ANIMAL SCIENCE AND GENETICS
Published by the Polish Society of Animal Production
vol. 21 (2025), no 3, 119-131
DOI: 10.5604/01.3001.0055.2626

Research Article ***Open Access***

Attitudes of selected Polish consumer groups towards pork and welfare labels

Ewa Sell-Kubiak[1*], A. Ludwiczak[2], G. Cieleń[1], K.G. Grunert[3]

[1]Department of Genetics and Animal Breeding, Poznań University of Life Sciences, Wołyńska 33, 60-637 Poznań, Poland
[2]Department of Animal Breeding and Product Quality Assesment, Poznań University of Life Sciences, Złotniki Słoneczna 1, 62-002 Suchy Las, Poland
[3]MAPP Centre, Department of Management, Aarhus University, Fuglesangs Allé 4, DK-8210 Aarhus V

SUMMARY

This study aimed to examine the preferences of Polish consumers buying pork products and to determine whether there are differences between groups of consumers (farmers, animal scientists/veterinarians, animal science/veterinary students, and ordinary consumers). For this purpose, an electronic survey was conducted to collect responses from the 6th of August till the 1st of September 2023. In total, 140 responses were obtained. Our survey was designed to capture a sufficient number of respondents among animal/veterinary scientists/students and pig farmers; for this reason, those three groups account for 42% of all respondents. Women reported paying attention to welfare labels more often than men. Those with the most frequent contact with pigs also eat pork most often. Scientists, students, and farmers all chose "yes" to a question on the importance of animal welfare. However, our study has a few limitations, specifically the online distribution of the survey and the focus on collecting a sufficient number of questionnaires from specific professional groups.

KEY WORDS: chi-square, consumer attitudes, pork, Poland, product labels, surveys

*Corresponding author e-mail:
Received: 05.05.2025 Received in revised form: 20.08.2025
Accepted: 20.08.2025 Published online: 30.09.2025

INTRODUCTION

Although Poland is Europe's largest consumer of meat per capita and a clear leader in pork consumption worldwide (FAO, 2024), as in many countries, consumer needs in Poland change over time, leading to different food choices (Resano et al., 2011). Pork consumption in Poland is predicted to decrease (Figure 1), and there may be many reasons for this change (Stoś et al., 2022; Stawicka et al., 2019; Gutkowska et al., 2014; Jakubowska and Radzyminska, 2010).

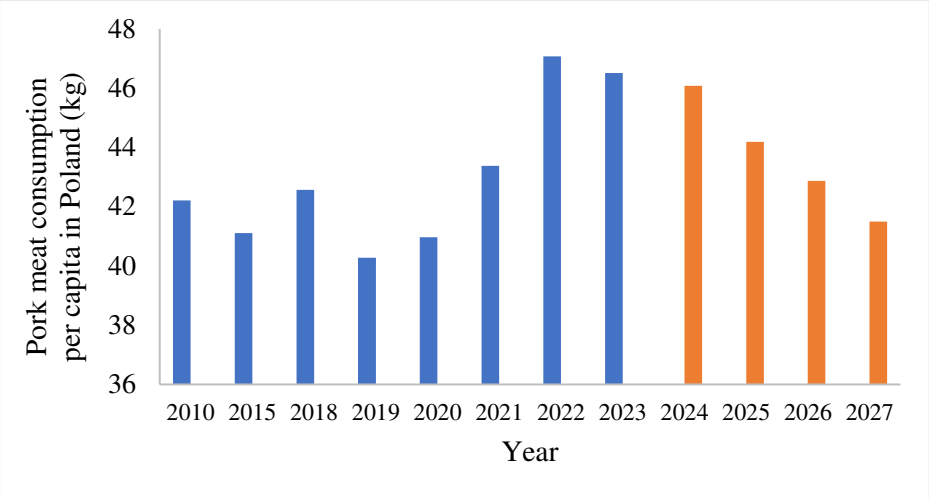


Figure 1. Pork consumption per capita in Poland (in kg) in 2010–2023 (blue bars) and predicted consumption in 2024–2027 (orange bars); source: FAOSTATS April 2024 (FAO, 2025).

