

Effects of Sex on the performance of Shami kids in Halfa Elgadida, Kassala State, Sudan

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Abstract: *The highly increased meat and dairy products demand and prices in the Sudan necessitates exploiting less exploited animal species for meat and dairy production. Goats are an attractive alternative due to high population, wide distribution, low investment, producing high quantities of high quality milk and meat and culled animals are exploited for meat production. There is an increasing interest in exotic breeds, especially Shami. Nutrition is a main constraints for goat production in Halfa Elgadida area in Kassala State. Sex is an important factor affecting performance, but there is no available information on its effects on Shami kids. Ten Shami kids (5 males and 5 females) at 7 month old and weighing 17.7kg on average were used in this study. They were treated against external and internal parasites, injected with Oxytetracycline 20% and allocated at random to individual pens. They were fed a concentrates ration based on sorghum grains and groundnut cakes ad lib in one meal at 7am for 45 days including a 10 days preliminary period. They were also fed 1kg green Abu 70 and Barseem weekly before the morning meal for normal gut functions and vitamins. Drinking water was available at all times. Daily feed intake was measured. The animals were weighed at the beginning of the experiment and then weekly before the morning meal. Data was statistically analyzed using the completely randomized design and Duncan's Test was used to split means differences. Body weigh increased in males and females and was higher in the former. Total weight gain, daily weight gain daily feed intake were higher in males than females, but not significantly ($P \geq 0.05$). Feed conversion ratio was higher in females than males, but not significantly ($P \geq 0.05$). There were no significant differences in Shami kids performance between males and females and the former were better in performance.*

Keywords: shami kids ,sex., performance ,Sudan.

1. Introduction

Animal products demand and prices increased substantially in the Sudan in the last decades (Ahmed, 2014). They are not afforded by a high percentage of the population with serious nutritional consequences on the poor, especially children. Meat and milk per capita consumption are too low in the country (Central Bureau of Statistics, 2016). Meat production satisfies local demands with an excess for export. But, the demand for dairy products exceeded production and imports are required at very high cost. It is important to produce cheap and high quality dairy products and meat *via* improving animals performance and exploiting less utilized animals for dairy and meat production. It is important to attain self-sufficiency in dairy products for food and national security, jobs, exploiting natural resources and saving imports cost. Cows are the main dairy animals with generally low yields due to inferior genetic potentials and poor management and nutrition. Goats rank second in milk production in the country. But, goat meat is the least preferred. Goats are important for self sufficiency in dairy products due to high population (30.649 millions, MARF, 2011), adaptation to a wide range of environments, especially harsh one and wide distribution (Casey, 1992). They produce high quantities of high quality milk and meat (Devendra and Mc Leroy, 1992). Goat milk has high nutritive and medicinal values (Addrizzo, 2002). Goat meat has high nutritive value and muscle and low fat and cholesterol (Banskalieva *et al.*, 2000). The demand for goat meat is increasing due to the disputed correlation between saturated fatty acids and cholesterol and cardiovascular diseases (Wikipedia, 2016). According to Devendra and Mc Leroy (1992) goats are small ruminants with low initial investment and are easy to feed,

manage and integrate with existing systems. They have high reproductive performance, milk production efficiency, DMI and digestive efficiency for low quality feeds compared to other ruminants. In addition they are browsers, selective feeders and have a wide range of feeds (Casey, 1992). Culled animals are exploited for meat production with large markets in the country and abroad. But, goats are generally neglected and managed in traditional systems with low inputs and outputs (Devendra and Mc Leroy, 1992). Sudan ranks 6th in world goat population and meat production and 3rd in world goat milk production (FAOSTAT, 2008). However, goat milk and meat production are too low compared to the expected. Improving goat dairy production is important for self-sufficiency in dairy products and culled animals meat is a valuable by-product. In addition it improves goat meat local and foreign demands and exports, other types of meat exports and hence the national income. There are many goat breeds in the country and the Nubian is the main dairy breed and the other breeds are considered meat producers (Devendra and Mc Leroy, 1992). The interest in exotic goat breeds, especially Shami and Saanen, for milk production is increasing. Culled animals, especially males are used for meat production.

Nutrition is one of the main obstacles for goat production in Kassala State, Sudan due to rangeland deterioration (Abusuwar and Darrag, 2002) and seasonal variations in feeds quantity and quality with serious shortages and effects on animals health and performance, especially in the dry season (Elhag, 1992). Crop residues are important in filling the nutritional gap, but generally have low nutritive value, DMI and animals performance (Hamed, 2007). Concentrates improved animals performance, but are expensive and not usually fed (Anyanwu, 2008). Sex is an important trait affecting goats birth weight and

weight gain (Das and Sendalo, 1992, Musa, 2013; Bushara *et al.*, 2013). Shami males had higher birth and weaning weights than females in Halfa Elgageda (Musa, 2013) and higher birth in Khartoum (Mahmoud *et al.*, 2012). However, there is no available information on the effects of sex on Shami kids performance in Halfa Elgageda area, Sudan. Consequently, this study was conducted to furnish this important information.

