

Livestock Production, Farmers' Terms of Trade, and Economic Performance of Indonesia's Livestock Subsector: Evidence from National Statistics

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Abstract

The livestock subsector plays an important role in supporting agricultural economic growth, farmer welfare, and national food security in Indonesia. This study aims to analyze the relationship between livestock production performance, farmers' terms of trade, and the economic contribution of Indonesia's livestock subsector using official national statistics. A descriptive quantitative approach was applied using secondary data from *Livestock and Animal Health Statistics 2025*. The analysis focused on livestock production indicators, livestock farmers' terms of trade, and gross domestic product of the livestock subsector. The results show that livestock GDP at constant prices reached IDR 189.8 trillion in 2024, increasing by 2.78% compared with 2023. The livestock subsector also contributed 16.60% to agricultural GDP in the narrow sense. In 2025, total meat production from large and small livestock reached 910.37 thousand tons, while poultry and other livestock meat production reached 4.56 million tons. Egg production reached 6.91 million tons, and milk production reached 820.87 thousand tons. Meanwhile, the livestock farmers' terms of trade reached 102.48 in 2024, indicating that farmers' received price index remained higher than their paid price index. These findings suggest that Indonesia's livestock subsector showed positive production and economic performance, although farmer welfare and regional balance remain important policy concerns.

Keywords: Livestock Production, Farmers' Terms of Trade, Economic Performance, Livestock Subsector, Food Security, Indonesia

1. Introduction

The livestock subsector is an important component of Indonesia's agricultural system because it contributes to food availability, farmer income, employment, and national economic development [1], [2]. Livestock products such as meat, eggs, and milk are essential sources of animal protein and play a strategic role in improving household nutrition [6], [7]. These products support dietary diversity and contribute to the fulfillment of nutritional needs, especially in relation to protein, fat, vitamins, and minerals [6], [8]. As demand for animal-based food continues to increase, the performance of the livestock subsector becomes increasingly important for supporting national food security [7], [9]. Therefore, evaluating livestock

production and its economic contribution is necessary to understand the resilience and sustainability of Indonesia's agricultural sector [2], [10].

The development of the livestock subsector is closely related to the capacity of the country to provide sufficient animal-based food for its population [6], [7]. Increasing production of meat, eggs, and milk can strengthen domestic food availability and reduce pressure on external supply sources [1], [8]. However, production growth alone is not sufficient if it is not accompanied by stable markets, efficient distribution systems, and improved farmer welfare [3], [12]. Livestock development must therefore be viewed not only from the perspective of output volume, but also from the broader economic and social benefits generated by the subsector [9], [15]. This makes an integrated assessment of production, farmer welfare, and economic performance highly relevant for agricultural policy planning [5], [20].

In addition to production performance, farmer welfare is an important dimension of livestock development [3], [12]. One commonly used indicator to assess farmer welfare in Indonesia is the Livestock Farmers' Terms of Trade or *Nilai Tukar Petani Peternakan* (NTPT) [3]. This indicator compares the price index received by livestock farmers with the price index paid by farmers [3]. A value above 100 indicates that farmers' received prices are higher than their paid prices, suggesting relatively favorable exchange conditions for farmers [3]. Therefore, NTPT provides useful information for evaluating whether livestock farmers benefit economically from livestock production activities and serves as an important indicator for monitoring rural welfare and agricultural development [3], [19].

Economic performance is another important aspect of livestock subsector development [2], [4]. Gross Domestic Product (GDP) and Gross Regional Domestic Product (GRDP) provide information on the contribution of livestock activities to the national and regional economy [4]. These indicators help policymakers understand whether livestock development contributes only to food supply or also to broader economic growth [10], [11]. A strong livestock subsector can stimulate related activities such as feed production, animal health services, processing industries, transportation, marketing, and rural employment [5], [18]. Therefore, integrating production, farmer welfare, and economic indicators provides a more comprehensive view of the livestock subsector and supports evidence-based policy formulation for sustainable agricultural development [10], [17].

