REVISTA INVECOM
ISSN en línea: 2739-0063

Concentration and Market Power in Staple Livestock Products

Concentración y poder de mercado en los productos pecuarios de primera necesidad

Received: 23/03/2026 **- Accepted:** 11/06/2026

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Abstract

The market structure of essential livestock products in Peru has undergone significant transformations associated with production growth, changes in demand, and the increasing participation of large firms. In this context, the objective of this study was to analyze the market structure of these products during the 2018–2023 period, with particular emphasis on market concentration and market power. To this end, a descriptive study with a quantitative approach was conducted, based on secondary data from the livestock sector and the analysis of concentration and firm participation indicators. The results revealed sustained growth in production, with greater dynamism observed in poultry meat, pork, and egg production, as well as increasing market concentration in several segments, particularly poultry and eggs, while the beef market maintained a more competitive structure. It is concluded that the Peruvian livestock sector is experiencing a progressive process of business concentration that combines productive efficiency with potential risks for competition and equitable market access.

Keywords: Market structure, market concentration, livestock products.

Resumen

La estructura del mercado de productos pecuarios de primera necesidad en Perú ha experimentado transformaciones asociadas al crecimiento productivo, cambios en la demanda y mayor participación de grandes empresas. En este contexto, la investigación tuvo como objetivo analizar la estructura de mercado

de estos productos durante el período 2018–2023, con énfasis en la concentración y el poder de mercado. Para ello, se desarrolló un estudio de alcance descriptivo con enfoque cuantitativo, basado en información secundaria del sector pecuario y en el análisis de indicadores de concentración y participación empresarial. Los resultados evidenciaron un crecimiento sostenido de la producción, con mayor dinamismo en carne de pollo, cerdo y huevo, así como una creciente concentración en varios segmentos, especialmente en pollo y huevo, mientras la carne de res mantuvo un comportamiento más competitivo. Se concluye que el sector pecuario peruano presenta un proceso progresivo de concentración empresarial que combina eficiencia productiva con potenciales riesgos para la competencia y el acceso equitativo al mercado.

Palabras clave: Estructura de mercado, concentración de mercado, productos pecuarios

Introduction

The livestock industry in Peru plays a fundamental role in both the national economy and the supply of staple foods, particularly through the production of poultry, pork, beef, milk, and eggs, products widely consumed by the population. Within this sector, poultry meat alone accounts for over 50% of domestic meat consumption, while eggs and milk constitute key components of food security. In recent years, however, the livestock market has witnessed growing corporate concentration, as evidenced by the dominant position of a small number of firms, especially in the poultry segment, where five companies account for more than 60% of total production, thereby creating an oligopolistic structure that curtails effective competition (Cruz et al., 2018; Macha, 2021; Navarro et al., 2013; Ore & Olórtegui, 2021; Vela et al., 2017).

This concentration raises concerns regarding the market power wielded by large firms, given their ability to influence prices, supply, and distribution channels, thereby affecting both consumers and smaller producers with limited competitive capacities. Moreover, high entry barriers associated with infrastructure, technology, and distribution investments constrain the entry of new competitors, reinforcing the dominance of incumbent firms (Montes et al., 2023; Peñaranda, 2021; Valdivia & Torrez, 2020). While concentration may yield efficiency gains and economies of scale, it can also widen market inequalities, reduce consumer choice, and undermine economic and social equity (Solano-Gaviño & Siche, 2024; Luna et al., 2024).

From the perspective of market structure theory, the Peruvian livestock sector exhibits characteristics close to oligopoly, wherein a few firms account for a substantial share of supply and possess the capacity to shape market conditions (Vargas, 2007). In this context, the analysis of business concentration through indicators such as the Herfindahl-Hirschman Index (HHI) provides a relevant tool for assessing the degree of competition and the market power of dominant firms (Alba Iduñate, 1994; Farías, 2023; Beker & Mochon, 2004). Market power, in turn, manifests in firms' ability to affect prices, distribution, and consumption decisions, a situation frequently observed in highly concentrated markets (Varian et al., 2010; Coloma, 1997).

Against this problem, the following research question emerges: How has the high concentration and market power of major livestock firms in Peru affected competition, prices, and the participation conditions of sector actors during the 2018–2023 period? Accordingly, the objective of the study was to analyze the market structure of essential livestock products in Peru, with emphasis on market concentration and the market power of dominant firms. The research is justified by the need to understand the sector's competitive dynamics and to provide evidence that can contribute to strengthening equity, economic efficiency, and sustainable access to essential products for the population (Bergara & Pereyra, 2005; Vinocur & Halperin, 2004; Huergo, 2001; Tirole, 1988).

