



## Scientific Research

## Perception and attitude towards meat products among consumers in Tehran

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ARTICLE INFO	ABSTRACT
<p><b>Article History:</b></p> <p>Received:2024/5/4</p> <p>Accepted:2024/11/10</p> <p><b>Keywords:</b></p> <p>Perception, Attitude, Consumers, Meat products, Qualitative study</p> <p><b>DOI:</b> 10.22034/FSCT.22.162.137.</p> <p>*Corresponding Author E- marjanbazhan@yahoo.com</p>	<p>In recent years, there has been a notable increase in the consumption of sausages, particularly among younger individuals. However, the perception and attitude of consumers towards these products in the country remain poorly documented. This study was designed to investigate this issue among consumers in Tehran. The research was carried out using a qualitative approach. The study examined adults aged 18 to 60 years who lived in Tehran. Semi-structured face-to-face interviews were used to collect qualitative data. A total of 43 individuals (25 women and 18 men) participated in the study. Participants were selected using a purposeful sampling technique to ensure maximum diversity. Qualitative content analysis of the data was conducted using MAXQDA2020 software. The participants, including those who consumed sausages, perceived sausages as unhealthy and unsafe due to several factors. These factors include poor quality raw materials, fraudulent production, harmful additives such as nitrates, and high levels of fat and salt. Furthermore, sausages are believed to have the potential to cause a range of diseases, including heart disease, high blood pressure, and cancer. This contributes to a negative attitude towards these products. Participants' lack of trust in the information provided on food labels, particularly regarding product ingredients, caused them to disregard it. In this study, participants expressed distrust not only towards manufacturers but also towards regulatory institutions and their performance. This research plays a pivotal role in enhancing the quality of these products at the national level by in-depth examination of the understanding and attitude of consumers towards sausages. The findings of this study demonstrate the necessity for meat product producers to enhance the quality of their raw materials, adopt healthier production methods, provide transparent labelling and reinforce consumer trust in order to address concerns and meet consumer expectations.</p>

## 1-Introduction

Meat products encompass a wide range of items that vary in terms of the type of meat, fat and salt content, processing methods, and consumption context (e.g., daily consumption vs. occasional consumption) [1-3]. Examples of these products include ham, bacon, salami, sausages, beef burgers, and chicken nuggets [4]. Meat products are considered a source of high-quality nutrients such as protein, iron, zinc, and B vitamins [5]. However, many consumers perceive these products as unhealthy due to their high levels of fat, saturated fat, cholesterol, sodium, and chemical compounds like phosphates, nitrates, and others [6].

The health implications associated with the consumption of meat products are contingent upon the specific type of meat product in question and the extent of its consumption. The extant evidence on this subject remains inconclusive [7]. Epidemiological studies suggest that high consumption of certain meat products may increase the risk of heart disease, diabetes mellitus, and cancer [8]. The precise mechanisms behind these harmful effects, particularly the link between meat consumption and cancer, remain unclear [7]. The 2015 World Health Organization (WHO) declaration on the increased risk of cancer associated with the consumption of processed meat products has brought the health concerns of this food group back into the public spotlight [9]. Alongside recurring waves of safety concerns, sustainability issues, and fraud that have generally affected the meat industry [10], recent debates on the health implications of meat products have made their production and consumption a contentious topic. Despite the perception of these products as

unhealthy by many consumers [6], a significant portion of regularly consumed meat comes in the form of processed meat products [10, 11]. The rising consumer demand for convenience and palatability indicates that meat products are likely to maintain a steady position in consumers' diets [12].

Consumers are the final step in the production chain, and meeting their expectations is a crucial part of their satisfaction and purchasing behavior [13]. Consumer behavior regarding food is not solely based on the sensory properties and physical state of the product but is also influenced by prior knowledge, past experiences, beliefs, and attitudes [14]. Consumer perception, which refers to the process of selecting, organizing, and interpreting information about meat products to form a meaningful image of them [15], plays a significant role in shaping consumer acceptance, purchase, and future consumption of these products [2]. In addition to perception, attitudes also play a crucial role in consumer behavior. Attitudes reflect an individual's positive or negative evaluation of adopting a behavior. Attitudes toward something influence information processing, judgments, and resulting behavior. Negative or extreme attitudes can have a more significant impact or be more enduring compared to positive or neutral attitudes [16]. Studies have shown that attitudes toward a food item or its components are highly important in their acceptance or rejection [17]. Attitudes toward meat products are related to chemical additives, as consumers are increasingly concerned about chemical additives in food [18] and perceive natural additives as safer [19]. A study by Hung et

al. found that attitudes toward meat products with natural ingredients and reduced nitrite levels were the main factors in the acceptance of these new products [20].

