2005 Florida Dairy Quality Honor Roll

Dairy Division – Florida Department of Agricultural and Consumer Services

Dairy Name	Location	Rank	SPC	SCC	Score
Brantley Dairy Farm, Inc. (3)	McAlpin	1	967	352,500	95
Rockin' W (2)	Vernon	2	2,009	274,545	96
Aprile Farms (2)	Temple Terrace	3	1,600	349,091	95
Norman Nickerson Dairy (8)	Wauchula	4	2,173	269,091	100
Ten Mile Grade Dairy (2)	Zolfo Springs	5	2,442	252,500	98
Eicher's Dairy	Walnut Hill	6	2,967	309,167	92
Lemon Grove Dairy	Wauchula	7	5,571	228,750	96
Aprile II (2)	Temple Terrace	8	3,525	396,364	95
Walker & Sons Farms, Inc. #II (2)	Monticello	9	8,954	178,846	92
DPS #2	Bell	10	5,560	294,000	95
A. Jackson & Family Dairy	Mayo	11	4,764	399,091	94
Oak Shade Farms (5)	Century	12	6,742	331,667	91
Alliance Dairy #2	Trenton	13	7,710	370,000	93
Levy County Dairy (2)	Chiefland	14	8,810	371,000	93
Shiver Dairy Farm, Inc.	Mayo	15	13,867	291,667	96
ATR Dairy	Mayo	16	11,288	388,235	93
Alliance Dairy	Trenton	17	13,810	389,000	92
TOP 20 AVERAGE			6,045	320,324	94
FLORIDA AVERAGE			26,844	483,740	93

(#) Indicates consecutive years on Top 20 Honor Roll

NOTE: "Top 20" producers were determined by multiplying the average annual bacteria count (SPC) by the average annual somatic cell count (SCC). To be considered for the "Top 20", a producer must have met the following minimum standards during the year:

a) No drug residue violations.

b) An average inspection score of 90 or more.

c) An average bacteria count of less than 15,000/ml.

d) An average somatic cell count of less than 400,000/ml.

2004 Dairy Business Analysis Project Financial Summary

Russ Giesy, University of Florida, (352) 793-2728, giesyr@aol.com
Lane Ely, The University of Georgia, (706) 542-9107, laneely@arches.uga.edu
Albert de Vries, University of Florida, (352) 392-7563, devries@ufl.edu

Full report on the DBAP website: http://dairy.ifas.ufl.edu/dbap

Table 1. DBAP 2004 Summary - Business size and production efficiency by state and overall average, median, and standard deviation.

	Overall			State Averages	
Category	Average	Median	Std[1]	Florida	Georgia
Number of farms	22	22	22	15	7
Business Size:					
Average number of cows	1,170	576	1,125	1,373	735
Average number of heifers	585	399	659	634	480
Milk sold (million lbs)	21.64	11.61	21.17	24.66	15.15
FTE[2] workers	20	11	18	23	14
Acres of pasture + cultivated land	656	372	788	793	361
Production Efficiency:					
Milk sold (lbs / cow / year)	18,207	18,304	3,111	17,273	20,210
Cows / FTE worker	53	56	25	55	49
Milk sold / FTE worker (million lbs)	0.97	1.02	0.45	0.96	0.98
Cull rate	31%	30%	6%	30%	33%

[1] Standard deviation
[2] Full-time equivalent

Table 2. DBAP 2004 Summary - Revenues and expenses by state and overall average, median, and standard deviation ($/cwt).

	Overall			State Averages	
Category	Average	Median	Std[1]	Florida	Georgia
Number of farms	22	22	22	15	7
Revenues:					
Milk sold	18.98	18.99	1.01	19.06	18.81
Raised, leased cow sales	0.64	0.53	1.14	0.51	0.92
Heifer sales	0.33	0.24	0.60	0.27	0.45
Gain on purchased livestock					
Sales	0.02	0.00	0.68	(0.11)	0.30
Other revenues	0.93	0.34	1.67	0.92	0.94
Total revenues	20.89	20.80	2.02	20.65	21.41
Expenses:					
Personnel	3.17	2.93	1.32	3.24	3.00
Purchased feed	8.13	7.78	1.66	8.65	7.03
Crops	0.26	0.09	0.34	0.25	0.30
Machinery	1.07	0.99	0.71	1.11	1.00
Livestock	1.87	1.77	0.99	1.88	1.84
Milk marketing	1.13	1.13	0.25	1.05	1.29
Buildings and land	0.80	0.62	0.71	0.62	1.18
Interest	0.51	0.36	0.59	0.54	0.44
Depreciation:					
Livestock	0.74	0.39	0.89	0.69	0.84
Machinery	0.60	0.46	0.52	0.48	0.85
Buildings	0.25	0.11	0.36	0.20	0.35
Other expenses	0.87	0.95	0.43	0.97	0.65
Total expenses	19.39	18.65	2.49	19.68	18.77
Net farm income from operations	1.50	1.52	2.46	0.97	2.64
Gain on sale of capital assets	0.08	0.00	0.26	0.07	0.11
Net farm income	1.58	1.51	2.56	1.04	2.75

[1] Standard deviation

2005 Southeast DHIA Data by Milking Frequency

	All	*Georgia*	*Florida*	*Herds Milked 2X*	*Herds Milked 3X*
Number of Herds	237	166	71	196	41
Number of Cows per herd	411	249	790	271	1082
% Cows in Milk	86	86	85	85	87
% Cow left herd	38	37	39	38	37
% Death	8.2	7.7	9.2	8.1	8.6
RHA Milk lbs per cow	18,192	18,348	17,827	17,764	20,235
RHA-Fat lbs	664	664	666	649	750
Rolling-Prot lbs	565	566	564	553	637
Avg SCC (weighted)	453	438	503	456	433
Avg Days open	194	195	194	195	190
Proj Calving Interval	15.6	15.6	15.6	15.6	15.5
Actual Calving Interval	14.5	14.6	14.3	14.5	14.4
Avg Days to 1st Service	110	109	113	112	99
Preg Rate-Year	13	13	12	13	12
Preg Rate-Current	8	9	7	9	8
PCT of heats observed	33	33	35	33	36
percent successful	49	48	53	50	45
Proj 305 day ME Milk	20,375	20,551	19,963	20,324	20,618
Yr Avg 150-day milk	65	65	64	63	71
Number Replac on Hand	326	234	537	225	763
Number of Calvings - Past Year	391	238	751	259	1022
% Birth Diff > 3	5.5	4.9	6.9	5.8	4.6
Total calves born	330	207	617	204	931
% males	56.1	55.9	56.5	56.5	53.9
% females	43.9	44.1	43.5	43.5	46.1
% D.O.A.	7.8	7.6	8.3	7.8	8.0

2005 Southeast DHIA Data by Breed

	All	*Holstein*	*Jersey*	*Others*
Number of Herds	237	214	9	14
Number of Cows per herd	411	424	191	362
% Cows in Milk	86	86	82	85
% Cow left herd	38	38	30	38
% Death	8.2	8.2	9.6	7.4
RHA Milk lbs per cow	18,192	18,526	13,099	16,357
RHA-Fat lbs	664	674	586	567
Rolling-Prot lbs	565	576	462	496
Avg SCC (weighted)	453	453	415	497
Avg Days open	194	195	194	191
Proj Calving Interval	15.6	15.6	15.6	15.5
Actual Calving Interval	14.5	14.5	14.4	14.4
Avg Days to 1st Service	110	110	102	115
Preg Rate-Year	13	13	13	14
Preg Rate-Current	8	8	11	11
PCT of heats observed	33	34	34	27
percent successful	49	50	40	49
Proj 305 day ME Milk	20,375	20,689	15,155	18,925
Yr Avg 150-day milk	65	66	47	59
Number Replac on Hand	326	333	207	306
Number of Calvings - Past Year	391	404	177	341
% Birth Diff > 3	5.5	5.5	0.0	7.6
Total calves born	330	338	163	320
% males	56.1	56.4	52.1	53.9
% females	43.9	43.6	47.9	46.1
% D.O.A.	7.8	7.5	7.3	12.9

