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Evaluation the birth weight of the Shami Cyprus goats in (winter and summer) in Kassala State: Sudan

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Abstract
This study aimed to evaluate the kids weight of the Shami Cyprus goats in intensive system the study included the 458 kids weight of the Shami Cyprus as the following: to determine the weight of kids (the average birth weight, sex birth weight, twins birth weight, twins rate, in two seasons (winter and summer) The kids were weighed immediately following delivery at their birth and recorded at balance weight. The overall average means of birth weight of Shami Cyprus kids were (3.96±0.39) Kg. male kids were (4.28±0.50) and female single kids were (3.86±0.40) kg in winter, while The means value of single male kids and single female kids in summer were (3.87±0.35) kg, (3.41±0.33) kg respectively, in both seasons we found that the single male kids were significant (p< 0.01) heavier than the single female kids, this might be due attributed to the male sex hormone secretion from gonads which had some anabolic effect during pre-natal life. The single birth kid heavier than twins birth kid, birth weight 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 single birth kid heavier than twins birth kid all these might be due to attributed to limitation of the uterine environment for twin and triplet, as the number of fetuses increase, the number of caruncles attached to each fetus decrease, thus reducing the feed supply to the fetus and hence reduction in the birth weight of the kids. the birth weight and rate of kids in the winter was higher significantly (P<0.01) than that rate kids born in summer These might be due to better pasture condition in pre-winter period plus Environmental circumstances affect the number of ovaries ovulating and undergoing conception, and also the number of young born.

Keywords: birth, weight, Shami Cyprus, different seasons, Kassala State

1. Introduction

1.1 Goat definition

Goats are important species of livestock in most traditional agricultural production system, they play a very important role in the rural economy and live mostly on grazing poor natural pastures in arid and semi-arid areas with no supplementary feeding. The Rural families own small ruminants for provision of milk, meat and other needs. They are a part of traditional extensive grazing systems in many countries. (Hatziminaoglou and Boyazoglu 2004) [9].

1.2 Damascus Goats production

The breed's performance of the Damascus goats under the semi-intensive system of production, is moderately high. Birth weights were range from 3.5 kg to 5.5 kg depending on the type of birth and the sex. The nutrition requirements for growth before and after weaning have been extensively studied. Kid carcasses are less fatty than lamb carcasses, when they are compared at similar slaughter weights or similar slaughter ages. (Mavrogenis A.P. *et al*, 2006) [22]. According to (Khazaal K. 2009) [16], in Lebanon, Shami goats which are raised and bred randomly by farmers have a large variation in their performance.

1.3 Birth weight

Birth weight is an important factor in production. It is influenced by environmental condition, genetic, sex, type of birth, condition before breeding and season of birth, 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 4.8 – 2.0 kg (El Zubeir and Abd El Gadir, 2005) [7]. Kids born as twin had lower birth weight and slower early growth rate than those born as single, but had a higher post-weaning growth rate. In general, males were all significantly heavier than females, and the effect of birth month suggests planning the kidding season would improve production efficiency (Wenzhong Liu *et al*, 2005) [26].

The study on Black Bengal goat showed the effect of region, birth type and sex were significant (p<0.01) on the birth weight, single kids showed the highest weight at birth following by twins and triplets, while birth weight of kids varied according to sex, male kids had higher birth weight than females (Husain *et al*, 1996) [10]. Study of the reproductive performance of South African indigenous (Boer and Nguni) goats was reported that mean kid birth weight (2.7± 0.5 kg), in addition male and crossbred kids were significantly (p<0.01), heavier than female and pure Boer goat kids, respectively. The mean birth weights for singles, twins, triplets and quadruplets were significantly (p<0.01), different from each other (Lehloenya *et al*, 2005) [19] Alama (1987) [3]

noted that the birth weight of single and twin Gezira sub-ecotype were 4.2 and 3.2 Kg respectively. Sex of kid also influences weight at birth and males were heavier than females (Khan, 1979 and Nefzaoui *et al*., 1995) [15, 23]. The birth weight of Jamnapari goats was studied by Khan (1979) [15] and showed that, birth weight of Jamnapari ranged between 2.20 and 4.80 kg for males and between 1.40 and 4.00 Kg for females.

