Leave No Dairy Calf Behind

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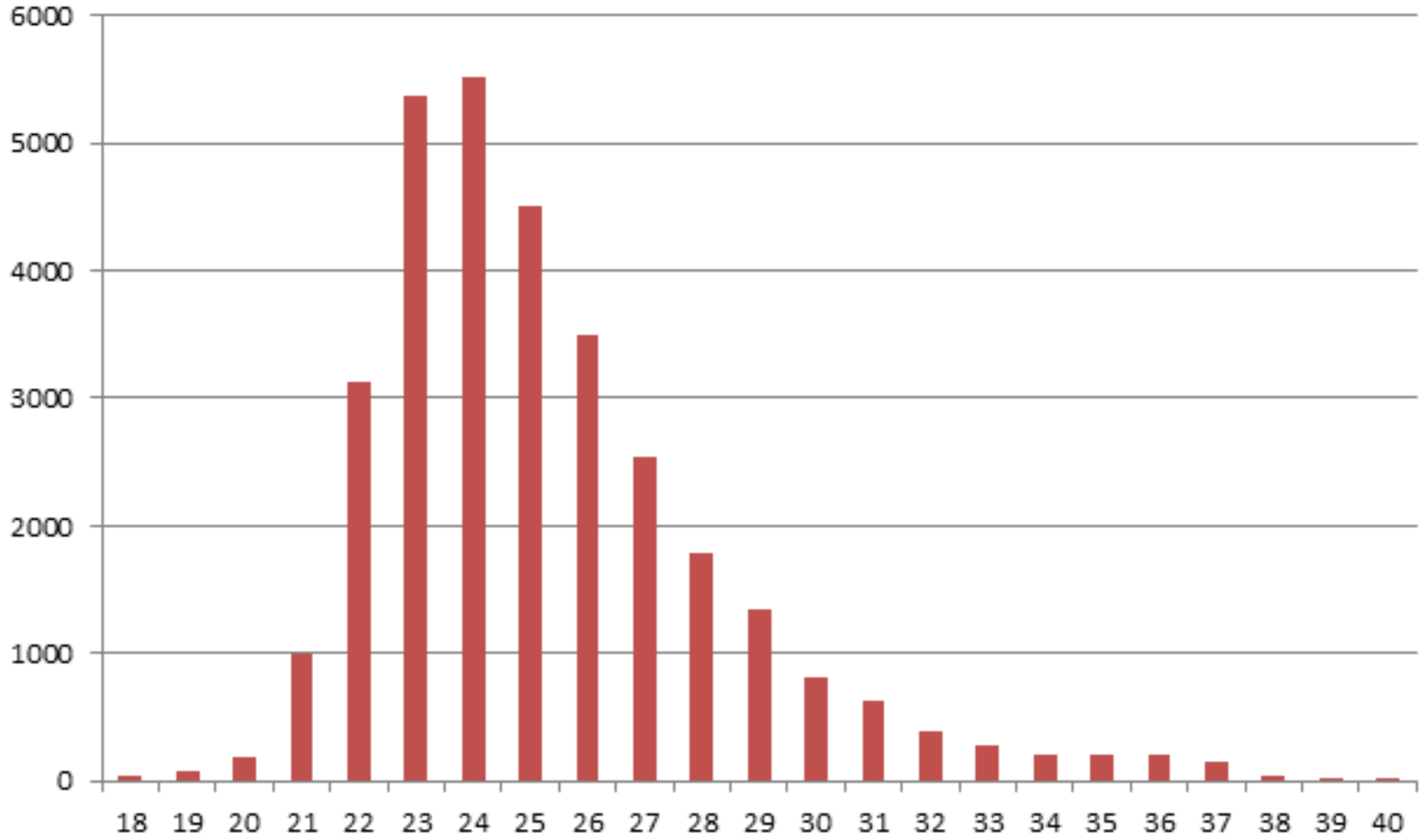
Calf Program Goals

- **Why do this?**
  - **Achieve breeding weight at an earlier age**
  - **Potentially reduce AFC/increase BW@calving**
  - **Increase potential for internal herd growth**
  - **Potentially increase milk yield**
  - **Potentially increase herd life**

