

EARLY SEPARATION AND WEANING STRESS ENCOUNTERED IN CALVES

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KEY WORDS:

Calf weaning,
weaning stress, calf
care

ARTICLE INFO

Received on:

17.01.2018

Revised on:

17.06.2018

Accepted on:

18.06.2018

ABSTRACT

Weaning the calf immediately after birth allows controlled milk feeding hence, saving milk for human consumption and profitability. Since the new born calf is incapable of digesting solid feed, milk or milk replacer diets have been provided along with grains and forage as early as a week in order to prepare a pre ruminant calf to ruminant. But a serious ongoing problem is with the stress the calf faces such as early separation from the mother, mother's milk, care and attention and failure of passive immunity transfer. Many protocols have been followed to reduce the problem of weaning stress and one of the more practical applications is the separation of the cow and calf through fence line contact.

INTRODUCTION

Weaning or early separation is a process when the offspring is denied social contact or maternal protection by the dam or access to udder and milk. Most of the dairy farmers practice the routine calf separation from their mother within few hours of birth. Colostrum and milk is bottle fed and the calves are reared in groups with provision to *ad lib* supply of calf starters and tender green forage. This not only enhances early rumen development but for economic reason as the milk is saved for human consumption. So, early rumen development and consumption of solid food not only cost less but is also less labour-intensive. Under natural conditions, the weaning process of a calf is completed at about 9-11 mts of age. In North America & European dairy farms calves are separated from their mother within 24hrs after birth and then fed milk by bucket or bottle until 4-10 weeks of age (Broom and Leaver, 1978). In Sweden, dairy cows are often tied up during calving and calves are given short duration of contact with the mother interfering natural mother young behaviour (Lidfors, 1993). But, in Indian condition, weaning is practiced immediately after birth (Thomas and Sastry, 1991)

Milk feeding and early rumen development

Since the new born calf is not capable of digesting solid feed, milk is fed at the rate of 10% body weight till it begins to consume feeds and fodders satisfactorily. Numerous researchers have reported minimal rumen development in calves receiving solely milk or milk replacers. Therefore, while milk or milk replacer diets results in rapid and efficient growth, it does little to prepare pre- ruminant calf for weaning/utilization of grain and forage based diets. The early intake of solid feed which is related to the development of microbial fermentation in the rumen influences the development of the rumen in calves (Jensen and Kyhn, 2007). Digestive enzymatic

changes coupled with high daily cost of maintaining a preweaned calf results the need to convert the calf from monogastric to ruminant animal with minimal loss in growth and development of the rumen so that there is efficient utilization of dry and forage based diets. Presence and absorption of volatile fatty acids is indicated to stimulate rumen epithelial metabolism and development.

Stress due to early separation of the mother and calf

Early separation or weaning is essential for economic reasons as milk feeding of the calf can be controlled and more milk is left for the producer to sell it. Immediately after weaning or separation both the cow and calf vocalize. Separation prior to natural weaning increases the vocalization rates, activity and catecholamine concentrations (Lidfors, 1996). It is suggested the maternal vocalization towards the new born calf functions both to activate the calf in combination with licking, sniffing and other maternal behaviours and to facilitate the calves learning its mothers call. The strongest effect due to separation was found directly post partum when cow and calves seemed to have a general activating effect on each other (Kirchgessner, 2004). This separation can be done as early as immediately after birth, 24hrs or even after 4 days of birth after receiving enough colostrum. It is seen that early separation is less distressing for both the cow and calf because longer period allows bonding between them (Phillips, 1993). Hudson and Mullord (1977) has investigated that even 5 minutes of contact with the calf is sufficient for the formation of maternal bond. Separating the cow and calf at 24 or 96hr the cow was unable to discriminate between her own calf and alien calf 3 days later. For a calf, a period of 7 days may be necessary for it to recognize its mother.

