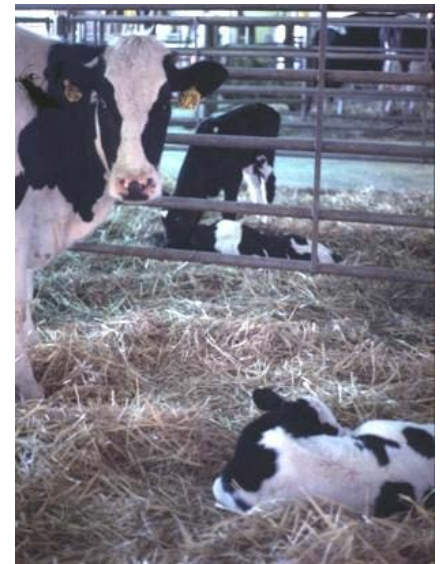




Automated Calf Feeders: Keys to Success

JIM PAULSON
U OF MN EXTENSION
ROCHESTER, MN



C1+C2+C3+C4+C5= CALF RAISING SUCCESS

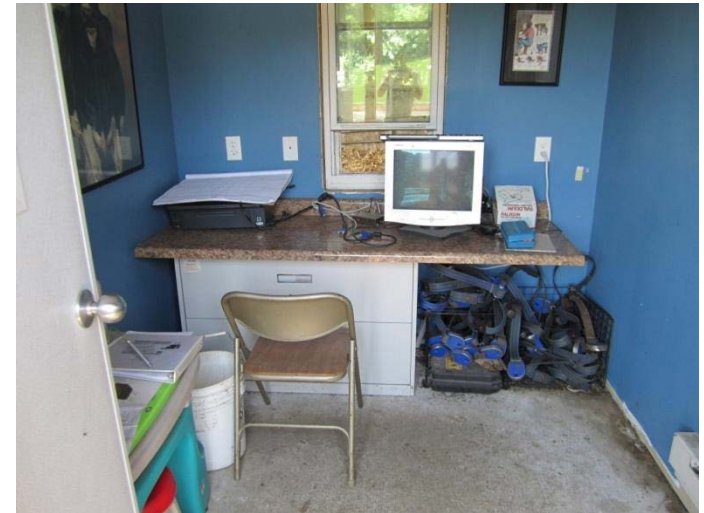
- C1 = Colostrum
 - Critical with all management systems
- C2 = Calories
 - Automated feeding allows the feeding of more calories
- C3 = Cleanliness
- C4 = Comfort
- C5 = Consistency
 - Milk is delivered at the same temperature and concentration every time

Why consider an automated calf feeding system?



AUTOMATED CALF FEEDING- ADVANTAGES

- Consistency of feeding
 - Water- Powder- Temperature
 - Mixing- Measuring
 - Data Collection
- Sick Calf Identification
- **Easy to manage an accelerated feeding program**
- Labor Saving



MOB FEEDERS



LOW COST MODEL

- Small batch size
- Fewer settings
- Less information
- More manual cleaning required



