

2007 DHIA Breed Comparison for Southeastern States

October, 2007

	DRMS	Southeast	Southeast	Southeast
	Holstein	Holstein	Jersey	Other Breeds
No. Herds	13552	382	58	57
No. Cows / Herd	144	311	153	201
No. 1st Lact	55	114	53	76
% 1st Lactation	38%	37%	35%	38%
Avg Days in Milk	195	215	189	200
% Left Herd	34	34	37	35
%died	9.7	9	6.5	6.6
%left Repro	6	6	3.3	5.8
Milk Price	21.4	22.8	24.2	23.7
Rolling HA Milk	20,934	19,236	14,521	17,234
Rolling HA Fat	779	699	651	649
Rolling HA Prot	640	589	509	545
Summit Milk 1st Lac	69	66	48	58
Summit Milk 3rd+	91	86	64	77
Peak Milk 1st Lac	75	73	54	64
Peak Milk 3rd+	100	96	70	86
Proj 305ME Milk	22,976	21,601	16,101	19,233
Std 150-day Milk	71	65	47	58
SCC Actual	333	455	425	412
SCC Score	3.1	3.6	3.6	3.5
SCC Score 1st Lact	2.7	3.2	3.2	3.1
SCC Score 2nd Lact	2.9	3.5	3.3	3.5
SCC Score 3rd Lact	3.6	4.1	4.1	3.8
% SCC Score <4	60	48	50	51
PregRate Current mo	14.3	11.9	18.3	14.5
Actual Calving Int	14.2	14.7	14.3	14.3
Days to 1st Serv	98	106	96	107
1st Serv Concep Rate	44	49	43	47
# Calvings	145	300	149	196
# calves per 100 cows	83	74	99	77
%Dry < 40 days	16	15	10	16
%Dry > 70 days	24	32	28	34
%Bred to Proven bulls	64	64	60	58
%Bred to non-AI	22	36	20	37
%Heifers with Sire ID	86	78	89	79
%Cows with Sire ID	71	52	90	55

* Southeast - includes 6 southeastern states

** DRMS - includes all herds processed by DRMS

2007 DHIA Data for Southeastern States
October 1, 2007

	Alabama	Florida	Georgia	Miss	SC	Tenn
<i>Holstein Herds</i>						
No. Herds	16	57	134	24	32	120
No. Cows / Herd	170	880	366	241	231	146
No. 1st Lact	62	322	97	80	93	53
% 1st Lactation	36%	37%	27%	33%	40%	36%
Avg Days in Milk	227	206	217	218	218	210
% Left Herd	32	36	34	33	36	34
%died	7.2	11	8.7	10.5	7.2	9.1
%left Repro	4.9	6.3	6.7	7.2	6.6	4.3
Milk Price	23.8	24.1	23.7	22.5	22.8	21.3
Rolling HA Milk	17,392	18,850	19,110	19,863	20,837	19,275
Rolling HA Fat	582	668	690	702	770	712
Rolling HA Prot	528	561	588	610	645	585
Summit Milk 1st Lac	60	66	65	67	71	66
Summit Milk 3rd+	77	86	86	87	95	86
Peak Milk 1st Lac	66	75	72	75	78	73
Peak Milk 3rd+	85	97	96	97	105	96
Proj 305ME Milk	19,382	21,121	21,393	21,638	23,650	21,795
Std 150-day Milk	60	63	65	65	69	65
SCC Actual	518	448	490	491	388	434
SCC Score	4.1	3.8	3.07	3.9	3.5	3.4
SCC Score 1st Lact	3.6	3.4	3.2	3.4	3.2	3.1
SCC Score 2nd Lact	4	3.8	3.6	3.7	3.4	3.2
SCC Score 3rd Lact	4.6	4.2	4.3	4.3	4	3.8
% SCC Score <4	40	46	48	45	52	53
PregRate Current	13	7.3	11	12	12.9	14
Actual Calving Int	15.4	14.3	14.8	14.6	14.4	14.7
Days to 1st Serv	132	108	108	94	100	104
1st Serv Concep Rate	47	53	51	40	48	47
# Calvings	165	824	260	227	237	145
# calves per 100 cows	81	58	69	78	91	82
%Dry < 40 days	17	16	15	14	11	16
%Dry > 70 days	31	34	31	23	26	34
%Bred to Proven bulls	65	65	66	72	58	61
%Bred to non-AI	29	35	38	24	30	38
%Heifers with Sire ID	68	67	76	84	85	82
%Cows with Sire ID	47	28	47	66	65	62

Data from DRMS - October, 2007.

2007 DHIA Comparison of Southeast Herds to DRMS Herds

All Breeds	2006 Southeast *	2006 DRMS **	2007 Southeast *	2007 DRMS **
No. Herds	533	13,693	498	15574
No. Cows / Herd	270	135	280	139
No. 1st Lact	97	49	103	52
% 1st Lactation	36%	36%	37%	37%
Avg Days in Milk	203	191	209	193
% Left Herd	35	33	35	34
%died	7	5	8.5	9.5
%left Repro	6	5	6	9.5
Milk Price	14.50	12.74	23.1	21.5
Rolling HA Milk	18,168	20,311	18493	20309
Rolling HA Fat	675	763	687	764
Rolling HA Prot	562	624	573	626
Summit Milk 1st Lac	62	67	63	67
Summit Milk 3rd+	82	88	83	89
Peak Milk 1st Lac	69	74	70	73
Peak Milk 3rd+	91	97	92	97
Proj 305ME Milk	20,613	22,264	20690	22280
Std 150-day Milk	63	68	62	69
SCC Actual	478	350	447	335
SCC Score	3.7	3.2	3.6	3.1
SCC Score 1st Lact	3.3	2.7	3.2	2.7
SCC Score 2nd Lact	3.5	3.0	3.2	2.9
SCC Score 3rd Lact	4.2	3.6	4.1	3.6
% SCC Score <4	47	58	48	58
PregRate Current	11	13	13	14.8
Actual Calving Int	15	14	14.6	14.2
Days to 1st Serv	105	97	105	98
1st Serv Concep Rate	48	43	48	44
# Calvings	261	135	271	140
# calves per 100 cows	97	100	77	83
%Dry < 40 days	14	16	15	15
%Dry > 70 days	30	24	31	25
%Bred to Proven bulls	63	62	63	63
%Bred to non-AI	35	24	36	23
%Heifers with Sire ID	78	85	79	86
%Cows with Sire ID	54	69	56	71

