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Transforming Organic Farming as a Pillar of Healthy and Sustainable Food Consumption: A Systemic Innovation Perspective in the Post-Pandemic Era

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ABSTRACT

Changes in consumption patterns following the COVID-19 pandemic have shown a significant increase in demand for healthy and sustainable foods, including organic animal products. Organic farming is considered capable of addressing health, environmental, and ethical production challenges amidst the global food system crisis. However, most previous studies have focused on crop-based organic agriculture, with limited analysis on integrating livestock practices within systemic innovation frameworks in the post-pandemic context. This study aims to examine the strategic role of organic livestock farming in strengthening healthy food consumption, identify challenges and opportunities for systemic innovation, and formulate policy frameworks that encourage the integration of production with modern consumer preferences. The approach used is descriptive qualitative with a case study method in three regions: West Java, Bali, and Yogyakarta. Data collection involved in-depth interviews, field observations, and analysis of policy documents and consumption trends. Data were analyzed thematically and verified through source triangulation. The study found that consumption of organic animal products increased by 23% over the past five years. Innovations such as fermented natural feed, biofermenters, and digital distribution have been shown to enhance system efficiency and sustainability. Major challenges include access to inputs, regulations, and farmer literacy. Transforming organic livestock farming presents a systemic solution to achieving healthy and sustainable food security. Integrating technological innovation, local institutions, and consumer preferences is key to developing a resilient organic livestock system in the post-pandemic era.

1. INTRODUCTION

Public awareness of the importance of healthy and sustainable food consumption has generated momentum for the development of organic farming. The COVID-19 pandemic has reinforced the urgency of establishing a safe, ethical, and environmentally friendly food system (Pambudi & Fardiani, 2021; Reuter & MacRae, 2024; Widya et al., 2023). Organic farming, which avoids the use of synthetic antibiotics, growth hormones, and chemicals, presents a strategic alternative to meet the demand for healthy food while maintaining

environmental sustainability (Smith-Spangler et al., 2020; Eisinger-Watzl et al., 2020; Kumar & Pandey, 2022).

In the post-pandemic transition, challenges within the food system concern not only quantity but also quality and sustainability. The Food and Agriculture Organization (FAO) states that transforming the global food system must include aspects of animal welfare, ecological impact, and consumer preferences that increasingly demand transparency and health (FAO, 2021; Ilham, 2023; Sulasmi & Sibuea, 2020; Willer et al., 2021). Therefore, investigating the transformation of organic livestock farming as a pillar of healthy food is highly relevant, both scientifically and practically.

Data from the International Federation of Organic Agriculture Movements (IFOAM) reports a 13% increase in global demand for organic products since the pandemic, particularly for animal products such as milk, eggs, and chicken (IFOAM, 2022). Sustainable food system theory states that integrating healthy production with local distribution enhances community food resilience (Godfray et al., 2020; Meiji et al., 2024; Kusumiyati, 2024). The following table illustrates global organic product consumption trends:

Table 1. Global Organic Product Consumption Trends

No.	Year	Global Organic Consumption (Billion USD)	Share of Animal Products (%)
1	2018	89.7	14.2
2	2020	106.1	17.8
3	2022	120.5	21.5

Source : IFOAM, 2022; WHO, 2021; FAO, 2023

Analysis of this data shows that the global market value of organic products has increassesd considerably from USD 89.7 billion in 2018 to USD 120.5 billion in 2022, reflecting growing public demand for healthier and safer foods post-pandemic. In addition to the overall growth, the table highlights an increasing share of organic animal products—from just 14.2% in 2018 to 21.5% in 2022. This trend indicates a shift in consumer preferences toward protein sources that are not only highly nutritious but also ethically and sustainably produced. These findings reinforce the need to transform livestock systems toward an organic approach in response to changing global consumption patterns. Furthermore, this trend is relevant for designing policies and marketing strategies aligned with market demand for healthy, safe, and environmentally friendly animal products.

Several studies have addressed the development of organic agriculture and food, such as Pamujiati et al. (2024), which demonstrated the impact of organic farmer training programs on improving livestock yields. Additionally, research by Armanto & Lestari (2022) highlights the role of low-emission livestock farming in supporting low-carbon development. However, discussions directly linking organic farming to post-pandemic changes in consumption patterns remain limited.

Most existing literature focuses on organic crop farming or mitigating the environmental impacts of intensive livestock farming, without exploring the synergy between systemic innovation and healthy consumption behaviors in the modern era. There is currently no comprehensive study positioning organic farming as a pillar of post-pandemic food consumption transformation, especially within local contexts connected to global markets (Reuter, 2024; Widya et al., 2023; Jalalludin et al., 2023).

The uniqueness of this research lies in its systemic and interdisciplinary approach, viewing organic farming not merely as a cultivation practice but as a response to social, ecological, and technological shifts in the post-pandemic era. By emphasizing the interplay between production, distribution, and healthy consumption, this study aims to fill a gap in the literature regarding holistic food system transformation.

