The EU Meat Market: A Focused Overview of the International Trade Flow Performance

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Abstract

The constantly growing world population, escalating food insecurity levels globally, geopolitical conflicts, increased food price volatility, and emerging environmental exigencies concerning the agricultural sector are shaping the new paradigm that the European Union is transitioning to. However, the path towards resilience, sustainability, and high levels of competitiveness requires a performance assessment that could support policymakers to take informed actions to enhance efficiency. Thus, the objective of this research was to provide empirical evidence and solutions to better navigate the challenges faced by the meat market of the European Union. The literature is complemented by this paper with a novel approach of measuring performance based on import and export flows, as well as trade balance results. Data used in this study were extracted from International Trade Centre's platform, covering the period from 2012 to 2023. Swine, bovine, and poultry were the types of meats analyzed in this paper. They were considered representative, since they collectively accounted for nearly 82% of the European Union's total exports of meat and edible meat offal. The research findings showed that Ireland, the Netherlands, and Poland are leading exporters with significant trade surpluses in bovine and poultry meats, with high specialization and strategic market dominance. On the flip side, Italy's pronounced trade deficits in both bovine and swine meats signal a substantial dependence on imports, calling for policy interventions to enhance self-sufficiency. Spain leads in terms of swine meat market performance, while Italy, Poland and Romania face large trade deficits, underscoring their reliance on imports. This detailed examination across different meat types revealed distinct challenges and opportunities for growth and sustainability.

Keywords

Foreign trade performance, meat, economic competitiveness, agricultural specialization, European Union

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Introduction

Within the ever-changing sphere of global commerce, the EU meat market stands out as an area of considerable societal, economic, environmental, and policy impact. Under the impact of globalization and of the sustainability paradigm (Patarlageanu et al., 2022), the agricultural sector broadens its scope (Potori et al., 2023). The multidimensional nature of livestock or animal production exemplifies these complexities. This sector generates income for the individuals directly engaged, and it also serves as a vital foundation for GDP, covering commercial operations that are significantly influenced by both national and European policy (Santeramo et al., 2019; Guyomard et al., 2021). Nevertheless, animal farming must also confront the obstacles of satisfying consumer demands while simultaneously addressing concerns related to both high economic efficiency and climate change needs (Castillo-Díaz et al., 2023). This delicate equilibrium is especially significant within the framework of the European Green Deal (European Commission, 2019), which establishes ambitious environmental objectives for European Union (EU) member states.

The agri-food sector is facing the demand to innovate and adjust its methods in order to decrease its impact on the environment, while also ensuring its economic sustainability and its role as a crucial food provider for the population (Istudor et al., 2019; Ladaru et al., 2020; Molitorisová and Burke, 2023; Haddad et al., 2024). The global trajectory of animal-based food product consumption has shown a significant increase, with the production of meat experiencing a 204% surge since the 1960s, a phenomenon prominently observed in high-income nations (Basu, 2015; McInnes, Carstairs and Cecil, 2023). EU's agricultural sector, particularly concerning livestock production, is presently undergoing notable transformations as a result of an increasing consumer inclination towards plant-based diets, as stated in a body of literature (Onwezen et al., 2021; Sun et al., 2022; Szenderák, Fróna and Rákos, 2022; Anusha Siddiqui et al., 2023). This trend is also confirmed by a survey entitled "Evolving Appetites: A Comprehensive Examination of European Perspectives on Plant-Based Eating", which was financially supported by the EU's Smart Protein program. Results revealed that a significant proportion (51%) of the European meat consumers are actively decreasing their consumption of meat. This emerging pattern indicates a more extensive shift in consumer conduct and presents some obstacles and prospects for the livestock industry. The primary drivers of this transition are mostly health-related issues (47%), environmental factors (29%), and animal welfare considerations (26%). In the work of Guadarrama, (2020), health concerns are more prominent in Romania and Italy, underscoring an increasing recognition of the health consequences associated with meat. In contrast, Denmark and the Netherlands have a greater emphasis on environmental concerns, which is consistent with their commitment to environmental activism and implementation of rigorous legislation.

