

Dam-associated rearing as animal friendly alternative to artificial rearing in dairy cattle

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Abstract

Dam-associated rearing provides contact between cow and calf, with cows being milked additionally. For 3 months postpartum, unrestricted cow-calf contact (UNRESTR), 2×15min contact (RESTR), and no contact (NO) were tested in two experiments (suffix 1 and 2). Sucking duration was longer in UNRESTR2-calves than in NO2-calves, and cross-sucking was never observed in UNRESTR-calves. Lying duration was shorter in UNR2-calves, indicating increased activity due to the diversified environment of the cubicle barn compared to the calf-area. Stress-related behavior was increased in RESTR1-cows in the beginning of lactation. Yield was reduced in UNRESTR1- and RESTR1-cows. Permanent cow-calf contact proved to be the most animal-friendly way of rearing. Restricted contact seemed to cause mild stress in cows but not in calves. Dam-associated rearing was advantageous for calf welfare, irrespective of contact intensity.

Key words: calf, sucking, welfare, cow-calf contact, restricted suckling

Introduction

In dairy production, calves are usually separated from their dam shortly after birth, and further cow-calf contact is prevented. However, there is growing concern of both, consumers and (mainly organic) farmers who question this practice. Some of these farmers allow contact between cows (dam or foster cow) and calves for suckling and milk the cows additionally. Due to farm to farm variability it is difficult to assess the impact of cow-calf contact on animal welfare and productivity. Aim of this study was thus to examine the effects of dam-associated versus motherless rearing on behavior and milk-yield on the same farm and in the same housing conditions.

Material and methodology

In experiment 1, 14 cow-calf pairs were kept with unrestricted contact (UNR1), 15 cow-calf pairs had contact two times per day for 15 min each (before milking, RESTR1), and 28 calves were reared without contact to their dam (NO1). In experiment 2, 21 cow-calf pairs were kept with unrestricted contact (UNR2) and 19 calves were reared without dam (NO2). Treatments lasted for three months, after which calves were weaned off milk and brought to a separated building. All cows were milked twice daily and kept in a cubicle barn. Calves with unrestricted contact to their dams were allowed to enter the cubicle barn via a sensor controlled gate or to stay in the calf area. All other calves were kept in the calf area which was adjacent to the cubicle barn. RESTR1 cows were brought to the calf area before milking to suckle their calves. The calf area was equipped with a computer controlled milk feeder providing 8 or 16 L/calf/day for the NO1 and NO2 calves, and a concentrate feeder to which all calves had free access at all times. In experiment 1, we observed:

- sucking behaviour and concentrate feed intake of calves,
- proximity between cows and calves,
- behavioural stress reactions during milking, and
- milk yield gained by machine milking

at different times during the rearing period.

In experiment 2, we observed sucking, lying and feeding behavior of the calves (35h per calf).

Results

Concentrate intake was higher in NO1-calves than in UNRESTR1-calves (Fig. 1a). Cross-sucking as abnormal oral behavior was observed in 93% of NO1-calves and 28.6% of NO2-calves, in 1 RESTR1-calf, but never in UNR-calves.

During milking, stress-related behaviour was increased in RESTR1-cows ($p=0.033$). RESTR1-cows were more often in proximity to the calf-area in the beginning of lactation ($p=0.003$) and showed more searching calls than UNR1-cows ($p=0.006$), indicating short-term stress caused by separation from the calf. Milk yield was reduced in UNR1- and RESTR1-cows ($p<0.001$, Fig. 1b).

