International Journal of Multidisciplinary Research and Development
Online ISSN: 2349-4182, Print ISSN: 2349-5979; Impact Factor: RJIF 5.72
Received: 14-06-2019; Accepted: 17-07-2019
www.allsubjectjournal.com
Volume 6; Issue 9; September 2019; Page No. 153-158

Kids mortality before weaning in *Damascus cyprus* goats eastern Sudan

Omer Mohammed Omer Musa[1], Yassin Elamin Ahmed[2], Ali FMI[3]
[1] Ministry of Livestock Resources and Fisheries, Kassala State, Sudan
[2, 3] Assistant Professor, Department of Animal Production, Faculty of Agriculture and Natural Resource, Kassala University, Sudan

Abstract
The objective of this study were to determine the pre-weaning kids mortality of the *Damascus cyprus* goats in the Eastern Sudan and it's conducted during the period extending from 2014 to 2016, included two district seasons cool dry(Dec-Feb) and hot dry March-May) season(Winter and Summer) on 444 kids born from 336 parent stock the number of kids died were 63 kids during the study. Data collected were used to evaluate the overall means weight, mortality percent in winter and summer, mortality percent at the first week, causes of mortality. The overall means weight of the *Damascus cyprus* kids were (3.96±0.39) Kg The overall mortality percent in winter were 11.6%, in summer were 17.5%, in both seasons winter and summer were 14.2 %. At the first week the mortality were 30.2 % followed by the second week 19% while in the third week were 12.7 % in fourth week were 11.1% and its reduced gradually till reach 4.7 % in eight weeks at weaning ages. then were reduced gradually with the increase of age. Mortality percent in winter were less comparing with in summer this might be due to environmental condition is favorable and no heat stress. The major causes of kid mortality identified during this study diarrhea was the most frequently suspected cause of mortality (44.4%); followed by weakness (27%), inadequate nutrition (12.6%), environmental condition (8%).

Keywords: *Damascus cyprus* goats, kids mortality, Eastern Sudan

1. Introduction
Goats play a potential role in the subsistence economy of Sudan where they are generally raised by poor farmers and distressed women and they are important species of livestock, They require moderate care, reproduce quickly and start to bear kids from the age of one year old (Sundaram *et al*., 2012) [12]. Birth weight is one of the traits that have no direct economic values but permit early selection by its high association with growth and production in later ages. The average birth weight of crossbred Sannen and Nubian kids was 3.56 Kg for the range of (2.0 - 4.8) kg (El Zubeir and Abd El Gadir, 2005) [5]. Kids born as twin had lower birth weight and slower early growth rate than those born as single. Birth weight is a critical factor in perinatal mortality. Kids that weigh over 2.9 Kg have higher survival rates than lighter kids. mortality rates as high as 40 % having been reported (Mamabolo and Webb 2005) [9]. Mortality were 12.1% - 28.1% in beetal kids, 3.1% - 10.4% in Teddy kids while In Nachi kids were 16.4%. On average, nearly 14 percent of kids in the U.S. die before weaning. under extensive system in tropical areas, were higher than intensive systems. (Farooq1, 2018) [6]. Mortality of 16-60% has been recorded, This may be under estimated as deaths of newborns, which occur when goats are browsing, may go unnoticed (Ademosun AA. 1988) [1]. In order to reduce high rate of kid mortality it is very important to know the causes of kid mortality. Knowledge of the causes of mortality would be helpful in designing strategies that would minimize loss of kids due to the identified problems. However Mortality of kids may be reduced by control of internal and external parasites, proper feeding of the dam, vaccination and improved housing. But on the other hand, relatively low birth weight; slow growth rate and insufficient milk produced by the does were identified as the major constraints directly associated with higher kid mortality. Among the factors affecting kid mortality during the pre-weaning period, birth weight was the most important. Mortality rate decrease with increase of birth weight (Sebei PJ, Mc Crindle. 2004) [11] The most dangerous time in a kid's life is its first month which raise the rate of death (Awemu, E. M at el, 1999) [2]. Kids that weigh less than 1 Kg have high death rates. Lightweight kids usually die of starvation or hypothermia. If your does do not receive enough nutrition during the third trimester of pregnancy, they are likely to have more trouble giving birth and produce less and lower quality colostrum. Factors that may be livelihood in the survival rate of kids include high birth weight of the kid, genetics, mothering ability and milk production of the dam, adverse environmental or feeding conditions, over suckling, diarrhea diseases and predators. (Snyman, 2010) [13]. As a result, farmers in communal areas encounter high kid mortality during summer (Komwihangilo *et al.* 2012) [8]. Low survivability and high mortalities of kids in communal areas result in low weaning percentages (El-Abid and Abu-Nikhaila 2009) [4]. Generally, higher kid mortality occurs at birth and from birth to weaning while mortality is relatively low from weaning to breeding age in many production systems (Donkin and Boyazoglu, 2004) [3]. Several factors had been reported in the literature to affect mortality rate in goat kids such as type of birth, multiple kids, sex of kid, birth weight of kid, parity order, season of kidding and age of the kid Turkson *et al*., 2004; Hailu *et al*., 2006) [14, 7]. Also In most cases, low productivity of goats is due to various factors such as high kid mortality and weak kids born, low weight born kids.