The difficulty experienced by traditional meat markets in adjusting to regulatory demands inside the EU are further exacerbated by regulatory constraints from the European Commission. It is anticipated that the swine industry would undergo a resurgence in 2024, on the ground of a rise in sow population, favorable feed costs, and beneficial market prices for piglets and carcasses (Flach, de Belder and Geller, 2024). The EU poultry market is currently grappling with distinct challenges and prospects due to evolving customer preferences, legal constraints, and environmental demands (Kowalska et al., 2023). The rise in poultry consumption on a global scale, similar to patterns observed in other meat markets, is also accompanied by a growing consumer inclination towards plant-based diets (Vida and Szakály, 2023). The emphasis on adopting sustainable farming methods and mitigating the negative effects of carbon emissions is in accordance with the goals established by the European Green Deal, which seeks to harmonize consumer preferences with environmental conservation (Ferguson, 2023).

Livestock farming is fundamental for EU's agricultural economy (Chatellier, 2021). Although composed of small-scale, family-operated farms, especially in post-communist countries, this segment reflects the rich diversity of the EU's geographical and socio-economic dimensions. The resilience and expansion of livestock farming have been significantly underpinned by the Common Agricultural Policy (CAP), through which vital subsidies have been dispensed, fostering economic prosperity for the farmers (Giuliani and Baron, 2023; Heyl et al., 2023; Ngaiwi et al., 2023). Despite recent policy reforms aimed at recalibrating subsidy allocations and aligning the EU's agricultural prices with global standards, such financial aids continue to be crucial for a considerable proportion of the EU's livestock producers (Cillero and Reaños, 2023; Haddad et al., 2024). This persistent support highlights the sector's essential role in balancing traditional farming practices with the demands of modern challenges, including market globalization, regulatory modifications, and environmental sustainability imperatives.

The objective of this research was to provide a solid empirical foundation for policy making in the EU meat market with statistical evidence that can support legislative regulations. This paper consists of an overview of the foreign trade flow performances based on a series of indicators that assess the economic efficiency of meat imports, exports and trade balance results. This research framework is novel and provides valuable insights for ensuring the resilience of EU's agri-food industry against external market shocks and shifts in consumer demand patterns, as well as ensuring the reduction of disparities across EU countries.

1. Materials and methods

Aligned with the objective of this empirical study, the international trade flow performances were analyzed in the case of the EU meat market by resorting to the statistical data available online on the International Trade Centre's platform (https://www.trademap.org/). Data collection took place in April 2024, according to the second class of Combined Nomenclature – "*Meat and edible meat offal*". This analysis contains the most recent data available in the statistical database at the time this paper was elaborated, specifically covering the period from 2012 to 2023. Regarding the types of meat included in the analysis, this research was focused on three types: (1) swine meat; (2) bovine meat; and (3) poultry meat (Gallus domesticus, ducks,

geese, and turkeys). They were considered representative, since, on average (2012-2023), these three types of meat summed up to almost 82% of the total EU-27's exports with "*Meat and edible meat offal*".

Data underwent quantitative analysis to measure performance, trade patterns, trends, and anomalies. Hence, for imports and exports, the following indicators were calculated: the amplification ratio (the import and export values registered in 2023 compared to the 2012-2023 average); the import and export shares from both national agri-food trade and the EU-27's trade in swine, bovine, and poultry meat. The amplification ratio was included in this research as a key metric because it quantitatively encapsulates the degree of change; it is a succinct measure of dynamics; hence a critical indicator of shifts in competitiveness and dependency within the EU meat market. The standard deviation was also computed for both previously described shares with the aim of ensuring the identification of potential anomalies in the dataset. Lastly, the trade balance result (surplus or deficit) was computed, as well as its associated amplification ratio.

Quantitative findings were interpreted in light of this research's objectives, with a focus on explaining the underlying factors contributing to the trade patterns of increase performance and efficiency. This involved synthesizing research results to draw conclusions about competitiveness, meat dependency on imports, and the strategic positioning of EU-27 member states in this specific market.

2. Results and discussion

As Table 1 depicts, Italy is the leading EU-27 importer of swine meat, with an import value close to 3 billion EUR in 2023, representing almost 20% of EU-27's total swine meat imports. The amplification ratio (1.47) proves that Italy's swine meat import volume has notably increased since 2012. Furthermore, the share from the national agri-food imports is relatively constant at 4.4% (standard deviation: 0.5%) over the 2012-2023 period, and the share from the EU-27 swine meat imports is constant at around 18.4% for the same period, illustrating Italy's dependence on importing swine meat. The country's trade balance result was marked by an average deficit of almost 2 billion EUR during 2012-2023, with a peak that was reached in 2023: 2.8 billion EUR. This constant raise in the swine meat deficit (1.54 amplification ratio) underscores Italy's heavy reliance on imports to satisfy domestic demand.

