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INFLUENCE OF EXPIRY DATE INTERPRETATION ON FOOD SAFETY AND WASTE

ВЛИЯНИЕ ИНТЕРПРЕТАЦИИ СРОКОВ ГОДНОСТИ НА БЕЗОПАСНОСТЬ И ОТХОДЫ ПИЩЕВЫХ ПРОДУКТОВ

Abstract. Food date labels inform consumers about shelf life, but confusion over terms like "best before" and "use by" often leads to premature disposal or unsafe consumption. This article examines how such

misinterpretation impacts food safety and waste in the U.S., EU, Japan, South Korea, Russia, Kazakhstan, and CIS countries.

Based on 2019–2025 data, the study shows that label confusion causes up to 10% of food waste in the EU and 20% in the U.S. and U.K. Differences in terminology and lack of standardization result in unnecessary waste or health risks. For instance, Russian consumers treat expiry dates strictly, while many in the EU and U.S. misread quality dates as safety warnings.

The article stresses the need for unified labeling and public education. Solutions include reforming "use by" labels, clearer definitions, and awareness campaigns. South Korea's reforms and voluntary measures in the U.K. and Japan demonstrate the effectiveness of coordinated efforts in reducing waste and ensuring safety.

Keywords: food expiration date, date labeling, food waste, food safety, consumer behavior, international comparison

Аннотация. Маркировка сроков годности информирует потребителей о сроке хранения продуктов, однако путаница в терминах, таких как «лучше употребить до» и «годен до», часто приводит к преждевременной утилизации или, наоборот, к употреблению небезопасной пищи. В статье рассматривается, как подобная интерпретация влияет на безопасность продуктов и образование отходов в США, ЕС, Японии, Южной Корее, России, Казахстане и других странах СНГ.

На основе данных за 2019–2025 годы установлено, что непонимание маркировки приводит к образованию до 10% пищевых отходов в ЕС и до 20% — в США и Великобритании. Различия в терминологии и отсутствие стандартизации вызывают либо избыточные отходы, либо риски для здоровья. Например, в России сроки воспринимаются как жёсткие границы, в то время как в ЕС и США многие путают даты качества с датами безопасности.

В статье подчёркивается необходимость унифицированной маркировки и просветительской работы среди населения. Среди предложенных решений — реформа «годен до», чёткие определения и информационные кампании. Реформы в Южной Корее, а также добровольные меры в Великобритании и Японии демонстрируют эффективность согласованных действий в сокращении отходов при сохранении безопасности продуктов.

Ключевые слова: срок годности, маркировка дат, пищевые отходы, безопасность пищевых продуктов, поведение потребителей, международное сравнение

Introduction

Food loss and waste are global challenges affecting food security, economy, and sustainability. According to FAO, about one-third of food produced annually (≈ 1.3 billion tons) is lost or wasted, much of it at the consumer level. A key factor is misinterpretation of expiration labels like "use by" and "best before."

Two main issues arise:

- Food safety risks: If "use by" is ignored, spoiled or unsafe food may be consumed.
- Food waste: If "best before" is mistaken for a safety date, edible food is discarded.

In the U.S., over 90% of consumers have thrown away food early due to label confusion, and 43% do so regularly. In the U.K., 20% of household waste is linked to this issue; in the EU — up to 10%. These figures underscore the need for clearer labeling and education.

This article explores how date label interpretation impacts food safety and waste in the U.S., EU, Japan, South Korea, Russia, Kazakhstan, and CIS

countries. Based on 2019–2025 data, it analyzes label definitions, regulations, consumer understanding, and policy efforts.

The paper presents methods, results with charts, comparative discussion, and concludes with policy recommendations for clearer labels and reducing waste through public education.

