

# Pasteurization Feeding Systems-Producer Surveys

## Introduction

Iowa State University Extension & Outreach conducted a survey in 2013 of producers who utilized a pasteurizer on their farm. Twenty producers responded to the survey. The average installation was 4 years old. The herds averaged 307 cows. The average cost to purchase a pasteurizer was \$8,329. Additional costs included electrical costs, construction of new or adaptation of existing structures such as a utility room or milk house to accommodate the pasteurizer. An average additional cost associated with the pasteurizer was \$3,370.

## Facility Management

Fifty-eight percent of farms housed calves in calf huts outside, and 42% housed calves inside a calf barn. Pens and barns were cleaned and disinfected between calves. Farms provided an average of 29 square feet per calf. Ventilation to minimize accumulation of moisture while not causing a draft on the calves is essential and can drive the success or failure of a calf management program. New and existing structures utilized a combination of curtain sidewalls and fans for summer ventilation and positive pressure tubes for winter ventilation.

## Pasteurizer Management

Pasteurizer temps and times varied with the system utilized. Times and temperatures ranged from 140-161<sup>oF</sup> for 30-60 minutes. Thirty percent of farms pasteurized colostrum and temperatures ranged from 130-146<sup>oF</sup> degrees for 30-60 minutes.

Milk was collected with fresh cow buckets, piped directly to pasteurizer or collection pails, and transported to pasteurizer or Milch Taxi. Forty-five percent pasteurized milk immediately after collection, 25% chilled the milk until it could be pasteurized and 30% left the milk at room temperature prior to pasteurization. After pasteurization, 40% cooled milk to feeding temperature and fed within ½ hour of being pasteurized.

Cleaning was done between collection times and manually cleaned with bleach, soap, chlorine sanitizer, or pipeline acid cleaner one to two times a day. Sixteen percent had an automatic cleaning system that washed once per day.

## Colostrum Management

Fifty-five percent of farms administered colostrum within 2 hours after birth when the calf was born between 5 am and 5 pm. When calves were born between 11 pm – 5 am, 15% percent of calves received colostrum within 2 hours after birth, 40% fed 2-6 hours after birth and 45% fed 6-12 hours after birth. Fifty-five percent of farms administered 1 gallon of colostrum at their first feeding. Fifty percent of farms used fresh colostrum, 47% occasionally fed frozen colostrum.

Fifty percent occasionally used a commercial replacer. Fifteen percent of farms utilized pasteurized colostrum. Twenty-five percent evaluated colostrum prior to feeding either visually or use of a colostrometer or refractometer. Ten percent periodically measured the success of passive transfer of immunity with a refractometer or serum test.

## Feeding Management

Prior to the pasteurizer, farms fed milk replacer or non-pasteurized waste milk two times per day. With the pasteurizer, farms fed two times per day with bottles or buckets and 5% utilized an automatic calf feeder (*see ACF producer survey, 26% utilized pasteurizer*). Twelve percent fed 3 qts, 53% percent fed 4 qts, 29% fed 6 qts, and 6% fed 8 qts. per day of pasteurized wastemilk; consisting of fresh cow, high somatic cell, or treated cow milk. Only 5% of farms tested their milk for solids content and 25% for bacteria levels in the milk. If pasteurized milk was in short supply a balancer was used or older calves were fed milk replacer. Saleable milk was also used and high somatic cell count cows were pulled out and used as waste milk.

Calf starter was offered free-choice to calves starting at Day 0-2 (35%), day 3-10 (55%), and days 14-21 (10%). Calf starter was replaced as needed to keep it fresh.

Fifteen percent had calves consuming between 1-3 lbs. of calf starter at weaning age. Fifty-five percent of producers had calves consuming between 3-5 pounds of calf starter and 30% reported calves eating greater than 5 pounds of calf starter at weaning age. Sixty-one percent used an 18% protein calf starter, 17% used a calf starter protein between 20-22% and 17% fed a calf starter protein greater than 22%.

Water was offered free-choice to calves, starting at day 0-3 (55%), day 3-10 (20%), day 14-21 (20%), and greater than 21 days (5%).

## Labor Management

Thirty percent of herd owners managed the calves, 25% were taken care of by a spouse, 15% herds person, 10% calf manager, 15% part-time, and 5% by other family members. If they were not the primary calf manager, other duties on the farm included milking and general farm labor to overall management of farm. On average, time spent feeding calves was 2.8 hours per day. This time included feeding, monitoring, vaccinating, dehorning, bedding and sanitation. Time spent feeding, managing, and caring for calves transitioning to pasteurized milk was 1.1 hour.

## Health Management

Calves transitioned onto pasteurized waste milk within 2 days of age. Thirty-five percent of farms used bodyweights as the main measurement to evaluate calf performance. Mortality and morbidity rates are often used along with management records.

Average mortality rate was 2%. Treatment for scours was 9% and respiratory treatment rate was 6%. Scour and respiratory treatment protocol included a combination electrolyte therapy with an antibiotic treatment and fever reducer.

Forty-two percent have monitored average daily gain. Average daily gain was 1.8 pounds per day from birth to weaning, with an average weaning age of 53 days.

## Challenges with Pasteurizer System

Main challenges encountered with the pasteurizer system included making sure pasteurizer was turned on, milk quality going into the machine, motor bearings and repairs, consistent feeding with varying waste milk volume, cooling issues due to faulty water hose, and temperature issues caused milk to curdle.

## Reasons for utilizing a pasteurizer system

The top reasons producers installed a pasteurizer in rank order:

- 1. Economic savings**  
Savings on milk replacer
- 2. Calf Health/Disease Control**  
Reduce disease transfer such as Johnes, overall herd health, less morbidity and mortality
- 3. Utilization of waste milk**  
Have the milk and currently throwing it away

## Management factors needed for success of pasteurizer feeding system

The top management factors producers say key to success:

- 1. Cleanliness**  
Closely monitoring and cleaning of pasteurizer and collection equipment
- 2. Management**  
Attention to detail, Colostrum management, proper operation, consistent
- 3. Temperature**  
Monitoring of time and temperature, consistent feeding temperature to calf

	Average	Range	Notes
Years since pasteurizer implemented	4 yrs.	0.5-13 yrs.	
<b>Herd &amp; Financial Assumptions</b>			
Herd Size	307	90-780	
Cost of Pasteurizer system	\$8,329	\$5,500-\$15,000	
Costs associated with pasteurizer	\$3,370	\$150-\$15,000	
Monthly costs associated with system	\$60	\$10-\$100	
<b>Feeding Management</b>			
Temperature pasteurized	140 F	130-146 F	
Time pasteurized	45 min.	30-60 min.	
Temperature for colostrum pasteurized	140 F	130-146 F	
Time for colostrum pasteurized	46 min.	30-60 min.	
How soon is milk fed after cooling	45 min.	0-60 min.	
<b>Labor Management</b>			
Hours per day feeding calves	2.8 hrs	0.5-12 hrs.	
Hours per day other than feeding labor	1.1	.25-4 hrs	
<b>Calf Health &amp; Management</b>			
Square feet per calf	29 sq. ft	10-42 sq.ft	
Mortality	2%	1%-5%	
Morbidity (Scours)	9%	1-20%	
Morbidity (Respiratory)	6%	0-20%	
Average Daily Gain	1.8	1-3.2	
Weaning Age (days)	53	35-84	

## Summary

Producer surveys showed success in switching from previous calf feeding systems to a pasteurized milk feeding system. Economic savings were noted, while achieving improved calf health and growth. Management factors utilized for the pasteurizer are important to the success of the overall calf management program.

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