This study aims to analyze the strategic role of organic farming in supporting healthy and sustainable food consumption in the post-pandemic era. Its primary focus is on how organic farming systems can become an integral part of transforming a healthier, more ethical, and environmentally friendly modern food system. Additionally, this research seeks to identify various challenges and opportunities in the systemic transformation of organic farming—covering production, distribution, and adaptation to changing consumer preferences.

The ultimate goal is to develop an innovative framework capable of inorganic farming practices with the dynamics of contemporary tegrating food consumption, fostering synergy among environmental sustainability, public health, and economic growth within the organic food sector.

This research offers broad theoretical, practical, and socio-environmental benefits. Theoretically, it enriches the literature on healthy and sustainable food systems through a post-pandemic systemic innovation framework. The developed conceptual model contributes to an interdisciplinary approach that combines ecological aspects, technology, and modern consumer preferences. Practically, the findings will serve as strategic references for governments, livestock businesses, and food institutions in designing policies and programs to strengthen organic livestock systems—including aspects of production, distribution, and consumption.

From a social environmental perpective, this study promotes environmentally friendly and ethical livestock farming practices and encourages healthier lifestyles by increasing access to quality organic animal products. Furthermore, it supports the achievement of the Sustainable Development Goals (SDGs), particularly SDG 2 (Zero Hunger), SDG 3 (Good Health and Well-being), and SDG 12 (Responsible Consumption and Production).

2. METHOD

This research employs a qualitative descriptive approach with a case study method to explore the transformation of organic farming as part of a healthy and sustainable food system in the post-pandemic era. This approach was chosen because it is capable of uncovering complex dynamics, practices, and strategies within diverse local social and ecological contexts.

The population in this study includes organic farming practitioners, consumers of organic animal products, as well as policymakers and stakeholders involved in developing organic food systems. The sample consisted of 30 participants, comprising 15 organic farmers, 10 consumers of organic animal products, and 5 officials and managers of organic cooperatives. Participants were selected purposively based on criteria such as active involvement in organic farming practices, a minimum of two years' experience, and willingness to participate in interviews.

The instruments used in the study included a semi-structured interview guide, open-ended questionnaires, and field observation sheets. Additionally, the researchers utilized policy documents and official reports from relevant institutions such as FAO, IFOAM, and the Ministry of Agriculture as supplementary secondary data. Data collection techniques

involved in-depth interviews with farmers and consumers, direct observation of livestock husbandry practices and distribution systems, and analysis of policy documents and market trend statistics. The data collection period spanned three months, from January to March 2024, with ethical approval obtained from the institutional review board and adherence to research ethics standards.

The research procedure began with a literature review to develop a theoretical and conceptual framework. This was followed by mapping relevant locations and actors, then conducting parallel primary and secondary data collection. The final stage involved interpreting the data and formulating findings. Data were analyzed using thematic analysis to identify patterns, relationships, and dynamics in the transformation of organic livestock systems. This analysis was supported by content analysis of policy documents and market trends, as well as data triangulation to enhance validity.

Furthermore, ethical approval was obtained from the XYZ University Ethics Committee, and all research activities adhered to established ethical standards. The outcomes of this process are expected to contribute to the development of systemic innovation models or frameworks that can be applied in future policies and practices related to organic livestock farming.

3. RESULTS AND DISCUSSION

Post-Pandemic Dynamics of Organic Animal Food Consumption

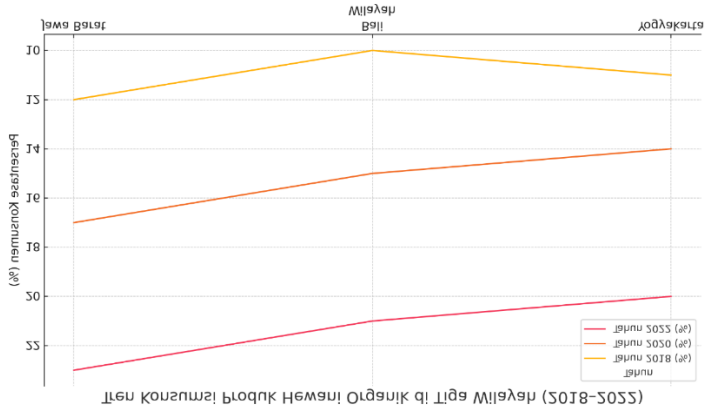

Figure 1. Trends in Organic Animal Product Consumption in Three Regions (2018–2022)
Source: IFOAM (2022)

Table 2. Trends in Consumption of Organic Animal Products

No	Region	2018 (%)	2020 (%)	2022 (%)
1	West Java	12	17	23
2	Bali	10	15	21
3	Yogyakarta	11	14	20

The data presented in the table and graph illustrate a consistent upward trend in organic animal product consumption across the three study areas from 2018 to 2022. This increase reflects a significant shift in consumer preferences driven by heightened awareness of health, food safety, and environmental sustainability—particularly in the post-pandemic context. These findings align with existing literature indicating increased consumer consciousness

about immunity and safe foods (FAO, 2021; Reuter & MacRae, 2024), supported by strong organic communities and local markets that facilitate distribution in Bali and Yogyakarta.