Extensive discussion of farm animal welfare and in general the use of animals for human needs in Europe (e.g. Alonso et al., 2020; Weible et al., 2016; Verbeke et al., 2011; Vanhonacker et al., 2009) has also reached Poland (Hanus, 2021; Małażewska and Gajos, 2018). Thus far, this has only changed Polish consumers' choices regarding the type of eggs they buy, resuling in a much larger market share for free-range or deep-litter egg producers (Pawlewicz, 2020). At the same time, many Polish people, instead of choosing higher-welfare meat products, have decided to change to a vegan, vegetarian, or flexitarian diet (Hanus, 2021), which is an increasing trend in Europe in general (Marinova et al., 2024; Nezlek and Forestell, 2020). This is often ethically and morally motivated by concern for farm animals' welfare. However, diet trends are also affected by limited budgets and the higher prices of meat products from improved welfare conditions (Grunert et al., 2018).

Pressure from European citizens to improve animal welfare has already led to many legislative changes in livestock husbandry practices (Fernandes et al., 2021; Molnár and Fraser, 2020). Most of those changes are followed by higher animal production costs, e.g. increased space allowance per animal, causing fewer animals to be reared, or changes in farm buildings required by the shift from individual crates to group housing. Naturally, this is also increasing the cost of producing animal

products. In more affluent countries, such changes have been easier to accept (Li and Kallas, 2021; Katt and Meixner, 2020), since consumers can more easily afford more expensive products with higher welfare ratings. This can even cause some products to disappear from the market, such as the demise of cage-system eggs in Dutch supermarkets (Vonk, 2021). In Poland, such significant changes in access to certain animal products have not yet taken place, and many butchers and supermarkets still offer meat products without clear labelling of welfare status. Such labelling indicates the rearing conditions of the animals from which the meat/animal product is produced, i.e. caged, improved welfare (e.g. more space per animal or outdoor runs), free-range, or organic.

A study by Gołębiewska et al. (2018) concluded that only 50% of Polish consumers were familiar with the concept of animal welfare. The consumers with the most knowledge of animal welfare are those who work with animals on an everyday basis (i.e. farmers), whose education is associated with a profession in the field (veterinarian or animal scientist), or who are in the process of acquiring this type of education (students). No consumer studies on these professional groups in Poland have been reported. It is also unclear whether consumers with more knowledge of pork production and pig welfare would have different preferences when purchasing meat. Therefore, in this study, we aimed to characterize Polish consumers in terms of their attitudes toward animal welfare and pork consumption, taking into account different professional groups: ordinary consumers, animal scientists/veterinarians, students of animal sciences/veterinary medicine, and pig farmers. To gather a sufficient number of respondents associated with animal husbandry, we reached out to those specific groups via email and social media.

MATERIALS AND METHODS

This study gathered data through an online survey shared in Poland from the 6th August to 1st September, 2023. Alongside ordinary consumers (Polish people without education related to animals or working as farmers), we included a substantial number of respondents involved in the pork industry or animal-related fields, which was crucial to fulfil the aim of the study. To this end, the survey was emailed to researchers and students in animal sciences or veterinary medicine from various universities of life sciences throughout Poland and shared with several pig farmer groups on Facebook. Participants were encouraged to share the survey link if they saw fit. In total, 140 responses were obtained.

QUESTIONNAIRE

The survey consisted of two sections. The first section dealt with the socio-demographic characteristics of the respondents, such as place of residence, province of Poland (voivodeship) within Poland, gender, age category, educational background, professional category, and prior contact with pigs. The second section focused on meat consumption habits and purchasing decisions related to pork. This included general pork consumption, frequency of eating pork, types of pork products consumed, the source of these products, preference for pork with welfare labelling, willingness to pay extra for such labelling, and opinions on the culinary and sensory qualities of pork with welfare labels.

STATISTICAL ANALYSIS

All figures and analyses presented in this study were created using R statistical software. The chi-square test was used to examine significant differences between the socio-demographics of respondents and their answers to the survey questions. This allowed us to explore the differences in responses based on different socio-demographic characteristics of the respondents, especially the professional groups associated with animals and ordinary consumers.

