MATERNITY SUCCESS

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STØTTET AF
Kvægafgiftsfonden
STØTTET AF
Mælkeafgiftsfonden

ST GENETICS

- World leader in bovine genetics, genomic testing, chromosomal mating and reproduction technologies
- The best way to predict the future is to create it

OHIO HEIFER CENTER

- 75 hectares
- 13 barns for cattle
- 4,000-6,000 head
- 3 sheds for manure recycling and composting
- Feed center – 2 barns and 3 forage bunkers

STgenetics®
Ohio Heifer Center

MATERNITY BARN

HEIFER HOUSING

WEANED BARNS – DATA COLLECTION

ROBOT BARN

- 16 Lely A5 Robot
- Milking 850-900
- Tunnel Ventilation
- Data Collection

GENETIC ADVANCEMENT

- Reducing Generational Interval
- Embryo Transfer
- OPU Collection
  - 7 months of age
  - 80-90 donors per week
- IVF Lab
  - 1500-2000 Oocytes per week
    - Creates 600 Embryos per week, Transfer 500
  - Sexed Female Program – 3 satellite farms
  - Internal Bull Program
- GOAL: 75 pregnancies per week at OHC

Table 1

Ireland		ST programme	
February	Heifer born	February	Heifer born
15 months later	Heifer inseminated with high EBI bull	7 months later	Elite heifer is flushed and embryos put into recipients
9 months later	High EBI calf born	9 months later	Multiple calves are born with different sires and different sexes
1 month later	Male calf identified by AI company as a calf of interest	1 month later	The best calves are identifed by ST for bull and heifer programme
25 months per generation and one sire line		17 months per generation and multipe sire lines	

(Brennan,2024)

MATERNITY DEPARTMENT

- 24/7 Barn, 13 employees, 1,000 cows, 20-60 calves
- 250 Calvings each month
- 70-80% First calf heifers
- 95% Embryo IVF calves
- 98% Passive Immunity Success

Female Holstein Average BW – 42.2 kg

Male Holstein Average BW – 49.9 kg

KEYS TO SUCCESS

1. Colostrum Program
    1. Quickness
    2. Quality
    3. Quantity
    4. Cleanliness
2. Monitoring
3. Biosecurity
4. Employee Management