Previous studies have primarily focused on consumers' perceptions of the quality of fresh meat [21, 22]. However, research on processed meat products, particularly sausage products, is scarce, and no studies have been conducted in this area in our country. This research gap highlights the need for a comprehensive study to examine Iranian consumers' perceptions and attitudes toward these products. Given recent changes in consumer lifestyles, increased public awareness of food safety and health issues, and growing concerns about the use of chemical additives in meat products, this study is of strategic importance. The results of this research will not only help producers develop new products that align with consumer needs and expectations but also assist policymakers in formulating policies to support producers and ensure consumer health and safety. Accordingly, this study was designed and conducted to explore the perceptions and attitudes of Tehrani consumers toward sausage products.

## 2-Materials and Methods

This study was a qualitative content analysis conducted in 2022. Given that the researchers did not find a comprehensive study on the topic in their literature review, this method was chosen for the current study. In qualitative research, the quality of information collected from each respondent is more important than the quantity, and there is no fixed rule regarding the number of samples required for such studies. The sample size is determined during the research process [23]. Therefore, the

criterion for the sample size in this study was reaching maximum information about the phenomenon or data saturation. Data saturation is achieved when the researcher no longer obtains new data by continuing sampling [24]. Accordingly, the total number of participants in this study was 43 (including 25 women and 18 men), selected through purposive sampling with maximum diversity in terms of age, gender, and socioeconomic status. The inclusion criteria for participants were as follows: an age range of 18 to 60 years, a willingness to participate in interviews, and the ability to express their experiences, opinions, and views. To ensure maximum diversity in socioeconomic conditions, Tehran was divided into five geographical regions (north, south, center, east, and west), and sampling was conducted to cover all regions. To this end, one geographical region (north Tehran) was randomly selected, and a municipal district (District 1) was chosen. Participants were recruited from various locations within the district, including parks, neighborhood centers, and large grocery stores. This process was repeated until data saturation was achieved in other regions of Tehran, including Districts 6, 14, 18, and 22, to ensure maximum diversity.

Data were collected using a questionnaire consisting of open-ended questions in the form of semi-structured face-to-face interviews. The questions were based on the study's objectives and a thorough review of previous studies on the topic, as well as discussions among the research team. Two pilot interviews were conducted, and final adjustments were made. The interviews were conducted by two members of the research team. An introductory explanation was provided to the study participants at the

commencement of each interview, delineating the objectives of the research. If they agreed to participate, they were asked to fill out a demographic and social characteristics form. During the interview, the researcher used various techniques to obtain more and purer information, such as creating a calm environment, providing feedback to participants, asking for further explanations, rephrasing questions, and using non-verbal communication. The researcher also made an effort not to let their prior beliefs and interpretations influence the process and avoided leading the participants' responses. With the participants' consent, the interviews were recorded. In addition to recording, the researcher took notes on participants' non-verbal cues, such as tone of voice, silence, emphasis, etc. Each interview lasted approximately 25 to 35 minutes, depending on the flow and context.

Data collection and analysis were conducted simultaneously using MAXQDA2020 software. After each session, the audio files were transcribed as quickly as possible. The transcribed texts were read multiple times, and key sections were highlighted and coded as conceptual codes or direct quotes (similar to what the participants had said). To resolve doubts and issues in determining categories, coding rules, or classification, specific cases were discussed within the research team until the issues were resolved. After this stage, the initial codes were categorized, similar codes were grouped together, and categories were formed. Data saturation in each category was examined and confirmed.