The objective of this study was to determine the pre-weaning kids mortality of the *Damascus cyprus* goats in the Eastern Sudan.

2. Materials and Methods

2.1 Study period and location

The total number of births recorded during the study period Four hundred and forty four male and female of *Damascus cyprus* goats kids were used in this study. All events such as environmental condition, diarrhea, weakness, births and deaths were recorded, whenever possible dead kids were subjected to post-mortem examination to establish the cause of the death. The kids were born during the period extending between 2014 to 2016 included two district seasons cool dry from December 2014 – February 2015 in winter season 249 kids as the following (103) single kids and 146 twins kids while in summer from March – May 2016 the total were 195 kids 55 single, 140 twins kids were studded, parent stock raised under semi- intensive system in Kassala State,which lies between latitude 34º 12' and 36º 57' East, and between longitude 14º 12' and 17º 12.

2.1.1. The climate

The area lies within poor savanna zone and can be classified at hot semi-arid zone. The annual temperature in Kassala town is 33 -47 c. the Northern and western wind blows in the winter, while the southern wind blows in autumn (the rainy seasons). The rainfall varies between 150 to 400 mm in autumn. The annual temperature were 33 -47 c. the Northern and western wind blows in the winter, while the southern wind blows in autumn. Source (Ministry of Agriculture and animal resources (2010).

2.2 Breeding method program

The main method practiced in breeding was natural mating

2.2.1 Kids and does growth

The kids were weighed immediately following delivery at their birth then Kid's mortality and the causes of death were recorded.

Fig 1: Tagging of new birth kids

2.3 Health and disease control

Vaccination against the major prevailing epidemic diseases in the farm internal and external parasites, control for preventing spread diseases and to reduce mortality were practiced regularly in the farm, vaccination was been carried against write full name P.P.R and Sheep pox.this were diseases spread in the area

2.4 Statistical Analysis

The Statistical Package for Social Sciences statistical computer software (SPSS for windows release version, (10.5). was used to analyze the data by Independent – samples T test. The analysis data were described by mean, standard deviation and Std. Error also The data were recorded on a computer coding sheet in the field every week. These were subsequently entered into an IBM personal computer for analysis.

3. Result

3.1 Kids birth weight

The result of data at birth weight of the *Damascus cyprus* kids were affected by different season. The result were revealed in Table (1) showing the birth weight (4.50 ±0.40) - (3, 86 ±0.30) kg, in the winter for the single and twins respectively while in summer (4.01±0.35) kg – (3.50±0.33) kg for the single and twins respectively. The overall means of the birth weight of the *Damascus cyprus* kids were 3.96±0.39 (Kg) which is significant ($p<0.05$).