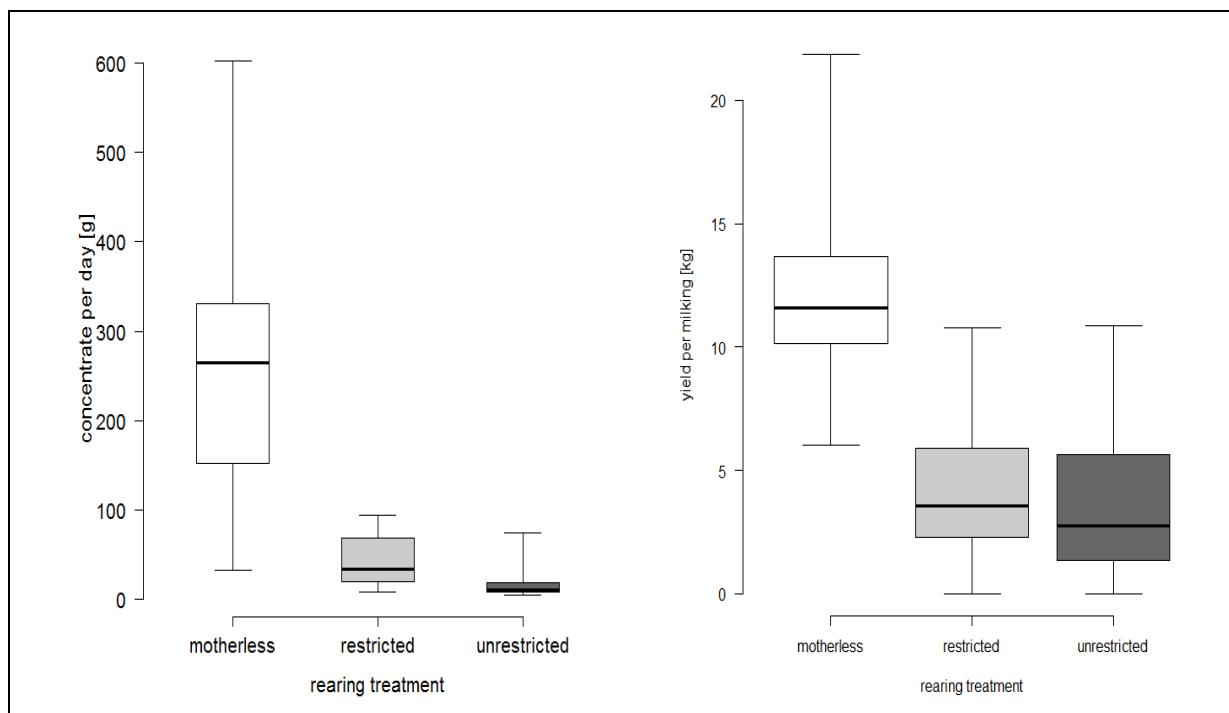


Figure 1. left: Concentrate intake [g/day] of calves and right: milk yield of cows in different rearing treatments in experiment 1

Sucking duration was longer in UNR2-calves than in NO2-calves (Table 1). Duration of roughage feeding did not differ between treatments, but UNR2-calves had a shorter lying duration, which may reflect increased activity due to a more diversified environment in the cubicle barn compared to the calf-area (Table 1).

Table 1: Behaviour of calves in different treatment systems in experiment 2

	unrestricted contact			motherless (no contact)			
	Median	Min.	Max.	Median	Min.	Max.	
lying (min h ⁻¹)	19.9	12.1	22.5	24.4	20.1	27.0	**
feeding roughage (min h ⁻¹)	1.24	0.15	3.27	0.38	0.53	2.4	ns
sucking (udder/automatic feeder, min h ⁻¹)	0.8	0.33	2.74	0.49	0.26	0.9	**

* significant at P<0.01 due to Wilcoxon rank sum test

Discussion

Calves that were reared with contact to their dam did not develop abnormal oral behavior (cross-sucking), irrespective of contact intensity (Roth et al. 2009). In parallel, milk yield of cows with contact to their calves and concentrate intake of calves that were suckled by their mother was very low indicating that calves' nutritional needs were fulfilled by sucking. While a low milk yield seems to be a mainly economic loss for the farmer, the low concentrate intake may lead to a suboptimal rumen development and thus, to nutritive difficulties after weaning (Khan et al. 2007).

In the first two weeks of lactation, restricted contact seemed to cause mild stress in cows but not in calves. Permanent contact, on the other hand, proved to be the most animal-friendly way of rearing, but in our study weaning stress that is assumed to increase with contact intensity, was not examined. Milk yield, feed intake by calves and weaning stress clearly have to be optimized for implementing dam-associated rearing on-farm.

Suggestions to tackle the future challenges of organic animal husbandry

Animal welfare and the reduced use of antibiotics are the main reasons of consumers to buy organic dairy products. Whereas barn design and equipment (e. g. brushes) aim to fulfill the physical needs of organic dairy cows, most of the cows are not allowed to express their maternal behaviour. To an increasing degree, this concerns consumers, especially in developed countries where the majority is no longer related to practical farming. Future organic husbandry should be aware of this. Maybe a high price "calf milk"-label might compensate the farmers' loss in milk yield and fulfill consumers' expectations as well.

References

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