

A Comparative Review: International Food Labelling Laws, Legislation and Regulations - Edible Oils and Fats.

Abstract:

This review article explores the intricacies and consequences of worldwide food labelling rules, legislation, and regulations that control edible oils and fats. The investigation uncovers a range of similarities and variations among jurisdictions like the European Union, the United States, Canada, the United Kingdom, and Scandinavian nations. Although consumer safety and transparency are prioritised in every country, the precise regulations on ingredient labelling, allergy disclosure, nutritional information, and date marking differ considerably. The harmonisation initiatives spearheaded by international organisations such as Codex Alimentarius provide an opportunity for simplifying regulations. However, the process of reaching agreement on language standards and labelling claims remains complex. Furthermore, consumer education activities play a crucial role in encouraging well-informed dietary decisions and fostering a more health-conscious food environment. To summarise, this analysis highlights the varied food labelling regulations across different countries, emphasising the significance of comprehending local intricacies and adhering to fundamental values of openness and safeguarding consumers in order to form a worldwide food market that prioritises public well-being.

Keywords: *Food labelling; Legislation; Edible oils and fats; Regulations; Laws*

1. Introduction

“Consumers by definition include us all.”

-Kennedy

The variety of the global food sector is seen in the multiplicity of items that cross international boundaries daily [1,2]. Edible oils and fats are vital components of the global food industry, contributing significantly to the nutritional value of a variety of food items in addition to being the main ingredient for cooking. A thorough grasp of food labelling rules, legislation, and regulations is essential for the worldwide trading of these commodities to guarantee consumer protection, fair trade practices, and the harmonization of global standards [3].

Food product labelling is a method used by the world's largest food manufacturing corporations to differentiate their products from the competition and serves as a policy instrument for guaranteeing customers get nutrition and health information. It has become more significant recently everywhere in the globe [4]. The International Food Information Council (IFIC), (2011) [5] states that customers may become wary of food labels if they do not grasp the information on them. The development of biotechnology and food regulations has led to a rise in the need for regulations about food labels, including components, processing techniques, and nutritional value. In essence, the labelling laws are a reaction to consumers' right to know the ingredients and nutritional value of a specific food product [6]. These standards aim to provide customers with uniform, comprehensible, and useful labels so they may make educated and healthier food choices [7]. In India, the regulation of edible oils is meticulously governed by a set of laws and standards aimed at ensuring consumer safety, promoting quality, and fostering fair trade practices. The cornerstone of edible oil regulation in India lies within the framework of the Food Safety and Standards Act (FSSA) of 2006. Enacted to uphold food safety and quality control nationwide, the FSSA entrusts the Food Safety and Standards Authority of India (FSSAI) with the task of overseeing the production, distribution, and sale of edible oils. Complementing these regulations is the historical Prevention of Food Adulteration Act of 1954, which, though now subsumed under the FSSA, historically set standards and penalties for food adulteration, including that of edible oils. Moreover, the Bureau of Indian Standards (BIS) offers voluntary standards for edible oils, serving as a quality assurance mechanism for manufacturers.

In India, oilseeds such as groundnut, rapeseed, mustard, sesame, safflower, sunflower, Niger, soybean, linseed, and castor are grown for their edible oil [8]. Vegetable oil may also be obtained from rice bran, cottonseed, palm, and coconut. Typically, pressing, and solvent extraction are the two processes used to extract edible oil [9]. The resulting crude oil may then be refined, bleached, and deodorized to get rid of non-triglyceride material, pigments, and unpleasant smells and Odors. At normal temperatures, oil is liquid and mostly made up of unsaturated fatty acids.

Vanaspati is refined hydrogenated vegetable oil. It is solid at room temperature, as during hydrogenation, the fatty acids get saturated [10]. Ghee is pure clarified fat with an especially developed characteristic physical structure and flavor [11]. Ghee is exclusively obtained from milk, cream, or butter from various animal sources employing processes, that result in

almost the total removal of moisture and solid-non-fat contents [12]. Different varieties of edible oil are consumed, generally depending on regional preferences and availability. Vegetable Oil Industry comprises around 1,50,000 oilseed crushing units with a total capacity of 425 lakh tonnes, 800 solvent extraction units with a capacity of 345 lakh tonnes of the oil-bearing material, about 300 refineries with a capacity of 50 lakh tonnes, and 205 vanaspati units with an annual capacity of 32 lakh tonnes.

