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Consumers' Acceptance of Meat Products Derived from Male Layer-Type Chickens—A Pilot Study

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Abstract: A pilot survey involving 50 respondents was conducted to evaluate ready-to-eat products (smoked chicken and chicken pâté) made from male layer-type chickens (Lohmann Brown Classic). The survey consisted of 19 questions divided into three panels, including sociodemographic questions, questions about preferences for different kinds of meat products, and questions related to the products from male layer-type chickens offered for evaluation. The aim of the study was to investigate the general attitudes of the respondents towards the consumption of chicken meat and chicken products, their opinion of the proposed solution for the utilization of the male layer-type chickens, as well as to evaluate the organoleptic properties of the proposed products and respondents' willingness to purchase them. The results demonstrated a high degree of approval of the option to raise male layer-type chickens for meat. The proposed ready-to-eat products were rated very highly (8.09 and 7.94 for smoked chicken and chicken pâté, respectively) on a 9-point hedonic scale, and the comparison with similar products in the market showed that the products evaluated in the survey were generally perceived as better than the products usually consumed by the respondents. The responses concerning the price ranges and the frequency of purchase indicated favorable stated purchasing intentions and potential consumer interest in the proposed products. Age was positively associated with both willingness to pay and intended purchase frequency for chicken pâté after false discovery rate (FDR) adjustment. The results are encouraging and support further investigation of raising male layer-type chickens for meat as an alternative to their culling, although the findings should be interpreted cautiously due to the pilot nature of the study and the limited sample size.

Keywords: male layer-type chickens; consumers; acceptance; ready-to-eat products; pilot survey

1. Introduction

The growing demands for globally produced poultry meat require intensive selection of broilers for fast growth and improved feed conversion. The selection of these indicators has mainly economic importance. However, intensive selection for rapid growth may be associated with certain meat quality defects [1], which may receive insufficient attention. This leads to an increasing interest in meat from another type of birds—slow-growing [2,3]. Slow-growing chicken genotypes have attracted increasing research interest as alternatives to conventional fast-growing broilers, particularly regarding meat quality and production characteristics [4–6]. In earlier studies [7], it was found that the male layer-type chickens meet the growth-rate criteria characteristic of

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slow-growing chickens. This revealed a possibility for utilizing male chicks from layer production as an alternative source of poultry meat, potentially contributing to the development of a specialized market niche for high-quality meat products. Previous research has indicated that meat from male layer-type chickens may exhibit favorable nutritional and sensory characteristics, supporting further investigation of its potential use in poultry meat products [8].

Worldwide research into the potential utilization of male layer-type chickens began in the 1970s, with the main aim of improving the economic efficiency of egg production. In the 1990s, the development of animal welfare concerns brought renewed attention to the utilization of male layer-type chickens, as the culling of male chicks shortly after hatching raised ethical and societal concerns. One approach to addressing this issue involves in ovo sex determination, which allows the identification of male embryos before hatching. This technology has already entered commercial application in some European countries, including Germany and France, although its implementation involves technical, economic, and animal-welfare considerations [9].

Also, the development of dual-purpose chicken genotypes has been investigated as an alternative strategy, although their production and economic competitiveness remain challenging. In dual-purpose systems, females are used for egg production and males for meat production; however, lower production efficiency compared with specialized commercial genotypes remains an important limitation [9,10]. Another approach involves rearing male layer-type chickens for meat production and developing value-added products, although economic efficiency and market acceptance remain important challenges [11].