2005 Southeast DHIA Data by Herd Size

	All	*1-100*	*101-200*	*201-400*	*401-999*	*over 1000*
Number of Herds	237	41	72	54	49	21
Number of Cows per herd	411	79	148	285	600	1846
% Cows in Milk	86	86	85	85	86	86
% Cow left herd	38	41	39	36	36	37
% Death	8.2	7.9	8.0	8.4	8.8	7.2
RHA Milk lbs per cow	18,192	17,706	18,048	17,430	18,937	19,857
RHA-Fat lbs	664	655	651	640	738	724
Rolling-Prot lbs	565	562	554	548	617	608
Avg SCC (weighted)	453	443	446	470	474	422
Avg Days open	194	198	196	203	184	187
Proj Calving Interval	15.6	15.7	15.7	15.9	15.3	15.3
Actual Calving Interval	14.5	14.7	14.6	14.6	14.2	14.3
Avg Days to 1st Service	110	105	115	112	109	101
Preg Rate-Year	12.8	14.0	13.1	11.9	12.4	12.5
Preg Rate-Current	8.4	12.2	7.9	8.2	6.9	7.8
PCT of heats observed	33	34	30	33	37	38
% successful breedings	49	42	52	49	53	45
Proj 305 day ME Milk	20,375	20,014	20,605	19,888	20,711	20,762
Yr Avg 150-day milk	65	63	65	63	67	70
# Replac. on Hand	326	75	142	219	513	1196
# of Calvings - Past Year	391	74	140	262	580	1763
% Birth Diff > 3	5.5	7.6	5.2	2.7	8.6	3.0
Total calves born	330	65	123	217	430	1612
% males	56.1	55.0	55.8	56.9	56.2	56.7
% females	43.9	45.0	44.2	43.1	43.9	43.3
% D.O.A.	7.8	7.8	7.8	6.3	9.4	8.0

2005 Southeast DHIA Data by Level of Production

	All	*Up to 11,000*	*11,000-15,000*	*15,000-18,000*	*18,000-20,000*	*20000- & above*
Number of Herds	237	6	26	79	56	70
Number of Cows per herd	411	215	256	353	302	638
% Cows in Milk	86	70	81	84	87	88
% Cow left herd	38	28	34	36	40	40
% Death	8.2	8.6	9.3	8.9	8.0	7.0
RHA Milk lbs per cow	18,192	9,313	13,635	16,696	18,934	21,740
RHA-Fat lbs	664	370	501	601	680	778
Rolling-Prot lbs	565	311	427	510	583	662
Avg SCC (weighted)	453	534	541	452	473	406
Avg Days open	194	287	218	195	189	181
Proj Calving Interval	15.6	18.7	16.4	15.6	15.4	15.2
Actual Calving Interval	14.5	16.2	14.4	14.3	14.6	14.5
Avg Days to 1st Service	110	115	126	112	112	100
Preg Rate-Year	12.8	8.2	9.6	12.8	13.5	13.7
Preg Rate-Current	8.4	8.4	8.3	9.2	7.4	8.5
PCT of heats observed	33.2	12.6	24.3	28.0	34.8	41.3
% successful breedings	49.4	39.2	58.5	55.8	48.9	40.1
Proj 305 day ME Milk	20,375	12,999	16,771	19,192	20,959	23,214
Yr Avg 150-day milk	65	42	52	60	67	75
# Replac on Hand	326	210	161	324	239	451
# of Calvings - Past Year	391	144	228	348	292	602
% Birth Diff > 3	5.5	0.0	8.6	5.3	3.1	7.5
Total calves born	330	113	131	269	246	559
% males	56.1	49.6	58.2	59.3	55.0	53.1
% females	43.9	50.4	41.9	40.7	45.0	46.9
% D.O.A.	7.8	6.1	9.3	6.3	8.5	8.5

2005 Southeast DHIA Production Recognition of High Florida Herds

Production as of September 31, 2005

Producer	City	BRD	Milkings	RHA Milk	RHA Fat	RHA Protein	Data Collection Rating Milk
CONDALE FARMS	Anthony	H	3X	26,114	939	760	101.6
B&D FARMS	Greenville	H	3X	23,810	864	727	98.7
NORTH FLORIDA HOLSTEINS	Bell	H	3X	23,748	821	696	96.7
UNIV FLA DAIRY RESEARCH	Gainesville	H	3X	23,468	873	702	87.0
SHENANDOAH DAIRY	Live Oak	H	3X	22,249	783	674	96.6
EICHER DAIRY	Walnut Hill	H		22,233	782	690	97.3
FULL CIRCLE DAIRY	Umatilla	H	3X	22,232	774	666	96.6
HAYMURPH FARMS LLC	Live Oak	H	3X	21,943	757	657	98.8
AURORA DAIRY GEORGIA	Baconton	H	3X	21,285	783	635	96.7
DPS-BRANFORD FARM	Branford	H	3X	20,929	746	623	96.5
SOUTHEAST DAIRY CO LLC	Morriston	H	3X	20,671	736	605	97.5
J-LU FARMS	Live Oak	H	3X	20,285			99.7
DPS-BELL FARM	Bell	H	3X	20,176	730	604	95.0
SUWANNEE DAIRY INC	Mc Alpin	H		20,097	702	586	99.3
WALKER & SONS FARM INC II	Monticello	H		20,013			99.4
MILK-A-WAY	Webster	H		19,987			94.6
V & W FARMS	Avon Park	H	3X	19,894			96.5
SHIVERS DAIRY	Mayo	H		19,970			93.8
PAUL TRAWICK & SON	Mayo	H		19,749	696	588	92.5
BRANTLEY DAIRY FARM INC	Mc Alpin	H		19,630			99.5
T.K. HATTEN DAIRY INC	Brooksville	H	3X	19,307			80.6
W B DAIRY INC	Hilliard	H	3X	19,290	718	596	93.2

Southeast DHIA - Testing cows in Florida and Georgia

2005 Florida DHIA Herd Performance Averages*

September 30, 2005

	1993	2000	2001	2002**	2003***	2004***	2005***
No. Cows	55,648	37,278	33,488	30,879	56,366	57,510	54,375
No. Herds	122	57	52	47	92	82	71
Average Herd Size	456	654	644	657	613	698	766
% Days in Milk	86	86	84	85	84	84	86
Pounds of Milk	17,761	19,054	18,661	19,461	18,160	18,307	18,987
Peak Milk - 1st Calf (lbs./day)	67	71	69	72	70	68	72
Peak Milk - 2nd & Later (lbs./day)	88	88	87	87	88	87	85
Fat %	3.5	3.5	3.6	3.7	3.8	4	3.7
Pounds of Fat	622	676	672	729	683	672	716
Pounds of Protein	592	610	593	599	541	546	577
Value of Milk ($)	2,658	2,779	3,048	3,065	2,579	3,210	3,211
Projected Minimum Calving Interval	14.1	15.2	15.7	15.6	16	15.6	15.5
Days Dry	69	72	74	75	78	77	75
% Cows Dry > 70 Days	19	19	21	21	37	36	19
Days to 1st Breeding	77	96	97	102	107	106	112
Days Open	148	183	197	194	197	192	193
% cows Open > 100 at 1st Breeding	14	29	34	22	33	28	31
No. Breedings per Conception	4.0	3.1	3.5	3.3	3	3	2.8
% Possible Breeding Serviced	52	29	26	28	26	25	26
Age at 1st Calving (months)	25	25	25	25	25	25	26
Age - All Cows (months)	44	43	44	65	44	43	44
% With Sire Identity	34	29	33	33	23	25	29
Average PTA$ Sires	151	124	147	177	86	149	98
Average PTA$ Service Sires	210	111	298	329	344	354	239
% Left Herd	40	32	33	34	39	33	31

* 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 29, 2005

Southeast Milk, Inc.
Dairy Check-Off

Project # 240

Title: **Nutrient Handling Systems on Florida Dairies.** R. Giesy

Nutrient handling systems continue to evolve. Several demonstration projects are currently studying the feasibility of different systems or products thought to be effective in helping dairies control nutrients and use them to best advantage. Unbiased analysis of these new systems is needed to assist producers in selection of systems most appropriate to their situation. Additionally, an effort will be taken to evaluate the economic efficiency of these systems. This is a continuing program.

