

## BEHAVIORAL EVALUATION FOR THE USED PRACTICES DURING NURSING OF BUFFALO CALVES IN EGYPT

BY

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### ABSTRACT

A total of forty five buffalo cows were assigned for nursing of sixty buffalo calves throughout this study which had been done at the farm of the Faculty of Vet. Med., Ismailia Province. For easier observation and identification, the animals were divided into three equal groups. The aim of the current work was to investigate the consequences when the number of the nursed buffalo calves exceeded the number of dams in the government owned farms. Concerning the pleuriparous and primiparous dams, the mother young relationship toward their own calves was maternal and selective. They accepted aliens during suckling of their own calves only. The percentage of pleuriparous dams, which accepted their own calves with one alien per mother, was  $85.1 \pm 2.4$ . That percentage decreased to be  $45.3 \pm 2.5$  during nursing of their own calves with two aliens per mother. Regarding the primiparous dams, the above mentioned percentage was  $29.3 \pm 3.4$  during nursing of their own calves with one alien. However, they did not accept nursing of two allens with their own calves. The dam young relationship in multiparous dams assigned for nursing of alien calves after death or weaning of their own, was maternal but not selective. The latter dams, which accepted aliens, were recently parturated and their own calves died. Generally the mother young relationships towards aliens were not selective because of absence of fostering and in turn absence of adoption. The mean duration of suckling during nursing of the mothered buffalo calves was significantly longer than that of aliens ( $P < 0.01$ ). On the other hand, the mean duration of suckling from pleuriparous dams was significantly longer than that from primiparous one ( $P < 0.01$ ). The percentages of buffalo calves that performed normal position during suckling and play after suckling were significantly higher in mothered calves than aliens ( $P < 0.01$ ). Eventually, the percentages of buffalo calves that displayed intersucking and calls of distress were significantly higher in aliens than in case of mothered calves ( $P < 0.01$ ).

### INTRODUCTION

The growth pattern of buffalo calves up to three months is quite variable and depending on the general management and feeding practices (Ranjhan and Pathak, 1979). Many specialized dairy farms in Egypt undergoes some management practices during nursing which may influence the successful rearing of buffalo calves. As a matter of fact, most breeders used to assign a number of mothers for nursing their own buffalo calves and aliens as well. Accordingly, the number of buffalo calves exceeded the number of mothers. Nursing is the behavior of the mother mammal, which allows the young to suck milk from her teats (Fraser and Broom, 1990).

They also added that, increasing attention is now being given to number of calves being fostered on nurse cows to feed naturally. When cross fostering (nursing)

is attempted normal procedure has been to present a cow, already in milk, with several young calves, perhaps newly born. Success has been realized when the fostered young is presented to the nurse cow immediately after her birth and before adopting her natural calf. During this period of maternal awareness, such cows readily adopt numbers of fostered calves and facilitate their suckling. Wyatt, et al. (1977) observed that the adopted calves nursed less frequently and for a shorter total interval daily than their natural born mates.

On the other hand, calves attempted to suckle any cow but were most successful at robbing from high producers when their own calves were suckling (Arave and Albright, 1981). Rosecrans and Hohenboken (1982/83) stated that alien (foster) calves tended to nurse any cow, which allow it. Meanwhile, Lewandrowski and Hurnik (1984) found that most calves (93%) displayed cross suckling and cows were slightly more selective (83%) in tolerating cross suckling. The time per nursing event averaged 10.4 min. while it was 5.0 min. per cross suckling event. Mohamed (1990) observed that the buffalo calves during suckling tended to move their bodies closer to their dams till touching and heifers did not enable their calves from a prolonged duration of suckling. He also noted that, all buffalo calves from healthy pleuriparous dams were showing successful suckling and imprinting in a very clear form without neither calls of distress, butting of udder, non nutritional suckling nor cross suckling. Those buffalo calves were also showing playful activities after suckling.

Shacepinka and Illmann (1992) reported that calves with their mothers present sucked on them almost exclusively and did so in a normal opposite parallel position on 80-90% of occasions, whereas most calves with their mother absent sucked on more than one cow and in a normal position on only 30-37% of occasions. The suckling of alien calves was unevenly distributed between cows. However, if the calf's need to suck is not satisfied during feeding, then non nutritional suckling occurs with the calf licking and sucking itself, other calves, walls and inanimate objects. This behavior leads to health problems and the vice of sucking cows (Albright and Arave, 1997). Limited suckling is mostly practiced in most Egyptian specialized dairy farms. Nevertheless, restricted suckling has beneficial effects on calf growth rate, cow milk yield and mastitis incidence (Preston, 1984).

