

Hysen Bytyçi¹, Elvire Hajdari¹, Fitore Ibrahimimi¹, Edona Ibrahimimi¹, Kaltrina Berisha^{1,2*}, Arife Vllasa¹, Albert Gashi²

¹University of Prishtina "Hasan Prishtina", Faculty of Agriculture and Veterinary, Department of Food Technology with Biotechnology, Prishtina, Kosovo;

²Hungarian University of Agriculture and Life Sciences, Institute of Food Sciences and Technology, Department of Nutrition, Budapest, Hungary.

INTRODUCTION

This study examines food waste, which affects one-third of global food production (1.3 billion tons annually). Supply chain inefficiencies deplete resources, consuming 300 million barrels of oil and 230 cubic kilometers of water yearly. Food waste exacerbates hunger (820 million people) and environmental damage through greenhouse gas emissions. Misinterpretation of labels like "Best Before" and "Use By" further contributes to waste.

OBJECTIVES

This study aims to assess consumer knowledge of food labeling and attitudes, proposing clearer labels to mitigate waste.

METHODOLOGY

SURVEY METHODOLOGY

Data was collected from 337 households in Kosovo using a survey methodology.

PERIOD OF STUDY

A period of 10 months, specifically from December 2022 to October 2023.

STUDY AREA

The survey included three main regions: Prishtina, Ferizaj, and Prizren.

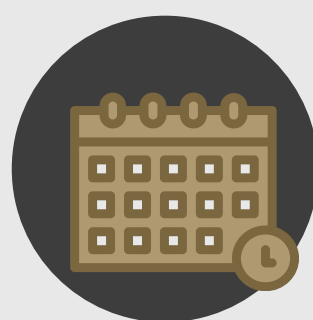


Table 1. Impact of Food Labeling on Consumer Behavior and Food Waste Dynamics

Category	Attributes	Key Insights
Food Marking-Related Factor	Definition of Expiration Date	70.3% see it as unsafe, 19.3% as freshness-related
	Understanding Expiry Labels	72.4% understand them, 27.6% do not
	Checking Expiry Dates (Before Buying)	72.1% always check, 22.6% sometimes
	Checking Expiry Dates (Before Eating)	65.3% always check, 29.4% sometimes
	Role of Expiry Dates in Food Waste	49.0% say it causes waste, 48.4% say it ensures safety
Food Waste-Related Factors	Percentage of Food Wasted (Expired)	69.4% think companies manipulate dates
	Action for Edible but Near-Expired Food	46.3% waste <1%, 34.1% waste <5%
	Reason for Discarding Expired Food	89.9% consume it, 5.3% discard it
	Ways to Reduce Expiry-Related Waste	86.9% due to safety concerns
	Belief in Altered Expiry Dates by Companies	56.4% suggest better education, 36.5% clearer labels
	Expired Goods Causing Illness	23.1% reported sickness, 68.0% did not

RESULTS

Table 3. Significance of Demographic Factors on the Impact of Food Labeling and Household Food Waste: Chi-Square Test Results

Attributes	Questionnaire	Region	Zone	Education	Gender	Age group (Years)	Income (€)	Number of members	Profession
	ρ - Value	ρ Value	ρ Value	ρ - Value	ρ Value	ρ Value	ρ Value	ρ - Value	ρ - Value
Definition of Expiration Date	0.027	NS	NS	0.004	0.027	NS	NS	0.004	NS
Understanding Expiry Labels	NS	NS	NS	0.000	NS	0.000	0.000	NS	0.000
Checking Expiry Dates (Before Buying)	0.000	0.038	0.014	0.000	NS	NS	NS	NS	NS
Checking Expiry Dates (Before Eating)	0.000	0.001	NS	NS	NS	0.052	NS	NS	NS
Role of Expiry Dates in Food Waste	0.005	0.001	NS	NS	NS	0.004	NS	NS	NS
Percentage of Food Wasted (Expired)	0.009	NS	NS	NS	NS	0.008	NS	NS	NS
Action for Edible but Near-Expired Food	NS	NS	NS	NS	NS	NS	0.002	NS	NS
Reason for Discarding Expired Food	NS	NS	NS	0.017	NS	NS	NS	NS	NS
Ways to Reduce Expiry-Related Waste	NS	NS	NS	NS	NS	0.002	0.008	NS	NS
Belief in Altered Expiry Dates by Companies	0.000	NS	NS	0.015	NS	NS	NS	NS	NS
Expired Goods Causing Illness	0.001	NS	NS	NS	NS	0.017	NS	NS	NS

