REVIEW ARTICLE

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Overview of Food Safety and Labeling Regulatory Frameworks in Morocco

Samya Boulaajine [1,2] **Hassan Hajjaj** [1,2]

1 Moulay Ismail University, Faculty of Sciences Meknes, Laboratory of Biotechnology and Bioresources Valorization, BP 11201, Zitoune, Meknes, Morocco. s.boulaajine@edu.umi.ac.ma
2 Moulay Ismail University, Cluster of Competency «Agri-food, Safety and Security» IUC VLIR-UOS, Marjane 2, BP 298, Meknes, Morocco. h.hajjaj@umi.ac.ma

ABSTRACT

Background: Food fraud and mislabeling pose substantial risks to consumer health, economic integrity, and public trust in the food supply chain. In Morocco, the increasing consumption of processed foods and the prevalence of informal markets further exacerbate the threats associated with food labeling violations.

Aims: This review aims to assess the current state of food labeling and safety regulation in Morocco. A central focus is to analyze the role and effectiveness of the National Office for Food Safety (ONSSA) in monitoring and enforcing these labeling standards.

Methods: A documentary research approach was employed, involving a comprehensive review of scientific literature, including peer-reviewed articles, as well as official reports and regulatory texts with a particular emphasis on Moroccan legal frameworks.

Results: Morocco has achieved notable progress in regulating food labeling, particularly through the implementation of Decree No. 2–12–389 and the inspection efforts of the ONSSA. However, significant enforcement challenges persist, especially in informal markets and in addressing ambiguous health claims. Annually, a considerable volume of food is seized due to labeling violations. Further progress is hindered by the lack of widespread front-of-pack labeling and inconsistencies in relation to existing regulations.

Conclusions: While Morocco has successfully strengthened its food labeling infrastructure, further improvements are necessary. Enhancing regulatory clarity, expanding producer education, and promoting consumer awareness—particularly through tools such as front-of-pack labeling—are essential for advancing food safety and public health. Greater alignment with international standards and the adoption of digital traceability systems will further support the modernization of Morocco's food system.

Keywords: Food products; Labeling; Claims; Fraud; Control; Safety.

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✉ **Corresponding author:** Samya Boulaajine
E-mail: s.boulaajine@edu.umi.ac.ma
Tel. +212 (661 59 43 51)

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1 INTRODUCTION

Food fraud is formally defined as "the intentional addition, adulteration, misrepresentation, or substitution of food, food ingredients, or packaging; or the making of false or misleading statements about a product" (Gussow & Mariët, 2022; Robson *et al.*, 2021; Spink & Moyer, 2011). It is widely recognized as deliberate deception for economic gain (Spink *et al.*, 2019; Spink, 2019) and has been identified as a pervasive issue across local, regional, and international food systems (Kendall *et al.*, 2019). These fraudulent activities erode public trust and can hinder legislative efforts aimed at reducing food fraud (Kendall *et al.*, 2019).

A notable case of food fraud in recent decades involved the widespread misrepresentation of horsemeat as beef, as well as the sale of horsemeat from animals treated with phenylbutazone as edible product (Walker, 2017). Other instances include the fraudulent marketing of conventional flour as organic, battery-raised eggs as organic, and the use of road salt in place of food-grade salt (Bakhtavoryan *et al.*, 2019). Similar fraudulent practices include dioxin-contaminated lipids in feed, fish misidentification, methanol in spirits, and seafood mislabeling (Borma, 2018; European Parliament, 2014). International reports in 2019 documented 114 cases of food fraud, with mislabeling and counterfeiting accounting for 64 cases (56.1%), adulteration for 40 cases (35.1%), and the sale; of unfit products for 10 cases (8.8%) (Brooks *et al.*, 2021; Han *et al.*, 2022; Onyeaka *et al.*, 2022). In 2020, a total of 147 cases were recorded, with mislabeling representing 42.2%, adulteration or dilution 45.6%, and unfit products 12.2% (Brooks *et al.*, 2021).

For a food product to be considered authentic, it must comply with regulations governing labeling, ingredient composition, production processes, and specific practices and technologies (Huck *et al.*, 2016). Transparency in these areas is crucial to prevent consumer deception and enable individuals to make informed choices based on their health and dietary needs (Ikonen *et al.*, 2020). The relationship of trust between producer and consumer relies on the provision of clear and accurate information about nutritional content, production methods, and product origin (Conway, 2011; Mick *et al.*, 2012).

Food labeling is defined as any reference appearing on a container, document, notice, label, or collar that is affixed to or referring to associated with a primary product or food (Cheftel, 2005). It functions as a primary communication tool between producers and consumers (Spink *et al.*, 2011), providing essential product information, such as the name, ingredients, quantity, as well as health- and nutrition-related details including storage guidelines, usage instructions, and nutritional data (Bandara *et al.*, 2016; Kramer & Caswell, 2019; Mackey & Metz, 2009). Beyond its informative role, labeling also serves as a tool for marketing and advertising (Czine *et al.*, 2020; Domínguez Díaz *et al.*, 2020), empowering consumers to make informed purchasing decisions (Van Der Bend & Lissner, 2019).

In addition, food labeling is fundamental for product traceability by displaying batch numbers (Galvez *et al.*, 2018). In the context of globalized markets, this traceability is essential for rapid identification of suppliers and customers, enabling efficient product withdrawal or recalls (Hall & Johnson-Hall, 2021; Prashar *et al.*, 2020). Products lacking proper labeling or those sold in bulk pose significant health risks and are often subject to marketing restrictions (Samiee, 1994).

International regulatory bodies, such as the European Food Safety Authority (EFSA) and the U.S. Food and Drug Administration (FDA), are responsible for monitoring food safety (Cattaneo *et al.*, 2023; Owusu-Apenten & Vieira, 2023; Wheatley & Spink, 2013). In Morocco, the National Office for Food Safety (ONSSA) serves as the key regulatory authority for food labeling, ensuring compliance for domestically produced, imported, and exported products (Ait Hou *et al.*, 2015; Codron *et al.*, 2014; Lharoual *et al.*, 2022).