* Southeast - includes 6 southeastern states

** DRMS - includes all herds processed by DRMS

2007 DHIA Production Recognition of High Florida Herds
 Production as of September 30, 2007

Producer	City	Milkings	RHA Milk	RHA Fat	RHA Protein	Data Collection Rating - Milk
NORTH FLORIDA HOLSTEINS	BELL	3X	25760	878	770	102.2
WHITE OAK DAIRY	MAYO		24919			95
SHENANDOAH DAIRY	LIVE OAK	3X	24591	913	736	96.5
ELJIM DAIRY	GRANDIN		22980	1032	682	69.9
JEFFCO DAIRY	QUITMAN	3X	22899			96
LARSON DAIRY #5	OKEECHOBEE	3X	22381			54.7
J-LU FARMS	LIVE OAK	3X	21669	822	624	99.2
ATR DAIRY	MAYO		21440			93.8
W B DAIRY, INC	HILLIARD	3X	21225	643	533	97.3
SHIVER DAIRY	MAYO		21116			94
DPS - BRANFORD FARM	BRANFORD	3X	20980	736	617	96.8
T.K. HATTEN DAIRY INC	BROOKSVILLE	3X	20831	497	470	70.2
SUWANNEE DAIRY, INC.	MC ALPIN		20813	703	614	99.2
BRANTLEY DAIRY FARM, INC	MCALPIN		20660			99.6
WALKER & SONS FARMS, INC II	MONTICELLO		20474			99.2
DPS - BELL FARM	BELL	3X	20469	689	618	96.6
V & W FARMS INC	AVON PARK	3X	20381			79.2
PAUL TRAWICK & SON	MAYO		20221	646	601	92.3
MILK-A-WAY	WEBSTER		20185	719	599	95.2
BRIAN MCADAMS	MAYO		20025			94.1

Southeast DHIA – Testing cows in Florida and Georgia

2007 Florida DHIA Herd Performance Averages*

September 30, 2007

	1993	2003***	2004***	2005***	2006***	2007***
No. Herds	55,648	56,366	57,510	54,375	54,978	51,406
No. Herds	122	92	82	71	66	62
Average Herd Size	456	613	698	766	833	829
% Days in Milk	86	84	84	86	85	86
Pounds of Milk	17,761	18,160	18,307	18,987	18,835	19,607
Peak Milk - 1st Calf (lbs./day)	67	70	68	72	72	74
Peak Milk - 2nd & Later (lbs./day)	88	88	87	85	91	94
Fat %	3.5	3.8	4	3.7	3.6	3.6
Pounds of Fat	622	683	672	716	687	705
Pounds of Protein	592	541	546	577	546	566
Value of Milk (\$)	2,658	2,579	3,210	3,211	2,982	3,558
Projected Minimum Calving Interval	14.1	16	15.6	15.5	15.7	15.7
Days Dry	69	78	77	75	72	74
% Cows Dry > 70 Days	19	37	36	19	18	20
Days to 1st Breeding	77	107	106	112	110	109
Days Open	148	197	192	193	196	197
% cows Open > 100 at 1st Breeding	14	33	28	31	27	25
No. Breedings per Conception	4.0	3	3	2.8	2.8	3.1
% Possible Breeding Serviced	52	26	25	26	25	26
Age at 1st Calving (months)	25	25	25	26	26	25
Age - All Cows (months)	44	44	43	44	44	45
% With Sire Identity	34	23	25	29	35	36
Average PTA\$ Sires	151	86	149	98	119	127
Average PTA\$ Service Sires	210	344	354	239	304	291
% Left Herd	40	39	33	31	34	32

* September 30, of the respective year

** Cows in Herds on official types of test (01 - 34)

*** Cows in Herds on all types of test (01 - 74)

Southeast Milk, Inc. Dairy Check-Off Program: Project Summaries

Active and Recently Completed Projects as of July 6, 2007



Project # 267

Title: **Evaluating the Effect of Seasonality on Financial Performance of Southeast Dairy Businesses.** Marvin Hoekema, Roger Natzke, Dan Webb (since 2002 Albert De Vries)

The goal of this project is to study the effect of seasonality found in DHI data on the financial performance of Southeast dairies that participate in DBAP. The 2005 DBAP data has been added to the database. A DHIA data set with records from 1990 through 2006 was obtained from DRMS in Raleigh, NC. Analysis is on-going.

Project # 275

Title: **Construction of a Rotational Shade Circle for Livestock on Pasture or Outside Lots.** K. Bachman

A prototype shade structure has been constructed adjacent to the Animal Science Building. Existing metal support poles were utilized to attach and suspend two parallel wire rope cables (30 feet) in an E-W direction. At the mid-point (15 feet) each E-W cable rested on a hook (additional support post required) to control downward and inward sag. Two cables (16 feet) in N-S orientation were attached to pulleys that traverse the E-W cables. The N-S cables were held separate at a fixed distance (60 inches) using a PVC spacer pipe and T's at the point of N-S cable attachment to the E-W pulleys. Excess cable sag was removed via turnbuckles installed in each cable run. Two pulleys on each of the N-S cables were used to attach and suspend the shade cloth frame (5x10 feet PVC pipe). Distance between the attachment straps affixed to the 10 foot pipes was 60 inches; thus, the shade frame can be oriented E-W or N-S. As configured, the cable and pulley assembly will allow the suspended shade frame to be moved relatively easily to any location within the confines of the outside perimeter cable support posts. However, during movement of the E-W pulleys past the mid-point support hook the E-W cable has to be lifted off the hook and subsequently re-hooked. By using telephone poles and come-a-longs, an up-scaled version of this assembly should provide practical and economical rotational shading and thereby help to reduce the development of mudholes. This project is completed.

Project # 289

Title: **Efficacy of a New Vaccine to Prevent Abortion in Dairy Heifers Naturally Infected with *Neospora caninum*.** J. Hernandez

No summary report submitted.

Project # 308

Title: **Effects of Lameness on Ovarian Activity, Maintenance of Pregnancy, Reproductive Performance, Milk Production and Efficacy of Corrective Foot Trimming Procedures to Prevent Lameness in Dairy Cows (year 1 of 3).** J. Hernandez

No summary report submitted.

Project # 314

Title: **A New Approach and Evaluation for Detection of *Mycobacterium paratuberculosis* (Johne's disease) in cattle.** O. Rae

Objectives: to explore an alternative method for detection of *M. avium subspec paratuberculosis* (MAP) in infected cattle, by sub iliac lymph node biopsy; to assess the sensitivity and specificity of individual and

serial test results using different diagnostic methods in Johne's positive cattle; and to explore methods to improve the sensitivity of sub iliac lymph node biopsy techniques for early detection of Johne's disease.

Procedures: About 150 cattle will be utilized (~100 samples are in storage waiting staining and processing). Animals have been selected from Johne's-ELISA tested animals at IFAS research units. Animals are from 2-10 years of age, and may or may not have signs suggestive of Johne's disease. Each study animal is identified by number, age, sex, breed, and evaluated by weight, body condition scores, and previous results of Johne's ELISA tests. Blood is collected for ELISA. A 100 gm fecal sample is cultured for *MAP*. A subiliac lymph node biopsy is taken or a whole lymph nodes taken at slaughter/necropsy. An impression smear of the lymph node cut-section is stained on a microscope slide (Zeihl Neelson) for microscopic evaluation. The remainder of the lymph node is placed in formalin for later histopathological evaluation.