This study aims to analyze livestock production, farmers' terms of trade, and the economic performance of Indonesia's livestock subsector using official national statistics [1], [2]. The analysis focuses on livestock GDP, livestock production, egg production, milk production, and NTPT as the main indicators [1], [3], [4]. By combining these indicators, the study provides an empirical overview of the relationship between output performance, farmer welfare, and economic contribution [4], [15]. The findings are expected to provide evidence-based insights for strengthening livestock development, improving farmer welfare, and supporting long-term food security [5], [6], [20]. In addition, the study is expected to contribute to policy discussions on sustainable livestock development and the role of the livestock subsector in Indonesia's agricultural transformation [11], [17], [18].

2. Materials and Methods

This study employed a systematic methodological framework to evaluate the production performance, farmers' welfare, and economic contribution of Indonesia's livestock subsector using official national statistical data [1], [2]. The analysis integrated multiple indicators representing the physical, economic, and socioeconomic dimensions of livestock development, including livestock production, livestock Gross Domestic Product (GDP), egg production, milk production, and Livestock



Farmers' Terms of Trade (NTPT) [1], [3], [4]. By combining these indicators, the study provides a comprehensive assessment of the current performance of the livestock subsector and its role in supporting agricultural development, farmer welfare, and national food security [5], [7], [20].

The methodological framework consists of four main components. The first subsection describes the research design adopted in this study. The second subsection explains the official data source and the characteristics of the statistical publication used in the analysis [1]. The third subsection presents the variables and units of analysis representing livestock production, economic performance, and farmer welfare [3], [4]. Finally, the fourth subsection describes the descriptive statistical methods employed to analyze and interpret the official data [2], [19]. Together, these methodological components provide a structured and evidence-based approach for evaluating the performance of Indonesia's livestock subsector and formulating policy-relevant conclusions [5], [20].

2.1 Research Design

This study employed a descriptive quantitative research design based on secondary data analysis. The descriptive quantitative approach was selected because the main objective of the study was to describe and interpret the performance of Indonesia's livestock subsector using official statistical data [1], [2]. This design is appropriate for presenting numerical indicators related to livestock production, farmers' terms of trade, and economic contribution [3], [4]. It also allows the study to provide an objective overview of livestock subsector performance at the national level [8], [14].

The descriptive approach was used to examine the condition of the livestock subsector without manipulating variables or conducting experimental treatments. The study did not aim to test causal relationships, but rather to identify patterns, trends, and relationships among key indicators [2], [19]. These indicators include livestock production, egg production, milk production, livestock GDP, and Livestock Farmers' Terms of Trade [1], [3], [4]. Therefore, the research design supports systematic interpretation of official statistics and national-level livestock performance [1], [8].

Secondary data analysis was considered suitable because the required data had already been collected, processed, and published by official government institutions [1], [2]. The use of official data increases the reliability of the analysis because the indicators are compiled using standardized statistical procedures [1], [19]. This approach also enables the study to analyze national livestock performance without conducting field surveys, interviews, or direct observations. As a result, the research can focus on interpreting existing data to generate evidence-based insights [5], [20].

The research design allows the study to integrate several dimensions of livestock subsector performance. Production indicators were used to evaluate the physical output of the subsector, while NTPT was used to assess farmer welfare conditions [1], [3]. In addition, GDP indicators were used to measure the economic contribution of livestock activities to the agricultural sector and the national economy [4], [10]. Combining these indicators provides a more comprehensive understanding of the livestock subsector than analyzing production data alone [7], [15].

Overall, the descriptive quantitative design provides a systematic framework for evaluating Indonesia's livestock subsector based on national statistical evidence [1], [2]. This approach enables the study to identify positive developments, potential challenges, and policy-relevant issues related to livestock production, farmer welfare, and economic performance [5], [20]. The findings generated from this design are expected to support more informed decision-making in livestock development policy [12], [15]. Therefore, the research design is consistent with the objective of producing an evidence-based assessment of Indonesia's livestock subsector [1], [19].



2.2 Data Source

The data used in this study were obtained from *Livestock and Animal Health Statistics 2025*, published by the Directorate General of Livestock and Animal Health Services, Ministry of Agriculture of the Republic of Indonesia [1]. This publication serves as an official national reference for statistical information related to the livestock and animal health subsector [1]. It provides comprehensive data that can be used to evaluate livestock development from production, economic, welfare, and institutional perspectives [1], [2]. Therefore, the publication was considered appropriate as the main data source for this study.