Failure of passive immunoglobulin transfer (FPT) is a serious ongoing problem especially in calves that have been weaned immediately after birth. Since the calves are born agammaglobulinemic, the stress encountered due to weaning exposes them to many infectious diseases. One of the prime reason is the failure to absorb adequate immunoglobulin especially IgG @ 10mg/ml (Beam *et al.*, 2009) within 2h of birth (Eidondo and Henrichs, 2009). But on the contrary, dairy calves allowed to nurse will not be able to ingest an adequate volume of colostrum to meet their immunoglobulin requirements as by the time the calf stands and suckles the most important period of immunoglobulin absorption is passed away (Weaver *et al.*, 2000). Therefore, dairy calves kept with their mother 10 days post partum also had higher weight gains, first to attempt to successfully stand, defecate and urinate while those separated from their mother at birth were less active and vocalized more (Metz and Metz., 1985). This retardation of growth and smaller weight gains may be due to abrupt feeding change forcing the animals in suckling stage to ingest inappropriate foods for their immature digestive system (Coppo, 2003). But on the other hand, early weight gains are correlated with social rank in cattle and that dominance can positively affect productivity (Broom and Leaver, 1978). Flower *et al.* (2001), found that delayed separation improved social behaviour as maternal presence is important for social learning (Krohn *et al.*, 1999).

Cross suckling

Nielsen *et al.* (2008) reported that cross suckling after weaning is modulated by early age in calves. Others suggest this problem elicited by feeding milk as it is more intense 12-15 min after milk ingestion. Hunger too is known to elicit cross suckling motivation in calves as predisposed due to inadequate milk feeding and underdeveloped rumen to digest solid food (de Passille *et al.*, 2010). But no effect on the frequency of rumination on cross suckling or weight gain was found (Roth *et al.*, 2009a). A critical situation arises when milk provision is discontinued without lowering the calves' nutritional requirements with solid food only leading to diminished weight gain and abnormal oral behaviour (cross suckling). Therefore, a positive effect of feeding duration on cross suckling was also found in the dairy calves directly after weaning (Keil *et al.*, 2001). The other important point is vitality as, calves born after difficult delivery were unable to suckle. Though the late separated calves' presumably suckled large quantities of milk, these cows recovered the milk production in late separation (Flower *et al.*, 2001).

Strategies for easing the cow and calf separation or weaning stress

Though, many separation methods have been suggested, a vast majority are practiced immediately after birth in Indian condition. Milk feeding is discontinued earliest when the calf consumes 0.5kg concentrate/day depending on the breed (Thomas and Sastry, 1991). This method also allows the healthy ones to be weaned and the unhealthy calves to be on milk till they attain strength and vigour. Separation

not only causes distress and anxiety with reduced weight gains in calves but also exposes them to infection and disease. So, in order to reduce the stress on calves, the separation techniques practiced should be slow and gradual. Keep the calves in small groups of 4-6 so that they adapt to social conditions. The housing provided should be clean and well ventilated. Calves that were gradually weaned exhibited less pacing, had lower neutrophil/lymphocyte ratios and increased body weight (Church, 1988). Calves given fence line contact with their mothers or with another adult was found to settle more quickly than abruptly weaned calves (Pollard *et al.*, 1992). They had better weight gains with fewer behavioural signs of stress and were more welfare friendly than any other methods (McCall *et al.*, 1985). Since cross suckling among the calves is a phenomenal problem, fascinating contraptions called 'calf weaners' worn over the muzzle are designed to keep calf away from suckling each other or the dam (Stookey, 1998). Since calf separation/weaning is a premature process from animal's perspective keeping the cow/adult and calf within visual and auditory reach has been found to counter psychological and physiological stress. Further, extensive investigation on effective weaning or mother young separation will give a clearer picture of the stress associated with it and the coping mechanism of the calf.