ELISA test results						
Lymph node	Negative	Suspect	Low Pos	Med Pos	High Pos	Total
Negative	17	16	8	23	3	67
Positive	0	0	0	0	0	0
Pending	7	4	2		4	17
	24	20	10	23	7	84

Tentative results: The causative organism *MAP* has not been detected in peripheral lymph nodes of the 67 animals thus far evaluated. In 8 of 19 study animals that were followed to markets or necropsy, the organism was recovered and identified in gut wall tissue and (or) mesenteric (gut) lymph nodes but not in the peripheral lymph nodes. Because of the results seen to this point in the study, we have discontinued doing biopsies on live animals. We now take samples only from animals going to necropsy or to the packing plant. We will continue to assess these samples as they are collected. The project is ongoing.

Project # 333

Title: **Dairy Herdsman Seminars and Cow College in Spanish.** J. Shearer

No summary report submitted.

Project #339

Title: **Use of Low-Dosage ECP (estradiol cypionate) to Reduce the Financial Risks Associated with 30-d Dry Period When an Earlier-Than-Expected Calving Occurs.** K. Bachman

Milk lactose in the blood of cows indicates that the tight junctions between the epithelial cells in mammary tissue have become leaky. Leaky tight junctions are an early indicator that the mammary tissue has begun to involute or dry-off. Blood samples collected from cows that received various dosages of ECP were tested for lactose to determine the minimal dose needed to initiate involution (dry-off). Categories of dairy animals from which blood has been analyzed for lactose include: 1) heifers <365d old, 2) dry cows > 40d to expected calving date, 3) cows from late dry period through early lactation, 4) cows at dry-off that received or did not receive various dosages of estrogen (ECP) to accelerate involution, 5) cows in lactation that were milked while receiving various dosages of estrogen (ECP or estradiol). As expected, blood from categories 1 and 2 did not contain lactose since the mammary tissue is immature (1) or fully involuted (2) and therefore is not capable of producing lactose. Blood from (3) showed an initial increase in blood lactose as lactose synthesis began prior to closure of the tight junctions. The continuation of milk removal (5) counteracted the involution process and attenuated differences in blood lactose profiles for the various treatments. Category 4 was the best comparison of the effect of ECP on blood lactose. Both 20 and 30 mg ECP elevated blood lactose relative to the cottonseed oil control which itself had an

elevated response due to the involution that was initiated by stoppage of milk removal. Based on the blood lactose responses, cessation of milk removal at dry-off by itself initiates involution by 24h and the numerical increase in blood lactose observed with 20 and 30 mg ECP did not differ from the control values except for the 48-72 h post-treatment timeframe within the 240 h study period. Thus, by this criterion, a minimum dose of 20 mg ECP would be needed to hasten involution beyond that which occurs upon cessation of milk removal. This project is complete.

Project #349

Title: **Antibody Response to Ovalbumin as a Measure of Genetic Disease Resistance of Dairy Cows.** A. Donovan

Project update – 1,023 cows and heifers were originally enrolled into the study. Of these animals, 745 were eligible for analysis. These cows have all been categorized based on their immune response to Ova (HIR) as well as their immune response to the intradermal antigen injection (CMIR). This was accomplished by ELISA testing over 3,000 serum samples. The preliminary results of the association between the immune categorizations and the dairy diseases of interest are as follows:

- Low cell mediated immune responders were 12.56 times more likely to have retained fetal membrane at calving compared to high responders. $P < .0001$
- Low antibody responders were 6.9 times more likely to have a displaced abomasum compared to high responders. $P = .011$
- Low responders were 4.9 times more likely to get ketosis compared to high responders. $P = .013$
- Medium antibody responders tended to get mastitis 2.6 times more often than high responders. $P = .10$
- Low antibody responders tended to get metritis 1.5 times more likely than high responders. $P = .10$

Additionally we have found there is a significant difference between multiparous and primiparous cows in their ability to respond to the test antigen. Multiparous cows are able to respond faster to antigens used in the study. We also found there are significant differences among milk production levels for high and low responders. It appears low responders produce more milk. For fertility, if considering a cow's ability to get pregnant by 150 days post calving, the preliminary results show that low responders are 2.7 times more likely to get pregnant. The results provided are preliminary and subject to change as statistical models are improved for greater relevance. Along with completing the statistical analysis, I will next need to configure the heritability of this response to our test antigens. I will also complete a pedigree analysis where I will identify sires with pedigrees that influence immune responsiveness.

Project # 363

Title: **The Development of Corn Silage Varieties and a Year-Round Cropping System for Florida Dairy Farms.** B. Scully

Project # 365

Title: **Factors Affecting the Quality of Corn Silage Produced in Florida, and the Risk of Variable Manure Syndrome in Dairy Cows.** A. Adesogan

Check-Off dollars funded a series of experiments aimed at addressing producer concerns about links between the quality of corn silage produced in the southeast and poor productivity or disease problems (particularly Hemorrhagic Bowel Syndrome, HBS) in dairy cattle. An experiment was designed to determine effects of maturity at harvest, hybrid staygreen ranking and rainfall at harvest on the performance of dairy cows and the incidence of HBS. The experiment confirmed that the efficiency of milk production was greater in corn harvested at 35% DM than at 26% DM. The study also showed that high hybrid stay-green rankings were associated with lower feed digestibility and intake and slightly higher rectal temperatures. However no direct link between staygreen rankings and HBS or digestive upsets was found. Indeed several researchers now consider the cause of HBS to be multifactorial. Several factors may contribute to the incidence of the disease including bad silage management practices such as inadequate consolidation, harvesting or ensiling while it is raining, harvesting crops too early, feeding excess levels of readily fermentable carbohydrates etc. The project also showed that high stay

green rankings did not influence the immune response of cows or counts of HBS-causing organisms (*Aspergillus fumigatus* and *Clostridium perfringens*) in the cows. Although this work has not shown a direct link between HBS and stay-green ranking, it has demonstrated that high stay-green hybrids from some companies have poorer nutritive value than their low stay-green hybrids. Also when high stay-green hybrids are ensiled during rainfall, silage yeast counts may be increased and rumen function in dairy cows may be impaired. This project has been completed.