The fatty acid makeup differs significantly across different types of oils and fats. Table 1 provides the percentage amounts of saturated, mono-unsaturated, and polyunsaturated fats in various types of oils, vanaspati, and ghee [13].

Table 1: Fatty Acid Composition of Oil and Fat			
Particulars	Saturated Fatty Acids (Mufa) (%)	Monounsaturated Fatty Acid (Pufa)%	Polyunsaturated Fatty Acid %
Coconut	90	8	2
Palm	50	39	9
Cottonseed	28	22	50
Groundnut	20	50	30
Rice bran	18	45	37
Sesame	18	43	39
Niger	12	36	52
Safflower	10	15	75
Butter	63	33	3
Mustard/rapeseed	6	67	27
Vanaspati	61	36	3
Ghee	64	33	3

The primary and essential factors considered while evaluating the storage quality of edible oil and fats are [14]:

- Percentage moisture content
- Percentage-free fatty acid
- Peroxide value
- Change in color/odor.

The BIS (the Bureau of Indian Standards) and PFA (The Prevention of Food Adulteration Act) standards only define the maximum limits for the essential spoiling factors, without any reference to the corresponding lower limits. The sector must decide about a lower or basic value. This is important because the shelf-life factor is closely connected to the quality of the product when it is ready to be packaged.

Table 2: Parameters and shelf-life	
Critical Parameters	Shelf-life & Specifications
Lower the initial value of critical parameters	Higher the shelf-life
Lower the initial value of critical parameters	More economical would-be packaging material
Higher the initial value of critical parameters	Higher the specification of the packaging material and, therefore, higher the packaging cost
Higher the initial value of critical parameters	Higher the packaging specification and, therefore, higher the packaging cost

2. Blended Edible Oils and Fats

Blended edible vegetable oil refers to a blend of at least two edible vegetable oils, where each oil utilized in the mixture makes up at least 20 percent of the total weight [15]. The constituent oils in the mixture must adhere to the specific specifications outlined in these laws. The mixture must be transparent, devoid of any unpleasant odor or taste, and should not contain any solid particles, impurities, water, artificial colorants, flavoring agents, mineral oil, non-edible oils or fats, argemone oils, hydrocyanic acid, castor oil, or tricresyl phosphate. It must also adhere to the following requirements. Mixed consumable vegetable oils Authorised by the Ministry of Health & Family Welfare under Government Notification GSR 457 (E) issued on 23rd April 1990. Since 1990, many firms have been involved in the production and sale of blended edible vegetable oil in India.

In India, the regulation of blended edible oil and fats is closely monitored and controlled by the Food Safety and Standards Act (FSSA) of 2006 [16]. This act establishes compliance criteria to guarantee the safety and quality of food goods, including blended oils. Producers and suppliers of mixed edible oils are required to comply with the rules established by the Food Safety and Standards Authority of India (FSSAI), which specifies guidelines for the manufacturing, packaging, labelling, and distribution processes. The Agricultural Output (Grading and Marking) Act, sometimes referred to as AGMARK, is crucial in overseeing the quality and grading of agricultural output, which includes edible oils [17]. The legislation requires blended edible oils to meet requirements and specifications to acquire AGMARK certification. The certification procedure includes a thorough evaluation of production facilities to verify their adherence to quality and safety requirements.

2.1. Global Perspectives on Blended Oils and Fats

Blended Edible Vegetable Oil is regulated internationally in places such as the European Union, the UK, Canada, the USA, Russia, and Pakistan [18]. Canadian rules require that Blended Edible Oil be labelled as Vegetable Oil. In contrast, rules in Pakistan classify the mixing of edible vegetable oils as Cooking Oil. These regulatory measures guarantee uniformity and clarity in labelling methods, fostering consumer awareness, and upholding safety standards in the worldwide edible oil industry.

