

REARING CALVES WITH THEIR MOTHERS ON DAIRY FARMS – IS IT POSSIBLE?

Agata Szewczyk

National Research Institute of Animal Production
Department of Production Systems and Environment, 32-083 Balice near Krakow

Global changes and increasing consumer awareness associated with a healthy lifestyle and respect for ethical values that determine choices and food preferences force producers to adapt their production and implement the strategies that will promote environmental protection and animal housing in conditions not causing them pain. Rearing calves with their dams on milk producing farms is such an adjustment of production to consumer preferences.

Key words: welfare, dairy cattle, rearing with the dam, weaning

Consumers' awareness related to good quality and safety of animal products, environmental protection and animal welfare has changed significantly over the last years. There is a growing number of buyers, who deliberately resign from the purchase of animal products, which is the only possible ethical way to eliminate animal suffering according to them. Increasingly, there are ethical arguments which concern suffering of farm animals and the need to align their rights with domestic animals (Hölker et al., 2019). Minimum welfare requirements laid down in legal acts are insufficient for conscious purchasers. The question arises which other animal protection strategies, apart from diet devoid of animal products can be applied in order to improve animal dignity and their quality of life. Intensive large scale husbandry is a silent killer of the environment, damaging it by CO₂ and other greenhouse gases emissions. Extensive methods of management protect climate and environment and they are animal friendly at the same time. Therefore, it is necessary to adjust production systems to customers' needs and requirements. One such innovation is an attempt to overcome producers' resistance and return to the traditional rearing of calves with dams/suckler cows. Thanks to GrazyDaiSy project, financed by the Core Organic programme of the European Union, work is underway in organic farming, which leads to the changes of manufacturing practice, so that animals can fully express their natural behaviors (Belluz, 2018).

Having the opportunity to raise their young, dairy cattle behaves similarly to wild animals. Cows are deeply emotionally attached to their offspring, they feed, nurture, protect it and finally wean it spontaneously. Licking is a common social behavior both shortly after parturition and during calf rearing. In the beginning, soon after birth these are cows that initiate feeding more often, over time the amount of feeding initiated by calves increases. Cows communicate with their offspring by means of voice – grunts and vocalizations help a calf to recognize its dam (von Keyserlingk and Weary, 2007). Calves and cows which stay together until natural weaning are characterized by much higher level of health and welfare (Grondahl et al., 2007; Duve et al., 2012).

Weaning calves shortly after birth is a standard procedure in commercial herds of dairy cattle. Drinking foremilk is solely allowed and not seldom even colostrum is milked and a calf drinks it from the bucket. A cow returns to the herd and is milked twice a day. Such a practice disrupts creation of a bond between a cow and a calf, it does not allow to express normal behavior and is incompatible with the idea of welfare. For all conscientious consumers of cow milk, who want to reduce animal suffering, this is a practice, which cannot be accepted (Beardsworth, 1992; Francione, 2012; Hölker et al., 2019).

Maintaining hygiene is the reason why calves are separated from dams just after birth. This measure is to restrict the likelihood of transmission of diseases from adult animals to the young, both directly among the animals, but also through manure, milk or feed. In so doing, the role of colostrum is diminished. Nevertheless, it contains immunoglobulins against environmental pathogens existing in the cowshed, where animals live. Colostrum has exceptional composition, which fully satisfies the needs of a calf, both for nutrients and antibodies. If we want to have strong and healthy calves, it is not sufficient to give them colostrum only once. It should be ingested in a natural way by a calf and in line with its needs. It is very important for a calf to drink the first dose of colostrum as soon as possible. On the first days calves suckle very often, even up to 10 times a day. Then, the amount of suckling gradually decreases to about 5-7 times. Colostrum contains much more fat, protein, vitamins and minerals, hormones, growth factors, cytokines, nucleotides and immunoglobulins G than later milk. The contents of these components falls dramatically during the first days of lactation (McGrath et al., 2016). In the first month of a calf's life, the amount of milk drunk will hover around 10 litres a day, and later, as it grows, even up to 15 litres a day. The quantity changes depending on the age of a calf, its motivation to suckle and even the availability of milk in the udder (de Passillé and Rushen, 2006; Duve et al., 2012).

If the cowshed is kept in a clean and sanitary condition, the animals are healthy and early weaning for hygiene reasons is not required. It is a common phenomenon that in pens, where calves are kept after weaning, conditions for frequent spread of diseases prevail. The calves get infected from one another, usually with diarrhoeic infections, lung diseases and parasites (Żychlińska-Buczek et al., 2015).

