]Cows**	**% Days in Milk**	**Milk**	**% Fat**	**TD Fat**	**Milk**	**Lbs. Fat**	
RODGERS' HILLCREST FARMS INC.*	McDuffie	H	445	88	103.4	3.4	3.08	31754	1066	
D & T DAIRY	Wilkes	H	48	84	96.4			26792		
A & J DAIRY*	Wilkes	H	433	89	95.2	3.9	3.45	24652	933	
DAVE CLARK*	Morgan	H	1125	88	94	3.5	2.94	29207	1051	
MARTY SMITH DAIRY*	Wilkes	H	327	86	90.4	3.1	2.5	24561	810	
J.EVERETT WILLIAMS*	Morgan	X	1776	88	88.4	4	3.17	26851	1067	
DANNY BELL*	Morgan	H	253	91	84.3	3.7	2.8	25127	968	
R & D DAIRY*	Laurens	H	292	90	84.2	3.6	2.71	26510	960	
SCOTT GLOVER	White	H	221	91	83.1	3.4	2.51	25901	946	
MARTIN DAIRY L. L. P.	Heard	H	317	90	82.7	3.2	2.58	24600	891	
DOUG CHAMBERS	Jones	H	430	88	82.7	3.6	2.58	24349	867	
B&S DAIRY*	Wilcox	H	743	87	81	3.7	2.68	23301	803	
COOL SPRINGS DAIRY*	Laurens	H	237	91	80.4	3.4	2.52	25572	908	
COASTAL PLAIN EXP STATION*	Tift	H	287	89	80.3	3.3	2.41	25679	918	
UNIV OF GA DAIRY FARM	Clarke	H	129	89	79.5	3.7	2.67	22504	859	
MUDDY H HOLSTEINS	Hancock	H	78	89	79.2	3.2	2.21	23336	783	
ANDREW YODER	Macon	H	97	88	78.3	3.3	2.37	19838	712	
IRVIN R YODER	Macon	H	142	89	77.7	3.8	2.61	22948	852	
VISTA FARM	Jefferson	H	89	91	76.8	3.8	2.88	23366	856	
WILLIAMS DAIRY	Taliaferro	H	144	90	76.7	3.2	2.3	23043	835	
EBERLY FAMILY FARM*	Burke	H	704	90	76.7	3.7	2.54	22768	856	

1Minimum herd or permanent string size of 20 cows. Yearly average calculated after 365 days on test. (Mo.) column indicates month of 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 Fat Production – March 2015										
				Test Day Average				Yearly Average		
Herd	County	Br.	[1]Cows	% Days in Milk	Milk	% Fat	TD Fat	Milk	Lbs. Fat	
A & J DAIRY*	Wilkes	H	433	89	95.2	3.9	3.45	24652	933	
J.EVERETT WILLIAMS*	Morgan	X	1776	88	88.4	4	3.17	26851	1067	
RODGERS' HILLCREST FARMS INC.*	McDuffie	H	445	88	103.4	3.4	3.08	31754	1066	
DAVE CLARK*	Morgan	H	1125	88	94	3.5	2.94	29207	1051	
RAY WARD DAIRY	Putnam	H	142	89	75.9	3.9	2.92	24164	914	
VISTA FARM	Jefferson	H	89	91	76.8	3.8	2.88	23366	856	
DANNY BELL*	Morgan	H	253	91	84.3	3.7	2.8	25127	968	
R & D DAIRY*	Laurens	H	292	90	84.2	3.6	2.71	26510	960	
B&S DAIRY*	Wilcox	H	743	87	81	3.7	2.68	23301	803	
EARNEST R TURK	Putnam	H	388	92	74.7	3.6	2.68	21432	802	
UNIV OF GA DAIRY FARM	Clarke	H	129	89	79.5	3.7	2.67	22504	859	
BERRY COLLEGE DAIRY	Floyd	J	32	80	58.4	5	2.63	16192	751	
IRVIN R YODER	Macon	H	142	89	77.7	3.8	2.61	22948	852	
MARTIN DAIRY L. L. P.	Heard	H	317	90	82.7	3.2	2.58	24600	891	
DOUG CHAMBERS	Jones	H	430	88	82.7	3.6	2.58	24349	867	
DAVID L MOSS	Morgan	H	88	87	70.4	4	2.56	19837	760	
EBERLY FAMILY FARM*	Burke	H	704	90	76.7	3.7	2.54	22768	856	
COOL SPRINGS DAIRY*	Laurens	H	237	91	80.4	3.4	2.52	25572	908	
SCOTT GLOVER	White	H	221	91	83.1	3.4	2.51	25901	946	
LEE WHITAKER	McDuffie	H	291	89	73.6	3.6	2.51	21114	803	