The publication contains various indicators related to Indonesia's livestock subsector. These indicators include livestock Gross Domestic Product (GDP), Gross Regional Domestic Product (GRDP), investment, producer and consumer prices, farmers' terms of trade, export-import data, labor, consumption, livestock population, slaughtering, production, livestock households, and livestock parameters [1]. Such wide coverage allows researchers to examine the livestock subsector from multiple dimensions [8], [14]. In this study, the analysis focused specifically on indicators related to production performance, farmer welfare, and economic contribution [3], [4].

The production data analyzed in this study included meat, egg, and milk production. Meat production was used to represent the output of large livestock, small livestock, poultry, and other livestock commodities [1]. Egg production was included because it is one of the most important animal protein sources in Indonesia and contributes significantly to household food consumption [6], [7]. Milk production was also analyzed because it reflects the performance of dairy livestock and supports animal-based food diversification [8], [9].

Farmer welfare was examined using the Livestock Farmers' Terms of Trade or *Nilai Tukar Petani Peternakan* (NTPT). NTPT data were used because they provide information on the relationship between the prices received by livestock farmers and the prices paid by farmers [3]. This indicator helps assess whether livestock farmers experience favorable or unfavorable exchange conditions [3], [19]. Therefore, NTPT was included as an important welfare indicator in the analysis [3], [12].

Economic performance was evaluated using livestock GDP data. GDP data were used to measure the contribution of the livestock subsector to the agricultural sector and the broader national economy [4], [10]. By combining livestock production, NTPT, and GDP indicators, this study provides a more integrated assessment of Indonesia's livestock subsector [1], [3], [4]. This combination of data enables the analysis to go beyond production performance and include farmer welfare and economic contribution as key dimensions of livestock development [5], [20].

2.3 Variables and Units of Analysis

This study analyzed five principal variables representing the performance of Indonesia's livestock subsector, namely livestock Gross Domestic Product (GDP), livestock production, egg production, milk production, and Livestock Farmers' Terms of Trade (NTPT) [1], [3], [4]. These variables were selected because they represent three fundamental dimensions of livestock development: economic contribution, production performance, and farmer welfare [5], [20]. Collectively, these indicators provide a comprehensive overview of the condition of the livestock subsector at the national level [8], [14]. The selection of these variables also reflects the multidimensional nature of livestock development, which extends beyond production to include economic and social aspects [12], [15]. Therefore, the combination of these indicators provides a more integrated framework for evaluating livestock sector performance.

Livestock Gross Domestic Product (GDP) was used to measure the economic contribution of the livestock subsector to Indonesia's agricultural economy [4]. GDP data were expressed in trillion rupiah at both current and constant prices, enabling the evaluation of the subsector's economic



performance and growth over time [4], [10]. In addition, the contribution of livestock GDP to the agricultural sector was considered an important indicator for assessing the strategic role of livestock in national economic development [2], [11]. Higher GDP values indicate greater economic output generated by livestock-related activities. Consequently, livestock GDP serves as an important macroeconomic indicator for evaluating the significance of the livestock subsector within the broader agricultural economy [10], [15].

Production variables consisted of meat production, egg production, and milk production. Meat production represents the total output of beef, buffalo, goat, sheep, poultry, and other livestock commodities and was measured in thousand or million tons depending on the commodity category [1]. Egg production reflects the output of laying hens, ducks, and other poultry commodities, while milk production represents the total production of fresh milk generated by dairy livestock [1]. These production indicators were used to evaluate the capacity of Indonesia's livestock subsector to supply animal-based food and support national food security [6], [7]. Together, they provide a quantitative measure of the physical performance of the livestock production system [8], [14].