In Bulgaria, research on the utilization of male layer-type chickens began in 2010 and subsequently included investigations of their meat quality [7,12]. As a result of these experiments, we found that the meat of the male layer-type chickens raised until 12 weeks of age exhibited quality characteristics comparable to those of slow-growing broilers. Nevertheless, further research is needed to assess consumer acceptance and the commercial potential of meat products derived from male layer-type chickens. The previous study by Petkov et al. [13], conducted in Sofia with 56 respondents, examined consumer attitudes towards the utilization of male layer-type chickens and the acceptability of products prepared from whole chickens of different weights (200 and 900 g). In contrast, the present study was conducted independently in Plovdiv with 50 different participants and focused on the sensory acceptance of two processed ready-to-eat products, smoked chicken and chicken pâté. There was no overlap between the participants in the two studies. Thus, the present investigation extends the previous research by providing additional preliminary evidence on consumer acceptance of specific processed meat products derived from male layer-type chickens. In collaboration with local gastronomes in Germany, Kaufmann and Andersson [14] investigated the potential of meat from male layer-type chickens to be marketed as a delicacy. Their study indicated a positive consumer response and suggested opportunities for marketing such meat in specialized niche markets. Nevertheless, evidence concerning consumer responses to specific processed products derived from male layer-type chickens remains limited, particularly regarding the relationship between sensory acceptance, animal-welfare attitudes, and stated purchasing intentions.

Hence, the aim of the study was to investigate the general attitudes of the respondents towards the consumption of chicken meat and chicken products, their opinion of the proposed solution for the utilization of the male layer-type chickens, as well as to evaluate the sensory acceptance of smoked chicken and chicken pâté and consumers' willingness to purchase these products, including their stated purchase frequency and willingness to pay. The findings were intended to provide preliminary evidence of consumer acceptance and to support further research into the potential utilization of male layer-type chickens for meat production as an alternative to their culling. The specific contribution of this study lies in examining consumer responses to two ready-to-eat processed products derived from male layer-type chickens, using an independent sample of respondents and integrating sensory evaluations with attitudes towards animal welfare and stated purchasing intentions.

2. Materials and Methods

2.1. Experimental Birds and Products

Lohmann Brown Classic male layer-type chickens were involved in the study. The birds were reared at the Institute of Animal Science-Kostinbrod until 5 and 9 weeks of age. The birds originated from the same experimental flocks described by Kolev et al. [15], where further details on the rearing conditions, feeding, and slaughter procedures are provided. Two products were prepared—pâté from the 5-week-old cockerels and smoked chicken from the older ones. The slaughter ages were selected based on technological considerations related to the different processing requirements of the two products. Meat from 5-week-old cockerels was used for pâté production, whereas meat from 9-week-old cockerels was used for smoked chicken production. The products were made at the University of Food Technologies-Plovdiv. The pâté was produced using previously described procedures involving cooking and deboning of the poultry meat, preparation of a meat emulsion with liver, pork back fat, and other

ingredients, stuffing into casings, and thermal processing to an internal temperature of 72 °C [15]. The smoked chicken was prepared by brine injection, vacuum tumbling, drying, smoking, and steam cooking to an internal temperature of 72 °C, following the procedure described by Dragoev et al. [16]. Detailed formulations and processing conditions are provided in the cited publications.

The different slaughter ages were associated with the production of the two distinct meat products. Since product type and slaughter age were not varied independently, their separate effects on sensory acceptance could not be determined. For the purposes of this pilot study, both products were offered for evaluation to visitors at the Plovdiv Fair in February 2024. A total of 50 volunteers participated in the survey and were recruited through convenience sampling among fair visitors. Participation was voluntary, and verbal informed consent was obtained from the respondents. Four respondents selected the "minor" category in the marital status question. Two of them reported being 16 years old, whereas the other two did not provide their age. All four participated in the presence of a parent, who provided verbal permission for their participation. One of the 16-year-old respondents participated in the sensory evaluation, while the other, who did not consume meat, answered only a limited number of questions and did not participate in the sensory evaluation. Respondents classified as minors were excluded from comparisons based on marital status because of the small subgroup size, while their other valid responses were retained in the corresponding analyses.

The experimental protocol involving the rearing and slaughter of male layer-type chickens was conducted under permit No. 277 issued by the Bulgarian Food Safety Agency, following the opinion of the Bulgarian Animal Ethics Committee (Statement No. 193, Protocol No. 18, 2 July 2020). The survey was conducted independently of the earlier investigation by Petkov et al. [13], which involved a separate group of respondents in Sofia. There was no overlap between participants in the two studies.