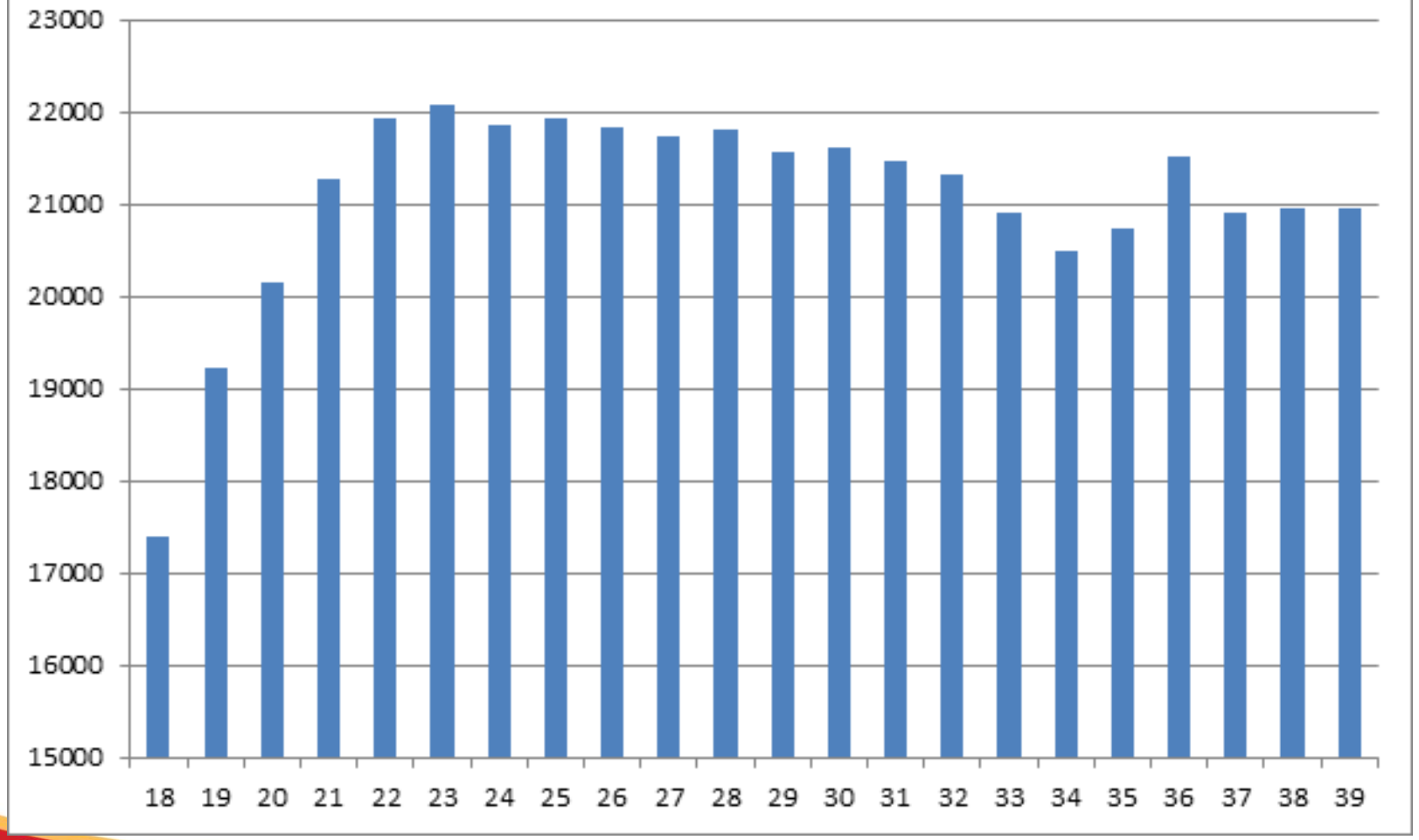
Age at 1st Calving

Iowa Holsteins Calving in 2011



Actual 305-day Milk Production

Iowa Holsteins Calving in 2011



Dairy Calf and Heifer Association
"Gold Performance Standards"
www.calfandheifer.org