Farmer welfare was evaluated using the Livestock Farmers' Terms of Trade (NTPT), which was measured as an index [3]. NTPT compares the price index received by livestock farmers with the price index paid by farmers, providing an indication of the relative purchasing power and economic condition of livestock producers [3]. An NTPT value above 100 indicates that the prices received by farmers exceed the prices they pay for production inputs and household needs, whereas values below 100 indicate less favorable economic conditions [3]. Therefore, NTPT serves as an important socioeconomic indicator for assessing the welfare of livestock farmers and the sustainability of livestock farming activities [12], [19].

The unit of analysis in this study was Indonesia's national livestock subsector rather than individual farms or administrative regions. Each variable was analyzed at the national level using official statistical data published by the Directorate General of Livestock and Animal Health Services [1]. The analysis focused on describing the relationships among production performance, farmer welfare, and economic contribution without examining individual household behavior [2], [19]. This national-level approach allows for a comprehensive assessment of the overall condition of Indonesia's livestock subsector using standardized indicators [1], [8]. Consequently, the selected variables and units of analysis provide an appropriate basis for evaluating livestock development and formulating evidence-based policy recommendations [5], [20].

2.4 Data Analysis Method

The data were analyzed using descriptive statistical analysis to describe the performance of Indonesia's livestock subsector based on official national statistics [1], [2]. This method was selected because the study aimed to interpret numerical indicators related to livestock production, farmer welfare, and economic contribution rather than to test causal relationships [2], [19]. Descriptive analysis enables the systematic presentation of key indicators such as GDP, production volume, egg production, milk production, and NTPT [1], [3], [4]. The results were presented in tables and interpreted to provide a clear overview of the current condition of Indonesia's livestock subsector [8], [14].

Production indicators were used to evaluate the physical output performance of the livestock subsector. Meat production was analyzed to describe the contribution of large livestock, small livestock, poultry, and other livestock commodities to national animal-based food availability [1]. Egg and milk production were also examined because both commodities play an important role in supporting household nutrition and food diversification [6], [7]. These indicators were interpreted to



assess the extent to which livestock production contributes to national food security [7], [9].

Economic performance was evaluated using livestock Gross Domestic Product (GDP) indicators. GDP at constant prices was used to examine real economic growth, while GDP at current prices was used to describe the economic value generated by the livestock subsector [4]. The contribution of livestock GDP to agricultural GDP was also analyzed to assess the strategic position of livestock within the agricultural economy [2], [10]. This analysis provides information on whether the livestock subsector contributes only to food production or also to broader economic development [11], [15].

Livestock Farmers' Terms of Trade (NTPT) was used to interpret the relative welfare condition of livestock farmers [3]. An NTPT value above 100 was interpreted as a favorable condition because the price index received by farmers was higher than the price index paid by farmers [3]. Conversely, an NTPT value below 100 would indicate a less favorable exchange position for livestock farmers [3], [19]. The results of the production, GDP, and NTPT analyses were then discussed in relation to livestock development, farmer welfare, agricultural economic performance, and national food security policy [5], [7], [20].

3. Results

This section presents the results of the descriptive statistical analysis of Indonesia's livestock subsector based on official data published in *Livestock and Animal Health Statistics 2025* [1]. The analysis focuses on evaluating three major dimensions of livestock development, namely economic performance, production performance, and farmers' welfare [1], [3], [4]. These dimensions are represented by livestock Gross Domestic Product (GDP), livestock production, egg and milk production, and the Livestock Farmers' Terms of Trade (NTPT) [1], [3], [4]. By examining these indicators simultaneously, the study provides a comprehensive overview of the current condition of Indonesia's livestock subsector and its contribution to agricultural development and national food security [5], [7], [20]. The findings also provide empirical evidence for understanding the relationships among production growth, economic contribution, and farmer welfare within the livestock sector [10], [15].

The presentation of the results is organized into four main subsections. The first subsection discusses the economic performance of the livestock subsector through the analysis of livestock GDP and its contribution to the agricultural economy [4]. The second subsection presents the performance of livestock production, including meat, egg, and milk production as indicators of animal-based food supply [1], [6], [8]. The third subsection examines the Livestock Farmers' Terms of Trade (NTPT) as an indicator of farmer welfare [3], [12]. Finally, the fourth subsection integrates these findings by discussing the relationship between production performance, farmer welfare, and the economic contribution of the livestock subsector [4], [15]. Together, these results provide a comprehensive basis for evaluating the current performance of Indonesia's livestock subsector and formulating policy recommendations for sustainable livestock development [5], [17], [20].