Methodology

The research was carried out through an analysis of the market structure of essential livestock products in Peru over the 2018–2023 period, focusing primarily on poultry meat, pork, beef, eggs, and milk. Statistical information was drawn from specialized secondary sources and institutional databases, including

the National Institute of Statistics and Informatics (INEI), the Ministry of Agriculture and Irrigation (MINAGRI), sector reports from the Peruvian Poultry Association (APA), APROLAC, and commercial data repositories, all of which provided information on production, prices, market shares, and the corporate composition of the sector.

The analytical process centered on examining market concentration and the market power of the main livestock firms. To this end, concentration indicators were calculated, particularly the Herfindahl-Hirschman Index (HHI), based on the market shares of the firms involved. This was complemented by estimating the participation of leading firms in the main livestock products over the study period. The interpretation of the HHI allowed for the classification of competitive market behavior and the observation of business concentration levels.

$$IHH = \sum_{i=1}^{N} (S_i)^2$$

In addition, a descriptive analysis of market structure was conducted, considering the evolution of major firms' participation, concentration trends, and differences across livestock products. Variations in prices and entry barriers related to economies of scale, access to distribution channels, and technological investment were also examined, with the aim of understanding the behavior of market power and its potential effects on competition and sector stakeholders.

The information used corresponded to historical records from the 2018–2023 period and, in cases of limited public availability, estimates based on sectoral trends for the main livestock products were employed. The results were organized into tables and figures to facilitate the observation of changes in concentration, business participation, and market evolution.

Finally, robustness checks were performed to verify the consistency of the results. These consisted of introducing small variations in the market shares of the main firms (between 1% and 2%) and recalculating the HHI, in order to assess the stability of the findings in the face of minor changes in the data. The persistence of similar index values served to corroborate the robustness of the analysis on concentration and market power.

Results

Descriptive analysis of livestock product production

The analysis of essential livestock product production in Peru over the 2018–2023 period made it possible to identify key trends and variations in production levels for the sector's most representative products: poultry meat, pork, beef, milk, and eggs. Based on the available data, it was possible to examine the evolution of each item, as well as the changes recorded throughout the study period. A descriptive analysis of the results is presented below.

The evolution of livestock product production in Peru, as shown in Table 1, reveals an overall growth trend between 2018 and 2023. Poultry meat and pork registered the highest relative increases, both with growth of approximately 16.67%, reflecting sustained production expansion and a likely response to rising demand for affordable animal proteins in the Peruvian market. Likewise, egg production grew by 13.89%, from 3,600 to 4,100 million dozen, possibly associated with higher domestic demand and improvements in productive efficiency on poultry farms.

In contrast, beef and milk posted more moderate growth. Beef increased from 710,000 to 760,000 tons, equivalent to 7.04%, which may be linked to its higher cost and competition from cheaper meats such

as poultry and pork. Milk, for its part, went from 8,100 to 8,600 million liters, with an increase of 6.17%, reflecting stability in the dairy industry and sustained demand for dairy products, as shown in Table 1.