2.2. Questions of the Survey

The questionnaire consisted of 19 questions divided into three panels. The complete original questionnaire, including questions not analyzed in the present study, is provided together with its English translation in a single bilingual table (Supplementary Questionnaire S1). The first panel contained 6 general questions about the sociodemographic characteristics of the respondents. The second panel included seven questions (Q7–Q13) concerning respondents' meat consumption habits, preferences for chicken meat and products, perceptions of meat quality, and purchasing decisions. Q11 allowed respondents to select multiple chicken parts or products. For the analysis, each respondent's total preference score was normalized to 1 and distributed equally among the selected categories. In Q12, respondents could select only one of four chicken production categories corresponding to the type of chicken meat they perceived as having the highest quality. Explanations of the different chicken production systems were provided by the survey administrators only upon request, and no standardized definitions were provided to all participants. In Q13, respondents could select up to five factors influencing their chicken meat purchasing decisions, although some selected fewer than five. The percentages for Q13 were calculated as the proportion of respondents selecting each factor among those who provided a valid response to the question. During data processing, it was identified that one respondent had selected six factors instead of the permitted maximum of five. All six selections were retained in the analysis to preserve the original recorded responses and avoid the arbitrary exclusion of any selected factor. The third panel consisted of 6 questions related to the products from the male layer-type chickens offered for evaluation. The third panel covered attitudes towards the utilization of male layer-type chickens, sensory evaluation of the two products, perceived product quality, and stated purchasing intentions, including willingness to pay and intended purchase frequency. The sensory evaluation of the products was performed using a 9-point hedonic scale. The scale was explained verbally to participants in Bulgarian, with descriptors ranging from 1 ("dislike extremely") to 9 ("like extremely"), and 5 representing a neutral response ("neither like nor dislike"). The sensory attributes assessed for both products included appearance, texture, smell, tenderness, colour, flavour, and overall acceptance. Both products were evaluated by the same participants. Smoked chicken and chicken pâté were assessed separately, as they represent two distinctly different types of meat products. Questions Q14 and Q15, concerning attitudes towards the culling of day-old male chicks and the proposed alternative, were answered after the sensory evaluation of both products. The price categories in Q18 referred to 1 kg of product. Prices were originally expressed in Bulgarian leva (BGN) and were converted into euros (EUR) for presentation in the manuscript using an approximate conversion rate of 1 EUR = 2 BGN. The price categories retained the boundaries used in the original questionnaire; therefore, adjacent intervals shared boundary values. For each product (smoked chicken and chicken pâté), respondents were asked to select only one cell in a price–purchase frequency matrix. Each selected cell simultaneously represented the price range the respondent was willing to pay (Q18) and the intended frequency of purchase (Q19). These two components were subsequently extracted as separate categorical variables for descriptive and statistical analysis. Although the

original questionnaire included seven price categories, only five were presented in the results, as no respondents selected the two highest price ranges (BGN 20–25 and above BGN 25). The evaluation was conducted without participant blinding or the inclusion of control samples of comparable commercial products. The order of product presentation was not documented; therefore, potential order effects on sensory ratings could not be assessed. Accordingly, the results reflect the participants' subjective perceptions and acceptance of the evaluated products rather than an objective comparative assessment against commercially available alternatives. For the classification of respondents by place of residence, large cities were defined as settlements with more than 20,000 inhabitants, while small towns were defined as towns with fewer than 20,000 inhabitants. Villages were considered a separate category.

2.3. Statistical Evaluation

Statistical analyses were performed using JMP Pro 17 software. Descriptive statistics, including absolute and relative frequencies, percentages, and medians, were used to summarize the questionnaire responses, as appropriate.

Given the categorical and ordinal nature of the questionnaire data and the relatively small sample size, statistical methods were selected according to the type of response variable. Associations between binary responses and categorical sociodemographic characteristics were assessed using Fisher's exact test. Ordinal responses were compared using the Mann–Whitney U test for two independent groups and the Kruskal–Wallis test for three or more groups. Where applicable, post hoc multiple comparisons were performed using the Steel–Dwass method.