Diarrhoeic infections can be caused by various pathogens: ranging from rotaviruses through to coronaviruses, *Cryptosporidium*, *E. coli*, *Salmonella*, *Pseudomonas aeruginosa*, *Clostridium perfringens*, and most frequently by the conglomerate of different pathogens. In the USA and Korea diarrhoeic infections cause 57% of deaths, and in Poland about 50% of mortality among the calves and thus they lead to great economic losses (Cho and Yoon, 2014; Radkowska and Szewczyk, 2017). According to Żychlińska-Buczek et al. (2015), calf mortality caused by diarrhoeic infections ranges between 33 and 69% in Poland, depending on the nature of the farms. This is a very dangerous and unfavourable phenomenon especially for heifers raised for replacements. Irrespective of its etiology, each diarrhoeic infection injures intestinal mucosa and such an animal will not be a high-value material for herd replacement at a later date. As a result of the damage to intestinal mucosa and poor nutrient absorption as a calf, heifers often suffer from fertility problems and have milk yield problems after calving (Cho and Yoon, 2014). If health problems are coupled with a reduced level of welfare, we can be sure that the heifers earmarked for herd replacement will not be used in the herd longer than one lactation due to poorer productivity (Svensson and Hultgren, 2008). Tests carried out by Haley and Stookey (2005) reveal that just the introduction of two-stage weaning system causes changes in calves' welfare, their health status and body weight.

Keeping calves with dams or suckler cows is an alternative method for milk producers. This allows to obtain higher-quality material for herd replacement, retain high level of welfare and produce high quality milk. On organic farms, where breeders usually have smaller herds (below 100 head) of lower performance from 4500 l to 6000 l per cow, rearing calves with suckler cows is a common practice. This method consists in leaving 2-3 calves with a cow, in separation from the herd. Weaning takes place after about six months. This practice is especially useful when heifers are raised for herd replacement. There can be different schemes of such a procedure. It is common to keep a calf with a dam for three days post-partum and subsequently 6 months with a suckler cow. Another method assumes that a calf stays with a dam for a longer time, as many as 26 days and afterwards for 6 months with a suckler cow. Farmers usually choose worse cows for suckler cows, which give less milk, milk hard or have low milk quality parameters, e.g. with increased content of somatic cells. The techniques which facilitate adoption of calves by a suckler cow are various, it is a very important moment, which determines the success of further rearing. It requires close scrutiny for at least 1-2 weeks. Cows and calves should be put in the space, which is far from the rest of the herd in the cowshed. Tether is used in case when a cow refuses to accept a calf for some reason. However, this is not a practice that improves the welfare of both cows and calves (Loberg et al., 2008). So called group adoptions, where calves have access to several suckler cows and it is easier to create cow-calf pairs, are the most beneficial solution. The idea of keeping calves with suckler cows aims at maintaining the health of calves, developing resistance, reducing stress and thereby increasing the level of welfare. Weaning of calves in older age usually takes place effortlessly.

A cow often weans a calf itself. Producers use various techniques of such a procedure. One of them is radical weaning, when calves are transferred to separate facilities. This is the most drastic measure in terms of welfare. Another method is a gradual reduction of contact between the calves and suckler cows or using calf nose rings, which prevent suckling (Loberg et al., 2008; Enriquez et al., 2010). Natural based preparations: herbal or homeopathic can be used in order to calm the calves and suckler cows. Weaning can typically cause an increase of high-pitched vocalization for several days, which is the result of the separation and can be successfully used as an indicator to evaluate the reduction of welfare. The increased anxiety and vocalization can be observed both in dams/suckler cows and calves, when they are separated too early (Johnsen et al., 2015b). Less signs of stress are observed when a dam and a calf have the opportunity of physical contact during weaning.

Rearing with cows gives producers a lot of benefits. The calves are significantly larger and better developed. Daily gains of the calves reared with a cow can be even 200 g higher compared to daily gains of the calves fed on a milk replacer. The calves are healthier, diarrhoea does not occur and the appearance of parasitic diseases diminishes. This allows earlier mating and calving of the heifers, changing the average age of the first calving from 36 to even 24 months (Bar-Peled et al., 1997; Flower and Weary, 2001; Coquil et al., 2017). In economic terms, rearing calves with suckler cows is a much simpler and cheaper solution than bucket feeding or using feeders. A very high level of welfare is maintained (Kišac et al., 2011).

Apart from keeping calves with suckler cows, which are not milked, other methods are used where cows are normally milked. One of them is so called free contact – a cow and a calf have unrestricted access to each other. Another method is a short daily contact with a dam/suckler cow – only for feeding. Some other way is a half-day contact with a cow – when a cow and a calf are kept together by day or at night. The latter is beneficial, since both a cow and a calf get used to separation, calves are healthier, display natural behaviour and rarely stereotypic behaviour/behavioral disorder (Loberg et al., 2008; Johnsen et al., 2016). The contact with a cow even devoid of suckling the udder ensures that the calves have higher level of welfare and drink larger amount of milk/milk replacer from the feeder (Johnsen et al., 2015a). Some producers claim that the only problem is the smaller quantity of milk obtained from the cows (Kišac et al., 2011). However, many studies have been carried out, which state that milk yield does not decrease or is diminished only in the period of feeding calves, but general milk yield is not reduced (Flower and Weary, 2001; de Passillé et al., 2008).