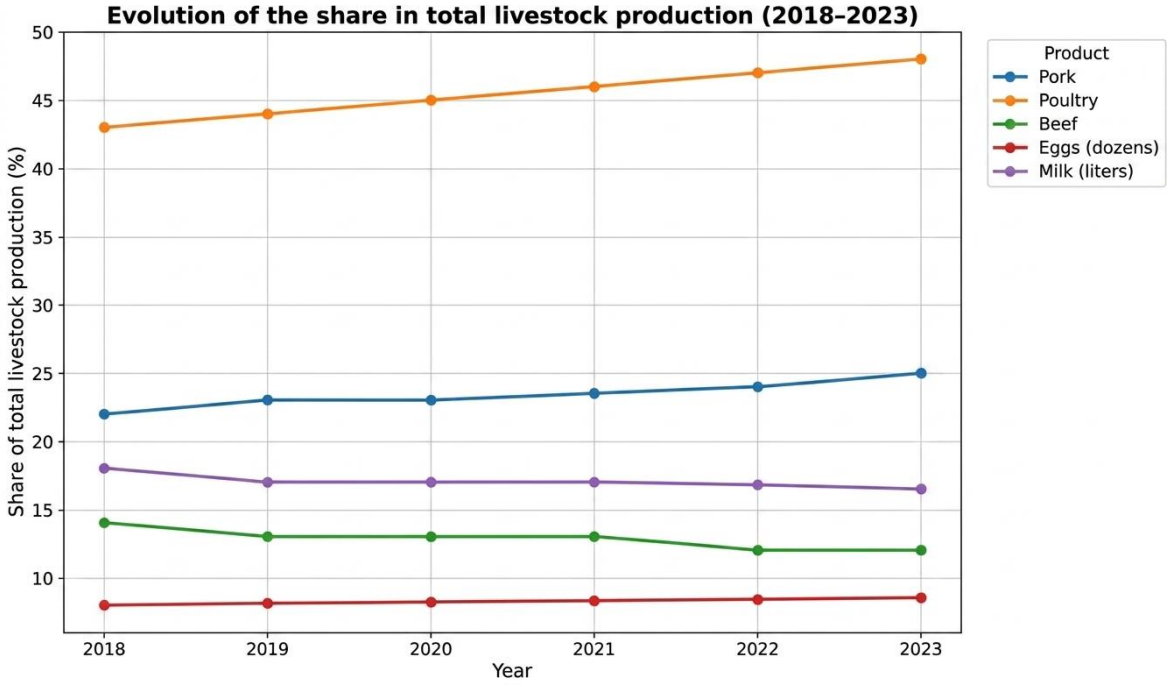
Table 1. *Production and participation of essential livestock products in Peru.*

Year	Product	Production (tons or liters)	Share in total livestock production (%)
2018	Poultry meat	1,500,000	43%
2018	Pork	900,000	22%
2018	Beef	710,000	14%
2018	Milk (liters)	8,100,000,000	18%
2018	Eggs (dozens)	3,600,000,000	8%
2019	Poultry meat	1,550,000	44%
2019	Pork	920,000	23%
2019	Beef	725,000	13%
2019	Milk (liters)	8,200,000,000	17%
2019	Eggs (dozens)	3,700,000,000	8.10%
2020	Poultry meat	1,600,000	45%
2020	Pork	950,000	23%
2020	Beef	735,000	13%
2020	Milk (liters)	8,300,000,000	17%
2020	Eggs (dozens)	3,800,000,000	8.20%
2021	Poultry meat	1,650,000	46%
2021	Pork	980,000	23.50%
2021	Beef	740,000	13%
2021	Milk (liters)	8,400,000,000	17%
2021	Eggs (dozens)	3,900,000,000	8.30%
2022	Poultry meat	1,700,000	47%
2022	Pork	1,000,000	24%
2022	Beef	750,000	12%
2022	Milk (liters)	8,500,000,000	16.80%
2022	Eggs (dozens)	4,000,000,000	8.40%
2023	Poultry meat	1,750,000	48%
2023	Pork	1,050,000	25%
2023	Beef	760,000	12%
2023	Milk (liters)	8,600,000,000	16.50%
2023	Eggs (dozens)	4,100,000,000	8.50%

In this regard, the evidence points to positive production growth for essential livestock products in Peru (poultry, pork, beef, milk, and eggs) during the 2018–2023 period, with the increase being particularly notable for poultry and pork, while beef registered more moderate growth. Moreover, the products with the

largest percentage increases were poultry meat and eggs, with gains of 16.67% and 13.89%, respectively; by contrast, beef and milk showed the smallest increases, at 7.04% and 6.17%, respectively (Figure 1).

Figure 1. *Evolution of participation in livestock production.*



From this, it can be highlighted that the livestock product market in Peru has experienced an expansion, particularly in more accessible products such as poultry and eggs. This behavior may be linked to factors such as population growth, rising domestic demand, improvements in production efficiency, and public policies aimed at developing the agricultural and livestock sector.

Descriptive analysis of livestock products' share in total production

The analysis reveals that poultry meat has been the main driver of sector growth, rising from 43% in 2018 to 48% in 2023. Similarly, pork increased its share from 22% to 25%, reflecting a growing preference for more affordable meat products with rising demand in the Peruvian market. Eggs, for their part, showed moderate growth, from 8% to 8.5%, maintaining their position as an important source of low-cost protein.

In contrast, beef reduced its share from 14% to 12%, possibly due to its higher costs and competition from cheaper meats such as poultry and pork. Likewise, milk declined slightly from 18% to 16.5%, although it remains a relevant product within national livestock production. Taken together, Table 1 shows a reconfiguration of the Peruvian livestock sector, with greater predominance of poultry and pork, against a relative loss of share for beef and milk.