Related to this program, but not part of its funding, is the most current project; the feasibility of the use of digesters to produce biogas and/or electricity on Florida dairies. Florida dairies require different digester technology than dairies in northern states due to flushing of barns and quantity of water in our manure handling systems. Estimates of the cost and productivity of fixed film and covered lagoon digesters are being accomplished. The reporting of results is expected to occur in fall 2005.

Project # 267

Title: **Evaluating the Effect of Seasonality on Financial Performance of Southeast Dairy Businesses.** A. deVries (M. J. Hoekema)

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 2003 DBAP data has been added to the database and collection of the 2004 data is almost completed. A DHIA data set with records from 1990 through 2004 was obtained from DRMS in Raleigh, NC. A student was hired in the summer of 2005, which will assist in completing this project. This project remains ongoing.

Project # 275

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

Increased awareness of hurricanes factored into the limited progress that has been made in the construction of the shade structure. Optimistic that labor can be focused on the construction of the prototype as planned. This project is ongoing.

Project # 279

Title: **Alleviating The Stresses of Concrete Floors in Florida Feed Barns IV**. D. Bray

We have tested many products and mats on floors, none tried will adhere to the floor except heavy rubber mats and they swell and expand in flush type barns and have to be refastened, rubber mats applied to travel lanes to the milking parlor seem to be worth the effort. This project is completed

Project # 287

Title: **Smoothing Progress Through the Transition Period by Feeding Glucogenic and Energy Compounds.** H. Head

Multiparous Holstein dairy cows were used to evaluate effects of feeding different glucogenic precursors to cows during the 3 weeks before calving through the first 4 weeks of lactation (the transition period). We evaluated daily feed intake, blood levels of important metabolites, energy status, health variables, and the subsequent milk production of all of the cows. Equal numbers of cows were assigned to be fed 1) cationic diet, 2) cationic diet plus Ca Propionate (NutroCal™), 3) cationic diet plus a mixture of Ca and Na propionates plus propylene glycol and fat (Metaxerol™), or 4) propylene glycol during this approximately 7 week time period. After calving, all cows were switched to the herd lactation diet. We measured feed intake, body weights and body condition scores and collected blood samples throughout the trial. Milk yields were recorded during the lactation at each of the 3 daily milkings through 150 days and milk samples were measured through 70 days of lactation. A subset of 40 cows (10/diet treatment) were used to collect liver samples for measure of lipid accumulation and expression of steady state expression of three liver enzymes at -21 prepartum and at + 2, +14, and + 28 days of lactation (see project # 327). Daily health records were collected for each of these trial cows.

A total of 124 cows completed the feeding and lactation periods (29, 33, 31, 31 cows in control or fed the three glucogenic precursors). Overall, these cows were all fed the test diets for at least 14 days before they calved normally, and then completed at least 100 days of the lactation. The amount of feed that cows consumed decreased 17-31 % the week before calving but the decrease did not differ across the four diets, but was greatest during the 2 days before the cows calved. After they calved, all cows rapidly increased their consumption of feed. The feed intake during the time before calving did not differ across the four treatments, except that control cows ate more than those fed NutroCal™. Overall, the increase in feed intake after calving was similar across the different diet groups, so it was not affected by the supplements fed.

Milk production of the four groups did not differ during the first 4 weeks after calving, the time when glucogenic supplements were being fed. The only exception was that cows fed propylene glycol produced slightly less milk, perhaps due to reduced palatability when it was added to the feed. Milk production during 28-70 days after calving and during 4-100 days after calving was essentially the same across all the groups. As we usually observe, cows produced less milk during the hot season of the year and also ate less feed, even though they were housed in a free-stall barn equipped with misters and fans. We saw no effects of feeding supplements on body weight or body condition

scores. Overall, cows had similar patterns of feed consumption during the 7 weeks the supplements were added to their TMR rations, the cows produced the same amount of milk during early lactation and also during the first 100 days of lactation, and all cows maintained body weight and body condition score equally well. We concluded that there were no positive or negative effects of adding glucogenic supplements to the total mixed ration during the transition period. Because of this, there appears to be no benefit to supplementing transition cows with any of these glucogenic precursors during the transition period by adding them to the transition diets. This project is considered complete.

Project # 289

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

No summary provided.

Project # 300

Title: **Alleviating the Stresses of Concrete Floors in Florida Feed Barns, V.** R. Bucklin

See summary for Project #345. This project is complete.

Project # 301

Title: **When to Purchase Replacement Animals, How Many, and What You Can Afford to Pay for Them.** A. deVries

In this project methods are developed to study the economics of cow replacement, give general guidelines, and be able to do farm specific analyses. Cow replacement has consequences for the number of cows that are milking, dry, open and pregnant over time. Coupled with the seasonality in milk production, reproduction, and involuntary culling, a systems analysis is needed to account for all effects and calculate the best course of actions. A computer program has been completed that is able to optimally rank cows in the herd for future profitability, support culling decisions, and suggests when to enter heifers in the herd. The program has been extended to calculate the economics of different reproductive strategies. An article has been published in Journal of Dairy Science 87: 2947-2958 and various extension meetings. Papers are available on http://www.animal.ufl.edu/devries/publications.html. A user-friendly version of the program has been finished in the summer of 2005 and will be used to work with dairy producers and extension agents. Talks are underway with DRMS in Raleigh, NC, about implementation of the program in their software (e.g. PCDart). This project is ongoing.

Project # 302

Title: **Field Evaluation of a *Mycoplasm bovis* Vaccine in Dairy Calves.** A. Donovan

No summary provided.

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 provided.

Project # 313

Title: **Testing Dairy Cattle Embryos for Enhanced Embryo Survival and Reduced Embryo Transfer Costs.** K. Moore

Maintenance of recipient cows is the most expensive component of embryo transfer, especially if the fetus is lost late in gestation. Improving our ability to select embryos that are genetically normal will increase chances of survival to term and decrease costs associated with maintaining open recipients. This will make the newer reproductive technologies, such as embryo transfer, in vitro embryo production, cloning, and genetic selection more economically feasible for the dairyman. The goal of this project was to develop genetic tests for pre-screening dairy cattle embryos prior to transfer, allowing us to quickly eliminate genetically abnormal embryos and even select for embryos with beneficial traits. The first objective, which was to optimize embryo biopsy and fusion techniques for producing metaphase spreads for genetic analysis has been completed. Three methods are now available, cell fusion, piezo injection and our latest improvement chemically induced condensation. The later is the method of choice, as it bypasses the fusion and injection procedure, making it easier and more efficient. Progress on the second objective has been problematic and will require additional funding to further optimize karyotyping procedures with fluorescent probes for FISH, making it commercially feasible for the dairymen. The proposed project is complete.

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 (84 animal samples have been processed at present). 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.

The project is ongoing.

Project # 320

Title: **Evaluation of Environmental Bedding Materials for Mastitis Pathogens.** D. Bray

We are still gathering data and building a database of information, one study of applying small amounts of a chemical to sand freestall to reduce bacterial numbers in freestall of both fresh sand and recycled sand did not lower bacteria numbers any better than no treatment. This project is completed.

Project # 321

Title: **Multi-Lingual Milking Videos for Florida Dairies.** D. Bray

We have completed over 50 videos in English and Spanish have been made.
This project is completed.