RESULTS AND DISCUSSION

EXPLORATORY STATISTICS

A total of 140 responses to our survey were collected. Most participants were women (N = 92), followed by men (N = 47) and one person unwilling to share their gender. Figure 2 presents an overview of the remaining general questions. The majority of respondents were from rural areas (50.7%, N = 71), while only 22.1% (N = 31) were residents of cities with a population of more than 500,000 (Figure 2a). As many as 70.7% (N = 99) of all respondents were from the Greater Poland province. Three Polish provinces were not represented (Lesser Poland, Pomeranian, and Świętokrzyskie), while the remaining provinces were represented in numbers ranging from one to nine respondents (data not shown). Regarding education, 38.6% of respondents had an MSc or equivalent education, while 20% had a high school diploma and another 20% had a PhD or other post-graduate studies (Figure 2b). Regarding age, the vast majority of respondents were between 25 and 35 (N = 41; 29.3%) and 36 and 45 (N = 51; 36.4%), and only seven (5% of all respondents) were in the age category > 65 years (Figure 2c). The next question concerned eating pork, to which nearly 90% of the respondents answered “Yes” (Figure 2e). Then we asked about previous contact with pigs. Here, the responses were fairly evenly distributed, with 13.6% responding “Yes, a few times a year” and 23.6% selecting “Yes, I work with pigs every day”. In contrast, only nine people (6.4%) selected the answer “Yes, but only during my studies” (Figure 2e). Most participants were people not working with pigs or animals in general (57.9%, N = 91; Figure 2f).

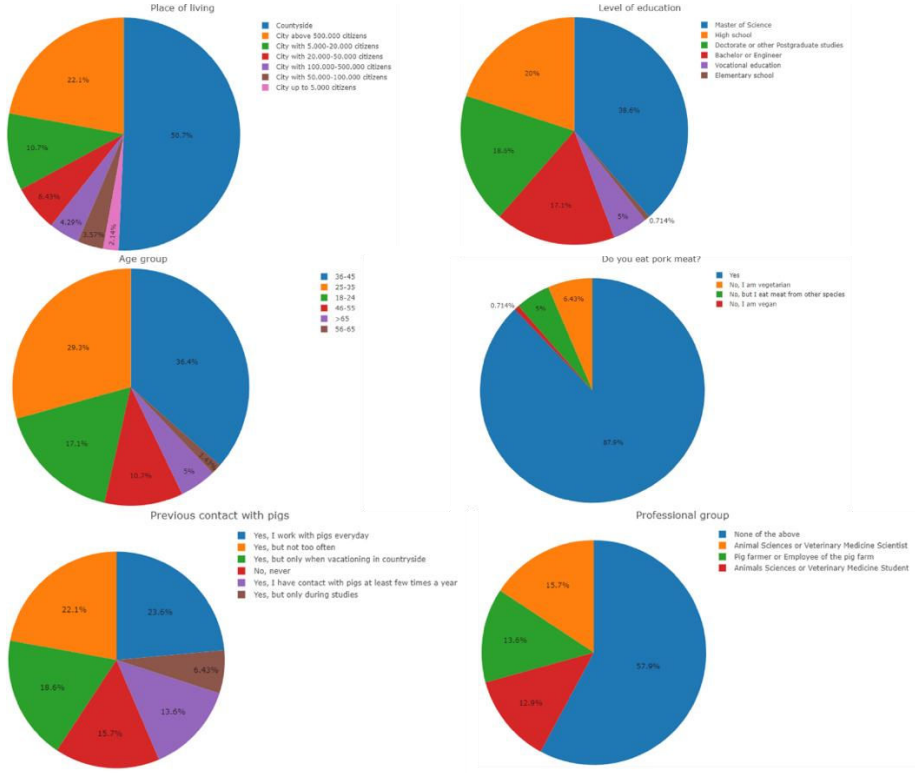


Figure 2. Socio-demographic description of the respondents (n = 140).

PORK CONSUMPTION, SHOPPING PREFERENCES, AND WILLINGNESS TO BUY PORK WITH A "WELFARE LABEL"

In the second section of the survey, we asked the respondents about their pork consumption and shopping preferences. Poland remains one of the largest pork consumers in Europe (FAO, 2025); however, its consumption in the coming years will decrease (Figure 1). Most of our respondents buy cured pork or raw meat to prepare at home, choosing ready meals at restaurants or shops much less frequently (Figure 3A). Our respondents usually buy pork at the butcher's or local meat shop, prepacked from the supermarket, or weighed and packed specially for them at a supermarket (Figure 3B). The results shown in Figure 3 are in line with the preferences of Polish consumers reported in previous studies (Ankiel et al., 2023; Guzek et al., 2020; Verbeke et al., 2011; Jakubowska and Radzyminska, 2010).