HIGHER LEVELS OF AUTOMATION

Forster Technik



HIGHER LEVELS OF AUTOMATION





OTHER BRANDS Other Models



COMPONENTS OF AN AUTOMATED CALF FEEDER

- Mixing unit
- Nipple feeders
- Computer and program



Milk Replacer Mixing Bowl



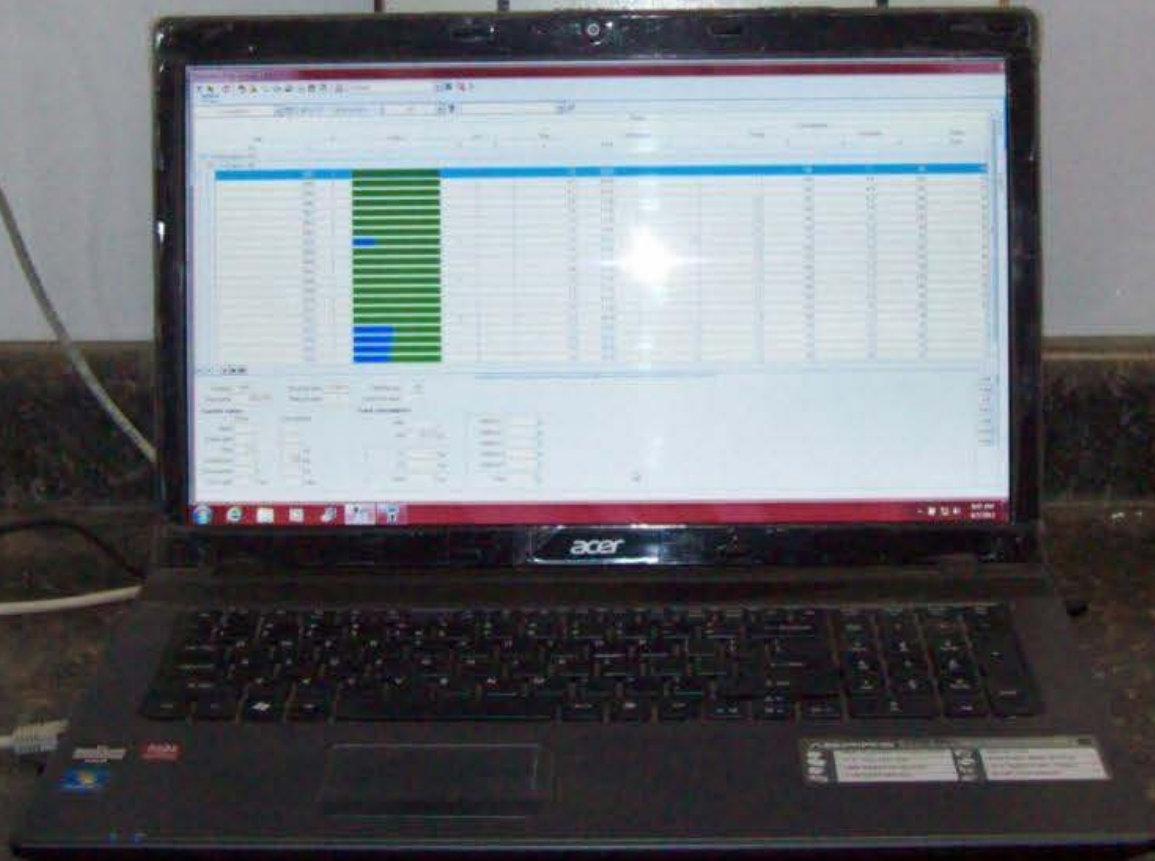




PANEL READERS AND NIPPLE OPTIONS



THIS IS AN



06/07/20



MILK REPLACER VS PASTEURIZED MILK

Milk Replacer

- Lower labor
- Lower equipment cost

Pasteurized Milk

- Use for waste milk
- Lower overall cost??



MILK REPLACER FEEDING



PASTEURIZED MILK



CHALLENGES?

- **Misconception of the feeder**
- **Ventilation**
- **Colostrum management**
- **Failure to clean machine**
- **Vaccination program**
- **Communication with your Veterinarian**

KEYS TO SUCCESS

- Colostrum management
- Starting calves on milk and starter
- Number of calves per nipple
- Ventilation
- Cleanliness
 - Calf housing area
 - Feeder
- Calf observation & Records



STARTING CALVES ON FEEDERS

- Start right on feeder if:
 - Age spread is very narrow
 - Keep animal numbers low
 - Close observation
 - Assist with drinking
- Start at 2-4 days if:
 - They are aggressively eating
- Start 10 – 14 days:
 - minimizes health issues in groups
 - Need more individual pens



START ON FEEDER OR INDIVIDUALLY





CALVES PER NIPPLE

- Time-lapse video studies
- Calf numbers/pen ie. 12 or 24
- Can feed 4-8 feedings/day, calves choose 5-6
- Unrewarded visits indicate calf health and satiety M.B. Jensen, Danish researcher

Farmer observations

- 18-20 calves per nipple – calves do great
- 20-22 calves per nipple – calves do OK
- >25 calves per nipples – some calves struggle



HOUSING

- 30 to 35 sq. feet per calf is ideal.
- What about air quality? How do we manage this?
- A.I.R. = Adequate, Incoming and Removal. Small calves do not generate a lot of body heat which limits convection air currents.

VENTILATION

- Most barns have positive pressure air tubes
- 4 exchanges in the winter months
- 40 exchanges in the summer months
- How do hutch calves compare?
- Do we struggle with issues in hutches?



