

The Effects of Milk Feeding Method and Group Size on Feeding Behavior and Cross-Sucking in Group-Housed Dairy Calves

M. B. Jensen¹ and M. Budde

Department of Animal Health, Welfare and Nutrition, Danish Institute of Agricultural Sciences, Research Centre Foulum, 8830 Tjele, Denmark

ABSTRACT

This study investigated the effect of teat feeding and group size on cross-sucking and competition for milk in dairy calves. Ninety-six Holstein-Friesian male and female calves were allocated to either pairs or groups of 6 and fed milk either from a bucket or via a teat. Calves fed via a teat spent more time ingesting the milk. They spent time sucking the empty teat after milk intake and they spent less time cross-sucking compared with calves fed from buckets. The results show that teat feeding reduces cross-sucking in groups of 6 calves. Calves in groups of 6 ingested the milk faster than calves housed in pairs, which suggests that the competition for milk was greater than in pairs. Teat-fed calves changed to another teat more often than bucket-fed calves changed to another bucket during milk intake. Thus, the use of teat feeding did not reduce the competition for milk as compared with bucket feeding and future studies should focus on improving teat-feeding methods so that they reduce competition for milk in group-housed calves.

Key words: calf, cross-sucking, group size, milk feeding method

INTRODUCTION

When dairy calves are group-housed they can have full social contact, which they value more than social contact through bars (Holm et al., 2002), and which ensures the development of their social skills (Bøe and Færevik, 2003). However, when dairy calves are group-housed during the milk feeding period there may be problems with cross-sucking (de Passillé, 2001; Jensen, 2003), which may be intensified as the calves grow older. Cross-sucking is an abnormal behavior defined as nonnutritive sucking directed toward another calf's head or body (Lidfors, 1993). The behavior is a redirection of the natural sucking behavior, and it is stimulated by the ingestion of milk (de Passillé and Rushen,

1997). Calves fed milk via a teat perform less nonnutritive sucking of a dry teat (Veissier et al., 2002) and less cross-sucking (Loberg and Lidfors, 2001) than bucket-fed calves. Thus, cross-sucking might be minimized by providing an outlet for the natural motivation to suck in connection with milk ingestion. However, the research conducted to date is based on calves housed individually, or in groups of 2 to 3, whereas under practical conditions there are often more calves per group. Therefore, the first objective of the present study was to investigate if the effects of teat feeding also apply to calves housed in larger groups and if problems with cross-sucking are intensified toward the end of the milk feeding period.

When calves are housed in groups they compete for the milk. Competition is increased among teat-fed calves when access to teats is reduced, but the calves compete even when there is one teat per calf (Keyserlingk et al., 2004). Calves take longer to ingest milk via a teat than to drink it from the open surface in a bucket (Jung and Lidfors, 2001), and the rate of ingestion may be reduced considerably when teat feeding is used (Haley et al., 1998a). Furthermore, teat-fed calves tend to suck on the empty teat after milk ingestion. However, it is unknown if the slower rate of ingestion and the tendency to suck the empty teat after milk ingesting will reduce competition for milk in teat-fed calves compared with bucket-fed calves. Therefore, the second objective of the present study was to investigate if teat feeding reduces competition for milk in group-housed calves.

MATERIALS AND METHODS

Six blocks of 16 Holstein-Friesian male and female calves, 96 calves in total, were used. The calves were housed with their dams for the first 24 h after birth and then moved to individual straw-bedded pens (0.9 m × 1.9 m). They were housed in individual pens until they were moved to the experimental pens when the youngest calf in the block was 1 wk old. For the first 3 d the calves were offered colostrum, and from d 4 until the end of the experiment the calves were offered 6 L/d of whole milk given in 2 feedings at 0800 and 1700 h. Concentrates [Grøn Kalv Valset; DLG, Denmark

Received March 17, 2006.

Accepted June 29, 2006.