Table 1: Kids Birth weight in winter and summer of *Damascus cyprus* goats

Season	Liter- size	N	Mean ± SD	Sig
Winter	Single	103	4.50 ±0.40(kg)	**
	Twins	146	3.86 ±0.30(kg)	
Summer	Single	55	4.01±0.35(kg)	**
	Twins	140	3.50±0.33(kg)	
Total average	Birth type	444	3.96±0.39 (Kg)	**

** = P<0.01

Sig = significant

3.2 Kids mortality:

The data in table (2)showed kid's mortality means and percent of the *Damascus cyprus* goats in winter and summer. overall mortality percentage in both seasons winter and summer were. (14.2%) The mortality percentage in summer high than in winter and in twins were high than in single.

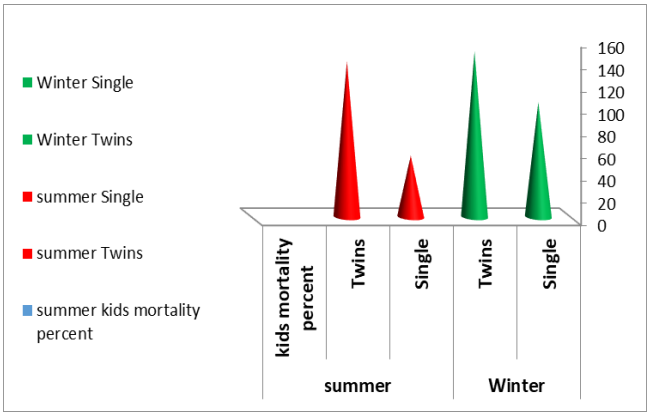

Fig 2

Table 2: Type of the birth and mortality kids percent in winter and summer

Season	Liter-size	No of the kids born	kids mortality	Means + S D	mortality %	Sig
Winter	Single	103	10	10.0 ± 3.65	9.7 %	**
	Twins	146	19	13.29 ± 2.26	13 %	
Summer	Single	55	9	16.92 ± 4.8	16.4 %	**
	Twins	140	25	18.31 ± 1.7	17.9 %	
Total	Type of birth	444	63	14.81 ± 2.8	14.2 %	**

**=P<0.01
Sig= significant

3.2.1 Kids mortality in winter

The data in table (3) showed kid's mortality means and percent of the Damascus goats in winter. the mortality means were (10.0 ± 3.65) (13.29 ± 2.26) for single and twins respectively The overall mortality means were (11.6± 2.9).. While mortality percent were (11.6%). Mortality in winter is less comparing with the summer.

Table 3: Type of birth and mortality percent in winter

No of the does	Type of birth	No of the kids born	kids mortality	Means + S D	kids mortality %
190	Single	103	10	10.0 ± 3.65	9.7 %
	Twins	146	19	13.29 ± 2.26	13 %
		249	29	11.6± 2.9	11.6 %

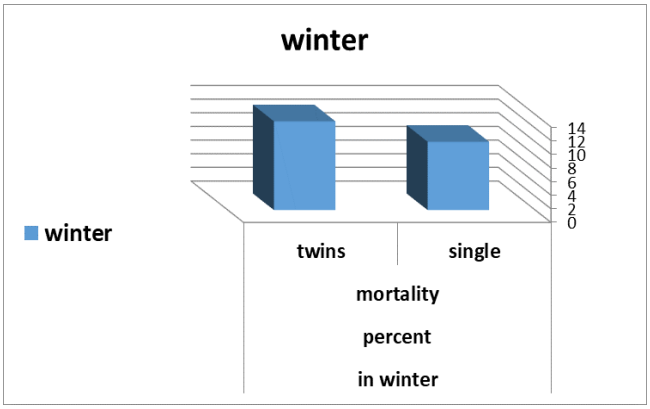

Fig 3

3.2.2 Kids Mortality in summer

The data in table (4) showed kid's mortality means and percent of the shami Damascus goats in summer. The mortality means were (16.92 ± 4.8) and (18.31 ± 1.7) for single and twins respectively. The overall mortality means were (17.6± 3.25).. While mortality percentage were (17.5%) The mortality percentage in summer high than in winter.