In contrast, Spain is the top EU-27 exporter of swine meat–its exports with this type of meat account for 6.6% (2012) to 8.7% (2023) of the country's total agri-food products exports, and 30% of EU-27's total swine meat exports in 2023. The share at the level of EU-27 steadily increased each year, considering the notable standard deviation value of 5.6% and the share peak that was reached in 2023, when Spain doubled its export levels from 2012 (15% vs 30%). This market growth positions Spain in the EU competitiveness leaderboard in terms of the swine meat exports, reflecting a strategic enhancement over the 2012-2023 period. Moreover, Spain achieved a trade surplus in swine meat of more than 6 billion EUR in 2023, which provides robustness to research findings–this value represents more than the overall swine meat trade surplus tracked at the level of the whole EU-27 in the same year. This surplus is particularly significant when considering its associated ratio of 1.60 (2023 trade surplus to the 2012-2023 surplus average) and it highlights the progressive strengthening of Spain's trade position in the European context.

Following Spain's position in the EU-27 swine meat market, Germany, the Netherlands, and Denmark are next in the competitiveness leaderboard. Germany's strategic positioning is defined by elements such as the balance it has achieved between its domestic swine meat consumption needs and its capacity to supply external markets, as well as its average surplus of 2.3 billion EUR, constant over the period of analysis, since the coefficient of variation is only 12.66%. Germany's swine meat exports represent, on average, 22.9% of EU-27's total swine meat exports, but it has been constantly decreasing since 2012 (25.5%), with an average annual decrease of 2.8%, leaving a window of opportunity for Spain towards competitiveness in this market. The Netherlands follows with a robust performance, exporting, on average, 2.1 billion EUR in swine meat, hence claiming 12.2% of the EU-27's market. Moreover, the Netherland's trade surplus of 2.1 billion EUR in 2023 further solidifies its status as a major EU-27 exporter, which is also the case for Denmark (2.3 billion EUR on average during 2012-2023), whose share from the national agri-food exports averaged at 13.5% over the 2012-2023 period, the highest percentage among all the EU-27 members, hence indicating that swine meat exports constitute a significant component of Denmark's overall agri-food export strategy. This specialization, although decreasing (16% in 2012 vs 10.2% in 2023), emphasizes the strategic importance of swine meat within Denmark's export portfolio for its agricultural sector, considering that swine meat exports share from the total national agri-food exports was 2.3% at the level of the EU-27.

Similar with Italy, Poland and Romania both exhibit substantial trade deficits in swine meat (above 1 billion EUR in 2023), although the deficit average (2012-2023) is around 0.5 billion EUR. The huge amplification ratios (2.16 for Romania and 1.84 for Poland) associated to the trade deficit underscore the magnitude of

their trade policy, lack of production capabilities, and a challenging trend that puts Poland and Romania at the bottom of the performances leaderboard in the swine meat sector. These countries exhibit market dynamics similar to those of Italy, characterized by significant trade deficits and an increasing reliance on swine meat imports. While Italy's scale of import activity and the magnitude of its trade deficit are almost three times larger, the trends in Poland and Romania mirror Italy's, yet on a smaller scale, hence signaling common challenges within both the domestic and the EU swine meat market.

Building upon the insights gathered from the performance assessment at the level of the EU swine meat market, the findings derived from the quantitative study of the EU poultry meat market in Table 2 reveal more nuances of competitiveness and efficiency. Once again, Germany has emerged as a significant player, this time in the poultry meat market, with the greatest import share (21.9% on average, with a standard deviation of 1.4%) in this type of product from the EU-27's total imports in poultry meat. Germany is followed by France (16.8%) and the Netherlands (13%), hence these three countries summed up more than 50% of EU-27's total poultry meat imports, on average, during 2012-2023. In the case of the EU-27 member states, at the national level, poultry meat imports constitute, on average, 1.8% (with a standard deviation of 0.7%) of the total agri-food imports. The highest poultry meat import amplification ratio was recorded by Hungary at 2.44, indicating a dependency on the global market. Though on average it accounts for only 1.5% of the EU-27's total poultry meat imports, Hungary's imports of this product increased fivefold in 2023 compared to 2012, reaching 0.272 billion EUR.

However, when it comes to poultry meat exports, Poland is very competitive, as it exported this product in value of more than 4 billion EUR in 2023, claiming its supremacy over EU's total poultry meat exports with the greatest export share (30%) in this type of product from the EU-27's total imports in poultry meat. The Netherlands is next in the EU leaderboard, with more than 3 billion EUR exports in poultry meat in 2023, yet its associated export amplification rate (1.25) is smaller than in the case of Poland (1.83), signaling a faster specialization and better export performance for Poland than for the Netherlands. In addition, for Poland, the poultry meat exports represent 7.3% (mean) of the country's total agri-food exports. These two countries sum up, on average, almost half of EU-27's total exports in poultry meat. Combined with Germany and France, all these four countries account, on average, for 66.5% of EU-27's total exports in poultry meat.

