MAKING MILK IN THE SOUTHEAST

Eric Diepersloot

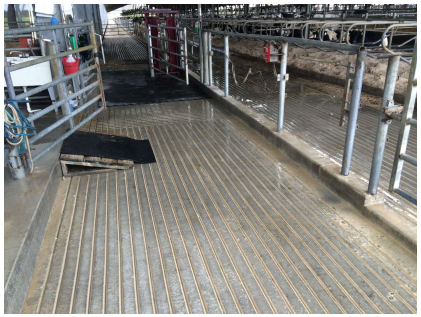
Full Circle Dairy

FULL CIRCLE DAIRY STATS

- AVG MILKING ANIMALS—3050
- DRY--375
- AVG DAILY MILK—87 LBS.
- AVG SCC—210,000
- TEAM MEMBERS—48

NEW MATERNITY ADDITION WHERE ANIMAL COMFORT STARTS

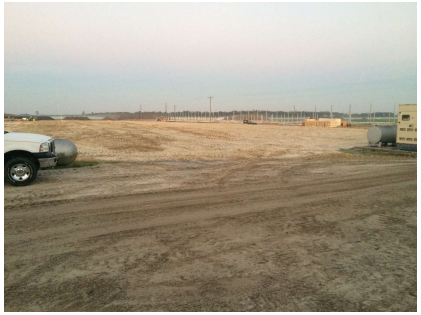
CLEAN WORK AREA



SAND BEDDED PENS FOR COWS IN LABOR
SANITIZED PEN FOR NEWBORNS

ANIMAL COMFORT BEGINS AT DAY ONE

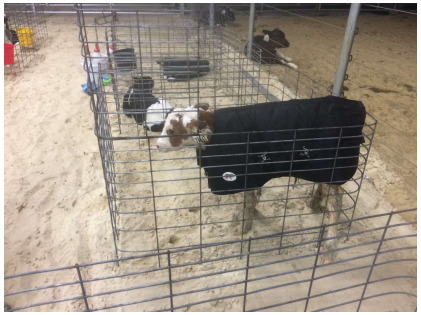
CONSTRUCTION OF NEW HEIFER FACILITIES



NEW CALF BARN 0-70 DAYS OLD

NEW WEANED BARN 70-180 DAYS OLD

BACKGROUND AREA FOR CALVES 1-4 DAYS OLD



COVERED STORAGE FOR MILK POWDER

EXTRA CAPACITY FOR AUTO FEEDERS

FIRST CALF PUT ON AUTOFEEDER

CALF BARN OPEN FOR AIR QUALITY AND SAND BEDDING FOR CALF COMFORT

FEED TROUGHS FOR WEANING CALVES

SHADE CLOTH FOR NORTH SIDE DURING COLD WEATHER

EXCELLENT FREESTALL USAGE IN PREGNANT HEIFERS

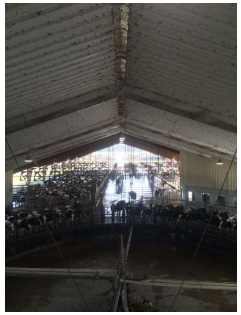
5-13 MONTH OLD HEIFER FREESTALL BARN

BODY WEIGHTS MONTHLY

ULTRASOUND AT 30 DSB

WHO KNEW SANTA HAS SO MANY DISGUISES

72 STALL ROTARY PARLOR MILKING
450-500 PER HOUR

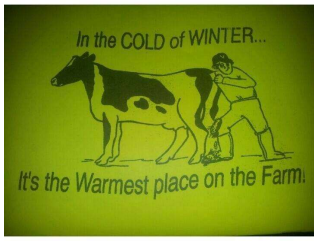


CLEAN COWS COMING IN FROM FREESTALLS

IMPROVED COOLING IN HOLDING AREA

IMPROVED COOLING BEFORE ENTERING HERD HEALTH AREA

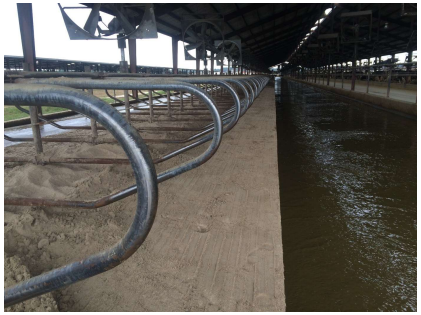
LINDSEYISM



6’ BELTING IN FEED LANE

IMPROVED FEET AND LEG HEALTH

CLEAN, DEEP BEDDED FREESTALLS



COMFORTABLE COWS MAKE MORE MILK

COOLING COWS IS A DAILY ROUTINE
FANS AND SPRINKLERS CHECKED DAILY

CLEAN FLOORS

MINIMAL STRESS

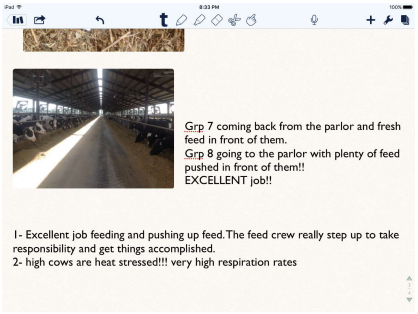
COMMODITY BARN RENOVATION

DECREASE FEED SHRINK

FEEDING MILKING HERDS 3 TIMES A DAY
PUSHUPS FOR FEED 7 TIMES A DAY

FEED DISTRIBUTION AND PUSHUPS ARE PRIORITY

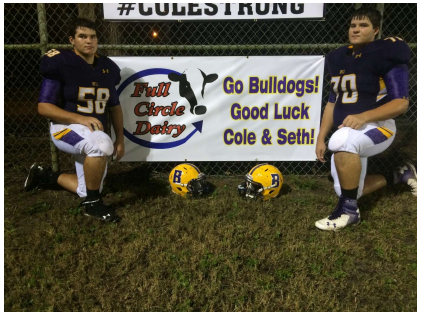
NOTES FROM BRUNO



CLEAN WATER IS NOT A GOAL IT IS A NECESSITY

NEW DIRECT LOAD AREA

AT FULL CIRCLE WE ARE ALL FAMILY



MY FIRST SUMMER AT FULL CIRCLE
I KNEW THIS WAS GOING TO BE AWESOME !!