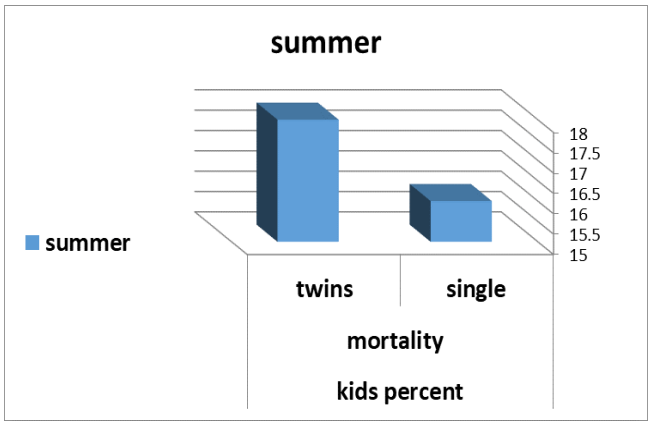

Fig 4

Table 4: Type of the birth and mortality percent in summer

Season	No of the does	Type of birth	No of the kids born	kids mortality	Means + S D	Kids mortality%
Summer	146	Single	55	9	16.92 ± 4.8	16.4 %
		Twins	140	25	18.31 ± 1.7	17.9 %
		Total	195	34	17.6± 3.25	17.5 %

3.3 Mortality per weeks

Table (5) concerning the Number and percentage mortality per weeks (8 weeks), at the first week mortality is very high they were 30.2 % second week were 19% till reach 4.7% at 8 weeks, while about month(4 weeks)were reach 71%.

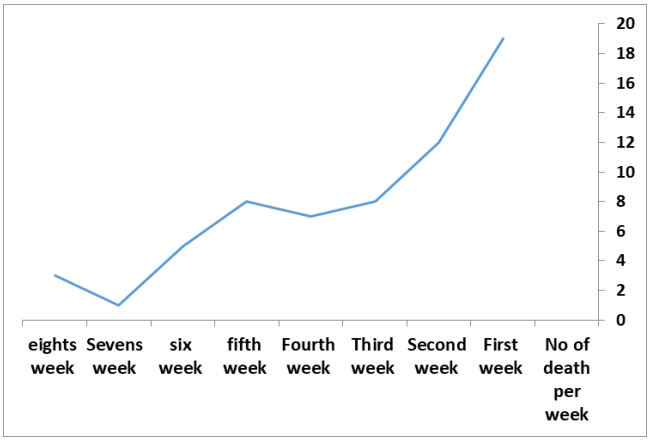

Fig 5

Number and percent mortality kids per weeks

Table 5

Age in week	Number of the mortality	Total percent of the mortality
First week	19	30.2 %
Second week	12	19 %
Third week	8	12.7 %
Fourth week	7	11.1
fifth week	8	12.7 %
six week	5	8 %
Sevens week	1	1.6 %
eights week	3	4.7 %
Total	63	100 %
Total average % in 8 weeks	63/444*100	14.2 %
Percent in first week	19/63*100	30%
Total mortality % in 4 weeks	46/63*100	73 %

3.4 Cause of the Mortality

Table (6) consist of major causes of kid mortality identified during the study and their contribution to the total number of death. diarrhea was the most frequently suspected cause of mortality (44.4%); followed by weakness (27%), inadequate nutrition (12.6%), environmental condition (8%),