SCHAEFER
Variable Speed Equipment

AUTOMATIC VARIABLE SPEED FAN CONTROL

Degrees F below Temp Set

AUTOMATIC SHUT-OFF SET: 8° -10° -12° -14° -16° -18° OFF

Click to reset display alarms

id → F → OS → OFF → (hold) Room Temp Set

8 9 10 hi

6 5 4 3 2 1 0

MAX. SPEED

IDLE SPEED SET

ROOM TEMPERATURE SET

LR61791 **MODEL #AVS550**
115/230 VAC 60 HZ 10 FLA

SCHAEFER
Variable Speed Equipment

AUTOMATIC VARIABLE SPEED FAN CONTROL

Degrees F below Temp Set

27

AUTOMATIC SHUT-OFF SET: 8° -10° -12° -14° -16° -18° OFF

Click to reset display alarms

id → F → OS → OFF → (hold) Room Temp Set

8 9 10 hi

7 6 5 4 3 2 1 0

MAX. SPEED

IDLE SPEED SET

ROOM TEMPERATURE SET

LR61791 **MODEL #AVS550**
115/230 VAC 60 HZ 10 FLA



CLEANLINESS

- LOTS of bedding
- Clean bedding often
- Clean hoses and nipple regularly

BEDDING SOURCE

- Wet bedding is another source of bacterial contamination. Around the feeder is generally very wet. Keep it dry also.
- Ammonia at the bedding surface, which is also the calf level. Combination of urine, manure and wet bedding leads to release of ammonia.
- What goes in does come out.....more powder = more water intake. Greater gains!









VISION



CHECKLIST FOR CLEANING FEEDER

- Switch nipples daily
- Clean hoses, discard once a week
- Periodically clean mixing unit itself
- Replace hose from mixing unit to feeder hose every 6 months







KEEP GOOD RECORDS

Feeder #3

Date	Time	Temp.	Name
1/24	6:55 AM	49.0° / 11.2° F	JRW
1/27	6:50 AM	49.3° / 11.3° F	JRW
1/28	7:00 AM	49.2° / 11.5° F	JRW
1/29	6:45 AM	48.7° / 11.4° F	JRW
1/30	7:00 AM	47.0° / 11.4° F	JRW
1/31	6:45 AM	46.5° / 11.1° F	JRW
2/1	6:40 AM	46.1° / 11.0° F	JRW
2/2	5:55 AM	46.7° / 11.6° F	JRW
2/3	6:45 AM	48.4° / 11.8° F	JRW
2/4	6:45 AM	48.2° / 11.5° F	JRW
2/5	6:45 AM	49.1° / 11.4° F	JRW
2/6	7:30 AM	48.0° / 11.3° F	JRW
2/7	6:45 AM	48.5° / 11.3° F	JRW
2/8	6:30 AM	47.1° / 11.4° F	JRW
2/9	6:30 AM	46.7° / 11.4° F	JRW
2/10	6:30 AM	46.7° / 11.3° F	JRW
2/11	6:30 AM	46.7° / 11.3° F	JRW
2/12	6:30 AM	46.7° / 11.3° F	JRW
2/13	6:30 AM	46.7° / 11.3° F	JRW
2/14	6:30 AM	46.7° / 11.3° F	JRW
2/15	6:30 AM	46.7° / 11.3° F	JRW
2/16	6:30 AM	46.7° / 11.3° F	JRW
2/17	6:30 AM	46.7° / 11.3° F	JRW
2/18	6:30 AM	46.7° / 11.3° F	JRW
2/19	6:30 AM	46.7° / 11.3° F	JRW
2/20	6:30 AM	46.7° / 11.3° F	JRW
2/21	6:30 AM	46.7° / 11.3° F	JRW
2/22	6:30 AM	46.7° / 11.3° F	JRW
2/23	6:30 AM	46.7° / 11.3° F	JRW
2/24	6:30 AM	46.7° / 11.3° F	JRW
2/25	6:30 AM	46.7° / 11.3° F	JRW
2/26	6:30 AM	46.7° / 11.3° F	JRW
2/27	6:30 AM	46.7° / 11.3° F	JRW
2/28	6:30 AM	46.7° / 11.3° F	JRW
2/29	6:30 AM	46.7° / 11.3° F	JRW
2/30	6:30 AM	46.7° / 11.3° F	JRW