Table 3: International Regulation			
Regulation	Vertical Standard Present	Fatty Acid Ratio Defined	Remarks
Kenya	Yes	No	Standards define the quality parameters and labelling requirements wherein the dominant oil shall appear first on the label [19].
Canada	Yes	No	A definition is provided, that allows the blend of oils as Multi-Source Vegetable Oils [20].
Russia	Yes	No	Definition & labelling requirements provided that indicate that blended edible vegetable oil is allowed to be manufactured in different ratios
Pakistan	Yes	No	Defined under cooking oil which means blending of vegetable oils of permissible edible grades of vegetable origin [21].
UK	No	No	Standards for blended edible vegetable oil are not defined under the regulation and blending is nowhere prohibited with no fatty acid ratio requirements
Japan	No	No	No specific standards for oils & fats under Japanese regulations, however defined labelling requirements for mixed oil (blended edible oil). No fatty ratio is defined. [22]
USFDA	No	No	Neither specific standards nor any prohibitions are imposed for blended edible vegetable oil, hence it is inferred that blended edible vegetable oil is allowed to be made with no restrictions on fatty acid ratios
FSANZ	No	No	Blended edible oil is neither separately defined nor prohibited, hence no fatty acid ratio defined for blended edible oil
European Commission	No	No	Only labelling requirements are defined to declare all vegetable oils in descending order under the ingredient list and no prohibitions are imposed on the blend of oil, hence it is interpreted

			that no fatty acid ratio requirements are defined for blended edible vegetable oil. [23].
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3. National and International food Labelling laws

Nutrition is vital for the sustenance of a human being [24]. The right to life encompasses not only the right to exist but also the right to have access to food. The case of People's Union for “**Civil Liberties v. Union of India and Others (PUCL)**” (2001) briefly addressed the concept of the Right to Food via a writ petition [25,26]. Article 47 of the Indian Constitution recognizes the Right to Food as a basic obligation of the state [27]. An increasing number of restaurants, food stalls, industries, and other establishments are being established daily in almost every corner of the globe. These establishments must maintain meticulous cleanliness and hygiene in all aspects of production, processing, preparation, and so forth. International organizations are established to guarantee that consumers get food of superior quality and safety.

3.1. National Food Labelling laws and regulations

Individuals seeking to establish a company in the production or processing of food may get certification marks for their products. These certification markings serve as a reliable indicator for customers when making a purchase. Below are the standards or marks that may be voluntarily accepted during the manufacture of food goods:

➤ **AGMARK (Agriculture Marketing Act)**



Figure 1: AGMARK (Agriculture Marketing)

The certification mark is a designation used for agricultural products to guarantee that they meet the standards set by the Directorate of Marketing & Inspection (DMI), which is part

of the Department of Agriculture, Cooperation and Farmers Welfare under the Ministry of Agriculture & Farmers Welfare. This certification is mandated by the Agricultural Produce (Grading Marking) Act of 1937. AGMARK covers a wide range of about 222 goods. While the certification system is optional, the Food Safety and Standards (Prohibition and Restriction on Sale) Regulations 2011 require obligatory certification under AGMARK for certain products, such as fat spread and mixed edible vegetable oil [28-31].

➤ **BIS (Bureau of Indian Standards)**



Figure 2: BIS (Bureau of Indian Standards)

The 2016 Bureau of Indian Standards Act formed BIS. The Ministry of Consumer Affairs, Food, and Public Distribution oversees it. The Food Safety and Standards (Prohibition and Restriction on Sale) Regulations of 2011 have mandated obligatory certification under BIS for some items, such as milk powder, newborn milk replacements, bottled drinking water, etc., even if this certification system is optional. Additionally, it specifies the certification marks for food items issued by the Indian Standards Institute [32-34].

Before 2006, the food industry was governed by many acts that addressed adulteration or the blending of toxic ingredients with food, as well as cleanliness, quality, and hygiene. These acts are listed below:

- **The Prevention of Food Adulteration Act, 1954** – This legislation imposes sanctions for the act of adulterating or contaminating food, which has the potential to provide a risk or threat to the well-being of consumers. The Act also governs the use of pesticides and chemicals in the process of food preparation [35].
- **The Fruit Products Order, 1955** – The objective of this Order is to maintain sanitary and hygienic standards throughout the manufacture of fruit and vegetable products. The restriction was implemented in compliance with Section 3 of the Essential Commodities Act of 1955. Vinegar, pickles, squashes, jams, and other similar items were included under the provisions of this Act. The Order also included details for the packaging and labelling of fruit goods [36].
- **The Vegetable Oil Products (Control) Order, 1947** – This Order standardized the manufacturing and dissemination of all consumable oils. Vanaspati and other edible oils used for culinary purposes must adhere to all ISI criteria [37].
- **The Edible Oils Packaging (Regulation) Order, 1998** – This Order mandated the preservation of the purity of edible oils throughout the process of selling. The oil for sale must comply with all the regulations outlined in the Prevention of Food Adulteration Act, of 1954 [38].
- **The Solvent Extracted Oil, De-oiled Meal, and Edible Flour (Control) Order, 1967** – This Order served as a mechanism for quality control, ensuring that the oils undergo refinement and processing before being made available in the consumer market [39].
- **The Milk and Milk Products Order, 1992** – This Order governed the production, processing, and distribution of liquid milk. This Order also ensured the timely supply of milk to wholesalers [40].

