

FREQUENCY OF BEHAVIOURAL DISORDERS OF CALVES IN THE FIRST MONTH OF LIFE

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Abstract: The manifestation of various forms of behavioural disorder in calves up to 30 days old was monitored on two farms for a year during four seasons in one year. On both farms calves were separated from mothers immediately after birth. On the farm A calves were tied in the first week of life, while at the farm B they were kept in individual boxes.

The following forms of behavioural disorder have been reported: apathy, twisting of the tongue, licking of the substrate and intersucking, while the appearance of aggression between calves has not been recorded.

Apathy was recorded in 16.28% of calves at farm A, most commonly in the age of 0-7 and 15 days, and in 84 calves (14.69%) at farm B, most often in the period immediately after birth. The occurrence of tongue twisting was recorded in 0.50% calves at farm A (2 at the age of 22 days and 1 at the age of 30), while no cases were reported at farm B. Calves were more susceptible to the licking of substrates (walls, fences, truncheons and other equipment) on both farms, since this phenomenon was observed in 8.89% of calves at farm A and 8.39% of calves at farm B at different age; most often at the age of 30 days at Farm A, and at the age of 22 days at Farm B, while in the youngest age was the most common occurrence of this form of behaviour. Also, during the examined period on both farms there was a phenomenon of mutual calves sucking, 2.35% of calves at farm A, most often at the age of 22 days and 3.32% of calves at farm B, most often at the age of 8 and 22 days. The occurrence of the behavioral disorders in calves was the most frequent during the winter period, and the least frequent during autumn.

The observed behavioural disorders indicate poor welfare quality. It is thought to have been caused by failures in the technology of keeping and accommodation, as well as early separation of calves from mothers. They are caused by disabling calves to satisfy basic physiological needs in behaviour and contact with other animals or as a result of exposure to pain, fear and stress.

Key words: welfare, behavioural disorders, calves

Introduction

The behaviour of calves is a conscious or unconscious response to the stimuli that come from the environment, causing voluntary or involuntary movement, actions, changes in body position, etc. The presence of physiological forms of behaviour and the good emotional state of the animals are a good indicator of the quality of well-being and is one of the principles of its assessment.

Calf welfare is largely related to animal behaviour. The positive emotional state of the animals depends on the ability to freely express physiological forms of behaviour in each stage, along with the unimpeded realization of social contact with other individuals (Rushen and de Passille, 2009). In addition, it is extremely important that there is a good "human-animal" relationship. By optimising these factors that define the emotions of animals, it can be expected that the exposure to stress,

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fear and other negative emotions will be minimized, which is the goal of animal welfare care.

Behavioural disorders and negative emotional states (pain, fear, frustration, etc.) in calves in the first month of life often arise as an indicator of poor quality of welfare and low degree of adaptability to the environment (Botreau et al., 2007). It is therefore necessary to monitor the behaviour of calves and the appearance of disturbed behaviours in order to eliminate adverse factors that affect both the quality of welfare and overall production results. The occurrence of abnormal forms of behaviour is the result of certain failures in calving (Færevik et al., 2008; Sutherland et al., 2014), nutrition (Hepola et al., 2006; Vieira et al., 2008) and production technology at the farm. In addition, various procedures by breeders, such as the early separation of calves from mothers, also lead to their occurrence (Stöhulova et al., 2008; Fröberg and Lidfors, 2009; Veissier et al., 2013). Interventions that cause pain, stress and fear, such as dysfunctional anaesthesia and analgesia (Kieland et al., 2010; Gottardo et al., 2011; Bergman et al., 2014) and poor breeders attitude toward animals (Lundvall and Saras- Johansson, 2011; Shütz et al., 2012) also contribute to the occurrence of calving disorders in calves. These abnormal behaviours can be manifested differently, such as apathy, aggression and manipulation of the substrates or parts of the body, of one's own or another's (licking and sucking each other).

The aim of this study was to identify the most significant and most frequent behavioural disorders of calves in the first 30 days after birth.