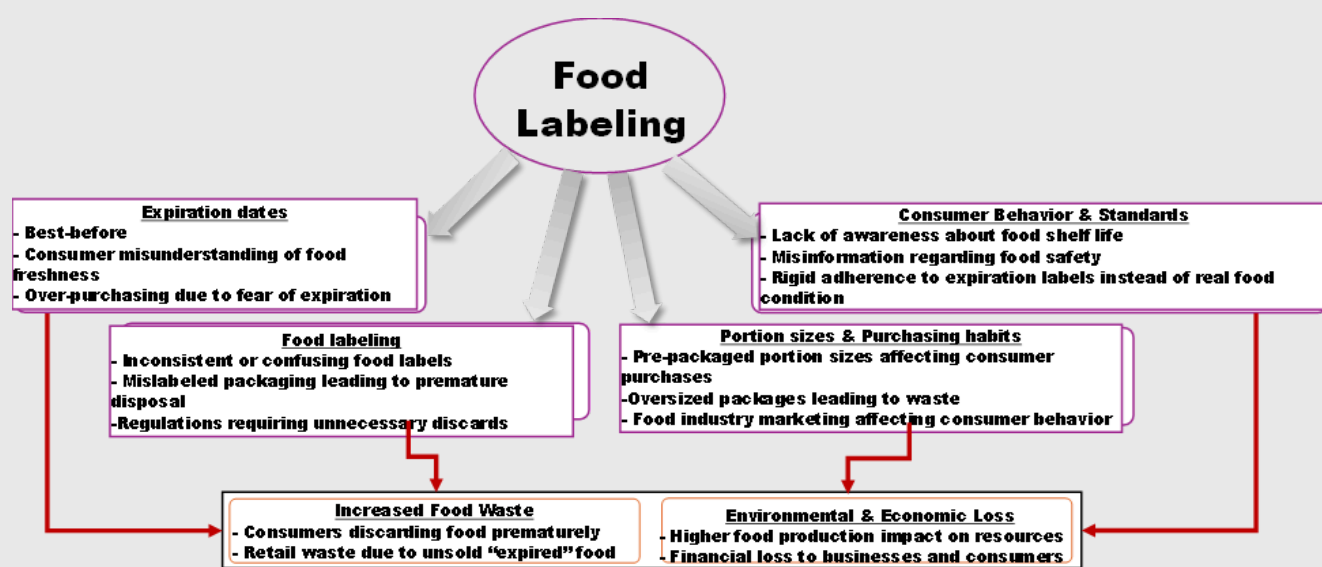


Figure 1. Impact of Food Marking Practices on Food Waste and Its Consequences flow chart

The study highlights that misinterpretation of expiration labels, especially "best-before" and "use-by," significantly contributes to food waste in Kosovo. While 72.1% of consumers check labels before purchasing, 70.3% mistakenly associate them with safety, leading to premature disposal. Despite 89.9% consuming near-expired food, 86.9% discard expired items due to safety concerns. These findings align with global trends. Clearer, standardized labels and consumer education are essential to reducing waste. Aligning regulations with international standards and addressing socioeconomic disparities can help mitigate environmental and economic losses.

CONCLUSIONS

This study highlights how misinterpreting food labels drives waste in Kosovo. Consumers often misunderstand "best before" and "use by," leading to premature disposal despite checking expiration dates. While some consume near-expired food, safety concerns persist. Clear labels and education are crucial for reducing waste and promoting sustainability.