Associations between ordinal responses and respondents' exact age or income were evaluated using Spearman's rank correlation coefficient (ρ). Binary logistic regression was applied to examine the relationships between binary responses and age or income. Response categories were coded as 0 and 1, and model significance was evaluated using the likelihood-ratio chi-square test. To account for multiple hypothesis testing, raw *p*-values were adjusted using the Benjamini–Hochberg false discovery rate (FDR) procedure within predefined families of comparisons. The correction was applied separately to the relevant families of hypothesis tests, as specified in the supplementary tables. For each questionnaire question, the six comparisons involving sociodemographic characteristics were treated as one family of tests. For sensory evaluations of smoked chicken and chicken pâté, FDR correction was performed separately for each product, with 42 comparisons comprising seven sensory attributes and six sociodemographic characteristics treated as one family of tests per product. Missing responses were excluded on an analysis-by-analysis basis. Consequently, the number of valid observations varied across questions, products, and sociodemographic characteristics. Each analysis included only respondents with valid data for both the sociodemographic variable and the corresponding questionnaire response. The numbers of valid observations for individual questions and sociodemographic subgroups are reported in the corresponding supplementary tables. Differences in sample sizes reflect missing questionnaire responses or missing sociodemographic information. The four respondents classified as minors were excluded from comparisons based on marital status but were retained in other analyses for which they had provided valid responses. Given the exploratory nature of this pilot study and the limited sample size, the findings were interpreted cautiously.

3. Results and Discussion

Table 1 presents the questions included in the three questionnaire panels. A total of 50 volunteers participated in the pilot survey; however, not all respondents answered every question. The number of valid responses varied across sociodemographic characteristics, ranging from 35 (70%) for monthly income to 50 (100%) for marital status, with the highest proportions of missing responses observed for age (28%) and income (30%). Some questions concerning meat consumption and purchasing preferences were not answered by respondents who reported that they did not consume meat.

Due to incomplete responses, the number of valid observations varied across questions and sociodemographic characteristics. Each statistical analysis included only respondents with valid data for the variables involved.

3.1. Panel 1: Sociodemographic Distribution of the Respondents

Various studies have shown that sociodemographic factors, such as age, gender, and level of education, as well as social group, family size, and income, influence consumers' food purchasing decisions [17–19]. Studies of organic food consumers have also identified differences in purchasing behaviour associated with sociodemographic characteristics. As indicated by Gundala and Singh [20], age, education, and income are associated with consumers' purchasing behaviour towards organic foods. The results of Gutkowska et al. [21] show that more educated consumers are more likely to accept changes in foods of animal origin compared to those with a lower level of education, while another study identified differences in preferences for genetically modified foods of plant and animal origin according to educational level [22]. Table 2 presents the sociodemographic characteristics of the respondents.

Table 1. Questions in the survey.

No	Panel Number and Questions
	Panel 1. Sociodemographic Questions
1	Gender
2	Age
3	Education
4	Marital status
5	Place of residence
6	Average monthly income
	Panel 2. General Questions about the Preferences for Meat Products
7	Do you consume meat?
8	How often do you eat chicken meat?
9	Which weight of the whole chicken do you prefer?
10	Would you pay a higher price for better quality?
11	Which kind of chicken part/product do you prefer?
12	Which type of chicken product, according to the rearing system, is perceived as having higher quality?
13	Which factors affect you when purchasing chicken meat?
	Panel 3. Questions Concerning the Poultry Products in Our Survey
14	What is your opinion about the generally accepted practice for culling the day-old male layer-type chickens?
15	Do you consider the decision proposed by the project to be appropriate for solving this issue?
16	Sensory evaluation of the proposed products
17	Please compare the quality of the products from this survey with other similar ones that you usually purchase.
18	What price would you pay for the proposed products?
19	How often would you like to purchase the proposed products?

Table 2. Sociodemographic characteristics of the respondents (Panel 1).

