



Research article

Chemical composition and sensory evaluation of beef tripe prepared in accordance with Sudanese traditional methods

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Abstract

The ultimate aim of this study is to determine the chemical composition and sensory attributes of beef tripe prepared by Sudanese traditional method. Sixty kg of beef tripe was obtained from Kuku research centre abattoir and immediately evaluated. The tripe was distributed into treatment A (in which beef tripe sample was washed only with abundant quantity of tap water), and treatment B (beef tripe sample was washed by tap water and then immersed in hot water for a few seconds and then scraped using sharp knife until be white in color) and C (beef tripe sample was washed by tap water and then immersed in hot water for a few seconds and then scraped using sharp knife until be white in color and washed in brine). Results of chemical composition showed that crude protein was significantly ($P<0.05$) higher in treatments A and B than treatment C. While the fat and ash percentage were significantly ($P<0.05$) lowest, intermediate and highest for treatment A, B and C respectively. On the other hand, the moisture percentage was significantly ($P<0.05$) high in treatment A and the lowest in treatment B. Results pertaining to sensory evaluation of beef tripe samples indicated that the values of sensory attributes (colour, tenderness, juiciness, flavour, and overall acceptability) were significantly ($P<0.05$) higher in treatment B and C than treatment A. The results of the present study concluded that the best and acceptable Sudanese method of preparation beef tripe was used in treatment C.

Keywords: Beef, tripe, traditional, chemical composition, sensory

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Introduction

Meat is not only the oldest human food but also the most biologically valuable product. This fact is mainly due to its high protein content. In addition, a considerable part of human requirement for vitamins and iron is also covered by eating meat.

Beef tripe is normally derived from the alimentary tract of animal, mainly the first (rumen) and second

(reticulum) stomachs that weigh about 3.9 kg. On the other hand, sheep tripe weights about 1kg (Reddy, 1998).

Rising of meat price and the growing demand for meat as result of rising of world food prices and the growing population make consumers to eat offal and inferior parts as tripe (stomach). This was confirmed by Abdelkarim et al. (2009) who observed that the purchase of beef and mutton had been affected by increase of prices for low and medium income groups

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in Khartoum state. Accordingly, some Sudanese household or those people of lower income have been enforced to look for another source of protein, and therefore, some attempts have been made to utilize tripe as partial substitute for lean meat.

Offal has become a common food item among Sudanese community; it is an inexpensive product of high nutritional value with a distinguished taste (Nollet and Toldra, 2011).

No research was conducted to study the chemical composition and sensory evaluation of beef tripe in Sudan. Understanding the chemical composition and sensory evaluation of beef tripe will provide basic information for this type of food item.

Therefore, the objectives of this study was to examine the effect of the Sudanese traditional method of beef tripe preparation on its chemical composition and sensory evaluation.

Materials and Methods

About 60 kg beef tripe was obtained from abattoir of Kuku Research Centre was immediately transported to the laboratory of College of Animal Production, University of Bahri. The beef tripe was distributed for three treatments which were prepared according to the following methods:

Treatment one: Beef tripe sample was washed only with abundant quantity of tap water.

Treatment two: Beef tripe sample was washed by tap water and then immersed in hot water for a few seconds and then scalded by using sharp knife until be white in color.

Treatment three: Beef tripe sample was washed by tap water then immersed in hot water and scalded by sharp knife and then immersed in brine solution (salted).

30 gm of the above beef tripe samples of each treatment was package in polythene bag and transported immediately to laboratory in Faculty of Animal Production - University of Khartoum and examined directly (zero storage). Parameters investigated were protein, moisture, fat, and ash content using AOAC, (2000). In addition sensory attributes of beef tripe samples were evaluated. Each sample of three treatments was randomly selected and cooked immediately in a pan for 5 minutes and then distributed to 13 untrained panellists who evaluated the beef tripe samples for colour, tenderness, flavour, juiciness and overall acceptability using an 8-points scale score (hedonic scale) card as described by Cross and Standfield (1978), in which the highest score of 8 being extremely desirable and 1 being extremely undesirable. The treatment samples and their analysis were replicated three times.

Statistical analysis

Data was statistically analyzed by using analysis of variance, and means were tested for significance using Duncan multiple range test in SPSS (2002).