As a result of the outstanding performance in terms of poultry meat exports, Poland surpassed all other EU-27 nations in terms of the trade balance results and achieved consistent surpluses that highlight its efficiency and strategic position in the poultry market. In 2023, Poland's trade surplus with this product was more than 4 billion EUR, with a very high surplus amplification ratio of 1.85. With a ratio almost double, but reflecting deficit amplification in this instance, France faces a substantial trade deficit in poultry meat, amounting to 1 billion EUR in 2023. These statistics indicate a growing reliance on imports to satisfy domestic demand, as evidenced by a deficit amplification ratio of 3.4. Although France registered trade surpluses in 2012, 2013, and 2015, the trend has shifted towards constant significant deficits. Similarly, Germany is in a situation that resembles that of France's, since Germany faced a trade deficit of 0.91 billion EUR in 2023, with an accompanying amplification ratio of 1.45, yet significantly lower than France's. More specifically, 2.34 times less severe for Germany, indicating a poultry meat deficit that is less pronounced than France's. Another significant player in the poultry meat market and the second best-performer in the EU-27 in terms of the trade surplus is the Netherlands, following closely behind Poland. In 2023, the Netherlands registered a surplus of 1.3 billion EUR, slightly below its average of 1.4 billion EUR for the period 2012-2023. The presence of a 5% coefficient of variation over the same period attests to the country's top-tier performance within the EU poultry meat market and, as well as a high degree of competitiveness through consistency.

Moving to the analysis of the bovine meat market, import dynamics from Table 3 reveal that Italy is the EU-27's leading importer, reaching nearly 2.5 billion EUR in 2023. This accounts for an average of 18.4% (with a standard deviation of 1.2%) of the EU-27's total bovine meat imports, surpassing Germany (17.5%), the Netherlands (15.4%), and France (12.5%). Combined, these four countries gather, on average, 63.9% of the EU-27's total bovine meat imports. After these countries, Spain accounts for 5.9% of the imports. This percentage is 47.2% lower compared to the share of France, the fourth-largest EU-27 importer. It is noteworthy that Greece's bovine meat imports accounted for 0.63 billion EUR in 2023, representing 6.6% of the country's total agri-food imports, thus a share that exceeds the EU-27 average by a factor of 3.16. For Greece, this high share of bovine meat imports relative to its total agri-food imports indicates a significant import dependence, confirmed by the standard deviation of only 0.4%. Consequently, the consistent patterns of Greece's bovine meat imports demonstrate a steady dependence on external sources to meet the domestic consumption needs, hence signaling a poor competitiveness level in this market.

Marked at 2.22, the amplification ratio associated to Croatia's bovine meat imports indicates a substantial increase, reflecting a significant import growth, as well as the country's reliance on importing bovine meat. In addition, Cyprus registered a similar amplification ratio (2.03), but with an import volume (0.042 billion

EUR) that represent 22.3% of Croatia's volume, on average, during the 2012-2023 period. At the level of the EU-27 member states, the average import amplification ratio was 1.47, while many of the big market players did not exceed this ratio: (Italy: 1.34; Germany: 1.11; the Netherlands: 1.34; and France: 1.35). These moderated growth paces in bovine meat imports are linked to Italy's, Germany's, the Netherland's, and France's already substantial import volumes (63.9% of EU-27's total bovine meat imports). Thus, the moderated amplification ratios observed in these countries can be attributed to the principle of diminishing marginal growth: as these nations already cumulate a large share of the EU's bovine meat imports, their capacity for exponential growth in import volumes is inherently constrained. These market dynamics put the spotlight on two factors, market saturation and growth potential, by illustrating that top market positions can temper the relative increase in import volumes, and the bovine meat market is no exception.