NOTES

Challenges In The Adoption of New Technologies For Animal Management/Monitoring

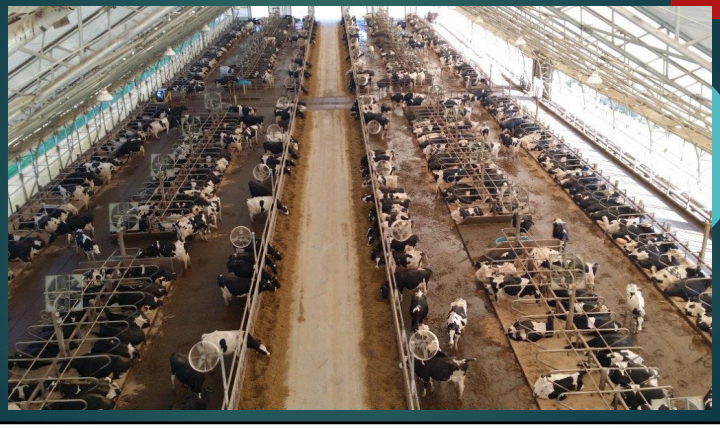
Steve Abel
Abel Dairy Farms

Abel Dairy Farms

- Started in 1857 in Eden, Wisconsin
- Owned by: Allen, Steve, & Bill Abel
- Crop 3300 acres
- Milk 1600 Holstein Cows
- 100 lb. Bulk Tank Ave. (3x), Sand Bedding
- Heifers Raised in Nebraska (Oshkosh Heifer Development)
- We do all harvesting, manure hauling, & milk hauling
- Young stock raised to 6 months

Winter Wonderland? Not Really!

Cover All Freestall Barn



Oshkosh Heifer Development

Things We Do To Monitor Cows:

- Daily Milk Weights
- Monthly DHI Testing
- Dairy Comp 305
- Feed Watch
- Heatime
- Weekly Urine ph's on Transition Cows
- Weekly Bulk Tank Cultures

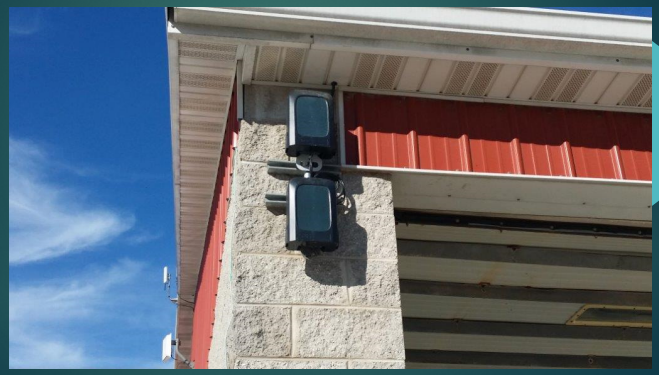
My Wish List

- Activity Monitor
- Rumination Capability
- No Portals
- Reliable
- No Batteries to Change
- Affordable
- Good Technical Service

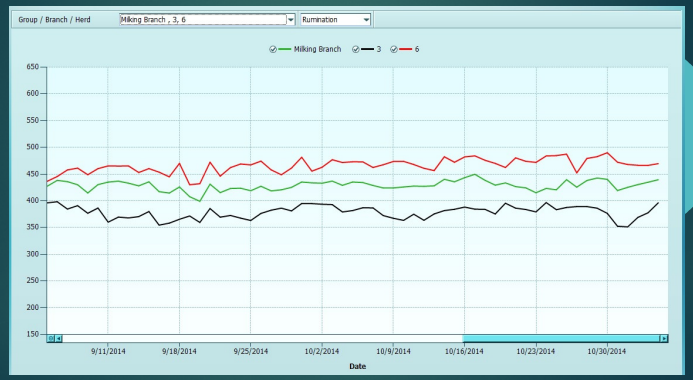
Reasons For Purchasing Heatime System

- 24/7 Heat detection and health monitoring
- Reduce the dependency on reproductive hormones
- Detect health problems before we see a drop in milk
- Track the effects of ration changes
- Track the effectiveness of treatments