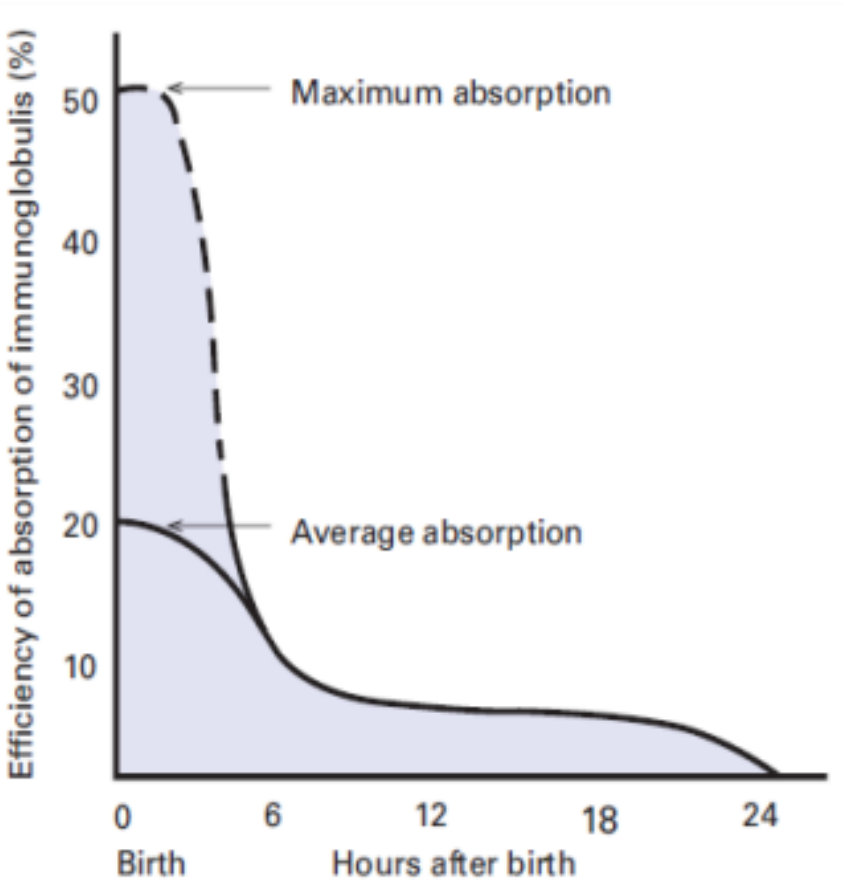
COLOSTRUM PROGRAM

Basics of Colostrum Management

1. Quickness
2. Quality
3. Quantity
4. Cleanliness

QUICKNESS

- Gut Closure
  - Progressive loss of ability to absorb Ig
  - Avg 35% absorption within 1-2 hrs of birth
  - At 6+ hrs after birth, drops to 10% absorption
  - Completed by 24 hrs
- Industry recommendation
  - Feed 1st feeding within 1 hr
  - Second feeding within 12 hrs



Source: *Raising Dairy Replacements* (1991).

COLOSTRUM QUALITY

Goal: feed min of 150-200 g/L

- 1st Feeding
  - ≥ 25% Brix
  - 25% Brix = 75 g of IgG/L
- 2nd Feeding
  - 22-24.9% Brix
  - 22% Brix = 50 g of IgG/L

Brix (%)	[IgG] (mg/mL)	Colostrum Quality
<15	0-28	Poor
15-21	28-50	Fair
22-30	50-80	Good
>30	>80	Very Good

A Brix value of 22% corresponds to 50 g of IgG/L

QUANTITY – OLD STANDARDS

- OLD Recommendation:
  - 1st Feeding: 4L within the first hour
  - 2nd Feeding: 2L fed at 8-12 hrs old
- Undesirable effects when feeding 10% BW
  - Abomasal distension
  - Discomfort and colic
  - Aspiration Pneumonia (heavy breathing)
  - Diminished absorption
- "Severe Colic in a Newborn Dairy Calf caused by a large colostrum curd: a case report" (Sockett, 2024)

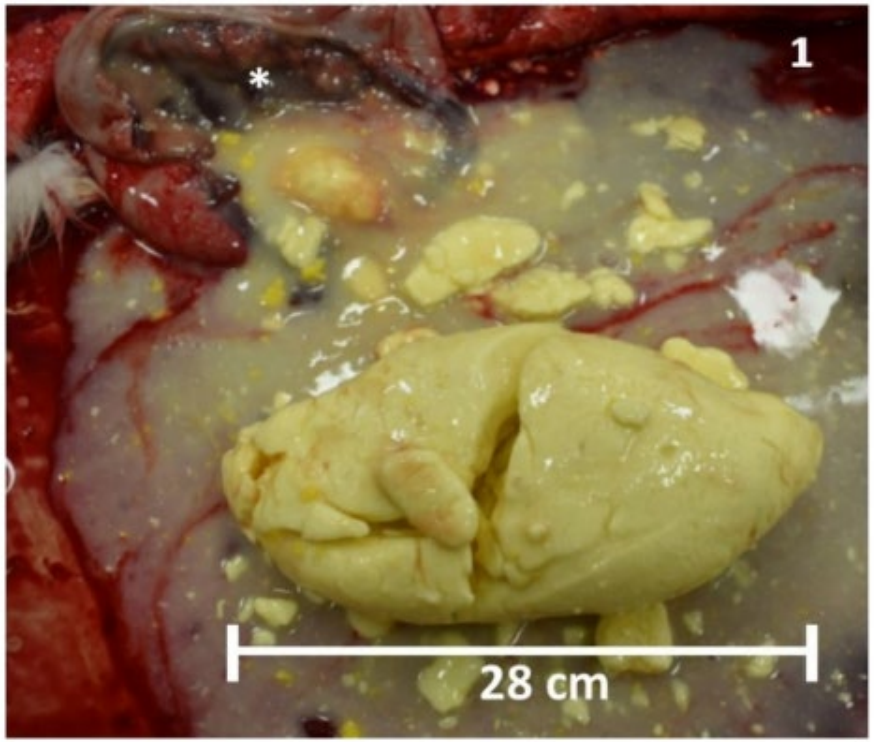


FIGURE 1
Postmortem abomasal colostrum clot. Photo of a very solid, yellow colostrum curd (28.0 cm in length, 15.4 cm in height) removed from the abomasum (white asterisk) of a 39.5 kg female, Holstein calf. Microscopic changes in the abomasum are limited to moderate vascular congestion.