Project # 323

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

We have evaluated various SCC methods, SCC counts ate not always repeatable, and more work on this is being done on another project. We are providing participating herds who supply us with their DHIA records with mastitis data from their herds comparing them with other herds on the project. This project is completed.

Project # 324

Title: **Alleviating the Stresses of Concrete Floors in Florida Feed Barns.** R. Bucklin

See summary for Project #345. This project is complete.

Project # 326

Title: **Do Carbohydrate Blends Give the Same Amounts of Nutrients as Individual Carbohydrates? (Do Associative Effects Help or Hurt Us?).** M. Hall

This project evaluated effects of different nonfiber carbohydrates (NFC) on types and amounts of fermentation products produced by rumen microbes, and their effects on fiber fermentation. The carbohydrates we evaluated were sucrose (sugar), starch, and citrus pectin – all commonly found in feeds fed to dairy cows. Different amounts and blends of NFC were fermented in the lab with a fiber source (neutral detergent fiber (NDF) from bermudagrass) and rumen microbes. Our findings:

-- Microbes gave a greater yield of microbial protein from pectin than from starch, and more from starch than from sucrose. Different combinations of NFC did not give more or less protein than we would have predicted from the single sources, so the protein from NFC could be treated additively.

--For fiber fermentation (measured by NDF disappearance by 24 hours of fermentation), there was slightly more fiber digestion with sucrose, starch had no effect, and less fiber was fermented with pectin. In a study with cows supported by the Milk Check-Off, we did not see a negative effect of citrus pulp on fiber digestion (citrus pulp contains both sugars and pectin).

--The NFC differed in energy products. Acetate, propionate, and butyrate are acids produced by the microbes that the cow uses for energy, or fat or glucose production. Acetate and butyrate can be used to make fat, but only the propionate is used to make glucose -- the products differ in how they meet the cow's nutrient requirements. Pectin gave the most acetate, sucrose and starch were highest and similar in propionate, and sucrose gave the most butyrate, pectin the least.
Sucrose, starch, and pectin differed in the products that microbes produced from them during fermentation, and their effects on fiber digestion. These differences could translate to feeds that differ in their NFC content differing in the nutrients they provide and how they affect cow performance. This project is complete.

Project # 327

Title: **Use of Management Strategies Throughout the Transition Period of Dairy Cows to Improve Their Liver Function, Health and Milk Production.** H. Head

We studied whether multiparous Holstein transition cows fed glucogenic compounds (n=124) or supplemented with bST (n=103) showed changes in blood metabolites and liver fat accumulation and steady-state expression of mRNA of specific enzymes for glucose and lipid metabolism that favored better milk production and health. In the first group, multiparous Holstein cows (n=124) were used to evaluate effects of

supplementing glucogenic compounds in daily TMR fed during the transition period (-3 wk to +4 wk). Some results of these treatments are described in project # 287. The second group of cows were given biweekly bST-supplementation (0.4 mL, 10.2 mg/d, POSILAC©), which began 21 d before expected calving and continued through 70 DIM. In the second experiment the TRT were I=no bST, n=26; II=bST postpartum, n=25; III=bST prepartum, n=27; IV= bST prepartum and postpartum, n=25. During both experiments, blood samples were collected 3 times a week from all cows during the transition period (21 d prepartum through 28 days of lactation) to measure non-esterified fatty acids (NEFA) and b-hydroxybutyrate (b-HBA) concentrations in plasma. Liver biopsies were taken from a subset of 9-11 cows/TRT (80 total cows) at ~-21 d, around calving, and +14 and +28 d postpartum and analyzed for total liver fat (wet weight basis) and steady state expression of messenger RNA for important liver enzymes [pyruvate carboxylase (PC), phosphoenolpyruvate carboxykinase (PEPCK), and microsomal triacylglycerol transfer protein (MTP-I)].

Overall, blood measures followed expected patterns for Holstein cows during the transition period. Cows supplemented with MET and PPG had slightly higher mRNA abundance of PC compared to CON and NUT supplemented cows, but the other (PEPCK mRNA abundance) was similar across treatments and no differences in concentrations of glucose were detected across treatments. Abundance of MTP mRNA was unaffected by treatment and no incidences of fatty liver or treatment effects on percentage liver fat were detected, although liver of NUT supplemented cows had numerically greater fat percentage (+~30%) compared to CON and PPG supplemented cows, and ~58% more than MET supplemented cows. Greatest percentages of fat in liver was on d +14 (9.9%) compared to the other three sample days. Adding glucogenic compounds to TMRs fed in transition cow diets did not alter the expected changes in plasma insulin, IGF-I, metabolites or liver lipids around calving, although small differences were detected due to including supplement in TMR during this period

bST supplementation did cause some changes in liver enzyme RNA levels for PC mRNA, but they did not differ among bST-supplemented groups of cows. Results indicated that supplemental bST caused increased MY and postpartum plasma IGF-1 concentrations, but did not affect plasma glucose, or hepatic PC mRNA. Also for bST treatments, no effects were detected on NEFA and b-HBA – both were within the expected normal concentrations indicating no greater tendency of a ketosis. No effects were detected on amount of liver fat, but there was greater expression of MTP-I during the postpartum period. We concluded that when bST was supplemented only during the postpartum (TRT II), b-HBA was increased after calving. The fat clearance from the liver of these cows was not greater than for cows of other treatments.

When we evaluated the effects of bST on animal health our overall results indicated that bST supplemented to cows during the transition period did not cause either positive or negative effects on incidences of postpartum calving related disorders (retained fetal membranes, metritis, clinical mastitis, ketosis, milk fever, displaced abomasums, or lameness). In fact, cows supplemented with bST were less likely to have these calving related disorders than non-supplemented contemporaries that also were evaluated. Our

overall conclusion from the series of studies we completed on bST supplementation during the transition period is that bST increased milk production and feed intake but had no negative effects on metabolism and animal health. This project is complete.

Project # 329

Title: **Evaluation of the Effectiveness of Decreasing the Dose of GnRH Used in Ovsynch Protocol for Synchronization of Ovulation and Timed AI in Dairy Cows.**

L. McKee

The objective was to determine the effectiveness of decreasing the standard recommended dose of GnRH used for synchronization of ovulation. First service lactating Holstein cows (n=100) at the University of Georgia Dairy in Athens were randomly assigned to 1 of 4 treatment groups using different doses of GnRH (100 µg and 100 µg; 50 µg and 50 µg; 100 µg and 50 µg; 50 µg and 100 µg). All cows received 25 mg of prostaglandin (PGF2α) 11 d (d -11) prior to starting Ovsynch. Blood samples were collected on d -11 and d 0 for progesterone analysis. Cows received GnRH on d 0, PGF2α on d 7, and GnRH on d 9. Cows were artificially inseminated (AI) 16 to 20 h after the second GnRH injection.

Pregnancy was checked via ultrasound at 35to 40 d and at 55 to 60 d after AI. Data were analyzed by Chi Square. The 100 cows averaged 2.3 lactations, 68 DIM, and 40 kg of milk on DHIA. Pregnancy rates at 35 to 40 d were 52%, 32%, 44%, and 56% for treatments 1, 2, 3, and 4 respectively. At 55 to 60 d, the rates were 36%, 28%, 36%, and 48%. Embryonic losses between d 40 and 60 were 16%, 4%, 8%, and 8%. Overall pregnancy rates were 46% at 40 d and 37% at 60 d.
Fourteen of the 100 cows were considered to be noncyclic (both samples < 1.0 ng/ml of progesterone) and only 2 of these were pregnant at 35 to 40 d versus 44 of the 86 cyclic cows (either or both samples > or = 1.0 ng/ml). Eight
(28.6%) were pregnant at 55 to 60 d when the highest temperature humidity index (THI) on the day that cows were bred was > or = 80, 45.2% of 31 were pregnant when the THI was between 70 and 79, and 36.6% of 41 pregnant when the THI high was <70.

