



## Pork meat consumption, from statistics to consumer behavior: a review

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**Abstract.** Pork is, by far, the most consumed meat in Europe, with almost half of the total meat consumption. In this context, the present study aims to offer an updated perspective on the pork meat sector, bringing to the fore the contribution of consumer behavior to the sustainability of the meat sector, as reflected in the scientific literature. Furthermore, based on the reviewed literature, it can be inferred that labeling the credence claims (e.g., organic, country of origin, fair trade, free-range, or animal welfare) could represent a competitive market advantage.

**Keywords:** consumers, preferences, pork, quality.

**Introduction.** Although the global meat industry supplies food to billions of people, it also has significant environmental and health consequences for the planet (OECD 2021). The livestock sector is pointed out as one of the main contributors to environmental degradation, influencing GHG emissions [percentages range between 12% and 18% to total GHG emissions (Gomez-Zavaglia et al 2020)], water footprint, water pollution and scarcity, or loss of biodiversity (González et al 2020; Petrescu et al 2017; Sanchez-Sabate & Sabaté 2019). That is why sustainability, with its three pillars – environmental, economic, and societal – plays an increasing role in EU meat markets, both for producers and consumers. Within this context, sustainable meat production is seen as a form of production 'ecologically sound, economically viable, socially just, and human' (Appleby 2004). Productivity, food safety, food quality, animal health, environmental protection, and efficiency from a cost-of-production perspective are all blended in this concept (Pethick et al 2010; Velarde et al 2015).

Since consumption influences the meat production sector, environmental deterioration, and population health, consumers' food behavior must be considered to increase resilience to environmental pressure in the agri-food sector (Petrescu et al 2015). Therefore, changing meat consumption behavior is one step towards minimizing the burden of the livestock sector on the environment. This challenge requires identifying the complex factors associated with meat-eating (Choueiki et al 2021; Godfray et al 2018; Vandenbroele et al 2021), taste preferences, culinary traditions, and eating habits. Meat demand is associated with higher incomes and a shift (due to urbanisation) in food consumption patterns favouring increased protein intake from animal sources (OECD, 2021). In addition, meat consumption often symbolizes strength and good health (Alimentarium, n.d.). Since we are immersed in a culture where consumption becomes a way of life, with the purchase and use of goods turned into rituals, individual satisfaction

is often expressed through consumption (Petrescu-Mag et al 2019), including food consumption.

Pork is by far the most consumed meat in both eastern and western Europe, with almost half the total meat consumption, poultry and beef each occupying less than one-quarter (Ngapo et al 2007). In this context, the present study aims to offer an updated perspective on the pork meat sector, bringing to the fore the contribution of consumer behavior to the sustainability of the meat sector, as reflected in the scientific literature.

**From statistics to consumer behavior.** Globally, approximately 37% of all meat consumed in the world is pork (110 million metric tons, mmt), ahead of beef (67 mmt) and chicken (104 mmt) (McGlone 2013). At the level of the European Union (EU), pork production increased by 466 000 t in the first half of 2021 (+4.1% year-on-year), and the pork exports are projected to remain dynamic, with a +7% increase in 2022 (European Commission, 2021a). However, EU pork export will be strongly influenced by developments in the Chinese market since it is the largest pork consumer and production country, accounting for 40% of global production (Zira et al 2021).

Although estimates indicate a slight upward trend in global pork consumption (Figure 1) by 2030, at the EU level, the forecast is different. As shown in Figure 2, in the EU, the estimated consumption of pork will decrease to 18.25 million tons in 2030. The same decrease in pork consumption is predicted by the European Commission (2021b) which expects that the EU meat per capita consumption is to drop to 67 kg by 2031 (in 2018, the consumption was 69.8kg/capita).

