



The effect of modern care methods on the mortality rate of Dromedary camels calves

تأثير طرق الرعاية الحديثة على معدل نفوق عجول الإبل العربية

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Abstract :

Examination opportunities of traditional camel calf management practices were subject of this study, which aims to reduce the mortality rate in the camel calf herd under the intensive care system. Fifteen camel calves were used in this investigation in a private farm in North Coast. They were divided into three groups, five calves each, in the group (G1) they were left with their mothers and their colostrum were taken in without care. in the second group (G2) they took part of the immunizations and were also loaded onto their mothers to nurse colostrum regularly, while in the third groups(G3), they have had all the immunizations and have been nursed and fed colostrum which was also loaded onto their mothers. The results indicated that group three G3 had a significantly ($P<0.05$) lower mortality rate and higher growth rate. Data illustrated that mortality rate can be reduced by administrating colostrum. Data showed that 100% of younger calves (<6 months) were more susceptible to diarrhea and older ones (6-12 months) suffering mange. Major animal health problems in the early stages of life are associated with lactation times and providing green fodder feeding. Both of good husbandry and health care practices considered one of important reason for successful camel calves rearing at first stage of life and played a vital role in animal physiological needs and the controlled local distribution of disease agents. So, deeper and more comprehensive epidemiological study was demand.

Keywords: Camel calves, diarrhea, calf mortality, North coast, Egypt

المستخلص:

الهدف من هذه الدراسة هو دراسة التحديات والفرص الحالية للممارسات التقليدية لإدارة صغار الإبل. والذي يهدف إلى تقليل نسبة الوفيات في قطيع صغار

الإبل تحت نظام العناية المركزة. تم استخدام خمسة عشر حور من الإبل في هذا البحث بمزرعة خاصة بالساحل الشمالي. تم تقسيم هذه الإبل إلى ثلاث مجموعات، المجموعة الأولى (G1) خمسة حيران من الإبل، تم تركها مع أمهاتها وتم أخذ اللبأ منها دون رعاية، المجموعة الثانية (G2) خمسة حيران من الإبل تم أخذ جزء من التحصينات وتم تحميلها أيضًا على ان تقوم أمهاتهم بإرضاع اللبأ بانتظام، المجموعة الثالثة (G3)، خمسة حيران من الإبل، وقد حصلوا على جميع التحصينات وتم رعايتهم وتغذية اللبأ كما تم تحميلهم على أمهاتهم. أشارت النتائج إلى أن المجموعة الثالثة G3 كان لديها فرق معنوي ($P<0.05$) في انخفاض معدل الوفيات وزيادة في معدل النمو. أشارت النتائج إلى أن المجموعة الثالثة G3 كان لديها معدل وفيات أقل معنويًا ($P<0.05$) ومعدل نمو أعلى. أظهرت البيانات أنه يمكن تقليل معدل الوفيات عن طريق إعطاء اللبأ. أظهرت البيانات أن ١٠٠% من العجول الأصغر سنًا (أقل من ٦ أشهر) كانت أكثر عرضة للإصابة بالإسهال بينما كانت العجول الأكبر سنًا (٦-١٢ شهرًا) تعاني من الجرب. ترتبط المشاكل الصحية الرئيسية للحيوان في المراحل المبكرة من الحياة بأوقات الرضاعة وتوفير الأعلاف الخضراء. تعتبر ممارسات التربية والرعاية الصحية الجيدة أحد الأسباب المهمة لنجاح تربية عجول الإبل في المرحلة الأولى من الحياة ولعبت دورًا حيويًا في تلبية الاحتياجات الفسيولوجية للحيوان والتوزيع المحلي الخاضع للرقابة لعوامل المرض. لذلك، كانت هناك حاجة إلى دراسة وبائية أعمق وأشمل.

INTRODUCTION

Dromedary camel considered one of the most important sources of livestock production, as it contributes by milk and meat production, increase income, and other services that are adapted to all pastoral and arid areas. Improving camel productivity can help control feed shortages by providing unconventional feed,

challenges of food insecurity, liver diseases, inadequate health and extension in poor husbandry systems (Al-Sultan.,2008). It is noted that mortality rates negatively affect the growth of the camel herd and its production potential. Camels characterized by low reproduction efficiency due to delayed maturation, long gestation period and long inter-calving intervals (Coventry, (2002)).A high mortality rate in (53.1%)



was recorded in camel calves less than a year old. On the other side, other factors affected the loss rate included widespread diseases, malnutrition due to household competition for milk and predators (**Browne & Deem . 2012**)., as well as some pathogens such as, contagious skin necrosis, pneumonia, tick and mite infestations and internal parasites. The misconceptions of some camel breeders, for example holding colostrum to newborns after birth that led to increasing rates of neonate loss (**Sarwar, and Majeed, 1997**). It is necessary to find easy and accessible solutions to reduce the mortality rate of newborn camels and work to achieve profitability.