Material and Method

The study of the effects of rearing conditions and the season of birth on the occurrence of calf behaviour in the first 30 days of life was carried out on two farms (farm A and farm B) within the same production system, so that the conditions of feeding and keeping all categories of animals were similar with the only exception relating to accommodation of the youngest categories. The production capacities of the farms are similar and amount to about 1500 dairy cows with accompanying categories.

On both farms calves were separated from mothers immediately after birth. At the farm A calves were tied on beds for the first week, while at farm B they were kept in individual boxes. At the age of 8 to 30 days, on both farms calves were placed in group boxes, at farm A 10 calves per box, and at farm B half 5 of them. Tattooing of calves was performed on both farms at the earliest age (from 0-7 days). Putting stamps with an identification number was also performed at this age, rarely in older animals without the use of analgesia and anaesthesia.

On farm A only female animals were dehorned earlier than 30 days of age, while on farm B this procedure was performed after the moving to the older category. Dehorning was performed by thermocauter, without prior anaesthesia of the calf and with the use of antibiotic ointment after the completion of the procedure.

Recording of various forms of calf behaviour, in the period from birth to 30 days old, was performed for a year in four seasons (I-Autumn, II-Winter, III-Spring and IV-Summer), with 596 calves on the farm A (nA) and 572 calves at farm B (nB). The research was carried out in the first two hours after the morning feeding of the calves and the observed anomalies were recorded in the defined ethogram. Different forms of behavior in calves were observed on the basis of individual observation of calves, as well as analysis of data recorded by the video camera (Sony DCR – SR75E).

Results and Discussion

Tables 1 and 2 show the established behavioural disorders of calves on farms A and B, depending on the age of the calves and the test season.

Table 1 Expression of behavioural disorders depending on the life of calves (nA = 596, nB = 572)

Age, days	Apathy		Twisting of the tongue		Licking of the substrate		Mutual sucking	
	Farm A N, %	Farm B N, %	Farm A N, %	Farm B N, %	Farm A N, %	Farm B N, %	Farm A N, %	Farm B N, %
0-7	24	21	0	0	3	3	2	0
	4.03	3.67	0.00	0.00	0.50	0.52	0.34	0.00
8	22	18	0	0	10	10	4	8
	3.69	3.15	0.00	0.00	1.68	1.75	0.67	1.40
15	27	16	0	0	11	9	0	3
	4.53	2.80	0.00	0.00	1.84	1.57	0.0	0.52
22	19	16	2	0	11	14	5	8
	3.19	2.80	0.34	0.00	1.84	2.45	0.84	1.40
30	5	13	1	0	18	12	3	0
	0.84	2.27	0.17	0.00	3.02	2.08	0.50	0.00
Total	97	84	3	0	53	48	14	19
	16.28	14.69	0.50	0.00	8.89	8.39	2.35	3.32

Apathy implies lack of reacting calves to environmental stimuli. The number of calves of apathy behaviour was somewhat higher on farm A (16.28%) than farm B (14.69%).

The highest number of calves with this disorder was observed at farm A at the age of 15 days, 4.53% of the all calves; although at the age from 0 to 7 days this number was still considerable, which is 4.03% calves. Observed by season, most apathetic calves at farm A were in the winter season (9.06%). At farm B distribution of calves with manifest apathy problem was more uniform in categories (from 3.67% in the youngest age group to 2.27% in the oldest). The largest number of apathetic calves was registered in the spring season (6.64%). Expressed apathy of calves, especially at the earliest age, can be consequence of the action of more powerful stress factors. The first is separation from the mother, with which Daros et al. (2014) agree, but there may also be inadequate housing conditions, as well as pain (Broom and Fraser, 2007).

In the study on both farms, A and B, has been established that the area for accommodating calves at the earliest age was inadequate because they did not allow them to move unhindered. The confined area of individual boxing (Farm B) and limited movement (farm A) with insufficient social contact act negatively on calves, which most often causes trouble and apathy.