REFERENCES

- Beam, A.L., J.E. Lombard, C.A. Kopral, L.P. Garber, A.L. Winter, J.A. Hicks and J.L. Schlater. 2009. Prevalence of failure of passive transfer of immunity in newborn heifer calves and associated management practices on US dairy operations. *Journal of Dairy Science*, 92(8): 3973-80.
- Broom, D. and J. Leaver. 1978. Effects of group rearing experience on subsequent behaviour and production of Holstein heifers. *Journal of Dairy Science*, 68: 923-929.
- Church, D.C. 1988. The ruminant animal: Digestive physiology and nutrition, Prentice Hall, Inc. Englewood Cliffs, New Jersey.
- Coppo, J.A. 2003. Early weaning as cause of malnutrition in half bred Zebu calves. *Veterinary Research Communication*, 27: 207-210.
- Elizondo-Salazar, J.A. and A.J. Heinrichs. 2009. Feeding heat-treated colostrum to neonatal dairy heifers: Effects on growth characteristics and blood parameters. *Journal of Dairy Science*, 92: 3265-3273.
- Flower, F.C. and M.W. Daniel. 2001. Effects of early separation on the dairy cow and calf: separation at 1 day and 2 weeks after birth. *App. Animal Behaviour Science*, 10: 275-284.
- Hudson, S.J. and M.M. Mullord. 1977. Investigations of maternal bonding in dairy cattle. *App. Anim Ethology*, 3: 271-276.
- Kirchgessner, M. 2004. In: Tierernahrung: Leitfaden für Studium, Beratung und Praxis. &the d. DLG-Verlag, Frankfurt am Main.

- Krohn, C.C., J. Foldager and L. Mogensen. 1999.** Long term effect of colostrum feeding methods on behaviour in female dairy calves. *Acta Agric. Scand.*, **49**: 57-64.
- Lidfors, L.M. 1993.** Cross- suckling in group housed dairy calves before and after weaning off milk. *App. Animal Behaviour Science*, **38**: 15-24.
- Lidfors, L.M. 1996.** Behavioral effects of separating the dairy calf immediately or 4 days post partum. *Applied Animal Behaviour Science*, **49**: 269-283.
- McCall, C.A., G.D. Potter and J.L. Kreider. 1985.** Locomotor, vocal and other behavioral responses to varying methods of weaning foals. *Applied Animal Behaviour Science*, **14**: 27-35.
- Metz, J. and J.H.M. Metz. 1985.** Maternal influence on defecation and urination in the newborn calf. *App. Animal Behaviour Science*, **16**: 325-333.
- Nielsen, P.P., M.B. Jensen and L. Lidfors. 2008.** Milk allowance and weaning method affect the use of a computer controlled milk feeder and the development of cross-suckling in dairy calves. *App. Animal Behaviour Science*, **109**: 223-237.
- Passille, A.M., B. Sweeney and J. Rushen. 2010.** Cross suckling and gradual weaning of dairy calves. *App. Animal Behaviour Science*, **124**: 11-15.
- Phillips, C. 1993.** Cattle Behaviour. *Farming press Books*. Ipswich.
- Pollard, J.C., R.R. Littlejohn, J.M. Suttie. 1992.** Behaviors and weight change of red deer calves during different weaning procedures. *Applied Animal Behaviour Science*, **35**: 23.
- Roth, B.A., N.M. Keil, L. Gygax and E. Hillman. 2009.** Influence of weaning method on health status and rumen development in dairy calves. *Journal of Dairy Science*, **92**: 645- 656.
- Stookey, J.M. 1998.** Alternate weaning strategies for cow-calf producers. In: Saskatchewan Beef Symposium Proceedings, Extension Division, University of Saskatchewan, Canada.
- Thomas, C.K. and, N.S.R. Sastry. 1991.** Calf Raising. In: Dairy Bovine Production, Kalyani Publishers, New Delhi, India, pp. 297-310.
- Weaver, D.M., J.W. Tyler, D.C. VanMetre, D.E. Hostetler, and G.M. Barrington. 2000.** Passive transfer of colostral immunoglobulins in calves. *Journal Vet. Inter, Med.*, **14**: 569-577.

How to cite this article?

Saroj Rai, Jyotimala Sahu, R. Behera, A. Muhammad, M.K. Ghosh and T.K. Dutta. 2018. Early separation and weaning stress encountered in calves. *Innovative Farming*, **3(2)**: 61-63.