In terms of bovine meat exports, the market dynamics in the EU-27 show patterns of high competitiveness and strategic positioning, especially in the case of the top three performers: the Netherlands, Ireland and Poland. With an average bovine meat export of 2.55 billion EUR during the 2012-2023 period, the Netherlands has reached a new peak in the EU-27 in 2023 by exporting bovine meat worth 3.58 billion EUR, which, in that year, represented 23.13% of EU-27's total bovine meat exports. Remarkably, the Netherlands has also reached an export amplification ratio of 1.40, on the ground of an existing high export volume. Moreover, Ireland also occupies a leading position in the bovine meat market, with an average export value of 1.97 billion EUR and a peak reached in 2022: 2.69 billion EUR, which, in that year, accounted for 17.7% of the EU-27's total bovine meat exports. Similarly, the third EU-27 top exporter, Poland, has also reached an export peak in 2023 with 2.2 billion EUR, which represents 12.4% of the EU-27's total bovine meat exports in the same year of analysis. With significant market impact, these three countries account for more than half of the EU-27's total bovine meat exports. Ireland's exports amplification ratio (1.33) is similar to that of the Netherland's (1.40), and only topped by Poland's (1.61), which shows high specialization, consistency in market growth, as well as effective agricultural and trade strategies, firmly establishing their roles as key EU-27 players in the bovine meat market.

Germany, France, and Spain are also competitive in the EU-27 in terms of bovine meat exporting, but to a lesser degree than the top three performers. On average, these top six performer countries account for more than 80% of EU-27's total bovine meat exports, out of which Germany, France, and Spain gathered 27.7% on average, while the rest was attributed to the Netherlands, Ireland and Poland, with almost a double share. With an export amplification ratio of 1.13, Germany's market presence is stable. It is a modest, yet steady expansion effort, similar to that of France's, with a ratio of 1.18. In contrast, Spain has registered a higher ratio (1.71), with a significant export growth, specialization, and active bovine meat market presence.

On average, 15.4% of Ireland's total agri-food product exports represents bovine meat, hence significantly surpassing the average of 1.7% observed across EU-27 member states. This high specialization of Ireland in bovine meat is indicative of the country’s strategic positioning within the EU-27 agricultural market. For the remaining two top performers in terms of export, the Netherlands and Poland, their bovine meat exports represent only 2.8% and 4.6% of their agri-food exports. These results suggest that the bovine meat market is of higher importance for Ireland, where increased specialization might imply higher product quality.

In terms of bovine meat trade balance results, the Netherlands, Ireland, and Poland are also representative based on their trade surpluses, with Ireland leading the trio with a surplus of 2.4 billion EUR in 2023, and with an amplification ratio of 1.32, highlighting a moderate increase, but on a base that is the most impactful at the level of the EU-27 bovine meat market. Following closely, Poland registered a trade surplus of more than 2 billion EUR in 2023, but with a higher amplification rate associated (1.6), which proves the high degree of competitiveness in this market among the EU-27 top performers. Lastly, the Netherlands's trade surplus accounts for 53.5% of the Ireland's in 2023, with an amplification ratio of 1.54.

On the other hand, Italy is the primary source of trade deficit in bovine meat in the EU-27, recording, on average, annual deficits of 1.47 billion EUR during the 2012-2023 period. The largest among all countries, these deficits are slightly increasing (amplification rate: 1.20) and reflect Italy's substantial reliance on imported bovine meat to meet domestic demand. At a smaller scale, France follows with a deficit of 0.38 billion EUR on average, but the one registered in 2023 is 1.8 times greater, hence signaling the foreign market dependency. Germany, Greece, and Sweden also register trade deficits in bovine meat, at 0.59, 0.47, and 0.40 billion EUR, respectively. However, their associated amplification rates (1.06 for Germany, 1.32 for Greece, and 1.23 for Sweden) suggest a less pronounced deficit increase compared to France's.

Conclusions

Given the context of EU trade patterns, the livestock segment is undergoing a period of transformation, driven by initiatives to promote sustainability across all its dimensions, and adapt to shifts in dietary preferences, while still preserving its pivotal position within both European and international agricultural markets. This evolution portrays a complex interplay between historical practices and contemporary pressures, emblematic of the sector's dynamic contribution to the EU's agricultural and trade narratives. The EU meat market shows the signs of complex dynamics and substantial economic impact, hence becoming evident that the future trajectory of the EU's livestock farming is one where adaptability and sustainability are at the forefront, responding proactively to both domestic and international demands.

The divergent paths of trade balance outcomes among EU member states highlight the importance of strategic positioning and specialization in maintaining and enhancing competitiveness within the global market. For instance, Spain's performance in the swine sector and Poland's dominance in poultry exports exemplify effective strategic responses to market demands and opportunities. Conversely, the substantial trade deficits in countries like Italy emphasize a pressing need for policy regulations and industry adjustments to address import dependencies and enhance domestic production performances.