Meanwhile, Hoffman, et al. (1996) reported that the presence of a non-suckling calf prolongs the interval to first post partum ovulation in its dam, but not to the same extent as a continuously present calf allowed ad libitum suckling. Eventually, Lamb, et al. (1997) assured that ad libitum suckling by an unrelated calf in the presence or absence of a cow's own calf prolongs post partum anovulation.

## MATERIALS AND METHODS

To test and evaluate the used practices of many breeders during nursing of buffalo calves in Egypt, this study was undertaken in the farm of the Faculty of Vet. Med., Suez Canal university, Ismailia Province. A total of forty five buffalo cows and sixty buffalo calves were used during this study which lasted from September, 1998 till the end of February, 1999 and again from September, 1999 till the end of November, 1999.

### **Housing and feeding programs:**

To ensure the colostrum intake, all buffalo calves were left to suckle their mothers ad libitum during the first week in their life. From the beginning of the second week after birth, the assigned mothers for nursing were housed away from calves in another loose housing yard that was compatible with labor saving and comfort. Suckling was allowed twice daily at 6 a.m. in the morning and at 6 p.m. the afternoon. The buffalo calves were located in a separate yard, and joined their mothers only during suckling which continued for one hour each time. All buffalo cows were fed 4 kg concentrate mixture + 6kg green corn + 2kg wheat or rice straw per head per day. Concerning the calves and in addition to suckling, a good quality hay and supplementation of calf starter were offered from the second week of life. Mineral mixture was available in the form of 20-40g calcium carbonate (ground limestone) + 40g common salt per head per day. Water was available ad libitum to animals throughout the day.

### **Experimental design:**

The design was accomplished to match the currently used practices for nursing the buffalo calves in Egypt. For easier and accurate observation, the animals were divided into three typical groups. Each group included fifteen buffalo cows, which were used for nursing of twenty buffalo calves. According to the presence or absence of the mothers in the nursing group, the buffalo calves were classified into mothered and aliens. Each group included ten mothered and ten alien buffalo calves.

The age of calves ranged from eight days to one month old. To test the role of maternal experience and the prevalent conditions in Egypt, the mothers in each group were chosen to be subdivided into three minor groups as following:

Group A: included 5 pleuriparous dams (2<sup>nd</sup> & 3<sup>rd</sup> calvers) and their calves were present within the nursing group.

Group B: included also 5 pleuriparous dams (2<sup>nd</sup> & 3<sup>rd</sup> calvers) but their calves died or weaned.

Group C: included 5 primiparous dams and their calves were present within the nursing group.

### **Observations and records:**

Observations were done for each separate group twice daily at 6 a.m. and again at 6 p.m., each time lasted one hour only. Stop watch, counter and regular camera were used during recording the behavioral activities. Concerning the mothers, the following items were observed:

1. Percentage of mothers within the different groups, which accepted their own, calves and aliens.
2. Investigating the mother - young relationship which was classified according to Perez, et al (1985) into:
  - Maternal and selective for own calves and fostered.
  - Maternal and not selective for aliens.
  - No mother - young relationships.

Secondly in calves, our main attention was to record the percentage of buffalo calves, which performed the following behavioral activities:

1. Normal opposite parallel position which mostly observed during suckling of the mothered and adopted calves (Shacekpinka and Illmann, 1992).
2. Intersucking which appears if the calf's need to suck is not satisfied, then non-nutritional sucking occurs (Albright and Arave, 1997).

3. Calls of distress, which appear either when the sucking need is not satisfied, or in response to the frustration due to absence of successful suckling.
4. Play which is a mirror reflecting the psychological status of buffalo calves after satisfaction of a sucking need. The last two items were observed according to Mohamed (1990). Eventually, the duration of suckling (sec.) was also measured at 23 days old for both mothered and alien buffalo calves. The data were statistically analyzed according to Snedcor and Cochran (1980).