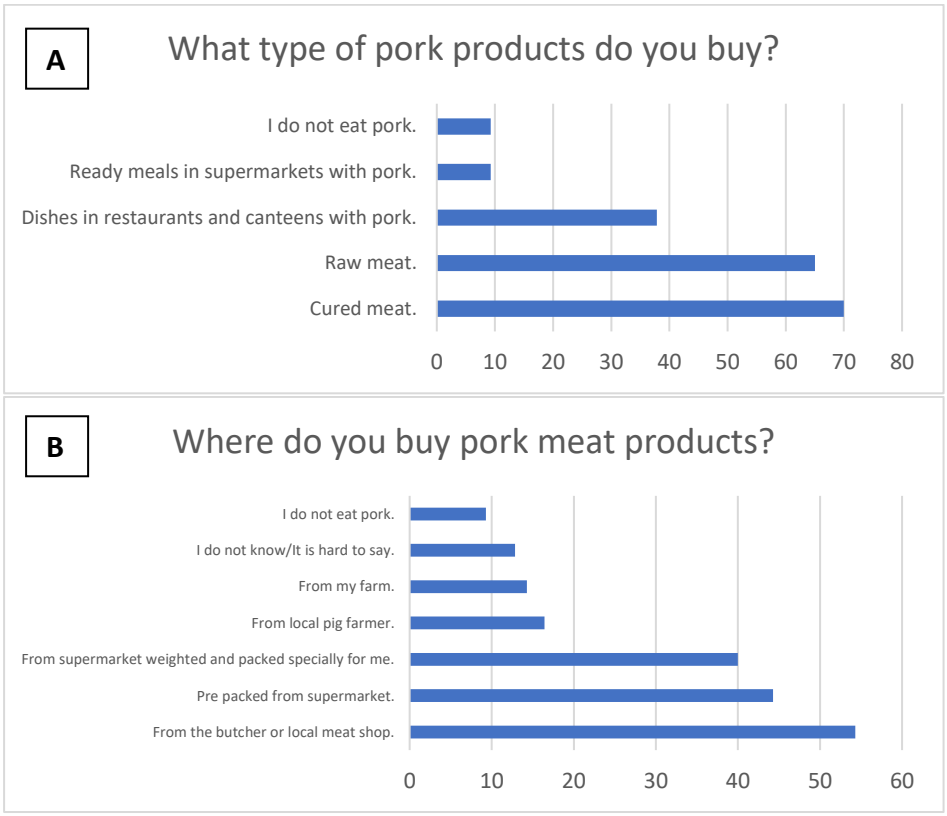


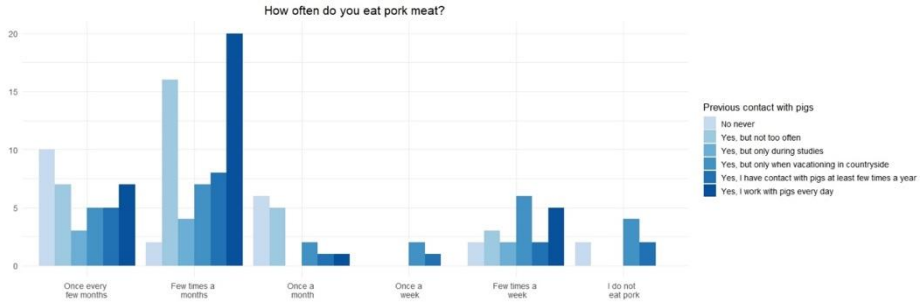
Figure 3. Percentage of Polish consumers selecting specific types of pork products and places they buy them (multiple answers possible).

Significant differences depending on the socio-demographic characteristics of the respondents were present only when the answers to pork consumption questions were compared between genders (chi-square test p-value = 0.01). Most women (n = 79; 86%) and men (n = 44; 94%) reported that they eat pork; only one woman was a vegan (Figure 4). This is in line with previous studies that clearly showed that pork meat is a popular source of animal protein in Poland (Guzek et al., 2020; Verbeke et al., 2011). It should be noted that there were very few vegetarians (n = 7) and vegans (n = 1) among our respondents compared to what is currently observed in Poland (Hanus, 2021); this might have been influenced by the title of the survey, which suggested that it was directed only to pork consumers.

Figure 4. Differences in pork consumption between genders.

Regarding the frequency of eating pork meat, only the degree of previous contact with pigs caused significant differences (chi-square test p-value = 0.01). We were interested to learn about the differences between respondents based on their frequency of contact with pigs, as this has been shown to affect one's perception of the animals' capabilities and needs (Duijvesteijn et al., 2014). Most respondents who work with pigs daily also eat pork most often (n = 20, 61% of this group), whereas 6 of 15 people who did not eat pork also belonged to the group that had no contact with pigs. Among groups that have contact with pigs a few times a year or only during holidays in the countryside, all levels of pork-eating frequency were present (Figure 5). The respondents who only indicated having contact with pigs during their studies also reported the lowest pork-eating frequency (Figure 5).

