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**Slaughterhouse blood: A state-of-the-art review on transforming by-products into valuable nutritional resources and the role of circular economy**

(2024) *Food Bioscience*, 61, art. no. 104644, .

DOI: 10.1016/j.fbio.2024.104644

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**Abstract**

The slaughterhouse is possibly one of the fastest-growing sectors driven by the increasing demand for food availability. Subsequently, the wastes especially blood produced from the slaughterhouse industry are in huge quantities, which could be a promising resource for the recovery of value-added products. Blood, particularly plasma, is a significant and sustainable natural protein source that offers economic feasibility, environmental friendliness, and nutritional benefits. Integrating circular economy principles can play a pivotal role in optimizing the utilization of these by-products, thereby reducing waste and promoting sustainability across the supply chain. This review explores the characterization of blood, including its physical and chemical properties, and underscores the potential for expanding the application of animal blood derivatives across various sectors. Advancements in food engineering play a crucial role in modifying the functional properties of animal plasma in food products. However, ensuring the safety and hygienic conditions of blood derivative products requires thorough investigations and testing. Addressing future challenges such as safety, flavor acceptance, cultural considerations, supply chain logistics, and market demand is essential to fully realize the potential of slaughterhouse blood as a sustainable ingredient. By making these efforts, blood-derived ingredients can contribute to a diversified and resource-efficient food system, minimizing waste and providing nutritional benefits aligned with sustainability goals. Through strategies such as waste reduction, reuse, and recycling, the circular economy approach can optimize resource utilization, minimize environmental footprint, and contribute to a more sustainable and resilient food system. © 2024 Elsevier Ltd

**Author Keywords**

Circular economy; Food application; Novel food; Slaughterhouse blood; Sustainable ingredient

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**Publisher:** Elsevier Ltd

**ISSN:** 22124292

**Language of Original Document:** English

**Abbreviated Source Title:** Food BioSci.

2-s2.0-85197565358

**Document Type:** Review

**Publication Stage:** Final

**Source:** Scopus

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