The history of food labeling in Morocco commenced with the 1915 Order, which only mandated basic product details. As the food industry evolved and consumer expectations rose, this legislation was updated by Decree No. 2–0 1–1016 of June 04, 2002, amended later to align with international norms. Yet, this decree still lacked provisions for nutritional information, allergen declaration, and specific requirements for imported and unpackaged products. The 2013 Decree No. 2–12–389 marked a significant update, introducing mandatory labeling for nutritional data, ingredients, and allergens.

Recent dietary shifts in Morocco, marked by an increase in processed and fast-food consumption, especially among young individuals (Allali, 2017), contribute to emerging health issues such as overweight and obesity and an increased prevalence of non-communicable diseases (NCDs) (Kaoutar *et al.*, 2022). In response, front-of-pack (FOP) labeling systems are increasingly recognized as a vital public health tool to inform consumers about the nutritional value and facilitate healthier food choices (Jones *et al.*, 2019; Muzzioli *et al.*, 2022). Systems such as Nutri-Score and traffic light labels have proven effective in influencing purchasing behavior and reducing health risks (Shrestha *et al.*, 2023). However, Morocco has yet to widely implement or enforce these systems, which limits their potential impact.

Simultaneously, the country faces rising risks of food fraud and labeling violations, particularly within informal markets and for certain industrial and imported products. Annually, substantial quantities of food are seized or destroyed for non-compliance, with several violations related to labeling issues such as missing expiration dates or unknown origin. Industrial products sold in informal markets are especially susceptible to fraud and contamination. Notable cases have involved mislabeled beverages, expired goods, and tainted dairy products (ONSSA, 2020). These trends underscore the urgent need for more stringent enforcement, improved inspection systems, and greater consumer education (ONSSA, 2020).

This review aims to provide a comprehensive analysis of food safety in Morocco, with a specific focus on food labeling regulations and the role of the National Office for Food Safety (ONSSA). The primary subtopics addressed include (i) the core functions of ONSSA's in food control; (ii) the types of inspections carried out; (iii) the categories of violations detected and the methods of detection; (iv) the specifics of labeling offenses and associated sanctions; (v) the applicable food labeling legislation in Morocco; and (vi) the types of claims governed by regulation. Collectively, these sections offer an overview of Morocco's current labeling practices, enforcement gaps, and broader food safety efforts.

2 METHODS

This review employed a documentary research approach. The methodology involved a comprehensive consultation of peer-reviewed publications addressing food safety, food security, labeling requirements, claims, and relevant legislation. In parallel, gray literature, including ministerial reports, official briefing notes, inspection summaries, and regulatory documents, was examined. A thorough review of

documents and data available on the websites of key Moroccan institutions was conducted, including the Ministry of Health, the Ministry of Agriculture, Maritime Fisheries, Rural Development, and Water and Forests, as well as the National Office for Food Safety (ONSSA). Particular attention was paid to ONSSA's inspection activities, reported violations, and detection methods. Additionally, for comparative purposes, the regulatory frameworks of the U.S. Food and Drug Administration and the European Union were analyzed. This comprehensive documentary review served as the foundation for assessing the current state of food labeling and safety in Morocco and for identifying areas requiring improvement.

3 RESULTS

3.1 The National Office for Food Safety at the Center of Morocco's Control Missions

The landscape of Food Safety and Labeling in Morocco is comprised of a series of specialized public institutions and bodies whose activities are governed by a defined legal framework. The key entity within this framework is the National Office for Food Safety (ONSSA), established by Law No. 25–08 (Chammem *et al.*, 2018). ONSSA is a government agency endowed with legal personality and financial autonomy. On behalf of the state, it executes responsibilities related to the preservation of plant and animal health and the protection of consumer health (Law n°25–08, 2009).

ONSSA intervenes throughout the entire food chain to ensure product quality and sanitary safety. It is responsible for implementing the government's policy for the sanitary protection of the national plant and animal heritage. This includes the control of animal feeds, plant and animal products, and their derivatives, as well as fishery products, whether during import, export or within the domestic market. The ONSSA also issues health authorizations or approvals for establishments involved in the production, manufacturing, processing, handling, transport, storage, preservation, or sale of food and feed. Furthermore, ONSSA oversees the control of fertilizers, irrigation water, food additives, and all materials in contact with food products, including packaging (Law n°25–08, 2009).

3.2 Typology of Controls Carried Out by the National Office for Food Safety

To fulfill its responsibility for consumer health protection, ONSSA, through its various departments, conduct food inspections in accordance with current rules and regulations. These inspections are categorized into two main types:

- *Regular Controls:* This category encompasses routine sanitary inspections of food products and food additives to ensure their conformity with established standards.
- *Reinforced Controls:* This involves an intensification of inspections on specific food products during certain periods of the year. This strategy is primarily employed during the summer months and the month of Ramadan, periods when consumption of certain products is elevated and the risk of food-related incidents or fraud is consequently higher (ONSSA, 2025).

The office also executes two distinct strategic plans:

- *Control plans*: These plans involve systematic controls of food and food additives, which are implemented at the central, regional, or provincial levels based on a hazard analysis.
- *Surveillance plans*: These plans are designed for the overall assessment of risks to consumers (ONSSA, 2025).

3.3 Typology of Offenses and Their Detection

According to Article 19 of Law No. 13–83 on the prevention of fraud in goods, the primary purpose of these control measures is to prevent fraud and, in the event of an offense, to detect and prosecute the perpetrators (Law No. 13–83, 1984). Table 1 summarizes the principal offenses defined in Laws No. 13–83 and 28.07.

