Maternal Behaviour in Buffalo
Post-partum Behaviour

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Introduction

The behavioural events at birth and shortly afterward have an important influence on the survival of the newborn and hence on the successful outcome of reproductive processes. This is especially true when the initial suckling and development of a bond between mother and young occur in all conditions even in close confinement (Hafez, 1992). Some standard practices interfere with the formation of the maternal bond between dam and offspring. Early separation of newly born young from the mother induces modifications in the behaviour of young animals (Houwing et al., 1990).

Post-parturient behaviour
1- Cow-calf interaction:
Recognition of the young calves is established in buffaloes soon after parturition, and other young may be adopted at that time which termed “critical period” (Gordon, 1996). Continuous contact is important and female may reject her own calf if separated from the dam for more than a few hours immediately after parturition (Cockrill, 1981). The recognition of calves occurs through the maternal grooming “Licking” (Fraser and Broom, 1990).

The critical period is the time of the animal’s life during which an important behavioural development are be facilitated. Critical period have also been termed “Sensitive Period” (Kent, 1987). During this period, the animal is particularly susceptible to fast learning involving specific cognitive ability. The best example of learning in the critical period is imprinting which is the rapid formation of a permanent close attachment between an animal and a salient environmental objects, such as its mother forming the mother–offspring bond. During the critical period, a reciprocal recognition between buffalo cows and their own calves (Usmani et al., 1990). At this period, the mother quickly acquires, or learns the identity of her own calf and thereafter, relates to it like a partially vulnerable extension of herself (Weary and Chuo, 2000). In contrast, other young’s, even if evidently similar, are rejected, hostile behaviour is exhibited to the alien.
2- Behaviour of buffalo cow:-

2.1. Licking behaviour (Maternal grooming):
Immediately after parturition all buffalo cows stand up and turn to lick their calves taking a particular care to avoid “stepping” on the calf (Hafez, 1992). The cow normally licks her newly born calf vigorously begins licking at head and neck, then concentrates on the back, abdomen, tail, and perineal region (Sato et al., 1991). Licking of the calf after birth seems to be important in strengthening the maternal bond between cow and calf (Fraser and Broom, 1990). The mother may “label” her offspring by maternal grooming at this time, thus providing a mechanism for offspring discrimination or recognition. Later, as the newborn mature, the licking is gradually directed to social functions relating to the establishment and maintenance of social bond between mother and young (Gordon, 1996).

Estes (1992) stated that, social grooming or licking is a behaviour trait. That presumably promotes maternal-offspring bonds and social bond among herd members. It should not be confused with the maternal licking that is designed to stimulate hider calves to eliminate wastes as bovine social licking directed mainly to the head and neck (Olsson and Keeling, 1998). While maternal licking directed to perineal region of the calf (Qureshi et al., 2000).

Several functions have been suggested for licking in buffaloes, removal of the foetal fluids, especially from nostrils and mouth of newly born calf stimulating respiratory center and breathing (Hafez, 1992). Drying of the coat leading to reduction in birth loss and chill diseases (Sato et al., 1991). Licking has a hygienic function leading to reduced risk of infection and predation as well as increasing the muscular tone. Licking also activates the lymph and blood circulation of calf as well as stimulate the first standing, urination and defecation of the newly born calf through perineal (ano-genital) licking.

2.2. Eating placenta (placentophagia)
If not prevented, the buffalo cows usually lick the placental fluid of the calf, the bedding materials contaminated with foetal fluids and eats the placenta (Fischer and Bodhipaksha, 1992). This behaviour occurs more frequently in group calved cows (Illmann and Spinka, 1993). The importance of eating placenta is unknown but, it may be recycling of nutrients (Minerals and proteins) or a form of defense against predators by removing odor, or a form of hygiene, when placenta is removed will protect the
foetus from secondary infection (Tulloch, 1988), or the placenta is rich in hormones. The farmers often remove the placenta after shedding for fear of digestive troubles.