Feeder #3

Date	Time	Amount	Name
1/24	7:00 AM	1 Bag	JRW
1/27	7:00 AM	1 Bag	JRW
1/28	6:45 AM	1 Bag	JRW
1/29	6:45 AM	1 Bag	JRW
1/30	7:00 AM	1 Bag	JRW
1/31	6:45 AM	1 Bag	JRW
2/1	6:45 AM	1 Bag	JRW
2/2	5:55 AM	1 Bag	JRW
2/3	6:45 AM	1 Bag	JRW
2/4	6:45 AM	1 Bag	JRW
2/5	6:45 AM	1 Bag	JRW
2/6	7:30 AM	1 Bag	JRW
2/7	6:45 AM	1 Bag	JRW
2/8	6:30 AM	1 Bag	JRW
2/9	6:30 AM	1 Bag	JRW
2/10	6:30 AM	1 Bag	JRW
2/11	6:30 AM	1 Bag	JRW
2/12	6:30 AM	1 Bag	JRW
2/13	6:30 AM	1 Bag	JRW
2/14	6:30 AM	1 Bag	JRW
2/15	6:30 AM	1 Bag	JRW
2/16	6:30 AM	1 Bag	JRW
2/17	6:30 AM	1 Bag	JRW
2/18	6:30 AM	1 Bag	JRW
2/19	6:30 AM	1 Bag	JRW
2/20	6:30 AM	1 Bag	JRW
2/21	6:30 AM	1 Bag	JRW
2/22	6:30 AM	1 Bag	JRW
2/23	6:30 AM	1 Bag	JRW
2/24	6:30 AM	1 Bag	JRW
2/25	6:30 AM	1 Bag	JRW
2/26	6:30 AM	1 Bag	JRW
2/27	6:30 AM	1 Bag	JRW
2/28	6:30 AM	1 Bag	JRW
2/29	6:30 AM	1 Bag	JRW
2/30	6:30 AM	1 Bag	JRW

CALVES NEEDING ATTENTION

S	Status	A/E A	Gr L	Plan	End Days	Entitlement Time	Consumption			
							Today	Yesterday	L/ton	
1		2	6.0	39	06:00	27	15	35	40	57
1		2	6.0	37	06:00	27	15	35	29	40
1		2	6.0	39	06:00	27	15	35	51	95
1		1	6.0	39	08:00	22	20	46	42	70
1		2	6.0	39	09:27	19	23	95	45	75
1		2	6.0	39	09:27	19	23	95	45	75
1		2	6.0	39	09:27	19	23	95	45	75
1		1	6.0	40	10:00	17	15	45		
1		1	6.0	26	11:34	13	16	57	70	101
1		1	6.0	38	11:46	13	20	60	54	85
1		1	6.0	37	14:00		32	100	30	42
1		1	6.0	39	14:32		30	100	56	93
1		1	6.0	40	14:52		30	100	07	100
1		1	6.0	40	14:55		30	100	06	100
1		1	6.0	40	15:01		30	100	05	100
1		1	6.0	40	15:04	04	25	85		
1		1	6.0	40	15:04	04	39	100	45	70
1		1	6.0	38	15:41		43	100	40	75
1		1	6.0	37	17:29					







DeLaval

CF1000

Dairytech
INCORPORATED

OFF
Do Not Start This Area - Clean with a Pump Cloth Only
Do not remove lid to handle specimens until when equipment is on
Do Not Fill the Equipment - Please see warning on Front Panel
Model 4100
Dairy Tech, Incorporated
P.O. Box 1000
Evanston, IL 60120
www.dairytech.com

CLEAN THIS CABINET AND MILK TANK WITH NORMAL DISHWASHING SOAP, HOT WATER AND A MILDLY ABRASIVE CLEANING PAD. TO AVOID SEVERE DAMAGE TO THE CABINET AND TANK COMPONENTS, DO NOT USE DAIRY ACIDS FOR CLEANING