Definition and importance of colostrum:

Colostrum describe as the initial milk secreted by mammary glandes taken up to five day's post-partum, represented approximately 0.5% of a dam's annual milk output. Characterized by thicken, creamy-yellow appearance, essentially milk reinforced with blood proteins and vitamins, helps the newborn develop in its first week of life. Important source of nutrition, necessary as metabolic fuels, essential for thermoregulation, needed for protein synthesis and glucogenesis to ensure homeostasis, required for general maintenance functions and vital as cofactors for enzymes and passive immunity to calves, it also has potent immunomodulatory properties that can preclude calves from developing an active immune response to certain antigens (**Guan , 2015**). Therefore, this study aims to determine the causes and rates of newborn mortality, how to avoid it, and take the necessary measures for improvement

MATERIALS AND METHODS

Many factors, either infectious (diseases caused by bacteria, viruses or protozoa) or noninfectious (dystocia,

improper feeding of colostrum, low birth weight and poor management practices) can affect calf mortality.

Animals :

Fifteen camel calves were used in the current investigation in a private farm in North Coast. they divided into three groups, five calves each. In the first group (G1), calves were left with their mothers and their colostrum were taken in without care. In the second group (G2) calves they took part of the immunizations and were also loaded onto their mothers to nurse colostrum regularly, while third groups(G3), calves have had all the immunizations and have been nursed and fed colostrum regularly

Collection of data :

A private farm records was used, each dams was numbered and named individually from birth to the end of the experiment. Also, their newborns were recorded individually from birth. Date of birth, sex, weaning age and weight, survival rate, culling or death reasons, date and time. and present destination all were recorded according to (**Godden,et al., 2003 and Kamber et al., 2001**).

Reproductive records :

From adult breeding females records, reproductive data (age at first calving, calving interval, mortality by sex and age, culling rates by age) were collected and calculated for three camel groups. Also, data related to calf mortality rates, especially the first year of life, at which newborn calves are weaned, were collected through records to identify the most important causes of mortality in this period and statistical analysis of data especially average weights, ages and weighted standard errors have taken into account) (**Noor,1999**).

Statically analysis

Data were analyzed using the general liner model procedure of SAS (2000). One way ANOVA procedure was used to analyze, Number of feeds per day, diarrhea. data following the next model; $y_{ij} = \mu + T_{ij} + E_{ij}$, were: μ is the overall mean of y_{ij} ; T_{ij} is the treatments effect; E_{ij} is the experimental error. The differences among means were separated according to Duncan's New Multiple Range Test

RESULTS AND DISCUSSION

Parturition pen:

Before three days of the expected day of parturition, dams were individually kept in cleanliness, warmth closed pen for careful observation, nearest herd management for observation the parturition process and provide assistance especially at night. After parturition the newborn calves were left with their respective dams to suckling ad lip. ensuring they gets colostrum.

Udder care:

Immediately after birth, the udder must be taken care by washing and disinfecting with a solution containing potassium permanganate, removing any impurities related to it, and drying.

Calf care:

After parturition, full attention should be paid to the calf because this period is considered a critical for the newborn calf which principally depends on maternal colostrum after birth as a source of protection against infections and disease early in its life and most of morbidity and mortality occurs. So that, the newborn continues with his mother for seven to ten days, after that , transferred to care and rearing young calves pens (Peter, 2010).

Dams care:

Postpartum dams must be carefully considered and close attention must be paid to monitoring any nutritional, metabolic, reproductive or health status disorders such as (milk fever, grass

tetany, acidosis, ketosis) and providing immediate treatment and intervention.

Composition of colostrum:

Colostrum is highly fortified source of nutrient having 7 times the protein and twice the total solids of normal milk, thus it gives an early boost in portion and solid intake. It contains higher amount of minerals and vitamin A which are essential to combat disease, and higher amount five time compared with cow's colostrum of vitamin C. Ingestion of these through colostrum substantially increase the calf's survivability. colostrum gives a laxative effect which is helpful in expulsion of Iconium (first fascies). (mohammed *et al.*, 2003). The camels should be vaccinated against contagious and infectious diseases which help to increase the quantity and quality of gama globulins in colostrums.