In conclusion – rearing calves with cows is nothing new, in practice it is applied mainly in herds of beef cows. In herds of dairy cows in Poland, keeping a calf with a dam even for a few hours is very seldom practiced. In pursuit of high performance, which has an impact on producer's profit, such values as high milk quality, respect and ensuring decent living conditions for an animal, which produces the milk, have been pushed into the background.

However, the development of the global movement for animals, which speaks out on the issue of agricultural ethics, causes the increase of consumer awareness. The law of supply and demand is starting to pressurize the breeders to adjust their production to the trends, which promote a high quality product from the farms, where people treat animals with respect, empathy and understanding. There are many ways to rear calves with cows. The choice between a dam and suckler cow and the length of rearing with them are selected and modified to the conditions prevailing on farms. This is a system that works well on organic farms and in conventional herds with large-scale production model (Bilik et al., 2011). The breeders, who decide to apply this solution, gain healthy udders of their cows and reduced amount of used veterinary drugs, apart from excellent material for herd replacement and high quality milk (Asheim et al., 2016; Wagenaar et al., 2011). Such solutions are successfully used in Switzerland (FIBL & FOUR PAWS, 2015) and Denmark, the Netherlands, France and Norway (Vaarst et al., 2019). It is time also for Polish breeders of dairy cattle to develop their methods of rearing calves with dams, adjusted to local conditions and needs.

References

- Asheim L.J., Johnsen J.F., Havrevoll O., Mejdell C.M., Grøndahl A.M. (2016). The economic effects of suckling and milk feeding to calves in dual purpose dairy and beef farming. *Review of Agricultural, Food and Environmental Studies*, 97: 225–236.
- Bar-Peled U., Robinzon B., Maltz E., Tagari H., Folman Y., Bruckental I., Vot H., Gacitua H., Lehrer A.R. (1997). Increased weight gain and effects on production parameters of Holstein heifer calves that were allowed to suckle from birth to six weeks of age. *J. Dairy Sci.*, 80, 10: 2523–2528.
- Beardsworth A. (1992). The vegetarian option: varieties, conversions, motives and careers. *The Soc. Rev.*, 92: 253–293.
- Belluz M. (2018). L'élevage des veaux laitiers par des vaches adultes, une technique innovante en élevage biologique. Mémoire, Institut d'Enseignement Supérieur et de Recherche en Alimentation, Santé Animale, Sciences Agronomiques et de l'Environnement, (FRA), 40 pp, <https://prodinra.inra.fr/record/445074>
- Bilik K., Łopuszańska-Rusek M., Fijał J. (2011). Odchów cieląt ras mlecznych według zasad ekologicznych z uwzględnieniem badań Instytutu Zootechniki PIB. *Wiad. Zoot.*, 1: 131–147.
- Cho Y., Yoou K.J. (2014). An overview of calf diarrhea – infectious etiology, diagnosis, and intervention. *J. Vet. Sci.*, 15 (1): 1–17.
- Coquil X., Brunet L., Hellec F., Paillet I. (2017). Conception d'une conduite de génisses laitières sous vaches nourrices: pour une intensification écologique des systèmes d'élevage herbager. *Fourrages*, 231: 213–222.
- Duve L.R., Weary D.M., Halekoh U., Jensen M.B. (2012). The effects of social contact and milk allowance on responses to handling, play, and social behavior in young dairy calves. *J. Dairy Sci.*, 95: 6571–6581.
- Enriquez D.H., Ungerfeld R., Quintans G., Guidoni A.L., Hotzel M.J. (2010). The effects of alternative weaning methods on behaviour in beef calves. *Livest. Sci.*, 128: 20–27.
- FIBL & FOUR PAWS (2015). Mother bonded and fostered calf rearing in dairy farming. Technical guide. <http://stichtingdemeter.nl.web03.webhosting.nl/wp-content/uploads/2012/04/FIBL-Mother-bonded-and-Fostered-Calf-Rearing-in-Dairy-Farming-1.pdf>