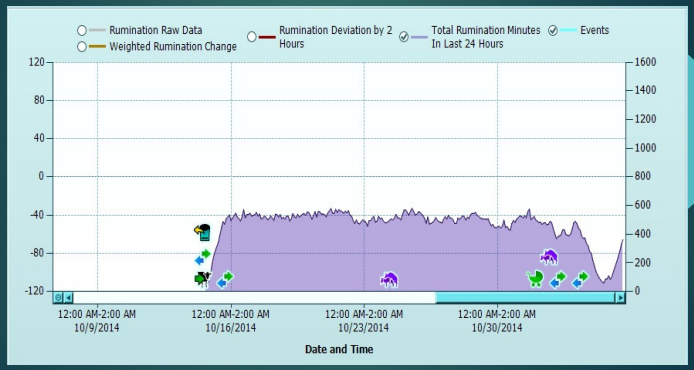
Two Antennas Cover The Entire Farm



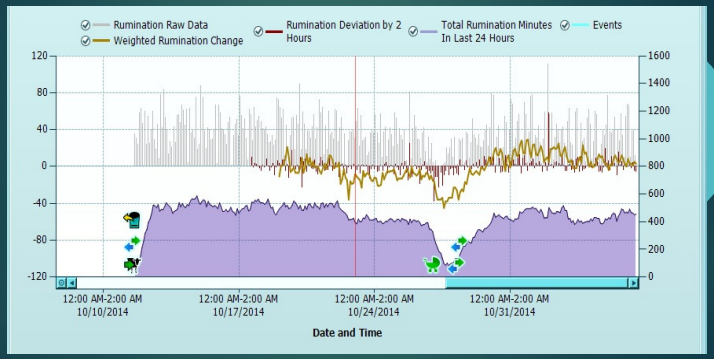
Group Rumination



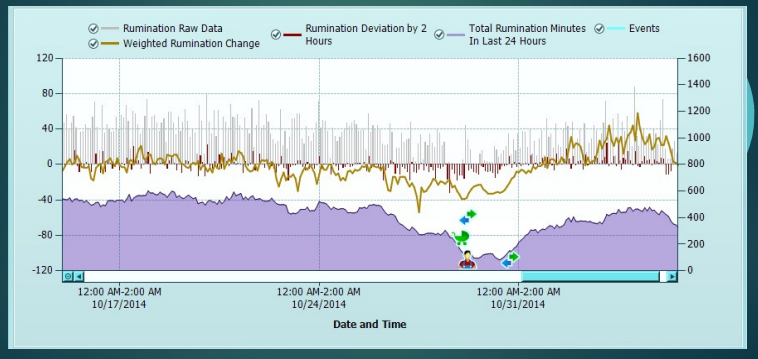
Typical Fresh Cow



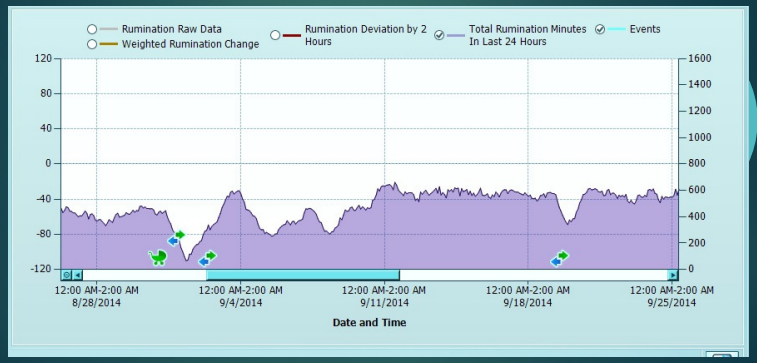
Typical Fresh Cow



Metritis Cow

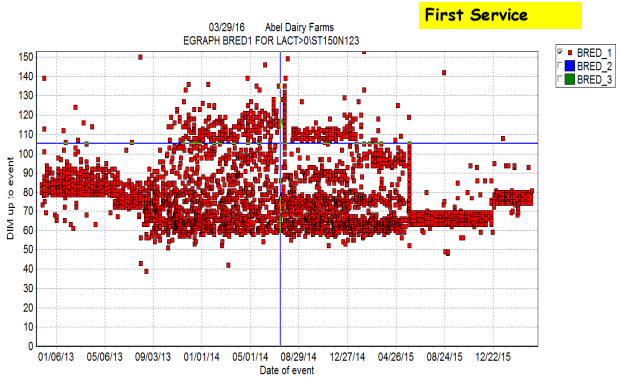


Adjusted Treatment



EGRAPH BRED1 FOR LACT>0\ST150N123

First Service



How efficiently are eligible cows becoming pregnant?

Presync

Date	Br Elig	Bred	Pct	Pg Elig	Preg	Pct	Aborts
9/01/12	314	204	65	310	68	22	4
9/22/12	327	213	65	321	76	24	9
10/13/12	318	185	58	313	63	20	7
11/03/12	331	231	70	326	77	24	17
11/24/12	317	177	56	313	64	20	12
12/15/12	331	201	61	326	61	19	9
1/05/13	333	192	58	331	64	19	12
1/26/13	330	206	62	328	75	23	7
2/16/13	315	198	63	308	56	18	5
3/09/13	318	197	62	317	72	23	9
3/30/13	309	200	65	304	79	26	5
4/20/13	287	178	62	282	60	21	8
5/11/13	291	174	60	279	54	19	9
6/01/13	279	176	63	269	70	26	9
6/22/13	243	150	62	232	46	20	4
7/13/13	229	152	66	226	43	19	7
8/03/13	253	155	61	245	37	15	9
Total	5125	3189	62	5030	1065	21	142

Wait Period 70

How efficiently are eligible cows becoming pregnant?

