



ECO-LABELING AND SUSTAINABILITY IN THE SERBIAN MEAT INDUSTRY: REGULATORY, INSTITUTIONAL, AND PERCEPTUAL PERSPECTIVES

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Abstract

The integration of eco-labeling into national frameworks has become a key component in aligning food production with sustainable development goals. This paper examines the current status of eco-label implementation in the meat sector in Serbia, with a focus on the regulatory environment, institutional mechanisms, and consumer perception. The analysis is based on an examination of Serbian legislation, relevant international standards, and existing literature addressing sustainability certification in food systems. The study identifies structural and procedural gaps that hinder the effective application of eco-labels, including limited regulatory enforcement, low market incentives, and insufficient awareness among producers and consumers. Particular attention is given to the alignment of national practices with European Union sustainability policies and certification schemes. The findings indicate that eco-labeling in this sector remains underdeveloped, despite increasing interest in sustainable consumption. The paper concludes that coordinated efforts in regulatory harmonization, institutional capacity building, and stakeholder education are necessary to enhance the credibility and uptake of eco-labeling as a mechanism for promoting sustainability in the Serbian meat sector.

Key words: *Eco-labeling, sustainability, regulation, certification, consumer perception, Serbia*

Introduction

In the contemporary context of globalization and the accelerated development of the food market, the concept of sustainability is becoming a key determinant in shaping policies and practices in the food industry. The pressure is particularly strong on

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sectors with a significant environmental impact, among which the meat industry occupies a special place due to its high consumption of natural resources, greenhouse gas emissions, and waste generation. In this regard, eco-labelling emerges as an instrument that enables consumers to be informed about the environmental aspects of products and promotes sustainable patterns of production and consumption.

In Serbia, eco-labelling in the food sector, and especially in the meat industry, is still in the development stage. The existing regulatory and institutional framework indicates the presence of formal prerequisites for the implementation of eco-labels; however, their practical application remains limited. At the same time, consumer perception of these labels and the level of their reliability varies, which further complicates the process of their wider use and acceptance on the market.

The aim of this paper is to analyse the current status of eco-labelling in the meat industry in Serbia, with an emphasis on the regulatory framework and alignment with European standards in the field of sustainable production and food labelling. By using domestic legislation, international guidelines, and relevant literature, the paper identifies key obstacles and potential directions for the development of the eco-labelling system in this sector.

Eco-labelling in meat industry

Eco-labels represent a system of marking products that meet specified criteria of environmental acceptability, supported by mechanisms of verification and certification. Their application in the food sector is gaining increasing importance, both due to the growing demand for “green” products and the necessity of harmonisation with international standards and sustainable development policies, particularly in the context of European integration.

Eco-labels play a crucial role in fostering green consumption, since most eco-labelled products are so-called “credence goods”, meaning that consumers cannot directly perceive the value attributes of the production process either at the time of purchase or after consumption. Consequently, consumers rely heavily on eco-labels as a guarantee that such attributes are indeed present and fulfilled in production [1,2].

According to the ISO standard, there are three types of labels concerning environmental protection [3]:

1. Type I includes labels with clearly defined criteria (not applicable to food products and beverages);
2. Type II refers to self-declared claims without established criteria or certification schemes;
3. Type III comprises declarations based on a life-cycle analysis approach.

However, these standards are not intended for the purposes of certification or registration. Eco-labels indicate products that meet specific criteria of environmental performance and may be owned or administered by governmental authorities, non-governmental organisations, or the private sector. In order to facilitate more informed and sustainable food choices, the European Commission has expressed its commitment to developing a legislative framework for sustainable food systems, in



which sustainability labelling would constitute a central element encompassing the nutritional, environmental, and social aspects of food [3].

New types of multi-level eco-labels, which indicate the degree of a product's environmental impact throughout its life cycle, are being tested across Europe with the aim of facilitating the transition to more sustainable food systems. A study conducted in Austria demonstrated that consumers are willing to pay a premium for products carrying such labels, particularly when the labels are visually clear, colour-coded, and positively evaluated. Even negative labels had a greater effect on willingness to pay compared with the complete absence of a label, indicating that the act of labelling itself carries some weight. However, the overall effect of the labels was limited – consumer preferences were not associated with their knowledge of eco-labels, health consciousness, or environmental concern. The source of protein had the greatest influence on choice, with a marked preference for animal-based products (particularly beef) strongly associated with meat attachment. This highlights the challenges in promoting changes in consumer behaviour and transitioning to more sustainable protein sources, as the average consumer continues to make choices primarily based on entrenched preferences rather than sustainability labels [4].