No	Question	Possible Answers	Number of Respondents	% of Respondents
1	Gender	male	25	51.02
		female	24	48.98
		total	49	100
2	Age *	≤20 y	3	8.33
		21–30 y	5	13.89
		31–40 y	8	22.22
		41–50 y	6	16.67
		51–60 y	5	13.89
		>60 y	9	25.00
		total	36	100
3	Education	student	2	4.08
		primary	1	2.04
		secondary	24	48.98
		higher	22	44.90
		total	49	100
4	Marital status	minor	4	8
		single	15	30
		married	19	38
		divorced	8	16
		widowed	4	8
		total	50	100
5	Place of residence	large city (>20,000)	25	52.08
		small town (<20,000)	15	31.25
		village	8	16.67
		total	48	100
6	Monthly income per family member (€) *	<750.00	14	40.00
		750.01–1000.00	12	34.29
		1000.01–1250.00	4	11.43
		>1250.00	5	14.29
		total	35	100

*: Age and monthly income are presented in categories for descriptive purposes. Exact age and income values were used as continuous variables in the correlation and regression analyses. The first age category includes respondents aged 20 years or younger (≤20 years). Four respondents selected the "minor" category for marital status. Two reported being 16 years old, while the other two did not provide their age. Therefore, the number classified as minors based on marital status differs from the number of respondents with a reported age below 18 years. Monthly income refers to the average net monthly income per family member.

Although the survey included participants differing in gender, age, education, marital status, place of residence, and income, the relatively small sample size and the recruitment procedure do not allow the sample to be considered representative of the general population. Due to the small number of observations in the "student" and "primary education" categories, these respondents were excluded from the comparative analyses based on education.

3.2. Panel 2: Preferences for Chicken Meat Products

Questions 7–13 in Panel 2 relate to the general attitudes of the respondents towards chicken meat and products. The results concerning the preferences of the respondents and numerical coding of the responses to Questions 7–10 are given in Table 3.

Table 3. Distribution and numerical coding of responses to Questions 7–10 concerning meat consumption and purchasing preferences.

Question	Possible Answers	% of Respondents	Numerical Coding
Q7. Do you consume meat?	yes	92.00	1
	no	8.00	0
Q8. How often do you eat chicken meat?	daily	8.70	4
	several times a week	50.00	3
	once a week	28.26	2
	several times a month	13.04	1
	once a month	0	-
	less than once a month	0	-
	I do not eat chicken meat	0	no value
Q9. Which weight of the whole chicken do you prefer?	>2.0 kg	15.91	5
	1.5–2.0 kg	22.73	4
	1.0–1.5 kg	50.00	3
	0.5–1.0 kg	9.09	2
	<0.5 kg	2.27	1
Q10. Would you pay a higher price for better quality?	yes	89.13	1
	no	10.87	0

All 50 participants answered Q7, with 46 respondents (92.00%) reporting that they consumed meat and four (8.00%) indicating that they did not. No statistically significant associations were observed between meat consumption and gender, education, marital status, place of residence, age, or income after adjustment for multiple comparisons using the Benjamini–Hochberg false discovery rate (FDR) procedure (all FDR-adjusted p-values > 0.05; Supplementary Table S7). Meat consumption was similarly prevalent among female (91.67%) and male (92.00%) respondents.

According to the data obtained from the answers to Q8, poultry meat was consumed frequently by the surveyed respondents (Table 3). All respondents who answered this question indicated a frequency of consumption ranging from every day to several times a month. The most frequently reported consumption frequencies were several times per week (50%) and once a week (28.26%). These results are similar to those obtained by Cărătuș Stanciu [23] in a study conducted with 240 consumers, where the frequency of purchasing chicken meat at least once a week was 62.48%. Also, Özkan et al. [24], in a study conducted in Turkey, found that slightly more than a third (36.5%) of the participants bought chicken meat only once a week, while the other third (33%) bought chicken meat several times a week. However, these studies examined purchasing frequency, whereas Q8 in the present study assessed consumption frequency; therefore, the results are not directly comparable. Although a higher frequency of poultry meat consumption among lower-income consumers might be expected based on the findings of Demir and Aydin [25], no significant association with income was observed in the present study. Age showed a nominally significant association with the frequency of poultry meat consumption (Spearman's $\rho = 0.3672$; raw $p = 0.0356$). However, this association did not remain statistically significant after FDR adjustment (adjusted $p = 0.2136$). No other statistically significant associations were identified (Supplementary Table S8).

Concerning the preferred weight for the whole chicken (Q9), most respondents preferred chickens weighing at least 1 kg, with the 1.0–1.5 kg category being the most frequently selected (50%). Age showed a nominally significant positive correlation with preferred whole-chicken weight (Spearman's $\rho = 0.3896$; raw $p = 0.0275$). However, this association did not remain statistically significant after FDR adjustment (adjusted $p = 0.1650$). No other statistically significant associations were identified (Supplementary Table S9).