Nutrition during fetal growth and during early-and- mid-pregnancy could impact a legacy of development changes that affect size, viability and health of neonatal growth. Malau-Aduli *et al* (2004) [21] demonstrated that, supplementation with concentrate and crop residues increased birth weight and live weight gain of kids. Increased level of dietary energy supplementation resulted in higher supply of nutrients to the fetus and reflected higher weight (Hossain *et al*, 2003) [11]. high protein significantly increase live weight gain in goats, so the average birth weight of kids was 0.85, 0.75 kg for goats given high protein and low protein respectively (Kabir *et al*, 2002) [12].

1.3.1 Effect type of the birth on birth weight

The type of birth is considered as one of the most important factors influencing birth weight in goats (Das *et al*, 1996; Kosum *et al*, 2004) [6, 18]. Type of birth affected birth weight where 1.21, 1.15, 1.01 and 0.85 kg for single, twin, triplets and quadruplets, and he concluded that, birth weight decrease with increase in litter size (Tuah *et al*, 1992) [25]. Generally the birth weight decreased with increase in litter size, the effect of birth type was persistent from birth to yearling age (Husain *et al*, 1996; Gubartalla *et al*, 2002) [10, 8]. Faiz *et al* (1994) found that, there was increase in birth weight of single than twins and triplets.

1.3.2 Effect of sex of kids on birth weight

The sex of the kids had been considered as one of the factors which affect birth weight. In Nubian goats male kids were significantly heavier at birth compared with female animals (Abu Nikhaila, ELHag, 2003) [1]. Male kids were born heavier than female 3.2+0.08 vs 2.6+0.08 kg for Tswana goat (Madibela *et al*, 2002) [20]. Results of Kochapakdee *et al* (2002) working with native Thai and their crosses with Anglo-Nubian goats showed that male kids were significantly heavier at birth compared with female animals and single kids were also significantly heavier at birth compared with multiple kids. Study of Ageeb (1992) [2] on Baggara goats in South Kordofan revealed that, the birth weight were heavier in males than the females. The birth weights of the twins in local Malawi goats for male's kids were 1.95+0.26 and 1.7+0.24 kg for female kids (Karua and Banda, 1992). Findings of Silva *et al* (1998) showed that kid birth weight of the Alpine dairy goats was varied 3.3-4.5 kg with males, 2.5-3.7 kg with females, and single. Generally several authors and researchers have shown that males are usually heavier at birth than females, (Abu Nikhaila and EL Hag, 2003) [1].

1.3.3 Effect of season of birth weight

Season of the birth is the one of the most important factor which significantly affected kidding rate (Barding *et al*, 2000) [5]. Reported that, the effect of season on litter size was evident, and they found higher twinning percentages in winter as compared with summer.

1.3.4 Effect of season of birth on Litter size

Season of the birth is the major factor affecting litter size, which is lower during the dry season (Alexandre *et al*, 1999). Findings of Karua (1989) revealed that, litter size were largest during the cool dry season (May-Aug) and smallest in the hot dry season (Sep-Nov), the twining rate was lower due to nutritional stress limits.

2. Material and Method

The experiment was conducted during the period extending from 2011 -2014, to assess the Factors affecting birth of kids and the Litter size which is one of the most important factors influencing the birth weight in goats and its known as a doe and often yields multiple kids in one kidding (Steele, 1996).

2.1 Farm Location and description

The study farm located in Eastern Sudan (Kassala State) its belonging to the Ministry of Agriculture and Animal Resources. It was lied in the Western part of Kassala Town, had been establish in 1964, the distance about 20 Fadden, five Fadden for cultivate of alfalfa (Medicago Sativa),for the animals. it consist of many units: nutrition, milk dairy, Beef, poultry Artificial Insemination and Shami Cyprus Goats.

2.2 Dam housing

The stall was constructed to protect the animals against temperature, storm, climates condition and predators. Adequate ventilation was ensured plus feeding equipment's and free access to drinking water is provided, six pens were equipped The 3 biggest for the mature animals in different physiological and production status, the rest of the pens are provided for kids and younger animals.

2.3 Feeding Dam system

The animals were fed on dry alfalfa (*Medicago Sativa*), depending on age and physiological stage; the animals were also offered 0.5-1.5 kg of concentrate mixture consisting of nut ground cake, sorghum seed, wheat bran, limestone and salt The concentrate offered once daily constantly while the dry alfalfa was offered twice after milking. Clean water was freely available.

2.4 Data collection

The collection of information relied on farm records. and direct weighing after immediately parturition.

2.5 Born Kids

The kids were weighed immediately following delivery at their birth weight and recorded plus weighing at balance weight.