Four criteria—credibility, dependability, confirmability, and transferability—were used to assess the validity and reliability of the qualitative data [25]. To enhance

credibility, the researcher allocated sufficient time for data collection and maintained prolonged engagement by repeatedly reviewing the data. In addition to the primary researcher, other team members actively participated in all stages of the research. Ensuring maximum sample diversity, setting aside all preconceived notions or biases during data collection and analysis, and returning some coded interviews to participants for review and agreement were other methods used to ensure credibility in this study. Dependability was assessed through team member reviews and by documenting all research details and transcribing interviews as soon as possible. Additionally, Holsti's coefficient of agreement was used [26]. Using this index, the average agreement between a coder within the research team and an external coder was 0.92, indicating acceptable reliability of the extracted evidence. Transferability was achieved by providing a complete description of participant characteristics, data collection methods, and analysis procedures, along with examples of participants' statements, to allow others to follow the research path. This study was approved by the Ethics Committee of the National Nutrition and Food Technology Research Institute under code IR.SBMU.NNFTRI.REC.1400.097 in February 2022. In this study, the researcher obtained written informed consent from participants. Participants were also informed about the study's objectives and that there was no formal or informal obligation for them to participate. They were assured that they could withdraw from the study at any stage. Permission was obtained from participants to record their statements. Participants were assured that their statements would remain confidential

and would not be shared with anyone other than the researchers.

## Results

In this study, 43 participants were involved, and their detailed characteristics are presented in Table 1.

### - Consumption status and reasons for consuming/avoiding sausage products:

Quantitative findings showed that half of the participants rarely consumed sausage products, and a small percentage never consumed these products. Based on qualitative findings, reasons for avoiding or rarely consuming these products included concerns about product safety, harmful additives, past experiences of poisoning, and severe allergies.

*"I'm not an expert, but what they say on TV, social media, I don't know what nitrates are, but I'm completely against it. Processed products have additives that are completely unknown"* (49-year-old male).

Those who consumed these products cited taste, children's preferences, quick preparation, affordability, and dietary variety as the main reasons for consuming sausage products.

*"You know it's bad for your body, but you eat it because of that craving, just for that momentary craving"* (33-year-old female).

- **Factors considered when purchasing sausage products:** The most important factors participants considered when purchasing sausage products were the production and expiration dates, brand, and meat percentage. Taste, packaging quality, price, ingredients, and the presence of standard and Food and Drug Administration logos were of secondary importance.

*"I don't trust the ingredients listed; they never write if they've used chicken skin or waste. They just write the best ingredients*

*are used. It's a waste of time to read their lies. I mostly check the expiration date, which might be accurate"* (35-year-old female).

*"I don't buy unknown brands because they're not trustworthy. If a brand tastes good once, I'll definitely buy it again"* (38-year-old male).

*"Packaging is also important; it should be sturdy. I prefer vacuum-sealed packages because they prevent contamination. I never buy products wrapped in plastic"* (36-year-old female).

- **Primary sources of information about sausage products:** Many participants stated that they primarily obtained information about sausage products from social media platforms like Instagram, WhatsApp, and Telegram, as they believed these platforms provided honest and uncensored information.

*"TV and radio don't tell the truth, but on social media, you see things that seem more accurate"* (36-year-old female).

*"Social media is more straightforward and less censored. They have to be honest there because people can see everything. It's better on social media; they're more direct and honest"* (20-year-old male).

In contrast, some participants mentioned that fake news and misinformation are easily spread on social media, making it difficult to trust these platforms. Therefore, they preferred to seek information from national media (TV and radio).

*"You can't trust social media. They might stage scenes to promote their products. But you can trust our national TV; they don't lie"* (48-year-old male).

*"Social media might have biases. They might spread false rumors about companies they don't like"* (42-year-old female).

Some participants also obtained information from other consumers, family members, friends, websites, magazines, newspapers, doctors, and specialists in the field.

*"We consult with others. You don't have to try everything yourself; we ask for others' opinions" (56-year-old male).*

*"I mostly use Google and search for information online" (52-year-old female).*

However, a few participants stated that they did not trust any information sources and relied solely on personal experience when purchasing and consuming food products.

*"I mostly rely on taste. I don't trust any of them; I have to try it myself" (27-year-old male).*

**- Perceptions and Attitudes Toward Sausage products:** Based on the analysis of participants' statements, their perceptions and attitudes toward sausage products were categorized into three main themes: "distrust in producers," "harmfulness of the product to health," and "distrust in regulatory systems" (Table 2).