The conducted research was focused on three distinct types of meat, namely swine, bovine, and poultry meat. The primary objective was to examine the implications of trading with different types of meat within the international trade dynamics and to comparatively assess their economic performances at the level of the EU-27 member states. Nevertheless, it is crucial to recognize specific constraints that are inherited to this research. A correlative study that could establish the nature of the relationship between production metrics and economic efficiency was not undertaken in this research but could be the subject of future studies. Moreover, other analyses could include elements pertaining to the sustainability of the meat production, supply chain management, and trade, hence yielding for more profound understandings of the relationship between agricultural output, economic viability, and environmental conservation.

References

Anusha Siddiqui, S., Bahmid, N.A., Mahmud, C.M.M., Boukid, F., Lamri, M. and Gagaoua, M., 2023. Consumer acceptability of plant-, seaweed-, and insect-based foods as alternatives to meat: a critical compilation of a decade of research. *Critical Reviews in Food Science and Nutrition*, 63(23), pp.6630–6651. https://doi.org/10.1080/10408398.2022.2036096.

Basu, S., 2015. The transitional dynamics of caloric ecosystems: changes in the food supply around the world. *Critical Public Health*, 25(3), pp.248–264. https://doi.org/10.1080/09581596.2014.931568.

Castillo-Díaz, F.J., Belmonte-Ureña, L.J., López-Serrano, M.J. and Camacho-Ferre, F., 2023. Assessment of the sustainability of the European agri-food sector in the context of the circular economy. *Sustainable Production and Consumption*, 40, pp.398–411. https://doi.org/10.1016/j.spc.2023.07.010.

Chatellier, V., 2021. Review: International trade in animal products and the place of the European Union: main trends over the last 20 years. *Animal*, 15, p.100289. https://doi.org/10.1016/j.animal.2021.100289.

Cillero, M.M. and Reaños, M.T., 2023. Farm technical and environmental efficiency and subsidy redistribution in Ireland: A simulation approach of possible performance and equity effects. *Journal of Agricultural Economics*, 74(2), pp.394–412. https://doi.org/10.1111/1477-9552.12509.

European Commission, 2019. *Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and The Committee of the Regions The European Green Deal*.

Ferguson, S.M., 2023. Unconstrained trade: The impact of EU cage bans on exports of poultry-keeping equipment. *Journal of Agricultural Economics*, 74(2), pp.435–449.

Flach, B., de Belder, T. and Geller, L., 2024. *Livestock and Products Semi-annual*. United States Department of Agriculture, Foreign Agricultural Services. p.19.

Giuliani, A. and Baron, H., 2023. The CAP (Common Agricultural Policy): A Short History of Crises and Major Transformations of European Agriculture. *Forum for Social Economics*, 0(0), pp.1–27.

Guadarrama, E., 2020. Evolving appetites: an in-depth look at European attitudes towards plant-based eating.

Guyomard, H., Bouamra-Mechemache, Z., Chatellier, V., Delaby, L., Détang-Dessendre, C., Peyraud, J.-L. and Réquillart, V., 2021. Review: Why and how to regulate animal production and consumption: The case of the European Union. *Animal*, 15, p.100283. https://doi.org/10.1016/j.animal.2021.100283.

Haddad, S., Escobar, N., Bruckner, M. and Britz, W., 2024. Subsidizing extensive cattle production in the European Union has major implications for global agricultural trade and climate change. *Journal of Cleaner Production*, 448, p.141074. https://doi.org/10.1016/j.jclepro.2024.141074.

Heyl, K., Ekardt, F., Roos, P. and Garske, B., 2023. Achieving the nutrient reduction objective of the Farm to Fork Strategy. An assessment of CAP subsidies for precision fertilization and sustainable agricultural practices in Germany. *Frontiers in Sustainable Food Systems*, 7.

International Trade Center. 2024. Trade Statistics Database. [online] Available at: https://www.intracen.org /itc/market-info-tools/trade-statistics. [Accessed 1 April 2024].

Istudor, N., Ion, R.A., Petrescu, I.E. and Hrebenciuc, A., 2019. Agriculture and the Twofold Relationship between Food Security and Climate Change. Evidence from Romania. *Amfiteatrul Economic*, 21(51), pp.285–285.

Kowalska, A., Olszańska, A., Szymańska, J. and Paskudzka, K., 2023. International competitiveness of the poultry sector in poland over the last 20 years. *Roczniki Naukowe Stowarzyszenia Ekonomistów Rolnictwa i Agrobiznesu*, 24(4). https://doi.org/10.5604/01.3001.0053.9504.