Project # 366

Title: **Enhancing Nutrient Intake and Digestibility and Performance of Lactating Dairy Cows Fed Diets Based on Tifton 85 Bermudagrass.** J. Bernard

Summary: Forty-four lactating Holsteins were used in an 8 week trial to determine the effectiveness of enzyme treatment on the utilization of diets based on corn silage plus either Tifton 85 bermudagrass haylage or alfalfa hay. The diets were formulated to provide similar concentrations of nutrients and included 12.1% of the ration DM as either Tifton 85 bermudagrass haylage or alfalfa hay. Third cutting Tifton 85 was chopped and ensiled in a bag prior to beginning the trial. The alfalfa hay was grown in the Western US and was purchased locally. The average nutrient content (DM basis) of the Tifton 85 was 14.2 % CP, 38.7 % ADF, and 72.4% NDF compared with 20.1% CP, 31.7% ADF, and 39.4% NDF for alfalfa hay.

There were no differences between treatments in dry matter intake (54.0 lb/d), milk yield (91.2 lb/d), milk fat percentage (3.69%), energy corrected milk yield (90.8 lb/d) or dairy efficiency (1.68 lb ECM/lb DMI). These results indicate that Tifton 85 can be included in rations for high producing cows up to 12% of the total DM without affecting dry matter intake or milk yield. Addition of an enzyme to the TMR did not improve performance of the cows in the current trial.

Economic analyses of the data without regard to the use of enzyme indicate an advantage for feeding Tifton 85 versus the alfalfa. Market prices used for the initial analysis were \$45/ton for corn silage, \$200/ton for alfalfa hay, \$40/ton for Tifton 85 bermudagrass haylage (equivalent to \$85/ton hay), \$200/ton for ground corn, and \$285/ton for soybean meal. The value of milk was calculated using a skim milk price of \$14.00/cwt and \$1.35 for lb of milk fat. Diets based on Tifton 85 resulted in \$0.34/cow/d greater income over feed cost (IOFC) because of the lower total feed cost. Milk price does not alter IOFC because milk and fat yield were similar among treatments. These results are consistent with previous research conducted by West et al. (1997). The magnitude of difference in feed cost will vary depending on cost of feed ingredients.

Publication: Bernard, J. K., J. W. West, and A. T. Adesogan. 2007. Performance of Holstein cows fed diets containing either alfalfa hay or Tifton 85 bermudagrass with or without a cellulase enzyme. *J. Dairy Sci.* 90 (Suppl. 1): in press (Abstr.). Status: Complete

Project # 368

Title: **Economic Comparison of Ultrasound Versus Rectal Palpation to Detect and Resynchronize Open Cows.** Albert De Vries, Julian Bartolome, and W.W. Thatcher

Objective is to compare the economics of ultrasound versus palpation to detect and resynchronize open cows using an Ovsynch (\pm CIDR) protocol. A graduate student (Ashley Sanders) was hired in September 2006 to develop a comprehensive tool to make the economic comparisons. Advice and data from experts around the country was sought. This project is actively on-going.

Project # 369

Title: **The use of CIDR Insert Post AI to Decrease Early Embryonic Loss in Heat Stressed Animals and the Efficiency of Reusing a CIDR Insert.** J. L. Fain

The objective of the first trial was to determine if incorporation of gonadotropin releasing hormone (GnRH) and estradiol cypionate (ECP) into the controlled internal drug release (CIDR)-prostaglandin (PGF 2α) protocol would increase pregnancy rates of dairy heifers using timed artificial insemination (TAI). This

study was conducted over a 6-mo period at the University of Georgia Teaching Dairy in Athens. Forty Holstein heifers with an average age of 16 mo were randomly allocated to 1 of 2 treatment groups. In treatment 1, 20 heifers were synchronized by: 50 µg GnRH (-9 d), CIDR (1.38 g progesterone, -9 d), 25 mg PGF2α (-3 d), 1 mg ECP (-2 d), CIDR removal (-2 d), 50 µg GnRH (d 0), and TAI (0 d), (OverSynch). A second group of 20 heifers (Control) were synchronized by: CIDR (1.38 g progesterone) (-9 d), 25 mg PGF2α (-3 d), CIDR removal (-2 d), and TAI (0 d). Upon CIDR removal, retention rates and discharges were recorded. Estrus activity was monitored using Estru\$ Alerts (Universal Cooperatives, Eagan, MN) applied at d -3. Timed AI occurred 48 h after CIDR removal. Pregnancy was determined by ultrasonography at 35 d post AI. For both treatments, CIDR retention rate was 100% and discharge was minimal with no significant effect on pregnancy rate ($P > 0.05$). Pregnancy rates of heifers synchronized by OverSynch (45 %; 9/20) were similar to those in the heifers synchronized with the control protocol (55 %; 11/20) ($P > 0.05$). In the OverSynch protocol, 16 of 20 (80%) heifers had Estru\$ Alerts that were all or partially rubbed while only 11 of 20 (55%) were observed in the control group. Additionally, 55% (11/20) of the Estru\$ Alerts on heifers in OverSynch were completely rubbed compared with 15% (3/20) in the control. Signs of estrus synchronization through visual appraisal of Estru\$ Alerts was significantly higher in the OverSynch heifers ($P < 0.05$). Although the OverSynch protocol did significantly increase estrus activity, it did not increase pregnancy rates with a TAI.

Two additional experiments were conducted to test the efficacy of using progesterone treatment post AI to decrease embryonic mortality in dairy animals and to resynchronize estrus in dairy and beef heifers. In experiment 1, all animals were synchronized utilizing a single injection of 25 mg PGF2α and were inseminated 12 h after animals were observed in standing estrus. Cows and heifers were randomly assigned to 1) receive post AI progesterone therapy (cow n = 11; heifers n = 13) from d 14 to 21 after AI using the CIDR insert (1.38g progesterone) (treatment) or 2) receive no further treatment post AI (cows n = 5 cows; heifers n = 9) (control). This trial was split and run in the summer and winter seasons to determine progesterone variability. Supplementation of progesterone after AI had no effect on pregnancy rates in heifers or cows, regardless of season ($P > 0.05$). No animals in this experiment diagnosed pregnant at d 35 were diagnosed open on d 60; therefore, no embryonic loss occurred, regardless of treatment. Progesterone concentrations on d 21 in heifers, regardless of treatment, tended to be higher ($P = 0.0651$) than those observed in cows. During both seasons, use of the CIDR maintained progesterone concentrations from d 14 to d 21; however, there were significantly higher progesterone values throughout the winter season when compared with summer ($P = 0.0084$). In experiment 2, beef (n=12) and dairy (n=32) heifers were initially synchronized utilizing a new CIDR insert (1.38 g progesterone) (d -10) with a 5 cc injection of PGF2α at the time of CIDR removal (d -3). Animals were then artificially inseminated at 12 h after detected estrus (d 0). At 14 d post insemination (d 14), all animals received the same previously inserted CIDR for a second 7-d period until removal on d 21, followed by reinsemination occurring 12 h after detected estrus. Pregnancy rate response to initial synchronization was higher in both dairy (52.17%; 12/23) and beef (75%; 3/4) heifers compared with resynchronization, which yielded 51 pregnancy rates of 40% (4/10) and 50% (3/6), respectively. Use of the new CIDR insert significantly increased ($P = 0.002$) progesterone concentrations from d -10 to d -3 in heifers, whereas the used CIDR did not increase progesterone concentrations from d 14 to d 21 ($P > 0.05$). A mean increase in progesterone concentrations from d 14 to d 21 was a significant positive predictor of pregnancy ($P = 0.0133$). Furthermore, on d 21, progesterone concentrations were positively correlated with incidence of pregnancy at d 35 ($P = 0.004$). The use of exogenous progesterone maintains circulating blood progesterone concentrations in heat stressed heifers and non heat stressed heifers and cows. Although a used CIDR does not appear to maintain progesterone concentrations similar to those with a new CIDR, it did successfully suppress and resynchronize return to estrus. This project is ongoing.

