Comparison of Sunflower Halva Products from Romanian Market

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Abstract. Halva is a traditional confection, consists of tahini (sesame paste), cooked sugar and soapwort root extract. Sunflower halva is made of sunflower seeds tahini, instead of sesame.

In this study fat, sugar and moisture content of sunflower halva products from Romanian market were compared. Sunflower halva samples from three different producers (A, B, C) were purchased from the market.

From the producer C two different batches were analyzed (C1 and C2). Researches shows a total fat content between 37.17-43.95%, total sugars within 20.40-34.40% and moisture content ranged between 2.74-3.84%. Differences between products from different sources may be due different technologies, recipes and raw materials used.

Keywords: sunflower halva, halva quality, total sugars and total fat.

INTRODUCTION

The use of oilseeds in human food has become increasingly important. Sunflower (Helianthus annuus) one of the most important oil crops, is used on a wide scale in many forms as food. Romania reported an annual production (2008) of 1.1 million tons; world total annual production (2008) was ~ 35.6 million tons (FAO, 2010). Sunflower seeds are rich in lipids (46 – 55%), proteins (23 – 24%), carbohydrates (8 – 12%); water content is 4 – 10%, and ash 3 – 4% (Muste, 2008).

Halva (also called halawa, halaweh, havah) is one of the oldest traditional desserts and is popular in Middle Eastern and North African countries. It consists of tahini (sesame or sunflower seeds paste), cooked sugar, and Saponaria officinalis (soapwort) root extract.

Halva is composed of 500 – 550 g kg\(^{-1}\) tahini, 250 – 350 g kg\(^{-1}\) sugar, 120 – 250 g kg\(^{-1}\) glucose and 10 g kg\(^{-1}\) additives such as whipping agents (Eissa and Zohair, 2006). It is one of the most nutritional food products having an energy content of 510 – 550 Kcal/100 g.

In some varieties of halva, cocoa powder or nuts are mixed for a richer nutritive value and a more flavourful taste. Sunflower halva popular in countries from Eastern Europe is made of sunflower seeds tahini, instead of sesame. It is rich in lipids (most being polyunsaturated) and sugars and has reasonably high protein content in addition to its pleasant nutty taste.

The volume of halva production is in the range of 35.000 and 40.000 tons per annum in Turkey (Kahraman et al., 2010). In Romania annual production is in the range of 1.500 – 2.000 tons, most of these being sunflower halva.

The traditional production of sunflower halva is shown in Fig. 1 (Racolța, 2008).
Sunflower halva, which is one of the oldest traditional desserts, has not been extensively investigated. The aim of this study was to compare fat, total sugars and moisture content of sunflower halva products from Romanian market. This study is important, as it is the first step on the assessment of the quality of sunflower halva from Romania.

MATERIALS AND METHODS

Samples.
Sunflower halva samples manufactured by traditional technology were purchased from local markets in Cluj-Napoca, Romania. Samples were from three different producers (A, B, C). From the producer C two different batches were analyzed (C1 and C2). All sunflower halva samples (HA, HB, HC1 and HC2) were collected in their original packages and were transferred to the laboratory at 4°C.

Analytical methods.
The protocol for total fat content determination was adapted after Racolta et al. (2008): 2 g of sample are well homogenized with 50 ml \( V \) of petroleum ether with boiling...
point of 40–60°C and is maintained for 24h at room temperature for extraction. 25 ml ($V_i$) from the clear upper phase is taken; solvent is evaporated on a laboratory water bath. Sample is brought to dryness using a laboratory oven set at 105°C and than cooled into a desiccator. The fat is weighed ($m_1$) and than the result is expressed on percentage of fat (%G) using the formula:

$$\%G = \frac{(V - 1) \cdot m_1}{(V_i - 1.1 \cdot m_1) \cdot 2} \cdot 100$$

where:

- $m_1$ - fat weight (g);
- 2 - sample weight (g);
- $V$ - volume of petroleum ether used (ml);
- $V_i$ - volume of petroleum ether and fat taken (ml);
- 1.1 = $\frac{1}{d}$ - volume correction, considering that the fat has a relative density ($d$) of ~ 0.9.