During the 11 mo of this study, days open on DHI decreased by 34 d. This results in an overall savings of almost $7000 for every 100 cows in a herd.

No differences were observed in pregnancy rate among the 4 treatments. Similar pregnancy rates can be obtained using any combination of 50 µg and 100 µg of GnRH in the Ovsynch protocol. Cyclicity had a significant influence on pregnancy rate at 35 to 40 d.

Cows that were cycling prior to Ovsynch were much more likely to become pregnant than noncycling cows. The Ovsynch protocol was not very effective in getting noncycling cows pregnant. Further research is needed to determine why this is and what can be done to help these problem cows conceive and maintain pregnancy.

While cows milking >31.8 kg/d were more likely to be pregnant than those milking <31.8 kg/d, the large difference in group size may have had an effect on this result. Cows milking higher than the average of cows in the study (40
kg/d) were just as likely to be pregnant as those milking less than the average. Since these 2 groups were of more equal size, it is likely that milk production had no effect on pregnancy rate.

Pregnancy rates were no different for the 3 THI levels, indicating that Ovsynch is just as effective in getting cows bred at high, moderate, and low temperatures.
If it is necessary to breed cows in the summer months, Ovsynch may be beneficial.
Less than half of the treated cows showed signs of standing estrus prior to breeding. Failure to show signs of estrus reduces the likelihood of cows injuring themselves and helps to prevent excess activity that may intensify the effects of heat stress.

The most economical was treatment 4 (half/half) both in terms of total hormone costs and cost per pregnancy. The GnRH dose in the Ovsynch protocol for synchronization of ovulation and timed AI in first service lactating dairy cows can effectively be decreased, while maintaining pregnancy rates. Based on this study and those by Fricke et al (1998), Navanukraw et al (2002), and Fricke and Welle (2003), producers could greatly benefit from a half dose Ovsynch program, particularly in the southeast where estrus detection rates are generally very low. This program could greatly reduce overall drug costs and decrease days open in their herds. This project is complete.

Project # 332

Title: **Thin Soles in Dairy Cattle. Investigation of Factors Affecting Sole Wear.**
S. Van Amstel

Claw disorders are major causes of lameness in dairy cattle. They are predisposed by laminitis and the overgrowth of claw horn which leads to altered weight bearing within and between the claws. In combination with hard flooring surfaces (common to confinement housing conditions) these become major contributors to ulcers and white line disease. Treatment of these disorders usually requires corrective trimming and the application of a foot block to the sound claw to relieve weight bearing on the diseased or damaged claw. Depending upon severity, prognosis following treatment of these conditions is good. The more difficult claw disorder to manage in recent years is that referred to as “thin soles”. The weight bearing surface of the bovine claw includes the abaxial (outside) wall, white line, sole and heel. When the rate of claw horn wear on the weight bearing surface is similar to the rate of claw horn growth; size, shape, and function of the claw is normal. When horn growth exceeds wear, function of the claw is reduced by overgrowth that causes altered weight bearing predisposing to claw disease. When claw wear is greater than rates of claw horn growth, trimming is unnecessary. When claw horn wear is excessive and the weight bearing surface becomes too thin, those portions of the corium that make up the weight bearing surface become vulnerable to damage from bruising or thinning of the sole that leads to exposure of the corium. Exposure of the corium is frequently complicated by infection of the corium and deeper structures of the claw including the 3rd phalanx, digital cushion

and distal interphalangeal joint. One of the objectives of our studies is to identify those factors which may predispose to “thin soles” in modern dairy cattle operations. Observations to date suggest that the following are potential predisposing factors: 1) the abrasiveness of flooring surfaces, 2) distance cows walk, 3) moisture content of claw horn, 4) stage of lactation, 5) parity, type of bedding (sand may increase claw wear rates), 6) seasonality (incidence seems to be higher during summer months), 7) size and/or weight of the cow, 8) effect of laminitis on quality of claw horn (particularly the horn cell keratinization rate and horn hardness), and 9) potential value of rubber applied to floors in confinement housing systems. Studies are continuing in 2 large dairies affected with thin soles to assess these and other possible factors that may be contributing to excessive claw horn wear. We expect to report on observations from the study herds over the next 1-2 years. This project is ongoing.

Project # 333

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

The Herdsman Seminars in Spanish were developed for the purpose of providing training for Spanish-speaking employees on Florida dairy farms. They are intended to be the Spanish counterpart to those presented in English by University of Florida Dairy Extension faculty over the past several years. All presentations and course materials are in Spanish and presented by recognized experts. The first in the program series is on the topic of reproduction. Four programs have been developed to cover this subject: 1) Artificial Insemination of Dairy Cows, 2) Detection and Management of Open Cows, 3) Obstetrics and Problems Associated with Calving, and 4) Management of Postpartum Problems in Dairy Cattle. The first 2 programs in this series have been conducted this past year. The third program: "Obstetrics and Problems Associated with Calving", is scheduled for August, 2005. Feedback on the first 2 programs has been extremely positive suggesting a need to repeat these seminars in English as well as Spanish. We are gathering additional materials to support programs in 1) Mastitis, Milking Management and Milk Quality, 2) Hospital Barn Procedures and Management, 3) Management of Dairy Replacements, and 4) Nutrition and Feeding Management. Foot care and claw trimming techniques in Spanish have been offered in Spanish through the Master Hoof Care Program for several years. With the addition of the Herdsman Seminars in Spanish, the Florida Dairy Extension Program is able to offer the Florida dairy industry a very comprehensive series of employee training opportunities. This project is ongoing.

Project # 337

Title: **Determining When to Harvest Stay-Green Corn Varieties for Silage Production**. A. Adesogan

To address producer concerns about when to harvest corn hybrids with high staygreen rankings, this study determined the effect of maturity at harvest on the nutritive value and aerobic stability of corn hybrids differing in stay-green ranking. One high staygreen corn hybrid and one average staygreen hybrid with similar relative maturity (118 d) were selected from Pioneer Hi-bred and Croplan genetics hybrids. The high staygreen hybrids were Croplan genetics 827 and Pioneer 31Y43, while average staygreen hybrids were Croplan genetics 799 and Pioneer 32D99. The four hybrids were grown on four replicate, 1 x 6 m plots. The hybrids were harvested at 26 (Cut 1), 34 (Cut 2), and 39 (Cut 3) % DM, yield was assessed and some selected plants were separated into ear and stalk fractions for chemical analysis. The rest of the forage from each plot was ensiled (15 kg) in within plastic bags in mini-silos for 100 days and then analyzed.

In the freshly harvested plant, yield was similar at Cuts 1 and 2, and higher at Cut 3. High staygreen hybrids had greater stalk crude protein concentration, lower stalk DM and lower stalk sugar concentration than average staygreen hybrids. Whole plant digestibility was also lower in higher staygreen hybrids than average staygreen hybrids.

The staygreen ranking or source (seed company) of the hybrids did not affect silage fermentation, but high staygreen hybrids had greater crude protein and lower starch concentrations than average staygreen hybrids. High staygreen silages tended to be less digestible, than average staygreen hybrids. This suggests that processing is required to improve the digestibility of high staygreen hybrids.

Dry matter and starch content increased with maturity while residual (post fermentation) sugar and crude protein content decreased. pH increased with maturity while ammonia-N, lactic acid and acetic acid concentrations decreased. Yeasts increased with maturity while molds decreased but aerobic stability was unaffected by maturity.

This study therefore indicates that staygreen corn hybrids should be harvested at the intermediate maturity stage (34% DM, Cut 2) to optimize nutritive value and yield. High staygreen hybrids seem more likely to have lower DM and sugar concentrations than low staygreen hybrids and such high staygreen hybrids should be processed to improve their digestibility and ensure proper starch release from the kernel. Staygreen ranking did not affect the normal fermentation indices. Further work on the effects of staygreen on some different fermentation indices is currently being done. This project is ongoing.