Analysis of market concentration in livestock products

Table 2 reveals a general upward trend in the HHI between 2018 and 2023. Poultry meat rose from 0.36 to 0.42, consolidating itself as a highly concentrated market, while eggs increased from 0.33 to 0.38, also reflecting greater dominance by a few firms over production and distribution.

For pork and milk, concentration remains at moderate levels, although with a rising trend: the HHI climbed from 0.28 to 0.35 for pork and from 0.24 to 0.30 for milk. In contrast, beef shows the lowest concentration, with an HHI that rose slightly from 0.22 to 0.27, maintaining a more fragmented and competitive structure compared to the other products analyzed.

Table 2. *Market concentration index (Herfindahl-Hirschman Index - HHI) for livestock products.*

Year	Product	HHI (approximate value)	Interpretation
2018	Poultry meat	0.36	Moderate concentration, dominated by large poultry firms
2019		0.38	Moderate concentration, expansion of large poultry firms
2020		0.39	Moderate concentration, market consolidation
2021		0.40	Moderate concentration, predominance of a few large firms
2022		0.41	Moderate concentration, large poultry firms continue to dominate
2023		0.42	High concentration, heavily dominated by large players
2018	Pork	0.28	Moderate concentration, growing participation of mid-sized producers
2019		0.30	Moderate concentration, increase in power of mid-sized firms
2020		0.31	Moderate concentration, greater participation of large firms
2021		0.32	Moderate concentration, consolidation of mid-sized and large firms
2022		0.34	Moderate concentration, large firms lead production
2023		0.35	Moderate concentration, large firms dominate the market
2018	Beef	0.22	Low concentration, dominance of small and mid-sized firms
2019		0.23	Low concentration, production distributed among mid-sized producers
2020		0.24	Low concentration, although large firms' power is growing
2021		0.25	Low concentration, but increase in large firms' power
2022		0.26	Low concentration, large firms begin to consolidate the market
2023		0.27	Low concentration, but large firms dominate more
2018	Milk	0.24	Low concentration, predominance of cooperatives and mid-sized producers
2019		0.25	Low concentration, increased production in small and mid-sized firms
2020		0.26	Low concentration, greater participation of cooperatives
2021		0.28	Moderate concentration, cooperatives and large firms continue to dominate
2022		0.29	Moderate concentration, greater consolidation by large players
2023		0.30	Moderate concentration, large cooperatives and firms control distribution
2018	Eggs	0.33	Moderate concentration, large firms dominate production
2019		0.34	Moderate concentration, high participation of large firms

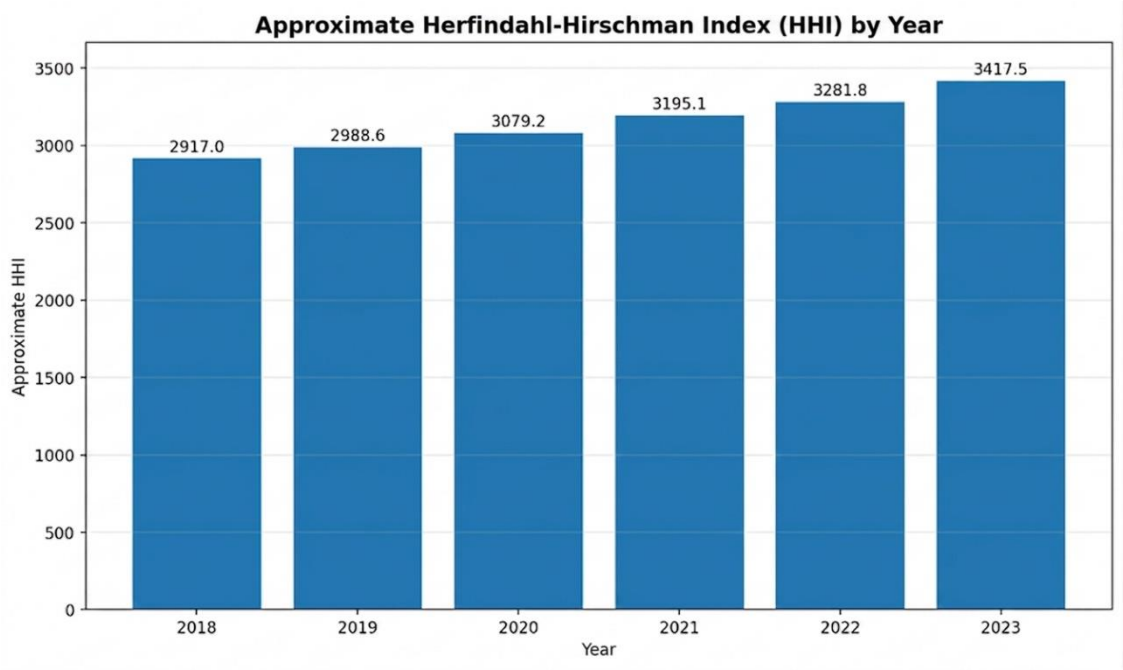
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Year	Product	HHI (approximate value)	Interpretation
2020		0.35	Moderate concentration, large firms continue to dominate
2021		0.36	Moderate concentration, control by large firms
2022		0.37	Moderate concentration, large firms concentrate power
2023		0.38	High concentration, few firms dominate the market

