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A Need for Jersey Data

- Jersey cow numbers continue to increase in the U.S. due to emphasis on milk components
- Crossbreeding with Jerseys can reduce inbreeding while improving fertility and health
- Jersey research data is limited as few Jersey herds exist at land grant colleges
- Most sponsored research is conducted with Holsteins

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Poll: Do Jersey nutritionists and farmers feed Jersey cows differently than Holstein cows?

- ○ Yes, they should have a different ration
- ○ No, it does not make a difference
- ○ Only if the Holsteins and Jersey cows are split
- ○ Depends on DMI and nutrient density of the ration

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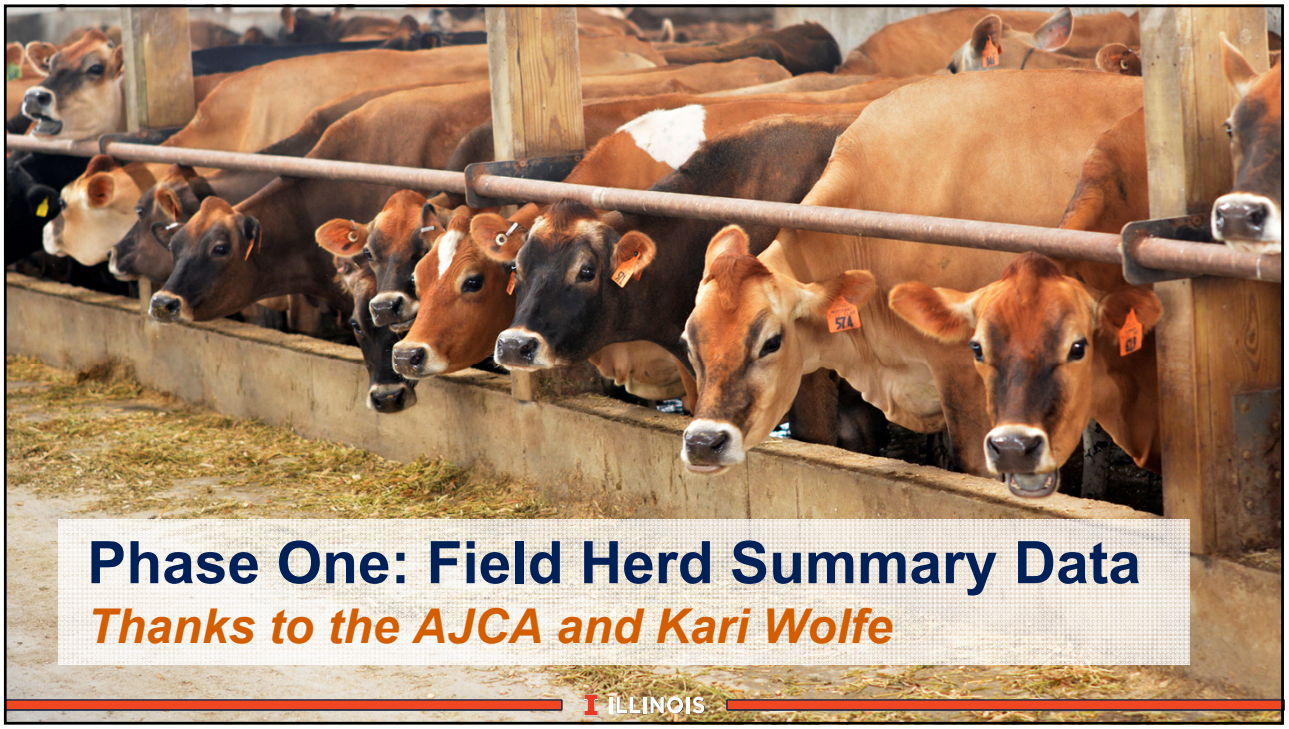

The Team

- American Jersey Cattle Association (AJCA) and Research Foundation for names and funding
- Co-leaders
  - Mike Hutjens: name recognition
  - Jim Baltz: Instructional design specialist who designed the survey instrument and dairy background
- Graduate students providing statistical analysis
  - Sarah Morrison: from Jersey herd in New England, provided
  - Kristen Glosson: from North Caroline pasture based herd