2.6 Number of kids

The number of kids in the both seasons winter and summer weighing at electronic balance weight were 458kids

2.7 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

3. Result

3.1 Kids birth weight

The result of data at birth weight of the shami Cyprus kids were affected by different season. And 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 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 were (3.96±0.39) (Kg)

Table 1: Type of the Birth weight in different seasons of Shami goats

Season	Birth number	N	Mean ± SD	S. E	Significance
Winter	Single	103	4.50 ±0.40(kg)	0.062	**
	Twins	149	3.86 ±0.30(kg)	0.044	
Summer	Single	55	4.01±0.35(kg)	0.079	**
	Twins	140	3.50±0.33(kg)	0.048	
Average	-	447	3.96±0.39 (Kg)	0.029	**

** = P<0.01
* = P<0.05
`Sig = significant

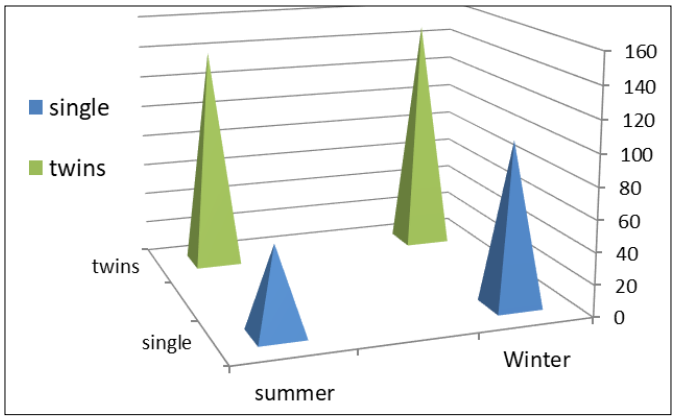

Fig 1: Type of Birth weight in different seasons of Shami goats

3.2 Kids sex birth weight in different seasons

3.2.1 Birth sex weight in winter

The result in table (2) showed that the sex birth weight of the kids born in the winter were highly significant (p<0.01), effected on birth weight. Single male kids heavier (4.28±0.50) than female single kids (3.86±0.40) kg, while in twins male and twins female, showed high significant(P<0.01) on the birth weight also the male twins weight (3.87±0.35) kg heavier than the female twins, kids (3.41±0.33)kg.

Table 2: Sex birth weight at different seasons

Seasons	Sex	number`	Mean ± SD	S.E	Significance
Winter	Male	125	4.28±0.50(kg)	0.2610	**
	Female	129	3.86±0.40(kg)	0.1824	
Summer	Male	98	3.87±0.35(kg)	0.1770	**
	Female	106	3.41±0.33(kg)	0.6551	
Total average	-	458	3.85±0.39	0.3188	***

**=P<0.01
* = P<0.05
Sig= significant

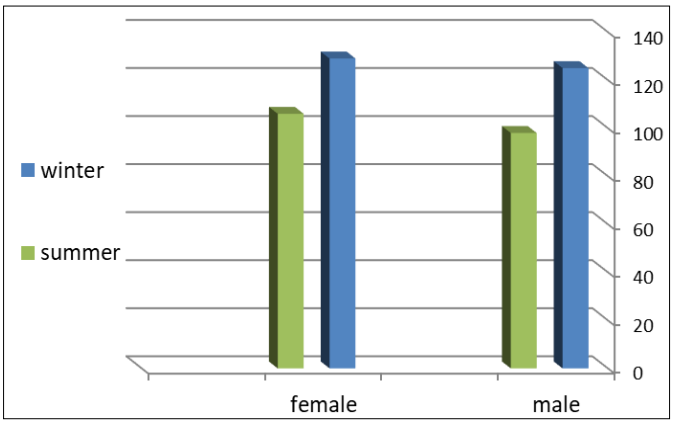

Fig 2: Sex birth weight at different seasons

3.2.2 Birth sex weight in summer

The result in table (2) showed that the birth sex weight in summer highly significant (p< 0.01). The means value of single male kids and single female were (3.87±0.35) kg, (3.41±0.33) kg respectively The birth weight of single born kids were heavier than females born kids.

In table (3) the birth weight of kids in the winter were higher significantly (P<0.01) and heavier than that kids born in summer, The birth sex weight of kids in winter and summer were (4.07±0.48 kg), (3.63±0.41kg) respectively.