Results and Discussion

Effect of treatments on chemical composition of fresh beef tripe prepared using the Sudanese traditional methods were shown in Table 1. The results showed that overall means of moisture, crude protein, fat and ash of beef tripe were 79.49, 17.4, 3.03 and 12.54 respectively. The results indicated that treatment A and B were statistically similar in crude protein, but increased significantly ($P<0.05$) than that of treatment C. This might be due to the effect of salt which enhances protein extraction. On the other hand, Table 1 also showed that treatment A had the lowest ($P<0.05$) fat content, while treatment B showed the lowest ($P<0.05$) moisture content, which can be attributed to its higher protein content, might be due to the reduction of moisture (Reddy, 1998). The table also indicated that the moisture content of treatments A and C were higher ($P<0.05$) than the treatment B. The present results showed that the hot water has less influence on the moisture content but affected fat content, beside this the table showed that treatment C gave significantly lower crude protein but higher fat and ash contents. The results of the three treatments were higher as compared to that found by Anna Anandh et al. (2012). This variation may be due to using frying in oil. The proximate composition of beef tripe samples in this study is in accordance with the literature, which shows that edible animal by-products should be recognized as significant sources of nutrients, particularly protein, and thus, these products provide an interesting opportunity to increase the nutritional quality of food products (Nollet and Toldra, 2011).

The Effect of treatments on sensory evaluation of the fresh beef tripe is presented in Table 2. The result showed higher ($P<0.05$) scores of colour in treatment B and C than that of treatment A, and this is due to scaling by sharp knife. In addition, the result also showed significant increase ($P<0.05$) in flavour, tenderness, juiciness and general acceptability in treatment B and C than that of treatment A. Accordingly the results in Table 2 indicates that beef tripe samples of treatment B and treatment C had the best sensory attributes (colour, flavour, tenderness, juiciness and general acceptability) than treatment A (washed with abundant of tape water only), which was rated moderately to slightly acceptable. These results were in agreement with Gregory (1998); Desmond (2006) and Tarte (2009) who reported that the increased water-holding capacity of salt-treated meat affects positively in cooking yield, tenderness and juiciness when the product is consumed. In Addition to that Na^+

ion, in contrast to Cl⁻ ion, is responsible for the flavour that is delivered by salt. Besides imparting saltiness, it increases the intensity of other flavours (Tarte, 2009). Although the incorporation of salt enhances protein extraction, it also increases the tendency for retention of water and tenderness. An intermediate level of salt gives the benefits of lower cooking loss and greater tenderness without excessive rancidity (Lawrie, 1985).

Table 1: Effect of treatments on chemical composition of beef tripe prepared by using Sudanese traditional methods (%)

Treatment	Moisture	Crude protein	fat	ash
A	11.50 ^c	82.7	18.58 ^a	2.31 ^c
B	75.5 ^c	18.40 ^a	2.39 ^b	12.70 ^b
C	80.25 ^b	15.20 ^b	4.31 ^a	13.46 ^a
SE	0.12	0.14	0.04	0.31
Overall mean	79.49	17.4	3.03	12.54
SD	±3.07	±1.6	±0.97	±0.79

Where A, B and C mean, A=sample was washed by tab water only. B=sample was washed with tab water, scalded and then immersed in hot water. C=sample was washed with tab water, scalded, immersed in hot water and then immersed in brine solution (salted). ES=standard error. Means with different superscripts were differ significantly.

Table 2: Effect of treatments on sensory evaluation

Treatment	Color	Flavor	Tenderness	Juiciness	General acceptability
A	4.54 ^b	4.94 ^b	5.08 ^b	4.62 ^b	4.86 ^b
B	6.38 ^a	5.75 ^a	5.32 ^a	5.49 ^a	5.62 ^a
C	6.27 ^a	6.00 ^a	5.76 ^a	6.05 ^a	6.22 ^a
SE	0.31	0.30	0.35	0.31	0.32

Where A, B and C mean, A=sample was washed by tab water only. B=sample was washed with tab water, scalded and then immersed in hot water. C=sample was washed with tab water, scalded, immersed in hot water and then immersed in brine solution (salted). ES=standard error. Number of observation =13. Sensory attributes of beef tripe samples were evaluated on 8-point descriptive scale (where 1= extremely undesirable; 8=extremely desirable). Means with different superscripts were differ significantly.

Conclusion

Based on the results of chemical parameters, and sensory attributes, it can be concluded that:

- Beef tripe that was washed by abundant of water only and that was washed by tab water and immersed in hot water for a few seconds and scalded by using sharp knife until be white in colour, gave better result as far as protein content is concerned. However, the first one is supreme to the second by having lower fat content.
- Beef tripe prepared by Sudanese traditional methods can be successfully used for value

addition in the preparation of traditional beef tripe products with acceptable sensory characteristics.

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