1Minimum herd or permanent string size of 20 cows. Yearly average calculated after 365 days on test. (Mo.) column indicates month of 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 – April 2015										
					Test Day Average				**Yearly Average**	
Herd	**County**	**Br.**	**Test date**	**[1]Cows**	**% Days in Milk**	**Milk**	**% Fat**	**TD Fat**	**Milk**	**Lbs. Fat**
RODGERS' HILLCREST FARMS INC.*	McDuffie	H		445	88	103.4	3.4	3.08	31754	1066
D & T DAIRY	Wilkes	H		48	84	96.4			26792	
A & J DAIRY*	Wilkes	H		433	89	95.2	3.9	3.45	24652	933
DAVE CLARK*	Morgan	H		1125	88	94	3.5	2.94	29207	1051
MARTY SMITH DAIRY*	Wilkes	H		327	86	90.4	3.1	2.5	24561	810
J.EVERETT WILLIAMS*	Morgan	X		1776	88	88.4	4	3.17	26851	1067
DANNY BELL*	Morgan	H	4/2/2015	253	91	84.3	3.7	2.8	25127	968
R & D DAIRY*	Laurens	H		292	90	84.2	3.6	2.71	26510	960
SCOTT GLOVER	White	H	4/6/2015	221	91	83.1	3.4	2.51	25901	946
MARTIN DAIRY L. L. P.	Hart	H		317	90	82.7	3.2	2.58	24600	891
DOUG CHAMBERS	Jones	H		430	88	82.7	3.6	2.58	24349	867
B&S DAIRY*	Wilcox	H		743	87	81	3.7	2.68	23301	803
COOL SPRINGS DAIRY*	Laurens	H	4/9/2015	237	91	80.4	3.4	2.52	25572	908
COASTAL PLAIN EXP STATION*	Tift	H		287	89	80.3	3.3	2.41	25679	918
UNIV OF GA DAIRY FARM	Clarke	H		129	89	79.5	3.7	2.67	22504	859
MUDDY H HOLSTEINS	Hancock	H	4/6/2015	78	89	79.2	3.2	2.21	23336	783
ANDREW YODER	Macon	H		97	88	78.3	3.3	2.37	19838	712
IRVIN R YODER	Macon	H		142	89	77.7	3.8	2.61	22948	852
VISTA FARM	Jefferson	H		89	91	76.8	3.8	2.88	23366	856
WILLIAMS DAIRY	Taliaferro	H	4/3/2015	144	90	76.7	3.2	2.3	23043	835
EBERLY FAMILY FARM*	Burke	H		704	90	76.7	3.7	2.54	22768	856

1Minimum herd or permanent string size of 20 cows. Yearly average calculated after 365 days on test. (Mo.) column indicates month of 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 Fat Production - April 2015										
					Test Day Average				Yearly Average	
Herd	County	Br.	Test Date	[1]Cows	% Days in Milk	Milk	% Fat	TD Fat	Milk	Lbs. Fat
A & J DAIRY*	Wilkes	H		433	89	95.2	3.9	3.45	24652	933
J.EVERETT WILLIAMS*	Morgan	X		1776	88	88.4	4	3.17	26851	1067
RODGERS' HILLCREST FARMS INC.*	McDuffie	H		445	88	103.4	3.4	3.08	31754	1066
DAVE CLARK*	Morgan	H		1125	88	94	3.5	2.94	29207	1051
RAY WARD DAIRY	Putnam	H		142	89	75.9	3.9	2.92	24164	914
VISTA FARM	Jefferson	H		89	91	76.8	3.8	2.88	23366	856
DANNY BELL*	Morgan	H	4/2/2015	253	91	84.3	3.7	2.8	25127	968
R & D DAIRY*	Laurens	H		292	90	84.2	3.6	2.71	26510	960
B&S DAIRY*	Wilcox	H		743	87	81	3.7	2.68	23301	803
EARNEST R TURK	Putnam	H		388	92	74.7	3.6	2.68	21432	802
UNIV OF GA DAIRY FARM	Clarke	H		129	89	79.5	3.7	2.67	22504	859
BERRY COLLEGE DAIRY	Floyd	J		32	80	58.4	5	2.63	16192	751
IRVIN R YODER	Macon	H		142	89	77.7	3.8	2.61	22948	852
MARTIN DAIRY L. L. P.	Hart	H		317	90	82.7	3.2	2.58	24600	891
DOUG CHAMBERS	Jones	H		430	88	82.7	3.6	2.58	24349	867
DAVID L MOSS	Morgan	H		88	87	70.4	4	2.56	19837	760
EBERLY FAMILY FARM*	Burke	H		704	90	76.7	3.7	2.54	22768	856
COOL SPRINGS DAIRY*	Laurens	H	4/9/2015	237	91	80.4	3.4	2.52	25572	908
SCOTT GLOVER	White	H	4/6/2015	221	91	83.1	3.4	2.51	25901	946
LEE WHITAKER	McDuffie	H		291	89	73.6	3.6	2.51	21114	803