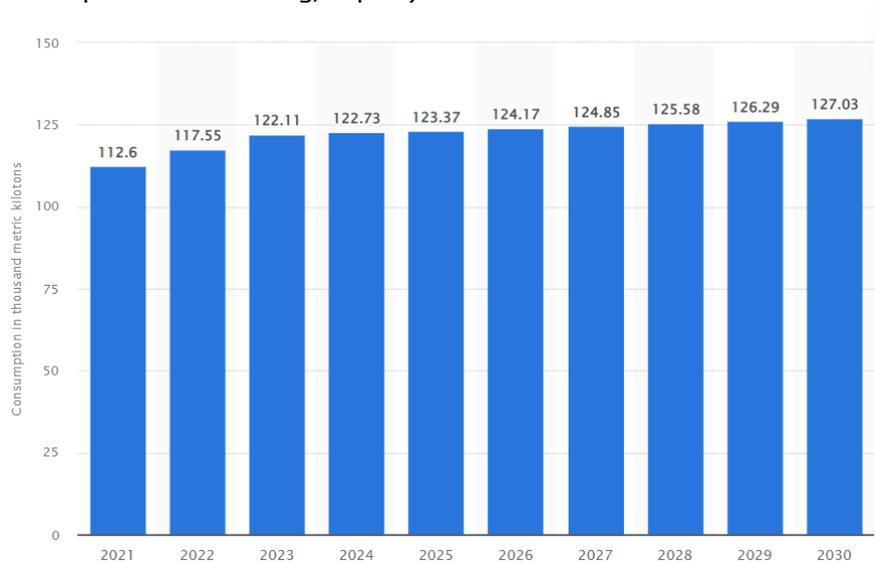


Figure 1. Forecast pork consumption worldwide from 2021 to 2030 (in 1,000 metric kilotons).

Source (Statista 2021b)

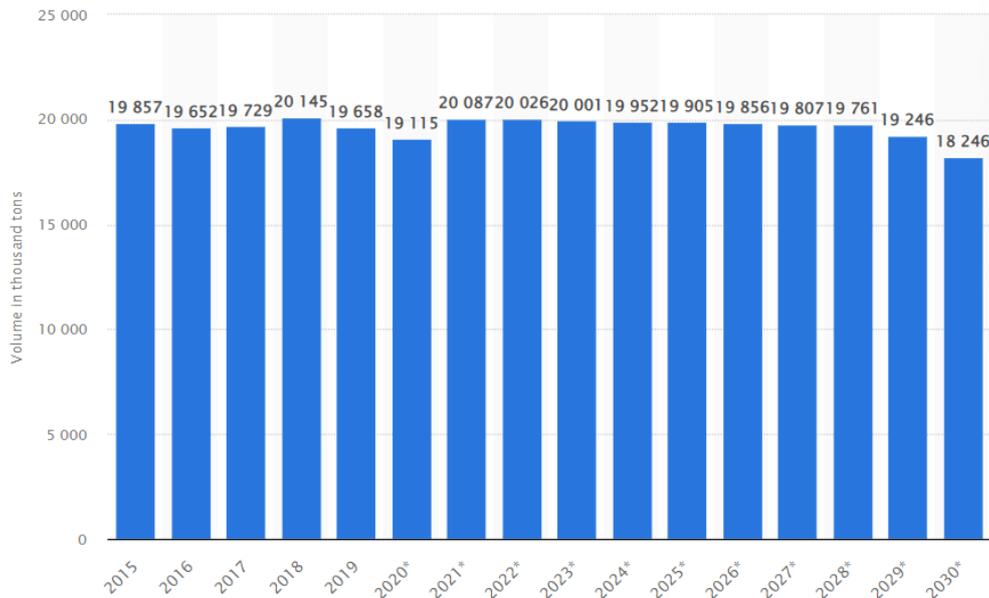


Figure 2. Projected volume of pig meat consumed in the EU (EU 28) from 2015 to 2030 (in 1,000 tons) (\*Data from 2021 to 2029 are forecast, data for 2020 are provisional)  
Source (Statista 2021a)

For many people worldwide, meat is still a luxury, and the Covid-19 economic crisis deepened the gap between consumers in various parts of the world. While in Germany, the average meat consumption/capita is 60 kg/year, and in the USA and Australia, it is more than 100 kg (Stiftung 2021), in South Africa, it is less than 3 kg (Ngapo et al 2007), and, at global level, the average is 34.1 kg/year (Salter, 2018). The decline in meat demand is not only caused by the Covid-19 pandemic but also by African swine fever. In China, it caused a 10% decrease in meat production and a more than 20% reduction in pork production (Stiftung 2021).

