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Hamburger Standard in Iran: Mini Review

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Abstract

One of the most important types of meat product is the hamburger, which is particularly popular due to the use of different percentages of meat and vegetable proteins. Hamburg, Germany, is considered the birthplace of the hamburger. In the 19th century, the plan to make hamburgers was formed in this city. For the first time, they ground beef and mixed it with vegetables, onions, salt and pepper and served it in molds without bread, thus obtaining the Hamburger Steak. The standards for the production and testing of hamburger in Iran include standards 2304 (Raw frozen hamburger - Specifications and test methods) and 6103 (Detection of unauthorized animal tissue by histological method). These standards address the formulation of hamburger, their classification, chemical properties, microbial properties, histological properties, and packaging. The National Standards Organization of Iran is the one that formulates the laws and regulations related to standards and implements and supervises them. The Standards Organization of Iran has a governmental structure as a subsidiary of the presidential institution. Almost all of the country's gross domestic products, especially in the field of food, have the standard mark engraved next to the Food and Drug Administration's health apple.

1. Introduction

One of the most important types of burgers is the hamburger, which is particularly popular due to the use of different percentages of meat and vegetable proteins. The hamburger production process includes preparing and weighing raw materials, mixing and molding. First, the raw materials must be of appropriate quality. In fact, quality control of raw materials is of great importance. Meat preparation includes: dividing the carcass, removing inedible entrails, cleaning the meat, deboning the meat, and finally grinding the meat. After preparation, the hamburger is stored in sub-zero cold stores. Hamburg, Germany, is considered the birthplace of the hamburger. In the 19th century, the plan to make hamburgers was formed in this city. For the first time, they ground beef and mixed it with veg-

etables, onions, salt and pepper and served it in molds without bread, thus obtaining the Hamburger Steak (National Standard of Iran No. 2304-2016). Hamburger is subject to mandatory standard regulations in the National Standards Organization of Iran (Asadi *et al.*, 2017).

2. Definition of Hamburger Standard

According to National Standard 2304, frozen raw hamburger is minced meat from halal animals to which other permitted ingredients have been added and prepared and produced by special mechanical devices in the production unit and packaged and labeled in a tablet form under hygienic conditions and supplied frozen. In the hamburger production standard in Iran, we have a type of burger mixed with meat and veg-

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etable proteins that is permitted and in which the minimum meat content is 30% using vegetable proteins and other permitted ingredients. Permitted vegetable proteins include soybean and gluten (Asadi *et al.*, 2023).

3. Types of Hamburgers According to Iranian Standards

3.1. Hamburger with 30% Red Meat

Hamburger mixed with meat and vegetable proteins (soybean and gluten).

3.2. Hamburger with 60% Red Meat

A type of hamburger in which a minimum of 60% meat is allowed along with other ingredients, and the use of vegetable proteins is prohibited.

3.3. Hamburger with 75% Red Meat

A type of hamburger in which a minimum of 75% meat is allowed along with other ingredients, and the use of vegetable proteins is prohibited.

3.4. Hamburger with 85% Red Meat

A type of hamburger in which a minimum of 85% meat is allowed along with other ingredients, and the use of vegetable proteins is prohibited.

3.5. Hamburger with 90% Red Meat

A type of hamburger in which a minimum of 90% meat is allowed along with other ingredients, and the use of vegetable proteins is prohibited.

3.6. Hamburger with 95% Red Meat

A type of hamburger in which the minimum meat content is 95% along with other ingredients is allowed and the use of vegetable proteins is prohibited (Yarvari *et al.*, 2025).

4. Main Requirements of the Hamburger Standard

4.1. Raw Materials

The raw materials include the following:

4.1.1. Red Meat

Must be made from beef or mutton that is prepared under veterinary supervision and under hygienic conditions and healthy slaughter. The use of chicken dough is prohibited.

4.1.2. Edible Oil

4.1.3. Fillers and Binders

4.1.4. Permitted Edible Phosphates

4.1.5. Edible Salt

4.1.6. Vegetable Proteins

Only includes vegetable proteins of soybean and gluten.

4.1.7. Vegetables and Spices (Ghazanfari *et al.*, 2018)

5. Sensory and Physical Characteristics

Sensory and physical characteristics include color, odor and texture, and the final product must have its natural color, odor and texture (Iranian National Standardization Organization 2304, 2016).

6. Chemical Properties

In the Iranian standard, the items tested for the hamburger product include measuring protein, fat, moisture, ash, starch and phosphate.

7. Microbiological Properties

The microbial items tested in this product include total microbial count, *Escherichia coli*, mold and yeast, *Salmonella*, *Staphylococcus aureus*.