With Activity Monitors

Date	Br Elig	Bred	Pct	Pg Elig	Preg	Pct	Aborts
9/01/13	360	234	65	352	76	22	11
9/22/13	353	216	61	346	74	21	11
10/13/13	358	212	59	353	77	22	1
11/03/13	364	212	58	358	82	23	10
11/24/13	346	206	60	343	79	23	17
12/15/13	351	195	56	350	75	21	5
1/05/14	353	200	57	349	64	18	6
1/26/14	348	176	51	345	58	17	3
2/16/14	382	200	52	380	62	16	10
3/09/14	405	207	51	398	63	16	12
3/30/14	406	211	52	403	62	15	10
4/20/14	395	211	53	394	68	17	8
5/11/14	393	186	47	391	56	14	7
6/01/14	379	193	51	373	51	14	11
6/22/14	372	160	43	370	42	11	5
7/13/14	396	220	56	392	61	16	11
8/03/14	392	209	53	387	59	15	8
Total	6353	3448	54	6284	1109	18	146

Wait Period 58

What We've Learned So Far

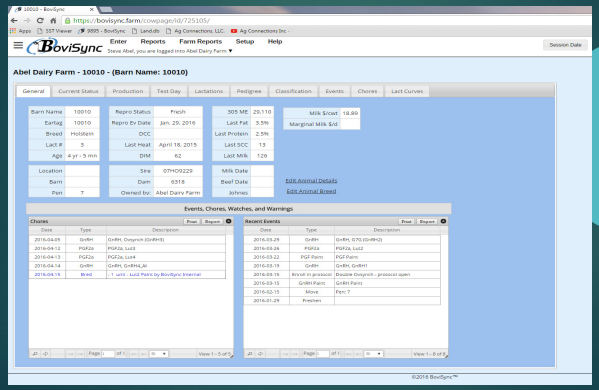
- We can't eliminate all repro hormones
- Off-feed cows are typically found 12 hours sooner
- ~ 5-10% of treatments changed based on rumination
- Addition of rumination data has made our herdsmen better cow people
- Heifer repro performance improved quickly

Unintended Consequences

- Need to upkeep collars at a 100% level
- Collars can and do fail.
- Spend around 260 hours/year changing and maintaining collars
- $5,000/year to change collars

Cloud Based Records System

Cattle Records On Your Smart Phone!!!



NOTES

PRODUCER PANEL

SUMMARIES OF MILK CHECK-OFF PROJECTS FUNDED IN 2014

Economic evaluation of dairy cow stocking density

Albert De Vries[1], Haile Dechassa[1,2], Henk Hogeveen[2]
1 Department of Animal Sciences, University of Florida, Gainesville, FL
2 Business Economics Group, Wageningen University, the Netherlands

Year awarded: 2014

Stocking density is a quantitative measure of the area occupied by cows. One measure is the number of cows per stall in a pen. Adding another cow to the pen may reduce each cow's performance, such as lowering lying time or milk yield, but also adds the net revenue of the additional cow. The economic optimal stocking density is reached when the marginal return of the pen equals the marginal cost of the pen. At this stocking density, the profit per stall is maximized. It is not clear how variations in stocking density affect profit per stall. Therefore, the objectives were to 1) Quantify the effects of stocking density on cow performance using literature review, 2) Perform an economic evaluation of stocking density, and 3) Make a spreadsheet available for custom evaluations. The study focused on lactating cows and not transition cows. Many studies exist that document the effects of (short term) stocking density on cow behavior but quantitative measures of stocking density on factors that directly affect cow cash flow (such as milk yield, fertility, lameness) are scarce. Lying time is reduced when stocking density >100% and starts to really be affected when stocking density >120%. Studies from Spain and New York both showed decreases of approximately 0.55 kg/day per 0.1 greater cows/stall in the range from 100% to 150% stocking density. Wisconsin data showed a loss of 0.01 conception rate per 0.1 greater cows/stall. Economic analyses of stocking density are therefore hampered by a lack of good performance data. The effect of stocking density on conception rate implies that the herd demographics change when stocking density is varied. Therefore a comprehensive herd budget spreadsheet was used to capture the combined effects of milk production loss and changes in demographics. The effects of milk losses of 0.50, 0.70 and 0.90 kg/cow per day on gain in profitability for each 0.1 greater #cows/stall were calculated. The level of milk loss had a large effect on the optimal stocking density and the gain in profitability. At a loss of 0.50 kg/cow per day, the maximum profit per stall was at a stocking density greater than 150%. The profit per stall per year at 150% stocking density was $145 greater than at a 100% stocking density. At a loss of 0.70 kg/cow per day, the optimum stocking density was at 122% and the profit per stall per year was $43 greater than at 100% stocking density. At a loss of 0.90 kg/cow per stall, the optimum stocking density was at 107% and the profit per stall per year was only $6 greater than at a 100% stocking density. Changes in prices had large effects on the optimum stocking density. The optimum stocking density was very sensitive to changes in cow performance and prices. Some overstocking typically was economically warranted. A spreadsheet has been developed to easily and quickly perform custom evaluations.

De Vries, A., H. Dechassa, and H. Hogeveen. 2015. Crowding your cows too much costs you cash. WCDS Advances in Dairy Technology, Vol.27:275-285.

De Vries, A., H. Dechassa and H. Hogeveen. 2015. Crowding your cows too much costs you cash (in Spanish). Pages 129-136: Proceedings 2015 DIGAL Conference, Delicias, Mexico.