Methods

The study used a comparative approach to assess expiration date labeling and its effects on food safety and waste. It included:

- **Regulatory Review:** Examination of food labeling laws in the EU, USA, Japan, South Korea, and EAEU, focusing on EU Regulation 1169/2011 and EAEU TR CU 022/2011.
- **Consumer Data (2019–2025):** Analysis of public surveys and reports, including U.S. national studies (2016, 2025), EU research, and South Korean government surveys [8].
- **Cross-Regional Analysis:** Comparison of trends, such as shifts in U.S. consumer behavior (2016–2025) and improved awareness in South Korea after its 2023 reform.
- **Case Studies:** Review of real-world practices, including Russia's strict disposal rules and UK retailers removing "Best Before" labels to cut waste.

This mixed-method design combines qualitative and quantitative data to provide a cross-country perspective, with results presented in tables and figures reflecting trends from 2019 to 2025.

Results

International Expiry Date Labeling Practices

Regulatory practices for food date labels differ by country, though labels typically fall into two categories:

- **Safety (e.g., "Use By")** — food should not be consumed after this date.

- Quality (e.g., "Best Before") — food remains safe but may decline in taste/nutrition.

USA: No unified federal regulation (except infant formula). Labels like "Best if Used By", "Use By", and "Sell By" are common. A 2017 initiative suggested standardizing terms, but adoption remains inconsistent, causing confusion.

EU: Requires "Use By" (safety) and "Best Before" (quality). Products past "Use By" can't be sold; those past "Best Before" may still be donated. Misunderstanding is still widespread [10].

Japan: Uses "消費期限" (Use By) and "賞味期限" (Best Before). Month-only formats are encouraged to reduce waste. Regulations are enforced by the Consumer Affairs Agency [6].

South Korea: Switched from "Sell By" to "Use By" in 2023. Over 94% compliance was reached quickly, and public awareness rose significantly.

Russia & CIS (e.g., Kazakhstan): Follow EAEU rules requiring one expiration date ("срок годности") that acts as both safety and quality cutoff. After this date, sale is prohibited and disposal is mandatory [9].

The UK, though previously under EU rules, has seen retailers voluntarily remove "Best Before" labels on produce to reduce waste.

Table 1. Comparison of Expiry Date Label Types and Definitions by Region

Country / Region	Main Labels	Meaning	Regulatory Status
USA	<i>Best if Used By, Use By, Sell By</i>	<i>Best if Used By</i> refers to quality; <i>Use By</i> implies safety (rare); <i>Sell By</i> is for retailers	No federal standard; voluntary industry guidelines since 2017
EU	<i>Use By, Best Before</i>	<i>Use By</i> = safety deadline; <i>Best Before</i> = quality indicator	Mandatory under Regulation EU 1169/2011
Japan	消費期限 (<i>Use By</i>), 賞味期限 (<i>Best Before</i>)	Distinct safety vs. quality dates; many foods still edible after <i>Best Before</i>	Regulated by the Consumer Affairs Agency; use of month-year formats encouraged

Country / Region	Main Labels	Meaning	Regulatory Status
South Korea	<i>Use By</i> (since 2023), previously <i>Sell By</i>	<i>Use By</i> marks actual safety limit; <i>Sell By</i> caused confusion	Law revised in 2023; over 90% industry compliance
Russia & EAEU (Kazakhstan, etc.)	<i>Срок годности</i> (single expiration date)	One date used as absolute safety and quality limit	Mandatory under TR CU 022/2011; sale after date is prohibited

Consumer Understanding and Behavior

Despite regional differences in labeling laws, a common global issue is consumer misunderstanding of expiry dates, which affects food handling and waste.

Key findings:

- USA: In 2025, 87% claimed to understand labels, but only 53% defined them correctly. 43% discarded food near expiry, leading to ~3 billion pounds of waste. Many confuse "Best if Used By" with a safety deadline [1].
- EU: Despite clear terms, only 47% correctly interpret "Best Before" and 40% "Use By". Up to 10% of food waste stems from misinterpretation [3].
- UK: 20% of household food waste is linked to date confusion. Consumers mix up "Best Before" and "Use By", prompting some retailers to remove labels to promote sensory judgment [4].
- Japan: People discard food at the "Best Before" (賞味期限) date, fearing spoilage. Education promotes understanding of "Use By" (消費期限), and companies now use month-based formats to reduce waste [5].
- South Korea: Replacing "Sell By" with "Use By" (2023) raised awareness from 34.5% to 88.5% in 16 months [7].
- Russia & CIS: Labels are treated as strict cutoffs; expired food is discarded. Donation practices remain rare but are under discussion.