Figure 5. Differences in respondents' pork consumption depending on the frequency of contact with



pigs.

To the question "Are you more interested in buying pork with a 'welfare label'?", as many as 68% (N = 95) of respondents answered "Yes", while 25 respondents answered "I don't pay attention

to welfare labels" and five answered "No". Significant differences were found only between genders (chi-square test p-value = 0.021) and levels of previous contact with pigs (chi-square test p-value = 0.002). Women are much more interested in pork products with animal welfare labels than men (33 vs. 9 respondents, Figure 5). This is in line with previous findings (Gołębiewska et al., 2018; Vanhonacker et al., 2009). At the same time, however, in our study, 13% of female respondents declared no interest in such products, compared to only 6.3% of men. Those with the most contact with pigs also often indicate interest in pork products with welfare labels from a known source (Figure 6). This is probably due to their extensive knowledge and understanding of the industry and pork production (Ankiel et al., 2023; Gorton et al., 2023; Cubero Dudinskaya et al., 2021; Guzek et al., 2020).

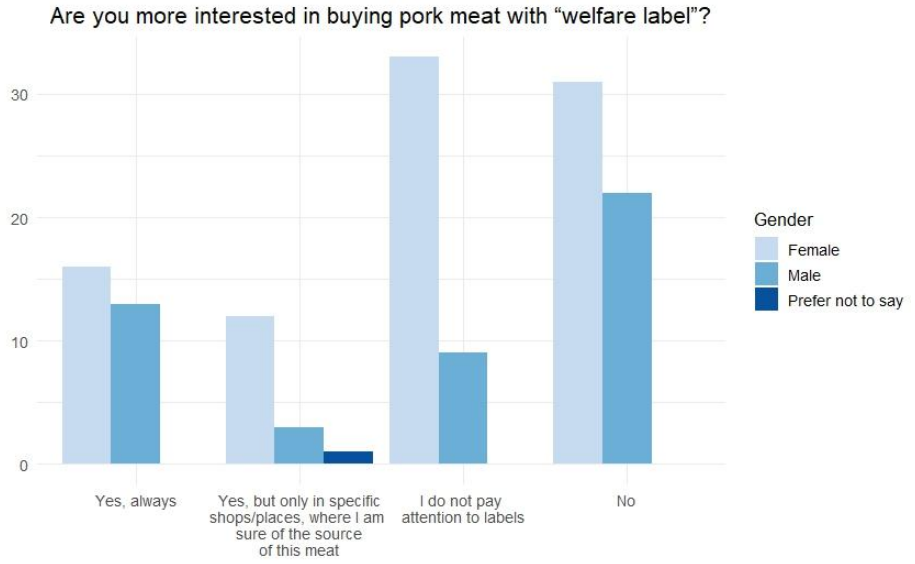


Figure 6. Differences in interest in buying pork meat with a "welfare label" between genders.

Our survey also included a question about consumers' willingness to spend more money on meat from farms with higher welfare. This is an important question because welfare practices such as reduced stocking densities or exploratory materials in pens are an additional expense for farmers, increasing rearing costs. Our results show that as many as 74% of people (N = 93) would spend more on pork produced under improved welfare conditions (Gorton et al., 2023; Cubero Dudinskaya et al., 2021; Li and Kallas, 2021). However, 32 people indicated that they cannot always afford such an expense, which aligns with findings by Gołębiewska et al. (2018). At the same time, responses to questions in a survey can differ from the consumer's actual choices in a shop (Resano et al., 2011) and therefore should be treated with caution.

In the case of the question about the quality of pork from farms with higher welfare standards, only 50% of respondents answered "Yes" (N = 72). Most people answering "Yes" also indicated that pork quality depends on its source (N = 41). This suggests that consumers are willing to buy such

meat for the sake of animal welfare rather than for higher meat quality. Significant differences in the responses to this question were only present between different provinces of Poland (chi-square test p-value = 0.004). This is an interesting result, given that most responses came from Greater Poland, where 40 of 99 people selected "I do not know/It is hard to say" (Figure 7). At least one respondent from nearly all provinces of Poland (except three) answered "Yes" to the question regarding higher quality of meat with a "welfare label" (chi-square test results).