QUANTITY – FIRST FEEDING

- Observed undesirable effects when feeding 10% BW
- Challenging the norm
- Research results:
  - Compared 7%, 8.5%, and 10% BW within the first 2 hrs (Connely, 2014)
  - Calves fed 8.5% BW colostrum had greatest mean serum IgG at 24 hrs
  - Maintained highest levels out to 642 hrs (26 days) of life

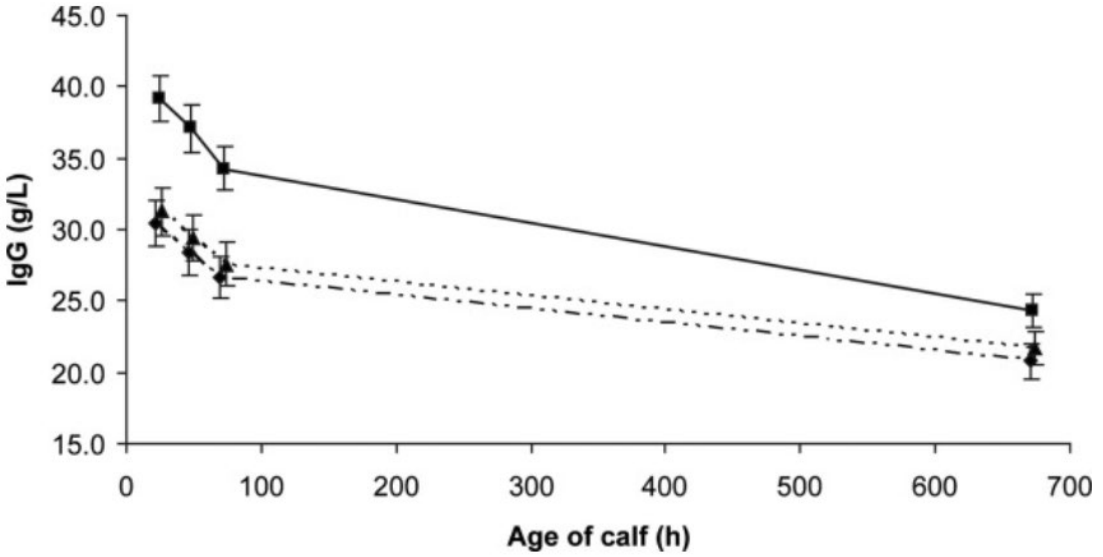


Figure 2. Mean serum IgG concentration (g/L) at 24, 48, 72, and 672 h of age for calves fed 7% of BW (– --♦– --), 8.5% of BW (—▪—), and 10% of BW (--▲--) in colostrum within 2 h of birth. Error bars represent 1 SE on each side of the LSM.

(Connely, 2014)