Overall, most consumers discard safe food prematurely due to lack of clarity between safety and quality labels.

Table 2. Consumer Behavior and Understanding of Expiry Dates by Region

Country / Region	Key Insights
United States	43% of consumers always or usually discard food near the labeled date; 88% do so at least occasionally. 87% believe they understand date labels, but only ~53% answer correctly. Estimated \$7 billion worth of food wasted annually due to date label confusion.
European Union	Only 47% understand "Best Before" and 40% "Use By" correctly. Up to 10% of food waste is related to label misunderstanding. Many discard food as soon as it passes the "Best Before" date.
United Kingdom	Around 20% of household food waste is due to misinterpreting date labels. Consumers often confuse "Best Before" with "Use By". Retailers have begun removing date labels from some products to reduce waste.
Japan	Consumers often discard food on the "賞味期限" (best before) date out of caution, even though it is a quality guideline. Campaigns promote understanding of "消費期限" (use by) as the real safety date. Companies use year-month formats to reduce waste.
South Korea	Before 2023, the "Sell By" label caused confusion. After switching to "Use By", consumer awareness rose from 34.5% to 88.5%. The change is expected to reduce premature food disposal.
Russia & CIS	Consumers treat expiration dates as strict cutoffs. Food is rarely consumed past the printed date. Retailers must immediately remove expired items. Donation of near-expiry products is being considered.

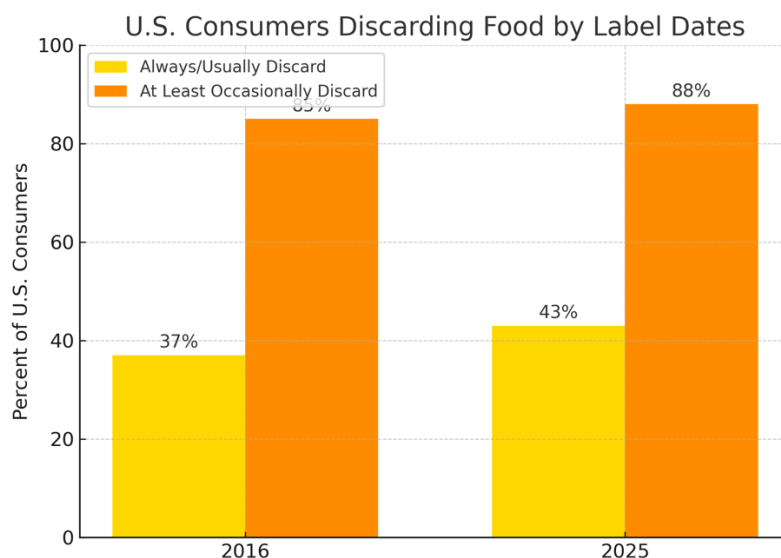


Figure 1. Between 2016 and 2025, the share of U.S. consumers discarding food near or after the labeled date increased—both among those who

always/usually discard and those who do so occasionally. This trend reflects growing caution and ongoing label confusion [1].

