

Feeding Practices in Top U.S. Jersey Herds

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Experimental Design

- AJCA provided a list of 110 top cheese yield herds in the U.S. in 2015 along with e-mail addresses.
- We developed an on-line survey instrument to collect on-farm management information and tested by the graduate students, Jim, and me.
- In addition, we requested DHI data summary from Nov/Dec 2016, current forage test results, and current milking and dry cow rations (up to seven could be submitted).

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A Need for Conducting the Field Study

- Jersey 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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Timeline of the Field Study

- AJCA sent out an e-mail indicating that a survey would be sent out from the U of IL in early 2017.
- Electronic survey was sent out January, 2017.
- Data arrived for the next four months with one reminder from us (those not responding).
- In May, any “unusual” or missing data were requested and clarified from participating farms.

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The Team

- AJCA and Research Foundation for names and funding
- Mike Hutjens—co-leader with name recognition
- Jim Baltz—co-leader, our IT specialist to design the survey instrument and dairy background
- Sarah Morrison—graduate student from Jersey herd in New England, provided statistical analysis
- Kristen Glossom—graduate student from North Carolina pasture based herd, provided statistical analysis

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Phase One Article Herd Summary Data

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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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Bunk Space

	Bunk space per cow				n
	<15"	16-22"	23-29"	>30"	
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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	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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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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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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Cows per Stall

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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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/RV	163.6	233.0	111.0	35.2	19

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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

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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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

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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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

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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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

Type of TMR Mixer (n=38)

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

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

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

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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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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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Frequency of Feeding? (n=38)

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

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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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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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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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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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Phase Two Article Statistical Analysis

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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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Effect of production level

- Farms that responded n = 38
- Farms with RHA milk < 19,800 lbs classified as LOW (n = 15)
- Farms with RHA milk > 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 (<19,800 lbs) vs. High (>19,800 lbs) Production Level

	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 1 st calving, months	23.1	23.4	0.32	0.58

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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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Take Home Messages: Level of Milk

- Higher protein dry cow ration with less hay in high herds
- Lower ADF and NDF corn silage in high herds (bmr silage)
- Less metritis in high herds
- Trend with lower SCC and more 3x milking in high herds

Conclusion: Differences were minor

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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 on Jersey farms.

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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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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 1 st calving, months	23.2	23.4	0.3	0.66

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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	19929	20533	567	0.39
RHA Fat, lbs	989.1	1006	33	0.67
RHA Protein, lbs	733.5	746.4	21	0.62
Age at 1 st calving, months	23.3	23.2	0.45	0.75

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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 1 st 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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