Colostrum feeding:

Due to poor hygiene the colostrum of various livestock species has a great potential for bacterial contamination in farms (Stewart *et al.*, 2005). colostrum has been a challenge because of its high protein content, which upon heating increases viscosity and coagulation. The time-temperature conditions of 60 min at 60°C has been described for successful pasteurization of colostrum (Godden *et al.*, 2003) that would decrease colostrum bacteria counts with reduced damage to Ig, vitamins A and E, and β -carotene (Johnson *et al.*, 2007; Donahue *et al.*, 2012). Diarrhea was reported to decrease in calves fed heat-treated colostrum (Godden *et al.*, 2012). Similarly, the calves had greater colonization of *Bifido bacteria* and less *Escherichia coli* than those fed unheated colostrum (Sallam *et al.*, 2012), suggesting possible improved gut health.



Fig (1): Figure showed maternal behavior of dromedary she camel.

Table (1): The amount of milk to feed to camel calves

calf weight	Age of camel calf	Number of feeds per day	Maximum amount per feed (liter)
40	1 week	Up to 6 initially colostrum	¾ litre
50	4 week	6 (4-hourly)	2 litres
70	2 month	4 (6-hourly)	3½ litres
90	3 month	3 (8-hourly)	4½ litres
110	4 month	2 (12-hourly)	3½ litres
130	5 month	1 (24-hourly)	3½ litres

Means in the same row with different superscript are significantly different ($P < 0.05$).

Table (2): Composition of camel milk and colostrum \pm SEM

Ingredients	Camel milk	Camel colostrum
DM (g L^{-1})	106 \pm 5.08	199.55 \pm 5.9
Proteins (g L^{-1})	31.5 \pm 0.79	143.42 \pm 5.91
Fat (g L^{-1})	22 \pm 6.36	1.71 \pm 0.22
Ash (g L^{-1})	7.5 \pm 0.102	9.75 \pm 0.59
Ph	6.45 \pm 0.025	6.28 \pm 0.04
Ca	1.47 \pm 0.38	2.03 \pm 0.31
K	0.98 \pm 0.24	1.26 \pm 0.34
Mg	0.07 \pm 0.01	0.08 \pm 0.07
Na	0.65 \pm 0.11	0.75 \pm 0.08

Means in the same row with different superscript are significantly different (P<0.05).

The highest content of dry matter was observed in camel colostrum due mainly to the high content of proteins. The Ca and K contents which could be necessary to bone growth of the newborn, were higher in camel colostrum than milk. The content of fat in camel colostrum was very low compared to that of bovine colostrum. A similar trend was noted for dromedary and Alxa Bactrian camel as is reported by (Field, 1979.) and (Wernery, 2006.), Therefore, changes in camel milk composition occurred along of lactation stage, (Al-Mutairi,2000), because towards the end of the lactation, the fat, protein, solids and mineral contents increase, while the lactose content decreases (Browne and Deem, 2012).

Table (3): Comparison between experimental groups in terms of number of suckling feeding times and Average daily gain.

items	G1	G2	G3
Number of suckling feeding times	10± 0.03	8± 0.05	6± 0.02
Diarrhea	There is diarrhea	There is diarrhea	There is no diarrhea
Average daily gain	0.523± 0.05	0.694± 0.02	0.960± 0.07

Means in the same row with different superscript are significantly different (P<0.05).

There is a significant difference (p < 0.05) between the different groups, as the results showed that the (G3) third group, which was immunized and ate its food at equal intervals 6 times, had a significant increase in growth parameters and a decrease in diarrhea.

Blood parameters.

There was significant difference ($P < 0.05$) in blood AST concentration among camels G1, G2 and G3 being, 69.05, 73.21 and 58.73 IU/L, respectively. In this respect, Mohamed and Hussein (1999) showed that AST concentration ranged between 34 – 148 IU/l. On the other side, the values of ALT ranged from 7.97 to 6.87 IU/L without significant differences among groups.

Table (4): Blood parameters of the experimental groups

items	G1	G2	G3	±SE
Total proteins, g/dl	8.12	9.35	9.01	0.14
Albumin, g/dl	4.58	4.41	4.74	0.16
Globulin, g/dl	3.42	3.84	3.27	0.30
Triglyceride, mg/dl	78.72 ^b	101.76 ^{ab}	102.32 ^a	8.11
Total lipid, mg/dl	879.00 ^{ab}	891.1 ^a	862.11 ^b	14.98
Glucose, mg/dl	38.11 ^b	57.97 ^a	55.31 ^{ab}	4.79
Urea, mg/dl	33.32	40.12	26.34	6.89
Creatinine, mg/dl	0.97	1.08	1.09	0.05
AST, IU/L	69.05 ^{ab}	73.21 ^a	58.73 ^b	54.92
ALT, IU/L	7.97	7.74	6.87	0.57

Means in the same row with different superscript are significantly different ($P < 0.05$).