3.2. International organization for food labelling Law

The Indian food sector is subject to regulation not just by the Food Safety and Standards Act, but also by foreign organizations that oversee the food's safety and cleanliness. They include: -

3.2.1. World Health Organization (WHO) -

The World Health Organization's Nutrition and Food Safety Team is responsible for ensuring food safety and providing guidance to prevent illnesses that may arise from unsanitary food [41]. The World Health Organization's Standards and Scientific Advice on Food and Nutrition (SSA) Unit is tasked with the oversight and development of policies about food nutrition.

3.2.2. Food and Agriculture Organization (FAO) -

It accomplishes this goal by developing more environmentally friendly policies that end hunger. It motivates sectors such as forestry, fishery, and agriculture to support their objectives and purpose [42,43].

3.2.3. Codex Alimentarius Commission (CAC) -

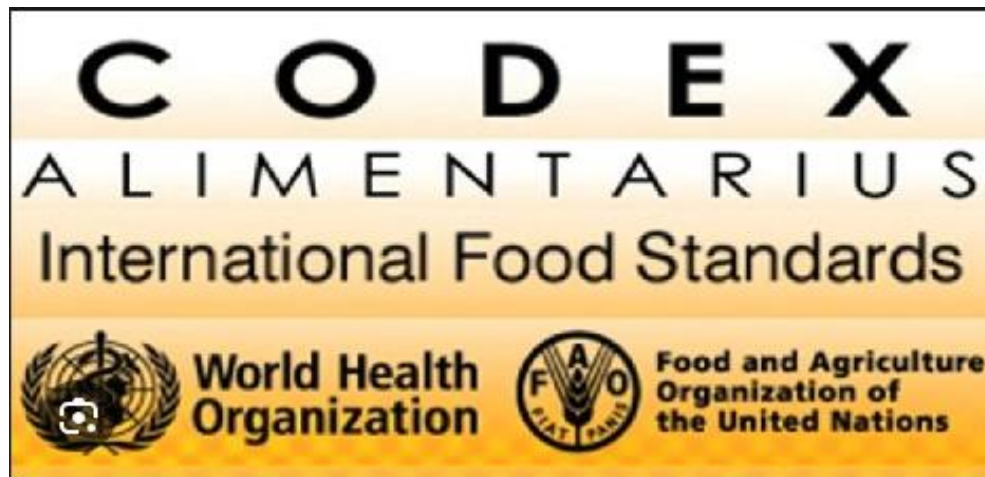


Figure 3: The Codex Alimentarius Commission (CAC)

To guarantee food safety and advance ethical behavior in the food trade, **the Food and Agriculture Organisation (FAO)** and **the World Health Organisation (WHO)** together established **the Codex Alimentarius Commission**, which establishes global food standards, guidelines, and codes of behavior [44,45]. Although the Codex Alimentarius Commission does not make legally enforceable standards, national and international food legislation often uses its recommendations as a baseline.

The Codex Alimentarius Commission offers extensive rules for food labelling, including edible oils and fats, to promote consumer choice and openness in food markets. Several important guidelines for food labelling, including those that are particular to edible fats and oils, include:

➤ **Ingredient Listing:**

- All constituents in the product, including any additions or processing aids, should be listed in a clear and precise manner.
- Ingredients should be listed in descending order of predominance by weight.

➤ **Nutritional Information:**

- Provision of nutritional information such as energy value and nutrient content per serving size.

- For edible oils and fats, this may include the breakdown of saturated, unsaturated, and trans fats, as well as cholesterol content.

➤ **Allergen Declaration:**

- Identification of common allergens present in the product, such as soy, nuts, or gluten.
- Allergens should be highlighted in the ingredient list or a separate allergen statement.

➤ **Country of Origin:**

Recommendation to include the country of origin for certain products, providing consumers with information about the geographical source of the food.

➤ **Storage and Handling Instructions:**

Guidance on proper storage conditions and handling instructions to maintain product quality and safety.

➤ **Language and Legibility:**

Labels should be clear, legible, and presented in languages understandable to consumers in the target market.

➤ **Labelling of Special Characteristics:**

Indication of special characteristics such as organic, non-GMO, or fair-trade certifications, if applicable.

