**Turkish Food Codex Salt Communiqué**

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| **Abstract**  Salt holds a fundamental importance in human nutrition and various industrial sectors. As a critical component of dietary regimes, it must be handled with great care concerning food safety. In Turkey, the hygienic production of salt, iodization, and packaging are regulated by the Turkish Food Codex Salt Communiqué (Communiqué No: 2013/48). This article examines the details of the communiqué and offers suggestions to enhance public health and consumer awareness.  The communiqué ensures that salt is produced under hygienic and suitable technical conditions, thereby safeguarding food safety. This regulation aims to maintain hygienic standards throughout the production and storage processes. Hygienic production not only protects consumers from health risks but also ensures that producers comply with national and international standards.  Moreover, natural salts can contain impurities that may be introduced through contamination. While limits are specified for heavy metals such as arsenic, copper, lead, cadmium, and mercury, there is currently no restriction concerning microplastics, despite their increasing prevalence in natural salts like sea salt. The potential harmful effects of microplastics on human health necessitate regulations in this area.  Additionally, the regulation mandates that iodized salts contain 25-40 mg/kg of potassium iodate to combat iodine deficiency-related diseases, particularly thyroid disorders. However, the loss of iodine over time due to exposure to light, heat, and air can compromise the effectiveness of iodization, which is why a two-year shelf life is established for refined salt.  In light of rising cardiovascular diseases and hypertension, reduced-sodium salts are crucial, yet the communiqué excludes these options. Incorporating reduced-sodium salts into regulations could provide consumers with healthier alternatives. |
| Keywords: Food Safety, Iodized Salt, Heavy Metals, Salt Regulation, Consumer Awareness |

1. **Introduction**

Salt plays a fundamental role in human nutrition and various industrial fields. As a critical component in the diet, salt is also a substance that requires careful attention when it comes to food safety. In Turkey, regulations governing the hygienic production of salt, iodine fortification, packaging, and storage conditions are outlined under the Turkish Food Codex Salt Regulation (Regulation No: 2013/48). This regulation sets forth a series of standards, including the chemical properties of salt, its mineral content, and the removal of foreign substances, with the goal of protecting public health. Specifically, the mandatory use of iodized salt plays a vital role in preventing health issues related to iodine deficiency, which is common in the population.

In terms of food safety, salt must be carefully controlled from production through packaging to consumer delivery. Ensuring purity in salt production and removing harmful substances such as heavy metals and soil residues are of utmost importance. Regular analyses must be conducted, and packaging must adhere to international quality standards. During packaging, materials that prevent moisture, air, and light permeability should be used to prevent spoilage. Salt should be stored in dry, dark environments to preserve its quality.

The health effects of salt are widespread. Excessive salt consumption can lead to serious health risks such as high blood pressure, cardiovascular diseases, kidney problems, and osteoporosis. The World Health Organization and other health authorities recommend that daily salt consumption be kept within certain limits, advising the use of low-sodium or mineral-supplemented salt alternatives. Furthermore, iodized salt consumption is important for thyroid health and is recognized as an effective preventive measure against diseases caused by iodine deficiency [1].

This article will examine the regulations contained in the codex and offer various recommendations to protect public health and increase consumer awareness.

**1. Positive Aspects**

**1.1 Hygiene and Production Standards**

The regulation mandates the hygienic production of salt under appropriate technical conditions to ensure food safety. This regulation aims to maintain specific hygiene standards throughout the entire process, from production to storage and sales. Hygienic production and processing practices help prevent consumer health risks while assisting producers in complying with national and international food safety standards. Stringent standards have been set for equipment cleanliness, raw material selection, worker hygiene, and product packaging. Salt produced in this manner reaches consumers as a safe product, minimizing the risk of microbiological contamination. Additionally, mandatory iodine fortification, as specified in the regulation, is crucial for public health, contributing to the prevention of health issues caused by iodine deficiency. This ensures both individual health and food safety standards are met.

However, working conditions for employees extracting salt from sources such as rock salt mines, sea salt, lake salt, and river salt pose specific health and safety risks. Workers directly handling raw materials and products using traditional hand tools or machinery face physical and occupational health risks. Therefore, workplace safety and hygiene standards must be strictly maintained. Workers should receive necessary training and use protective equipment to ensure both their own safety and the protection of consumers' health. Regular monitoring and improvement of hygiene and safety standards in these workplaces are essential.

Natural impurities in salts, including heavy metals and other contaminants, pose significant health risks to consumers. Current regulations set limit values for heavy metals such as arsenic, copper, lead, cadmium, and mercury. Exceeding certain concentrations of these substances is considered hazardous to health. For example, high levels of lead and cadmium can harm the nervous system and kidneys, while long-term exposure to arsenic may lead to cancer. However, with increasing microplastic pollution, natural salt sources, particularly sea salts, may contain microplastic particles. No restrictions are currently in place regarding microplastic contamination in salt. While the effects of microplastics on human health are not fully understood, research indicates that microplastics can enter the human body through the digestive system, potentially weakening the immune system. Therefore, it is crucial to establish regulations to limit the presence of microplastics in salt products to safeguard public health, particularly as the consumption of natural salts increases.