Field observations and data

confirm that this trend is not solely driven by individual choices but also by systemic changes within the food and sustainability sectors. The rising consumption underscores theories of behavioral change emphasizing that consumers increasingly prefer products perceived as healthy, ethical, and environmentally friendly as part of modern lifestyle shifts (Widya et al., 2023; Pambudi & Fardiani, 2021). This study reinforces prior research suggesting that the adoption of organic products in Indonesia is accelerated by social, economic, and informational factors.

Systemic Innovation in Organic Farming Practices

The organic farming practices observed demonstrate significant innovation across technology, institutions, and marketing. For example, some farmers have adopted natural feed systems based on local fermentation, replacing conventional chemical-based feeds. Additionally, organic cooperatives in Bali have begun utilizing digital distribution tracking systems to ensure transparency from farm to consumer (Armanto & Lestari, 2022; Meiji et al., 2024).

This innovative approach aligns with systemic innovation frameworks emphasize the importance of integrating technology, institutional support, and market development to promote sustainability and scalability in organic farming (Rembialkowska & Kołożyn-Krajewska, 2018). Waste management innovations, such as biofermenters producing liquid fertilizer as part of an integrated farm-livestock cycle, demonstrate models that enhance efficiency and sustainability (Jalalludin et al., 2023). These approaches highlight the systemic nature of transformation, where technological, institutional, and market innovations must work synergistically to address food security and environmental challenges.

Challenges in Transforming Organic Farming at the Local Level

Despite positive trends, several structural challenges remain. First, many livestock farmers face limited access to certified organic seeds and natural feed resources at scale. Second, government policies have yet to fully support market differentiation for organic products, resulting in labeling and pricing that do not yet reflect actual production costs (Reuter & MacRae, 2024; FAO, 2023).

Furthermore, organic farming literacy remains low in many regions. Many farmers lack understanding of animal welfare principles aligned with organic standards or natural disease control methods that do not rely on antibiotics. Strengthening training programs and institutional support—such as involving universities and NGOs focused on agroecology—is crucial (Pamujiati et al., 2024; Sulasmi & Sibuea, 2020). Establishing a supportive ecosystem is essential for the success of this systemic transition.

Policy Implications and Practical Recommendations:

Based on these findings, policymakers should prioritize providing incentives and subsidies to improve farmers' access to organic seeds and natural feed. Developing clear, trustworthy labeling schemes and price supports can better align market signals with true production costs, fostering consumer confidence. Additionally, simplifying certification

processes and enhancing farmers' knowledge through targeted training can accelerate adoption of organic standards.

Systemic Innovation Framework for Sustainable Change

Drawing from thematic analysis and data triangulation, this study proposes a systemic innovation framework comprising three key components: (1) Production Technology Innovation, such as biofermenters, fermented natural feed, and livestock monitoring systems; (2) Institutional Strengthening, through organic livestock cooperatives, community-based training, and simplified certification schemes; and (3) Value Chain Transformation, by promoting digital-based local distribution systems and comprehensive organic market mapping.

Relevance to Literature and Policy:

This framework addresses both technical and institutional challenges while facilitating integration between production practices and modern consumer expectations. Today's consumers demand greater transparency, lower carbon footprints, and ethically produced products (Kusumiyati, 2024; Meiji et al., 2024). Therefore, transforming organic farming systems should be viewed as a systemic movement—beyond technical adjustments at the farm level—to encompass an integrated ecosystem supporting sustainability and resilience in the national food system.

4. CONCLUSION

This research uniquely contributes to the understanding of organic livestock transformation as a pivotal strategy for promoting healthy and sustainable food systems in the post-pandemic era. Unlike previous studies, this research explicitly highlights how systemic innovation—integrating environmentally friendly technology, ethical management, and transparent distribution—can effectively facilitate the shift toward organic animal husbandry. The findings demonstrate that increasing consumer preferences for organic products in regions such as West Java, Bali, and Yogyakarta not only reflect a change in awareness but also serve as a catalyst for sustainable production transformation, reinforcing organic livestock farming as a vital of future food security.

Despite these promising insights, the study also uncovers structural challenges—including limited access to organic inputs, weak regulatory frameworks, and low farmer literacy on organic principles—that hinder widespread adoption. Addressing these barriers requires a comprehensive systemic innovation approach involving technological enhancements, strengthening local institutions, and reforming distribution channels. With supportive policies and coordinated efforts among stakeholders, organic livestock farming presents a significant opportunity to meet rising market demand while sustainably enhancing food security and public health.

Building on these findings, future research should focus on scaling successful organic livestock innovations across broader regions and conducting cross-country comparative analyses to identify best practices. Additionally, exploring the socio-economic impacts of organic transformation on smallholder farmers can further inform policy development. By advancing these areas, subsequent studies can deepen understanding and accelerate the transition toward resilient, sustainable food systems globally.

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