

A Comparative Study of Fat Content in Beef and Sheep Meat

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ABSTRACT

This study was conducted on samples of beef and mutton which Obtained from the local market in Khartoum in order to conduct an analysis to compare the fat content between the two types of meat. The presence results showed there was high-significant difference ($P < 0.01$) between beef and mutton in the fat content. The study also showed that there was a decrease in the level of the proportion of fat in beef, compared with mutton fat as 3.32% in the beef and 3.80% in the lamb meat.

Keywords: Fat, beef, sheep meat

INTRODUCTION

Sudan is located in the northern part of the African continent between longitudes 3 - 22 degrees east and latitudes 22 - 38 degrees east and occupies an area of 1,865.83 km. Sudan is located west of Eritrea and Ethiopia, southern Egypt and Libya, eastern Chad and the Central African Republic, northern Congo and southern Sudan. AAS (2012) estimated the beef production in the Sudan as (1286400.0 tons/year), the sheep and goat meat were estimated as (1286400.0 tons/year) and the camel meat as (511850.0 tons/year). Meat is a necessary nutrient for human growth because it contains a high quantity of protein needed to build the body and its various tissues (Yusuf, 1996). The percentage of fat in the meat depends on the type of animal, how it is raised, and the type of food, but in general it is possible to know how much fat in the meat by looking at the color of meat, the meat is dark reddish fat is less than meat, which is open color (Sharifa, 2013). Beef is highly acceptable and high-fat, with good fat distribution and a relatively low sweating rate (Yusuf, 1996). Consumption of meat in developing countries is increasing steadily from an annual per capita consumption of 10 kg in (1960) to about 26 kg in (2000) and is expected to reach 37 kg in (2030) according to (FAO 2007). The percentage of fat within the cells (1.5-2%), between the muscles (2.5-3.5%), and represent (18-30%) of the weight of the carcasses, and the amount of fat in different carcasses depending on the type of animal and its growth, Muscle (Saad and Nadia, 2013). Fat content in meat (10-25%) and 30-35% in fat-rich pieces of meat, commonly used in meat products, is found to have smooth, tender flesh and low fat meat (Yusuf, 1996). the fat percent in beef was 22% and in the sheep meat was 27.7 (Alaeddin, 1994). The percentage of fat in beef was 2.21% and in sheep meat was 6.01% (Nora, 2009). The percentage of fat in beef was 4.7%, whereas the proportion of fat in sheep meat was 6.2% meat (Youssef, 2003). The proportion of fat in lean meat was 3.5% (Ghita et al., 2009). Sheep meat has a lower fat content compared with beef (Williams, 2007). Siham (2015) reported that the proportion of fat in beef was (2.75%). The proportion of fat in sheep meat was 3.5% (Ghita et al., 2009). IJ FSN (2010), reported that the proportion of fat in beef was (0.9%). Lee (2008) reported that the proportion of fat in beef was 3.2%. Siham 2008 reported that the percentage of beef fat was (4.8%). The percentage of fat in beef was 17% and the proportion of fat in meat was 21% (Mohamed, 2008). (Mohamed, 1983) found that the percentage of fat in cows (3.99%). Williamson, et. al., (2006) reported that lean red meat has a relatively low fat content, moderate in cholesterol. The area of the thigh is one of the finest types of meat and the proportion of fat in it is very low, and consider the meat of calves or cows preferably from the area of the thigh muscle spasm, giving 6 grams fat (6% fat (Jamal, 2012). The fatty acid composition and total fatty acid content of subcutaneous adipose tissue and *longissimus* muscle from loin chops or steaks of sheep and cattle. Enser et. al. (1996).

The purpose of this study is to analyze the ratio of fat in beef and lamb to quantify these two types with statistical analysis to determine the level of significant.

MATERIALS AND METHODS

This study was conducted at the Central Laboratory for Veterinary Research in Soba. The meat samples were purchased from the local market and the samples were freshly and taken randomly. The percentage of fat in the sample was estimated according to AOAC (2000) method.

Determination of Fat

The percentage of fat was determined by the extract of the ether:

1. 2 g of sample was taken to Soxhlet Apparatus.
2. The sample was subjected to continuous extraction with ether for 3 hours.
3. The sample was removed from the extraction apparatus and subjected to drying for 2 hours in the drying oven at 100 ° C until the remains of the ether were removed.
4. The sample was cooled and weighed to determine Ether Extraction (E E) as follows:

Fat %	Fat weight	100
	Sample weight	X

STATISTICAL ANALYSIS

The collected data were subjected to statistical analysis using the Independent-Samples T. Test by using (SPSS, 2008).

RESULTS

Table (1) and Figure (1) shows the result of analysis of fat ratio in beef and mutton. In this study, the average fat ratio in beef and lamb was 3.32% and 3.80% respectively. The study also showed a significant difference ($P < 0.01$) between beef and mutton in their fat content.