3- Behaviour of calf (neonatal behaviour):

3.1. Ist standing
The calf stood for the first time 15 minutes after birth and started to walk one hour after birth, this is although newborn buffaloes are not as agile as some other domestic bovid (Mloszewski, 1983). On the other hand, Hafez (1992). Reported that, most newly born calves take at least 45 minutes to stand and may take upward of 4 h to suckle for the first time. Fischer and Bodhipaksha, (1992), stated that, the first attempts to stand up begin about 9.5 ± 8.0 min after birth. The calf is able to stand steady after about 22.0 ± 13 min. Mothers of high maternity help their calves to stand earlier by vigorous licking around the perineum of the calves (Jainudeen and Hafez (1992).

3.2. Teat – seeking (udder searching) behaviour.
Within a few hours after parturition , the buffalo calves begin to show hunger by exploring the mother’s body with muzzle and tongue until a teat is located, the calf readily mouths and sucks any protuberance on the mother’s body (Hafez, 1992). The search for the udder usually starts by buffalo cow from the side but later, calf reaches the udder from behind between the thighs of the dam (Fischer and Bodhipaksha, 1992). The young buffalo calf after standing turns to its mother and first touches the face and dewlap of the mother , it then immediately moves to the udder and starts suckling (Pathak, 1992).

The calf in the lst attempts of suckling was frequently directed to the wrong parts of the dam’s body especially any protuberance as axilla, belly , neck, and groins and few calves misdirected teat-seeking to the underside of the feeding trough. The calf may be guided to the udder by its tendency to follow the line of underbelly of the cow towards its highest point which is usually the region of the udder . The guides of the calf to find teat were summarized by Fraser and Broom (1990) as follow;1- The pendulous shape of the udder; 2- The udder tilting (movement of udder), and 3- Thigmotaxis effect, i.e. the slightly high temperature between thighs. The mother seems to help the calf find a teat by positioning her body appropriately that facilitate teat-seeking (maternal postural changes), and this includes ; 1) rotating her body ; 2) abduction of the hind legs or moving forward bringing the udder closer to the calf ; and 3) licking, nuzzling and nudging the calf.
3.3. **Suckling behaviour:**

Nursing in buffaloes involves both mother and calf. Reciprocal stimulation (reciprocal nursing), during suckling as the buffalo cow initially helps the calf locate her teats. Sucking by the neonate, in turn, likely has a stimulating influence on the mother in that it reduces tension in the udder and enhances milk let down, while the calf suckles, the cow licks the perineal and preputial areas of the calf, stimulating its sucking, first urination, and/or first defecation (Day et al., 1997).

Pathak (1992) stated that, almost all dams, except a few aggressive ones, stand quietly at the time of suckling and caress (nurse) their calves by licking. They may also attempt to stimulate their calves to urinate. Nervous and aggressive buffaloes are restless during suckling and take little interest in caressing the calves. Most of the nervous and aggressive buffaloes also resist the handling of their calves and don’t allow strangers in the vicinity of their calves.

Typically, the buffalo calf stands alongside the mother facing caudally, and this is the normal suckling posture, but occasionally, a calf’s body will be at right angle to teat of the dam (Hafez, 1992). Unlike cattle, buffalo calves nurse between the mother’s hind legs (Estes, 1992). As the buffalo calf presses and nudges the mother’s flank and legs with its muzzle, more or less at random, the mother gradually walks forward until the calf is left slightly behind, then halts and allows calf to catch up with her rump. The calf becomes increasingly more aggressive and exploratory in the pursuit of its mother’s rump until it finds a teat. This method of initial presentation of the mammae may explain why young buffalo calf tend to suckle from the rear, between the mother’s hind legs, while domestic calves of genus Bos (cow) suckle mainly from the side (Mloszewski, 1983). Tail wagging is a behaviour occurs in case of the peaceful suckling which is accompanied frequently by wagging of the tail both of calf and its mother (Gordon, 1996).