Between 2014-2016, global meat consumption per capita was 34.1 kg/year, and almost 60% was red meat (pork, sheep and beef) (Salter 2018). These numbers are alarm bells since, due to ruminant enteric fermentation, red meats produce more CO<sub>2</sub> emissions than white meat (Farchi et al 2017). The characteristics of the meat production process (e.g., animal welfare, lack of medical residues) (Montossi et al 2013) and their influence power on consumption decisions were evaluated by various scientists. Extensive research has been conducted on the sustainability of meat production systems (Verbeke et al 2010). Burnier et al (2021) argued that sustainable consumption decision-making embedded the concern for taste, price, and attitudes towards social responsibility, e.g., environment and fair trade. The increased demand for sustainable food products by consumers, in general, is a driver of sustainable food claims. Argem-Armengol et al (2019) reported that pork credence cues were important for Spanish and Portuguese consumers. The willingness to pay a premium price varied between these countries, but the overall mean was 11.8% for marbled pork, 20.0% for outdoor pork, and 24.3% for the organic label.

Comparisons of Irish consumers' beliefs about pork and poultry showed that they perceived pork as safer than poultry but less healthy, and were significantly more concerned about environmental issues related to pork than poultry (McCarthy et al 2004). Van Loo et al (2014) showed that most of the investigated Belgium consumers (87%) would welcome the introduction of an EU animal welfare label. The paper asked, in particular, whether there was a risk that Danish consumers would abandon high-level welfare pork if less expensive products with a medium level of animal welfare became available. Denver et al (2017) study on Danish respondents revealed that the Danish market could accommodate more than one pork product with a welfare label. Still the

premium price differentiating medium and high-level animal welfare pork will have to be relatively narrow.

However, animal welfare is often not the most important attribute that drives consumers towards pork (Nocella et al 2010). Fat content (Moeller et al 2010), country of origin (Balcombe et al 2016; Grunert et al 2018; Yeh et al 2010), and freshness (Ma et al 2017) were rated among the most sought-after attributes of pork. Fortomaris et al (2006) assessed the effect of the appearance of meat on the preferences of Greek and Cypriot consumers for pork chops. They found that consumers under 35 years of age showed preferences for dark red, lean pork, while consumers 35 years of age and older preferred dark or light red pork (Fortomaris et al 2006). Marbling appeared to be the most important factor for Greek consumers, regardless of when they evaluated the quality of the pork or their intention to purchase it (Papanagiotou et al 2013). For Mexican consumers, the most important criteria for pork choice were color and fat cover (Ngapo et al 2018). Japanese pork consumers considered the origin of the meat along with the price when purchasing pork (Oh & See 2012). In Denmark, Norway, and Sweden, pork flavor was ranked as the most important attribute, along with its suitability for many dishes (Bryhni et al 2002). Regarding the pork place of purchase, Hungarian consumers indicated that the farmers' market was preferred over the butcher and supermarket (Czine et al 2020).

Finally, other studies investigated pH, water holding capacity, tenderness, or endpoint cooking temperature as factors that influence consumer liking of pork (Lonergan et al 2007; Miller 2020; Verbeke et al 1999).

**Conclusions.** The paper highlights that pigmeat consumption varies widely across the pork-consuming nations, and consumers consider a wide range of quality attributes when making consumption decisions; therefore, their preferences are heterogeneous. Based on the reviewed literature, it can be inferred that labeling the credence claims (e.g., organic, country of origin, fair trade, free-range or animal welfare) could represent a competitive advantage. Therefore, marketers should consider pork quality from the multidimensional perspective of consumers (search-experience-credence attributes).

**Conflict of interests.** The authors declare no conflict of interests.

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