### **1- Distrust in the manufactures**

Distrust in the manufactures was the first concept that emerged during the continuous analysis and comparison of data. "Low-quality raw materials", "fraud in production", "distrust in the information provided on the label", and "distrust in the safety and health of the product " were among the factors that participants believed contributed to this distrust.

#### **- Low-quality raw materials**

Most participants, even those who consumed sausage products, stated that producers use low-quality raw materials to reduce costs and increase profits. As a result, they believed these products lacked nutritional value.

*"I feel like the meat used isn't even first-grade; it might be waste meat turned into paste. I've heard they might use old or sick chickens. That's why I don't eat them" (50-year-old male).*

*"It's cheaper for factories to use low-quality meat and add a lot of spices to improve the taste and sell more" (35-year-old female).*

#### **- Fraud in Production**

Widespread fraud in the sausage products market was another issue mentioned in this study, significantly contributing to distrust in producers. Participants believed that producers used unauthorized animal tissues, such as chicken skeletons, necks, wings, skin, gizzards, intestines, rooster combs, and waste meat from slaughterhouses and meat suppliers, as well as old and sick chickens, in the production of sausage products. Some participants, referring to videos and news on social media, did not rule out the possibility of using meat from other animals like cats, dogs, and donkeys.

*"I think there's a little bit of meat, and the rest is... I'm not judging, but I think it's not right. I've seen videos showing rooster combs and other things being used. I don't want to be rude, but maybe even cat meat" (27-year-old male).*

*"I know that even the high percentage of meat in sausage products isn't trustworthy. I think it's a lie; most of it is waste" (35-year-old female).*

*"Because there's so much fraud, you can't trust anyone. I don't trust any company or producer; I have to see it myself... So, I don't buy it; I don't trust it" (48-year-old male).*

The use of fava beans instead of pistachios during the production process was another example of fraud mentioned in this study, which participants believed could be dangerous for individuals with favism.



*"People who work in factories say it's not pistachio; it's fava beans. Fava beans can cause allergies in some people. I think it might cause allergies in some children" (24-year-old female).*

- Distrust in the information provided on the label

Many participants stated that the information on product labels, especially the ingredients, was not accurate, and they could not trust it. As a result, when purchasing these products, they did not pay attention to this information and mostly focused on the production and expiration dates. However, a few participants mentioned that despite their doubts about the accuracy of the information, they trusted it because they had no other way to verify it.

*"It's not clear what they put in it sometimes. I'm not really sure if it's really 90% meat as it says on the label" (26-year-old female).*

*"The information isn't accurate in my opinion. I've seen the expiration dates being tampered with, even in reputable stores. I don't trust them at all; I'm sure 100% of what's written isn't true" (36-year-old female).*

Regarding food labeling, one participant stated that the labels themselves were not the problem, but the behavior of producers and the regulatory system led to consumer distrust in these labels.

*"I wish this distrust could be resolved. It's not because I distrust the labels that they're useless. There should be a regulatory system that builds consumer trust. In the right conditions, consumers rely on these labels, so they must be present, even with more details" (21-year-old male).*

- Distrust in the safety and health of the product

Negative experiences regarding the production process of sausage products, as well as the belief that standards and hygiene were not followed in their production, were among the issues mentioned in this study. Participants believed that these factors made them doubt the safety of these products.

*"One of my experiences was seeing on the media that a refrigerated truck had an accident, and the meat inside had gone bad and was left on the street, emitting a foul smell. When they checked, it was donkey meat. Seeing such things makes you lose trust" (48-year-old male).*

### **3- The harmfulness of the product to human health**

Another concept extracted from participants' statements was their perception of the harmfulness of sausage products to health. This concept was divided into two subcategories: "Having harmful additives" and "Causing a wide range of health problems".

- Having harmful additives

Many participants stated that sausage products contained large amounts of preservatives, salt, spices, artificial colors, and unauthorized additives, which they believed were very harmful to health. One participant referred to chemical additives as tools for creating addiction and dependency in consumers of these products.