The nursing calf assumes a crouched stance with spread legs and shoulders lowered allowing it to bunt upwards at the udder of mother (Packer et al., 1992). This udder bunting behaviour functions in the stimulation of milk let down. Newborn calves normally suckle five to ten times a day with each nursing session lasting up to ten minutes (Nordin and Jainudeen, 1991). The number of nursing bouts usually
decreases with age, but this may vary depending on the rate of growth of the calf and the milk yield of the buffalo cows (Tulloch, 1988).

Suckling occurs most frequently, at dawn, dusk and at the start of grazing. Buffalo cows suckle the single calves about 4–6 times daily, while suckle twins more frequently (6-8 times daily). The rate of suckling is related to age and size of calf, breed (beef or dairy), method of suckling (nature, nipple or bucket feeding); and persistence of the calf during suckling. Calves with their dams suckle 8-10 min / feeding with a total of 37-56 min / day. New born calf begins to suckle within 2 to 5 hours of birth. Paranhos da Costs et al. (1994) suggested the factor affecting 1st suckling in calves, the udder configuration, poor calf vigor especially after difficult calving, the parity of the dam, calving season, abnormal maternal behaviour especially in heifers, group or individual calving, and the success of teat seeking behaviour.

4- Abnormal Maternal behaviour
4.1. Cross-Sucking behaviour in calves
Cross-sucking (Lidfors, 1993); inter-sucking (Mloszewski, 1983); non-nutritive sucking (De Passille and Rushen, 1997) is abnormal maternal behaviour in buffalo calves. When young buffalo calves are raised in groups separated from their mothers in obvious behavioural problem is the cross-sucking. This behaviour is described as a calf sucks the ear, mouth, scrotum, prepuce, penis, tail, udder, and other body parts of the pen mates (Lidfors, 1993). Self sucking is rare in buffalo calves (Lidfors, 1991). Calves raised in isolation spent much time licking fittings and this might expressed as a need for exploration and termed as "non-nutritive. Sucking" (De Passille et al., 1992). It has not been reported to occur in systems where the buffalo cows and calf were kept together (Hafez, 1992). It is most frequent in bucket-fed calves (De Passille et al., 1993), which may indicate that an unsatisfied requirement for sucking activity could be responsible for the cross-sucking behaviour.

Cross-sucking is most frequent shortly after meal and stops once the calves are weaned off milk (Lidfors, 1993). When calves fed milk ad-labium from a bucket, they will suck a dry teat during the meal period, and will continue to suck of the teat once the milk is finished. It has been demonstrated that, the ingestion of milk plays an important role in stimulating sucking on a dry teat in calves (Rushen and De Passille, 1995). It has also been suggested that cross-sucking between calves may be stimulated in an analogous way by milk ingestion by another calf (De Passille et al., 1997). Also some stimuli from the calf itself could stimulate the sucking
The incidence of inter-sucking was significantly less for calves housed in bedded stalls than for those on slatted floors (Lidfors, 1993). The frequency of inter-sucking decreases with time after milk feeding. Another study revealed that calves fed from nipple pails drank more slowly than those drinking from open-buckets but the incidence of inter-sucking was lower in calves fed from nipple pails. Hafez (1992) reported that, non-nutritional sucking markedly increase in calves fed low-energy, low-protein diets suggesting that it is related to the diet.