2014 Georgia Youth Programs

W.M. Graves and J.F. Bohlen
University of Georgia

The state of Georgia offers numerous youth and undergraduate programs that foster the development of young people in the dairy industry. The fundamental concept of these programs is to increase exposure of young people to the various aspects of the dairy industry through a wide variety of activities. In 2014, youth in the state of Georgia competed in national dairy quiz bowl as well as dairy judging competitions. The team from Morgan Co. 4-H competed in the national dairy quiz bowl competition held in conjunction with the North American International Livestock Exposition (NAILE) in Louisville, KY. The top state dairy judging team from Carroll Co. competed at national dairy judging competition at World Dairy Expo in Madison, WI while the second place 4-H team from Houston Co. competed at the All American Dairy Show in Harrisburg, PA. In addition to these competitive events, six Georgia youth with two chaperones attended the Southeast Dairy Youth Retreat held in Blacksburg, VA while three youth and one chaperone attended the National 4-H Dairy Conference in Madison, WI as the Georgia delegation. The most successful program of 2014 for Georgia youth was the Commercial Dairy Heifer Project. At the 2014 State Show there were just over 235 youth members competing with over 300 heifers in the project. Monica Schaapman of Wilcox Co. 4-H was named Master Showman while Jacie Babb of Houston Co. FFA was named Supreme Showman. Jacie Babb from Houston Co. had the highest ranking heifer in conformation classes. Students enrolled in undergraduate programs at the University of Georgia have the opportunity to compete and represent UGA in a number of different events. The UGA Collegiate Dairy Judging Team competed at the Maryland State Fair, All American Dairy Judging Contest, World Dairy Expo Dairy Judging Contest, and the NAILE Contest in Louisville. The team was 6th in reasons in Harrisburg and 8th high team overall at World Dairy Expo. The UGA Dairy Challenge team (three students) attended the national Dairy Academy in Fort Wayne, IN and a second group (six students) attended the regional Dairy Challenge event in Salisbury, NC. Finally, four students and two advisors served as the representatives from UGA at the 2014 National American Dairy Science Association Meetings held in Kansas City, MO on July 19-22nd. One student was named 3rd Vice President on the national board, the UGA scrapbook was awarded 3rd place, and the Chapter from UGA was named third most outstanding in the country. These programs are made possible through dollars generated by such programs as the SMI Milk Check-off. Georgia 4-H, FFA, and the University of Georgia thank producers that contribute to this program and the opportunities it provides to the young people in the state of Georgia.

Florida's Dairy Youth Development Program

Chris Holcomb
Department of Animal Science
University of Florida
2013-15

Objectives

Our youth are often exposed to many different draws on their time, many of which can be very detrimental to their development. The Florida youth dairy program has designed a curriculum and many activities to stimulate these youth and expose them to the dairy industry. These events are also designed to help the youth hone their skills in public speaking, critical decision making, leadership, career development, and develop valuable future industry connections.

Methods

The youth are given the opportunity to compete in many events that will help accomplish the program objectives. In the past three years there have been over three hundred (300) different youth that have attended multiple events throughout the state and country. These events include state, regional, and national dairy judging events in over thirteen (13) states, and state and national quiz bowl competitions in over nine (9) states. There have been over sixty (60) different youth that have traveled to the Southeast Dairy Youth Retreat and National 4-H Dairy Conference which covers six (6) different states. There have also been over fifty (50) different adult leaders trained through the youth dairy programs volunteer leader training.

Results

The youth dairy program continues to grow at a large rate. This is demonstrated by the number of both cattle and exhibitors at shows, events, and workshops throughout the state and country. In 2015 there were over one hundred sixty (160) unique exhibitors and over three hundred (300) head, with over fifty (50) unique participants in events beyond the state level. At the national competitions, Florida had national winners in many competitions as well as being the most recognized state in the country at the National Guernsey Convention in 2013 through 2015 and added the National Holstein Convention to that astounding resume in 2015. We also added a new contest for 2015, The Jr. Dairyman Contest which is located in Harrisburg, Pennsylvania and tests students on feeding, management, and records evaluation. The Florida team placed first overall in their first ever entry. There is a marked increase in knowledge of the dairy industry and improvement in life skills such as public speaking and decision making.

Implications/Conclusions

The overall numbers of animals and exhibitors is growing exponentially throughout the state as demonstrated by participation throughout the many fairs and events. The most impactful results are seen through the development in both communication skills and personal confidence. Thus the youth that are graduating from the youth dairy project are much better communicators, are more decisive, and have a much increased amount of knowledge in the dairy industry. This makes them more marketable and is developing a new group of leaders and ambassadors for the dairy industry and agriculture in general.

Minimizing costs of mastitis though enhancing antimicrobial protein production in the udder

Kathryn E. Merriman, Mercedes F. Kweh, O. Monika Trejos Kweyete, Michael B. Poindexter, Jose E.P. Santos, and Corwin D. Nelson
Department of Animal Sciences, University of Florida, Gainesville, FL