3.4 Labeling Offenses and Penalties

Table 2 summarizes the key labeling violations and their corresponding penalties as cited in Moroccan laws.

3.5 Food Labeling Regulations in Morocco

Food labeling is primarily regulated by the Decree No. 2–12–389 of 11 *Joumada* II 1434 (April 22, 2013) which establishes the conditions and procedures for labelling food products. As per Article 10 of this decree, the sales name, country of origin, and batch indicator must be included on the labels of primary products. However, Article 11 mandates that the labeling of all packaged foods must include the following information:

i. The product name.
ii. The complete list of ingredients.
iii. The names of any allergenic ingredients.
iv. The net quantity of the product and its specific ingredients.
v. The use-by date or the date of minimum durability.
vi. Any special storage conditions.
vii. The name or business name and address of the party responsible for placing the product on the market (including the importer for imported products).

viii. The country of origin or the place of provenance of the product.
ix. Instructions for use, if any
x. The alcoholic strength by volume for beverages with an alcoholic content exceeding 1.2% alcohol by volume;
xi. Nutritional information, when mandated by applicable regulations or where the product or its advertising mentions a nutritional or health claim;
xii. The manufacturing or packaging batch number for traceability purposes;
xiii. The additional mandatory information specified in Annex II of the said Regulation;
xiv. The authorization or approval number and any other mandatory information required, where applicable, by the regulatory provisions specific to the product in question (Decree No. 2-12-389, 2013).

Table 1. The Principal Offenses Mentioned in the Moroccan Food Laws (*Law No. 13-83, 1984; Law No. 28-07, 2010*)

References	Offenses	Penalties
Articles 4, 5 and 6 of Law No.13-83	- Deceiving or attempting to deceive the contractor: ▪ Either as to the nature, substantial qualities, composition and content in useful substances of all goods; ▪ Either as to the nature or origin of the goods, if, according to convention or usage, the designation of the nature or origin falsely attributed to the goods must be considered as the principal cause of the behind the contractor's commitment; ▪ Either by the quantity of goods manufactured, packaged, stored for sale, sold or delivered; ▪ Or their identity, by the delivery of goods other than the specific thing that was the subject of the contract. - Adulterating Foodstuffs for human or animal consumption, medications, drinks, and natural or agricultural goods meant for distribution or sale; - Importing or attempting to import, producing, displaying, offering for sale, selling or distributing food for human or animal consumption, beverages and agricultural or natural products known to be adulterated, tainted, toxic or to which chemical, biological or other natural substances have been added for any reason whatsoever, in particular for preserving, coloring, flavoring or sweetening, or which have been subjected to irradiation likely to cause a change in their nature or properties, other than those for which their use is authorized; - Importing or attempting to import, manufacturing, displaying, offering for sale, selling or distributing: ▪ adulterated, deteriorated or expired medicinal substances; ▪ products knowing that they are intended for the adulteration of food intended for human or animal consumption, beverages, agricultural or natural products and medicinal substances. - Placing any food or beverage into contact with materials composed of substances other than those whose use is authorized; - Detention without legal grounds: ▪ Food for human or animal consumption, beverages, agricultural or natural products known to be adulterated, spoiled or toxic; ▪ Falsified, damaged or expired medicines; ▪ Products likely to adulterate food for human or animal consumption, beverages, agricultural or natural products.	- Imprisonment of 6 months to 5 years and a fine of 1,200 to 24,000 Moroccan Dirhams (MAD), or only one of these two penalties (Article 1 of law No.13-83).
Article 2 of Law No.13-83	- Deception, falsification or fraud committed with the use of products or treatments dangerous to human or animal health, or if the perpetrator sells or offers for sale meat or offal from animals which he knows to have died of diseases recognized as infectious or parasitic diseases transmissible to humans or animals, or which have been slaughtered because they suffered from these diseases.	- Imprisonment from 2 to 6 years, if the use of such substances has caused another person sickness or inability to work for more than twenty days; - Imprisonment for 5 to 10 years if the use of such substances has caused another person either an incurable disease or the loss of the use of an organ or a permanent infirmity; - Imprisonment for 10 to 20 years if the use of such substances has caused death without the intention of causing it.

Table 1. (Continued)

Article 3 of Law No.13-83	- Offenses specific to any member of the armed forces, administrator or military accountant: ▪ Falsifying any material, food, or liquid in his or her custody or under his or her supervision; ▪ Distributing falsified materials, food, or liquids; - Intentionally distributing meat from animals suffering from recognized contagious or parasitic diseases communicable to humans or animals, or tainted or spoiled materials, foodstuffs or liquids.	- Imprisonment of 4 to 10 years and a fine of 2,400 to 48,000 MAD of only one of these two penalties.
Article 25 of Law No.28-07	- Placing on the national market, importing or exporting primary products, foodstuffs or animal feeds dangerous to human or animal life or health; - Handling, processing, packaging, distributing, placing on the national market or exporting primary products, foodstuffs or animal feeds provided by an unauthorized establishment or company or whose the authorization or approval has been suspended or withdrawn. - Failure to comply with the terms of Article 10 when aware that the primary product (food or feed) did not meet the requirements for qualification as safe.	- Imprisonment of 2 to 6 months and a fine of 50,000 to 100,000 MAD, or only one of these two penalties, without prejudice to the provisions of the Penal Code or the specific legislation applicable to the products.
Article 26 of Law No.28-07	- Placing a product or food product on the domestic market, exporting it, or importing it without labeling it in accordance with the applicable requirements as per the provisions of Law No 28-07 and the texts taken for its application, or by virtue of any other specific legislation or regulations. - Refusing to withdraw a primary product, food product or animal feed from the national market within the period fixed by the competent authority pursuant to Article 20 of Law No. 28-07.	5,000 to 20,000 MAD
Article 27 of Law No.13-83	- Flagrant offense of adulteration or sale of adulterated goods or products recognized as damaged, toxic or expired.	Seizure
Article 23 of Law No. 28-07	- Primary products, food or feed that present a risk to human as well as animal health, recognized adulterated, spoiled, toxic or expired, or unfit for consumption; - Objects or apparatus that can be used to commit adulteration.	Seizure