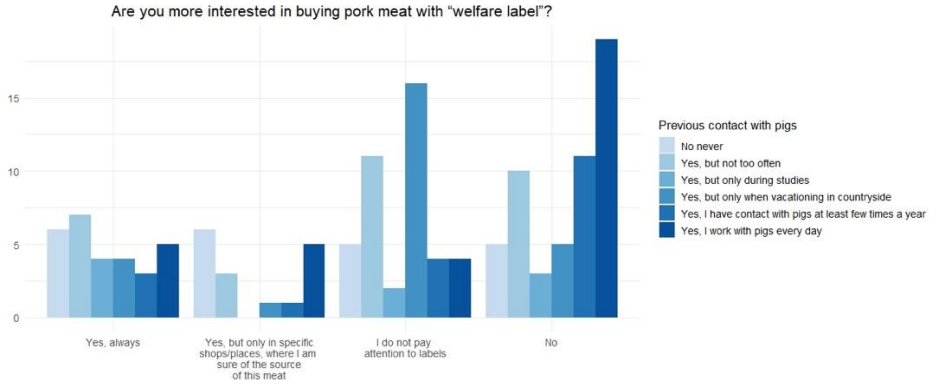


Figure 7. Differences in interest in buying pork meat with a "welfare label" between respondents with different frequency of contact with pigs.

We also wanted to learn whether there are differences in interest in the "welfare label" among Polish consumers. The chi-square test results indicated that the only significant differences were between professional groups (p-value = 0.035). This was because ordinary consumers selected all possible responses to this question (Figure 8).

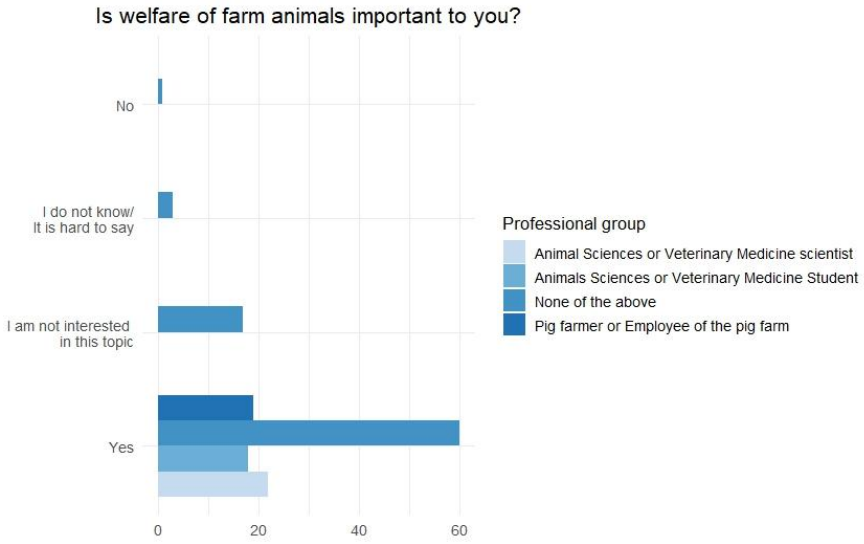


Figure 8. Importance of animal welfare according to professional group.

STUDY LIMITATIONS

Our study is relatively small compared with others, such as the European online survey of consumers conducted by Verbeke et al. (2010), in which about 500 responses per country were collected in Belgium, Denmark, Germany, Greece, and Poland, or a Polish survey of more than 700 consumers (Gołębiewska et al., 2018). At the same time, a relatively recent study used only 100 replies to an online survey among Polish pork consumers (Stawicka et al., 2019). Thus, our study has some limitations, including the online distribution of the survey and the focus on collecting enough questionnaires from specific professional groups (professionals working with pigs).

The online distribution of the survey with questions regarding shopping habits may lead respondents to select a "socially expected" answer that would not be reflected in practice in the shop. To ensure honest answers, we included the option that money is an issue when selecting products with welfare labels. Regarding questions related to animal welfare, the presence of scientists could help the ordinary consumer understand the meaning of the specific terms used in the survey, if necessary. The responses suggest that participants may have struggled to grasp the meaning of the specific conditions in which pigs could be kept. Nevertheless, online distribution of surveys remains the most efficient method in terms of time and reaching large numbers of participants.

In our study, we needed to collect replies from animal scientists, students, and professionals working with pigs on a daily basis. This caused an unusual imbalance in the distribution of all professional groups working with animals (42%) compared to the rest of the respondents (58%). This setup, however, was intentional on our part to ensure that there were ~20 respondents per professional group of animal scientists/veterinarians, students of animal sciences/veterinary medicine, and pig farmers to obtain sufficient data for further analysis, especially given that previous research aiming

to tackle the differences in pig welfare perception had only six participants in each group (Duijvesteijn et al., 2014).