In September 2021, the Earth Foundation launched a pilot eco-labelling scheme using the “Eco-Impact” method, which integrates carbon emissions, water consumption, pollution, and biodiversity loss throughout the product life cycle (excluding use and end-of-life stages). Products receive ratings from A (good) to G (poor), displayed using a traffic-light system (Figure 1). The rating reflects actual production practices and allows comparison within the same food category. The Foundation later adopted an assessment based on the Product Environmental Footprint (PEF) methodology, which covers the entire life cycle and factors such as food preparation, waste and end-of-life emissions, presenting the rating on a scale from A+ to G [5].

The International Organization for Standardization (ISO 14024:2018) recommends that eco-labels be accurate, impartial, and promote consumption that reduces environmental stress. The transparent and scientifically grounded label developed by the Earth Foundation meets these criteria and can play a significant role in mitigating the environmental impact of meat production, thereby encouraging a shift towards more sustainable diets [5].



Figure 1: Multi-grade eco-labelling in the meat industry [5]

However, despite consumers' positive attitudes towards sustainable products, understanding the factors that motivate such choices remains complex. One reason for this is the wide variety of labels currently available on the market, which represent different aspects of sustainability, as well as the diverse associations consumers make when purchasing products bearing green labels.

In the European context, the environmental attributes of beef are conveyed through private standards established by producers and retailers, as well as through public, voluntary EU organic labels. These labels differ in terms of certification type, the information they provide, and their mode of presentation, most commonly confirming characteristics such as animal welfare, carbon footprint, absence of genetically modified organisms, and the origin of raw materials [6].



Figure 2: Label "Bien-Être Animal" [7]

France is among the first European countries to develop a labelling system aimed at providing consumers with clear information on animal welfare standards (Figure 2). The initiative was launched at the end of 2018, when the first products bearing this label appeared on the market, specifically *Terre & Saveurs* brand chickens within the Casino retail chain. Shortly thereafter, other relevant stakeholders from the meat production and distribution sector joined the initiative, including farmers from Loué, farmers from southwestern France, the company Avigers, the organisation Welfarm, as well as retail chains Carrefour, U Stores, and Galliance. The label is designed to provide consumers with reliable information regarding the level of animal welfare throughout the entire production process – from rearing and feeding to transport and slaughter. At the same time, it serves as an incentive for producers to improve their practices in accordance with the principles of sustainable and ethical production. The initiative has received considerable public attention, and its growth reflects the increasing consumer demand for transparent information and greater consideration



of ethical aspects in meat production. The French model is increasingly used as a reference in discussions on the potential introduction of a harmonised label at the European Union level [7].

The European regulatory framework for meat eco-labelling

In the context of the growing need for transparency in the food supply chain and the promotion of sustainable consumption, the European Union is developing various mechanisms for the eco-labelling of animal-derived products. Although a single, mandatory label encompassing all aspects of environmental sustainability in the meat industry has not yet been established, a range of regulatory, political, and technical instruments is laying the groundwork for future harmonisation in this field.

The most developed labelling system in the EU to date is the organic production label, the requirements of which are defined by Regulation (EU) 2018/848 on organic production and the labelling of organic products. This label entails strict criteria, including the prohibition of genetically modified organisms (GMOs), restricted use of antibiotics, and mandatory access to outdoor space for animals. In the meat sector, this means that products carrying the EU organic label originate from animals raised under high standards of ecological and ethical production [8].

In order to quantify the environmental impacts of food products, the European Commission is developing the Product Environmental Footprint (PEF) methodology, which is based on life cycle analysis (LCA). This tool enables the standardised calculation of factors such as greenhouse gas emissions, water consumption, soil pollution, and biodiversity loss. Although not mandatory, the PEF provides a foundation for future policy development, including the proposed regulations on so-called “green claims” and sustainability labelling of products [9].