## RESULTS AND DISCUSSION

All pleuriparous dams accepted their own calves and were oriented towards them. They accepted aliens only during suckling of their own calves. The percentage of pleuriparous dams, which accepted their own calves with one alien per mother, was 85.1%. That percentage decreased to be 45.3% during nursing of their own calves with two aliens per mother (table,1).

All mothers denied the suckling trials from aliens alone and that may be attributed to the incomplete understanding of fostering technique & its application by many Egyptian breeders. Group B included the pleuriparous dams assigned for nursing of alien buffalo calves after death or weaning of their own. The percentage of mothers that accepted one alien buffalo calf was 26.6%, Meanwhile the percentage of those which accepted two aliens was 23.9% (table,1). The lower percentage of the previous mothers that accepted aliens could be attributed to incorrect application of fostering. As a matter of fact, many Egyptian breeders in our specialized dairy farms, used to assign a number of buffalo calves to be nursed by a decreased number of dams without following up the consequences. Regarding the primiparous dams, eighty percentage of their own calves were accepted. Three mothers abandoned their own calves because of the emotional trauma, which they got as a result of dystocia. The percentage of the primiparous dams that accepted her own calf with one alien was 29.3% (table, 1) while they did not accept the trials from two aliens with her own calf. The above mentioned findings were nearly similar to what mentioned by Arave and Albright (1981); Rosecrans and Hohenboken (1982/83); Lewandrowski and Hurnik (1984) and Perez *et. al.* (1985).

The mean duration of suckling during nursing of the mothered buffalo calves was significantly longer ( $P < 0.01$ ) than that of aliens (table, 2). On the other hand, the mean duration of suckling was also significantly longer ( $p < 0.01$ ) when nursing from the pleuriparous dams than from the primiparous ones. Anyhow, this may be attributed to the maternal orientation as well as the maternal experience of the pleuriparous dams. The forementioned results are consistent with what reported by Wyatt, *et. al.* (1977) and Lewandrowski and Hurnik (1984). Percentages of buffalo calves that performed the normal position during suckling and play after suckling, were significantly higher ( $P < 0.01$ ) in mothered buffalo calves than that in aliens (table, 3). Majority of the mothered buffalo calves displayed the normal position during suckling because of the proper maternal orientation of their mothers. On the other hand, the majority of the mothered buffalo calves displayed different forms of play after suckling which indicate the satisfaction and vanishing of the sucking need. Percentages of buffalo calves which displayed intersucking and distress calls were

significantly higher ( $P < 0.01$ ) in alien buffalo calves (table, 3). Actually, increased number of aliens displayed cross suckling (intersucking or non-nutritional suckling).

The presence of intersucking gives an indication that the sucking needs are not satisfied yet, and reflects the absence of human conscience during nursing of tender buffalo calves in the government owned farms in Egypt. The previously mentioned observations, findings and explanations are nearly similar to what mentioned by Mohamed (1990); Shacepinka and Illmann (1992) and Albright and Arave (1997). The behavioral signs which indicate the disturbances in the dynamic homeostasis of the buffalo calves during nursing are the presence of tail wagging, distress calls and intersucking (table, 4). This observation coincided with Mohamed (1990). From the above, it could be concluded that the human care is essential for successful rearing of buffalo calves, especially during this critical period of their life. As a matter of fact, when the number of calves exceeds that of dams during nursing then the human role should concentrate on the following points:

- Providing the healthy pleuriparous mothers to perform nursing.
- Fostering is essential to create the maternal responsiveness (adoption) towards the alien buffalo calves.
- Fostering is well known and feasible but needs a loyal person to do and observe till complete adoption.
- Assuagement of the calf sucking need by ensuring successful suckling and imprinting to avoid the occurrence of vices, which may persist all over the animal life.

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Results

**Table (1): Percentage of mothers, which accepted their own buffalo calves and aliens.**

Groups	Total number	Accepted their own calves	Accepted one alien	Accepted her own calf with one alien	Accepted two aliens	Accepted her calf with two aliens
A	15	100%	0%	85.1±2.47	0%	45.3±2.5
B	15	-	26.6±2.1	-	23.9±3.3	-
C	15	80%	0%	29.3±3.4	0%	0%

Group A includes fifteen pleuriparous dams, which were *maternal and selective* for their own buffalo calves. They accepted aliens only during suckling of their own calves.