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Experimental Design

- American Jersey Cattle Association (AJCA) provided list of U.S. top 110 top cheese yield herds in 2015.
- On-line survey instrument
  - Tested by the graduate students, Jim, and me
  - Collect on-farm management information and
  - Requested DHI data summary from Nov/Dec 2016
  - Current forage test results
  - Current milking and dry cow rations

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2017 Timeline of Field Study

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Herd Stats

	Ave	Max	Min	SD	n
Cows	593.2	6,545	24	1,259	32
Milk Yield	63.4	78.5	50.4	7.6	31
Fat %	5.14	6.72	4.10	0.48	31
Protein %	3.77	4.10	3.50	0.17	31
SCC	180.3	475	42.5	94	29
RHA-Milk	20,124	24,195	16,987	1,786	31
RHA-Fat	995	1271	831	101	31
RHA-Protein	738	875	634	66	31
Age at 1st Calving	23.3	25	21	1.08	24

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	High Group Rations					Dry Cows Rations				
	Ave	Max	Min	SD	n	Ave	Max	Min	SD	n
DM	52.0	88.6	40.0	10.7	21	50.7	79.9	41.0	9.5	15
CP	17.1	18.3	16.0	0.6	22	14.5	16.5	12.1	1.3	16
Fat	4.7	6.4	2.7	1.0	20	3.2	4.2	2.0	0.6	13
ADF	18.5	21.6	14.6	1.7	18	28.2	35.4	19.3	5.0	12
NDF	28.9	34.9	25.0	2.2	22	41.3	49.1	31.4	5.2	16
Sugar	5.1	6.5	3.1	1.2	16	4.3	8.2	2.7	1.7	9
Starch	26.5	30.9	21.1	2.6	21	15.3	23.5	4.5	6.4	15
% Corn Silage	64.3	92.0	35.0	13.7	27	55.3	81.0	20.0	20.6	16
% Haylage	30.6	65.0	9.0	15.4	21	37.4	66.0	4.0	20.6	11
% Hay	20.5	51.0	3.0	16.8	15	34.4	73.0	8.0	18.9	14
% Straw	5.0	6.0	4.0	1.4	2	20.3	36.0	11.0	7.6	10

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Corn Silage Test Results

	Ave	Max	Min	SD	n
DM	35.9	43.1	27.7	4.5	23
CP	8.1	10.1	6.9	0.7	23
ADF	23.3	28.6	16.0	3.1	23
NDF	38.1	45.0	29.3	3.9	22
uNDF-240	10.8	28.0	5.2	5.4	14
Starch	33.8	43.3	26.8	4.7	23

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Legume/Grass Forage Test Results

	Ave	Max	Min	SD	n
DM	58.1	91.4	30.6	23.2	22
CP	20.2	25.5	12.5	3.4	22
ADF	31.4	40.2	21.2	4.8	22
NDF	39.7	55.0	27.6	6.9	22
uNDF	15.7	20.4	5.7	4.4	10
RVQ/RFV	163.6	233.0	111.0	35.2	19

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Bunk Space

	Bunk space per cow				
	<15"	16-22"	23-29"	>30"	n
All	12%	31%	40%	17%	121
All Dry Cows	7%	30%	41%	22%	27
All Milking	19%	33%	38%	11%	64
Close Up		25%	50%	25%	16
Far Off	7%	33%	53%	7%	15
Fresh		33%	42%	25%	12
Heifers	33%	11%	33%	22%	9

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Housing

	Freestall	Tie Stall	Loose Housing	Corral / Open Lot / Pasture	Individual pens	n
All	66%	8%	20%	6%	1%	128
All Dry Cows	38%	6%	40%	15%	2%	48
All Milking	81%	10%	7%	1%		68
Close Up	17%		61%	17%	6%	18
Far Off	50%	6%	19%	25%		16
Fresh	92%		8%			12
Heifers	89%			11%		9

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Stalls per Cow

Group	Stalls per Cow	Max	Min	n
Far Off	1.39	2.00	1.00	11
Close Up	1.37	2.00	0.90	10
All Dry Cows	1.29	2.00	0.90	31
All	1.08	2.00	0.49	105
Fresh	1.03	1.35	0.49	12
All Milking	0.98	1.50	0.49	75
Heifer	0.95	1.35	0.78	8