Birth – to – weaning

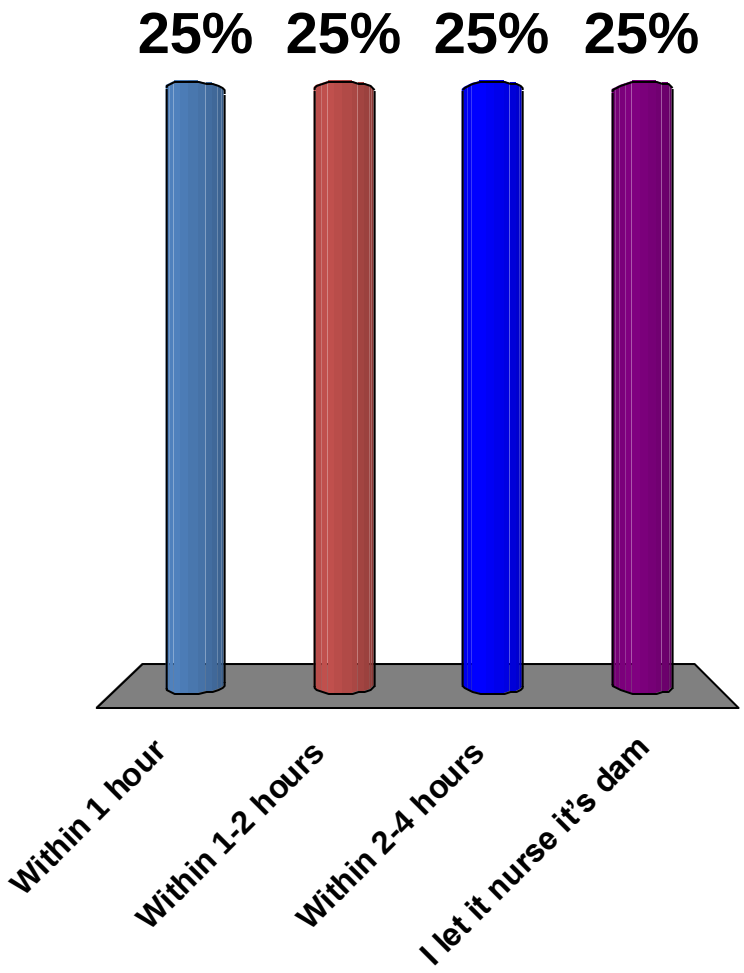
Weaning – to – calving

Dairy Calf and Heifer Association
"Gold Performance Standards"

- Mortality
- Morbidity
- Colostrum management
- Nutrition
- Growth rate
- Housing

How soon after a calf is born do you feed colostrum?

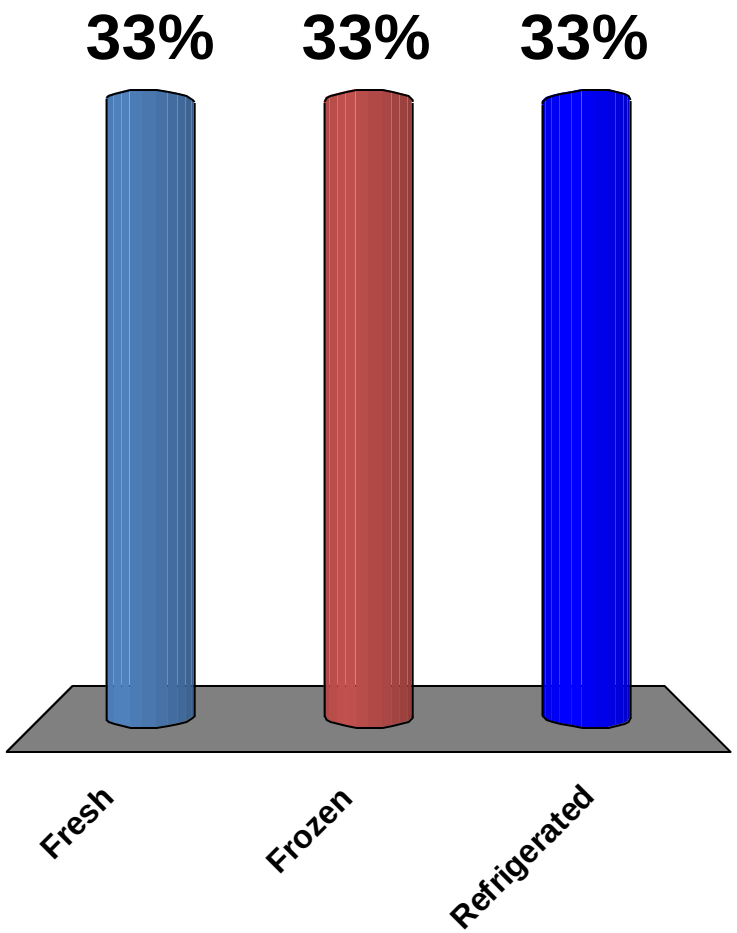
1. Within 1 hour
2. Within 1-2 hours
3. Within 2-4 hours
4. I let it nurse it's dam



Response Counter

What form of colostrum do you feed?