Project #338

Title: **Comparison of Timed Insemination and Exogenous Progesterone for Treating Ovarian Cysts in the Lactating Dairy Cow.** C. Archbald

The objective of this study was to compare the clinical effectiveness of the Ovsynch and CIDR protocols under commercial conditions for the treatment of cystic ovarian disease in dairy cows. A total of 401 lactating dairy cows with ovarian cysts were allocated to 2 treatment groups on the day of diagnosis. Cows in the Ovsynch group (n=201) were treated with 100 µg GnRH *i.m.* on Day 0, 25 mg PGF2a *i.m.* on Day 7, 100 µg GnRH *i.m.* on Day 9, and timed inseminated 16-20 hours later. Cows in the CIDR group (n=200) were treated with a CIDR Insert on Day 0 for 7 days. On Day 7, the CIDR was removed, and cows were given 25 mg PGF2a *i.m*. All cows in the CIDR group were observed for estrus and cows exhibiting estrus within 7 days after PGF2a treatment were inseminated within 12 hours of estrus. The outcomes of interest were the likelihood to be inseminated, the return to cyclicity (determined by the presence of a CL on Day 21), conception and pregnancy rates. Data were analyzed using logistic regression. The percentage of cows inseminated in the Ovsynch and CIDR groups were 81.6% and 45.3%, respectively. Cows in the Ovsynch group were 5.6 times more likely to be inseminated than cows in the CIDR group. The percentage of cows with a CL on Day 21 for the Ovsynch and CIDR groups was 82.9% and 78.7%, respectively. Cows in the Ovsynch group were 2.2 times more likely to return to cyclicity than cows in the CIDR group, although cows in the CIDR group had higher progesterone concentrations on Day 21. Conception and pregnancy rates for cows in the Ovsynch group were 18.3% and 14.4%, respectively. Conception and pregnancy rates for cows in the CIDR group were 23.1% and 9.5%, respectively. There was no significant difference between conception and pregnancy rates of cows in both groups. Primiparous cows were 4.1

times more likely to conceive than multiparous cows. It was concluded from the results of this study that fertility was not different between cows with ovarian cysts treated with either the Ovsynch or the CIDR protocol. However, cows treated with the Ovsynch protocol were more likely to return to normal cyclicity compared to cows treated with the CIDR protocol. This project is complete.

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

Presence of milk lactose in the blood of cows indicates that tight junctions in mammary tissue have become leaky. Leaky tight junctions are an early indicator that mammary tissue is involuting or drying off. Blood samples collected cows that received various dosages of ECP are being tested for blood lactose to determine the minimal dose needed to initiate involution (dryoff). This project is ongoing.

Project #340

Title: **Effect of Supplemental Energy Source on the Performance of Lactating Dairy Cows Fed Diets Based on Sorghum and Ryegrass Silage.** J. Bernard

Two trials were conducted to evaluate the addition of ground corn, hominy, or a 50:50 blend of ground corn and hominy on the performance of lactating cows fed diets based on sorghum silage and ryegrass silage in either a 75:25 or 50:50 blend. In trial one, 31 Holstein cows were assigned to one of six experimental diets formulated to contain equal concentrations of CP, NDF, and energy. Dry matter intake was similar for all treatments; however there was a tendency for improved milk and higher yield of milk fat and energy-corrected milk for cows fed the diet based on 75:25 sorghum silage and ryegrass silage. The higher energy-corrected milk yield also improved feed efficiency for cows fed diets based on 75:25 sorghum silage and ryegrass silage. Milk yield and composition was similar for cows fed ground corn, hominy, or the 50:50 blend. In trial two, three ruminally cannulated Jersey cows were used in a 3 x 3 Latin square to evaluate the effect of energy supplement on ruminal function and nutrient digestibility. Treatments included ground corn, hominy, or a 50:50 blend of ground corn and hominy. Diets were based on a 50:50 blend of sorghum silage and ryegrass silage and formulated to provide equal concentrations of CP, NDF, and energy. Cows fed the blend of ground corn and hominy had higher ruminal pH and molar proportions of propionate and lower concentrations of ruminal ammonia and molar proportions of butyrate than those supplemented with either ground corn or hominy.

Results of these trials indicate that feeding a greater proportion of sorghum silage than ryegrass silage supports similar dry matter intake and higher yields of milk, fat, and energy-corrected milk resulting in improve feed efficiency. Previous research demonstrated a positive effect for feeding a blend of corn silage and ryegrass silage, but performance was similar at any given combination. The in vitro digestibility of ryegrass silage was greater than sorghum silage, so additional fiber that is more slowly

digested possibly improved ruminal digestibility supporting improved yield of milk and fat. Ruminal fermentation was improved when a blend of ground corn and hominy was fed compared with feeding either ground corn or hominy alone; however these improvements did not result in improved milk production. This project is complete.

Project #341

Title: **Effectiveness of Two Cooling Systems for Cooling Cows in Free Stall Barns.** J. Bernard

A trial was conducted to compare two different fan systems for cooling cows in free stall barns. Treatments included cooling with either a high speed fan or a high volume low speed fan (HVLS). A high pressure mister system was used for both fan systems. Cows were fitted with a vaginal temperature probe that recorded body temperature every six minutes. Air speed for the HVLS fans ranged from 2.5 to 5 mph compared with 5 to 8 mph for the high speed fans. Average body temperature of cows cooled with the HVLS was higher than that observed for cows cooled with the conventional high speed fans, 102.9 and 103.2 F, respectively.

The body temperature of both groups of cows tended to peak at approximately 5:00 p.m. and decreased until10:00 p.m. when body temperatures increased again until approximately midnight. At approximately 10:00 p.m. the relative humidity had increased enough to shut off the high pressure mister system. This suggests that running the system longer would provide additional cooling. We are continuing to collect data from this trial. This project is ongoing.

Project # 342

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

Comparisons were made between an ultra high pressure fog cooled barn and an identical facility, the fogged barn was about 10 degrees cooler than the non fogged barn. This project is completed.

Project #343

Title: **Multi-Lingual Milking Videos for Florida Dairies**. D. Bray

Over 70 videos have been produced in English and Spanish. This project is completed.

Project #344

Title: **Development of a Milking Machine Monitoring System to Determine Milking Performance**. D. Bray

This project is ongoing.

Project #345

Title: **Alleviating the Stresses of Concrete Floors in Florida Feed Barns – 2004.**

R. Bucklin

This is a project continuing several previous years of work. Victor Carvalho completed his PhD work using the Tekscan Matscan system supported by check off funds. The combination of hoof pressures and video analysis of gait have greatly added to our understanding of the forces acting on cow hoofs and gives us information to better understand the causes of lameness and develop effective prevention and treatment methods.

Procedure

Claw lameness may be associated with biomechanical factors caused by imbalances of the pressure distribution under hooves when cows are confined on hard concrete flooring. Using the Tekscan Matscan system based on a thin pressure measurement film, the pressures under the hooves of a population sample of 32 cows divided into trimmed and untrimmed groups were measured under dynamic conditions (stance phase) and compared to evaluate the effects of trimming in correcting the imbalance caused by overgrowth of hoof tissues.

Figure 1. Tekscan Matscan thin pressure measurement film.

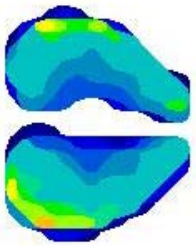

Figure 2. Pressure distribution under cow hoof.