Although the non-nutritive suckling is likely to aid the secretion of digestive hormones (De passille et al., 1993), and some non-nutritive sucking is considered as a normal component of nursing by beef buffaloes. It has been suggested that cross-sucking behaviour can be detrimental to the health of the calves (Lidfors, 1991), since persistent preputial sucking resulted in the loss of hair around the muzzle and cases of poor growth among the sucking calves whereas hair loss of the prepuce occurred among the calves which were sucked. Such inter-sucking can occur very frequently and cause skin irritation. Prolonged sucking of ears resulted in a wet ear which may have then frozen in extremely cold weather. Some calves in group-reared systems habitually drink urine from other-calves resulting in liver disorders (Młoszewski, 1983). Non-nutritive sucking has important consequences, particularly if it continues into adult life. Such activity markedly decrease the dry matter consumption of calves and retard growth. Hair balls commonly occur in the rumen of buffalo calves that exhibit this behaviour (Hafez, 1992), this may attain a size of 3788 g and may be fatal if they block the entrance of the rumen and prevent eructation.

Calves should be taken from their dam as soon as possible after birth and give access to milk or milk replacer via nipple dispenser to help avoid inter-sucking. Also making the calf works harder and longer for his milk, tie up calves for 10 minutes after feeding or separate them after feeding, apply muzzle, put a repellent on ears, teat, and navels of herd mates; or give them access to dry feed following milk feeding to reduce the problem of inter-sucking. Delaying mixing of calves for at least 4 weeks and offering concentrate feed ad-libitum could lead to reduced cross-sucking (De Passille et al., 1992). Housing calves individually until weaning as practiced on many dairy units will essentially eliminate most inter-sucking problems in buffalo calves. Providing calves with a water teat after each milk feed was found to reduce the level of cross-sucking behaviour (Daolio, 2000).
4.2. Communal Suckling

Communal suckling (Murphey et al., 1991); Allo-suckling (Paranhos da Costa et al., 2000); non-offspring nursing (Packer et al., 1992), or allo-nursing (Murphey et al., 1995), is a common abnormal maternal behaviour in buffaloes. This behaviour was described as one adult buffalo cow nursing groups of calves from other females (alien calves. It seems a very costly pattern of allo-parental care, since milk could be subtracted from her own calf and distributed to other calves. Cross-nursing is apparently a behaviour that most calves participate if given the opportunity. This behaviour occurs mainly in group housed buffaloes (Paranhos da Costa et al., 2000). Communal care and ease of adoption are of an importance in raising farm animals, especially under conditions of substantial loss of young or their parents. It is common knowledge that, water buffalo often engage in communal nursing, and that they frequently adopt orphans under free-ranging conditions.

The behaviour is described as fostering in mammals (Paranhos da Costa et al., 2000). Increasing attention is now being given to numbers of calves being fostered on nurse cows to feed naturally. When cross-fostering is attempted, the normal procedure has been to present a buffalo cow already in milk, with several young calves, perhaps newly born. Recent research on fostering has shown much higher degree of success when the young calves to be fostered are presented to the nurse cow immediately following her parturition, before she has adopted her own calf; but while she is still in the critical period of maternal awareness. At this time such cows readily adopt numbers of fostered calves and continue to facilitate their nursing subsequently, so these calves grow better.

4.3. Inter-suckling (milk-sucking) in buffalo cows

This behaviour is described as a buffalo cow or bull sucks milk from the udder of lactating cow (Daolio, 2000). The sucking includes withdrawal of milk from the udder, and it is more common in group penned buffaloes, especially in open husbandry system. Self suckling, although rare, is a vice that occurs in buffaloes. Significant losses in milk yield of the problem cow can result if not corrected. This behaviour negatively affects the social structure of a herd and impacts the health of the mammary gland through pathological changes and deformation of teats and udder (Fischer and Bodhipaksha, 1992). First lactation cows had a much higher incidence of inter-sucking (25.2 vs 4.3%) than multiparous cows.
Commercial available weaners may help to control inter-suckling and self suckling in buffalo cows. A weaning ring (anti-sucking bit) was used. Surgical excision of a portion of the ventral lingual mucosa, with or without underlying muscle was judged to be the best of four surgical procedures tried to solve the problem of milk sucking. Provision of roughage in the diet is recommended to prevent the inter-suckling between buffalo cows. A final and ultimate solution to this behavioural problem is to cull the offending cow(s) from the herd but this represents, a serious economic problems. Some dairy farmers prevent the problem by penning the buffalo cows in stalls.