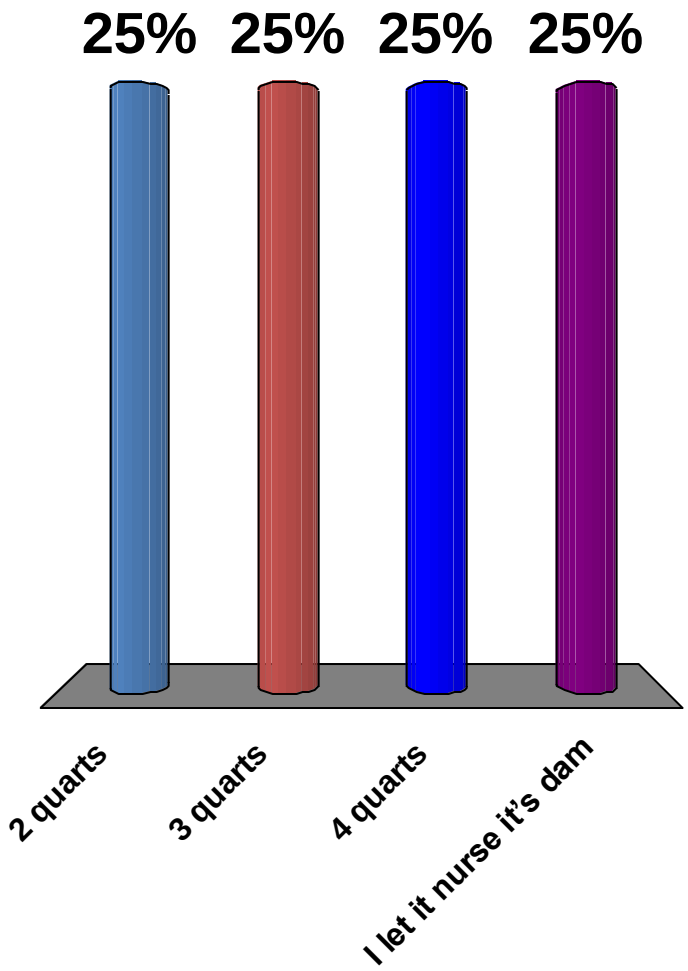
1. Fresh
2. Frozen
3. Refrigerated



Response Counter

How much colostrum do you feed a calf in the first feeding after birth?

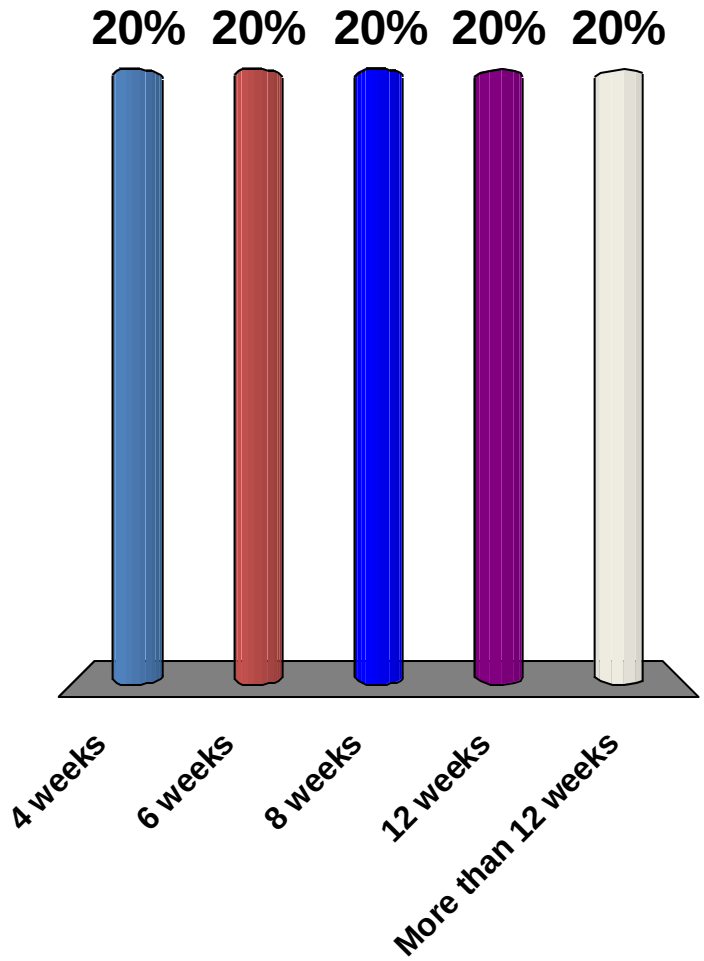
1. 2 quarts
2. 3 quarts
3. 4 quarts
4. I let it nurse it's dam