3.1 Economic Performance of the Livestock Subsector

Indonesia's livestock subsector showed positive economic performance in 2024 [1], [4]. Livestock GDP at constant prices reached IDR 189.8 trillion, increasing by 2.78% compared with 2023 [1]. At current prices, livestock GDP reached IDR 349.8 trillion in 2024 [1]. The livestock subsector contributed 16.60% to agricultural GDP in the narrow sense, indicating its important position within Indonesia's agricultural economy [1], [4]. These figures show that livestock remains one of the key subsectors supporting agricultural growth, food system development, rural economic activity, and national economic resilience in Indonesia [5], [10], [11].



Table 1. Economic performance of Indonesia's livestock subsector

Indicator	Value	Year
Livestock GDP at constant prices	IDR 189.8 trillion	2024
Growth of livestock GDP	2.78%	2024
Livestock GDP at current prices	IDR 349.8 trillion	2024
Contribution to agricultural GDP	16.60%	2024

3.2 Livestock Production Performance

Livestock production increased across several major commodity groups in 2025 [1]. Total production of carcass, offal, and variety meat from large and small livestock reached 910.37 thousand tons, increasing by 4.36% compared with 2024 [1]. Meat production from poultry and other livestock reached 4.56 million tons, increasing by 3.71%, while egg production reached 6.91 million tons and milk production reached 820.87 thousand tons [1]. These production increases indicate that Indonesia's livestock subsector continued to expand its contribution to the availability of animal-based food and to strengthening national food security [6], [7], [8]. The positive growth across multiple commodity groups also reflects the importance of livestock production in supporting nutritional improvement and agricultural economic development [5], [10].

Table 2. Livestock production indicators in Indonesia

Commodity Group	Production	Growth
Large and small livestock meat	910.37 thousand tons	4.36%
Poultry and other livestock meat	4.56 million tons	3.71%
Egg production	6.91 million tons	2.81%
Milk production	820.87 thousand tons	1.46%

3.3 Livestock Farmers' Terms of Trade

The average Livestock Farmers' Terms of Trade (NTPT) in 2024 reached 102.48, indicating that livestock farmers maintained a relatively favorable economic position [1], [3]. This value indicates that the price index received by livestock farmers was higher than the price index paid by farmers [3]. The average price index received by farmers reached 122.91, whereas the average price index paid by farmers was 119.94 [1], [3]. Compared with 2023, NTPT increased by 0.66%, suggesting a modest improvement in the purchasing power and exchange conditions of livestock farmers [1], [3]. These findings indicate that although livestock farmers experienced positive economic conditions, maintaining sustainable farmer welfare still requires continuous policy support and improvements in production efficiency [12], [15], [19].

Table 3. Livestock farmers' terms of trade indicators

Indicator	Value	Interpretation
NTPT	102.48	Above 100
Price index received by farmers	122.91	Increased by 3.67%
Price index paid by farmers	119.94	Increased by 3.00%
NTPT growth	0.66%	Improved from 2023

3.4 Linkage between Production, Welfare, and Economic Performance

The results show that livestock production, farmer welfare, and economic performance moved in a generally positive direction during the study period [1]. Increased production of meat, eggs, and milk indicates improved physical output in the livestock subsector and demonstrates its growing contribution to national food availability [1], [6], [7]. This condition suggests that the



livestock subsector continued to strengthen its role in supporting domestic demand for animal-based food while contributing to agricultural development [5], [8]. Higher production also reflects the capacity of the subsector to respond to increasing food demand and national development priorities [10], [18]. Therefore, production growth remains an important foundation for strengthening Indonesia's livestock sector and improving national food security [6], [20].

At the same time, the NTPT value above 100 suggests that livestock farmers maintained a relatively favorable economic position [1], [3]. This means that the price index received by livestock farmers was higher than the price index paid by farmers, indicating positive exchange conditions during the observed period [3]. However, the level of improvement should be interpreted carefully because farmer welfare may still be affected by input costs, feed prices, market access, production risks, and price volatility [12], [15]. Consequently, NTPT provides an important but not complete picture of livestock farmer welfare because it does not directly measure farm profitability or household income [3], [19]. Additional policy interventions are therefore required to ensure sustained improvements in farmer welfare and production efficiency [5], [17].