Table 2: Expression of behavioural disorders depending on the season of birth (nA = 596, nB = 572)

Season	Apathy		Twisting of the tongue		Licking of the substrate		Mutual sucking	
	Farm A N, %	Farm B N, %	Farm A N, %	Farm B N, %	Farm A N, %	Farm B N, %	Farm A N, %	Farm B N, %
I	4	12	1	0	23	12	12	1
	0.67	2.09	0.17	0.00	3.85	20.9	2.01	0.17
II	54	12	2	0	17	10	0	12
	9.06	2.09	0.34	0.00	2.85	1.75	0.00	2.09
III	23	38	0	0	2	8	2	2
	3.85	6.64	0.00	0.00	0.34	1.40	0.34	0.35
IV	16	22	0	0	11	18	0	4
	2.68	3.85	0.00	0.00	1.85	3.15	0.00	0.70
Total	97	84	3	0	53	48	14	19
	16.28	14.68	0.50	0.00	8.89	8.39	2.35	3.32

Twisting of the tongue is a type of behavioural disorder when calf tears tongue out of mouth and then returns to swallow the air. This behaviour most commonly occurs in the conditions where calves are being exposed to inadequate nutrition, that is, because of the diet that excludes sucking, but also in the restricted movement (Broom and Fraser, 2007). No large number of tongue twisting cases in calves was recorded on the investigated farms. Only three such cases were recorded at farm A, namely 2 (0.34%) at age of 22 days and 1 (0.17%) at the age of 30, and 2 cases during the second and one during the first season.

In contrast to the previously described stereotypical behaviour that occurred in rare cases, more frequent behavioural disorders were detected in the older age of the calves, for which the contact with other calves is necessary (intersucking) or the place of accommodation with water heaters, feedlots and fences (stereotypical behaviour of substrate manipulation).

Licking of walls, box fences and drinkers was recorded on farm A with 8.89% of calves, and on farm B with 8.39% calves. At the farm A the most noticeable of stereotypical behaviour was in the category of calves aged 30 days (3.02%), and the smallest were between 0 and 7 days (0.50%). At farm B recorded situation was identical as on farm A in the youngest category, while the number in other categories did not vary much, i.e. from 1.57% (15 days) to 2.45% (22 days). At farm A the highest number of calves with this behavioural disorder was recorded in autumn (3.85% calves) and at farm B the worst situation was in the summer with 3.15% of cases of licking of the substrate. The manifestation of this form of abnormal behaviour of calves was consequence of premature separation from mothers (Broom and Fraser, 2007).

There is a significant influence on the manifestation of abnormal forms of behaviour and the length of stay of calves with mothers and the possibility of sucking. Calves that are able to satisfy innate reflex of sucking for a longer period of time are less likely to manifest anomalies in behaviour, although at the time of separation, they react more turbulent than those who spent shorter times with mothers (Weary and Chua, 2000; Flower and Weary, 2001; Fröberg and Lidfors, 2009; Veissier et al., 2013).

Premature separation of calves from mothers results in an unsatisfied primary need for sucking, which leads to the occurrence of intersucking of calves at different ages. Usually they suck in the area of the navel, scrotum, prepuce, udder or ears (Broom and Fraser, 2007), which can lead to digestive disorders, various infections or damage of the organs.

Analyzing this at farms A and B in calves up to 30 days old, it was notable that it was not widespread, 2.35% and 3.32%, respectively, of observed intersucking. There were no cases at farm A at the age of 15 days, 0.34% of cases were recorded at 0-7 days, 30 days at 0.50%, 8 days at 0.67% and 22 days at 0.84%. There was a slightly more frequent intersucking at farm B: 1.40% of cases at the age of 8 and 22 days and 0.52% at the age of 15 days. Observed by seasons, the highest number of recorded mutations at both farms was equal to 12 heads in the first season at farm A (2.01%) and in the second season at farm B (2.09%).

The occurrence of mutual aggressive behaviour of calves has not been noticed in this study. As already emphasized in the introduction, the behaviour of calves is a conscious or unconscious response to the stimuli that come from the environment surrounding them by causing voluntary or involuntary movement, actions, changes in the body's position, etc. Botreau et al. (2007) defined twelve criteria for assessing the welfare of calves, including behaviour.

