EFFECT OF DIFFERENT SEASONS ON TAGGAR GOAT PERFORMANCE

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Abstract:
Effect of climate change through season of birth was carried out to evaluate some reproductive and productive performance of mountain goat (Taggar goats). Forty seven (47) mature Taggar goats were used in this experiment. Animals were allocated in two groups according to season of birth, rainy season and dry season. The results indicated that rainy season kidders secured higher litter size 1.45 compared with dry season kidders 1.18. Where kidding rate was high in rainy season kidders 100% compared with dry season kidders. Body weight was heavier at kidding and weaning time for rainy season kidders compared with dry season kidders. The kidding interval and service period for the rainy season kidders shorter compared with dry season kidders. In conclusion the season of birth was sharply affected goat reproductive and productive performance.

Key words: - Dry land, Nuba Mountain, climate, season, range land, taggar.
INTRODUCTION:
Climate change, particularly global warming, may strongly affect production performance of farm animals worldwide. Climate change affects natural resources (such as water sources, land and pastures), biodiversity and livestock health (Thornton, 2010). Under tropical environmental conditions, the main factor influencing the productivity of goat’s flocks is climatic seasonality. Since raising goats under extensive conditions implies that environmental factors and their interactions (relief and altitude, climate parameters and climate change) are of central importance and they determine the levels of performance and productivity (Nassif and El Amiri, 2011). This change rise as a seasonal fluctuation in feed resources, poor management and diseases, especially endoparasitism. The impact of climate change on pastures and rangelands may include deterioration of pasture quality towards poorer quality (Field, 2005). The widespread of negative impacts on forage quality affect livestock productivity (Porter et al., 2014).

The indirect effects of climate driven changes in animal performance result mainly from alterations in the nutritional environment. However changes in climate would affect the quality and quantity of forage produced (Topp and Doyle, 1996a). Livestock nutrition is the major constraint to sustainable livestock production in drylands especially during the dry seasons (Mnene et al 2004). In the Arid and Semi-Arid Lands, rainfall is the key driving factor and is characterized by high diversity and failure that lead to frequent droughts. A drought is a prolonged dry season, two to three or more dry seasons.

The level of reproductive performance is dependent on the interaction of genetic and environmental factors, but this performance is particularly susceptible to the latter, for example, the seasonal availability of nutrients can affect reproduction considerably. Season of parturition influence the duration of postpartum anoestrus (Rojer et al, 2005), kidding interval (MajeleSibanda et al, 2000). Goat populations in Sudan were estimated to be 42 million, the mainly composed of Nubian, Desert, Nilotic and Mountain (Taggar) breeds. Under the tropical condition of western Sudan, the traditional farming system is practiced on communal grazing areas (Ahmed et al 2001). Goats fulfill their nutrition needs mainly by eating the available vegetation. They rarely receive any supplements. The supply of nutrients from the veld fluctuates between years and seasons. When basic requirements are not fulfilled goats start to use body weight loss, this might be reflected on goat’s productivity performance (Ramirez-Perez et al 2000). The goal of this study is to explore the effects of season change on Taggar goat’s productivity under dry land conditions of western Sudan.

Material and Methods

Study area
This study were conducted in Dalanj area (longitudes 12.02˚ N, Latitudes 29.39˚E) Southern Kordofan state. The mean monthly temperature ranged from 25.8 C° in July to 31.3 C° in April. The mean maximum is about 39 C° in the three months prior the rainy season with peak temperature in May. The mean minimum Temperature varied between 17 C° in January to more than 20 C° at the onset of the rains in May. Annual rainfall of a range 500-800 mm, with peak rain in August. The relative humidity of 35% rose to 75% during the rainy season.