The increase in livestock GDP further confirms that the subsector contributed positively to Indonesia's agricultural economic performance [1], [4]. Livestock GDP reflects the economic value generated from livestock-related activities, including production, processing, marketing, and supporting services [4], [10]. When livestock GDP increases alongside production growth, it indicates that the subsector contributes not only to food supply but also to employment creation, value addition, and broader economic development [11], [18]. These findings demonstrate that livestock has a dual function as both a food-producing subsector and an important driver of agricultural economic growth [5], [10]. Consequently, livestock development should continue to be regarded as a strategic component of Indonesia's agricultural transformation agenda [17], [20].

Nevertheless, the positive movement of production, NTPT, and GDP does not automatically indicate that all livestock development challenges have been resolved. Production growth may not always be evenly distributed across regions, livestock commodities, or production systems [1]. Likewise, a favorable NTPT at the national level may conceal disparities in farmer welfare among provinces and between commercial and smallholder livestock producers [3], [15]. Economic growth within the livestock subsector may also be concentrated in downstream industries rather than being fully transmitted to primary producers [12], [18]. Therefore, a balanced interpretation is required when assessing the relationships among production performance, farmer welfare, and economic contribution.

Overall, the linkage among livestock production, farmer welfare, and economic performance highlights the importance of integrated livestock development policies [5], [20]. Continued policy support is needed to ensure that production growth translates into stronger farmer welfare and more balanced regional livestock development [17], [20]. Such policies should include productivity improvement, feed availability, animal health services, market access, price stabilization, farmer capacity building, and livestock value chain strengthening [5], [12], [18]. By aligning production, welfare, and economic objectives, Indonesia can develop a more inclusive, competitive, and sustainable livestock subsector [11], [17]. This integrated approach is essential for strengthening national food security, improving rural livelihoods, and enhancing long-term agricultural economic resilience [6], [7], [20].

4. Discussion

The findings indicate that Indonesia's livestock subsector plays a dual role in supporting both food availability and agricultural economic growth [1], [6], [7]. The increase in meat, egg, and milk production demonstrates that the subsector contributes directly to the supply of animal-based food



[1]. This is important because animal protein is essential for improving nutrition quality, reducing malnutrition, and supporting national food security [6], [7], [8]. The livestock subsector also supports rural livelihoods through employment creation and value-added economic activities along the livestock value chain [5], [18]. Therefore, livestock development should remain a strategic priority in Indonesia's agricultural policy and long-term food security strategy [5], [17], [20].

The positive growth of livestock GDP also indicates that the subsector contributes meaningfully to the national economy [1], [4]. Livestock GDP at current prices reached IDR 349.8 trillion in 2024 and contributed 16.60% to agricultural GDP in the narrow sense [1], [4]. This contribution shows that livestock is not only a food-producing subsector but also an important economic sector that generates employment, value addition, and rural income [10], [11]. Strengthening livestock value chains, processing industries, market access, and downstream agribusiness could further increase its economic contribution and competitiveness [5], [15], [18]. Consequently, livestock development should be viewed as an integral component of Indonesia's agricultural transformation and economic development agenda [11], [17].

The NTPT value of 102.48 suggests that livestock farmers had a relatively favorable exchange position in 2024 [1], [3]. Since the price index received by farmers was higher than the price index paid by farmers, livestock farming conditions were generally positive [3]. However, the increase was relatively modest, indicating that farmer welfare remains sensitive to production costs, feed prices, inflation, and market price fluctuations [3], [12], [19]. Sustainable improvements in farmer welfare therefore require not only higher output but also greater production efficiency, improved input availability, and stronger market institutions [5], [12]. Accordingly, policies aimed at reducing production costs, improving feed availability, strengthening veterinary services, and stabilizing livestock prices remain essential for improving farmer welfare [5], [18], [20].