The protocol for total sugars content determination was adapted after Racolța et al. (2008): 2 g ($m$) of sample are homogenized with distilled water in a 200 ml ($V$) volumetric flask and than is filtered; 100 ml from the filtrate is taken into a 200 ml ($V_i$) volumetric flask with 2 drops of methyl-orange and 7 ml of hydrochloric acid (1.19 g/cm$^3$). The flask is maintained 5 minutes into a water bath with the intern temperature in the range of 67-70°C. After cooling, the sample is neutralized with sodium hydroxide (25% w/w), than distilled water is added up to 200 ml. 10 ml ($V_1$) from this solution are used for further analysis which was done according to Luff - Schoorl method. Total sugars content is expressed on percentages, following formula was used:

$$\%T.S. = \frac{c \cdot V \cdot V_i \cdot 100}{V_1 \cdot 100 \cdot 1000 \cdot m}$$

where:

- $c$ - sugar content (mg) corresponding to sodium thiosulphate volume used for titration;
- $V$ - volume of the homogenized sample (ml);
- $V_i$ - volume of the inverted sample (ml);
- $V_1$ - sample volume used for titration (ml);
- $m$ - sample weight (g).

The moisture content was determined by oven method (Racolța et al., 2008).

RESULTS AND DISCUSSION

Oil content of food contributes to the initial appearance and aroma of the product, but also affects texture and flavour and thus plays a vital role in the sensory quality of food. Sunflower seeds are the source of the oil of halva. Total fat content of sunflower halva analyzed is shown in Figure 1. The sample from the producer B has the lowest fat content (37.17%), whereas samples HA, HC1 and HC2 have a fat content between 41-43%. Romanian standard states a maximum halva fat content of 40%, samples HA, HC1 and HC2 exceeding this value. Damir and Abdel-Nabey (1990) reported for sunflower halva an ether extract of 34.1%, on dry matter basis. Kahraman et al. (2010) analyzed 120 sesame halva samples with a content of sesame oil between 24.51 and 40.20%. Turkish Food Codex stated
for sesame halva at least 26% of oil. Samples from producer C show a tiny difference in fat content, which may come from sampling.

![Fig. 2: Total fat content of sunflower halva samples](image)

Sugar content is one of the most important parameter for assessing the quality and nutritional value of halva. The sample from producer B has the highest total sugar content (34.40%), as it has also the lowest fat content. In the other samples, total sugars content ranged between 20-24%. Sample HB has a total sugar content according with the standard, the others three samples have values below Romanian standard value (min. 28%). Differences in sugar content between halva samples from different producers may be due to different recipes used. The samples from producer C had very similar values 20.4% and 21%. Kahraman et al. (2010) reported for sesame halva values between 32.65% and 46.21%.

![Fig. 3: Total sugars content of sunflower halva samples](image)

Moisture content is critical to the quality and safety of foods (Labuza and Hyman, 1998, cited by Kahraman et al., 2010). All samples had a moisture content below 4%, which
is according with Romanian halva standard; the sample from producer B had the lowest moisture content 2.74%. Kahraman et al. (2010) reported moisture content between 0.99% and 2.52% for the sesame halva. Karakahya (2006), cited by Kahraman et al. (2010) founded that the moisture content increases during the storage period. All samples had a moisture content below 4%, which indicates that was used raw materials of quality and properly storage conditions.

![Fig. 4. Moisture content of sunflower halva samples](image)

**CONCLUSIONS**

Total fat, total sugars and moisture contents were similar with those reported in the literature. Regarding the fat and total sugar content, sample HB has values according with the Romanian standard; all others exceed the standard limits. Concerning moisture content all samples are within the standard.

The sample from the producer B showed a different profile compared with the other samples, as it has lower fat content and higher sugar content, probably due to a different ratio between cooked sugar and tahini.

Differences between halva samples from different producers are due to different technologies, recipes and raw materials used. Regarding consumer acceptance it is desired a constant product quality. Further, more detailed studies on both sunflower seeds and sunflower halva quality will be taken into consideration.

**REFERENCES**