In practice, most sustainability labels operate on a voluntary basis. Among the best known is Eco-Score, developed in France, which combines data obtained through life cycle analysis (LCA) with additional criteria such as local origin, pesticide use, and seasonality, assigning products a rating from A (lowest impact) to E (highest impact). Planet-Score represents a further refinement of this approach, as it additionally incorporates aspects of animal welfare and antibiotic use, providing a broader view of a product’s environmental profile. In addition to these, the pan-European pilot project Earth Foundation is significant; it is based on the PEF methodology and aims to establish a unified sustainability label at the European Union level [10].

Although there is still no obligation for producers to use these labels, their adoption is increasing, particularly in sectors where consumers demonstrate greater concern for the environmental and ethical aspects of production, such as the meat industry [5].

Within the framework of the EU Green Deal and the “Farm to Fork” Strategy, the European Commission has announced its intention to introduce a mandatory food sustainability label by 2026, covering the environmental, nutritional, and ethical aspects of production. This label is expected to be based on scientifically grounded indicators such as the PEF and ESG factors (Environmental, Social, Governance), with the aim of combating so-called “greenwashing” and ensuring fair competition [11,12].



Eco-labels for meat and meat products in Serbia and regulatory framework

In Serbia, the implementation of eco-labels for meat and meat products has not yet been fully institutionalised or systematically developed, particularly in comparison with European Union countries. Nevertheless, the growing interest among both consumers and producers in sustainability and transparency within the meat sector indicates a need to improve existing labelling frameworks. Consumers increasingly demand precise and verified information that would enable them to make environmentally responsible purchasing decisions, posing a challenge for regulatory authorities and industry stakeholders.

Serbia's regulatory framework for the eco-labelling of food, including meat and meat products, is primarily based on the Law on Organic Production. This legislation defines the criteria for organic production and the conditions for placing products on the market with the "organic product" label, which entails a prohibition on the use of synthetic pesticides, hormones, and other artificial substances. Such a legal framework provides the foundation for the development and implementation of eco-labels in the meat sector [13].



Figure 3: Organic meat with the label "Produced in Serbia" [14]

However, specific standards and labels that would consistently identify and guarantee the environmental sustainability of meat and meat products at the national level have not yet been fully established. The introduction of the "Produced in Serbia" label in 2022 represents an initial step towards increasing transparency of product origin, although this label does not have a direct environmental character and



primarily relates to geographic identification and support for domestic production (Figure 3).

The announcement of a new regulation on meat labelling in Serbia represents a significant step towards greater transparency in the meat sector. A key innovation is the requirement to indicate the age of the meat – the time elapsed from slaughter to sale – for both domestic and imported meat. The aim of this regulation is to create conditions for informed decision-making and to strengthen consumer trust. Although the regulation does not directly address eco-labelling, it provides a framework for the development of additional labelling systems that could include information on production sustainability. This is particularly important in the context of quality control for imports and the prevention of practices such as repackaging older meat. Increased transparency can serve as a foundation for the introduction of integrated labels encompassing environmental aspects of production [15].

Research limitations

The research is primarily based on the analysis of available legislative acts, strategic documents, and secondary literature sources, without conducting empirical research among key stakeholders such as producers, consumers, or representatives of the competent institutions. Consequently, the conclusions are limited to the normative and conceptual level, while lacking practical insights that would further illuminate the real challenges in implementing ecological labelling in the meat industry in Serbia. Moreover, due to the lack of publicly available data on domestic initiatives in this field, the analysis relies largely on international examples and European standards as models for potential adaptation to the national context.

Conclusion

Eco-labelling in the meat industry is gaining increasing importance as a mechanism for promoting sustainable consumption and responsible production. The European Union continues to develop instruments such as the Product Environmental Footprint (PEF) and voluntary labels like Eco-Score, thereby establishing guidelines for informing consumers about the environmental impact of products. These initiatives are increasingly becoming part of market dynamics and consumer expectations regarding transparency in the food supply chain.

