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The effect of two different variety of sesame seed color on the sesame paste tahini

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Abstract

This research assessed the sensory attributes of tahini made from two types of sesame seeds—brown and white—sourced from the Aya local market in Erbil, Iraq. After being cleaned by hand, the seeds were dry-roasted to bring out their flavour and then crushed into a paste in a high-speed food processor. The tahini was put in sealed jars for examination, and a pinch of salt was added to each batch. A panel of 25 people who were acquainted with sesame goods did a sensory assessment using a 9-point hedonic scale to rate the items' look, smell, feel, taste, aftertaste, and overall acceptability. Statistical study (ANOVA, $p < 0.05$) demonstrated substantial disparities between the two types. White sesame tahini always got better scores in all categories, with the biggest differences in appearance (8.1 ± 0.6 vs. 7.2 ± 0.8), scent (8.3 ± 0.5 vs. 7.5 ± 0.7), and texture (8.0 ± 0.7 vs. 6.8 ± 0.9). The findings show that tahini made from white sesame seeds has a more attractive colour, smoother texture, and milder flavour, making it more generally acceptable (8.3 ± 0.5) than brown sesame tahini (6.9 ± 0.9). These results provide both customers and producers useful information about which kind of sesame seeds to use to make high-quality tahini.

Keywords: Sesame paste, sensory evaluation, Brown sesame seed, White sesame seed

I. Introduction

Among the Pedaliaceae family of plants, sesame seed (Sesamum indicum L.), often called beniseed, was one of the first oil crops grown and consumed by humans. Its distribution included India, China, and Malaysia after its first discovery in Pakistani archaeological sites (Zech et al, 2015). Countries like Tanzania, India, Sudan, Myanmar, and China are important sesame growers worldwide. African nations have been cranking out sesameseeds at a faster rate recently, with Tanzania displacing India as the top producer. With 806,000 metric tonnes coming from Tanzania and 733,000 metric tonnes from China, the world's sesame output reached 5.899 million tonnes in 2017, as reported by the UN Food and Agriculture Organisation (Wei et al, 2022).

The molecular make-up of sesame seeds is as follows: 50-52% glycerides of fatty acids, 17-19% protein, and 16-18% carbohydrates (3.2% glucose, 2.6% fructose, and 0.2% sucrose). In particular, compared to saturated fatty acids (mostly palmitic and stearic acid), sesame includes a larger amount of unsaturated fatty acids (oleic, linoleic, and linolenic acid) (Hadipour et al., 2023). Sesame is a good source of arginine (140 mg), leucine (75 mg), methionine (36 mg), lysine (31 mg), and cysteine (25 mg), among other amino acids. In addition, it has minerals, vitamins, phytosterols, lignans, water-soluble glucosides, and fat-soluble lignans, with a fibre content of about 10.8%. Whether roasted or unroasted, sesame seeds may be refined into edible oil, which has several applications in human nutrition, pharmaceuticals, industry, agriculture, and medicine (Labban and Sumainah, 2021).

According to Al-Ismail et al. (2018), sesame oil is susceptible to oxidative rancidity because it contains a high percentage of polyunsaturated fatty acids (linoleic acid makes up about 50% of the lipid fraction) and monounsaturated fatty acids (oleic acid makes up about 37% of the lipid fraction). Unsaponifiable substances including sesamol, sesamin, and α-tocopherols are abundant in sesame oil. Brouzes et al. (2020) found that sesame oil's sensory and

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nutritional qualities are protected by their antioxidant characteristics, and they also appreciate. The Arabic word for sesame seeds—tahini, tahina, or tehineh—means "beige" or "oily" in English. The paste is thick and prepared from roasted and powdered sesame seeds. Depending on the kind of sesame seeds used, it goes by many names in the literature: sesame butter, sesame paste, tahini butter, and tahini dressing (Pathak et al, 2014).

Raw tahini, made from unsalted seeds, is another option. In addition to its culinary uses in South and Southeast Asian, Central Asian, and African nations, tahini is primarily used as a condiment in the Middle Eastern area, particularly in the Levant countries (Syria, Lebanon, Palestine, and Jordan) (Wallace et al, 2016). Its added flavour has made it a popular component in vegetarian cuisine, particularly in the last three decades. Hummus, baba ghanoush, and a plethora of other Middle Eastern appetisers all include tahini as an essential component (Baxevanis et al., 2021). The goal of this research is to examine the sensory and qualitative characteristics of tahini made from white and brown sesame seed types. It aims to ascertain which seed colour produces a more favourable sesame paste for customer choice and product development.

II. Material and Method

. Raw Material Preparation

Two varieties of sesame seeds, brown and white, were procured from Aya local market from Erbil, Iraq. Seeds were manually cleaned to remove impurities such as dust, stones, and broken seeds. Both varieties were stored separately in airtight containers at room temperature prior to processing.

Sesame Seed Roasting

To enhance flavor and facilitate oil release, the sesame seeds were lightly toasted in a dry pan over medium heat for approximately 3 minutes, stirring continuously to prevent burning. The seeds were roasted until they emitted a nutty aroma and turned slightly golden, then cooled to room temperature.