Year awarded: 2014

The innate immune defenses of the mammary gland are critical for elimination of bacterial pathogens that cause mastitis. Laboratory experiments have demonstrated that the active form of vitamin D, 1,25-dihydroxyvitamin D_3 (**1,25D**), enhances the expression of multiple host defense genes, such as, β-defensin antimicrobial peptides, inducible nitric oxide synthase (**iNOS**), and the chemokine RANTES. Previous work using an experimental model of mastitis in dairy cattle also has shown that CYP27B1, the enzyme that catalyzes 1,25D production from 25-hydroxyvitamin D_3 (**25D**) is activated in the mammary gland during mastitis, and that intramammary 25D treatment inhibited experimental *Streptococcus uberis* infection. The objective of this study was to determine the effects intramammary 1,25D treatment on mammary host-defense gene expression. In the first experiment, contralateral quarters of 14 healthy Holstein cows (SCC ≤ 200,000 cells/mL) were treated intramammary with 10 μg of 1,25D or placebo (10 mL of phosphate buffered saline with 10% fetal bovine serum). Milk samples were collected at 0, 2, 4, 8, and 12 h relative to treatment, and somatic cells were collected for analysis of host-defense gene expression. At 2, 4, 8, and 12 h post 1,25D infusion CYP24A1, a positive control gene for 1,25D activity, was increased in the infused quarters relative to the control quarters ($P < 0.0001$). The 1,25D treatment increased iNOS expression >2-fold in milk somatic cells at 8 h and 12 h post infusion relative to the control quarters ($P < 0.05$), and β-defensin 7 (DEFB7) expression >2-fold at 4 h post infusion relative to the control quarters ($P < 0.05$). In addition, macrophages isolated from milk somatic cells using fluorescence-activated cell sorting had 2-fold greater iNOS expression in response to 1,25D treatment ($P < 0.05$). In the second experiment, the effects of 1,25D treatment on mammary immunity during subclinical mastitis were investigated. Fifteen cows with SCC > 500,000/ mL were selected and infected quarters were treated with 10 μg 1,25D or placebo after 5 consecutive milkings. Expression of iNOS and DEFB4 were upregulated 2-fold from 12 to 48 h relative to the start of treatments in the 1,25D-treated quarters demonstrating that 1,25D can enhance mammary immunity during naturally occurring infection. However, there was not an effect of 1,25D on SCC or bacteria counts in milk from infected quarters. The effects of 1,25D on clinical mastitis are also being investigated along with the effects of 25D, the precursor of 1,25D, on mammary immunity. The current Milk Check-Off project (2015-2016) is investigating the effects of dietary 25D on mammary immunity and mastitis resistance, which potentially offers a very practical and affordable means to improve mastitis resistance. In conclusion, 1,25D enhances expression of critical host-defense genes in mammary macrophages and indicates 1,25D or its precursors may be useful therapeutics or adjuvants to minimize the cost of mastitis in dairy cattle. Further work is needed to determine effects of 25D treatments on clinical and subclinical mastitis, and to understand how dietary vitamin D influences mammary immunity.

Impact of the IBR MLV on Ovarian Dynamics and Subsequent Breeding Success in Holstein Heifers

J. Bohlen, C. Widener, and W. Graves

Concerns regarding the modified live vaccine (MLV) for Infectious Bovine Rhinotracheitis (IBR) have recently resurfaced regarding its impact on the reproductive success of dairy animals. Previous research has focused primarily on pregnancy loss in naive animals following vaccination with a MLV vaccine. The same mechanism by which the IBR vaccine induces abortion in pregnant animals may have implications on the reproductive success of non-pregnant females. To investigate this concept, 28 Holstein heifers between the ages of 11.5 and 13 months housed at the University of Georgia Teaching Dairy in Athens, Georgia were selected for enrollment in this trial. Four animals were removed for either lack of synchrony or pre-existing immunological challenge. All animals were calf-hood vaccinated with an available bovine respiratory disease complex (BRD) with a modified live IBR component. Heifers were housed in the same pen and maintained on the heifer TMR used by the UGA Teaching Dairy to meet their maintenance, growth, and reproductive needs. Heifers were synchronized for estrus using a 7-day CIDR protocol with 2 injections of $PGF_{2\alpha}$, one at CIDR removal and a follow-up injection 16 hours later. Heifers were observed for one complete estrous cycle to establish a baseline of normal cyclicity for each animal. At approximately Heat 2 of the project, heifers were vaccinated with either the calf-hood MLV or a BRD vaccine with a Killed IBR component. One week prior to and 3 weeks post vaccination blood was collected and analyzed for titers against IBR and bovine viral diarrhea to ensure previous exposure to the BRD vaccine and to examine the efficacy of the vaccine types. The heifers were tracked for two complete treatment cycles and bred on Heat 4 of the trial. One week before vaccination, a baseline immune profile was established for each animal utilizing a complete blood count (CBC) and an assay to measure neutrophil activity as indicated by the presence of reactive oxygen species (ROS). The CBC was used to evaluate relative proportions of different white blood cells as an indicator of response to the vaccine. Neutrophils are an abundant circulating population of white blood cells and an early mediator of inflammatory response. These cells produce ROS when they engulf and destroy antigen. This oxidative burst contributes to the immune function of these cells but is also linked to damage to surrounding host tissues, which could include the reproductive tract and associated structures. Blood was drawn for this immunological profile on days 1 and 3 post vaccination and then weekly until the week of breeding (Heat 4). Preliminary examination of the CBC data, particularly the granulocyte counts and the granulocyte to lymphocyte ratio, indicate that the MLV animals had a stronger initial response to the vaccination but a faster return to baseline. Meanwhile, the Killed animals experienced a lower initial response but an extended duration of elevated cell counts. Peak endogenous neutrophil activity (ROS) was delayed to day 3 for the MLV vaccinated animals versus day 1 for the Killed vaccinated animals. Early post vaccination, the MLV heifers appeared to have more white cells in circulation while the Killed vaccinated heifers' ROS results indicated more active neutrophils in circulation. Early observations indicate a prolonged inflammatory response, as indicated by white cell counts, in Killed vaccinated heifers but less antibody (titer) production. Although the neutrophil response was delayed and the overall inflammatory response had a shorter duration in the MLV vaccinated heifers, there is no apparent difference in estrous cycle length or duration of estrus between the two groups. Blood was drawn every-other-day of the study for progesterone (P4) and estradiol (E2) analysis accompanied by trans-rectal ultrasound for ovarian structures. Every fifth day blood was sampled for for Anti-Mullerian Hormone (AMH). Ultrasound of ovarian structures was used to determine the cycle parameters of the heifers and is currently being validated by P4 and E2 concentrations. Changes in AMH concentrations will be used as an indicator of changes in the population and viability of the follicular pool. Alterations or reductions in these small follicles may temporarily diminish a heifer's fertility.