Table1. Mean values (\pm SD) of Fat Percent in beef & sheep meat.

Parameters	Type of meat	Fat %
	Beef	3.32%
	Sheep meat	3.80%
	Level of Significance	**

** = ($P < 0.01$) There is a significant difference

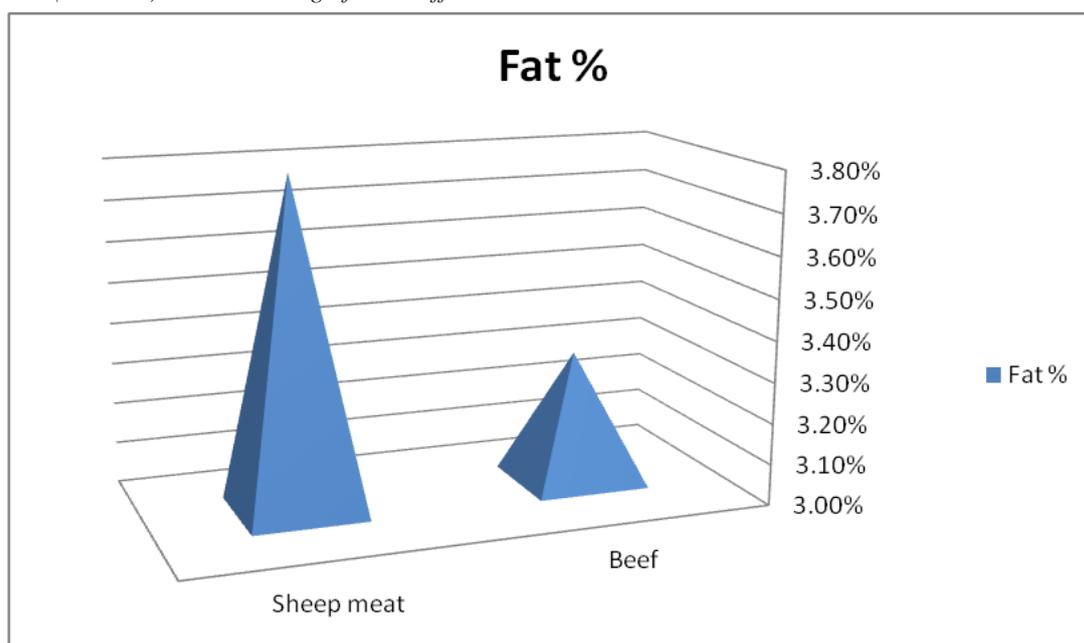


Figure1. Fat Analysis of Beef and Sheep Meat

DISCUSSION

In this study, the ratio of fat in beef and mutton was compared. The study showed a significant difference ($P < 0.01$) in fat content between the two species studied As shown in Table (1) and Chart (1). Beef was characterized by low fat content as 3.32% compared to 3.80% fat in sheep. The results obtained in this study agree with Marinova *et al.*, 2001, where they found that the fat in sheep meat ranged from 2.7 to 16.5%. The result of this study was less than the result of (Yusuf, 2003), who found that the percent of fat in beef was 4.7% and sheep meat 6.2%. The result in this study was less than the result (Siham, 2008) where the fat percentage in beef (4.8%) was reported. As well as less than the result of (Jamal, 2012), where it was mentioned that the proportion of fat in beef 20%, while the proportion of fat in sheep meat 23%. The result of this study was higher than the result (Nora, 2009) which found that fat ratio in beef (2.21%). The results of this study were also less than the result of (Muhammad, 2008), where it was found that the proportion of fat in beef (17%), while the proportion of fat in sheep meat (21%). The result of this study was also lower than that of (Schonfeldt, 1989), where fat was found sheep meat (4.7%). The result of this study was higher than that of (Siham 2015), where it was found that the percentage of fat in beef (2.75%). The result obtained in this study was higher than the result of Ghita *et al* (2009), where fat was found in sheep meat (3.5%). Also higher than the result (Sadler, *et.al.*, 1993; Sinclair, *et.al.*, 1999 and Williams, 2007) where they reported that the proportion of fat in beef (2.8%). And higher than the result of (IJFS N, 2010), where it was reported that the percentage of fat in beef (0.9%). And higher than the result of (USDA, 2001) who was reported that the proportion of fat in beef (3%). The result of this study is higher than that of (Lee, 2012), who mentioned the percentage of fat in beef as (3.2%). The results of this study differ with (Williams, 2007), where it was reported that sheep meat has a lower fat content compared with beef.

CONCLUSION

In this study, it was found that there was a significant difference ($P < 0.01$) in fat ratio between beef and mutton. The study also showed that beef has a lower content of fat (3.32%) than sheep meat (3.8%).

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