Table 2. Principal Labeling Offenses Cited in Moroccan Laws (*Law No. 25-06, 2008; Law No. 28-07, 2010; Law No. 39-12, 2013*)

References	Offense	Sanctions
Article 27 of law No.28-07	- Placing food or products without compliant labels on the national market, or their import or export.	5,000 to 20,000 MAD.
Article 37 of Law No.25-06	- Using a unique sign of quality and origin, or attaching a mark that reflects that sign, to a product without it having received the certification mentioned under Article 20 of this Law, or using the certification after it has been revoked.	50,000 to 500,000 MAD, without prejudice to the terms of the text of the Penal Code.
Article 38 of Law No.25-06	- The labeling of a product, logo, or trademark with a protected geographical indication or origin designation that, in violation of the terms of Article 29 of Law No. 25–06, misleads consumers about the nature, identity, attributes, or origin of the product; - The use of an advertisement or sales description in violation of Law No. 25–06's Article 30 that can misinform customers about the origin of the product or its characteristics, or compromise the agricultural label's specificity, protected geographical indication or origin designation; - The use of a label that can mislead the consumer as to the origin or characteristics of the product or undermine the specificity of the agricultural label, the protected geographical indication or origin designation, in violation of the provisions of Article 30 of Law No. 25–06; - Presentation that might deceive the buyer about the real origin of the goods, especially if it implies that it has a distinguishing quality or origin label; - The name of an agricultural label, a protected geographical indication or origin designation that would deceive or damage the reputation of said distinctive signs of origin and quality, for a product other than those covered by Law No. 25–06, for a natural or legal person, or for a service, in violation of the terms of Article 34 of Law No. 25–06.	5,000 to 50,000 MAD, without prejudice to the other penalties provided for by Law No. 13–83 on the suppression of fraud involving goods and by Law No. 17–97 on the protection of industrial property.
Article 32 of law 39-12	- The utilization of terms or logos mentioned in Article 29 of Law No. 39–12 concerning the organic production for the purpose of describing or advertising said product, or to deceive customers by calling it a "organic product" even though it was not produced in compliance with the regulations established by this Law.	20,000 to 100,000 MAD, without prejudice to the provisions of the Penal Code. Products bearing the said indications or logos must be withdrawn from the market at the expense and risk of their owners.
Article 33 of law No.39-12	- The product labeling, logo, phrase, or commercial brand that might mislead a customer into thinking that the product originates from organic farming when, in fact, it was not obtained in accordance with statute No. 39–12; - A claim that might mislead the customer about the nature or qualities of the product or harm the reputation of organic products or the organic production process in the product's name or promotion.	10,000 to 50,000 MAD, without prejudice to the other penalties provided for by Laws Nos. 13-83, 17–97 and 28–07.

The designation of ingredients, including additives and compound ingredients, must adhere to the terms listed in Section A of the Appendix to Order of the Minister of Agriculture and Maritime Fisheries No. 2037–16 of 7 *Chaoual* 1437 (July 12, 2016) which lays down the technical terms for the designation of ingredients in food products. If the ingredients used in a food product belong to the categories listed in Section B of the Annex to Order No. 2037–16, only the name of the category may be utilized. Food additives must be identified by their category and by their specific name or by their "E" identification number, in accordance with Article 18 of the aforementioned Order. If a food additive is falls into more than one category, the category designated on the label shall be based on the primary function it performs in the food. The defined categories for additives include, but are not limited to, acidifiers, anti-caking agents, anti-foaming agents, antioxidants, flour treatment agents, foaming agents, leavening agents, firming agents, glazing agents, modified starches, colorants, acidity correctors, preservatives, thickeners, sweeteners, flavor enhancers, emulsifiers, propellants, gelling agents, humectants, baking powders, sequestrants, stabilizers, and emulsifiers (Order No. 2037–16, 2016).

Article 5 of the said Order stipulates that any composed ingredient must be listed by its name, according to its overall weight in the final product, and its own list of constituent ingredients must be defined. However, the composition of the compound ingredients is not required, subject to the provisions of Article 19 of Decree No. 2–12-389, for:

- Spices, aromatic herbs, or their mixtures that constitute less than 2% of the finished product's weight, with the exception of food additives and without prejudice to the provisions of (a) to (d) of Article 14 of Decree No. 2–12–389;
- Ingredient for which a list of components is not required in accordance with Article 14 of Decree No. 2–12–389.

Concerning allergenic substances, which represents a major public health issue, a complete list of allergenic ingredients must be declared (Guennouni *et al.*, 2022). According to Annex II of Decree No. 2–12–389, the following ingredients or processing aids may cause allergies or intolerances:

i. Cereals containing gluten, including wheat, kamut, spelt, oats, barley, rye and their hybrids, and products derived from them, with the exception of wheat glucose syrups (including dextrose), barley glucose syrups, and cereals used to produce alcoholic distillates (such as ethyl alcohol derived from agriculture);
ii. Crustaceans and their derivatives;
iii. Eggs and their derivatives;
iv. Fish and their derivatives, with the exception of isinglass or fish gelatin used as a clarifying agent in wine and beer and as a carrier for vitamin or carotenoid preparations;
v. Peanuts and peanut products;
vi. Soya and its derivatives, with the exception of natural D-alpha-tocopherol; natural mixed tocopherols (E306); fully refined soya oil and fat; natural D-alpha-tocopheryl succinate; natural D-alpha-tocopheryl acetate; and phytosterols and phytosterol esters derived from vegetable oils derived from soya beans; and vegetable stanol esters derived from sterols derived from vegetable oils derived from soya beans;
vii. Milk and milk-based products, including lactose, except whey used for the production of alcoholic distillates, including ethyl alcohol of agricultural origin and lactitol.
viii. Almonds, hazelnuts, walnuts, cashew nuts, pecan nuts, Brazil nuts, pistachios, macadamia nuts or Queensland nuts and products derived from these fruits, except nuts used for the production of alcoholic distillates, including ethyl alcohol of agricultural origin.
ix. Celery and its derivatives;
x. Mustard and mustard-based products;
xi. Sesame and its derivatives;
xii. Sulphur dioxide and sulphites at concentrations exceeding 10 mg/kg or 10 mg/liter, expressed as total SO_2 for products ready to eat or reconstituted according to the manufacturer's instructions;
xiii. Lupine and its derivatives;
xiv. Molluscs and their derivatives.

Regarding the indication of net quantity, pursuant to Article 2 of Order No. 3871–15 of 8 *Safar* 1437 (November 20, 2015) which sets up the terms and conditions for indicating the net quantity and drained net weight of certain products, the indication of the batch production or manufacturing or packaging to which the prepackaged product belongs, the indication of the net quantity on the label is optional for foods that contain less than five (5) grams or milliliters, except for spices and aromatic herbs; pursuant to the provisions of paragraph 3 of Article 21 of the aforementioned Decree No. 2–12–389, foods that, due to their nature, are subject to significant losses in volume or mass and are sold by the piece or weighed in front of the purchaser, as well as foods that are usually sold by the piece, if the number of pieces is clearly visible from the outside and can be easily counted or if this number is indicated on the label (Order No. 3871–15, 2016).

According to Article 3 of the aforementioned Order No. 3871–15, when a package consists of two or more individual packages of the same product quantity, the total net quantity

must be indicated on the outer packaging, along with the number and the net quantity of the individual packages. However, this is not required if the individual packages can be easily counted from the outside or if at least one indication of the net quantity contained in each package is visible (Order No. 3871–15, 2016). Pursuant to Article 4 of the aforementioned Order, the indication of the net quantity of a package must include both the total net quantity and the number of individual packages contained therein if the package contains two or more packaged units that are not considered sales units.

In accordance with Article 5 of this Order and the requirements of Article 22 of the aforementioned Decree No. 2–12–389, the labeling of a food product presented in a covering liquid must refer to the drained net weight. In the case of a glazed food product, the net weight indicated on the label may not include the weight of the icing, in accordance with the requirements of article 6 of the Decree.

Regarding the expiration date, the Joint Order of the Minister of Agriculture, Maritime Fisheries, Rural Development, Water and Forests and the Minister of Health and Social Security No. 1289–22 of 9 *Chaoual* 1443 (May 10, 2022) establish the list of microbiologically highly perishable products, their expiration dates, and their storage temperatures (Joint Order No. 1289–22, 2022). This expiration date and storage temperature must be indicated visibly and indelibly on the label of the products listed in the annex of the Decree.

According to Annex V of Decree No. 2–12–389, a minimum durability date is not required for:

- Fresh fruit and vegetables including unpeeled and untreated potatoes;
- Beverages with an alcoholic content of 10% or more by volume, including wines, liqueur wines, sparkling wines, aromatized wines, and similar products;
- Products typically consumed within 24 hours of manufacture;
- Vinegar, table salt, sugar, sweet products containing only flavored and/or colored sugar, chewing gum, and similar products.

Concerning the batch, according to Article 7 of Order No. 3871–15, mandates that the producer, manufacturer or packer, or the first seller of the food product in question, must indicate the production, manufacturing or packaging batch to which the packaged product belongs. This indication must be preceded by the letter "L:", unless it is clearly distinguished from other information on the label (Order No. 3871–15, 2016). As per the provisions of Article 8 of Decree (No. 2–12–389), the batch number or the letter "L:" must appear on the packaging or on a label attached to the packaging. This label must not be removable or reusable. In the case of unpackaged foodstuffs, the batch number may be located on the packaging or container, or in the commercial documents related to the said products.

In accordance with Article 9 of the aforementioned regulatory text, the batch number may be omitted from the packaged product if the expiry date is displayed and clearly states at least the day and month.

All required labeling information must be legible, using appropriate typography and contrasting features. The information must also be indelible and positioned in a prominent location, free from any obstruction, covering, abbreviation, or truncation. According to Article 8 of Decree No. 2–12–389, the required information must be provided in Arabic and may also be presented in one or more additional languages. However, according to the provisions of the Order of the Minister of Agriculture and Maritime Fisheries No. 1379–10 of 29 *Chaabane* 1431 (August 11, 2010), which outlines products exempt from certain mandatory labelling requirements, the following may not be labeled in Arabic: goods intended for use as raw materials; food and beverages for special diets; food intended for the diplomatic corps stationed in Morocco; food imported under specific customs procedures (temporary admission and transit); goods for commercial, cultural, or sports events; food intended for sampling or distribution; food imported as gifts; food specifically for hotels or restaurants; and alcoholic beverages, including those produced locally (Order No. 1379–10, 2010).

3.6 Nutrition Labeling: An Obligation in Case of Claims

The Ministers of Agriculture, Maritime Fisheries, and Health jointly issued Order No. 281–16 of 21 Rabii II 1437 (February 1, 2016), which establishes the requirements and methods for the inclusion of nutritional information on the labels of prepackaged food products in Morocco. This nutritional information is only mandatory when required by applicable regulations or when a nutrition or health claim is mentioned on the food. A nutrition declaration, which provides information about the nutrient composition and energy content of a food, is a statement or list of the nutrients present (Khalis *et al.*, 2020). The conversion coefficients used to calculate the energy value are specified in Table 3. The declared values are average values derived from known or actual averages of the components used or based on a scientific study of the food. Order No. 281–16 states that any nutrition declaration must include the following two components: mandatory nutrition information and supplementary nutrition information.