Our results showed that almost 90% of the respondents answered positively when asked whether they would pay a higher price for higher quality (Q10). Binary logistic regression revealed a nominally significant positive

association between age and willingness to pay a higher price for better-quality meat (β = 0.09435; raw $p = 0.0122$). However, this association was not statistically significant after Benjamini–Hochberg FDR correction (adjusted $p = 0.0734$). No statistically significant associations were found between willingness to pay a higher price for better quality and gender, education, marital status, place of residence, age, or income after FDR adjustment (all adjusted p-values > 0.05; Supplementary Table S10). A study conducted in Chile reported that consumers were willing to pay an average of 15.2% more for beef produced under improved animal welfare standards [22]. In our study, the question of price is examined in more detail in the third panel of questions.

The possible answers of the respondents and their numerical coding for Questions 11–13 are presented in Table 4.

Table 4. Numerical encoding of responses to Questions 11–13 concerning preferred chicken parts and products, perceived product quality, and purchasing factors.

Question	Preference	Possible Answer	Numerical Coding	Possible Answer	Numerical Coding
Q11. Which kind of chicken part/product do you prefer?	whole chicken	yes	1	no	0
	breast	yes	1	no	0
	legs	yes	1	no	0
	wings	yes	1	no	0
	pâté	yes	1	no	0
	other	yes	1	no	0
Q12. Which type of chicken product, according to the rearing system, is perceived as having higher quality?	fast-growing commercial broiler	yes	1	no	0
	slow-growing broiler	yes	1	no	0
	backyard broiler	yes	1	no	0
	backyard chicken	yes	1	no	0
Q13. Which factors affect you when purchasing chicken meat?	shelf-life	yes	1	no	0
	price	yes	1	no	0
	colour	yes	1	no	0
	smell	yes	1	no	0
	producer	yes	1	no	0
	place of purchase	yes	1	no	0
	flavour	yes	1	no	0
	rearing	yes	1	no	0
	tenderness	yes	1	no	0
	country of origin	yes	1	no	0
	diet	yes	1	no	0
	weight	yes	1	no	0
	texture	yes	1	no	0
	packaging	yes	1	no	0
	animal welfare	yes	1	no	0

Q11 referred to the respondents' preferences for various chicken parts and products. Whole chicken accounted for the largest share of normalized preferences, exceeding 50% of the total (Figure 1).

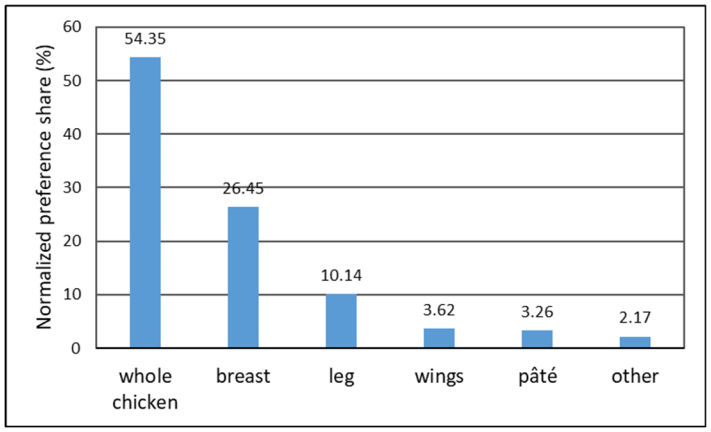

Figure 1. Distribution of normalized preferences for different chicken parts and products. Note: Respondents could select more than one chicken part or product. Each respondent's total preference score was normalized to 1 and distributed equally among the selected categories (e.g., 1.0 for one selected product, 0.5 for each of two products, and 0.333 for each of three products). The percentages represent the relative contribution of each product category to the total normalized preference score across respondents.

Among the individual chicken parts, breast and legs accounted for the largest shares of normalized preferences (26.45% and 10.14%, respectively) (Figure 1). Wings were less preferred, while pâté accounted for 3.26% of the total normalized preferences.