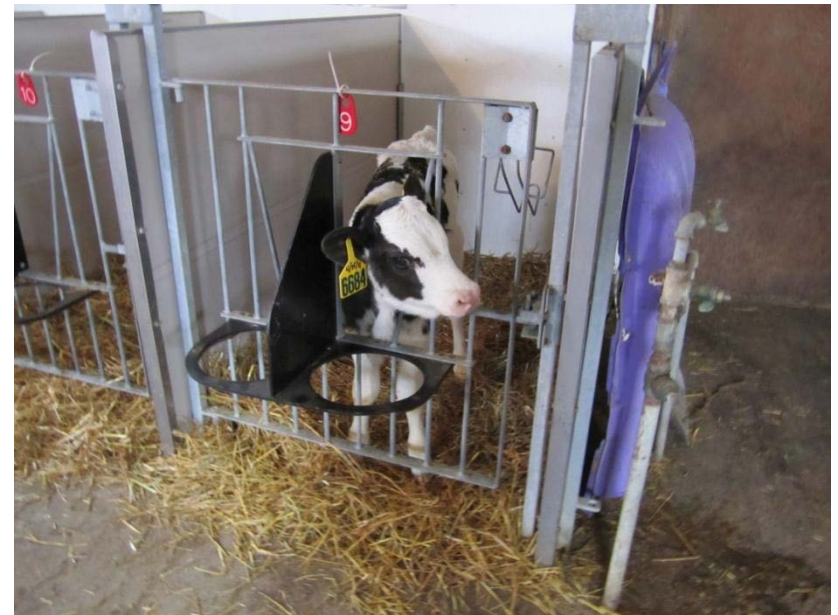






AUTOMATED CALF FEEDING - CHALLENGES

- Group Housing = greater potential for disease exposure
 - Respiratory disease exposure can increase due to “shared” air
 - Scour disease exposure can increase due to “shared” nipple
- Cleaning





What have we learned?

Calves need >30 sq. ft. each

Plenty of bedding

Respiratory problems are common

Calves need 30 – 50 minutes/day nipple station time

Starter feeder limits intake if overstocked, ie. Need more feeders







Screen display area

CALM

Auto

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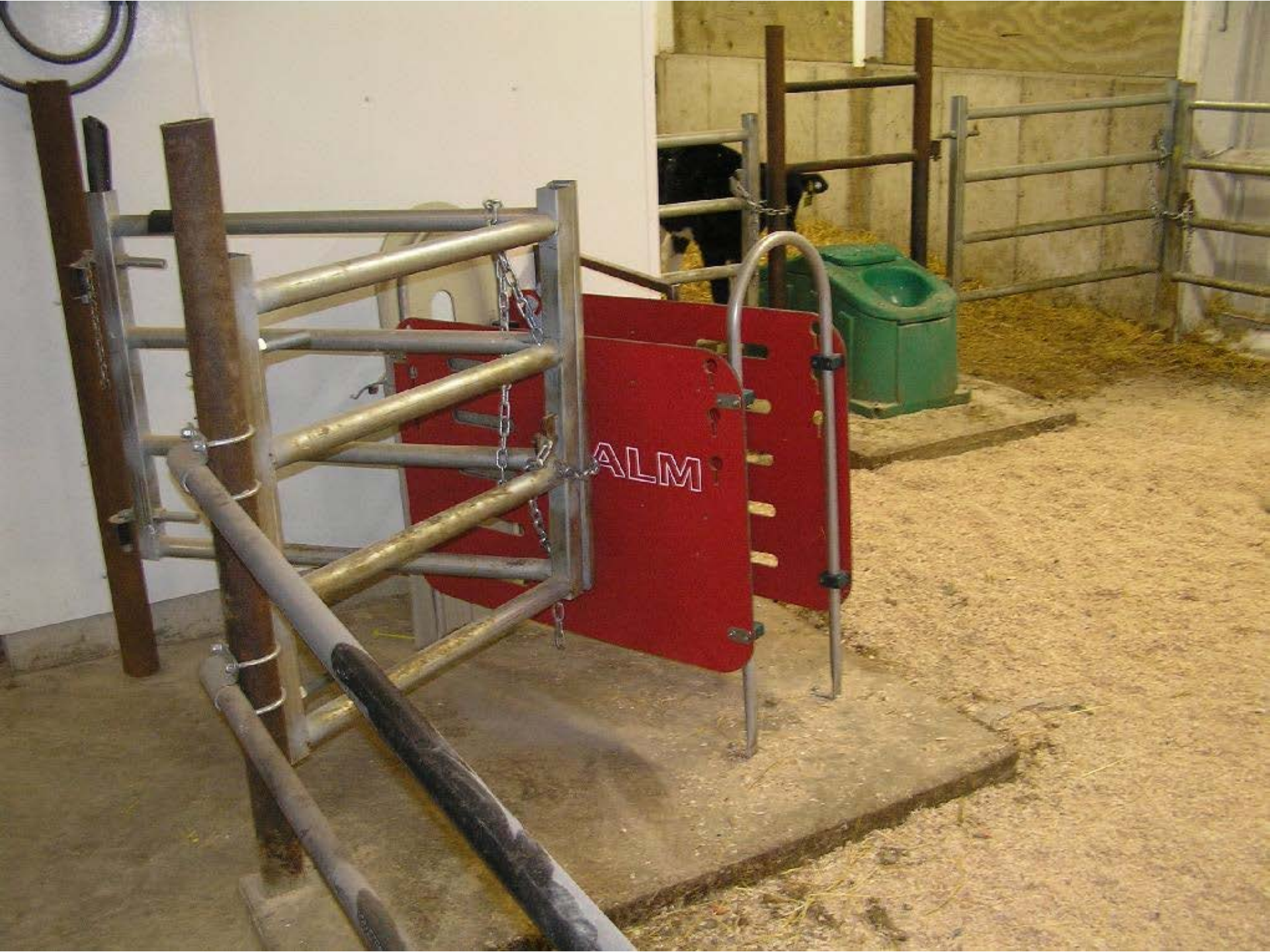
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FORSTER Technic