8. Prohibitions and Prohibited Items in Hamburgers

The use of artificial colors in hamburgers is prohibited, such as red color, which is used to make the hamburger look good. The use of preservatives exceeding the standard limits in meat products is prohibited, sulfites and boric acid and nitrates and nitrites in high amounts cause allergic reactions and ultimately cancer.

9. Packaging and Labeling

Hamburger packaging containers play a very important role in maintaining the quality, safety, shelf life and attractiveness of the product. These containers must comply with Iranian national standards. Hamburgers should be packaged in appropriate and permitted food-grade packaging with the approval and approval of the legal and competent authorities in Iran. The following information must be included on the label and packaging for marking:

Name and type of product - Percentage of meat used - Name and address of the production unit and its trademark - Date of production - Expiration

date - Storage conditions and consumption conditions (Iranian National Standardization Organization 2304, 2016).

10. Histological Characteristics

The history of histology dates back to the study of the microscopic structure of tissues and organs and has evolved over the centuries. The science has developed significantly with the development of the microscope and tissue preparation techniques. In the early 17th century, scientists such as Malpighi and Grew studied plant structures using early microscopes and recorded images of plant tissues (National Standard of Iran 6103, 2016; Asadi *et al.*, 2023; Yarvari *et al.*, 2025).

In the 19th century, with the development of the microscope and tissue preparation techniques, histology emerged as an independent science. During this period, scientists such as Johann Pürsinger and Marie Villiers developed techniques for staining tissues to view more detail. Histology also witnessed significant advances in the 20th century. New techniques such as the electron microscope made it possible to observe cellular and molecular structures with very high precision. Histology also became an applied field in medicine and biology with the advent of tissue engineering. And finally, in the 21st century, tissue engineering has made significant advances, with the aim of repairing and replacing damaged tissues using engineered cells and materials. hamburgers must be free from unauthorized organs and tissues of livestock and poultry. According to this standard, tissues of the thoracic and abdominal organs of livestock and poultry (such as heart, liver, trachea, lung, spleen, abomasum, intestines, esophagus, stratum corneum, gizzard, cloaca), urinary and reproductive organs (kidney, bladder, ovary, fallopian tubes, testicles and mammary glands), nervous tissues (spinal cord and brain) and lymphatic tissues (lymph nodes, tonsils, thymus, spleen and bursa of Fabricius), glandular tissues (such as salivary glands), tongue, skin, peritoneal fat, tail, bone tissues and cartilage are considered as unauthorized tissues in the production of meat products (National Standard of Iran 6103, 2016).

11. Storage Conditions

The storage conditions of hamburgers are very important for maintaining safety, quality and preventing spoilage. Failure to comply with these conditions can lead to the growth of dangerous bacteria such as salmonella and poisoning. The storage temperature of frozen raw hamburgers is minus 18 degrees Celsius and the cold chain should not be interrupted. Signs of spoilage of hamburgers include a pungent, sour or rotten smell, a change in color to gray, green or brown,

and the presence of slime on the surface (Iranian National Standardization Organization 2304, 2016).

12. Difference Between Iranian Standards and International Standards

The Iranian standard is more stringent in some cases than many international standards (such as Codex Alimentarius), especially in the field of fat percentage and restrictions on the use of additives.

13. Challenges in Implementing the Standard

Including insufficient supervision of small production units, differences in quality in different seasons, increased smuggling of meat and non-standard products, and lack of consumer awareness of the characteristics of a standard hamburger.

14. Recommendations for Consumers

Buy from reputable centers.
Pay attention to labeling and expiration date.
Pay attention to uniform texture and absence of heterogeneous parts.
Pay attention to the standard mark on the product.

15. Comparison of Iranian Standards with other Countries

The hamburger standard in Iran is more stringent than many countries in terms of restrictions on chemical additives and some quality parameters, but it needs to be developed in terms of information transparency, traceability system, and standards beyond safety. The best solution is to maintain the advantages of the current standard (such as restrictions on chemicals) and strengthen the weaknesses using international experiences. Standardization is a dynamic process and must be updated according to scientific advances, changing consumer tastes, and international trade requirements.

16. Conclusion

Compliance with the hamburger standard not only ensures consumer health, but also helps develop the country's food industry and increase public trust. Continuous supervision by competent authorities and informing consumers are the main pillars of the successful implementation of this standard. In Iran, special attention should be paid to the challenges and frauds and the issue of smuggling, and also, unauthorized additives and preservatives, and especially unauthorized textures in hamburger products, should be monitored

better and more. In the field of exports to Muslim countries in the Persian Gulf and in the issue of halal branding, the meat used should be further refined so that sanitary conditions and religious slaughtering and separation of forbidden components are carried out accurately.

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