In Serbia, although the eco-labelling system for meat has not yet been institutionalised in the way it is in the EU, relevant legislative foundations exist, primarily through the Law on Organic Production and the newly adopted regulations on meat labelling. These acts contribute to increased transparency and provide a potential basis for the further development of integrated labels that also include environmental criteria.

At the same time, the pronounced need to align with European standards, coupled with growing consumer interest in sustainability issues, highlights the importance of systemic support in the form of education, institutional capacity, and market incentives. The establishment of a credible eco-labelling system in the meat sector will



depend on the coordinated action of all stakeholders – legislators, producers, distributors, and consumers themselves.

References

- [1] European Commission, About the EU Ecolabel, *Environment*, https://environment.ec.europa.eu/topics/circular-economy/eu-ecolabel/about-eu-ecolabel_en#how-is-the-eu-ecolabel-managed (Accessed: September 26, 2025).
- [2] Daugbjerg, C., Smed, S., Andersen, L. M., Schwartzman, Y., Improving Eco-labelling as an Environmental Policy Instrument: Knowledge, Trust and Organic Consumption, *Journal of Environmental Policy & Planning*, 16, (2014), 4, pp. 559–575, <https://doi.org/10.1080/1523908X.2013.879038>.
- [3] Tiboni-Oschilewski, O., Abarca, M., Santa Rosa Pierre, F., Rosi, A., Biasini, B., Menozzi, D., Scazzina, F., Strengths and weaknesses of food eco-labeling: a review, *Frontiers in Nutrition*, 11, (2024), pp. 1–14, <https://doi.org/10.3389/fnut.2024.1381135>.
- [4] Kolber, A., Meixner, O., Effects of Multi-Level Eco-Labels on the Product Evaluation of Meat and Meat Alternatives – A Discrete Choice Experiment, *Foods*, 12, (2023), 15, 2941, <https://doi.org/10.3390/foods12152941>.
- [5] Williams, V., Flannery, O., Patel, A., Eco-score labels on meat products: Consumer perceptions and attitudes towards sustainable choices, *Food Quality and Preference*, 111, (2023), 104973, <https://doi.org/10.1016/j.foodqual.2023.104973>.
- [6] Stranieri, S., Ricci, E. C., Stiletto, A., Trestini, S., How about choosing environmentally friendly beef? Exploring purchase intentions among Italian consumers, *Renewable Agriculture and Food Systems*, 38, (2023), e2, pp. –, <https://doi.org/10.1017/S1742170522000357>.
- [7] Association Étiquette Bien-Être Animal, Étiquette Bien-Être Animal – Informative animal welfare labelling, <https://www.etiquettebienetreanimal.fr/en/>.
- [8] European Commission, Regulation (EU) 2018/848 of the European Parliament and of the Council of 30 May 2018 on organic production and labelling of organic products, <https://eur-lex.europa.eu>.
- [9] FoodDrinkEurope, Guidelines on the use of Product Environmental Footprints in the food and drink industry, FoodDrinkEurope, Brussels, Belgium, 2023.
- [10] Environmental Labels, How Foundation Earth is disrupting labelling of consumer products, <https://environmentallabels.co.uk/how-foundation-earth-is-disrupting-labelling-of-consumer-products/>.
- [11] European Commission, Farm to Fork Strategy: For a fair, healthy and environmentally-friendly food system, https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy_en.
- [12] European Commission, Green Claims: Proposal for a Directive on substantiating environmental claims, European Commission Newsroom, <https://ec.europa.eu/newsroom/env/items/784086/en>.
- [13] Government of the Republic of Serbia, Law on Organic Production (Official Gazette of RS, No. 30/2010 and 17/2019), <https://www.paragraf.rs/propisi/zakon-o-organskoj-proizvodnji-republike-srbije.html>.
- [14] BioSalasidei, Organska junetina kolenica B K Black Angus BIO Beef 500 g, <https://biosalasidei.rs/proizvod/organska-junetina-kolenica-b-k-black-angus-bio-beef-500g/>.
- [15] ERO, Uticaj pravilnika o obeležavanju mesa u Srbiji: Obezbeđenje transparentnosti za potrošače, <https://ero.rs/uticaj-pravilnika-o-obelezavanju-mesa-u-srbiji/> (Accessed: September 27, 2025).