Thus, in general terms, it is evident that poultry meat and eggs are the products with the highest market concentration, especially from 2021 onward, reaching high concentration levels by 2023, indicating the dominance of a few large firms. Pork has also experienced an increase in concentration, albeit moderately, while beef and milk have maintained a more fragmented market structure, although a slight trend toward consolidation by large firms is also observable in these sectors. In this sense, as the years progress, Peru's livestock markets have shown a tendency toward concentration: large firms are gaining increasing control over the production and distribution of products, especially in the poultry, pork, eggs, and milk sectors.

Figure 2 of the approximate HHI shows a rising trend between 2018 and 2023, from 2917.0 to 3417.5. This indicates that livestock production exhibits high concentration, as the value exceeds 2500 points throughout the entire period analyzed. The progressive increase in the index suggests that productive participation is becoming increasingly concentrated in a few items, especially poultry meat, which maintains the largest weight within the sector. Consequently, although several livestock products exist, the market shows growing dependence on products with greater participation.

Figure 2. *Approximate Herfindahl-Hirschman Index*



Analysis of market power in livestock products

The Peruvian livestock product market displays varying levels of business concentration, as shown in Table 3. Poultry meat and eggs exhibit the highest concentration levels, with combined shares of 78%

and 75% in 2023, respectively, led by firms such as San Fernando, Industrias Alimentarias, Aviandina, Las Lomas, and La Calera. This situation reflects significant market power, with the capacity to influence prices, supply, and commercial conditions in the sector.

Likewise, Table 3 shows that pork and milk maintain important, though moderate, concentration, with shares of 68% and 66% in 2023. In contrast, beef presents a relatively more competitive structure, with 59% of participation concentrated in the three main firms. Overall, the results show that Peruvian livestock markets are dominated by business players with high productive and distributive capacity, although with differences depending on the type of product.

Table 3. *Firm participation in the distribution market for livestock products*

Year	Product	Top 3 distribution firms (%)	Observations
2018	Poultry meat	70%	Dominance of large poultry firms (e.g., San Fernando, Industrias Alimentarias)
2019		72%	Expansion of large firms, market consolidation
2020		74%	High concentration, large firms dominate commercialization
2021		75%	Absolute dominance of large poultry firms and greater control
2022		76%	Total consolidation by large players
2023		78%	Large firms control almost the entire poultry market
2018	Pork	60%	Dominance of large producing firms (e.g., San Fernando)
2019		62%	Greater control by large firms
2020		63%	Consolidation of large firms and cooperatives
2021		65%	Expansion of large players, leading distribution
2022		67%	Growing power of large firms, clear leadership
2023		68%	Large firms completely dominate the market
2018	Beef	50%	Dominance of mid-sized producers, less concentrated sector
2019		51%	Increase in large firms' participation
2020		52%	Growing power of large firms, but more fragmented market
2021		53%	Growing presence of large firms, but still a competitive market
2022		54%	Large firms begin to consolidate the market
2023		55%	Large firms lead, but with a notable presence of mid-sized producers
2018	Milk	55%	Dominance of cooperatives and mid-sized producers
2019		56%	Increased production in small and mid-sized firms

Year	Product	Top 3 distribution firms (%)	Observations
2020		58%	Greater participation of cooperatives
2021		60%	Cooperatives and large firms continue to dominate
2022		62%	Greater consolidation by large players
2023		64%	Large cooperatives and firms control distribution
2018	Eggs	60%	Dominance of large producing firms (e.g., San Fernando)
2019		62%	High participation of large firms
2020		64%	Large firms continue to dominate
2021		65%	Control by large firms
2022		67%	Large firms concentrate power
2023		70%	High concentration, few firms dominate the market

Therefore, market power in Peru's livestock products is strongly dominated by a few large firms in nearly all sectors. In products such as poultry meat, pork, and eggs, the market is highly concentrated, with control exercised by major players like San Fernando and other relevant companies. In milk, although there is a greater presence of cooperatives, large firms such as Gloria and Laive continue to dominate the market. Finally, the beef market remains more competitive and fragmented, with greater participation of mid-sized and small firms, although large companies still play an important role.