CONCLUSION

Our survey was designed to capture a sufficient number of respondents from among animal/veterinary scientists/students and pig farmers to show the differences between animal experts and ordinary consumers. Although women pay more attention to welfare labels than men, it is high time Polish supermarkets and butcheries began labelling their products with welfare labels to support the knowledge and needs of consumers. At the same time, women accounted for seven of the eight vegetarians/vegans in our study, which confirms their awareness of the necessity of farm animal welfare. Even so, we showed that the consumers with the most frequent contact with pigs also eat pork most often. Thus, consumers with the most knowledge of the pork sector also support it the most. Only ordinary consumers selected all possible answers regarding the importance of animal welfare, whereas scientists, students, and farmers chose only one answer – "yes".

THE SOURCE OF FOUNDING

This work was conducted within the project "Linking extensive husbandry practices to the intrinsic quality of pork and broiler meat" – *mEATquality*, funded by the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement No 101000344.

ETHICS APPROVAL

No animals were used to generate the results of this study. The questionnaires were fully anonymized, no personal data was used, and the respondents were informed that the information collected would be used in scientific publications.

REFERENCES

1. Alonso, M.E., González-Montaña, J.R., Lomillos, J.M., 2020. Consumers' concerns and perceptions of farm animal welfare. Animals 10, 1–13. doi:10.3390/ani10030385.
2. Ankiel, M., Łyko, M., Pachołek, B., 2023. Polish Consumers' Attitudes Towards 'Clean Meat'. Marketing of Scientific and Research Organizations 50, 115–136. doi:10.2478/minib-2023-0025.
3. Cubero Dudinskaya, E., Naspetti, S., Arsenos, G., Caramelle-Holtz, E., Latvala, T., Martin-Collado, D., Orsini, S., Ozturk, E., Zanoli, R., 2021. European Consumers' Willingness to Pay for Red Meat Labelling Attributes. Animals 11, 556. doi:10.3390/ani11020556.
4. Duijvesteijn, N., Benard, M., Reimert, I., Camerlink, I., 2014. Same Pig, Different Conclusions: Stakeholders Differ in Qualitative Behaviour Assessment. Journal of Agricultural and Environmental Ethics 27, 1019–1047. doi:10.1007/s10806-014-9513-z.
5. FAO, 2025. The State of Food Security and Nutrition in the World 2025. FAO ; IFAD ; UNICEF ; WFP ; WHO, Rome, Italy.
6. Fernandes, J.N., Hemsworth, P.H., Coleman, G.J., 2021. Costs and Benefits of Improving Farm Animal Welfare 1–14.
7. Gołębiewska, B., Gębska, M., Stefańczyk, J., 2018. ANIMAL WELFARE AS ONE OF THE CRITERION DETERMINING POLISH CONSUMERS' DECISIONS REGARDING THEIR PURCHASE OF MEAT. Acta Scientiarum Polonorum. Oeconomia 17, 13–21. doi:https://doi.org/10.22630/ASPE.2018.17.3.33.