(Ahmed Idris, et al., 2015) stated that the ALT content in blood of different camel breeds were 3.01– 6.91 IU/l. Also, (Sarwar and Majeed, 1997) reported that serum ALT activity was positively correlated with serum globulin and total protein levels. Blood plasma transaminase enzymes activity (ALT and AST) are the most important indicators of liver cells activity where increasing the concentration of these enzymes indicate that the tissue activity is destroyed (Bissa, 1998)

Program of the immunizations :

Immunization program for the most important endemic infectious diseases. Endemic infectious diseases represent a real threat to livestock negative effects on the national economy,

because it causes a high rate of mortality among livestock, and a high cost in implementing health, preventive and curative measures to control foci of infection. In addition, some of these diseases are considered diseases common, it threatens human life from time to time. Prevention and control methods depend on developing emergency plans and the necessary strategies that depend in the first place on immunization programs implementation and adherence to procedures preventive Security, the speed of intervention and the extent to which these programs are implemented within the framework of a well-defined emergency plan. This, in turn, is reflected in the degree of success we obtain in resistance and struggle. Any defect in the implementation of these plans negatively affects them. Vaccination program for the most important endemic infectious diseases affecting livestock. There are many endemic infectious diseases that threaten livestock, which livestock are vaccinated against to protect them from infection, It can be divided by the pathogen is of several types: A- Bacterial diseases:1- Infectious abortion disease (Brucellosis) 2- Enterotoxemia. 3- Pasteurellosis. B- viral diseases: 1- Rift valley fever. 2- Foot and mouth disease, 3- Peste des petites ruminants. 4- camel pox.

Implement the immunization program:

These programs must be implemented and completed before the expected start of seasons. In which the emergence of these diseases at least a month depending on the seasonal spread these diseases, and the extent of its endemism, spread, and gifting to livestock in the regions different in light of the available capabilities, disease and immunization times foot and mouth disease, one month before the onset of winter. Infectious abortion. Favorite at any time of the year, blood poisoning one month before the start of the summer season. intestinal poisoning one month before the onset of winter. PPR one month before the



onset of winter. camel pox one month before the onset of winter. Due to the spread of these diseases in an epidemic manner in the region, Therefore, it is preferable to be vaccinated against these diseases every six months vaccination of mothers two months before delivery to give newborns immunity for a period of time up to about two months except for immunization against brucellosis (brucellosis), at the age of 3-8 months with the concentrated vaccine and more with the vaccine diluted with note that some vaccines are given once a year, prefer every six months because encountered infected cases during work in the field.

pox vaccine (live):

Either we immunize the calves when the second month is complete Then it repeats yearly Infested area immunized before the second month Then it is repeated after 6 months and then repeated annually. The vaccine must be used within two hours of dissolving it, and the remainder should be discarded.

Hematopoietic septicemia vaccine (dead):

It has several types used to prevent Pasteurella like lysopase – Coblavax. It is a liquid and shaken before use, used as injection (2 cm) under the skin for calves weighted more than 30 kg and (1cm) for calves weighted less than 30 kg.

For adult animals, two doses are given 4 weeks apart, then an annual dose is given every year.

For small animals.

- Calves from immunized dams' immunization two doses 4 weeks apart the first one at the third week of life, then an annual stimulant dose at the end of the first year of life.

Calves from unvaccinated dams, should be immunized at the end of the first week with two doses, 4 weeks apart, then an annual stimulant dose at the end of the first year of life.

Comments:

The number of vaccinated animals in endemic areas is small to see the reaction within 3-4 days taking into account stressed animals should not be vaccinated.

- In some animals, injections may lead to the appearance of a knot that ranges in size, it is a normal reaction and it disappears after two months.

Intestinal poisoning vaccine :

It is against clostridia, and the bottle must be shaken before use it is injected under the skin on the side of the neck, and the dose is 2 cm per head. Females who have not previously been vaccinated, fortify with two doses 4-6 weeks apart, then dose it a week or two before delivery. Females who have been previously immunized vaccinate annually with 2 cm before birth, one or two weeks. Calves born from two mothers are vaccinated: It is divided as follows:

- A- Prepared for slaughter, vaccinate once 2 cm at the 6-8th week
 - B- equipment for education, immunized in the sixth week, 4 weeks later, a dose, then repeated annually
 - C- calves produced from unvaccinated mothers, fortify when buying in two doses, 4-6 weeks apart, then repeat annually
- Adult males, annually vaccinated 2 cm below the skin

Pseudotuberculosis vaccine:

It is used subcutaneously at a dose of 2 cm per head immunization programmed, female camels produced from immunized mothers, vaccinated annually as for the result of unprotected mothers' vaccination in two doses between 4-5 weeks and then repeated annually. Males used for reproduction. Repeat annually before pollination calves produced from immunized mothers, injected in two doses 4-6 weeks apart, then repeated annually.