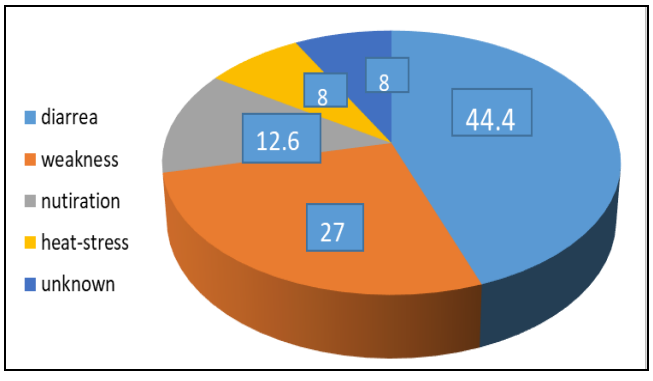

Fig 6: Cause of mortality kids percent

Table 6: Cause of the Mortality %

Cause of the death	Mortality Number	Mortality %
Diseases		
Diarrhea	28	44.4%
Predator	-	-
Environmental condition	5	8 %
inadequate nutrition,	8	12.6 %
Weakness	17	27 %
Mismanagement	-	-
Unknown	5	8 %
Miss – mother	-	-
Ticks	-	-
Total	63	100 %
Total percent	63/444*100	14.2 %

4. Discussion

4.1 Kids birth weight

The birth weight of the *Damascus cyprus* kids goats were (4.50 ±0.40) - (3, 86 ±0.30) kg, in the winter for the single and twins respectively while in summer (4.01±0.35) kg (3.50±0.33) kg for the single and twins respectively. The overall means were (3.96±0.39) Kg this result were favorable with El Zubeir and Abd El Gadir, 2005). who

reported that The average birth weight of cross -breed Sannen and Nubian kids was 3.56 Kg for the range of (2.0 - 4.8) kids born as twin had lower birth weight and slower early growth rate than those born as single,

4.2 Kids mortality

In this study the overall mortality percentage in both seasons winter and summer were. (14.2%) this result were acceptable because were less than normal this is due to the high birth weight (3.96±0.39 Kg) which leads to high survive and this result one line with (Mamabolo and Webb 2005) [9]. Who noticed that Kids that weigh over 2.9 Kg have higher survival rates than lighter kids. The mortality rate is affected by many factors such as diseases, heat stress, inadequate nutrition and mismanagement.

4.2.1 Type of birth on mortality

They were found that in this experiment mortality percentage in twins high than in single. this might be referred to low weight and weakness of the twins kids comparing with the single which were heavier. This result agree with (Turkson *et al*., 2004) [14]; (Hailu *et al*. 2006) [7]. Who reported that some factors had been affected mortality rate in goat kids, multiple kids died more than single kids.

4.2.2 Average rate on mortality

The overall mortality percent in winter were 11.6% while in summer were 17.5% and overall mortality percent in both seasons winter and summer were 14.2 % this is compatible with (Farooq1, 2018) [6]. Who reported that the mortality kids were 12.1% - 28.1% in beetal kids, 3.1% - 10.4% in Teddy kids while In Nachi kids were 16.4%.On average, nearly 14 percent of kids in the U.S.

4.2.3 Kids mortality in winter

The overall mortality percent in winter were (11.6%). This were agree with (Mamabolo and Webb 2005) [9]. Who reported that Mortality in beetal kids and Teddy kids were (12.1% - 28. 1%), (3.1% - 10.4%) respectively and mortality in winter were less comparing with the summer this might be referred to the good environmental condition which led the doe consume a large amount of food in the winter, then better growth and increase of weight would be occurred and no heat stress.

4.2.4 Mortality percentage in summer

In this study the mortality percentage in summer high than in winter might be to the high heat stress which leads to prevent kids for suckling beside low consuming of feeding resulting of low productivity in milk production. The result is favorable with (Komwihangilo *et al*. 2012) [8]. Who reported that. The result, of farmers in communal areas encounter high kid mortality occur during summer.