Additional studies are being conducted with heifers to evaluate combining the Ovulation and CIDR synchronization protocols with both timed AI and heat detection. The authors would like to thank the Committee for their support.

Project # 371

Title: **Use of Radio Frequency Identification (RFID) for Dairy Cattle Management.** D. Webb

This project is considered complete. See renewal project #380 for summary.

Project # 373

Title: **Multi-Lingual Training Videos for S. E. Dairies.** D. Bray

Over 15 videos have been produced in English and Spanish. This project is completed.

Project # 374

Title: **Environmental Modifications for Reducing Summer Stress on S. E. US Dairy Farms.** D. Bray

Comparisons were made again between various number of ultra high pressure fog coolers in a calving barn, the lower the temperature in the barn the more moisture was on the bedding, which was not a problem since the sand bedding was replaced every 4- 5 days, this still seems to be a economically way to cool sand bedded calving barns. Strip spray nozzles were installed at the DRU to provide a constant spray of water in the back free stall alleys of the barns, this provided back alley cows to be cooled when the feed face area was full of cows, on extremely hot days these cows body temperature dropped about 1 degree F, it also provided entertainment for "boss cows" to play in the water. This project is completed.

Project # 375

Title: **2006 Florida Mastitis and SCC Reduction Study.** D. Bray

We have evaluated free stall bedding for pathogens at various depths at the front and rear of the stalls, rear stalls were higher in moisture and pathogen numbers than the front of the stalls, which demonstrates the need to remove the sand from the rear of the stalls at least once a year. Changing from 3X milking to 2X milking increased leaking milk between milkings, which increased pathogen levels in these stalls, thus cleaning material from the back of stalls is needed more often in fresh pens. This project is completed.

Project # 376

Title: **Support for Florida and Georgia Youth Programs, 4-H Dairy Activities and Youth Events, Dairy Judging Team Support, Undergraduate Programs and Scholarships, Participation in 5th North American Intercollegiate Dairy Challenge, State 4-H Dairy Show.** B. Broadus

No Summary Required

Project # 377

Title: **Dairy Business Analysis Project-Georgia-2006.** L. Ely

Financial data for the year 2005 were collected from participating dairy farms and screened for completeness and validity. Each dairy farm then received a benchmark report detailing its financial results compared to the average results for the other participants and the six dairy farms with the highest net farm income per cwt. This benchmark report is discussed with the dairy farms to identify challenges and opportunities for improvement.

Twenty-one dairy farms were included in the summary results. Of these, 15 were located in Florida and 6 in Georgia. The average herd size of the participating dairies was 1045 cows and 538 heifers with 18,322 lbs. milk sold per cow. The average culling rate was 36%. The average milk price was \$18.24. Average total revenues were \$20.73 per cwt. milk sold. Total expenses averaged \$20.20 per cwt. sold. The largest items were purchased feed, \$7.22, and personnel costs, \$3.50. Net farm income from operations averaged \$0.53 per cwt. sold. Net farm income per cwt. was \$0.07. The herds were divided into 3 equal groups on size, <446, 446 to 670 and >670 cows. The average number of cows and heifers by group was 261 cows and 50 heifers, 562 cows and 348 heifers and 2,312 cows and 1,218 heifers. Milk sold per cow was 15,777, 19,225 and 19,963 pounds by group. Culling rate was highest (42%) for the smallest herd

size and lowest (31%) for the largest herd size. Milk revenue increased with herd size (\$17.95, \$18.14 and \$18.63 per cwt) but total revenue was highest (\$21.57 per cwt) for the smallest herd size. Total expenses decreased with increasing herd size (\$22.22, \$20.75 and \$17.65 per cwt). This resulted in the highest net farm income from operations (\$2.79 per cwt) and net farm income (\$2.79 per cwt) for the largest herd size. The largest expense item was purchased feed for each group but it decreased with increasing herd size. Labor costs were highest for the smallest herd size and decreased with herd size. The herds were divided into 3 equal groups on pounds of milk sold, <17,300, 17,300 to 19,500 and >19,500. The average pounds of milk sold, cows numbers and heifers numbers for each group was 14,950 pounds of milk, 1,117 cows and 363 heifers; 18,420 pounds of milk, 447 cows and 215 heifers; and 21,594 pounds of milk, 1,571 cows and 1,038 heifers. Culling rate was highest for the lowest production group (44%) and lowest for the highest production group (29%). Milk revenue was nearly equal for each group (\$18.32, \$18.08, and \$18.32 per cwt) but total revenue was highest for the lowest yield group and lowest for the highest yield group. Total expenses decreased with increasing milk sold (\$21.78, \$19.86 and \$18.98 per cwt). This is resulted in the highest net farm income from operations (\$1.31 per cwt) and net farm income (\$1.19 per cwt) for the highest production group.

Data collection for 2006 has been started and 5 Georgia dairies have been collected so far.

Project # 378

Title: **Milk Check-Off Recovery.** G. Hembry

No Summary Required

Project # 379

Title: **The Development of Corn Silage Varieties & A Year-Round Cropping System for Florida Dairy Farms.** B. Scully

Project # 380

Title: **Use of Radio Frequency Identification (RFID) for Dairy Cattle Management.** D. Webb

Objectives: To determine usefulness of electronic identification for collection of dairy cattle information including: heifer body weights, milk weights on test-day, reproduction and veterinary checks, health data and group movement.

Progress so far: Our group has been working to determine usefulness of electronic identification for collection of dairy cattle information including: heifer body weights, milk weights on test-day, reproduction and veterinary checks, health data and group movement. Animals were tagged with ear tags containing the RFID chip. Cows are identified in the chute or lockup stanchions by waving a wand near the ear, which transmits to a hand-held computer (Palm PDA). Using the palm version of PCDART from Dairy Records Management Systems, management data can be entered and automatically attached to the cow's data file. This electronic identification can reduce labor required for record keeping and improve accuracy of records.