➤ **Use of Labelling Claims:**

Regulation of labelling claims to ensure they are truthful, not misleading, and substantiated by scientific evidence.

➤ **Date Marking:**

A clear indication of the production date, best before date, or expiration date to inform consumers about product freshness and shelf life.

3.2.4. International Regulations and Standards for Allergen Food Labelling law.

➤ **Food Labelling Laws in the U.S.**

MADE WITH SMILES AND ENRICHED WHEAT FLOUR
 (FLOUR, NIACIN, REDUCED IRON, THIAMINE
 MONONITRATE, RIBOFLAVIN, FOLIC ACID), CHEDDAR
 CHEESE ([CULTURED MILK, SALT, ENZYMES], ANNATTO),
 VEGETABLE OILS (CANOLA, SUNFLOWER AND/OR
 SOYBEAN), SALT, CONTAINS 2% OR LESS OF: SUGAR,
 YEAST EXTRACT, WHEY, CORN FLOUR, AUTOLYZED
 YEAST EXTRACT, TORULA YEAST, PAPRIKA EXTRACT
 (COLOR), SPICES, CELERY, ENZYME MODIFIED CHEDDAR
 CHEESE (MILK, CULTURES, SALT, ENZYMES), ONION
 POWDER, GARLIC POWDER, CITRIC ACID, LACTIC ACID,
 CALCIUM LACTATE, NATURAL FLAVOR, MILKFAT,
 MONOCALCIUM PHOSPHATE, BAKING SODA.
CONTAINS: WHEAT, MILK.

Figure 4: The U.S. food product's allergy labelling displays the components in descending order of quantity, along with information about allergens present.

According to a 2019 research, food allergies affect at least 10% of individuals in the United States (U.S.) [46]. According to estimates from the U.S. Food and Drug Administration (FDA), allergies accounted for around 30,000 ER visits among Americans in 2018, with food allergies responsible for 150 fatalities [47]. The FDA is the main government agency in the United States that oversees the nutrition and allergy information on medications, cosmetics, and food products. The Food Allergen Labelling and Consumer Protection Act of 2004 (FALCPA), enacted by the US Congress, lists eight common food allergies, including wheat, peanuts, soybeans, eggs, fish, crustaceans, and shellfish [48]. Companies and manufacturers are already required by US law to properly state their components on packaging (Fig. 4). [49]. Retailers are required to inform consumers of the country of origin of muscle cuts and ground lamb, chicken, goat, wild and farm-raised fish and shellfish, perishable agricultural commodities, peanuts, pecans, ginseng, and macadamia nuts [by the Farm Bills of 2002, 2008, and the Consolidated Appropriations Act of 2016, which amended the Agricultural Marketing Act of 1946] [50].

➤ **Food Labelling Laws in Canada**



Figure 5: An Amazon label for Perigord Duck Rillettes, only using commonly used English terminology.

Colombia, Costa Rica, Guatemala, Honduras, El Salvador, Nicaragua, Chile, and Mexico. The Codex Alimentarius is the source of requirements for food allergen labelling in many nations. These include the following: gluten-containing cereals; crustaceans and their products; eggs and their byproducts; fish and their products; peanuts, soybeans, and products derived from them; milk and its byproducts, including lactose; tree nuts and their byproducts; and sulfates when levels are 10 mg/kg or higher [54].

➤ **Food Labelling Laws in the UK**



Figure 7: Enhancing Allergen Safety: Restaurant-Provided Food Allergen Marker in England.

According to UK legislation, fruit and vegetables imported from outside the European Union (EU) as well as cattle, veal, lamb, mutton, hog, goat, poultry, fish, shellfish, honey, olive oil, and wine must have a place of origin stated [55]. The UK's Natasha's rule went into effect in October 2021 and mandates that food items prepared on-site and packaged for direct sale must have complete ingredient and allergy labels displayed by merchants. [56] In 2022, a single restaurant in England labelled and prepared meals for patrons who disclosed dietary allergies. The meal was accompanied by a flag that said it was made with care and included the hashtag allergen aware (Fig. 7).