Group B includes fifteen pleuriparous dams; their own calves were either died or weaned. The mothers, which accepted aliens, were recently parturated and their calves died. *The mother young relationship was maternal but not selective.*

Group C includes fifteen primiparous dams, which were *maternal and selective* for twelve of their own calves. Those, which accepted the alien calves, were only observed during suckling of their own.

*Concerning the aliens, the mother young relationship was not selective* because of absence of fostering which is essential for adoption.

**Table (2): Mean duration of suckling (sec.) during nursing of buffalo calves.**

Calves	Buffalo dams	
	Pleuriparous	Primiparous
Mothered	28.0±1.57**	14.5±1.31
Aliens	21.83±1.01	7.66±0.67

\*\* There was a highly significant difference at P<0.01

L.S.D0.01 = 5.11

**Table (3): Percentage of buffalo calves, which performed the behavioral Activities during suckling.**

Behavioral activities	Mothered (30)	Aliens (30)
Normal opposite parallel position.	78±5.83**	36±2.44
Intersucking.	20±3.16**	62±3.74
Calls of distress.	25±6.45**	90±4.08
Play after suckling.	65±3.27**	21.4±2.6

^ Total number of buffalo calves was 60

\*\* There was a highly significant difference at  $P \leq 0.01$ .

**Table (4): Possibilities and outcomes when calves exceeded The number of dams during suckling.**

Calf during nursing	The outcome	Calf behavioral signs
Alien.	Calf does not find teat.	Tail wagging during suckling, calls of distress & intersucking in a very clear form.
Rejected by his prim. Mother.	Calf does not find teat.	
Accepted with aliens.	Calf finds teat but drinks little.	Tail wagging during suckling, calls of distress & intersucking in a clear form.
Accepted alone from his mother.	Calf finds teat & drinks well.	Playful activities & rest after suckling.

- Tail wagging is normally displayed at the onset of suckling and Diminishes during suckling as a sign of satisfaction.
- Fostering is of special importance for creation of maternal responsiveness, which makes the mothers responsible for aliens as their own.

## المخلص العربى .

## التقييم السلوكى للممارسات المتبعة لرعاية عجول الجاموس فى مصر

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أجريت هذه الدراسة على عدد ٤٥ جاموسة خصصت لرعاية ٦٠ عجل جاموس (من عمر ٨ أيام وحتى عمر شهر) . كان الهدف من هذه الدراسة هو معرفة النتائج المترتبة على زيادة عدد العجول عن عدد أمهات الجاموس فى المزارع الحكومية. أوضحت النتائج أن علاقة الامهات بعجولها أثناء الرضاعة هى علاقة أمومة واختيار وكانت محاولات رضاعة العجول الغربية منها تبوء بالفشل الا أثناء رضاعة عجولها فقط. كانت النسبة المئوية للامهات التى ولدت سابقا وتقبل رضاعة عجل غريب مع عجلها هى ٨٥,١% بينما قلت نسبة الامهات التى كانت ترضع عجولين مع عجلها الى ٤٥,٣%. كانت النسبة المئوية للامهات البكارى التى أرضعت عجل غريب مع عجلها هى ٢٩,٣% بينما لم تقبل أن ترضع عجولين غربيين عنها. كانت علاقة الامهات التى فطمت عجولها أو فقدت تجاة العجول الرضيعة علاقة أمومة فقط وليس اختيار. وعموما كانت علاقة الامهات تجاة العجول الغربية عنها ليست اختيارية حيث كانت لا تختار عجولا بعينها كما تفعل الامهات معى عجولها. وذلك يعزى الى عدم التطبيق السليم لتواجد الامهات الحاضنة وبالتالي غياب التبني. كانت مدة رضاعة العجول التى لها أمهات طويلة بصورة معنوية عن تلك التى ليست لها أمهات. وبشكل عام كانت مدة الرضاعة من الامهات التى ولدت سابقا أطول معنويا عن الرضاعة من البكارى. كانت النسبة المئوية لعجول الجاموس التى اتخذت أوضاعا طبيعية أثناء الرضاعة وكذلك فى العجول التى مارست اللعب بعد الرضاعة أعلى بشكل معنوى فى العجول التى لها أمهات عن العجول الغربية على الامهات. كانت النسبة المئوية للعجول التى مارست الرضاعة البينية (الغير طبيعية) وكذلك التى أظهرت نداءات ضيق أعلى معنويا فى العجول الغربية عن تلك التى لها أمهات.