After the initial tagging of young animals, we have tagged all animals at the University of Florida, Dairy Research Unit including 527 adult milking cows, 354 heifers and 47 bulls. Since the beginning of the project, 1108 animals have been tagged with RFID at UF's DRU. At two other cooperator herds, 760 cows and 568 heifers have been tagged.

Readability of tags has been variable. Our standard procedure was to apply the tag then read it with one of the wands, immediately. All of the tags except one, read successfully, immediately after tagging. So far, we have used five different wand readers: 1) AgInfolink's Blue tooth, 2) Digital Angel Blue tooth, 3) Allflex stick reader (wired), Allflex stick reader – Bluetooth, Idology vibrator wand. All five wands have given satisfactory reads, but the Allflex stick reader has performed the best in our study. The wand from Idology has one advantage in that it gives a vibration upon successful read of a tag. This is helpful in noisy situations. Evaluation criteria included distance from the tag and successful read on first try.

Having RFID on all heifers has enabled us to evaluate the electronic weighing system manufactured and marketed by TruTest. We have used the XR3000 with the companion load bars and the Allflex stick reader. While heifer weighing at the DRU is usually associated with treatments and other management, we have been able to evaluate the system for collection and retrieval of body weight data. In our facilities, the weighing sequence goes like this: 1. heifer enters the approach chute; 2. we open the gate which allows her to enter the platform scale; 3. Identification is read by the wand; 4. press the button to record; 5. open gate to release heifer.

We are beginning to evaluate the use of RFID with TruTest's Data Handler, a hand-held unit for collection of test-day milk weights. It can be used with and without RFID. This project is ongoing.

Project # 381

Title: **Investigation of Strategies for Increasing Milk Production from Bermudagrass Silage and Reducing Nitrogen Pollution on Dairy Farms.** A. Adesogan

In order to enhance the utilization of tropical grasses in dairy cow rations, this project aims to determine the influence of maturity (regrowth interval length) of bermudagrass silage and dietary enzyme supplementation on the performance of dairy cows.

A 30-acre Tifton-85 bermudagrass pasture was cut on May 30, 2007 to stage the forage for the experiment. On June 27, half of the pasture (4-week regrowth) was harvested, but the remaining half was not. Therefore on July 25, which is the anticipated harvest date for the trial, half of the pasture will be a 4-week regrowth and the other half will be an 8-week regrowth. Both of these regrowths will be ensiled in separate 12 foot-wide Ag bags for at least 21 days. Subsequently, the forage in each of these bags will be fed with or without supplementation with a fibrolytic enzyme to 60 dairy cows in a 56-day experiment. The feeding trial will be conducted as soon as the facilities required for the experiment become available. This project is ongoing.

Project # 382

Title: **To Evaluate Strategies for and the Benefits of Adopting a Shortened Dry Period.** K. Bachman

The Goals of this proposal were to identify factors that dairy producers need to consider when adopting use of the shortened dry period because these factors can affect milk production, health and economic benefits. This proposal was approved in 2006 and the funds provided were to be co-mingled with additional funds available to support personnel to carry out this project over a 12-16 month time period. Because of an unexpected delay in arrival of the key member of the research team, the timing to accumulate sufficient cow numbers to meet project goals made it impossible to undertake this project. The appearance of published research that meets many of the goals of the proposed research reinforces the current decision of the Investigators to withdraw the proposal and return the financial support awarded to the check-off committee. Some results and conclusions of the published research and reference citations are provided as information to the dairy producers. Portions of their results have appeared in various dairy related publications.

Recent large field studies have evaluated the effect of dry period length on health, production and reproduction of Holstein cows (Watters et al., 2006. J. Animal Science, (Suppl. 1), 89:213,288. These studies used 772 cows managed on a large commercial dairy to evaluate dry periods of 34 or 55 days. Milk production through 150 days in lactation was slightly greater for cows given the longer dry period. Cows in their 3rd or greater lactation produced more milk but the amount produced was not affected by length of the dry period or the parity of the cows. Slight differences in fat and protein percentages were detected due to dry period length and parity, but not the yields of fat or protein. The incidences of mastitis, displaced abomasum, ketosis, metritis and retained placenta were not affected by dry period length. Based on their studies, cows given the shorter dry period also had fewer days to first postpartum ovulation and first service, but service conception rate did not differ. The proportion of cows pregnant during the first 150 days in lactation was greater for cows given the short dry period. Overall, the shorter dry period appeared to improve reproduction by decreasing the days open and the greater number of

cows pregnant with no negative effects on milk production or composition. This project is being withdrawn.

Project # 383

Title: **Effects of Dietary Trans Fatty Acids on Uterine Infection and Interval to First Breeding in Early Postpartum Dairy Cows.** L. Badinga

This project was planned for the Fall semester of 2006. However, due to hurricane damage to Monsanto barn last year and the time needed to repair the barn, several animal experiments at the Dairy Research Unit have been delayed. We are now in the queue and the paperwork (project protocol, IACUC, etc.) has been finalized to conduct this experiment between January and April 2008. The Dairy milk check off committee will be briefed as soon as the project is completed. This project is ongoing at this time.

Project # 384

Title: **Effect of Dry Matter Content of Ryegrass Silage on Intake and Performance of Lactating Cows.** J. Bernard

The ryegrass silage was harvested in March; however, only two of the three dry matter concentrations were achieved because of equipment problems. Because of this, the project was delayed until the check-off advisory committee could be consulted. After consulting with the committee and Dr. Dahl, the project will be conducted this summer. Treatments will include a comparison of ryegrass silage harvested at two moisture concentrations (31 and 41% DM). Results will be available by the end of the year. Status: Ongoing

Project # 385

Title: **Alternative to Sand Bedding in Freestall Barns.** D. Bray

We have installed over 100 Dual Chamber water beds at the DRU, and have about 75 other stall surface materials waiting to be installed, we are in the process of comparing the waterbeds with sand stalls for usage, cow cleanliness and leg and hock health. This project is ongoing.

Project # 386

Title: **Development of an Interface between PCDART and an Excel Spreadsheet that Optimizes Breeding and Culling Decisions.** Albert De Vries, Adriane Bell, Jose Alfredo Villagomez-Cortes, Dan Webb, and Peter Hansen

A program has been developed that optimizes economic decision making about breeding and culling decisions for individual dairy cows. The program ranks cows for breeding and culling decisions. The program works currently in Excel. The program needs cow-specific data currently available in PCDART. Thus an automatic routine is needed to bring data from PCDART into Excel. This involves development of an interface between both pieces of software. Once that is completed, the program is ready to be implemented on dairies that have both PCDART and Excel. This project is actively on-going.