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Additive Usage by Farms

	Product	n		Product	n
96%	Buffer	25	38%	Probiotics/DFM	21
89%	Rumensin/monensin	27	35%	Sodium bentonite	20
86%	Organic trace minerals	22	35%	Immune stimulation	23
85%	Anionic product	27	29%	Enzymes	21
79%	Yeast product	24	15%	Niacin	20
63%	Mycotoxin binder	24	10%	Calcium propionate	20
52%	Choline (rumen protected)	21	5%	Essential oil compounds	20
52%	Biotin	23	5%	Propyl glycol	20
48%	Cation product (heat stress)	21	0%	Organic Acids	20

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Close Up Additives

Product	Sum	Percent	n
Anionic product	23	85.2%	27
Rumensin/monensin	19	76.0%	25
Organic trace minerals	16	72.7%	22
Yeast product	16	66.7%	24
Biotin	10	43.5%	23
Choline (rumen protected)	8	38.1%	21
Mycotoxin binder	8	33.3%	24
Sodium bentonite	5	25.0%	20
Immune stimulation	5	21.7%	23
Cation product (heat stress)	3	14.3%	21
Enzymes	3	14.3%	21
Probiotics/DFM	3	14.3%	21
Buffer	3	12.0%	25
Niacin	2	10.0%	20
Calcium propionate	1	5.0%	20

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Far Off Additives

Product	Sum	Percent	n
Rumensin/monensin	14	56.0%	25
Organic trace minerals	11	50.0%	22
Anionic product	10	37.0%	27
Yeast product	8	33.3%	24
Mycotoxin binder	6	25.0%	24
Biotin	5	21.7%	23
Sodium bentonite	4	20.0%	20
Immune stimulation	4	17.4%	23
Buffer	3	12.0%	25
Cation product (heat stress)	2	9.5%	21
Choline (rumen protected)	2	9.5%	21
Enzymes	2	9.5%	21
Calcium propionate	1	5.0%	20
Niacin	1	5.0%	20
Probiotics/DFM	1	4.8%	21

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High Group Additives

Product	Sum	Percent	n
Buffer	24	96.0%	25
Organic trace minerals	18	81.8%	22
Rumensin/monensin	20	80.0%	25
Yeast product	16	66.7%	24
Mycotoxin binder	14	58.3%	24
Biotin	11	47.8%	23
Probiotics/DFM	8	38.1%	21
Sodium bentonite	7	35.0%	20
Immune stimulation	7	30.4%	23
Cation product (heat stress)	6	28.6%	21
Enzymes	6	28.6%	21
Choline (rumen protected)	3	14.3%	21
Calcium propionate	2	10.0%	20
Essential oil compounds	1	5.0%	20
Anionic product	1	3.7%	27

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Rumensin/Monensin Levels

mg/head/day	Close up	Far off	Fresh	High	Low
<200	15%	20%	5%	0%	10%
200 to 250	40%	33%	10%	14%	10%
250 to 300	25%	27%	33%	24%	25%
300 to 350	10%	13%	14%	19%	15%
350 to 400	10%	7%	10%	14%	15%
>400	0%	0%	29%	29%	25%
n	20	15	21	21	20

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Percent of herd on rBST (n=38)

Do NOT use	63.2%
< 30%	5.3%
30 to 50%	10.5%
> 50%	21.1%

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Milking Frequency

2X	64.9%
3X	18.9%
Combination of 2x-3x	8.1%
Combination of 3x-4x	2.7%
Robot	5.4%

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Type of TMR Mixer (n=38)

Horizontal	Reel	Tumble	Vertical
11%	11%	5%	74%

Number or augers/screws in your TMR mixer?

1	2	3	4
42%	45%	3%	11%

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"On average, how times a year do you review and/or reformulate your ration?" (n=38)

4 or less (Quarterly)	5 to 8 (Bimonthly)	9 to 15 (Monthly)	16 to 30 (Biweekly)	>30 (Weekly or more)
9	6	13	6	4
24%	16%	34%	16%	11%

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"On average, how times a year do you test your forages? " (n=37)

4 or less (Quarterly)	5 to 8 (Bimonthly)	9 to 15 (Monthly)	16 to 30 (Biweekly)	>30 (Weekly or more)
7	10	15	2	3
19%	27%	41%	5%	8%

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When do you check the moisture content of your TMR? (n=38)