Table 3. Conversion Coefficients Established for the Calculation of the Energy value (*Joint Order No. 281–16, 2016*)

Nutrients	Conversion coefficients	
	kJ/g	kcal/g
Carbohydrates (excluding polyols)	17	4
Polyols	10	2.4
Protein	17	4
Fat	37	9
Alcohol (ethanol)	29	7
Organic acids	13	3
Different forms of "salatrim"	25	6
Dietary Fiber	8	2
Erythritol	0	0

The following nutrition information is required for the Nutrition Facts Panel:

- **Energy:** expressed in kilocalories (kcal) or kilojoules (kJ) per 100 g or 100 mL.
- **Total fat and saturated fatty acids:** expressed in grams (g) per 100 g or 100 mL.
- **Carbohydrates and sugars:** expressed in grams (g) per 100 g or 100 mL.
- **Proteins:** expressed in grams (g) per 100 g or 100 mL.
- **Salt:** expressed in grams (g) per 100 g or 100 mL (Joint Order No. 281-16, 2016).

Additionally, the following nutrition information may be provided:

- **Monounsaturated fatty acids:** expressed in grams (g) per 100 g or 100 mL.
- **Polyunsaturated fatty acids:** expressed in grams (g) per 100 g or 100 mL.
- **Polyols:** expressed in grams (g) per 100 g or 100 mL.
- **Starch:** expressed in grams (g) per 100 g or 100 mL.
- **Dietary fiber:** expressed in grams (g) per 100 g or 100 mL.
- **Vitamins and minerals:** expressed in milligrams (mg), micrograms (µg), or as a percentage of the Recommended Daily Allowance (RDA) per 100 g or 100 mL (Joint Order No. 281-16, 2016).

Where nutrient information is expressed as a percentage of the nutrient reference values, the phrase "Reference Intake for a Typical Adult (8400 kJ/2000 kcal)" must be provided in close proximity. Amounts of vitamins and minerals are considered significant if they represent 15% of the reference values for solids, 7.5% for beverages, and 15% per serving for single-serving packages.

The recommended daily values for energy and some nutrients are:

- **Energy:** 8400 kJ or 2000 kcal;
- **Total fat:** 70g
- **Saturated fatty acids:** 20g
- **Carbohydrates:** 260g
- **Sugars:** 90g
- **Protein:** 50g
- **Salt:** 6g (Joint Order No. 281-16, 2016).

The recommended daily concentrations for vitamins and minerals are listed in Table 4.

Table 4. Recommended daily intake of vitamins and minerals (*Joint Order No. 281–16, 2016*)

Vitamins and minerals	Nutritional reference values
Biotin	50 µg
Calcium	800 mg
Chloride	800 mg
Chromium	40 µg
Copper	1 mg
Fluoride	3.5 mg
Folic acid	200 µg
Iodine	150 µg
Iron	14 mg
Magnesium	375 mg
Manganese	2 mg
Molybdenum	50 µg
Niacin	16 mg
Pantothenic acid	6 mg
Phosphorus	700 mg
Potassium	2000 mg
Riboflavin	1.4 mg
Selenium	55 µg
Thiamine	1.1 mg
Vitamin A	800 µg
Vitamin B12	2.5 µg
Vitamin B6	1.4 mg
Vitamin C	80 mg
Vitamin D	5 µg
Vitamin E	12 mg
Vitamin K	75 µg
Zinc	10 mg

All nutrition information must: i) meet the characteristics stipulated in Decree No. 2–12–389; ii) appear within the same visual field; and iii) be presented in the following order: energy; fat (saturated, unsaturated, and optionally monounsaturated and polyunsaturated fatty acids;

carbohydrates and their components (sugars, and optionally polyols and starch); fiber (optional); protein; and finally, salt, vitamins, and minerals (optional). Nutrition information may also be presented in a linear format if the space on the label's space is insufficient for the standard layout.

However, according to Annex IV of Decree No. 2–12–389, the following products are exempt from nutrition labeling, even if they bear a nutrition or health claim:

i. Unprocessed foods consisting of a single ingredient or a single class of ingredients
ii. Processed products that have undergone only maturing and contain only one ingredient or one class of ingredients
iii. Drinking water, including those containing only carbon dioxide and/or flavorings
iv. Aromatic herbs, spices, or their mixtures
v. Salt and its substitutes
vi. Table-top sweeteners
vii. Goods regulated by trade regulations governing the coffee, chicory, and tea industries
viii. Infusions and teas, including decaffeinated teas, instant or soluble teas, and tea extracts, with any additional ingredients other than flavorings that do not affect the nutritional value of the tea
ix. Fermentation vinegars and their substitutes, including those with flavorings as the only additional ingredient
x. Flavorings
xi. Food additives
xii. Technological processing aids
xiii. Food enzymes
xiv. Gelatin
xv. Gelling agents
xvi. Yeasts;
xvii. Chewing gums;
xviii. Products packaged in containers with a surface area of less than 25 cm^2
xix. Products, including handmade products, supplied in small quantities directly from the manufacturer to the final consumer or to nearby retail outlets for sale to the consumer (Decree No. 2-12-389, 2013).

3.7 Claims Covered by Regulations

In Europe, claims are defined and controlled by Regulation (EC) No. 1924/2006, which aims to harmonize practices among EU member states and ensure a high level of consumer protection (Bröring & Khedkar, 2018). These regulations define two types of claims: nutrition claims, including comparative claims, and health claims. These health claims are further categorized into three categories: generic functional health claims, disease reduction claims, and claims related to children's development and health (Regulation–1924/2006–EN–EUR–Lex, 2006).