1Minimum herd or permanent string size of 20 cows. Yearly average calculated after 365 days on test. (Mo.) column indicates month of 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 – May 2015										
					Test Day Average				Yearly Average	
Herd	County	Br.	Test Date	[1]Cows	% Days in Milk	Milk	% Fat	TD Fat	Milk	Lbs. Fat
RODGERS' HILLCREST FARMS INC.*	McDuffie	H	5/6/2015	437	88	103.2	3.5	3.18	31868	1074
DAVE CLARK*	Morgan	H	5/4/2015	1130	88	96.4	3.4	2.91	29215	1054
A & J DAIRY*	Wilkes	H	4/27/2015	433	89	95.2	3.9	3.45	24652	933
D & T DAIRY	Wilkes	H	5/8/2015	50	84	91.5			27067	
MARTY SMITH DAIRY*	Wilkes	H	4/15/2015	327	86	90.4	3.1	2.5	24561	810
PHIL HARVEY #2*	Putnam	H	5/22/2015	1147	87	86.1	2.9	2.24	25500	755
J.EVERETT WILLIAMS*	Morgan	X	5/11/2015	1793	88	85.2	4	3.01	27002	1074
DANNY BELL*	Morgan	H	5/7/2015	270	91	84.8	3.7	2.77	25356	972
R & D DAIRY*	Laurens	H	5/15/2015	289	91	83.6	3.7	2.92	26703	969
COOL SPRINGS DAIRY*	Laurens	H	5/5/2015	231	92	83	3.2	2.5	25779	908
MARTIN DAIRY L. L. P.	Heard	H	4/18/2015	317	90	82.7	3.2	2.58	24600	891
DOUG CHAMBERS	Jones	H	4/30/2015	431	88	81.5	3.6	2.53	24512	876
B&S DAIRY*	Wilcox	H	4/28/2015	743	87	81	3.7	2.68	23301	803
IRVIN R YODER	Macon	H	5/2/2015	148	88	78.7	3.6	2.66	22945	854
EBERLY FAMILY FARM*	Burke	H	5/18/2015	711	90	78.3	3.7	2.53	22866	861
ANDREW YODER	Macon	H	4/12/2015	97	88	78.3	3.3	2.37	19838	712
COASTAL PLAIN EXP STATION*	Tift	H	5/19/2015	296	89	77.8	3.5	2.47	25383	908
WILLIAMS DAIRY	Taliaferro	H	5/8/2015	144	91	77.1	3.3	2.33	23302	835
BUD BUTCHER*	Coweta	H	5/8/2015	322	89	76.9	3.1	2.16	21561	
SCOTT GLOVER	White	H	5/14/2015	228	91	75	3.6	2.45	25713	932
VISTA FARM	Jefferson	H	5/16/2015	84	91	75	3.7	2.79	23233	870