➤ **Food Labelling Laws in the European Union**

As of March 2022, the 27 members of the European Union include Germany, France, Italy, Sweden, Poland, Spain, Ireland, Romania, Netherlands, Denmark, Bulgaria, Belgium, Croatia, Portugal, Austria, Greece, Czech Republic, Hungary, Finland, Luxembourg, Malta, Lithuania, Republic of Cyprus, Slovenia, Slovakia, Estonia, and Latvia. Although Switzerland is not a member of the European Union, in November of 2013, the Swiss government published changes to the “*Ordonnance du DFI sur l’étiquetage et la publicité des denrées alimentaires (817.022.21)*”. If a food contains an element that does not need an ingredient list, the maker is obligated to disclose and highlight the allergy on the product. As an example, according to European Union legislation, wine is not obligated to provide an ingredient list. [57,58].

➤ **Food Labelling Laws in Scandinavian Countries**



Figure 8: The food is a product of Denmark. The label is in English.

The food labelling regulations in Scandinavian nations, such as Denmark, Sweden, Norway, Finland, and Iceland, are typically strict and prioritize consumer safety, transparency, and the ability to make educated choices. The ingredients should be given in decreasing order of weight. The allergy declaration regulations of Nordic nations exhibit several commonalities. The allergens listed include cereals containing gluten and their derivatives, crustaceans and their derivatives, eggs and their derivatives, fish and their derivatives, peanuts and their derivatives, soybeans and their derivatives, milk

and its derivatives, and mustard and its derivatives. In Nordic jurisdictions, it is mandatory to differentiate allergies by using a distinct typography or layout. Furthermore, allergens must be disclosed if they are included as an ingredient, compound ingredient, food category, additive, or processing aid [59]

4. National vs. International Food Labelling Laws for Edible Oils and Fats

National and international food labelling laws regarding edible oils and fats exhibit both similarities and disparities, shaping consumer understanding, industry practices, and regulatory frameworks [60]. At the core, both national and international regulations prioritize transparency, consumer safety, and informed choice. Commonalities include requirements for clear ingredient listings, allergen declarations, nutritional information provision, date marking, and often, country of origin labelling [61]. These shared mandates ensure consumers have access to crucial information about the products they consume, fostering trust and informed decision-making. However, notable differences exist between national and international standards. National regulations may impose additional labelling requirements, such as specific language mandates or stricter guidelines for labelling claims like organic or low-fat, reflecting regional preferences and consumer demands. Enforcement mechanisms also vary, with national regulations typically overseen by local authorities and international standards relying on voluntary adoption and adherence by member states. Furthermore, while international standards aim for harmonization to facilitate global trade, disparities in certification programs and enforcement levels among countries can lead to discrepancies in labelling practices and consumer perceptions. Nonetheless, efforts to align national regulations with international standards can promote consistency, enhance market access, and ensure consumer protection. Achieving a balance between harmonization and national considerations remains crucial in navigating the complex landscape of food labelling laws for edible oils and fats, ultimately benefiting both consumers and industry stakeholders.

5. Discussion

The discussion section of this review paper explores the intricacies and implications of international food labelling laws, legislation, and regulations governing edible oils and fats. Across jurisdictions such as the European Union, the United States, Canada, the United Kingdom, and Scandinavian countries, various commonalities and differences emerge. While each region prioritizes consumer safety and transparency, specific requirements regarding ingredient listing, allergen declaration, nutritional information, and date marking vary significantly [62]. These differences pose challenges for industry stakeholders

operating in multiple markets, as they must navigate diverse regulatory landscapes and adapt labelling practices accordingly. Harmonization efforts led by international organizations like Codex Alimentarius offer opportunities to streamline regulations and promote consistency across borders. However, achieving consensus on key issues such as language requirements and labelling claims remains a complex endeavor. Policymakers play a pivotal role in shaping food labelling regulations, balancing the interests of consumers, industry, and public health. Moving forward, collaboration among stakeholders and investment in technology and compliance systems are essential for enhancing transparency, consumer trust, and market access. Consumer empowerment through education and awareness initiatives is also critical in fostering informed dietary choices and promoting a healthier food environment. By addressing emerging challenges and capitalizing on opportunities for collaboration, the global community can work towards building a more equitable, sustainable, and resilient food system that meets the needs of all stakeholders.

Conclusion

In conclusion, this review highlighted the diverse international landscape of food labelling laws for edible oils and fats. While variations exist among regions, commonalities include ingredient listing, allergen declaration, and nutritional information, aiming to ensure consumer safety and transparency. Language requirements and organic certification underscore market-specific considerations, while harmonization efforts seek to streamline regulations and promote global trade. Navigating these complexities requires understanding regional nuances and aligning with core principles of transparency and consumer protection, ultimately shaping the global food market, and prioritizing public health.

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