¹Corresponding author: MargitBak.Jensen@agrsci.dk

Table 1. Description of the recorded behaviors

Behavior	Description
Ingesting milk	The calf is ingesting milk either by sucking a teat or by drinking from an open surface
Sucking empty bucket or teat	The calf is sucking on an empty teat or an empty bucket, but no milk is ingested. The sucking movements are performed with part of bucket or teat in the mouth
Cross-sucking head or neck	The calf is sucking on the head (muzzle, ear or skin) or on the skin of the neck of another calf. The sucking movements are performed with the body part in the mouth
Cross-sucking under belly	The calf is sucking under the belly of another calf, mainly on navel, scrotum or udder base. The sucking movements are performed with the body part in the mouth
Bunting calf	The calf is pushing its forehead with a rapid and forceful movement against another calf's head, neck or body
Bunting bucket or teat	The calf is pushing its forehead with a rapid and forceful movement against a bucket or a teat
Licking fixtures	The calf's tongue is out of its mouth and in contact with any fixtures of the pen, except teat or bucket
Social grooming	The calf's tongue is out of its mouth and in contact with the head, neck or body of another calf
Self grooming	The calf's tongue is out of its mouth and in contact with its own body
Inactive	The calf is standing or lying still
Other activity	The calf is performing any activity not described above

(18% CP, 4% fat, and 6% fiber)], high-quality hay, and water from water bowls were offered ad libitum throughout.

Calves were assigned to blocks according to date of birth; within blocks, the calves were allocated to milk feeding method (bucket or teat) balanced for date of birth and sex. Before the calves of a block were moved to the experimental pens they were assigned to either pair housing or group housing balanced for milk feeding method and age. Thus, the treatments were 1) pair housing and bucket feeding; 2) pair housing and teat feeding; 3) group housing and bucket feeding; and 4) group housing and teat feeding. When the calves were moved to the experimental pens and the experimental period began, the calves were on average 17 (± 7) d old and weighed 54 (± 6.3) kg. The experimental period lasted for 6 wk and at the end of the experimental period the calves weighed 92 (± 13) kg. One teat-fed calf from a group of 6 calves was removed from the pen due to arthritis, and data for this calf were not included in the analyses.

The experimental pens for pair-housed calves measured 1.94 m \times 2.15 m (2.1 m²/calf) and the experimental pens for calves in groups of 6 calves measured 2.49 m \times 4.15 m (1.7 m²/calf).

For bucket feeding, open steel buckets were used. For teat feeding of pair-housed calves, plastic buckets fitted with one teat (Peach Teat, Skellerup Industries, Ltd., Christchurch, New Zealand) were used. In both cases there was one bucket per calf. For teat feeding of group-housed calves, so-called teat bars (Power Feeder for 6 calves, Skellerup Industries, Ltd.) were used. The teat bars were compartmented and each compartment had one teat.

When the calves were offered the milk it was ensured that all calves in a pair or a group had access to the milk simultaneously. For pair-housed calves, 3 L of milk was poured into each of the 2 buckets simultaneously.

For bucket-fed calves in groups of 6, a cover made from wire mesh was placed over the 6 buckets while 3 L of milk was poured into each of them. Once all the milk had been poured, this cover was removed and all calves in a group could start drinking simultaneously. For teat-fed calves in groups of 6, the 18 L of milk was poured so that the 6 compartments of the feeder were filled at the same time and it was ensured that all calves accessed a teat immediately after the milk was poured. For all treatments the buckets or feeders were placed in the pens just before the milk was poured and they were not removed until 30 min after.

The behavior of the calves was recorded at milk feeding in the morning by direct observations using instantaneous recording at 45-s intervals (blocks 1, 2, and 3; observer 1), or 60-s intervals (blocks 4, 5, and 6; observer 2). The recordings of calves in a group began the minute the calves in the group had access to the milk and continued for 30 min. The behaviors recorded are defined in Table 1. The calves in each block were observed by direct observations once during wk 2, 4, and 6 of the experiment.

The behavior of the calves was also recorded by video recording in wk 4 of experiment using continuous recording. These recordings were conducted at milk feeding in the morning and, like the direct observations, began the minute the calves in the group had access to the milk and continued for 30 min. Competitive behavior was observed for each calf using continuous recording. First, it was recorded whenever the calf switched from a bucket or teat that still contained milk to another bucket or teat. Second, it was recorded whenever the calf switched from one bucket or teat to another while at least one bucket or teat in the pen still contained milk.

Calves were weighed twice on 1 d in wk 4 of experiment to get an estimate of the milk intake of individual calves within the groups. All calves within each group

Download English Version:

<https://daneshyari.com/en/article/2440858>

Download Persian Version:

<https://daneshyari.com/article/2440858>

[Daneshyari.com](https://daneshyari.com)