Never check moisture content of TMR	6	16%
Every 3 months or more	3	8%
Monthly	9	24%
Weekly	6	16%
Daily	3	8%
Nutritionist checks	10	26%
After heavy rains	2	5%
Only when there is a problem	7	18%
Other	2	5%

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Frequency of Feeding? (n=38)

1X	2X	3X	>3X
42%	53%	5%	0%

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Number of times a day feed is pushed up? (n=38)

37%	5 to 12 times a day
34%	3 to 4 times a day
11%	We don't push up feed
11%	1 to 2 times a day
8%	>12 times a day

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Amount of Weigh Back Dry Matter as % of Daily DMI (n=38)

Feed to empty bunk	1 to 2%	2 to 3%	4 to 5%	>5%
16%	34%	26%	18%	5%

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Where does the weigh back go? (n=34)

32%	Heifers
24%	Discarded
18%	Remix in lower group ration
12%	Dry cows
9%	Steers
6%	Remix in current ration

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Forage Storage

	Bags	Bunkers	Piles	Silo	Wrapped bales	Silage inoculant	n
Corn Silage	41%	52%	14%	21%		52%	29
Corn Silage (BMR)	56%	50%	13%	25%		56%	16
Grass Silage	26%	32%	5%	16%	32%	42%	19
Legume Silage	42%	33%	4%	21%	21%	42%	24
Small Grain Silage	63%	19%	13%	13%	6%	56%	16
Sorghum Silage	71%	14%	14%		14%	71%	7

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How do you handle a majority of your hay? (n=7)

53%	Big square bales
25%	Balage
14%	Round bales
8%	Conventional small square bales

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Do you use a hay preservative/inoculant when baling?

37% Yes (47%)

42% No (53%)

21% We do not bale hay

Do you require a hay preservative/inoculant when purchasing hay?

11% Yes (16%)

55% No (84%)

34% We don't purchase hay

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Do you have a fresh cow group? (n=38)

Yes 47%

No 53%

How days are fresh cows kept in the fresh group? (n=17)

Average: 30.7

Max: 100

Min: 10

SD: 24.1

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How do you determine when the cow(s) are ready to move to another group? (n=26)

54% Days in milk
31% Cows general appearance
31% Other
23% Whenever there is a group of cows to move
19% Milk production
8% Feed intake
4% Body temperature
4% Rumination activity

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Are you using calcium boluses?

37% Use as needed

32% Use only on 2+ lactation cows

24% Do NOT use

8% Use on all cows

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Fresh Additives

Product	Sum	Percent	n
Buffer	22	88.0%	25
Rumensin/monensin	20	80.0%	25
Organic trace minerals	17	77.3%	22
Yeast product	15	62.5%	24
Mycotoxin binder	13	54.2%	24
Biotin	10	43.5%	23
Probiotics/DFM	7	33.3%	21
Sodium bentonite	6	30.0%	20
Cation product (heat stress)	6	28.6%	21
Choline (rumen protected)	6	28.6%	21
Immune stimulation	6	26.1%	23
Enzymes	5	23.8%	21
Calcium propionate	2	10.0%	20
Essential oil compounds	1	5.0%	20
Niacin	1	5.0%	20
Propyl glycol	1	5.0%	20
Anionic product	1	3.7%	27

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Health Issues: % Incidents

	Ave	Max	Min	SD	n
Milk fever	5.6	25	1	6.40	37
Ketosis	5.9	30	1	6.46	36
Displaced abomasum	1.8	5	0.005	1.36	30
Retained placenta	3.3	10	0.05	2.47	34
Metritis	3.8	15.3	0.05	3.80	35

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Effect of production level

Farms that responded n = 38

Farms with RHA milk

< 19,800 lbs classified as LOW (n = 15)

> 19,800 lbs classified as HIGH (n = 16)

Evaluated the effect of production level on different production parameters, diets, forages, management, and health on Jersey farms.