Response Counter

At what age do you wean your calves?

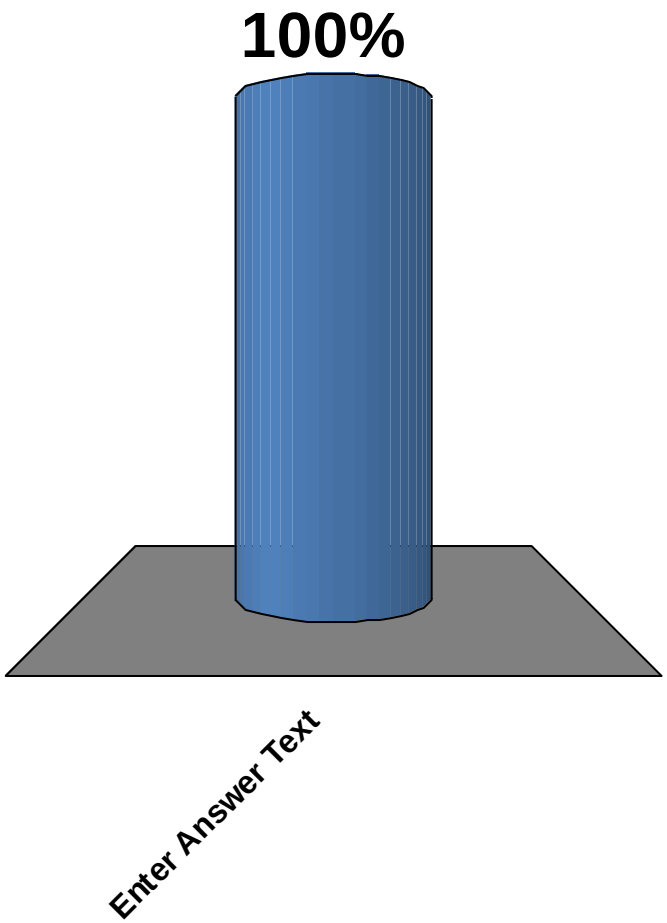
1. 4 weeks
2. 6 weeks
3. 8 weeks
4. 12 weeks
5. More than 12 weeks



Response Counter

How much milk or milk replacer do you feed calves per feeding?

1. 2 quarts
2. 3 quarts
3. 4 quarts
4. More if it's cold



Response Counter

DCHA Benchmarks

Mortality

24 hr to 60 days of age	< 5%
61-120 days of age	< 2%

DCHA Benchmarks

Morbidity

	scours	pneumonia
24 hr to 60 days of age	< 25%	< 10%
61-120 days of age	< 2%	< 15%

DCHA Benchmarks

Growth rate

24 hr to 60 days of age	double birth weight
61-120 days of age	2.2 lb/day
121-180 days of age	2.0 lb/day

Colostrum Management

Quality	**≥ 50 g/L IgG**
Quantity	**10-15% if birth weight**
Quickly	**with 2-4 hrs of birth**
sQueaky clean	**< 100,000 cfu/ml TPC**

Colostrum Management

Target is serum IgG levels > 10.0 g/L or 12.0 g/L

Each 1% increase above 12.0 g/L means 18 lb milk

Colostrum Management

Parity	IgG levels
1	42.2 mg/mL
2	68.6 mg/mL
3	95.9 mg/mL

Percentage of samples by IgG concentrations

IgG (mg/mL)	no. samples	%
< 50	243	29.4
50-80	303	36.6
80-100	156	18.9
100-120	75	9.1
> 120	50	6.0

Percentage of samples by IgG concentrations

IgG (mg/mL)	no. samples	%
< 50	243	29.4
50-80	303	36.6
80-100	156	18.9
100-120	75	9.1
> 120	50	6.0