*"The peppers, artificial colors, and spices they use affect your digestion" (30-year-old female).*

*"When food becomes commercial, like fast food, and sausages they work on addicting consumers. The flavorings they use are to attract customers in a competitive market, and this can only be done with chemicals" (24-year-old male).*

- Causing a wide range of health problems

Most participants believed that consuming sausage products was harmful to health due to the low quality of raw materials, high levels of additives, and high fat, calorie, and salt content. They believed that long-term consumption of these products could lead to a wide range of health issues, including weight gain, obesity, digestive disorders, fatty liver, cancer, high blood pressure, diabetes, and cardiovascular diseases. Some participants also mentioned the exacerbation of migraines, allergies, and acne as a result of consuming these products. Overall, participants stated that sausage products were generally perceived as unhealthy and harmful to health by the public and medical professionals, and they should be avoided. They believed that the good taste of these products was a barrier to consumers giving them up.

*"I used to eat a lot of them, and I developed fatty liver, grade one. I had high cholesterol, and I ate fast food twice a week.*

*I used to eat these a lot, but I stopped four months ago, and my body is healthier now" (21-year-old female).*

*"Because of the nitrates, nitrates are bad for the body and cause cancer" (43-year-old female).*

*"Sausages are full of spices and salt, which are harmful to most people. The high salt content causes high blood pressure" (54-year-old male).*

#### **4- Lack of trust in surveillance systems**

Some participants, referring to the need for oversight in product production and proper labeling, stated that there was no proper oversight in this area, or if there was, it was not done correctly. Therefore, they could not trust the safety of these products or the information and labels on them, such as the standard mark.

*"Personally, I don't trust the information on the labels except for the expiration date. I don't think there's any control over the other information; it's proven to me that there's no proper oversight" (21-year-old male).*

**Table 1. Sample characteristics (N=43)**

<b>Characteristic</b>	<b>n (%)</b>
<u>Gender</u>	
Female	25 (58.1)
Male	18 (43.1)
<u>Age (year)</u>	
18-24	7 (16.3)
25-34	10 (23.3)
35-44	14 (32.6)
45-54	9 (20.8)
55-60	3 (7.0)
<u>Marital status</u>	
Married	28 (65.1)
Unmarried//Divorced/Widow	15 (34.9)
<u>Household size</u>	
<3	7 (16.3)
3-4	33 (76.7)
5+	3 (7.0)
<u>Education</u>	



Under diploma	3 (7.0)
Diploma	12 (27.9)
University	28 (65.1)
<u>Employment status</u>	
Unemployed/ Housewife	10 (23.3)
Worker	1 (2.3)
Employee	19 (44.2)
Self-employed	12 (27.9)
Retired	1 (2.3)
<u>Children &lt; 18 years</u>	
Yes	18 (41.9)
No	25 (58.1)
<u>Responsible for household food shopping</u>	
Yes, always	19 (44.2)
No	24 (55.8)
<u>Frequency of sausage consumption</u>	
Never	5 (11.6)
Rarely	22 (51.2)
1-3 times/ month	14 (32.6)
1-3 times/ week	2 (4.6)
More than 3 times/ week	0 (0)
<u>Residential area</u>	
North	8 (18.6)
South	9 (20.9)
Center	9 (20.9)
West	8 (18.6)
East	9 (20.9)

**Table 2. Participants' perception and attitude towards sausages**

Categories	Sub-categories	Codes
Distrust in the manufactures	Low- quality raw materials	<ul style="list-style-type: none"> <li>- The use of poor-quality raw materials</li> <li>- The procurement of meat from unsanitary centres</li> </ul>
	Fraud in manufacturing the product	<ul style="list-style-type: none"> <li>- The utilization of meat and chicken waste</li> <li>- The use of unconventional meat such as cat and donkey meat</li> <li>- The substitution of beans for pistachios in the production of sausages</li> </ul>
	Distrust in the information provided on the label	<ul style="list-style-type: none"> <li>- The inaccuracy of the information on the label</li> </ul>
	Distrust in the safety and health of the product	<ul style="list-style-type: none"> <li>- Negative experiences regarding manufacturing the product</li> <li>- Failure to comply with standards in manufacturing the product</li> <li>- lack of hygiene in the manufacturing process</li> </ul>
The harmfulness of the product to human health	Having harmful additives	<ul style="list-style-type: none"> <li>- Containing a substantial quantity of preservatives</li> <li>- The presence of artificial colors</li> <li>- The presence of a considerable quantity of spices and salt</li> <li>- Containing unauthorized additives</li> <li>- The use of chemicals to create dependence in consumers</li> </ul>
	Causing a wide range of health problems	<ul style="list-style-type: none"> <li>- A risk factor for obesity</li> <li>- The occurrence of digestive problems</li> <li>- A risk factor for fatty liver disease</li> <li>- A significant factor in the aetiology of cancer</li> <li>- The occurrence of high blood pressure</li> <li>- A risk factor for diabetes</li> <li>- A risk factor for heart disease</li> <li>- The exacerbation of migraine headaches</li> <li>- The Exacerbation of allergies</li> <li>- Increased thirst</li> <li>- Early menopause/infertility</li> </ul>
Lack of trust in surveillance systems	-	<ul style="list-style-type: none"> <li>- Belief in the lack of control over the production process</li> <li>- Belief in the non-implementation of the principles of proper supervision and control</li> <li>- Lack of confidence in the standard mark on product packaging</li> </ul>