8. Gorton, M., Yeh, C.-H., Chatzopoulou, E., White, J., Tocco, B., Hubbard, C., Hallam, F., 2023. Consumers' willingness to pay for an animal welfare food label. Ecological Economics 209, 107852. doi:10.1016/j.ecolecon.2023.107852.
9. , , K.G., Sonntag, W.I., Glanz-chanos, V., Forum, S., 2018. Consumer interest in environmental impact , safety , health and animal welfare aspects of modern pig production : Results of a cross-national choice experiment. Meat Science 137, 123–129. doi:10.1016/j.meatsci.2017.11.022.
10. Gutkowska, K., Jankowski, P., Sajdakowska, M., Zakowska-Biemans, S., Kowalczuk, I., 2014. Kryteria różnicujące zachowania konsumentów wobec produktów żywnościowych na przykładzie mięsa i przetworów mięsnych. Żywność Nauka Technologia Jakość 21. doi:10.15193/ZNTJ/2014/96/085-100.
11. Guzek, D., Głąbska, D., Sajdakowska, M., Gutkowska, K., 2020. Analysis of Association between the Consumer Food Quality Perception and Acceptance of Enhanced Meat Products and Novel Packaging in a Population-Based Sample of Polish Consumers. Foods 9, 1526. doi:10.3390/foods9111526.
12. Hanus, G., 2021. Rationalization as New Trend in Food Behavior of Polish Consumers. In Eurasian Business Perspectives (eds Bilgin, M.H., Danis, H., Demir, E., Vale, S.). Springer International Publishing, Cham, pp. 347–360.
13. Jakubowska, D., Radzyminska, M., 2010. Polish consumer attitudes and behaviour towards meat safety risk. Polish Journal of Food and Nutrition Sciences 60.
14. Katt, F., Meixner, O., 2020. Trends in Food Science & Technology A systematic review of drivers influencing consumer willingness to pay for organic food. Trends in Food Science & Technology 100, 374–388. doi:10.1016/j.tifs.2020.04.029.
15. Li, S., Kallas, Z., 2021. Meta-analysis of consumers ' willingness to pay for sustainable food products. Appetite 163, 105239. doi:10.1016/j.appet.2021.105239.
16. Małażewska, S., Gajos, E., 2018. Animal Welfare As a Public Good in Polish Opinion. Annals of the Polish Association of Agricultural and Agribusiness Economists XIX, 153–158. doi:10.5604/01.3001.0010.7921.
17. Marinova, D., Bánáti, D., Bogueva, D., 2024. Flexitarianism: Responding to the Health and Environmental Challenges of Human Diets. In Consumer Perceptions and Food (ed. Bogueva, D.). Springer Nature, Singapore, pp. 333–348. doi:10.1007/978-981-97-7870-6_17.
18. Molnár, M., Fraser, D., 2020. Protecting farm animal welfare during intensification : Farmer perceptions of economic and regulatory pressures 133–141. doi:10.7120/09627286.29.2.133.
19. Nezlek, J.B., Forestell, C.A., 2020. Vegetarianism as a social identity. Current Opinion in Food Science, Sensory Science & Consumer Perception • Food Physics and Material Science 33, 45–51. doi:10.1016/j.cofs.2019.12.005.
20. Pawlewicz, A., 2020. Change of Price Premiums Trend for Organic Food Products : The Example of the Polish Egg Market 14–18.
21. Resano, H., Perez-Cueto, F.J.A., de Barcellos, M.D., Veflen-Olsen, N., Grunert, K.G., Verbeke, W., 2011. Consumer satisfaction with pork meat and derived products in five European countries. Appetite 56, 167–170. doi:10.1016/j.appet.2010.10.008.
22. Stawicka, J., Sobotka, W., Pomianowski, J.F., Szramko, E., 2019. AN ANALYSIS OF CONSUMER ATTITUDES AND PREFERENCES CONCERNING PORK PURCHASES. POLISH JOURNAL OF NATURAL SCIENCES 34, 455–466.

23. Stoś, K., Rychlik, E., Woźniak, A., Ołtarzewski, M., 2022. Red and Processed Meat Consumption in Poland. Foods 11, 3283. doi:10.3390/foods11203283.
24. Vanhonacker, F., Verbeke, W., Van Poucke, E., Buijs, S., Tuyttens, F.A.M., 2009. Societal concern related to stocking density, pen size and group size in farm animal production. Livestock Science 123, 16–22. doi:10.1016/j.livsci.2008.09.023.
25. Verbeke, W., Pérez-Cueto, F.J.A., Barcellos, M.D. de, Krystallis, A., Grunert, K.G., 2010. European citizen and consumer attitudes and preferences regarding beef and pork. Meat Science 84, 284–292. doi:10.1016/j.meatsci.2009.05.001.
26. Verbeke, W., Pérez-Cueto, F.J.A., Grunert, K.G., 2011. To eat or not to eat pork, how frequently and how varied? Insights from the quantitative Q-PorkChains consumer survey in four European countries. Meat Science 88, 619–626. doi:10.1016/j.meatsci.2011.02.016.
27. Vonk, S., 2021. The Dutch journey to cage free. doi:https://www.vencomaticgroup.com/blog/the-dutch-journey-to-cage-free.
28. Weible, D., Christoph-Schulz, I., Salamon, P., Zander, K., 2016. Citizens' perception of modern pig production in Germany: a mixed-method research approach. British Food Journal 118, 2014–2032. doi:10.1108/BFJ-12-2015-0458.

ACKNOWLEDGMENTS

ESK would like to thank Dominika Kroplewska for her help with the survey distribution and Katarzyna Rzewuska for many fruitful discussions during the preparation of the manuscript.