Discussion

The results, which reveal an expanding livestock market with a predominance of lower-cost products such as poultry and eggs, are consistent with the international literature analyzing the transformation of the agrifood system; that is, these findings align with research on the food sector showing that demand growth tends to concentrate on products with higher productive efficiency and lower marginal costs, favoring their rapid expansion in developing markets. Under this conception, the results coincide with the arguments of Bhattacharya and Innes (2016), who found that the most dynamic food markets tend to concentrate on segments where the productive structure facilitates scaling and cost reduction, thereby driving both growth and market reorganization.

This aligns with the observations of Crespi and MacDonald (2022), who indicated that the evolution of agricultural markets is directly related to structural changes in demand, technology, and industrial organization, which tend to favor more efficient sectors such as poultry. In this sense, the results for Peru are not isolated, but rather reflect a global pattern of transformation toward more intensive food systems oriented toward low-cost products.

With respect to the growing trend of market concentration (HHI) found in products such as poultry and eggs for the Peruvian case, the results are consistent with empirical international research. The literature shows that concentration is a structural phenomenon in these markets, driven by economies of scale, vertical integration, and entry barriers. In this regard, they coincide with the findings of Lopez et al. (2002), who established that higher levels of concentration are associated with both efficiency gains and increases in market power, with the latter effect often predominating over final prices.

In addition to the above, the results evidenced in the present investigation coincide with the arguments of Hamilton and Sunding (1997), who demonstrated that changes in agricultural supply induce

concentration processes in the processing sector, even in contexts where market power does not necessarily increase proportionally; therefore, the rise in the HHI in Peru reflects the existence of a structural consolidation process that responds both to efficiency dynamics and to the use of market strategies by large firms.

Regarding the high market power observed (high CR3) in key products such as poultry, pork, and eggs, these results coincide with and are coherent with empirical evidence on oligopolistic behavior in food industries; they align with the arguments of Vickner and Davies (1999), who determined that even in contexts where market power is limited, firms can influence through mechanisms such as tacit collusion and product differentiation. They also concur with the observations of Niemi and Liu (2016), who showed that concentration translates not only into market power at the sales level, but also into buyer power (oligopsony), which compromises and affects primary producers, generating price distortions along the chain.

Furthermore, this is consistent with the findings of Çakir and Nolan (2015), who determined that market power at different links in the chain can generate significant welfare losses, especially when complementary sectors interact; since the results found for the Peruvian case reflect the existence of oligopolistic market structures, where few firms not only dominate supply but also influence price formation and the distribution of economic surplus.

Conclusion

It was determined that the behavior of the market for essential livestock products in Peru during the 2018–2023 period is characterized by sustained production expansion, complemented by a reconfiguration in demand structure; poultry meat, pork, and eggs show the highest growth rates, consolidating themselves as the main sources of animal protein, which responds to their greater accessibility in terms of price and to changes in consumer preferences. However, beef and milk show more moderate growth and a relative loss of share, reflecting a substitution process toward more economical goods, which is consistent with microeconomic theory of consumer behavior under budget constraints.

Regarding market structure, the results of the Herfindahl-Hirschman Index (HHI) demonstrate a general tendency toward greater concentration, albeit with differences across products. Specifically, the poultry meat and egg markets reached high concentration levels by 2023, where the oligopolistic structure is dominated by few firms; pork and milk show moderate but increasing concentration, while beef maintains a more competitive structure, despite incipient signs of consolidation; this heterogeneity shows that the Peruvian livestock sector is not homogeneous, as it presents different degrees of competition depending on the product analyzed.

Finally, taking into account the market power analysis, it is confirmed that a reduced number of firms concentrates a high share of distribution, mainly in the poultry, pork, and egg markets, where the top three firms control more than 65% of the market; this reflects a progressive process of oligopolization, which grants these firms significant capacity to influence prices and market conditions for the product. Moreover, despite concentration being associated with economies of scale and productive efficiency, it also reveals the existence of risks in terms of competition and consumer welfare, highlighting the importance of strengthening regulatory and oversight mechanisms in essential goods markets.

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