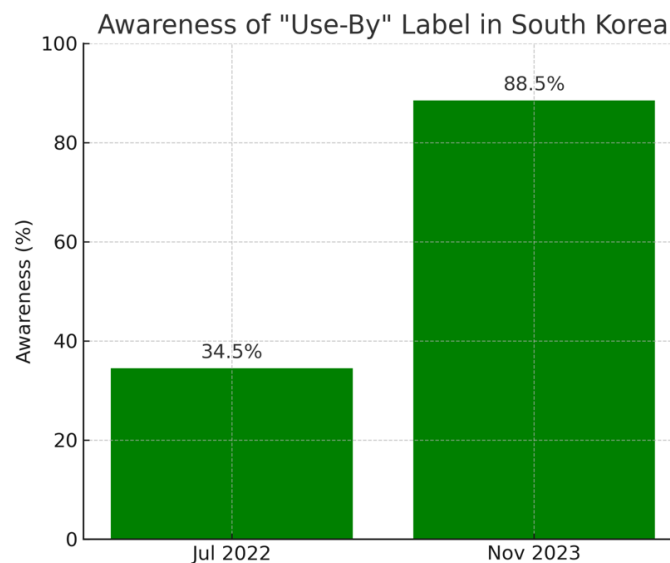


Figure 2. In South Korea, consumer awareness of the "Use-By" label rose from 34.5% (July 2022) to 88.5% (Nov 2023) after the new labeling law and public education campaign. The reform greatly improved understanding of food safety.

Discussion

Although labeling rules vary by country, a common issue is poor consumer understanding of expiry terms.

Standardization vs. Context: The EU uses "Use By" and "Best Before", but confusion persists. In the U.S., inconsistent terms worsen the issue. Japan and South Korea show that combining clear policy with education—like South Korea's 2023 "Use By" reform—can significantly improve awareness [2].

Food Safety vs. Waste: Strict enforcement in Russia and CIS reduces risks but increases waste. In contrast, EU and U.S. consumers often discard food too early or rely on sensory checks. Clear guidance for high- and low-risk foods is needed.

Trends (2019–2025): Many countries are tackling label confusion. The U.S. is moving toward national standards, EU may revise "Best Before", and retailers in the UK/Japan have adopted voluntary changes. EAEU countries still use one-term systems; dual labeling or better education could help.

Since expiry dates are a major but solvable driver of food waste, clearer labeling offers a fast, cost-effective solution.

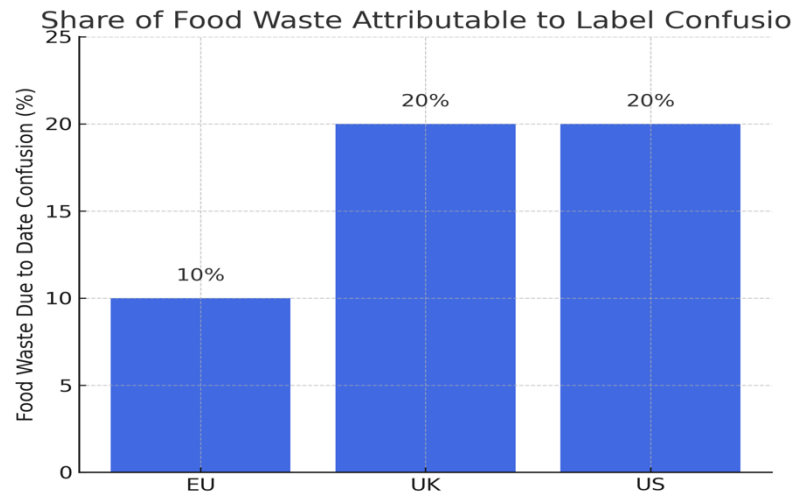


Figure 3. An estimated 10% of household food waste in the EU and around 20% in the UK and US is due to misunderstanding date labels [3]. These figures show the significant waste reduction possible through better consumer understanding and clearer labeling.

Conclusion

Expiration labels significantly impact consumer decisions, food safety, and waste. This study confirms that even in strictly regulated regions (EU, Russia), food is often discarded due to misinterpretation. In less regulated countries like the U.S., multiple label types create more confusion.

To address this, three key steps are needed:

1. Label simplification — use "Use By" for safety and "Best Before" for quality. South Korea's reform shows this works.

2. Legal reform — require clear, standardized terms and remove redundant labels.

3. Public education — inform consumers about high- vs. low-risk products via schools, media, and agencies.

For Kazakhstan and CIS countries, education and possible adoption of a dual-label system could reduce unnecessary waste. Allowing near-expiry food donations can also improve food security.

In conclusion, clearer labeling and education are practical, high-impact tools to cut food waste and improve safety. Progress made between 2019–2025 shows that change is possible with coordinated action.

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