6086







ECONOMICS

Mixing control unit -	\$20,000
Computer	\$ 4,000
Nipple feeders	\$ 2,000
Calf starter units	\$ 5,000



ANNUAL PARTIAL BUDGET ANALYSIS

Economics of Automatic Calf Feeding Systems

Annual Partial Budget Analysis

Jenn Bentley, Dairy Specialist, and Kristen Schulte, Farm Management Specialist, Iowa State University Extension

Positive Impacts

Increased Incomes

Total Increased Incomes \$0

Decreased Expenses

Reduced Calf Treatment \$0

Reduced Feeding Labor \$14,408

Reduced Calf Management Labor \$2,483

Reduced Labor Management \$2,920

Total Decreased Expenses \$19,811

Total Positive Impacts \$19,811

Annual Value to Quality of Life = \$2,000

Annual Value of Software = \$750

1st Lactation Milk Production Gain 18,240

Net Financial Impact -\$3,297

with QoL and Herd Software -\$547

with QoL, Software, and Milk Gain \$17,693

Negative Impacts

Increased Expenses

Capital Recovery Cost of Feeder (Dep & Int) \$13,460

Increased Insurance Costs \$150

Increased Milk Replacer Intake \$5,453

Increased Pasturized Milk Intake \$0

Increased Calf Starter Intake \$570

Increased Calf Treatment \$30

Increased Utilities and Supplies \$525

Increased Records Management \$2,920

Total Increased Expenses \$23,108

Decreased Incomes Expected

Total Decreased Incomes \$0

Total Negative Impacts \$23,108

Estimated Payback Period, Years n/a

Estimated Payback Period, Calves n/a

ISU
Extension
D
A
I
R
Y
TEAM

Available at: <http://www.extension.iastate.edu/dairyteam/calves-heifers>

How much time do you spend feeding calves?

- 40 calves bucket fed a day
 - 5-10 are < 10 days old
 - 35 10 – 50 days old
 - In hutches or calf facility?
 - What part of your time will be replaced?
- 40 calves on automatic feeder at 1 minute a day
 - .67 hours per day
 - 21 hours a month
 - At \$10.00 an hour
- Labor Savings



How do we make this pay?

More free time for other things

More timely feeding

Feed out bull calves



CHECKLIST FOR CALF FEEDER

- Make sure enough milk replacer is in hopper!
- Once every 6 months clean hopper.
- Calibrate machine at least every month.
Replacers need to be calibrated every ton batch.
- Make sure electrodes are mineral deposit free.
- Manually clean machine periodically.
- Set up a maintenance plan with your dealer.
Every 6 months is a good target.

SUCCESSFUL MANAGEMENT

- 1. Colostrum management
- 2. Isolating the calves at birth
- 3. Adequate housing
- 4. Ventilation
- 5. Ration management
- 6. Hygiene
- 7. Care for the calves

TAKE HOME MESSAGE

- The Calf Feeder does exactly what it is meant for...feeding calves.
- Human error?
- Human Management?
- Successful management is dependent on achieving high performance of many variables.
- Q & A



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CHECKLIST FOR AUTOMATIC CALF-FEEDER

Swap nipples daily

Discard nipples after each group

Be confident in your ventilation and climate control