2. Materials and Methods

Study area

The study described below was conducted in the goat pens in the animal production farm in the Faculty of Agriculture and Environmental Sciences, Kassala University in Halfa Elgageda, Kassala State, Sudan.

Animal

Ten Shami kids including 5 males and 5 females at 7 month old and weighing 17.7kg on average were used in this experiment. They were ear tagged and housed in individual pens and treated against external and internal parasites and injected with Oxytetracycline 20%. The kids were allocated at random to the experimental pens.

Feeds and feeding -1

The kids were fed a concentrates ration based on sorghum grains and groundnut cakes. Table 1 shows the ingredients of the concentrates ration. The kids were changed gradually to the concentrate ration to avoid digestive disturbances. They were fed the concentrates ration *ad lib* for 45 days including a 10 days preliminary period. The ration was fed in one meal at 7am. The animals were fed weekly 1kg of green Abu 70 and Barseem before the morning meal to maintain normal gut functions and vitamins. Clean drinking water was available at all times. Daily feed intake was measured by offering weighed rations and collecting and weighing the refusals before the morning meal in the following day. The animals were weighed at the beginning of the experiment and then weekly before the morning meal after fasting for 12 hrs to avoid variations in gut contents.

Calculations and statistical analysis -2

Feed intake was calculated as the difference between the offered rations and the refusals. Total weight gain was calculated as the difference between initial and final BW. Daily weight gain was calculated as the difference between successive BW divided by the days between them. Feed conversion ratio was calculated by dividing total feed intake by total weight gain. The data was statistically analyzed according to Snedecor and Cochran (1980) using the completely randomized design and Duncan's Multiple Range Test was used to split means differences.

Table 1. The ingredients of the ration fed to Shami males and females kids in Halfa Elgageda, Kassala State, Sudan.

Ingredients	%
Sorghum grains	50
Groundnut cakes	23
Wheat bran	14
Groundnut shells	5
Lime stone	2
Salt	1
Molasses	5
Calculated CP (%)	20.4
Calculated ME (Mj/ kg DM)	11.36

$$ME (Mj/kg DM) = 0.012CP + 0.031 EF + 0.005 CF + 0.014 NFE.$$

3. RESULTS AND DISCUSSION

Table 2 shows sex effects on the performance of Shami kids in Halfa Elgageda. Final BW was higher than the initial BW in males and females indicating that the animals gained weight during the feeding period. Similarly BW increased with feeding in Tagger (Elimam *et al.*, 2010) and Nubian (Yagoub and Babikir, 2008) kids. Initial and final BW were higher in males than females, but not significantly. This was mainly attributed to Shami males higher birth and weaning weights than females in Halfa Elgageda (Musa, 2013) and higher birth and body weight in Khartoum (Mahmoud *et al.*, 2012) and androgens enhancing protein deposition in males (Abu Nikhaila and EL Hag, 2003). However, kids initial and final BW were lower than in culled Shami females in Halfa Elgageda due to the latter higher age (Osman and Elimam, 2015).

Total weight gain and daily weight gain were higher in males than females, but not significantly ($P \geq 0.05$). This was mainly due to males androgens enhancing protein deposition. Shami males had highly significantly heavier birth weight than females in Kassala State (Musa, 2013). Males were significantly heavier and grew faster after weaning (Das and Sendalo, 1992). Daily weight gain in this study was higher than the reported 279- 318g in culled Shami females in Halfa Elgageda (Osman and Elimam, 2015). This was mainly due to the latter old age.

Daily feed intake was higher in males than females, but not significantly ($P \geq 0.05$). This was mainly due to males heavier BW and higher total and daily weight gain and nutrients requirements. Daily feed intake was lower than the 1.34-1.63g in culled Shami females in Halfa Elgageda (Osman and Elimam, 2015) and was mainly due to the latter higher age, BW and nutrients requirements.

Feed conversion ratio was higher in females than males, but not significantly ($P \geq 0.05$). This was mainly due to females higher fat in carcasses and high energy cost. It was very high compared to the 4.8 - 5.33 in culled Shami females in Halfa Elgageda (Osman and Elimam, 2015) and was mainly due to higher age and BW in the latter.

The results showed no significant differences in performance between Shami males and females and the former were better in performance.

Table 2. The performance of males and females Shami kids in Halfa Elgageda, Kassala State, Sudan.

Parameters	Males	Females	Significance
Initial BW (kg)	18.50±2.87	16.90±1.59	NS
Final BW (kg)	21.00±2.87	19.00±2.87	NS
Total weight gain (kg)	2.5±0.94	2.1±1.19	NS
Daily weight gain (g)	680±0.27	590±2.20	NS
Daily feed intake (g)	810±0.13	780±0.13	NS
FCR	10.94±2.68	11.94±5.10	NS

BW= Body weight; FCR= Feed conversion ratio = kg feed/kg weight gain.

NS= No significant differences at $P \geq 0.05$.

4. References

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