Experimental animals
Forty seven pregnant Taggar does ranging in age between 1-4 years, with three bucks were acquired by direct purchase local market. Does and bucks were treated with the necessary medication against endo-and ecto-parasites (AGVET, USA 1.0 ml/50 kg body weight subcutaneously Ivomec super drench) and vaccinated against goat pox, Anthrax and Hemorrhagic Septicemia. The does were ear tagged, weighted and divided into two groups according to season of birth (rainy season and dry seasons) as group 1 and 2 consisting of 29 and 18 does respectively. Mix all animals were allowed free grazing on an early pasture from 8.00 am to 6.00 pm. The does were weighed at weekly interval for 8 weeks before kidding and 12 weeks post kidding. The does were fasted overnight before being weighed.

Statistical analysis
The data statistically analyzed according to complete randomizes design using Statistical Package for the Social Sciences, software package (SPSS version 10 1996). Analysis of covariance was carried out. Duncan’s Multiple Range Tests (DMRT) was also used to test means significance differences.

Results:
Effect of season on litter size and kidding rate:
The effect of season of birth on litter size is displayed in (Table 1). The results showed the rainy season kidder had secured large litter size compared with the dry season kidders. The two seasons of birth exert significantly (P<0.05) effect on the kidding rates were 100% for the rainy and 94.4% dry season respectively.

Table 1. Effect of season on litter size and kidding rate

| Season of birth | N  | No. of kidding doe | No. of kids | Litter size | Kidding rate % |
|----------------|----|--------------------|-------------|-------------|----------------|
| Rainy season   | 29 | 29                 | 42          | 1.54±0.09a  | 100            |
| Dry season     | 18 | 17                 | 20          | 1.18±0.09b  | 94.4           |

*Ab Values in same column with different superscripts differ at P<0.05*
Effect of season on body weight at kidding, and weaning:
The does that kidded during the rainy season maintained a significantly (P<0.05) heavier body weight than those which kidded in the dry season. The season of birth secured insignificant (P>0.05) effect on weight at weaning, however, the does kidded during the rainy had heavier body weight at weaning than does kidding during the dry seasons (Table 2).

Table 2. Effect of season on the body weight at kidding and weaning

| Season of birth | N      | Body weight at kidding | Body weight at weaning | Body weight change | change %  |
|----------------|--------|------------------------|------------------------|--------------------|-----------|
| Rainy season   | 29     | 25.08±0.28a            | 22.01±0.29             | -3.07±0.21b        | 12.2      |
| Dry season     | 17     | 24.15±0.23b            | 21.24±0.35             | -2.94±0.30a        | 12.2      |

abc Values in same column with different superscripts differ at P<0.05

Kidding interval and service period:
Season of birth exerted significant effect on kidding interval and service period despite that the rainy season kids have shorter kidding interval and service period compared with dry season kids (Table 3).

Table 3. Effect of season on kidding interval and service period (days)

| Season of birth | N       | Kidding interval | Service period |
|----------------|---------|------------------|----------------|
| Rainy season   | 27      | 257.77±3.32      | 80.98±4.81     |
| Dry season     | 17      | 261.93±7.95      | 83.25±3.44     |

abcd Values in same column with different superscripts differ at P<0.05

Discussion:
The season of birth significantly (P<0.01) affected litter size, does that kidding during the rainy season maintained litter size of 1.45 compared to 1.18 kids for the cool dry season kids. This result complies with several authors, Silva et al (1998), Madibela et al (2002) and Dadi et al (2008). The large litter size during the rainy season could be due to the availability of green folder grasses and forages which resulted in higher body condition score and body weight at mating and may be also due to high temperature accruing during dry season which delay feed intake for the dry season kids. The difference in kidding interval, the despite longer kidding interval was noticed in the dry season. This complies with Mtenga et al (1994) and Alexandre et al (2000). The differences in kidding interval may be related to availability of feed from pasture during the rainy and dry seasons, which have direct influence on ovulation rate and fertility, since the nutritional stress appears to be a prime probable cause of cyclicity and long kidding interval in the goats, body weight changes support this hypothesis.

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