A. Vieira-Neto, I. R. P. Lima, F. Lopes Jr., C. Lopera, R. Zimpel, K. Galvão, C. Nelson, and J.E.P. Santos
University of Florida, Gainesville, FL

Year awarded: 2014-2015

Use of 1,25 Vitamin D3 (Calcitriol) to Maintain Postpartum Blood Calcium (Ca) and Improve Immune Function in Dairy Cows

Objectives were to determine the effect of a slow-release injectable formulation of 1,25$(OH)_2$ D_3 (calcitriol) on mineral metabolism and measures of immune function in dairy cows. Cows were blocked based on parity (2 vs. >2) and sequence of calving and, within each block, randomly assigned to either a control (CON = 25) or 1,25$(OH)_2$ D_3 (**VitD =** 25) within 6 h of calving. Treatments were administered subcutaneously and CON cows received 1 mL of vehicle whereas VitD cows received 300 μg 1,25$(OH)_2$ D_3. Cows were milked twice daily and milk samples were collected during both daily milkings until day 5 postpartum and then twice a week until 35 days in milk (**DIM**). Milk samples were analyzed for true protein, fat, lactose and somatic cells count by the DHI Laboratory. Blood was sampled immediately before administration of treatment, 12 h after treatment, and on days 1, 2, 3, 5, 7, 9, 12, and 15 postpartum. Samples were analyzed for total and ionized Ca (**iCa**), magnesium (**Mg**), phosphorus (**P**), nonesterified fatty acids (**NEFA**), beta hydroxybutyrate (**BHBA**), glucose. Urine collected in the first days postpartum was analyzed for concentrations of creatinine and urine and milk samples were analyzed for concentrations Ca, Mg, and P. Complete blood cell count and assays for neutrophil function were performed in the first week postpartum. Dry matter intake was measured daily from 6 to 35 DIM. Data were analyzed by ANOVA with mixed models using the MIXED procedure of SAS. Treatment with VitD increased ($P < 0.001$) concentrations of 1,25$(OH)_2$ D_3 within 4 h of application from 24 to 420 pg/mL and concentrations returned to baseline within 3 d. Blood iCa and total Ca took between 12 and 24 h after treatment to increase in VitD compared with CON. Concentrations of iCa (CON = 1.10 vs. VitD = 1.25 m*M*), total Ca (CON = 2.12 vs. VitD = 2.44 m*M*), and P (CON = 1.51 vs. VitD = 2.22 m*M*) remained elevated ($P < 0.01$) in VitD compared with CON, whereas concentrations of plasma Mg (CON = 0.74 vs. VitD = 0.64 m*M*) decreased ($P < 0.01$) with VitD in the same period. Concentrations of plasma minerals equalized after d 7 postpartum. Cows treated with VitD excreted more urinary Ca (0.6 vs. 1.7 g/d; $P < 0.01$) in the first 5 DIM and Mg (3.6 vs. 5.5 g/d; $P = 0.02$) only on d 1 postpartum. Concentrations of glucose (CON = 58.3 vs. VitD = 59.5; $P = 0.74$), NEFA (CON = 0.57 vs. VitD = 0.61 m*M*; $P = 0.47$), and BHBA (CON = 0.84 vs. VitD = 0.95 m*M*; $P = 0.21$) in plasma did not differ between treatments. Yields of milk (CON = 34.1 vs. VitD = 34.2; $P = 0.94$), 3.5% fat-corrected milk (CON = 38.2 vs. VitD = 38.1 kg/d; $P = 0.88$) and of milk components did not differ between treatments in the first 35 DIM. Dry matter intake in the first 35 DIM did not differ ($P = 0.50$) between treatments and averaged 19.9 and 19.4 kg/d for CON and VitD. Ongoing analyses of innate immune function are ongoing. In conclusion, administration of 300 μg of 1,25$(OH)_2$ D_3 increased concentrations of calcitriol in blood within 4 h up to 3 d, and those of iCa, total Ca, and P after 12 h of treatment and maintained elevated concentrations for up to 5 d. No differences in productive performance were observed with calcitriol treatment. The dose of calcitriol used in the current experiment was effective and safe at increasing blood concentrations of Ca in early lactation dairy cows.

Title: Jiggs Bermudagrass and Mulato II Brachiariagrass: Are They Viable Options for Use on North Florida/South Georgia Dairies?

Authors: Lynn Sollenberger (Agronomy Dept.), Joe Vendramini (Range Cattle REC), Marta Kohmann (Agronomy Dept.), Leonardo Moreno (Agronomy Dept.), and Jose Dubeux (North Florida REC)

Abstract:

Productive and high quality forages are critical to the success of dairy operations, but the combination of high yield and excellent quality has been difficult to find among warm-season perennial grasses adapted to the Gulf Coast region. Mulato II brachiariagrass and Jiggs bermudagrass have characteristics that make them attractive to dairy enterprises, but additional research station and on-farm evaluation is needed before they can be recommended to producers. Jiggs bermudagrass establishes rapidly, has fine stems for rapid wilting/drying, is persistent under frequent defoliation, and tolerates poorly drained soils. Mulato II is a productive grass with high nutritive value, but persistence in cooler climates is not documented. For both grasses, it is important to know if they provide advantages over currently used hybrid bermudagrasses in North Florida/South Georgia, environments that are cooler than where they have been most widely tested and used.