1Minimum herd or permanent string size of 20 cows. Yearly average calculated after 365 days on test. (Mo.) column indicates month of 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 Fat Production – May 2015										
					Test Day Average				**Yearly Average**	
Herd	**County**	**Br.**	**Test Date**	**[1]Cows**	**% Days in Milk**	**Milk**	**% Fat**	**TD Fat**	**Milk**	**Lbs. Fat**
A & J DAIRY*	Wilkes	H	4/27/2015	433	89	95.2	3.9	3.45	24652	933
RODGERS' HILLCREST FARMS INC.*	McDuffie	H	5/6/2015	437	88	103.2	3.5	3.18	31868	1074
J.EVERETT WILLIAMS*	Morgan	X	5/11/2015	1793	88	85.2	4	3.01	27002	1074
R & D DAIRY*	Laurens	H	5/15/2015	289	91	83.6	3.7	2.92	26703	969
DAVE CLARK*	Morgan	H	5/4/2015	1130	88	96.4	3.4	2.91	29215	1054
VISTA FARM	Jefferson	H	5/16/2015	84	91	75	3.7	2.79	23233	870
DANNY BELL*	Morgan	H	5/7/2015	270	91	84.8	3.7	2.77	25356	972
EARNEST R TURK	Putnam	H	5/26/2015	419	92	69.6	4	2.72	21456	805
B&S DAIRY*	Wilcox	H	4/28/2015	743	87	81	3.7	2.68	23301	803
IRVIN R YODER	Macon	H	5/2/2015	148	88	78.7	3.6	2.66	22945	854
BILL DODSON	Putnam	H	5/25/2015	240	88	74.3	3.7	2.6	22648	815
OCMULGEE DAIRY	Houston	H	4/30/2015	329	87	73.8	3.8	2.6	19769	738
MARTIN DAIRY L. L. P.	Hart	H	4/18/2015	317	90	82.7	3.2	2.58	24600	891
CECIL DUECK	Jefferson	H	5/9/2015	88	90	74	3.7	2.55	24217	886
DOUG CHAMBERS	Jones	H	4/30/2015	431	88	81.5	3.6	2.53	24512	876
EBERLY FAMILY FARM*	Burke	H	5/18/2015	711	90	78.3	3.7	2.53	22866	861
RAY WARD DAIRY	Putnam	H	5/18/2015	136	89	72.5	3.5	2.52	24045	913
LEE WHITAKER	McDuffie	H	4/24/2015	291	89	73.6	3.6	2.51	21114	803
COOL SPRINGS DAIRY*	Laurens	H	5/5/2015	231	92	83	3.2	2.5	25779	908
MARTY SMITH DAIRY*	Wilkes	H	4/15/2015	327	86	90.4	3.1	2.5	24561	810
UNIV OF GA DAIRY FARM	Clarke	H	5/16/2015	127	89	70	3.7	2.5	22630	863

1Minimum herd or permanent string size of 20 cows. Yearly average calculated after 365 days on test. (Mo.) column indicates month of 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 Lows Herds for SCC Score March 2015									
Herd	County	Test Date	Br	Cows	Milk-Rolling	SCC-TD-Average Score	SCC-TD-Weight Average	SCC- Average Score	SCC-Wt.
DAVID ADDIS	Wilcox	3/26/2015	H	46	19404	1	42	1.3	56
COOL SPRINGS DAIRY*	Laurens	3/7/2015	H	247	25376	1.5	114	1.6	133
SCOTT GLOVER	White	2/28/2015	H	182	25424	1.6	107	1.7	117
J.EVERETT WILLIAMS*	Morgan	3/9/2015	X	1806	26619	1.6	103	1.6	115
DAVE CLARK*	Morgan	3/2/2015	H	1093	29292	1.8	108	1.9	123
BILL DODSON	Putnam	3/23/2015	H	249	22565	1.9	154	1.9	152
BERRY COLLEGE DAIRY	Floyd	2/22/2015	J	33	15792	2	78	1.9	112
SOUTHERN ROSE FARMS	Laurens	3/21/2015	H	125	23597	2	132	2.4	228
IRVIN R YODER	Macon	2/12/2015	H	214	23135	2.1	163	1.9	125
VISTA FARM	Jefferson	3/14/2015	H	89	23524	2.1	181	2.3	187
DANNY BELL*	Morgan	3/5/2015	H	251	24950	2.1	131	1.9	142
COASTAL PLAIN EXP STATION*	Tift	3/19/2015	H	283	26001	2.1	234	2.3	211
JARRETT EVERETT	Macon	3/15/2015	X	81	13117	2.2	132	3.1	271
GARY LOTT	Hart	3/2/2015	H	98	12099	2.3	193	2.3	171
EUGENE KING	Macon	3/23/2015	H	121	19577	2.3	237	2.3	259
RUFUS YODER JR	Macon	3/14/2015	H	159	23091	2.3	196	2.5	248
MARTIN DAIRY L. L. P.	Hart	3/12/2015	H	322	24486	2.3	249	2.7	272
MARTIN HOSTETLER	Macon	3/23/2015	H	109	14529	2.4	309	2.7	324
DAN DURHAM	Greene	2/26/2015	X	135	17197	2.4	186	2.4	184
LOUIS YODER	Macon	3/13/2015	H	131	20578	2.4	297	3	382
LEE WHITAKER	McDuffie	3/19/2015	H	299	20870	2.4	266	2.4	229
TROY YODER	Macon	3/25/2015	H	155	22474	2.4	233	2.7	216
RAY WARD DAIRY	Putnam	3/16/2015	H	145	24170	2.4	185	2.5	251
R & D DAIRY*	Laurens	3/16/2015	H	282	26250	2.4	253	2.2	227