Under U.S. regulations, including the Nutrition Labeling and Education Act of 1990, three categories of claims may be used on foods and dietary supplements: health claims, nutrient content claims, and structure/function claims (Public Law n° 101-535, 1990).

- **Health claims** describe the relationship between a food substance (a food, food component, or dietary supplement ingredient) and a reduced risk of a disease or health-related condition. These claims are subject to prior review and approval by the FDA.
- **Structure/function claims** address the role of a specific substance in maintaining normal body structures or functions. These claims do not require prior FDA approval.
- **Nutrient content claims** characterize the amount of a nutrient in a food. They are approved by the FDA if they are made in accordance with established regulations.

In Morocco, Order No. 281–16 defines authorized nutrition claims. A nutritional claim is any representation or advertising message that states, suggests or implies that a food possesses particular nutritional properties related to its composition or nutritional characteristics (Decree No. 2-12-389, 2013). The nutrition claims permitted in the labeling or advertising of foods, along with their conditions of use are listed in Table 5. These claims relate to energy, proteins, carbohydrates, fats and their components, fiber, salt and other substances with a nutritional or physiological effect, as well as vitamins and minerals for which a nutritional reference value (NRV) has been established (Joint Order No. 281-16, 2016)

According to Article 26 *bis* of Decree No. 2–12–389, only health claims included in the list established by the joint order of the Minister of Agriculture and the Minister of Health may be mentioned on foods, subject to the conditions of use.

4 Discussion

Morocco has made substantial progress in developing its food safety and labeling regulatory frameworks, particularly by aligning its regulatory texts with certain international standards. These efforts reflect the country's commitment to consumer protection, supply chain transparency, and the facilitation of global trade. However, the Moroccan system continues to face considerable challenges in implementation and enforcement that require immediate attention.

Table 5. Nutrition claims and their conditions of use (*Joint Order No. 281-16, 2016*)

Claims		Terms of use
Energy value Claims	"Low energy value"	The product shall not contain more than 40 kcal (170 kJ) /100 g for solids or more than 20 kcal (80 kJ) per 100 mL for liquids. For table-top sweeteners, the limit is 4 kcal (17 kJ) per serving with sweetening power equivalent to 6 g of sucrose.
	"Reduced energy value"	The energy value of the product shall be reduced by at least 30%, with an indication of the characteristic(s) leading to the reduction of the total energy value of the said product.
	"Without energy supply"	The product shall not contain more than 4 kcal (17 kJ) per 100 mL. In the case of table-top sweeteners, the limit shall be 0.4 kcal (1.7 kJ) per portion, with sweetening power equivalent to 6 g of sucrose.
Fat Claims	"Low-Fat content"	The product shall not contain more than 3 g of fat /100 g for solids or 1.5 g of fat per 100 mL for liquids (1.8 g of fat per 100 mL for semi-skimmed milk).
	"Fat-Free"	The product shall not contain more than 0.5 g of fat /100 g or 100 mL. Claims such as "X% fat free" should not be used.
	"Low saturated fat"	The sum of saturated and trans-fatty acids in the product shall not exceed 1.5 g /100 g of solid or 0.75 g per 100 mL of liquid, the sum of saturated and trans-fatty acids shall not provide more than 10% of the energy in both cases.
	" Free Saturated Fat "	Saturated fat content combined with trans-fat cannot be more than 0.1 g of saturated fat //100 g or 100 mL.
Sugar Claims	"Low sugar content"	If the product is a solid, it cannot have more than 5 g of sugar per 100 g, or a liquid, it cannot have more than 2.5 g of sugar per 100 mL.
	"without Sugar "	The maximum amount of sugar in the product is 0.5 g per 100 g or 100 mL.
	" No added sugar"	No additional mono- or disaccharides, or any other food product utilized for its sweetening qualities, may be added to the product. "CONTAINS NATURALLY OCCURRING SUGARS" is another statement that must be on the label if sugars are naturally present in the product.
Salt Claims	"Low in sodium or salt"	The product's sodium or salt equivalent content cannot exceed 0.12 g per 100 g or 100 mL. This amount for fluids other than naturally occurring mineral waters cannot be more than 2 mg of sodium per 100 mL.
	"Very low in sodium or salt"	The product's sodium or salt equivalent content cannot exceed 0.04 g per 100 g or 100 mL. Other waters and naturally occurring mineral waters are not covered by this claim.
	"No Sodium or salt"	The maximum amount of sodium or salt equivalent per 100 grams in the product may be found at 0.005 grams.
Fiber Claims	"Fiber source"	A minimum of 3 grams of dietary fiber per 100 grams or 1.5 grams of dietary fiber per 100 kcal must be included in the product.
	"Rich in fiber"	A minimum of 6 g of dietary fiber per 100 g or 3 g of dietary fiber per 100 kcal must be included in the product.
Protein Claims	"Protein source"	Protein must make up at least 12% of the food's energy content.
	"Rich in protein"	Protein must make up at least 20% of the food's energy content.
Vitamins, minerals, and nutrients claims	"Source of [name of vitamins and/or minerals]"	Only if the product includes at least a considerable proportion may this claim be made.
	"Rich in [name of vitamins and/or minerals]"	At least twice as much as is necessary for the claim "Source of [NAME OF VITAMINS] and/or [NAME OF MINERALS]" to be made is present in the product.
	"Contains [name of nutrient or other substance]"	A food product may only be claimed to include a nutrient or other substance for which this Regulation does not specify conditions, or any other claim that is likely to have the same significance for the consumer, if it complies with all of the Regulation's requirements.
	"Enriched with [name of nutrient]"	In order for a product to be eligible for the "source of" claim, it must have at least a 30% higher nutritional content than a comparable product.
	"Reduced in [name of nutrient]"	When compared to a comparable product, the nutritional content must be reduced by at least 30%. This claim can be made for micronutrients that differ by 10% from reference levels, or for sodium or salt equivalents that differ by 25%.