Calves are in various ways exposed to stressful environmental factors from birth. Therefore, it is necessary that they be provided with conditions in which they can exercise all forms of their

physiological behaviour and that the level of stress, fear, and other negative emotions is reduced to a minimum. Behavioural disorders are caused by failures in the process of rearing and treatment of animals, which deprive them from satisfying basic needs in behaviour and contact with other animals or are exposed to pain, fear and stress. One of the most powerful stressors in calves at the earliest age is separation from mothers. This is particularly noticeable in dairy cows, where calves are for economic reasons separated from mothers after a few hours after birth, rarely after a few days, and only in exceptional cases later. This way of separating calves from mothers is reflected in the manifestation of stress reactions, and has long-term consequences on the growth of calves and the appearance of some abnormal forms of behaviour (substrate manipulation, intersucking).

Comparing the behaviour of calves that could suckle mothers (sometimes other cows) and calves that were fed from automatic feeds from the beginning, Fröberg and Lidfors (2009) concluded that calves allowed to suck use solid foods less, lie longer, move less and exhibit exploratory behaviour, have less social contacts than calves fed artificially, but at the same time exhibit less abnormal forms of behaviour, such as intersucking or rolling and twisting of the tongue.

This was supported by findings of Stehulova et al. (2008) and Veissier et al. (2013), who investigated whether mothers influence the reduction of non-nutritive oral activity of calves (licking of other calves, floors and walls, twisting of tongues, etc.). They found that calves that spend more time with mothers are less prone to abnormal behaviour than those who are early separated and artificially fed. Negative response to stress due to separation can be mitigated by allowing physical contact (separation by fence) and avoiding separating calf from mothers with solid walls (Johnsen et al., 2015). One of the important risk factors for the welfare of calves is the endangerment of their comfortable accommodation, movements, resting and other activities that calves practice in the box. Hepole et al. (2006) state that group accommodation has affected that calves consume more concentrate and chew longer in the group than calves that are placed in individual boxes, but are prone to hair licking, other calves or box walls.

In order to avoid the appearance of pathological forms of non-nutritive behaviour (intersucking, twisting of the tongue and licking of substrates), the calves' diet after separation from the mothers should be similar to the milk as much as possible. It is desirable to provide artificial feeders which prevent shortened feeding time. Feeding should take approximately the duration of normal mother's sucking. Additionally, it is possible to prevent movement and prevent contact with other calves for 30 minutes to an hour immediately after feeding. The high biological and nutritive value of rations for calves is a precondition that is implied. In addition to the nutrition recommendations, other recommendations should also be taken into account to reduce the risk and improve the overall well-being of calves, which relate primarily to rearing conditions for the calves. It is necessary to avoid the tying of calves and the placement in individual or group boxes of inadequate size. Calves in the first 30 days of life should be provided with dry and clean bedding in the box, allow movement and establishment of social contact with other sorts.

Conclusion

Based on the study of the frequency of calf behavioural disorders in the first month of life, the following can be concluded:

- apathy, twisting tongue licking substrate and intersucking were identified, while the occurrence of aggressive behaviour in calves is not recorded;

- the highest incidence of calf behavioural disorders was observed in the ages of 8 and 22 days, while the smallest was recorded in the earliest (0 to 7 days) and the oldest age (30 days);
- the most unfavourable impact on calves behaviour was the winter season; on the contrary, autumn season was most favourable in terms of calves behaviour;
- apathy in the behaviour of calves was most frequently present, and less frequent licking of the substrate; the appearance of intersucking was rare, and the occurrence of tongue manipulation was sporadic;
- behavioural disorders are caused by omissions in the process of keeping and treatment of animals, which prevent them from meeting basic needs in behaviour and contact with other animals or are exposed to pain, fear and stress;
- for the manifestation of physiological forms of calves behaviour, it is necessary to provide adequate nutrition and appropriate accommodation, which would allow for a greater degree of freedom of movement and better establishment of social contact in animals.

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