Results and Conclusions

The results, obtained for three different points of the stance phase, showed that the pressure distribution under the medial sole, heel bulb, and toe of trimmed cows changed slightly as compared to untrimmed cows. The medial sole displayed higher peak pressures as compared to the heel bulb and toe, which displayed lower peak pressures at the midstance phase. In the acceleration phase, the overall peak pressures shifted to the toe, except on the rear feet of untrimmed cows, which maintained slightly greater (2.5%) peak pressures at the heel bulb than at the toe. The deceleration phase showed similar peak pressures at the heel bulb and lateral sole for both trimmed and untrimmed cows. It was concluded that trimming results in slightly higher pressures towards the medial sole. This may help improve gait stability by removing some of the peak pressures at the heel bulb and lateral sole (weight-bearing border). However, the higher peak pressures at the medial sole may cause an increase in stresses on that region and favor the incidence of lesions, particularly sole ulcers.

According to the data obtained in this study, claw trimming may provide some balance to the pressures applied to various regions of the lateral claws of the front and hind feet by redistributing some of these pressures to the medial sole. However, it is questionable whether shifting pressures from the weight-bearing border (lateral sole) towards the softer portion of the sole in order to achieve balance is the correct approach. Lameness of biomechanical origin is thought to be related to the overburdening of soft tissues in the axial region of the claw anterior to the heel bulb, as caused by claw overgrowth under confinement housing conditions. This particular region, a typical spot for sole lesions, did not appear to be obviously overloaded in untrimmed claws as expected. However, the claw divisions used in this experiment merged some of the sole with the heel region.

The heel bulb and lateral sole were the major weight-bearing portions of the claws in the untrimmed group as compared with the trimmed group. The results of pressure distribution between these two groups led to the assumption that there may be an area of overburdened soft sole at the vulnerable spot. Further, it was assumed that the high pressures at this spot may be mitigated by claw trimming, which tends to increase the contact surface area at that spot. However, the experimental data obtained in this study suggest that these pressures may not be redistributed evenly towards the anterior part

of the medial sole (midstance and acceleration phases) and may instead be redirected towards the vulnerable spot where sole ulcers occur. If this is the case, then trimming cows according to the Toussaint Raven method may not accomplish the desired effects (redistribution of weight bearing away from the vulnerable area).

Performing other analyses with data obtained from different approaches can be useful to clarify overall findings obtained in studies such as that described above. Some of these approaches include the following. First, development of a recording system that defines a subdivision of the medial sole towards the vulnerable spot would permit the assessment of pressures at the anterior and posterior portions of the medial sole. Second, calculations of the center of pressure (COP) trajectory during gait may also help to clarify this issue. Because the part of the sole that is not in contact with the ground can be overstressed as well, due to the suspended structures (suspensory apparatus) within the claw, a follow-up analysis of the trajectory of the center of pressure under the claw could be the next step in order to supplement the findings obtained with pressure analysis. This project is complete.

Project #346

Title: **Use of Real-Time Blood-PCR and Milk-PCR for Detection of Cattle Infected with Mycobacterium avium subsp. Paratuberculosis**. C. Buergelt

A total of 156 lactating dairy cows from two herds were tested. We used ELISA, AGID, fecal culture, nested PCR and Real-time PCR. The objective was to develop a quantitative PCR (Real-time) test and compare it to the previously developed nested PCR and ELISA (IDEXX). Herd A with 56 animals tested was chosen as negative control; herd B was used as principal herd, with 100 animals tested. Sampling and tests of herd A have been completed; sampling of herd B has been completed, but some tests are still conducted. The following results were obtained thus far:

Herd A N=56		Herd B N=100	
AGID Pos: 0	(0%)	AGID Pos: 0	(0%)
ELISA Pos: 6	(10%)	ELISA Pos: 10	(10%)
nPCR Pos: 6	(10%)	nPCR Pos: 6	(6%)
RT-PCR Pos. 6	(10%)	RT-PCR Pos: 6	(6%)
Fecal culture Pos. 0	(0%)	Fecal culture: pending	

Interpreting these results, it becomes evident that herd A was not Johne's disease negative and not closed as originally recommended. The management bout individual cows some of which originated from known Johne's disease positive dairy herds. The real-time PCR compared well with the nested PCR in that blood or milk from the same animals was positive. Herd B, the principal herd, had a relatively low detection rate by PCR. This might have been the result of previous culling of many JD positive animals. (Culling and necropsy of 12 clinical cows for 2004). The same animals reacted positively on the two methods. It is important to notice that all animals in this study were

subclinical animals.Subclincal in this context is defined as an infected animal from a proven JD herd with expected milk production, no diarrhea and no weight loss. We are encouraged that our PCR methods pick some of these animals up. It is also important to notice that the PCR positive animals were different from those that were ELISA positive which is now considered to have a sensitivity of 35%. The reasoning behind this discrepancy of animal identification is that serology testing and agent detection methods identify two different subpopulations of infected animals. Thus the recommendation to use both test systems together for the highest possible detection of infected animals and removal from the herd regarding disease management.

The project is ongoing as we will test 100 animals from a third herd this fall.

Project #347

Title: **Florida Dairy Students Participate in the 3rd Annual North American Intercollegiate Dairy Challenge.** A. deVries

A team of Florida dairy science students participated in the 3rd North American Intercollegiate Dairy Challenge (NAIDC) in Altoona, PA, on April 2 and 3, 2004. This year's contest was hosted by Penn State University. The UF team consisted of Melanie Burson, Kassie Krieg and Jose Aparicio. Coach was Albert de Vries. Created to inspire students and enhance university dairy programs nationwide, the NAIDC is a 2-day dairy management contest that incorporates all phases of a specific dairy business in a fun, interactive and educational forum. It enables students to apply theory and learning to a real-world dairy, while working as part of a team. The first day of the contest consists of a thorough analysis of a dairy farm's records and a farm visit. The teams prepare a presentation outlining what they believe are strengths and opportunities, including their recommendations to the dairy farmer. The second day the team presents these finding to a jury consisting of dairy farmers, allied industry, and educators. In addition to the contest, the NAIDC gives students and sponsors plenty of opportunity to interact and many students are recruited for internships or jobs. The 2004 contest was the largest ever, with twenty-five teams representing 23 North American universities' dairy science programs from coast to coast. The Florida team did well and obtained a silver award. The NAIDC is supported financially through generous donations by industry and coordinated by a volunteer steering committee. More information about this exciting contest can be found at http://www.dairychallenge.org. This project is complete.

Project #348

Title: **2004 Mastitis and Somatic Cell Count Reduction Study.** A. deVries

We measured milking-to-milking variation for 15 milkings in a row (5 days) in 400 cows at the UF Dairy Research Unit in September 2004. The trial was repeated in December with 3 milkings in a row. Another herd was sampled for 3 days in a row (1 milking per day). The observed variation in all studies was large and many cows had spikes with over 1 million SCC in one milking while dropping to below 250,000 the next milking. The value of testing cows for SCC once per month is debated and more analyses are underway to try to explain the variation. A poster was presented at an

International Mastitis Conference this summer (http://www.animal.ufl.edu/devries/publications.html). A paper is in preparation to describe our findings. Results will be presented in Extension meetings in 2006. This project is ongoing.

Project #349

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

No summary provided.

Project #350

Title: **Dairy Business Analysis Project – Georgia – 2004.** L. Ely

Twenty-seven dairies submitted financial data in 2003. Twenty-six dairies were included in the summary results. Of these, 17 were located in Florida, and 9 in Georgia. The average herd size was 1,316 cows and 619 heifers with 17971 lbs. milk sold per cow. The average culling rate was 40%. There was an average of 24 FTE workers per farm and 0.96 million lbs milk sold per FTE worker. Total revenue per cwt. was $17.66 / cwt with $15.89 / cwt milk income. The average total expense was $18.27 / cwt. The largest expense items were purchased feed ($7.16 / cwt), labor ($3.22 / cwt), and livestock ($1.95 / cwt). Net farm income from operations was on average $-.61 / cwt and net farm income was $-.51 / cwt. The debt to equity ratio was .62, the rate of return on assets was --0.01, the rate of return on equity was -0.18, the operating profit margin ratio was -0.06. There is no clear association income, expenses or returns with herd size in 2003. Milk price / cwt was lowest for <500 cows ($15.45) but other income was highest ($1.94 / cwt). Total expenses were highest for the smallest herds ($19.26 / cwt) resulting in the lowest net farm income from operations ($-1.66 / cwt). Milk price and total income decreased with production level. Net farm income was highest for lowest production level. Data collection for 2004 is being conducted. This project is ongoing.