## 5-Discussion

This qualitative study aimed to explore the perceptions and attitudes of Tehrani consumers toward sausage products. Based on the findings, concerns about product safety, harmful additives like nitrates, past experiences of poisoning, and severe allergies were among the reasons for avoiding or rarely consuming these products. Consistent with this study, Haugaard et al. [27] reported that Danish consumers were averse to the use of chemical additives in meat products. Consumers likely associate chemical food additives with food fraud and health risks [28]. A study on consumers in four European countries, including Germany, the Netherlands, Italy, and Belgium, also found that even without mentioning the use of nitrites or other food additives, consumers tended to associate diets high in processed meat products with negative health effects. Similar findings were previously reported by Tobin et al. [6].

Among the factors participants considered when purchasing sausage products, the production and expiration dates were of primary importance. The expiration date of food products is one of the most important pieces of information on food labels. This information is often checked by consumers and plays a significant role in their purchase intentions [29]. The key role of expiration dates in influencing consumer decision-making and food product selection has been reported in previous studies [30].

Some studies have identified brand image as the most important factor influencing the choice of convenience foods like meat products [31]. Brand recognition [32], brand authenticity [33], and brand reputation [32, 34] are essential brand

characteristics that influence the choice of convenience foods. Lassoued and Hobbs [35] observed that the quality and safety characteristics of convenience food products build brand trust and, consequently, consumer loyalty to the brand. These researchers also stated that consumer dissatisfaction with the characteristics of a particular brand leads them to switch to another brand. In this study, brand familiarity, reputation, and authenticity were also important to participants and played a significant role in their decision-making and purchasing behavior.

Another factor participants considered when purchasing sausage products was the percentage of meat used in the product. They perceived a higher meat percentage as an indicator of better product quality. Previous studies have also shown that perceived food quality significantly impacts consumer satisfaction [36] and loyalty [37]. Additionally, perceived food quality influences perceived value and brand preference [38] and purchase intention [39]. In a recent study, quality was identified as the highest criterion in food purchase decisions [40].

Sensory quality should also be considered an important factor in food perception and acceptance, as consumers seek foods with specific sensory characteristics [41]. The acceptance of a food product depends on how well it meets consumer expectations and provides satisfaction [42]. Accordingly, in this study, sensory characteristics like taste were important factors participants considered when purchasing sausage products. This finding reflects the results of previous studies, which have reported that taste is the primary determinant of

consumer satisfaction with meat products and that consumers are unwilling to accept sensory characteristics of products reformulated for health reasons [43].

In addition to product quality, appearance and packaging quality are also important, as they are the only form of communication between the product and the buyer during the first purchase [44]. The positive and significant impact of appearance and packaging quality on consumers' intention to purchase and consume convenience foods has been reported in previous studies [31], which aligns with the findings of this study.

In this study, participants did not perceive sausage products as safe and healthy products due to reasons such as low-quality raw materials, fraud in production, harmful additives like nitrates, and high levels of fat and salt. They associated sausages with the risk of various diseases, including heart disease, high blood pressure, and cancer. Concerns about meat products have increased in recent years [45]. These concerns are mainly due to the results of epidemiological studies that have shown a link between high consumption of meat products and an increased risk of non-communicable diseases such as cancer, diabetes, and cardiovascular diseases [46]. The manifestation of this epidemiological relationship does not necessarily correspond to an unacceptable risk, as the odds ratios for specific diseases may only be slightly above unity [47]. Nevertheless, the health implications associated with the consumption of processed meat products are well-documented. These consequences have been widely discussed and have made meat production and consumption, particularly in the perception of consumers, a contentious issue [48].