Project # 387

Title: **Anionic Salts Pre-Partum and Supplemental Fat Post Partum to Improve Health and Productivity of Lactating Dairy Cattle.** M. Froetschel

The project is ongoing; however, the starting date of the experiment was delayed, resulting in less multiparous cows being available at once to complete the animal feeding experiment as initially intended. The animal feeding portion of the experiment was conducted in the last 6 months using 50% of the intended animal numbers. A second group of transition cows will be used to complete the animal feeding portion of the experiment next Fall. Although this will require the use of additional funds, it is hoped that extra funds secured from another recently completed project will be available and enough to complete the animal experimentation.

The starting date of the experiment was delayed approximately six months because of renovations to the free-stalls associated with the calan-gate feeding area of the UGA Dairy in Athens. The delay resulted in missing a group of multiparous cows with Fall calving dates. The animal experiment started December 2006, 24 multiparous cows with calving dates from January to April were identified and placed into pre-arranged treatment groups based on their previous milk production records and parity in an attempt to balance their milk production potential amongst the four treatment groups. The four treatment groups were designated as: 1) Control/Control: without anionic salts pre-partum and without supplemental fat post partum 2) DCAD/Control: Anionic salts pre-partum and without fat supplementation post-partum, 3) Control/ Fat: without anionic salts pre-partum and fat supplementation post-partum and 4) DCAD/Fat: Anionic salts pre-partum and fat supplementation postpartum. Cows on anionic salt treatment were fed to receive approximately 3lbs of BIO-CHLOR® (Church and Dwight Co., Inc. Princeton, NJ) per head per day for 2 weeks pre-partum based on their expected calving date. Urine pH collected prepartum indicated that their anion-cation status was altered by as intended. Cows on the fat treatment were fed 4% supplemental fat as Ca salts of fatty acids (Megalac-R®, Church and Dwight Co., Inc. Princeton, NJ).

It became apparent after the onset of the animal feeding experiment that it was not possible to attain the numbers of multiparous transition cows (24: 6 per treatment) originally intended during January through April season. Several cows were dropped from the experimental schedule. Cows were excluded due to changes in calving dates and health problems in early lactation. Several cows had complications related to displaced abomasum, mastitis or lameness. In order to capitalize on the progress completed thus far, it was decided to assign at least 3-4 cows per treatment and intensify the sampling of these cows to insure a representative but incomplete set of data with cows calving from January through April. Plans are in place to complete the experiment during the Fall with a second group of multiparous transition cows. It is hoped in the Fall season, that more multiparous cows will calve within a closer time period enabling the second group of cows to start and finish more as an entire within the 12 week feeding period.

Complete intake and milk production data were collected on twelve cows from January through July. Daily intake and milk performance data was obtained on these cows 2 weeks pre-partum and through 12 weeks post-partum. This data is being statistically analyzed. The post-partum sampling routine was intensified by obtaining hourly feed intake observations and blood samples on these cows for 24h periods during week one, four and eight post-partum. Blood is currently being analyzed for glucose, insulin, non-esterified fatty acids and ionizable calcium. Weekly composite milk samples are being analyzed for compositional analysis. Weekly composites of the silage and TMR fed and weigh-back are being analyzed for dry matter, neutral detergent fiber, crude protein fat and ash. Cows were fed .4% chromic oxide during week 5-6 and week 11-12 as a digestibility marker. Feed and fecal samples collected during week 6 and 12 from all the cows at 12 times throughout these weeks to represent each 2 h period of a 24 h day. Feed and fecal samples from week 6 are being analyzed for chromic oxide, dry matter, neutral detergent fiber, crude protein, fat and gross energy. These samples are being processed and analyzed to determine the ratio of nutrients and marker in feed and feces will be used to determine nutrient digestibility and energetic efficiency.

We hope that these results will eventually confirm our previous findings that indicate that anionic salts improve the animal's ability to utilize ruminally inert fat in early lactation. Although the outcome of the experimentation has been delayed, we have strived to maintain our experimental objective of measuring the regulation of nutrient metabolism in transition cows fed supplemental fat as influenced by their calcium status. We still hope to prove that using a combination of anionic salts and ruminally inert fat in transition cows will have health, reproduction and productivity benefits for dairying in warmer climates.

Project # 388

Title: **Does Heterosis Occur for Crossbred Embryos?** P. Hansen

For this proposal, we hypothesized that one aspect of reduced reproductive performance in Holsteins is the increase in early embryonic losses due to inbred embryos that have a decreased potential for development. If so, crossbred embryos should develop better than purebred embryos. Therefore, the goal was to test the idea that crossbred embryos have superior development using a relatively inexpensive in vitro culture system. Embryos were produced using Holstein oocytes and sperm from

either Montebeliard, Swedish Red or Holstein bulls. Problems were encountered with sperm quality and the number of observations were less than optimal. Based on the data obtained, there was no evidence that crossbred embryos developed better than purebred embryos. This project is complete.

Project # 389

Title: **Embryo Transfer in Summer Using Embryos Produced by In Vitro Fertilization with Sexed Semen.** P. Hansen

The purpose of this experiment is to evaluate the effectiveness of sexed semen for producing pregnancies using embryo transfer. Embryos are being transferred to lactating cows following timed embryo transfer. Currently, most transfers were performed during heat stress. To date, the proportion of cows pregnant and pregnancy rates are as follows:

AI - 10/46 = 22%

ET - control semen - 11/41 = 27%

ET - sexed semen - 6/30 = 20%

This project is ongoing.

Project # 390

Title: **Evaluating Ryegrass Cultivars for Improved Dairy Silage and Water Quality.** C. Mackowiak

Annual ryegrass is an excellent quality winter forage for dairy greenchop and silage. It has high digestibility and energy. In addition, ryegrass offers a means for utilizing lagoon wastes from confinement dairy operations because it can accumulate large quantities of nitrogen (N) and phosphorous (P).

There are a number of commercial varieties available and they differ in yield, disease resistance, and seasonal forage distribution. Some of the better yielding and more disease resistant varieties have twice the number of chromosomes (tetraploid types) than the more common varieties (diploid types). There are reports of differences in soluble sugar content between diploid and tetraploid "perennial" ryegrasses. However, little is known about potential quality differences between annual ryegrasses, which predominates acreage in the southeast US.

We investigated the nutrient removal and forage quality parameters of four (2 diploid and 2 tetraploid) annual ryegrass varieties. Studies were planted in the fall of 2006 at 3 locations:

1. Cultivated field located at a private dairy, grown under lagoon waste fertigation
2. Overseeded on a bermudagrass sod located at the University of Florida Dairy, Hague, grown under lagoon waste fertigation
3. Cultivated field located at the NFREC, Marianna, grown under dryland conditions and using mineral fertilizer

The tetraploid varieties out-yielded diploid varieties at all locations. Unfortunately, the variability (differences) among replicates of the same species for soluble sugars was greater than differences among varieties. Therefore, we were unable to verify if ploidy (chromosome number) influenced annual ryegrass soluble sugar content. Other forage quality parameters were similar among the diploid and tetraploid varieties. However, the tetraploids tended to have greater crude protein. Greater crude protein (N) in combination with greater biomass, led to over 30% more N removal. The tetraploids also tended to have greater ash content, which reflects nutrient removal. From this, it can be concluded that the tetraploids were better able to remove and accumulate nutrients from lagoon effluents than were the diploids. The greater nutrient capture and removal through plant uptake lessens the potential for nutrient leaching losses.