ADJUSTING THE COLOSTRUM PROGRAM

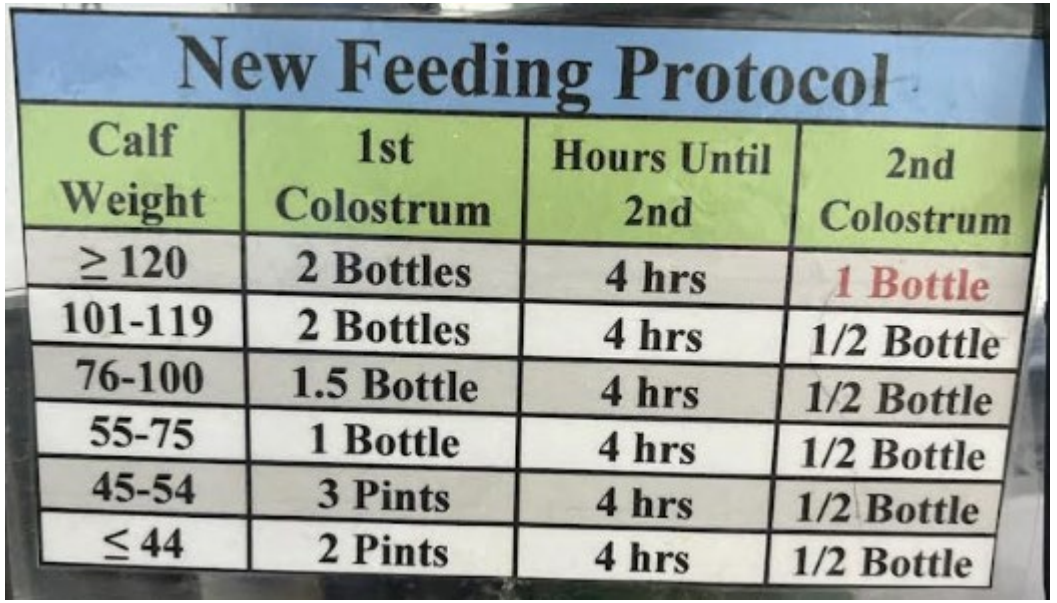
GOAL: Reduce colostrum volume without sacrificing STP levels

1. Decrease first feeding to 8.5% BW
    1. Monitor weight groups for FPT, observe changes to STP
    2. Keep 2nd feeding at 6 hrs after 1st, 2L volume
2. Half the 2nd volume
    1. 1L at 6 hrs
    2. Observe changes to STP
3. Bump up 2nd feeding to 4 hrs after 1st
    1. Keep 1L volume
    2. Observe changes to STP
    3. Re-evaluate weight classes

- **Observations:**
    - Calves immediately looked better
        - Less bloat, vocalizing, heavy breathing
    - STP decreased by 0.21g/dL when 2nd volume was halved
    - STP increased by 0.19g/dL when 2nd was moved from 6 hrs to 4 hrs
    - Assumption: if you feed a 2nd more than 4 hrs, you will need to up the volume or quality in order to maintain STP levels

NEW COLOSTRUM PROTOCOL

- 1st Feeding
  - ≥ 25% Brix
  - 2-4 L, **8.5%** body weight
    - No more than 4L at first feeding despite BW
  - Within 1 hr of birth
- 2nd Feeding
  - 22-24.9% Brix
  - 1L, 2L if > 54 kf
    - Increased volume compensates for low %BW 1st feeding
  - 4 hrs after 1st feeding
- Manageable volumes



New Feeding Protocol

Calf Weight	1st Colostrum	Hours Until 2nd	2nd Colostrum
≥ 120	2 Bottles	4 hrs	1 Bottle
101-119	2 Bottles	4 hrs	1/2 Bottle
76-100	1.5 Bottle	4 hrs	1/2 Bottle
55-75	1 Bottle	4 hrs	1/2 Bottle
45-54	3 Pints	4 hrs	1/2 Bottle
≤ 44	2 Pints	4 hrs	1/2 Bottle

1 bottle = 2 L

Weight	1st Feeding (1 hr)	%BW	2nd Feeding	%BW	Total %BW	Avg STP	Percent Failure
≥120 lbs (54 kg)	4 L	7.5%	2L	3.8%	11.3%	6.63	3% (6/196)
101-119 lbs (45.8-53.9 kg)	4L	7.5-8.8%	1L	2-2.2%	9.5-11%	6.81	0.2% (1/406)
76-100 lbs (34-45 kg)	3L	6.7-8.8%	1L	2.4-2.9%	9.1-11.7%	6.77	1.5% (14/954)
55-75 lbs (24.9-34 kg)	2L	6.0-8.1%	1L	3-4%	9-12.1%	6.67	1.5% (3/202)
45-54 lbs (20.4-24.5 kg)	1.5 L	6.7-7.5%	1 L	4.1-5%	10.8-12.5%	6.56	7% (1/28)
≤44 lbs (20 kg)	1 L	5%	1 L	5%	10%	6.73	25% (1/4)

WHAT NEXT?