Project #351

Title: **Improved Pregnancy Rte in the Summer Using Embryo Transfer-Development of an Embryo Freezing Protocol.** P. Hansen

The purpose of this project was to develop a more effective freezing protocol for bovine embryos produced by in vitro fertilization. This is an important goal because embryos produced by in vitro fertilization do not freeze as well as embryos produced by superovulation and this fact limits their usefulness. Three approaches were evaluated. The first was to culture embryos with 2, 4-dinitrophenol (DNP), a molecule that may reduce embryo lipid content and improve freezability. The second was to culture embryos with hyaluronan, a molecule that has been reported to increase embryo freezability through an unknown mechanism. The third approach was to treat embryos with a molecule called cytochalasin B that makes the embryo's cells more flexible and therefore potentially better able to survive freezing. Of these three approaches, there was no benefit to DNP and only slight benefit caused by culture in hyaluronan. Treatment of embryos with cytochalasin B was effective at increasing survival of

embryos to freezing as determined by measuring embryonic development in culture after thawing. Future studies are needed to determine whether acceptable pregnancy rates can be achieved when cytochalasin B treated embryos are transferred to cows. This project is complete.

Project #352
Title: **Milk Check-Off Recovery**. G. Hembry

No Summary Required

Project #353
Title: **Vitamin A Stability in the Rumen and Concentrations in Milk.** L. McDowell

An experiment was carried out at the University of Florida's Dairy Research Unit to evaluate the effects of supplemental vitamin A on transfer of the vitamin to the calf and milk characteristics. Twenty-seven Holstein cows at 6 weeks prepartum and 2nd parity received three quantities of supplemental vitamin A (0, 4, 340, 8,942 IU/day) from -30 prepartum and 3 and 30 days postpartum. Milk and calf blood were collected periodically.

Liver vitamin A increased linearly (P=0.007) and reflected dietary vitamin A intake. Increasing dietary vitamin A lowered somatic cell counts linearly (P=0.007) and had a tendency (P=0.08) to increase milk weights. There was little difference in cow or calk plasma vitamin A concentrations, milk fat, milk protein and milk vitamin A. In conclusion the most beneficial aspect of supplemental vitamin A was the tendency for increased milk yields and the lowering of somatic cell counts. This project is complete.

Project #354
Title: **The Development of Corn Silage Varieties and Year-Round Cropping System for Florida Dairy Farms.** B. Scully

Corn Silage: Silage experiments were hosted at four on-farm sites, including: Avon Park (2), Lorida (1), and Belle Glade (1). Additionally, three field experiments were planted at IFAS research sites in Belle Glade, Ft. Pierce and Gainesville. Over 1000 lbs. of seed from four different silage populations were distributed to three dairy farmers in the Okeechobee region. The "Upright–Leaf" population is under development for high-density plantings of ±45,000 plants/ac, while the "Tall" population was distributed to assess corns ability to produce a maximum forage yield. The "CIMMYT" population is under selection for resistance to the fall armyworm, and is intended for use as a *refugia* variety to compliment the use of *Bt* hybrids. Seed of this population was specifically distributed for summer and/or fall production when insect pressure is heaviest.

A set of test hybrids made a few years ago have been sequentially tested over years, and this year at Dairy Research Unit in Gainesville and in Belle Glade. From an initial set of 800 test hybrids, repeated testing has narrowed the field of acceptable test hybrids to nearly 100.

Winter Legume: A year-round/continual cropping system has been an ongoing goal of this research effort and has the potential to improve land productivity, feed quality and fertilizer-use-efficiency. The proposed three-crop cycle begins with corn silage grown from March through June (Cycle #1); sorghum grown from July through October (Cycle #2); and a freeze tolerant legume grown from November through February (Cycle #3).

The faba bean has proven robust enough to warrant consideration. In a second year of testing on a dairy farm in Avon Park fresh yields varied from 9.4 t/ac to 17.3 t/ac depending on plant height at harvest (Table 1).

Table 1: Yield of faba beans at different plant heights grown in Avon Park, FL.

Fresh Yield (TPA)	4 ft Plants	5 ft Plants	6 ft Plants
'Banner'	9.38 ± 0.38	13.17 ± 0.30	17.33 ± 1.92

Planted Dec. 6 '04; Harvested April 15, '05. 400#/ac 14-14-14. cv 'Banner'

These data suggest that fresh yields of faba beans are suitable for consideration by Florida Dairy farmers for a winter freeze tolerant forage crop. This project is ongoing.

Project #355

Title: **Resynchronization of Ovulation and Timed Insemination in Lactating Dairy Cows Using the CIDR Insert 14 or 18 Days After Previous Insemination.**
W. Thatcher

A total of 718 cows received $PGF_{2\alpha}$ on Days 39 and 53 postpartum, GnRH on Day 67, $PGF_{2\alpha}$ on Day 74, and GnRH and TAI on Day 77 (experimental Day 0) postpartum. Cows in estrus between Days 74 and 77 were inseminated. Between Days 67 and 74 cows received either a CIDR Insert (Presynch-Ovsynch-CIDR Group) or were used as a nontreated control (Presynch-Ovsynch Control Group). Between experimental Days 14 and 23, cows received a CIDR Insert (Resynch-CIDR Group) or were used as a nontreated control (Resynch Control Group). After 1st service, cows detected in estrus were inseminated (AIDE). On Day 23 cows received GnRH and on Day 30 subjected to ultrasonography for pregnancy diagnosis. Nonpregnant cows received $PGF_{2\alpha}$ on Day 30 and GnRH and TAI on Day 33. Pregnancy was evaluated 30 and 55 d after insemination. For first service, pregnancy rates at Day 30 and 55 were increased in cows of Presynch-Ovsynch-CIDR Group with high progesterone (42.3 and 40.2 %; respectively) compared to cows in the Presynch-Ovsynch-CIDR Group with low progesterone (30.0 and 27.5 %; respectively) and control cows with either low progesterone (32.6 and 28.0 %), or high progesterone (32.9 and 27.8 %; respectively). Pregnancy loss was reduced in the Presynch-Ovsynch-CIDR Group (7.0 %) compared to cows in the Presynch-Ovsynch Control Group (15.6 %). For second service, pregnancy rates on Day 30 and 55 were reduced for cows AIDE in the Resynch-CIDR Group (28.6 and 26.8 %) compared to cows AIDE in the Resynch Control Group (38.8 and 36.2 %). Pregnancy rates on Day 30 and 55 were increased in cows with a CL at

ultrasonography and TAI in the Resynch-CIDR Group (29.7 and 27.5 %; respectively) compared to cows with a CL and TAI in the Resynch Control Group (19.4 and 13.4 %; respectively) and reduced in cows without a CL and TAI in both groups (Resynch-CIDR: 10.0 and 7.5 %; Resynch Control: 15.4 and 15.4 %). There was no difference in pregnancy loss for second service between groups.

Based upon these results, the second phase of the project is ongoing to compare early resynchronization based on ultrasound at day 30 versus a later resynchronization based on rectal palpation of pregnancy at day 36. The resynchronization protocols have been altered to include insertion of the CIDR device between GnRH and $PGF_{2\alpha}$ injections. This project is ongoing.

Project #356

Title: **Support for Florida and Georgia Youth Programs, 4-H Dairy Activities and Youth Events, Dairy Judging Team Support and Undergraduate Programs and Scholarships.** J. Umphrey

No summary report required.