Health is a key motivational factor for purchasing food, including meat and meat products [49]. Many aspects that influence consumers' perceptions of meat products, consistent with this study, are related to salt, sugar, and fat, which are considered unhealthy [20, 29]. The fat and sodium content in meat product formulations are reasons for consumer concern, as high consumption of animal fat is associated with an increased risk of heart disease. Furthermore, an association has been demonstrated between sodium intake and an increased risk of developing various health conditions, including high blood pressure, heart disease, diabetes, stroke, and kidney disease [50]. The WHO recommends reducing salt intake in adults to less than 5 grams per day (equivalent to 2 grams of sodium) [51]. However, studies show that the average salt intake in most countries is around 9 to 12 grams per day, and in many Asian countries, it exceeds 12 grams per day [52]. The average salt intake in our country has been reported as 9.52 grams per day [53]. After bread and cheese, fast foods are the largest source of salt intake in the Iranian diet [54]. Another concern is the presence of nitrates and nitrites in meat products. Despite their utilization for microbiological safety and sensory characteristics, these compounds possess the potential to induce significant chemical hazards [55]. The formation of N-nitroso compounds (NOCs) is a consequence of the cooking process of meat products that contain nitrites and/or nitrates. Among N-nitroso compounds, nitrosamines are considered a risk factor for colorectal cancer [56]. Studies have shown that consumers are hesitant to accept artificial food additives [57], even if the additives used in the industry comply with the Codex

Alimentarius standards. Consumers likely associate chemical additives with food fraud and health risks [28].

Distrust in the information on sausage products labels, particularly information about the product's ingredients, was another important finding of this study, reflected in participants' disregard for this information during the purchasing process. Distrust in food labeling has been reported as a barrier to using food labels in some studies [58]. According to a study by Sousa et al. [59], many Brazilian consumers did not trust food labels and, similar to participants in this study, believed that many companies omitted important information from food labels to increase sales. Consumer concerns about inadequate food labeling systems, such as incomplete disclosure of harmful ingredients, were also reported in a study by Marrota et al. [60]. Distrust in food labels mainly arises from distrust in the food industry and undermines belief in the nutritional information provided [61]. Distrust in the industry when considering food label information has also been reported among Australian consumers [62]. Empirical studies have shown that consumer trust is an important driver of food choice [63]. Trust is likely particularly important for food products with potential health risks [64]. Consumers want to ensure that the food they consume is safe and that the information accompanying food products is accurate. In recent years, there has been a notable decline in consumer trust, which can be attributed to a series of food fraud scandals. A prime example of this is the horse meat scandal that occurred in Europe, wherein horse meat was substituted for beef in meat products [65]. According to Moreira et al. [66] found that meat and meat products were among the

least trusted food items by Portuguese consumers. These findings are consistent with the results of this study, where the majority of participants expressed distrust in sausage producers.

In addition to distrust in producers, participants in this study also distrusted regulatory bodies. Researchers have confirmed that trust in the production system and regulatory bodies influences consumers' perceptions of food safety [67]. A study by Wang et al. also found that trust in the government, certification organizations, and food producers was positively associated with perceptions of food safety [68]. However, many food safety issues remain unclear to the general public, who do not always understand the available scientific information and are uncertain about the health effects of certain foods. As a result, they rely on information from regulatory bodies and other institutions. In such cases, trust in these institutions is of utmost importance to consumers [69]. Therefore, individuals who distrust regulatory bodies are unlikely to act on the information or risk messages they receive from these institutions [70]. Consequently, it is essential for relevant institutions to take greater care in protecting consumer health and minimizing their concerns about food safety and health. These institutions must earn and maintain consumer trust and ensure that producers comply with food safety and hygiene guidelines. By establishing and maintaining high levels of oversight and quality control, the likelihood of fraud in product production will decrease, and consumer trust in regulatory bodies will increase.