**1.2.** **Iodine Fortification**

Iodine deficiency remains a significant public health issue in Turkey. Iodine is a vital mineral for the normal function of the thyroid gland, and its deficiency leads to widespread thyroid disorders, including goiter. In response, the Turkish Food Codex Salt Regulation mandates the addition of 25-40 mg/kg of potassium iodate to table salts, offering an effective solution to this problem. This regulation represents a critical step in preventing iodine deficiency-related diseases. Potassium iodate enhances the bioavailability of iodine, helping to minimize health issues caused by iodine deficiency. The goal is to increase iodine intake in the population and reduce iodine deficiency-related health problems [2].

Various studies conducted in Turkey have shown that iodine deficiency negatively impacts growth and development, especially in children. Adequate iodine intake not only supports thyroid health but also positively affects overall health. Thus, the implementation of this regulation will significantly contribute to improving public health and preventing thyroid diseases. Health authorities should also organize awareness campaigns to educate the public on the importance of iodine intake, ensuring that more individuals in the population are healthier.

**1.3.** **Packaging and Labeling Regulations**

The regulation mandates that packaging for iodized salts must include measures to prevent iodine loss. This regulation aims to preserve the stability of iodine in salt by taking both physical and chemical properties of the packaging into account. Packaging materials that block light and minimize air permeability are encouraged to preserve iodine content. Additionally, the regulation requires that the iodine content and its form (e.g., potassium iodate) be clearly stated on the packaging. This enables consumers to assess the health benefits of the product and make informed choices.

These regulations support consumer awareness and healthy product selection while ensuring that products remain safe for long-term use. Consumers can use labeling information to select salts that meet their iodine requirements, contributing to the prevention of health issues such as iodine deficiency. Furthermore, these regulations encourage producers to comply with quality standards, furthering the goals of food safety and public health.

**2. Gaps and Areas for Improvement**

**2.1 Flexibility in Iodine Levels**

The regulation prescribes that the amount of iodine added to table salt should be between 25-40 mg/kg, allowing a deviation of +3 mg/kg. This flexibility could lead to situations where consumers may not receive an adequate amount of iodine. Establishing a more fixed range would be beneficial for public health.

Iodine added to salt may degrade over time due to environmental factors, particularly light, temperature, and air. This process reduces the effectiveness of iodine, weakening the health benefits of the salt. Therefore, to maintain iodine's efficacy, a shelf life is set for refined salt. In Turkey, this shelf life is two years.

The two-year shelf life represents a critical period for iodine stability in salt, ensuring that the consumer receives an adequate amount of iodine. If stored under proper conditions (cool, dry, and dark), iodine loss remains minimal during this period. However, exceeding this period could significantly reduce the iodine content, potentially leading to iodine deficiency issues.

Therefore, it is crucial for both producers and consumers to pay attention to this two-year shelf life to prevent health issues related to iodine intake. To ensure the effectiveness of iodized salts, the expiration date must be clearly indicated on the labels, with a recommendation for consumption by this date. This is essential for safeguarding public health and combating iodine deficiency.

**2.2 Reduced-Sodium Salts**

Given the rising cases of cardiovascular diseases and hypertension, the importance of reduced-sodium salts has become more pronounced. The World Health Organization and various health authorities emphasize the negative health impacts of excessive sodium intake and raise awareness about it. In particular, reduced-sodium salts play a crucial role in combating conditions like hypertension and heart diseases.

However, the current regulation excludes reduced-sodium salts, limiting options for consumers seeking healthier alternatives. Including reduced-sodium salts in the regulation would allow both producers and consumers to use these products more reliably and contribute positively to public health.

Consumers must be informed about the contents of reduced-sodium salts, their potential health benefits, and correct usage areas. In this way, these alternative salts can offer a healthy solution for individuals aiming to reduce the risks of hypertension and heart diseases by making informed choices. Furthermore, by ensuring that producers comply with quality and safety standards for reduced-sodium salts, these products can become more reliable from a food safety perspective.

In conclusion, including reduced-sodium salts in the regulation will contribute to preventing critical health issues like cardiovascular diseases and hypertension, thus offering consumers healthier dietary options.

**2.3. Food Industry Salt Sales**

Limiting the retail sale of food industry salt could pose serious challenges, especially for small-scale producers. Small producers, who typically have limited resources and market access, may face decreased competitiveness and jeopardized market presence due to such restrictions. This situation threatens their economic sustainability and may reduce local production capacity.

More flexible regulations for the sale of food industry salt are necessary to meet the needs of small-scale producers. These regulations could allow small producers to bring their products to the market more easily, contributing to local economic development. For instance, special permits or incentives could be established to enable small producers to sell certain amounts of salt. Additionally, supporting local markets would offer significant opportunities to promote these producers' products and increase sales.

More flexible sales conditions would encourage small producers to comply with quality standards while offering consumers a wider variety of products. This creates a win-win situation for both producers and consumers. Integrating small-scale producers into the market would increase the diversity of local products and provide consumers with healthier and more natural food options [3].