Percentage of samples by total plate count

Range (CFU/ml)	no. samples	%
< 100,000	409	54.8
100,000-300,000	90	12.1
300,000-500,000	47	6.3
500,000-1,000,000	74	9.9
> 1,000,000	126	16.9

Percentage of samples by total plate count

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< 100,000	409	54.8
100,000-300,000	90	12.1
300,000-500,000	47	6.3
500,000-1,000,000	74	9.9
> 1,000,000	126	16.9

Percentage of samples meeting one or both quality standards

IgG	TPC	Overall no.	Overall %	Midwest no.	Midwest %
> 50 mg/mL	< 100,000 cfu/mL	294	39.4	88	53.7
> 50 mg/mL	> 100,000 cfu/mL	233	31.2	51	31.1
< 50 mg/mL	> 100,000 cfu/mL	104	14.0	14	8.5
< 50 mg/mL	< 100,000 cfu/mL	115	15.4	11	6.7

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Percentage of samples bases on cleanliness

TPC	Fresh no.	Fresh %	Refrigerated no.	Refrigerated %	Frozen no.	Frozen %
< 100,000 cfu/mL	122	67.0	35	23.0	252	61.2
100,000-300,000	21	11.5	17	11.2	52	12.6
300,000-500,000	9	5.0	10	6.6	28	6.8
500,000-1,000,000	8	4.4	32	21.0	34	8.2
> 1,000,000	22	12.1	58	38.2	46	11.2

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100,000-300,000	21	11.5	17	11.2	52	12.6
300,000-500,000	9	5.0	10	6.6	28	6.8
500,000-1,000,000	8	4.4	32	21.0	34	8.2
> 1,000,000	22	12.1	58	38.2	46	11.2

Percentage of samples meeting one or both quality standards

IgG	TPC	Fresh no.	Fresh %	Refrigerated no.	Refrigerated %	Frozen no.	Frozen %
> 50 mg/mL	< 100,000 cfu/mL	76	42.0	30	18.5	188	46.7
> 50 mg/mL	> 100,000 cfu/mL	38	21.0	86	53.1	109	27.0
< 50 mg/mL	> 100,000 cfu/mL	21	11.6	38	23.5	45	11.2
< 50 mg/mL	< 100,000 cfu/mL	46	25.4	8	4.9	61	15.1

Brown Swiss calves fed two levels of colostrum

Colostrum fed	2 L	4 L
Number of calves	37	31
ADG, lb/d	1.76	2.20
Age @ conception, mo	14.0	13.5
Survival thru 2 lactations	75.3%	87.1%
Milk, two lactations, lb.	35,297	37,558

Effect of initial colostrum feeding and feeding milk replacer

Treatment	4L/AL	4L/R	2L/AL	2L/R
Number calves	34	38	26	27
Birth wt, kg.	44.0	43.4	41.8	43.3
Weaning wt, kg (52 d)	78.2	63.5	72.2	62.4
ADG pre-weaning, kg	0.79	0.42	0.67	0.39
Total MR intake, kg	44.4	20.5	40.9	20.0
Grain intake pre-weaning, kg	2.5	12.0	2.1	9.7
ADG post-weaning, kg	1.1	0.97	0.88	0.92

Est. ADG for 100 lb. calf fed whole milk or a 20-20 milk replacer

Diet source	Gain Predicted from Energy	Gain Predicted from Protein
Milk Replacer, 1 lb./day	0.39 lb. ADG	0.52 lb. ADG
Whole milk, 1 gal./day	1.15 lb. ADG	0.91 lb. ADG
Milk replacer, 1.5 lb./day	0.78 lb./day	0.84 lb./day
Whole milk, 1.5 gal./day	1.62 lb./day	1.38 lb. ADG

Amount of Milk Replacer/Milk Dry Matter Required to Meet Maintenance Needs

Temperature, ^{0} Fahrenheit

	68	50	32	15	5	-5	-20
BW, lb							
60	0.6	0.8	0.9	1.0	1.1	1.2	1.4
80	0.8	0.9	1.1	1.3	1.4	1.5	1.7
100	**1.0**	**1.1**	**1.3**	**1.6**	**1.7**	**1.8**	**2.0**
120	1.1	1.3	1.5	1.7	1.9	2.0	2.3

Mike Van Amburgh, Cornell Univ.