The relationship between production growth and farmer welfare should be interpreted carefully [12], [15]. Higher production does not automatically guarantee higher farmer income if input costs, distribution constraints, transaction costs, or market inefficiencies remain high [10], [12]. Likewise, increases in production may not be fully transmitted into better household welfare when marketing channels are inefficient or bargaining power remains weak [15], [18]. Therefore, livestock development policies should not focus solely on increasing production output but should also improve value chain efficiency, strengthen farmer organizations, expand market access, and enhance farm profitability [5], [17], [20]. Such integrated interventions are expected to generate more inclusive and sustainable livestock development outcomes.

Overall, the study shows that integrating production, NTPT, and GDP indicators provides a more comprehensive understanding of livestock subsector performance [1], [3], [4]. Production indicators describe food supply capacity, NTPT reflects farmer welfare, and GDP measures the economic contribution of livestock activities [3], [4]. Together, these indicators provide useful evidence for designing balanced livestock development policies that simultaneously improve productivity, farmer welfare, and economic performance [5], [15], [20]. Future policy should therefore integrate productivity improvement, farmer welfare protection, technological innovation, value chain strengthening, and livestock-based economic development [5], [17], [18]. Such an integrated policy framework is essential for achieving sustainable livestock development and strengthening Indonesia's long-term food security [6], [7], [20].

5. Conclusion

This study analyzed livestock production, farmers' terms of trade, and the economic performance of Indonesia's livestock subsector using official national statistics [1], [2]. The findings show that livestock Gross Domestic Product (GDP) reached IDR 189.8 trillion at constant prices in



2024, representing an increase of 2.78% compared with 2023 [1], [4]. At current prices, livestock GDP reached IDR 349.8 trillion and contributed 16.60% to agricultural GDP in the narrow sense [1], [4]. These results demonstrate that the livestock subsector continues to play a significant role in supporting Indonesia's agricultural economy and generating economic value [10], [11]. Overall, the economic indicators confirm that livestock remains one of the strategic subsectors contributing to national development and agricultural transformation [5], [17].

Livestock production also demonstrated positive performance during the study period [1]. In 2025, total meat production from large and small livestock reached 910.37 thousand tons, while poultry and other livestock meat production reached 4.56 million tons [1]. Egg production increased to 6.91 million tons, whereas milk production reached 820.87 thousand tons [1]. These production indicators reflect the important contribution of the livestock subsector in providing animal-based food and supporting national food security [6], [7], [8]. The continuous improvement in livestock production also indicates the subsector's capacity to respond to the growing demand for animal protein in Indonesia while supporting sustainable agricultural development [9], [18].

The Livestock Farmers' Terms of Trade (NTPT) value of 102.48 in 2024 indicates that livestock farmers maintained a relatively favorable exchange position because the prices they received were higher than the prices they paid [1], [3]. Nevertheless, the improvement in NTPT was relatively modest, suggesting that farmer welfare remains vulnerable to fluctuations in production costs, feed prices, and market conditions [3], [12]. Improving livestock productivity alone may not be sufficient to enhance farmer welfare if marketing systems and value chain efficiency remain weak [12], [15]. Therefore, policies aimed at stabilizing livestock prices, improving feed availability, strengthening farmer institutions, and expanding market access should continue to receive priority attention [5], [18], [20]. Such measures are essential to ensure that improvements in production are accompanied by sustainable improvements in farmer income and economic resilience [12], [17].

Overall, Indonesia's livestock subsector demonstrated positive production, welfare, and economic performance during the observed period [1], [4]. However, future livestock development should not focus solely on increasing production volumes but should also strengthen the relationship between production growth, farmer welfare, and economic value creation [5], [15]. Integrated development strategies that combine productivity improvement, value chain strengthening, farmer empowerment, technological innovation, and market development are required to achieve sustainable livestock development [5], [17], [18]. Continuous monitoring using official national statistics is also necessary to evaluate policy effectiveness and identify emerging challenges within the livestock subsector [1], [2], [19]. Through these integrated efforts, Indonesia can strengthen the resilience, competitiveness, and sustainability of its livestock subsector while supporting long-term food security and inclusive agricultural economic growth [6], [7], [20].

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