- **Always room for improvement!**
- Breed specific protocols?
  - Angus
  - Brown Swiss
- Transition milk feeding prior to milk replacer
  - STP effect?
  - Morbidity/Mortality differences?
- Evaluating the STP gain vs final 24hr value
  - Breed differences?

COLOSTRUM PROGRAM

Basics of Colostrum Management

1. Quickness ✓
2. Quality ✓
3. Quantity ✓
4. Cleanliness

CLEANLINESS – CALVING PENS

- Individual boxstalls for calving
- Maximum 5 calvings per boxstalls
- Hand pitch manure/placenta
- Clean and disinfect weekly
- Limit time the cows are in the stall
- Calf transport

CLEANLINESS – COLOSTRUM

- Harvesting Colostrum
- Pasteurization
  - Effective kills Salmonella, E coli, Mycobacterium avium subspecies paratuberculosis (Johne's), M. californicum, M. bovis, and Listeria monocytogenes.
  - Improves IgG absorption
  - 2 L for seconds quality
  - 3 or 4L for 1st quality
  - Record keeping – cow #, date, brix, CMT, volume
- Colostrum Handling and Storage
  - Bacterial growth can double every 20 mins
  - < 24 hours refrigeration, < 6 months freezer

CLEANLINESS – FEEDING

- Feeding
  - **GLOVES!!!**
  - Quickly
- Disinfection protocols
  - Physical brushing
  - Chemical selection
- Storage
- Rotation/Replacement
  - Brushes, bottles, nipples, hoses, etc.

KEYS TO SUCCESS

1. Colostrum Program ✓
    1. Quickness
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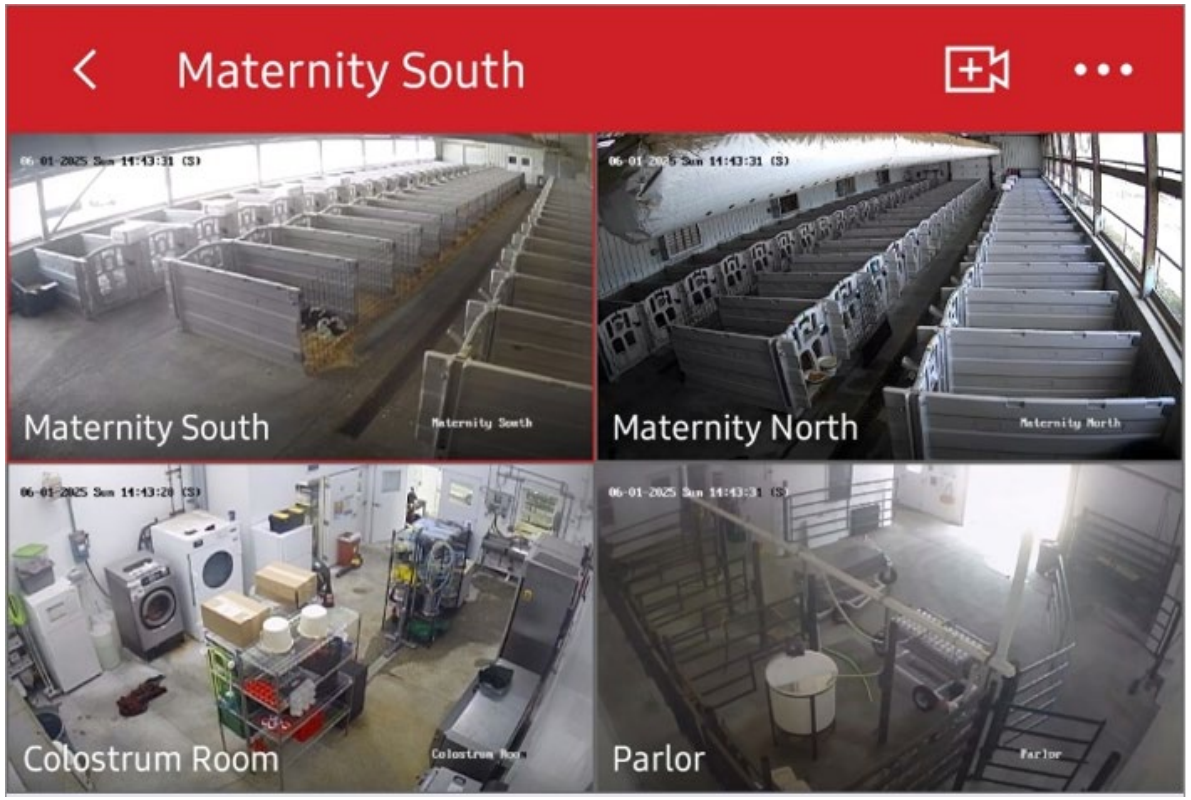
    3. Quantity
    4. Cleanliness
2. Monitoring
3. Biosecurity
4. Employee Management