Amount of Milk Replacer/Milk Dry Matter Required to Meet Maintenance Requirements and Gain One Pound per Day

Temperature, ^{0} Fahrenheit

	68	50	32	15	5	-5	-20
BW, lb							
60	1.1	1.2	1.4	1.5	1.6	1.7	1.8
80	1.2	1.4	1.6	1.7	1.9	2.0	2.2
100	**1.4**	**1.6**	**1.8**	**2.0**	**2.2**	**2.3**	**2.5**
120	1.6	1.8	2.1	2.2	2.5	2.6	2.8

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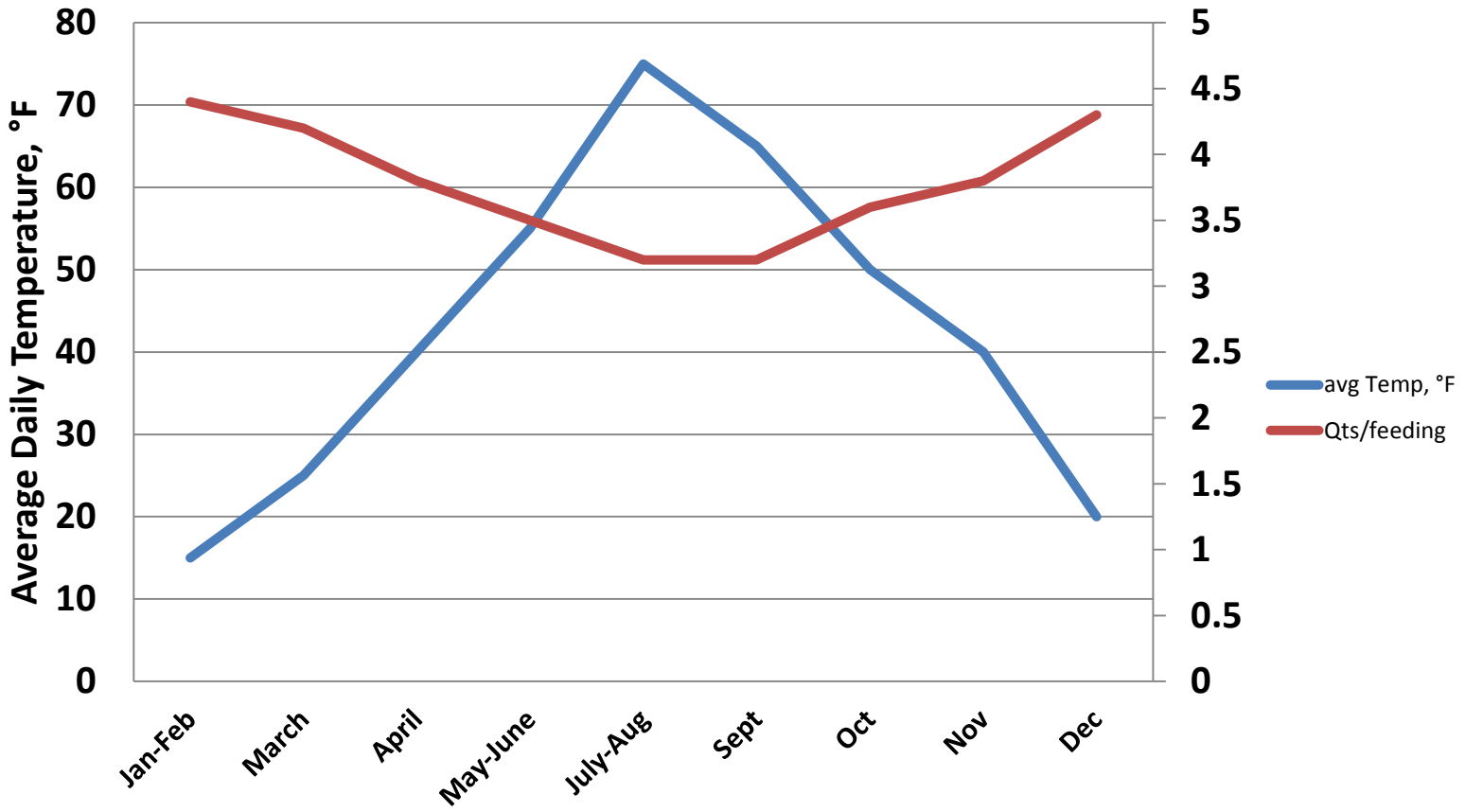
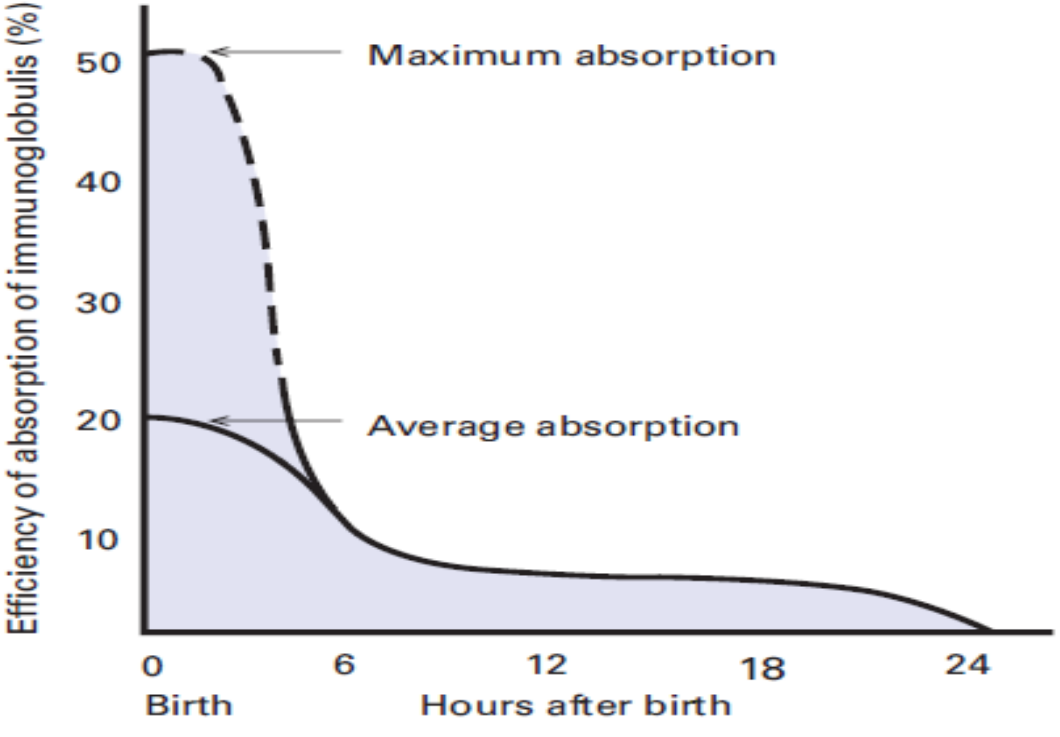
Whole milk needed (qts/feeding, 2x) for 1.6 lb ADG (NRC 2001)