- Flower F.C., Weary D.M. (2001). Effects of early separation on the dairy cow and calf: 2. Separation at 1 day and 2 weeks after birth. *Appl. Anim. Behav. Sci.*, 70: 275–284.
- Francione G.L. (2012). *Animal Welfare, Happy Meat and Veganism as the Moral Baseline*. W: *The Philosophy of Food*, Kaplan D. M. (red.). University of California Press, ss. 169–189.
- Grondahl A.M., Skancke E.M., Mejdell C.M., Jansen J.H. (2007). Growth rate, health and welfare in a dairy herd with natural suckling until 6–8 weeks of age: a case report. *Acta Vet. Scand.*, 49: 16.
- Haley D.B., Stooker J.M. (2005). Weaning cattle in two stages reduces the behavior changes typically associated with weaning stress. *J. Dairy Sci.*, 88: 349.
- Hölkner S., von Meyer-Höfer M., Spiller A. (2019). Animal ethics and eating animals: consumer segmentation based on domain-specific values. *Sustainability*, 11: 3907.
- Johnsen J.F., de Passille A.M., Mejdell C.M., Bøe K.E., Grondahl A.M., Beaver A., Rushen J., Weary D.M. (2015a). The effect of nursing on the cow–calf bond. *Appl. Anim. Behav. Sci.*, 163: 50–57.
- Johnsen J.F., Ellingsen K., Grondahl A.M., Bøe K.E., Lidfors L., Cecilie Marie Mejdell C.M. (2015b). The effect of physical contact between dairy cows and calves during separation on their post-separation behavioural response. *Appl. Anim. Beh. Sci.*, 166: 11–19.
- Johnsen J.F., Zipp K.A., Kälber T., de Passillé A. M., Knierrim U., Barth K., Mejdell C.M. (2016). Is rearing calves with the dam a feasible option for dairy farms? – Current and future research. *Appl. Anim. Behav. Sci.*, 181: 1–11.
- von Keyserlingk M.A.G., Weary D.M. (2007). Maternal behavior in cattle. *Horm. Behav.*, 52: 106–113.
- Kišácp., Brouček J., Uhrinčáť M., Hanus A. (2011). Effect of weaning calves from mother at different ages on their growth and milk yield of mothers. *Czech. J. Anim. Sci.*, 56 (6): 261–268.
- Loberg J.M., Hernandez C.E., Thierfelder T., Jensen M.B., Berg C., Lidfors L. (2008). Weaning and separation in two steps – a way to decrease stress in dairy calves suckled by foster cows. *Appl. Anim. Behav. Sci.*, 111: 222–234.
- McGrath B., Fox P.F., McSweeney P.L.H., Kelly A.L. (2016). Composition and properties of bovine colostrum: a review. *Dairy Sci. Technol.*, 96, 2: 133–158.
- de Passillé A.M., Rushen J. (2006). Calves' behaviour during nursing is affected by feeding motivation and milk availability. *Appl. Anim. Behav. Sci.*, 101: 264–275.
- de Passillé A.M., Marnet P.G., Lapierre H., Rushen J. (2008). Effects of twice-daily nursing on milk ejection and milk yield during nursing and milking in dairy cows. *J. Dairy Sci.*, 91: 1416–1422.
- Radkowska I., Szewczyk A. (2017). Wykorzystanie fitoterapii w profilaktyce i leczeniu cieląt. *Rocz. Nauk. Zoot.*, 44 (2): 149–160.
- Svensson C., Hultgren J. (2008). Associations between housing, management, and morbidity during rearing and subsequent first-lactation milk production of dairy cows in southwest Sweden. *J. Dairy Sci.*, 91: 1510–1518.
- Vaarst M., Hellec F., Sørheim K., Johanssen R.J.E., Verwer C. (2019). Calves with their dams in dairy cow systems. Report from the CORE-Organic project GrazyDaiSy based on experiences from the Netherlands, France, Norway and Denmark. <https://orgprints.org/36915/2/fullreport-pdf-version-december-2019.pdf>
- Wagenaar J.P., Locke P., Butler G., Smolders G., Nielsen J.H., Canevara, Leifert C. (2011). Effect of production system, alternative treatments and calf rearing system on udder health in organic dairy cows. *NJAS – Wageningen Journal of Life Sciences*, 58: 157–162.
- Żychlińska-Buczek J., Bauer E.A., Kania-Gierdziewicz J., Wrońska A. (2015). The main causes of calf mortality in dairy farms in Poland. *J. Agr. Sci. Technol.*, A 5: 363–369.

Agata Szewczyk

Rearing calves with their mothers on dairy farms - is it possible?

SUMMARY

Global changes and increasing consumer awareness associated with a healthy lifestyle and respect for ethical values that determine choices and food preferences are forcing producers to adapt their production and implementing strategies that will promote environmental protection and animal welfare. Therefore such adjustment of production based on consumer preferences is rearing calves with their mother dairy cows.

Key words: welfare, dairy cattle, rearing with the dam, weaning