This research is continuing under a 2007 Milk Check-Off grant award, comparing small grain options in terms of yield, forage quality, (including soluble sugars) and nutrient removal under dryland, and dairy effluent fertigation systems. Determining the performance of several different small grain species and cultivars will aid the dairy producer in his/her decision making process regarding timing and forage selection to fill specific needs.

Project # 391

Title: **Non-Esterified Fatty Acids (NEFA) and Calcium Concentrates at Calving to Predict Lactation Performance of Transition Dairy Cows.** P. Melendez

The study is still in progress. We are in the phase of analyzing serum samples from 750 cows for NEFA and calcium. We are expecting to have preliminary results in 2 months and hopefully a first draft of a manuscript for publication at the end of this year. This project is ongoing.

Project # 392

Title: **Dynamics of Breeding Soundness and Physical Parameters in Holstein Bulls Used for Natural Service in Dairy Herds.** C. Risco

Dynamics of breeding soundness and physical parameters in Holstein bulls used for natural service in dairy herds. C. A. Risco, M. Benzaquen, R.L. de la Sota, M. J. Thatcher and L.F. Archbald

Objectives of the study are: 1) to evaluate reproductive and physical traits of bulls used for natural service (NS) in a dairy herd during a one year breeding period. 2) To compare accumulated pregnancy rate by days post partum in two different breeding systems without estrus detection; timed artificial insemination and NS.

The project began in December 2006 and will continue through October 2007. The calculated sample size for animal (bulls and cows) assignment to the project has been attained. Analysis of data is expected to be completed by late 2008.

Project # 393

Title: **Use of a Reproductive Management Program to Evaluate Reproductive Performance of Lactating Dairy Cows Without or With Subclinical Endometritis that are Treated Intrauterine with Ceftiofur Hel.** C. Risco

A graduate student coming to UF on a Fulbright Scholarship has been recruited to conduct this project. The student will begin classes and project in fall 2007.

Project # 394

Title: **A Reproductive Management Program in Spanish.** J. Shearer

Project # 395

Title: **What are the Effects of Formulating Diets for Low or High Heat Increment on Efficiency and Cost of Production During Heat Stress?** J. West

Preliminary results from earlier work: A study funded by the Milk Check-Off in 2005 compared diets with high and low heat increment (HI) diets, plus cows that were on a low HI diet and were restricted in their intake to the same calorie (energy) intake as those on a high heat increment diet. Preliminary results showed that cows with restricted intake had lower respiratory rate and improved efficiency of yield compared with other treatments. Efficiency of yield were similar for the low and high heat increment diets, suggesting that the high heat increment diet was used relatively efficiently. Since the diet was lower cost, it suggests that the high heat increment diet might be more cost effective.

Procedures for the current study: The study was conducted during the summer of 2006 at the UGA - Tifton Campus Dairy Research Center, and ran from July 6 to August 15.

Diets and cows: Four diets were formulate for theoretically low and high HI from concentrates and from forages. Treatments were arranged as indicated in Table 1.

Table 1. Arrangement of low and high heat increment (HI) concentrate and forage combinations.

Treatment #	Low HI Concentrate		High HI Concentrate	
	Low HI Forage	High HI Forage	Low HI Forage	High HI Forage
	1	2	3	4

Low HI concentrates included higher levels of corn and fats (Megalac) and high HI grains contained more by-products (cottonseed hulls) and less fat. Low HI forage blends contained higher concentrations of corn and ryegrass silages, while high HI forage blends contained bermudagrass hay in lieu of ryegrass silage. The forty lactating Holstein cows (ten per treatment) were housed in free stalls and fed behind Calan doors.

Results: Preliminary results are included in Table 2. There was a concentrate by forage interaction for DMI, where cows consuming the low HI concentrate consumed more feed when offered the high HI forage blend, while cows receiving the high HI concentrate consumed the least feed when offered the high HI forage blend. A similar trend, though not significant occurred for milk yield. It appears that the cows fed the combination of high HI concentrate and forage had the worst DMI and milk yield, likely due to the high fiber content and potentially lower digestibility of those diets. These diets also have the potential for greater heat production in the cow and lower efficiency of use.

Table 2. Production response of dairy cows to diets with low or high theoretical heat increment (HI) for concentrate mixes and forage blends.

	Low HI ¹ Concentrate		High HI Concentrate		Effect
	Low HI Forage	High HI Forage	Low HI Forage	High HI Forage	
DMI, lb/d	49.8	52.1	51.0	45.7	C ² x F ³ , P<.02
Milk, lb/d	72.8	75.2	71.9	66.6	NS
ECM ⁴ , lb/d	68.8	66.7	70.7	58.7	NS
Milk/DMI, efficiency	1.42	1.47	1.35	1.52	NS
ECM/DMI, efficiency	1.33	1.30	1.35	1.35	NS

¹Heat increment

²Concentrate

³Forage

⁴Energy-corrected milk

Dairy efficiency measures, in this case measured as milk yield per DMI or energy-corrected milk per DMI, did not differ statistically. However the results trended toward improved efficiency for the high HI concentrate and forage blend. This was likely due to the lower DMI for these treatments, without as large a decline in milk yield. This could be due to greater efficiency of use for these diets, or due to the use of body reserves by cows mobilizing tissue to support milk yield in these groups. Further data analysis should address this issue.

Additional analysis is currently being conducted on body weight changes, body temperatures, and respiratory rates to determine treatment effects on these measures. These additional analyses should help determine if improved efficiencies resulted from HI of the diets.

Project # 396

Title: **Effects of Disease Infestation of Corn Hybrids on Crop Survival, Silage Quality and Performance of Dairy Cows.** A. Adesogan

This project seeks to determine the effect of disease infestation of corn hybrids on crop survival, silage quality and milk production by dairy cows. Tropical corn hybrids will be infested with rust spores this summer at the 4-8 leaf stage. A control area will be treated with a fungicide. Crop survival and health will be monitored and forage from both treatments will be ensiled in mini silos to determine rust infestation effects on silage quality.

The second half of this experiment would have involved feeding control and rust-infested corn silage to dairy cattle over several weeks to determine rust infestation effects on dairy cow performance and milk quality and safety. However, if the rust infestation results in contamination of the milk, the cost of dumping the milk would be prohibitive. Therefore, we are currently investigating the possibility of using dairy goats as an alternative to dairy cows for this part of the experiment. This project is ongoing.



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Notes