Ladaru, G.-R., Ilie, D.M., Diaconeasa, M.C., Petre, I.L., Marin, F. and Lazar, V., 2020. Influencing Factors of a Sustainable Vegetable Choice. The Romanian Consumers' Case. *Sustainability*, 12(23), p.9991.

McInnes, C., Carstairs, S.A. and Cecil, J.E., 2023. A qualitative study of young peoples' thoughts and attitudes to follow a more plant-based diet. *Frontiers in Psychology*, 14.

Molitorisová, A. and Burke, C., 2023. Farm to fork strategy: Animal welfare, EU trade policy, and public participation. *Applied Economic Perspectives and Policy*, 45(2), pp.881–910.

Ngaiwi, M.E., Molua, E.L., Sonwa, D.J., Meliko, M.O., Bomdzele, E.J., Ayuk, J.E., Castro-Nunez, A. and Latala, M.M., 2023. Do farmers' socioeconomic status determine the adoption of conservation agriculture? An empirical evidence from Eastern and Southern Regions of Cameroon. *Scientific African*, 19, p.e01498.

Onwezen, M.C., Bouwman, E.P., Reinders, M.J. and Dagevos, H., 2021. A systematic review on consumer acceptance of alternative proteins: Pulses, algae, insects, plant-based meat alternatives, and cultured meat. *Appetite*, 159, p.105058. https://doi.org/10.1016/j.appet.2020.105058.

Patarlageanu, S.R., Dinu, M., Diaconu, A. and Negescu, M.D.O., 2022. Ecological agriculture and its role in sustainable development. *Proceedings of the International Conference on Business Excellence*, 16(1), pp.390–399. https://doi.org/10.2478/picbe-2022-0038.

Potori, N., Himics, M., Witzke, P., Szabo, Z., Savoly, J. and Egri, E., 2023. *Socio-economic Implications of Banning Conventional Farrowing Crates in EU Pig Farming: A CAPRI-based Scenario Analysis Studies in Agricultural Economics*. https://doi.org/10.7896/j.2584.

Santeramo, F.G., Lamonaca, E., Tappi, M. and Di Gioia, L., 2019. Considerations on the Environmental and Social Sustainability of Animal-Based Policies. *Sustainability*, 11(8), p.2316.

Sun, Z., Scherer, L., Zhang, Q. and Behrens, P., 2022. Adoption of plant-based diets across Europe can improve food resilience against the Russia–Ukraine conflict. *Nature Food*, 3(11), pp.905–910.

Szenderák, J., Fróna, D. and Rákos, M., 2022. Consumer Acceptance of Plant-Based Meat Substitutes: A Narrative Review. *Foods*, 11(9), p.1274. https://doi.org/10.3390/foods11091274.

Vida, V. and Szakály, Z., 2023. Analysis of Consumer Behaviour in the European Poultry Meat Market. *Applied Studies in Agribusiness and Commerce*, 17(1).

Appendix

Table no. 1. Overview on the performance of swine meat trade flows at country level across the EU