MONITORING OUR PROGRAM

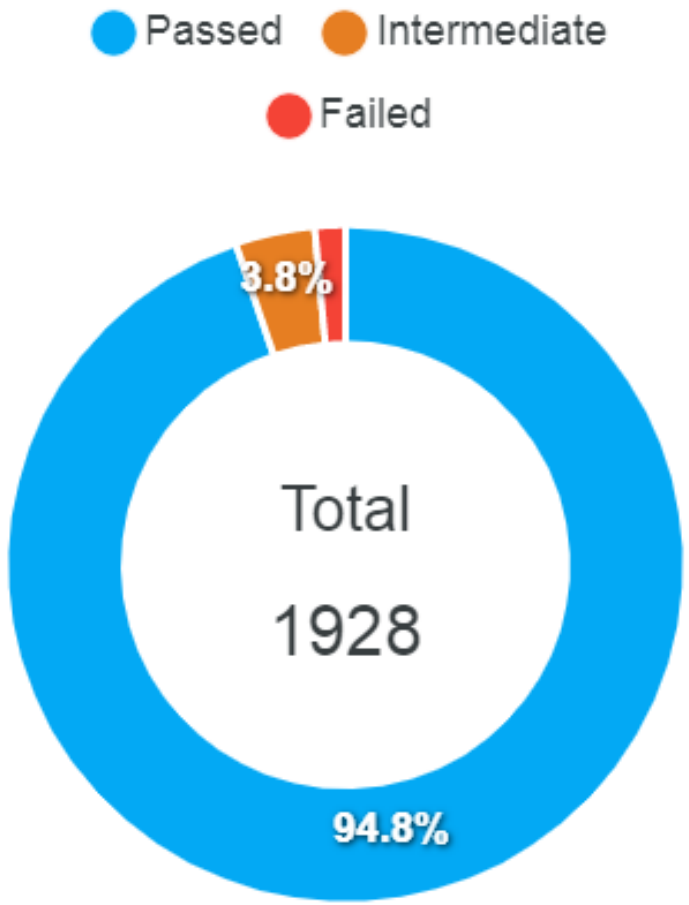
- Serum Total Proteins
- ATP Meter
- Cameras
- Monthly Statistics
  - DOA%, Born on Pack %, Calving ease, Time to first feeding, Tube vs Bottle, STP percentages



SERUM TOTAL PROTEINS

- The Transfer of Passive Immunity (TPI) is the absorption of maternal immunoglobulin present in colostrum absorbed in the small intestine during the first 24 hours after birth.

- TPI failure will mean more treatments and higher death loss



STATISTICS ON THE FAILURES

Weight	Percent Failure
≥120 lbs (54 kg)	3% (6/196)
101-119 lbs (45.8-53.9 kg)	0.2% (1/406)
76-100 lbs (34-45 kg)	1.5% (14/954)
55-75 lbs (24.9-34 kg)	1.5% (3/202)
45-54 lbs (20.4-24.5 kg)	7% (1/28)
≤44 lbs (20 kg)	25% (1/4)

- Breed Trends FPT
  - Brown Swiss – 5% (3/60)
  - Jerseys – 2% (3/128)
  - Holstein – 1.7% (27/1517)
- Calving Ease FPT
  - Min/No assistance – 1.1% (14/1290)
  - Chain pull – 3.5% (7/195)
  - Calf Jack – 1.0% (2/196)
  - C-section – 4.6% (5/109)