1Minimum herd or permanent string size of 20 cows. Yearly average calculated after 365 days on test. (Mo.) column indicates month of 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 Lows Herds for SCC Score – April 2015									
Herd	County	Test Date	Br.	Cows	Milk-Rolling	SCC-TD-Average Score	SCC-TD-Weight Average	SCC- Average Score	SCC-Wt.
DAVID ADDIS	Wilcox	4/18/2015	H	45	19562	0.7	23	1.3	55
COOL SPRINGS DAIRY*	Laurens	4/9/2015	H	237	25572	1.1	64	1.6	127
SCOTT GLOVER	White	4/6/2015	H	221	25901	1.6	108	1.7	117
J.EVERETT WILLIAMS*	Morgan	4/13/2015	X	1776	26851	1.6	114	1.6	115
DANNY BELL*	Morgan	4/2/2015	H	253	25127	1.7	100	1.9	139
BERRY COLLEGE DAIRY	Floyd	3/30/2015	J	32	16192	1.8	67	1.9	107
G & H DAIRY	White	4/16/2015	X	74	14867	1.9	126	2.7	231
ANDREW YODER	Macon	4/12/2015	H	97	19838	1.9	99	2.8	267
DAVE CLARK*	Morgan	3/30/2015	H	1125	29207	1.9	145	1.9	122
JUMPING GULLY DAIRY LLC	Brooks	4/9/2015	X	1608	15136	2	176	2.4	230
BILL DODSON	Putnam	4/27/2015	H	247	22632	2	189	2	159
RUFUS YODER JR	Macon	4/11/2015	H	156	22856	2	216	2.5	254
CHARLES COPELAN	Greene	4/24/2015	H	64	16858	2.1	99	3.1	304
DAN DURHAM	Greene	4/9/2015	X	131	17375	2.1	141	2.4	179
DONALD NEWBERRY	Bibb	4/4/2015	H	106	18781	2.1	152	2.8	290
IRVIN R YODER	Macon	3/30/2015	H	142	22948	2.1	124	1.9	128
VISTA FARM	Jefferson	4/14/2015	H	89	23366	2.1	189	2.3	194
SOUTHERN ROSE FARMS	Laurens	4/23/2015	H	118	23403	2.1	227	2.4	228
COASTAL PLAIN EXP STATION*	Tift	4/17/2015	H	287	25679	2.1	209	2.3	215
R & D DAIRY*	Laurens	4/17/2015	H	292	26510	2.1	267	2.3	239

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Top GA Lows Herds for SCC Score – May 2015									
Herd	**County**	**Test Date**	**Br.**	**Cows**	**Milk-Rolling**	**SCC-TD-Average Score**	**SCC-TD-Weight Average**	**SCC- Average Score**	**SCC-Wt.**
DAVID ADDIS	Whitfield	5/16/2015	H	45	19816	1	36	1.3	54
COOL SPRINGS DAIRY*	Laurens	5/5/2015	H	231	25779	1.3	84	1.6	120
DAN DURHAM	Greene	5/21/2015	X	142	17422	1.4	52	2.2	164
DANNY BELL*	Morgan	5/7/2015	H	270	25356	1.6	102	1.9	139
BERRY COLLEGE DAIRY	Floyd	4/29/2015	J	32	16448	1.7	124	1.9	107
BILL DODSON	Putnam	5/25/2015	H	240	22648	1.7	121	2	160
VISTA FARM	Jefferson	5/16/2015	H	84	23233	1.7	164	2.3	192
J.EVERETT WILLIAMS*	Morgan	5/11/2015	X	1793	27002	1.7	118	1.6	117
BUD BUTCHER*	Coweta	5/8/2015	H	322	21561	1.8	168	2.6	244
G & H DAIRY	White	4/16/2015	X	74	14867	1.9	126	2.7	231
ANDREW YODER	Macon	4/12/2015	H	97	19838	1.9	99	2.8	267
PHIL HARVEY #2*	Putnam	5/22/2015	H	1147	25500	1.9	171	2.1	187
SCOTT GLOVER	White	5/14/2015	H	228	25713	1.9	137	1.8	121
DAVE CLARK	Morgan	5/4/2015	H	1130	29215	1.9	151	1.9	124
JUMPING GULLY DAIRY LLC	Brooks	4/9/2015	X	1608	15136	2	176	2.4	230
CHRIS WATERS	Meriwether	5/8/2015	H	145	15707	2	189	3.4	456
RUFUS YODER JR	Macon	4/11/2015	H	156	22856	2	216	2.5	254
R & D DAIRY	Laurens	5/15/2015	H	289	26703	2	215	2.3	248
WILLIAMS DAIRY	Taliaferro	5/8/2015	H	144	23302	2.1	241	2.9	288
SOUTHERN ROSE FARMS	Laurens	4/23/2015	H	118	23403	2.1	227	2.4	228

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