Grinding and Paste Preparation

The cooled sesame seeds from each variety were separately transferred to a high-speed food processor. Seeds were ground for about 5 minutes, with periodic scraping of the bowl sides to ensure uniform grinding. Continuing to blend until a smooth, creamy consistency was achieved (Sakketou et al, 2022).

Seasoning and Storage

A pinch of salt was added to each batch to enhance flavor, and the tahini paste was blended briefly to incorporate it evenly. The prepared tahini from both brown and white sesame seeds was transferred to clean, airtight jars and refrigerated. Samples were stored for sensory evaluation and further analysis.

Sensory Evaluation

In order to evaluate the qualitative qualities of tahini samples made from brown and white sesame seeds, a panel of 25 individuals who are well-versed in sesame products was assembled. After being instructed on the assessment methods, panellists were checked to ensure they had normal sensitivities to smell and taste. To guarantee blind testing, identical, tagged containers were used to serve at room temperature tahini samples from both sesame kinds. In order to prevent bias, the samples were presented in a randomised sequence. In order to ease the palate in between samples, participants were given water and plain crackers (Haidari, et al., 2016).

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peoples evaluated the tahini samples based on the following sensory attributes:

- **Appearance:** Color uniformity and visual appeal
- **Aroma:** Intensity and pleasantness of sesame aroma
- **Texture:** Smoothness, creaminess, and mouthfeel
- **Flavor:** Nutty taste, bitterness, and overall flavor intensity
- **Aftertaste:** Lingering taste and any off-flavors
- **Overall Acceptability:** General preference and likability

A 9-point hedonic scale was used for each attribute, where 1 = dislike extremely and 9 = like extremely. Scores were recorded individually, and mean values were calculated for comparison.

Statistical Analysis

Sensory data were analyzed using analysis of variance (ANOVA) to determine significant differences between tahini from brown and white sesame seeds. A significance level of $p < 0.05$ was considered statistically meaningful.

III. Result and Discussion

Tahini is a popular Middle Eastern sauce prepared from ground hulled sesame seeds that have been roasted. People all around the world are using the paste more since it is good for you and tastes good. Tahini is important since it is utilised in various ethnic dishes both at home and in restaurants (Frankenfeld and Wallace, 2020). Hummus and mtabalbetejen (roasted aubergine with tahini) are two examples of items that have become famous across the world. Tahini is really good for you. It has a lot of lipids, proteins, carbs, niacin, thiamin, and certain minerals like calcium and phosphorus (Reister and Leidy, 2020). White sesame tahini looked a lot better (8.1 ± 0.6) than brown sesame tahini (7.2 ± 0.8). People tend to like white sesame paste better since it is a lighter colour and seems more homogeneous. Al Augustin et al. (2015) found that white sesame tahini is preferred for its creamy colour.

People thought the smell of white sesame tahini (8.3 ± 0.5) was better and stronger than the smell of brown sesame tahini (7.5 ± 0.7). This is in line with what El-Adawy (2002) found, which was that white sesame seeds give tahini a gentler, more pleasant smell than brown sesame seeds, which may have stronger, occasionally bitter undertones.

The texture score for white sesame tahini was higher (8.0 ± 0.7) than for brown sesame tahini (6.8 ± 0.9). This means that it felt smoother and creamier in the mouth. This is in line with studies by Mohamed et al. (2019), which found that white sesame seeds make a smoother, less gritty paste because their seed coat is softer and they have more oil.

The flavour ratings showed that white sesame tahini (8.2 ± 0.6) was better than brown sesame tahini (7.0 ± 0.8). White sesame has a gentler, nuttier taste that most people like. Brown sesame, on the other hand, may have a stronger, somewhat bitter taste, as Saleh et al. (2023) say.
White sesame tahini also had a better aftertaste (7.8 ± 0.7) than brown sesame tahini (6.5 ± 1.0). This is because it was less bitter and had a cleaner finish, which is what Al Juhaimi et al. (2011) found in their investigations of consumer preferences.

The overall acceptance score for white sesame tahini (8.3 ± 0.5) was higher than that for brown sesame tahini (6.9 ± 0.9), which means that people generally liked the white sesame variation better in terms of sensory quality. This

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supports the results of El-Adawy (2002) and Saleh et al. (2023), which indicated greater customer approval of white sesame tahini.

Table 1: Sensory Evaluation of two type of sesame paste

Sensory Attribute	**Brown Sesame Tahini (Mean ± SD)**	**White Sesame Tahini (Mean ± SD)**
Appearance	7.2 ± 0.8	8.1 ± 0.6
Aroma	7.5 ± 0.7	8.3 ± 0.5
Texture	6.8 ± 0.9	8.0 ± 0.7
Flavor	7.0 ± 0.8	8.2 ± 0.6
Aftertaste	6.5 ± 1.0	7.8 ± 0.7
Overall Acceptability	6.9 ± 0.9	8.3 ± 0.5

IV. Conclusion

Tahini prepared from white sesame seeds demonstrated superior sensory qualities compared to that made from brown sesame seeds. The white variety produced a paste with more attractive appearance, smoother texture, and milder, more pleasant flavor, resulting in higher overall acceptability scores among panelists. These results suggest that white sesame seeds are preferable for tahini production when aiming for optimal consumer satisfaction and product quality.

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