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Low vs. High Production Level

<19,800 lbs vs. >19,800 lbs

	Production level		SE	*P* value
	Low	High		
n	15	16		
Milk Yield, lbs	58.6	67.9	1.6	<0.001
Fat, %	5.23	5.05	0.12	0.31
Protein, %	3.78	3.76	0.04	0.73
SCC	197.7	164.1	25.2	0.35
RHA milk, lbs	18,640	21,515	270	<0.001
RHA Fat, lbs	932.1	1053.2	21.1	<0.001
RHA Protein, lbs	687.2	785.0	11.6	<0.001
Age at 1st calving, months	23.1	23.4	0.32	0.58

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Take Home Messages: Level of Milk

Higher protein dry cow ration with less hay in high herds

Lower ADF & NDF corn silage in high herds (BMR silage)

Less metritis in high herds

Trend with lower SCC & more 3x milking in high herds

Conclusion: Differences were minor

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Effect of BST use

- Farms that responded n = 38
  - Farms that did not use BST were classified as NO (n = 25)
  - Farms that did use BST were classified as YES (n = 13)

Evaluated the effect of BST use on production parameters, diets, forages, management, and health on Jersey farms.

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Effect of BST Use (Yes vs. No)

	BST		SE	*P* value
	No	Yes		
n	25	13		
Milk Yield, lbs	63.31	63.53	2.4	0.94
Fat, %	5.16	5.09	0.15	0.68
Protein, %	3.77	3.77	0.05	0.97
SCC	168.0	203.8	30	0.34
RHA milk, lbs	19,929	20,533	567	0.39
RHA Fat, lbs	989.1	1,006	33	0.67
RHA Protein, lbs	733.5	746.4	21	0.62
Age at 1st calving, months	23.3	23.2	0.45	0.75

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Take Home Message: Use of rBST

- Higher levels of fat fed, less ADF, and less hay (higher energy rations) in rBST herds
- Dry cow rations higher in ADF and NDF with less starch (may reflect high straw dry cow ration) in rBST herds
- Forages contain less uNDF in rBST herds (wish I had more data)
- Pushed up feed more frequently in rBST herds

Conclusions: More aggressive feeding and management

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Effect of herd size

- Farms that responded n = 38
  - Farms that had a herd size < 200 cows were classified as small (n = 21)
  - Farms that had a herd size >200 cows were classified as YES (n = 13)

Evaluated the effect of herd size on production parameters, diets, forages, management, and health.

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Small (<200 cows) vs Large (>200 cows)

	Herd Size		SE	*P* value
	Small	Large		
n	21	17		
Milk Yield, lbs	63.8	63.1	2.1	0.81
Fat, %	5.2	5.1	0.1	0.71
Protein, %	3.7	3.8	0.04	0.26
SCC	186.3	175.5	27	0.77
RHA milk, lbs	19,856	20,344	481	0.46
RHA Fat, lbs	981	1006	27	0.50
RHA Protein, lbs	722	751	18	0.23
Age at 1st calving, months	23.2	23.4	0.3	0.66

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Take Home Message: Herd Size

- No differences in milk production
- No effect on rBST use
- Trend for more pushing up of feed in larger herds

Conclusion: Surprised to observe no differences

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Effect of Percent of Herd as Jersey

- Farms that responded n = 38
  - Farms that had <100% of cows as Jersey were classified as <100% (n = 22)
  - Farms that had 100% of cows as Jersey were classified as 100% (n = 16)

- Evaluated the effect of % of herd as Jersey on production parameters, diets, forages, management, and health on Jersey farms.

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<100% vs 100% Jerseys in Herd

	Percent Jersey		SE	*P* value
	<100%	100%		
n	22	16		
Milk Yield, lbs	64.2	62.5	2.0	0.52
Fat, %	5.08	5.20	0.12	0.49
Protein, %	3.73	3.82	0.04	0.13
SCC	152.3	214.9	25	0.08
RHA milk, lbs	20,126	20,122	469	0.99
RHA Fat, lbs	976.5	1014	23	0.31
RHA Protein, lbs	731.6	744.1	17	0.61
Age at 1st calving, months	23.3	23.3	0.4	0.98

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Take Home Message: Mixed vs. Jersey

- More 3X milking occurred in mixed herds
- More weigh-back/feed refusal in mixed herds
- More ketosis and higher SCC in Jersey herds

Conclusion:
Mixed herds may be more aggressive in feeding management and intake.

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Limitations of the Study

- Could not collect the actual dry matter fed
- Multiple TMRs were difficult to interpret
- Could not trace which legume/grass forages were being fed in each group
- Close up rations had limited numbers
- A face-to-face data collection would be ideal, but is not possible with a $2500 grant.