ATP METER

- Tests for the presence of adenosine triphosphate
  - Molecule in all living cells, including bacteria
- Luminometer detects and measures the amount of ATP present on a surface
  - RLU – relative light units
- If biofilm is present RLU > 1,000
- “Clean” - < 100 RLU ; “In Use” < 500

MATERNITY SWAB DATA

	1/31/2025		2/1/2025		3/31/2025		4/28/2025		5/30/2025	
Calf Equipment:	**ATP Level**	**Interpretation**	**ATP Level**	**Intrepretation**	**ATP Level**	**Intrepretation**	**ATP Level**	**Intrepretation**	**ATP Level**	**Intrepretation**
Bottle Holder (in use or clean)	0 clean	Excellent	0 clean	Excellent	0 clean	Excellent	4	Excellent	15 clean	Excellent
Bucket (in use or clean)	21 clean	Excellent	5 clean	Excellent	12 clean	Excellent	7	Excellent	2 clean	Excellent
Clean Bottle Cart	1	Excellent	0	Excellent	0	Excellent	0	Excellent	2	Excellent
Clean Colostrum Bottle	13	Excellent	0	Excellent	0	Excellent	0	Excellent	4	Excellent
Clean Nipple	1	Excellent	10	Excellent	0	Excellent	0	Excellent	1	Excellent
Colostrum Nipple	0	Excellent	1	Excellent	7	Excellent	0	Excellent	5	Excellent
Tube Feeder	0	Excellent	2	Excellent	0	Excellent	2	Excellent	1	Excellent
Mixing/Colostrum Room Equi	**ATP Level**	**Intrepretation**	**ATP Level**	**Intrepretation**	**ATP Level**	**Intrepretation**	**ATP Level**	**Intrepretation**	**ATP Level**	**Intrepretation**
Milk Mixer	0	Excellent	5	Excellent	1	Excellent	1	Excellent	57	Good
7 Spicket Milk Dispenser	1	Excellent	0	Excellent	0	Excellent	0	Excellent	7	Excellent
Dispensing Hose	7	Excellent	0	Excellent	2	Excellent	2	Excellent	2	Excellent
Colostrum Funnel	6	Excellent	0	Excellent	0	Excellent	0	Excellent	0	Excellent
Calving Equipment:	**ATP Level**	**Intrepretation**	**ATP Level**	**Intrepretation**	**ATP Level**	**Intrepretation**	**ATP Level**	**Intrepretation**	**ATP Level**	**Intrepretation**
Wheelbarrow	0	Excellent	57	Good	2	Excellent	57	Good	156	Good
Calving Chains	9	Excellent	0	Excellent	0	Excellent	0	Excellent	0	Excellent
Ear Tagger	6925	Needs Attention	1586	Needs Attention	7271	Needs Attention	632	Needs Attention	1562	Needs Attention

CAMERAS

- Protocol compliance
  - Protocol Adjustment
  - Re-training
- Welfare
  - Handling calves/cows
- Safety
  - Cow body language
  - Training new employees
- Entertainment

KEYS TO SUCCESS

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3. Biosecurity
4. Employee Management

BIOSECURITY

- Maternity unit
  - Highest biosecurity on the farm
  - Limit visitors – PPE
  - Crib = safe zone
- Foot baths in high risk areas
- Signs to stop traffic
- Structure movement based on biosecurity level

BIOSECURITY

- Crib = safe zone for the calf
  - Limit traffic
  - Minimize trips into crib
    - Especially in the first 24 hrs
  - Clean boots and change gloves between each crib
- Keep aisles clean

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EMPLOYEE TRAINING

- "Our barn, our calves"
- Parturition
  - When to move up into the boxstalls
    - Stage 2 labor or signs of distress
  - Dystocia decisions
- Colostrum selection
  - Failure statistics
- Monthly statistics and goals!

EMPLOYEE MANAGEMENT

- Communication is KEY
- Monthly meetings
- Making it fun to learn
  - Calving Bingo cards
  - Competitions

THANK YOU!! ANY QUESTIONS???