Foot and mouth disease vaccine:

Quadruple killed vaccine against the following strains, A-O-V-ASIA 1 is administered in a dose of 1 cm per head subcutaneously, animals are vaccinated with an initial dose at the age of 6 months, then it is repeated every 4-6 months periodically, according to the epidemiological situation. Immunization program for the most important endemic infectious diseases.

Important guidance related to immunization processes :

- 1- record the date and type of vaccination in the periodic immunization schedule.
- 2- vaccination is not a substitute for caring for livestock and feeding them well to raise their natural immunity.
- 3- Examination of livestock for internal and external parasites and giving them treatments occasion because the presence of these parasites reduces the immune response to immunizations.
- 4- Vaccinations must be carried out in the absence of stressors on the animal and his immune system such as malnutrition, high or very low temperatures or in there are winds and storms.
- 5- Adhere to the precautions and requirements for storing the vaccine, transporting it to the field, and dealing with the vaccine during the immunization process.
- 6- Commitment to the dates specified for the primary and reactivated immunization operations.
- 7- Obligation to record the type of vaccine and the date of vaccination in the vaccination schedule.

Available Calf losses:

Average preweaning mortality (birth to 12 months of age) was found to be 27.3 calves, respectively, over the 20 years. Calf mortality for single years shows a wide variation especially in the dromedary extensive systems. It ranged from 5 to 87% maghrebian calves. The often-quoted calf mortality rates of 30 to 50% for north coast can well represent values of single years, but

seem to be exaggerated if used as long-term averages. Only in the extensive system, mortality of male calves was significantly higher than that of female calves and of male calves in the other two systems (table III). In a milk-oriented system, higher male calf mortality rates would not be surprising especially when males cannot be sold or fattened and slaughtered (9).

Further analysis of the production systems (15) showed that the maghrabian camel production system is predominantly geared towards milk production and male calves are of secondary importance. In the intensive systems, however, males are of higher value because of their transport function and as savings (15).

Table (5): Different percentage of calves' losses in experimental groups

Item	G1 (without immunization and feed some of colostrum)	G2 (with some immunization and often with mothers)	G3 (with all immunization and totally with mothers)
Calves losses %	4 ± 0.08	2 ^b ± 0.08	0 ± 0.08

values with different letters differ at (p < 0.05)

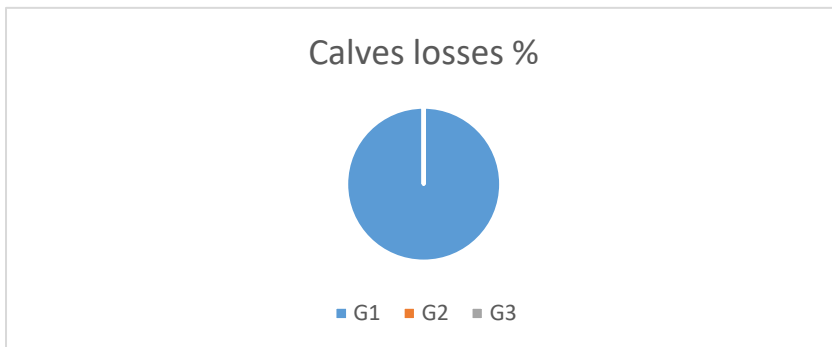


Fig (2): Figure explain calves losses of different experiments

CONCLUSION

It is important to give colostrum milk to newborns, and the third group showed a significant difference in decrease mortality rate, as the young calves were left with their mothers without isolation for 15 days. On the third day of birth, the calves in the third group were given 1 cm of Mariucil or Draxin subcutaneously with 3 cm of vitamin D, and repeated after 15 days, with 1 cm of Ivomac given under the skin, and repeated after 15 days. Sovereign immunizations after the age of one year, immunizing the ten diseases with covaxin 10 every 6 months, also Rift Valley fever every 6 months and foot and mouth disease every 6 months. Aminovit is mixed, which is a mixture of vitamins necessary for drinking water. One centimeter per liter is added for three consecutive days. Thirst is taken into account before adding.

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