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Poll: Do Jersey cows vary in the ratio of peak milk yield to total milk yield for that lactation based on herd average?

- ○ Yes, ratio depends on peak milk and herd average
- ○ Yes, ratio depends on milk yield and lactation number (parity)
- ○ Yes, ratio depends on lactation number and days in milk
- ○ No, the same relationships exist

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Table 1. Jersey Milk Production Profile (parity and days in milk)

**15,000 RHA n=121; 17,000 RHA n=92; 19,000 RHA n=59; 21,000 RHA n=17*

Lact #	Milk	Peak	Milk/Peak	Days in Milk			
				1 - 40	41 - 100	101 - 199	200 - 305
1	15,000	54	278	45	49	46	42
	17,000	59	288	47	54	51	46
	19,000	65	292	53	60	57	52
	21,000	72	292	56	63	65	58
2	15,000	65	231	57	59	52	43
	17,000	73	233	63	66	59	49
	19,000	79	241	68	72	65	55
	21,000	85	247	71	76	71	59
3+	15,000	71	211	60	64	56	45
	17,000	79	215	65	71	62	51
	19,000	85	224	71	78	69	57
	21,000	92	228	73	81	75	62

Table 2. Jersey Milk Component Profile (parity and days in milk)

** 15,000 RHA n=121; 17,000 RHA n=92; 19,000 RHA n=59; 21,000 RHA n=17*

Lact #	Milk	Fat %				Fat/Prot	Protein %			
		1 - 40	41-100	101-199	200-305	1 - 40	1 - 40	41-100	101-199	200-305
1	15,000	3.1	3.7	4.3	4.8	1.29	2.4	2.8	3.3	3.6
	17,000	3.6	4.0	4.6	4.9	1.29	2.8	3.0	3.5	3.7
	19,000	4.1	4.3	4.8	5.2	1.32	3.1	3.2	3.6	3.8
	21,000	4.0	4.2	4.6	5.0	1.29	3.1	3.2	3.5	3.7
2	15,000	3.3	3.7	4.3	4.6	1.27	2.6	2.8	3.3	3.5
	17,000	3.6	4.1	4.6	4.9	1.29	2.8	3.1	3.5	3.7
	19,000	4.0	4.3	4.8	5.1	1.29	3.1	3.2	3.6	3.9
	21,000	4.2	4.3	4.6	5.0	1.20	3.5	3.3	3.5	3.8
3+	15,000	3.8	4.1	4.6	4.9	1.27	3.0	3.1	3.5	3.8
	17,000	4.3	4.4	4.8	5.0	1.30	3.3	3.3	3.6	3.8
	19,000	4.4	4.3	4.8	5.0	1.33	3.3	3.2	3.6	3.8
	21,000	4.3	4.4	4.6	4.9	1.26	3.4	3.3	3.5	3.8

In Summary

- High producing Jersey herds have high nutrient dense rations.
- Opportunities exist to fine tune rations (fresh cow groups, weigh backs, etc.)
- Milk components in the initial 100 days in milk should be analyzed and evaluated

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YouTube Channel
http://Go.Illinois.edu/dairy

Online Dairy Courses
http://online.ansci.illinois.edu/

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UPCOMING WEBINARS

September 10, 2018

Bolstering transition cow immunity

Presented by Marcus Kehrli, National Animal Disease Center, Ames, Iowa

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October 8, 2018

The feed supply/quality cards we've been dealt

Presented by Mike Hutjens, University of Illinois and Mike Rankin, Hay & Forage Grower

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Question from Greg W, Oregon, USA

We think Jerseys are more efficient compared to other breeds. Is that true?

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Question from Teunis M, Netherlands

We have 100 percent grass-based ration and 200 days grazing.

Can you tell more about how to run that with Jerseys?

Question from Greg W, Oregon, USA

When evaluating the lower value of bull Jersey calves, does the Jersey breed give up part of any economic advantages?

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UPCOMING WEBINARS

September 10, 2018

Bolstering transition cow immunity

Presented by Marcus Kehrli,
National Animal Disease Center, Ames, Iowa

Sponsored by Diamond V

October 8, 2018

The feed supply/quality cards we've been dealt

Presented by Mike Hutjens, University of Illinois
and Mike Rankin, Hay & Forage Grower

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