Bacterial contamination of colostrum

- Feces
- Infected quarter or udder
- Contaminated collection, storage, or feeding equipment
- Bacterial proliferation in stored colostrum (double every ½ hr at room temperature)

Timing of Colostrum



Source: *Raising Dairy Replacements* (1991).

Figure 3.1. **Efficiency of immunoglobulin absorption.**

Factors affecting [IgG]

- First milk volume
  - > 18 lb < quality
- Immune status
  - Exposure/vaccination
- Length of dry period
  - 3-4 week minimum
- Dry cow nutrition
  - Deficient protein and energy reduce quality
- Age of cow
  - 2 yr olds = poorest
- Leaking
  - Removal & dilution
- Breed
  - Jerseys = highest
    - ~66 [28-115 g/L]
  - Holstein = lowest
    - ~48.2 [20-100 g/L]
- Season
  - Weather stress
  - Forage quality

Housing

Don’t shortchange calves & heifers on space!

Age	Stalls	Bunk
24 hr-120 d	min. 34 sq ft	
120 d-6 mo	min 40 sq ft	
6 mo-12 mo	min 45 sq ft	18 in
12mo-18 mo	min 50 sq ft	20 in
18 mo to pre-freshen	min 60 sq ft	24 in
pre-fresh pen	min 100 sq ft	30 in

Summary

- Feed high quality colostrum
- Feed it quickly after calf is born
- Minimize chances for bacterial contamination
- Feed more colostrum than traditional practice
- Fresh or frozen beats refrigerated colostrum
- Increase feeding amounts in colder weather

Questions?