4.2.5 Weeks mortality percent

In this study mortality in the first week were 30.2 % followed by the second week were 19% while in the third week were 12.7 % in fourth week were 11.1% and its reduced gradually till reach 4.7 % in eight weeks at weaning ages and were reduced gradually with the increase of age this result is on line with(Awemu, E. M at el, 1999) [2]. who said that The most dangerous time in a kid's life is its first month which raise the rate of death

4.2.6 Mortality high at birth

It were found that total mortality at 4 weeks were reach 71 %.So the mortality reduced gradually with the increase of age because the kids were suckling enough colostrum and milk to build and maintain their body and get strong resistance against diseases and mortality. This result is on line with(Donkin and Boyazoglu, 2004) [3]. Who reported that Generally, higher kid mortality occurs at birth and from birth to weaning while mortality is relatively low from weaning to breeding age in many production systems.

4.2.7 Causes of kid mortality

Major causes of kid mortality identified during this study and were contribution to the total number of death. diarrhea was the most frequently suspected cause of mortality (44.4%); followed by weakness (27%), inadequate nutrition (12.6%), environmental condition (8%), this result on line with (Snyman, 2010) [13]. Who said that Factors that influence survival rate of kids include environmental, feeding conditions, over suckling, diarrhea diseases and predators.

4.3 Health and disease control

In material and method Vaccination against the major prevailing epidemic diseases in the Farm internal and external parasites, to prevent spreading diseases, reduce deaths and to keep hygiene were done this step were agree with (Sebei PJ, Mc Crindle. 2004) [11] Who reported that Mortality of kids may be reduced by control of internal and external parasites,, vaccination and improved housing proper feeding of the dam.

5. References

1. Ademosun AA. Appropriate management systems for the West African Dwarf goat in humid Tropics, 1988.
2. Awemu EM, wakalor LNN, Abu-Bakr BY. Environmental influences on pre weaning mortality and reproductive performance of Red Sokoto does. Sm Rumen Res. 1999; 34:161-165.
3. Donkin EF, Boyazoglu PA. Diseases and mortality of goat kids in a South African milk goat herd. South Afr. J. Anim. Sci. 2004; 34:258-261.
4. El-Abid KEH, Abu-Nikhaila AM. A study on some factors affecting mortality rates in Sudanese Nubian kids. International Journal of Dairy Science. 2009; 4(2):74-79.
5. El Zubeir, Ibtisam EM, Abd El Gadir ME. Production performance of crossbred (Sannen and Nubian) goats in the second kidding under Sudan conditions. Pakistan Journal of Biological Sciences. 2005; 8(5):734-739.
6. Farooq 1. FVet. Sci. p-ISSN 2348–8883 Scholars Academic and Scientific Publishers (SAS Publishers) A Unit of Scholars Academic and Scientific Society, India, 2018.
7. Hailu D, Mieso G, Nigatu A, Fufa D, Gamada D. The effect of Environmental factors on pre-weaning survival rate of Borana & Arsi-bale Kids. Small Rumen. Res. 2006; 66:291-294.
8. Komwihangilo DM, Jackson M, Munishi Y, Liheta SAB. Situational analysis of smallholder goat production and marketing in Central Tanzania point towards the establishment of farmers' groups. Journal of Agricultural Extension and Rural Development. 2012; 4(12):356-364.

9. Mamabolo MJ, Webb EC. Goat production survey fundamental spects to model goat production systems in Southern Africa. Case study Agricultural commission-WITFOR, South Africa, 2005.
10. MAR. Minstry of Animal Resources, Statistical Bulletin for Animal resources, 2007.
11. Sebei PJ, Crindle MC, Webb EC. Factorsin fluencing weaning percentages of indigenous goats on communal grazing. J. Anim. Sci.; 34(Supplement 1), 2004, 130-133.
12. Sundaram SM, Muthuram lzingam T, Rajkumar JSI, Nishanth B, Sivakumar T. Growth performance of Tellichery goats in an organized farm. Int. J. Dairy. Sci. Res. 2012; 1(3):9-11.
13. Snyman MA. Factors affecting pre-weaning kid mortality in South African Angora goats. South African J. Anim. Sci. 2010; 40(1):0–0.
14. Turkson PK, Antiri YK, Baffuor- Awuah O. Risk factors for kid mortality in West African dwarf goats under an intensive management system in Ghana. Trop. Anim. Health Prod. 2004; 36:353-364.