Fig 3: Weighing of kids at electronic balance weight

Table 3: Birth weight in different seasons of Shami goat

Seasons	N	Mean ± SD	SE	Significance
Winter	254	4.07±0.48(kg)	0.043474	**
Summer	204	3.63±0.41(kg)	0.044833	
Overall average	458	3.85±0.39	0.029189	***

**=P<0.01
* = P<0.05
Sig= significant

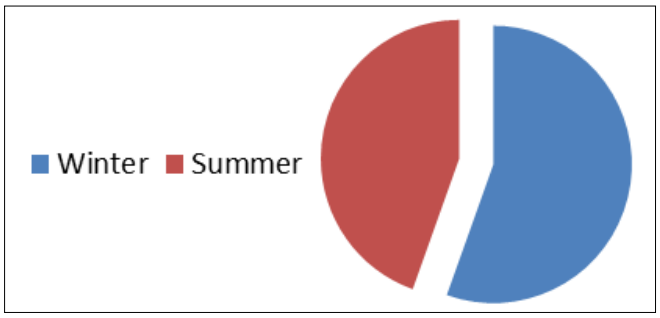

Fig 4: Birth weight in different seasons of Shami goat

4. Discussion

The overall average means of birth weight of shami Cyprus kids of this study was(3.96±0.39 (Kg)).This is similar with Mavrogenis A.P.*et al* (2006) who found the Birth weights of the Damascus goats under the semi-intensive system of production range from 3.5 kg to 5.5 kg depending on the type of birth.and were consistence with The result obtain from El Zubeir and Abd El Gadir, (2005) [7]. Who reported The average birth weight of crossbred Sannen and Nubian kids was 3.56 Kg for the range of 2.0 - 4.8 kg. on line with by Khan (1979) [15]. Who showed that, birth weight of Jamnapari ranged between 2.20 and 4.80 kg.The male kids were (4.28±0.50) and female single kids were (3.86±0.40) kg in winter, while The means value of single male kids and single female kids in summer were (3.87±0.35)kg, (3.41±0.33) kg respectively, in both seasons we found tha Damascus goats under the semi-intensive system of production Damascus goats under the semi-intensive system of production t the single male kids were significant ($p< 0.01$) heavier than the single female kids this result on line with(Abu Nikhaila, ELHag,(2003) [1]. who reported that In Nubian goats male kids were significantly heavier at birth compared with female animals and. agreed with (Madibela *et al*, (2002) [20] who noticed that male kids were born heavier than female 3.2+0.08 vs 2.6+0.08 kg for Tswana goat and favorable with Kochapakdee *et al* (2002), who working on native Thai Goats.and also simillar with Khan (1979) [15] showed that, birth weight of Jamnapari ranged between 2.20 and 4.80 kg for males and between 1.40 and 4.00 Kg for females and consistence with Ageeb (1992) [2] for his study on Baggara goats in South Kordofan revealed that, the birth weight were heavier in males than the females. All this might be due attributed to the male sex hormone secretion from gonads which had some anabolic effect during pre-natal life The single birth kid heavier than twins birth kid, birth weight were (4.50 ±0.40) kg - (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. this is on line with (Lehloenya *et al*, 2005) [19] Alama (1987) [3] who reported that the birth weight of single and twin Gezira sub-ecotype were 4.2 and 3.2 Kg respectively. And on line with (Tuah *et al*, 1992) [25] who studied Type of birth affected birth weight where 1.21, 1.15, 1.01 and 0.85 kg for single, twin, triplets and quadruplets, and were agreed with (Husain *et al*, 1996; Gubartalla *et al*, 2002) [10, 8].

Faiz *et al* (1994). They found that, there was increase in birth weight of single than twins and triplets.

All these might be due to attributed to limitation of the uterine environment for twin and triplet, as the number of fetuses increase, the number of caruncles attached to each fetus decrease, thus reducing the feed supply to the fetus and hence reduction in the birth weight of the kids.

The birth weight and rate of kids in the winter was higher significantly ($P<0.01$) than that rate kids born in summer this might be referred to the good environmental condition which led the doe consume a large amount of food in the winter. this is on line with (Barding *et al*, 2000) [5]. Prasad *et al* (1972) reported that, litter size higher twinning percentages in winter as compared with summer.and agreed with (Alexandre *et al*, 1999) [4]. reported litter size, is lower during the summer, high in winter and consistence with findings of Karua (1989) [13] and Ndlovu (1992) revealed that, litter size were largest during the cool dry season (May-Aug) and smallest in the hot dry season (Sep-Nov), the twining rate was lower due to nutritional stress limits. These might be due to better pasture condition in pre-winter period plus Environmental circumstances affect the number of ovaries ovulating and undergoing conception, and also the number of young born.

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