The objective of this project was to assess the potential of Jiggs and Mulato II for use as warm-season forages on dairies by measuring yield, persistence, and nutritive value in research station experiments and on-farm demonstrations carried out at three dairies. At each dairy, Jiggs and Tifton 85 bermudagrasses and Mulato II brachiariagrass were planted in side-by-side 0.5-acre strips between July 24 and August 6, 2014. Establishment was monitored during the 2014 growing season. On-station, one experiment compared Jiggs and Tifton 85 bermuda-grasses, harvested every 28 days during summer at two stubble heights (3 and 6 inches) and fertilized at three levels of K_2O (0, 20, and 40 lb/acre/harvest). The second experiment compared Jiggs and Mulato II harvested every 28 days and fertilized at two nitrogen rates.

The on-farm demonstrations showed that under producer conditions Jiggs bermudagrass consistently established easier and faster than Tifton 85 or Mulato II. Through two years, on-station experiments showed no evidence that Jiggs is less cold tolerant than Tifton 85 in North Florida, but Jiggs forage is less digestible than Tifton 85 and Mulato II. Mulato II stands survived the first winter after planting with virtually no stand loss and produced higher yields than Tifton 85 in the year after planting due to strong late-season production. However, an average to slightly colder than average second winter killed most of the Mulato II stand indicating that it will not function as a long-lived perennial in North Florida. Based on these studies, we conclude that Jiggs provides rapid establishment and earlier spring growth than most bermudagrasses. Additionally, it has persisted under frequent cutting in North Florida for at least two years, but its forage is less digestible than Tifton 85. Mulato II is not well suited to systems requiring a long-lived perennial, but because it is a seeded forage, it may have some potential as a high digestibility, short rotation forage crop. It could be seeded in spring of one year and produce high yields of high quality forage that growing season and the next.

Progress Report. Dairy Milk Checkoff Program

Development of tools to select cattle that are genetically resistant to heat stress.

Principal Investigators: P.J. Hansen (Dept. of Animal Sciences, University of Florida) and S. Dikmen (Department of Animal Science, Faculty of Veterinary Medicine, University of Uludag, Bursa, Turkey).

Scientists on the Project: M. Sofia Ortega and P. J. Hansen (University of Florida), S. Dikmen (University of Uludag) and D.J. Null and J.B. Cole (USDA-ARS, Beltsville, MD)

Objectives: Dairy cows with increased rectal temperature experience lower milk yield and fertility. Rectal temperature during heat stress is heritable so genetic selection for body temperature regulation could reduce effects of heat stress on production. The long term goal of the research is to identify genetic markers (called single nucleotide polymorphisms or SNPs) that can predict a cow's genetic ability to resist negative effects of heat stress. For the current project, the goal was to validate 26 SNPs previously shown to be related to rectal temperature regulation during heat stress.

Methods: A total of 2273 lactating dairy cows located in 11 farms in Florida and California were genotyped for 77 SNPs that had been previously related to body temperature, fertility or milk production. Farm records were retrieved and used to determine reproductive function for each cow. It was hypothesized that seasonal variation in days open and services per conception would be reduced in cows inheriting copies of SNPs previously related to regulation of body temperature. This would be indicated statistically as a genotype (0, 1 or 2 copies of the minor allele of the SNP) by season of breeding interaction.

Results: Several SNPs were found that were significantly associated with reproductive traits. In particular, there were 20 SNPs that affected days open, 17 for services per conception and 12 for pregnancy rate at first service. There were significant genotype x parity interactions affecting days open for 6 additional genes. However, there were no interactions between genotype and season of breeding for any SNP.

Conclusions: These data fail to support the hypothesis that SNPs previously related to rectal temperature during heat stress affect the physiology of the cow in a way to reduce effects of heat stress on reproductive function.

Future Research: Interactions between season and genotype will also be determined for milk production traits.

Long term comparison between individual housing and group feeding with cooling on calf performance in Georgia

Sha Tao and John K. Bernard

Animal & Dairy Science Department, University of Georgia, Tifton, GA

Abstract

Group housing with computerized automatic feeding is gaining in popularity because of improved labor efficiency and other advantages. For example, group housed animals have improved social skills which benefit the transition during weaning and minimize related stress. Compared with individual hutch, group housing of 12 neonatal calves with automatic feeder has similar animal growth during preweaned period, but improves average daily gain (ADG) during post-weaning period, which may be due to a smoother transition during weaning. Additionally, group feeding reduces the medication cost during the first month of animal's life relative to individual housing. However, a long-term study to compare animal's growth, health and producer's economic return between individual hutch and group feeding of preweaned calves is still not available. Such study probably is more important for producers in Southeast because hot and humid weather is longer than other regions; and group housing may be an effective approach to overcome negative impacts of heat stress on calf. Thus, the overall objectives are to compare individual hutch with group housing equipped with automatic calf feeder and cooling during preweaned period on calf growth, feed efficiency and health in Georgia during a year and to evaluate the economic return between different management systems. This project is still ongoing. The remodeling the calf barn for the project was completed. One automatic calf feeder (DeLaval CF1000) equipped with two sucking stations plus two scale units that measure the calf's body weight at feeder have been purchased and installed in the calf barn. Two DeLaval concentrate stations which automatically measure starter intake were kindly donated by a Georgia Dairy producer and were installed. The animal study is expected to start at the beginning of 2016.

NOTES