4.4. Calf does not suckle
Calves refuse to nurse or suckle from own or alien mothers just after birth. Calves that have gone through the trauma of a difficult birth (dystocia) are more likely than those from a normal birth to refuse suckling (Jainudeen, 1984). Calves of first calf heifers took 5.5 h to nurse following birth while calves of multiparous cows first nursed at 3.3h after birth. Calves who delay nursing are at risk of receiving inadequate colostral antibody protection (McFarland, 1989). Genetic make-up of the calf may influence nursing ability in buffalo calves (Rushen and De Passille, 1995). The head-to-tail alignment of the dam to its newborn, licking off the placental membranes and fluids, are essential components of mother-offspring recognition. Failure by the dam to recognize the calf as her own causes rejection of any advances by the newborn.

Restraining the cow, helping the calf to standing position and to find a teat, squiring a taste of milk into the calf's mouth may get the calf to take the colostrum. If the calf is to be artificially reared, guiding its head to the nipple or assisting it to drink from a bucket by allowing it to sucking fingers while guiding the head downward the milk. Most calves will eventually suckle when assisted in a helpful but persistent way (Hafez, 1992).

4.5. Aberrant behaviours related to group housing
Calving in a group may lead to behavioural problems in buffaloes, which can depress the neonatal sucking of colostrum these seems to be least four such problems. First, newborn calves may attract maternal licking of a cow other than its dam (cross-licking behaviour); second, calves may fail to suckle during the first few hours after birth for other reasons. Third, the occurrence of cross-sucking could depress consumption of colostrum in two ways, either the calf sucks from another dam first and sucking from its own mother is postponed, or the mother is sucked by alien calves shortly after
parturition and first colostrum is ingested by the calf before the mother's own calf starts suckling. **Fourth,** the sucking may be too short for adequate colostrum ingestion due to disturbance caused by conspecifics.

**Illmann and Spinka (1993)** stated that, the occurrence of the mis-mothering in a group calving situations could be resulted in delayed suckling, and hence impaired calf immunity levels, and in misidentification of calves for pedigree recording. Frequently, female buffaloes may give birth in the close company of pregnant conspecifics and mothers with newborn calves (group-housed buffaloes). This may increase patterns of aberrant maternal behaviours i.e., abandonment of "young calf stealing" and "cross-licking" (**Hafez, 1992**). Calf stealing is a common and deleterious consequence of housing pregnant buffalo cows together in groups and defined as, cows have been found to show maternal interest prior to parturition and in some cases they have adopted alien calves, which has caused the mothers to reject their own calves after calving.

During intensive calving periods, interest in alien calves might be frequent and possible disturb the formation of a mother- calf bond. **Illmann and Spinka (1993)** observed licking of alien calves (cross-licking) in primiparous cattle kept in group housing during calving, but this did not cause cows to reject their own calf as occurred in buffaloes. As the water buffalo cows seem to exhibit only, slight isolations at calving from the herd; maternal isolations at calving has been suggested to lower the risk of predation on the calf and to facilitate imprinting between cow and calf, and in case of isolation in calving pen, the bond between mother and calf may be formed without the disturbance caused by the interactions from other members (**Mloszewski, 1983**).

**4.6. Other aberrant maternal behaviours.**

1. Buffalo cows may slow to stand after a recumbent calving and usually stimulated to get up by the movement and vocalization of the calf. 2. Delayed first standing by newly born calves which must be helped to stand. 3. Delayed grooming (licking) of the calf. 4. Delayed 1st suckling by the calf. 5. Some cows of low maternal care back or sidle away from the calf during suckling and sometimes inexperienced mothers show a fear response by butting or kicking when the newborn moves but this phenomenon is transient.
References