Country	Import			Export			Trade balance
	Import value in 2023 (billion EUR) (Amplification ratio)	Share from the national agri-food imports (average 2012-2023) (Standard deviation)	Share from the EU-27 swine meat imports (average 2012-2023) (Standard deviation)	Export value in 2023 (billion EUR) (Amplification ratio)	Share from the national agri-food exports (average 2012-2023) (Standard deviation)	Share from the EU-27 swine meat exports (average 2012-2023) (Standard deviation)	Surplus (+) or deficit (−) value in 2023 (billion EUR) (Amplification ratio)
AT	0.450 (1.42)	2.5% (0.4%)	2.9% (0.2%)	0.470 (1.21)	3.3% (0.6%)	2.3% (0.3%)	0.020 (0.28)
BE	0.267 (1.41)	0.5% (0.1%)	1.7% (0.2%)	1.571 (1.21)	3.2% (0.5%)	11.9% (0.9%)	1.304 (1.18)
BG	0.375 (1.67)	6.4% (1.0%)	2.1% (0.3%)	0.021 (2.30)	0.2% (0.1%)	0.1% (0.0%)	−0.353 (1.64)
HR	0.328 (1.74)	6.0% (0.6%)	1.7% (0.3%)	0.033 (1.78)	0.8% (0.4%)	0.2% (0.1%)	−0.296 (1.73)
CY	0.032 (1.94)	1.3% (0.2%)	0.1% (0.0%)	0.002 (0.82)	0.6% (0.6%)	0.0% (0.0%)	−0.030 (2.14)
CZ	0.935 (1.53)	6.6% (0.6%)	5.6% (0.4%)	0.092 (1.18)	1.0% (0.4%)	0.7% (0.1%)	−0.844 (1.58)
DK	0.177 (1.18)	1.2% (0.2%)	1.4% (0.2%)	2.425 (0.98)	13.5% (1.6%)	22.8% (1.6%)	2.249 (0.96)
EE	0.081 (1.55)	2.8% (0.4%)	0.5% (0.0%)	0.039 (1.48)	1.7% (0.3%)	0.2% (0.0%)	−0.043 (1.61)
FI	0.054 (0.99)	1.0% (0.2%)	0.5% (0.1%)	0.076 (1.03)	4.3% (0.7%)	0.7% (0.1%)	0.021 (1.16)
FR	0.922 (1.15)	1.5% (0.3%)	7.4% (1.0%)	1.093 (1.20)	1.4% (0.2%)	8.4% (0.4%)	0.171 (1.58)
DE	1.744 (1.10)	1.7% (0.4%)	14.6% (1.9%)	3.809 (0.98)	5.2% (0.8%)	35.8% (3.1%)	2.065 (0.89)
EL	0.657 (1.44)	6.4% (0.7%)	4.2% (0.2%)	0.012 (1.31)	0.1% (0.0%)	0.1% (0.0%)	−0.645 (1.44)
HU	0.422 (1.42)	4.9% (0.9%)	2.7% (0.3%)	0.455 (1.34)	3.6% (0.4%)	3.1% (0.2%)	0.034 (0.76)
IE	0.130 (1.07)	1.4% (0.2%)	1.1% (0.2%)	0.369 (0.91)	3.2% (0.4%)	3.7% (0.3%)	0.239 (0.84)
IT	2.953 (1.47)	4.4% (0.5%)	18.4% (0.8%)	0.129 (0.72)	0.4% (0.1%)	1.6% (0.2%)	−2.824 (1.54)
LV	0.098 (1.51)	2.5% (0.5%)	0.6% (0.1%)	0.028 (2.50)	0.4% (0.1%)	0.1% (0.0%)	−0.070 (1.30)
LT	0.215 (1.65)	3.1% (0.3%)	1.2% (0.1%)	0.022 (1.14)	0.4% (0.2%)	0.2% (0.1%)	−0.193 (1.73)
LU	0.023 (1.35)	0.7% (0.0%)	0.2% (0.0%)	0.013 (1.43)	0.7% (0.1%)	0.1% (0.0%)	−0.011 (1.26)
MT	0.012 (1.34)	1.2% (0.1%)	0.1% (0.0%)	0.000 (0.00)	0.0% (0.0%)	0.0% (0.0%)	−0.012 (1.34)
NL	0.742 (1.27)	1.0% (0.1%)	5.4% (0.4%)	2.890 (1.36)	2.3% (0.2%)	19.6% (1.0%)	2.148 (1.39)
PL	1.867 (1.37)	7.1% (1.4%)	12.6% (0.7%)	0.827 (1.03)	3.0% (0.9%)	7.4% (0.7%)	−1.040 (1.84)
PT	0.351 (1.22)	2.6% (0.4%)	2.6% (0.2%)	0.081 (0.86)	1.4% (0.4%)	0.9% (0.2%)	−0.270 (1.39)
RO	1.063 (2.07)	6.1% (0.9%)	4.7% (1.7%)	0.004 (0.15)	0.4% (0.3%)	0.2% (0.1%)	−1.060 (2.16)
SK	0.445 (1.59)	5.8% (0.6%)	2.6% (0.5%)	0.032 (0.94)	1.0% (0.4%)	0.3% (0.1%)	−0.413 (1.67)
SI	0.157 (1.39)	4.6% (0.9%)	1.0% (0.1%)	0.091 (6.03)	0.7% (0.6%)	0.1% (0.1%)	−0.067 (0.68)
ES	0.272 (1.34)	0.6% (0.1%)	1.9% (0.2%)	6.297 (1.59)	7.8% (1.4%)	36.5% (5.6%)	6.025 (1.60)
SE	0.209 (0.84)	1.7% (0.6%)	2.3% (0.7%)	0.058 (1.23)	0.5% (0.1%)	0.4% (0.0%)	−0.151 (0.75)

Source: Authors' own calculations based on International Trade Center data (2024).

Tables 2 and 3 are available online: https://doi.org/10.6084/m9.figshare.25699986.