Dairy Research Summary

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A Survey of Dairy Calf Management Practices Among Farms Using Manual and Automated Milk Feeding Systems in Canada

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Why is this important?

On most dairy farms, calves are housed individually and fed using a manual milk feeding (MMF) system through open buckets or bottles. Most farms also use restricted milk feeding protocols, providing calves with 10% of their body weight in milk each day. The thought is that these systems promote early weaning by encouraging solid feed intake and reduce rearing costs. However, recent research has shown that restricted milk feeding and the lack of socialization limit the expression of natural behaviours, cause hunger and frustration, impair calf health, and reduce growth potential. Some studies have also shown a reduction in future milk production.

Automated milk feeders (AMF) are an alternative to MMF systems. These systems include computer-controlled feeders that allow for individualized feeding of milk while housing calves in groups. The feeding patterns of calves reared in AMF systems are more natural and efficient, as they allow larger amounts of milk to be fed several times a day, resulting in improved welfare and growth. That said, good management practices are essential when using AMF systems, as intensive group housing can have detrimental effects on calf health. This study aimed to compare management practices between MMF and AMF systems on calf welfare. A companion study explored Canadian producer perceptions of MMF and AMF systems, to determine factors influencing management decisions.

What did we do?

An online survey of Canadian dairy farmers was conducted in 2015. Separate surveys for farms with MMF and AMF included the same type of information on farm, personnel responsible for calves, management and calf care during first days of life, and management and care during the entire milk feeding period. The second study specifically focused on the questions related to factors influencing decision-making and perceptions of respondents' current calf feeding systems. A total of 670 dairy producers across Canada were included in the analysis (16% AMF and 84% MMF).

Table 1. Percentage of farms using AMF and MMF systems.

Farm descriptor	AMF	MMF
Herd Size		
>80 milking cows	62	31
Barn Type		
Bedded pack	6	4
Free-stall	69	46
Tie-stall	25	50
Milking System		
Automated milking system	30	8
Conventional parlour	46	42
Pipeline	24	50
Other Technology		
Activity monitors	63	32
Automated manure scrapers	69	39
Automated feed pushers	17	7
Cow brushes	70	36
Automated cow grain feeder	22	24
Automated calf grain feeder	9	0.2

What did we find?

Generally, farms using AMF systems had larger herds, free-stall housing, and were also more likely to have adopted automated milking systems and other technologies compared with farms using MMF (Table 1). Management practices differing between AMF and MMF farms are shown in Table 2. There were no differences in colostrum management, with only 23% of farms always evaluating colostrum quality. While all farms using AMF housed calves in groups, only 25% housed in groups ≤9. Calves in AMF systems were fed more milk than calves in MMF systems, with an increase in cumulative milk fed over 4 weeks (231 L vs. 182 L).

The four most frequent factors reported for making the switch from MMF to AMF systems were: to raise better calves, to offer greater amounts of consistent quality milk more frequently, reduce labour, and improve working conditions. Producers opting to continue use of MMF systems reported that the major factor influencing their decision was the economic investment involved in changing to AMF systems. Many of these producers also noted that they prefer the individual feeding and housing because of the direct contact with the calf and because they felt it reduces disease transmission and cross-sucking.

Table 2. Percentage of farms implementing management practices by feeding system type.

Management Practice	AMF	MMF
Dam-Calf Separation within 12 h	98	86
Group Housed	100	24
Liquid Feed		
Milk Replacer	89	40
Saleable Milk	5	36
Waste Milk	4	20
Combination Saleable/Waste	2	4
Pasteurization of Whole Milk	44	7
Ad lib access to hay/starter	86	70
Weaning Protocol		
Based on Age	94	84
Based on Starter Intake	16	50
Gradual Weaning	100	85

What does it mean?

There is a broad mix of practices being implemented on both AMF and MMF farms. Group housing is considered a beneficial practice, yet many of the group sizes found in this survey are well above the recommended size of 3-8 calves, which could result in increased health issues. However, delaying grouping to 8 weeks results in less solid feed intake, lower weight gain and reduced performance compared to calves grouped earlier. Most producers are not using pasteurization when feeding whole or waste milk, which increases the risk of transmitting pathogens to calves. Feeding milk replacer is one way to limit this risk. Finally, although weaning calves at a fixed age is the most common method of weaning, weaning based on starter intake is a preferable alternative. Generally, practices used on farms with AMF may allow for improved health and welfare of calves.

Economic return is an important factor that influences technology adoption. This study found that producers placed a great deal of weight on other producers' experiences and on information and guidance obtained from other producers. As research has demonstrated the advantages of AMF systems, this is important for commodity organizations, researchers, and extension specialists to note. Identifying resources or learning opportunities for producers to interact with their peers and gain knowledge from fellow producers on their experiences may aid in adoption of new technology.

Summary Points

- Farms using AMF were more likely to feed more milk, group house calves, feed milk replacer, pasteurize whole milk and adopt other technologies compared with farms manually feeding milk.
- The primary reason for producers not switching to AMF was the economic investment required in changing systems.

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