The use of qualitative research methods is one of the strengths of this study, as this approach greatly aids in understanding and

exploring research questions in depth [71]. Particularly, given the lack of similar studies in the country and the need for a tool to collect accurate and appropriate data to identify consumer perceptions and attitudes, the use of this method was logical and appropriate. Collecting data from different geographical regions of Tehran is another strength of this study. However, the difficulty in obtaining consent from some individuals to participate in interviews was one of the challenges and limitations of this study.

## 6-Conclusion

This study revealed that sausage products face significant challenges in terms of favorable consumer perceptions and attitudes. Consumers have serious concerns about the quality, nutritional value, and safety of these products, the potential health risks associated with high levels of fat and salt, nitrates and nitrites, and other additives, as well as the possibility of fraud in their production. These concerns influence consumers' beliefs and judgments about sausages and, ultimately, their purchasing decisions. Reformulating meat products with a focus on health and informing consumers about research efforts to improve the quality, safety, and nutritional value of these products are effective steps toward addressing public health concerns and enhancing individual consumer perceptions. In this regard, food producers, given their significant social responsibility to protect and promote consumer health, must make every effort to improve the quality of their products and provide transparent and accurate information to consumers to address their legitimate concerns about the safety and health of meat products. In addition to producers' actions, relevant institutions can also play their part in ensuring the safety

and health of these products for consumers by adopting necessary measures, including stricter regulations, closer oversight of the production and supply processes of sausage products, and decisive action against violators.

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## Conflict of Interest

There is no conflict of interest.

## 7-References

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در سال‌های اخیر، مصرف سوسیس و کالباس، به‌ویژه در میان نسل جوان، افزایش چشمگیری داشته است. با این حال، اطلاعات دقیقی از درک و نگرش مصرف‌کنندگان نسبت به این محصولات در کشور وجود ندارد. این مطالعه با هدف بررسی این موضوع در بین مصرف‌کنندگان تهرانی انجام شد. پژوهش حاضر به روش کیفی انجام گرفت. جامعه آماری مورد مطالعه، بزرگسالان با محدوده سنی ۱۸ تا ۶۰ سال ساکن شهر تهران بودند. داده‌ها با روش مصاحبه چهره به چهره از نوع نیمه‌ساختارمند جمع‌آوری شد. تعداد ۴۳ نفر (۲۵ زن و ۱۸ مرد) در این مطالعه مشارکت داشتند. روش انتخاب مشارکت‌کنندگان، نمونه‌گیری هدفمند و با حداکثر تنوع بود. اطلاعات به روش تمانیک یا درونمایه‌ای تحلیل شد. نرم افزار مورد استفاده MAXQDA2020 بود. مشارکت‌کنندگان در مطالعه حاضر، حتی آنهایی که از سوسیس و کالباس استفاده می‌کردند، این محصولات را به دلایلی چون مواد اولیه نامرغوب، تقلب در تولید محصول، دارا بودن افزودنی‌های مضر مثل نیترات، و میزان بالای چربی و نمک به عنوان محصولات سالم و ایمن درک نکرده بودند. آنها سوسیس و کالباس را با خطر بروز انواع بیماری‌ها مثل بیماری‌های قلبی، فشار خون بالا و انواع سرطان مرتبط می‌دانستند، به همین دلیل نگرش مطلوبی نسبت به این محصولات نداشتند. بی‌اعتمادی به اطلاعات روی برجسب، به ویژه ترکیبات تشکیل‌دهنده محصول، از مهم‌ترین دلایل عدم توجه مشارکت‌کنندگان به برجسب غذایی بود. علاوه بر بی‌اعتمادی به تولیدکنندگان، مشارکت‌کنندگان در مطالعه حاضر به نهادهای نظارتی و عملکرد آنها نیز بی‌اعتماد بودند. این پژوهش با واکاوی عمیق درک و نگرش مصرف‌کنندگان نسبت به سوسیس و کالباس، نقشی محوری در ارتقای کیفی این فرآورده‌ها در سطح کشور ایفا می‌کند. یافته‌های این مطالعه ضرورت اهتمام تولیدکنندگان فرآورده‌های گوشتی به ارتقای کیفیت مواد اولیه، به‌کارگیری روش‌های تولید سالم‌تر، شفافیت در برجسب‌گذاری و تقویت اعتماد به برند را به منظور رفع دغدغه‌ها و جلب رضایت مصرف‌کنندگان به وضوح نشان می‌دهد.