Other claims	"Light"	The same requirements as those for the word "reduced to" must be met by this claim. Furthermore, it must be followed by a statement indicating the trait or characteristics that cause the food's weight to decrease.
	"Naturally/Natural"	The word "naturally" may appear with a nutrition claim if the meal satisfies the necessary criterion or conditions.
	"Source of omega-3 fatty acid"	The product must provide at least 40 mg of mixed eicosapentaenoic and docosahexaenoic acid per 100 grams and 100 Kcal, or at least 0.3 grams of alpha-linolenic acid per 100 grams and 100 Kcal.
	"Rich in omega-3 fatty acid"	Only products containing at least 0.6 g of alpha-linolenic acid per 100 g and 100 kcal or at least 80 mg of combined eicosapentaenoic and docosahexaenoic acid per 100 g and 100 kcal are eligible to make this claim.
	"Rich in monounsaturated fats"	A minimum of 45% of the product's fatty acids must come from monounsaturated fats, and these fats' energy content must account for more than 20% of the product's total energy intake.
	"Rich in polyunsaturated fats"	At least 45% of the product's fatty acids must be from polyunsaturated fats, and more than 20% of the product's total calorie intake must come from polyunsaturated fats.
	"Rich in unsaturated fats"	The product's fatty acid content must be at least 70% unsaturated fat-derived, and unsaturated fat energy must account for more than 20% of the product's total energy consumption.

Several national reports indicate that non-compliance with labeling regulations, such as the omission of ingredients or inaccurate expiration dates, remains a persistent issue, leading to regular seizures of non-conforming products. A cross-sectional survey of 156 packaged food items in Moroccan supermarkets identified 266 non-conformities across 112 products (71.8 %), primarily due to missing allergen statements, poor emphasis, or the obscured placement of declarations (Guennouni *et al.*, 2022). This suggests that, despite the existence of a foundational regulatory, the mechanisms for enforcement and compliance require substantial improvement.

Additionally, certain labeling areas, such as the use of health claims, are not precisely defined in Moroccan legislation. This vagueness permits inconsistent application and interpretation, thereby compromising consumer protection. Another notable gap is also the absence of mandatory labeling for trans fatty acids (TFAs), despite their well-documented link to cardiovascular diseases and their inclusion in labeling requirements in numerous other countries (Wilczek *et al.*, 2017). Mandating TFA content on food labels would align Morocco with World Health Organization (WHO) recommendations and international best practices (Al-Jawaldeh *et al.*, 2021) and contribute to public health by empowering consumers to make more informed dietary choices.

Strengthening these components through clearer guidelines, requirement for scientific substantiation, and harmonization with Codex Alimentarius standards would significantly enhance labeling reliability and consumer trust. Additionally, low level of awareness regarding labeling requirements among both producers and consumers hinders effective implementation. This underscores the urgent need for capacity-building initiatives, such as education campaigns and training programs, to target small-scale producers and market vendors.

In this context, the National Office for Food Safety (ONSSA) plays a critical role as the Moroccan authority responsible for enforcing food safety and labeling regulations. The ONSSA monitors compliance, conducts inspections, and ensures that food products across the country adhere to national safety and labeling standards, which is particularly vital for ensuring that food labels are accurate and transparent.

However, ONSSA's ability to enforce labeling regulations is hindered by structural and operational limitations. One significant barrier is the large informal sector that operates outside the scope of formal regulatory oversight. This issue not only affects the broader food safety system but also directly impedes the consistent enforcement of labeling laws, as several informal actors are either unaware of or unable to comply with existing regulations.

To address this challenge, ONSSA could pursue closer collaboration with local authorities and private stakeholders to gradually integrate informal producers into the formal economy. Such an approach would improve traceability, increase accountability, and facilitate a more uniform application of food labeling standards. These efforts would support food safety goals while simultaneously promoting fair competition, and protecting consumers.

In conclusion, while Morocco has made substancial progress in developing its food safety and labeling frameworks, continued efforts are necessary to improve regularity clarity, enforcement, and public awareness. Strengthening ONSSA's capacity and fostering collaboration among regulatory agencies and stakeholders are critical steps toward building a robust, transparent, and effective food safety system.

5 Conclusion

Food labeling serves as a vital tool for public health and consumer protection, particularly in a context where food

fraud and mislabeling pose increasing risks. The rising prevalence of obesity, diabetes, and cardiovascular disease, driven in part by poor dietary habits and increased consumption of ultra-processed foods, highlight the urgent need for accessible and clear nutritional information. Greater transparency in nutrition is more crucial than ever, as it empowers consumers to make informed dietary choices and encourages healthier food environments.

Morocco has taken important steps to regulate food labeling, notably through the implementation of Decree No. 2–12–389 and the active role of the National Office for Food Safety (ONSSA). These measures provide a solid foundation for ensuring that consumers receive accurate and accessible information about food products. However, the current regulatory system continues to face challenges in terms of enforcement, precision of health claims, and coverage of informal markets where non-compliant products may circulate.

Moving forward, strengthening Morocco's food labeling framework would benefit from: improved precision in regulations governing health and nutrition claims; expanded training and support for food producers, especially small and medium-sized enterprises (SMEs); and enhanced public awareness regarding how to read and how to interpret food labels. In addition, integrating tools such as front-of-pack labeling systems could improve consumers' ability to make healthier dietary choices and reduce diet-related health burden.

Aligning national regulations with international standards and strengthening digital traceability systems would also aid ensure the safety, transparency, and competitiveness of Moroccan food products both domestically and in international markets.

In summary, Morocco has achieved significant progress in regulating food labeling. Continued collaboration between public institutions, food industry stakeholders and consumers will be key to addressing current challenges and promoting a food system that prioritizes safety, health and informed consumer choice.

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