In conclusion, rather than limiting the retail sale of food industry salt, re-evaluating these sales with more flexible and producer-friendly conditions will enhance small-scale producers' competitiveness and contribute to strengthening the local economy.

**2.4. Mixing of Different Types of Salt**

Mixing salts containing heavy metals like arsenic, copper, lead, cadmium, and mercury with those that do not, in order to reduce their levels below the limits specified in the Turkish Food Codex Salt Regulation, could pose significant health risks to consumers. Therefore, mixing salts from different sources is prohibited.

This regulation is critical for ensuring food safety and protecting public health. Producing salt hygienically and in accordance with standards minimizes health risks and provides consumers with more reliable products. Additionally, the presence of heavy metals above certain limits should be considered for its harmful effects on human health.

This aspect of the regulation contributes to raising awareness among both producers and consumers while ensuring that food products are safely brought to the market. The prohibition not only increases food safety but also prevents low-quality and hazardous products from entering the market, fostering a healthy competitive environment. Thus, it can be viewed as an important step in ensuring the hygienic production and safe consumption of salt.

However, banning the mixing of salts may complicate the production of mineral-enriched or reduced-sodium salts under controlled conditions. Allowing controlled mixing could facilitate the production of healthier products [4].

**2.5. Salt Consumption Warning**

The regulation mandates that all salt products must feature the statement "Reduce salt, protect your health." This regulation is an important step in encouraging consumers to be more cautious about their salt consumption. However, requiring this statement only on high-sodium salt products may be more effective in raising awareness, as the negative health impacts of excessive salt intake are more pronounced in such products.

Furthermore, placing this warning more prominently on the packaging, such as with eye-catching colors and graphics, could help consumers better understand the message. For instance, a warning with vibrant colors and visual elements could help raise awareness during product selection.

Excessive salt consumption can lead to serious health issues, including hypertension, cardiovascular diseases, kidney problems, and stroke. Additionally, it can negatively affect bone health and increase the risk of osteoporosis. Clearly communicating these health risks to consumers could serve as a motivation for them to be more cautious about their salt intake.

In conclusion, regulations and improvements like these will contribute significantly to public health protection by raising awareness. Informing consumers about adopting healthy lifestyle habits plays a critical role in enhancing food safety.

**2.6. Iodine-Free Salt Packaging**

The regulation stipulates that iodine-free table salts must only be sold in 250-gram packages. While this regulation is primarily aimed at combating iodine deficiency, the restriction on package size presents practical challenges. For larger families or commercial kitchens, where more salt is consumed, 250-gram packages may be insufficient.

Large families, which use more ingredients in their daily meals, and commercial settings, such as restaurants and hotels, where large amounts of salt are consumed, may find this packaging limit inadequate. Therefore, limiting to only small packages will not meet consumer needs. Offering larger package sizes, such as 1 kilogram or larger, could provide both economic and practical advantages. For example, larger packages allow consumers to buy the salt at a more reasonable price, preventing waste.

Additionally, offering larger packages could increase the use of iodized salts, as they are more suitable for long-term use, reducing the need for frequent repurchases. In conclusion, expanding the range of available packaging sizes, rather than limiting to 250-gram packages, will increase consumer satisfaction and play an essential role in achieving health objectives.

**2.7. Mineral-Enriched Salts**

The regulation does not include any provisions for salts enriched with minerals like potassium and magnesium. However, these salts have gained popularity in recent years in line with healthy eating trends. Potassium has positive effects on heart health, while magnesium is critical for muscle and nerve function. Salts enriched with these minerals not only reduce sodium intake but also provide nutrients that support human health.

With rising health awareness, consumers are becoming more attentive to the functional properties of foods. Enriched salts are recommended as part of a healthy diet, and including such products in the regulation would be beneficial for both producers and consumers.

Furthermore, adding minerals like potassium and magnesium can reduce sodium intake while providing additional health benefits, making these salts a valuable product for improving public health [5].

1. **Conclusion**

In conclusion, the regulation of salt and its additives plays a crucial role in public health, particularly in preventing diseases related to excessive sodium consumption and iodine deficiency. The flexibility in the iodine content of salt, while allowing some leeway, may cause discrepancies in consumers' iodine intake, which could lead to health issues. Establishing more consistent iodine levels and clear labeling for salt products will significantly contribute to better health outcomes. Moreover, the inclusion of sodium-reduced salts in the regulations, as well as more flexible sales conditions for small-scale producers, can foster both healthier consumer choices and a more robust local economy.

The prohibition on mixing salts from different sources is essential in ensuring food safety and protecting consumers from the risks associated with heavy metal contamination. Additionally, the mandatory inclusion of health warnings on high-sodium salt products is an effective step in raising consumer awareness about the health risks of excessive salt consumption. Finally, the availability of larger packaging options for iodized salt and the incorporation of mineral-enriched salts into the market will enhance the public’s access to healthier alternatives.

As the global health landscape continues to evolve, it is imperative that regulations adapt to the growing demand for healthier, functional food products, while ensuring food safety, sustainability, and equitable access. Addressing these areas will not only protect public health but also contribute to a more sustainable and health-conscious food industry.

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