The analysis of normalized preference scores showed that whole chicken was the most preferred product, followed by chicken breast (Supplementary Table S11A). Although a positive correlation was observed between age and preference for whole chicken (Spearman's ρ = 0.4055; raw p = 0.0192), this association was not statistically significant after FDR adjustment (adjusted p = 0.4760). Nominally significant associations were also observed between place of residence and preference for whole chicken (raw p = 0.0485), and between education and preference for chicken wings (raw p = 0.0454). However, neither association remained statistically significant after FDR adjustment (adjusted p = 0.4760 for both). Overall, no statistically significant associations were found between preferences for chicken parts/products and the examined sociodemographic characteristics after FDR adjustment (Supplementary Table S11B).

Q12 examined respondents' perceptions of chicken meat quality in relation to the poultry rearing system. We found that over 80% of respondents perceived products from backyard-reared chickens as having higher quality (backyard chicken—53.33% and backyard broiler—28.89%) (Figure 2).

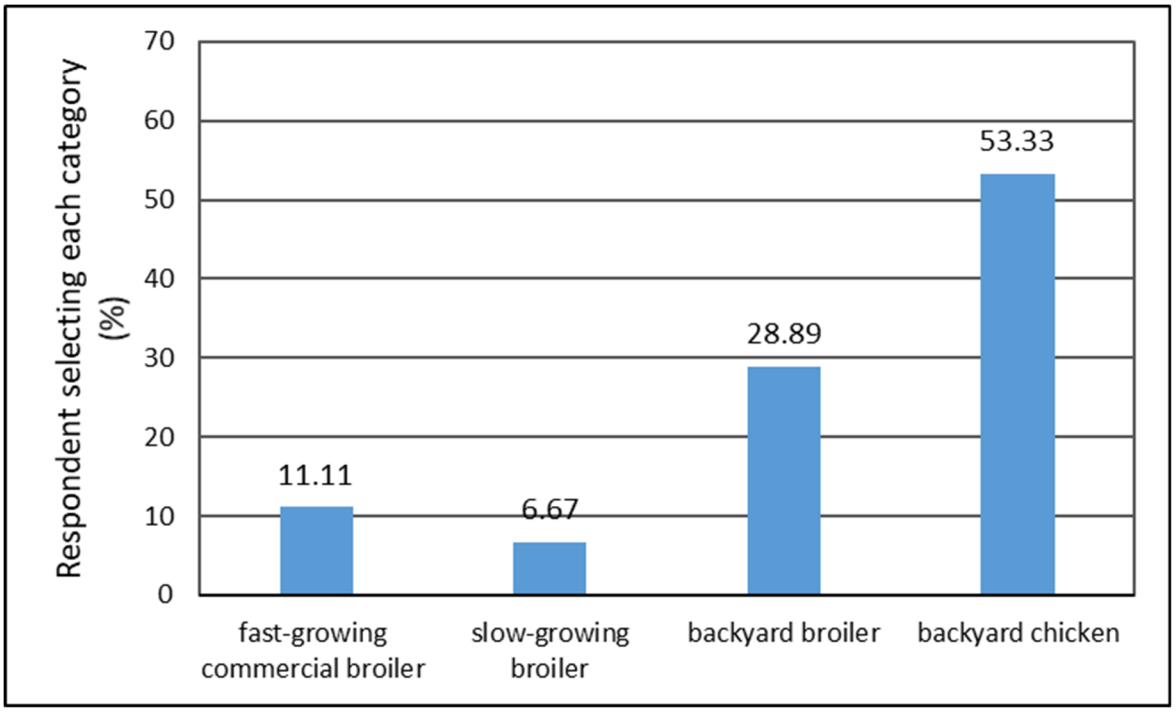

Figure 2. Perceived meat quality according to chicken type and rearing system.

The perception of backyard chicken as the higher-quality meat source was significantly associated with age (β = 0.1052; FDR-adjusted p = 0.0072) and place of residence (FDR-adjusted p = 0.0072). Older respondents were more likely to select backyard chicken, while the proportion selecting this category increased from 28.57% among residents of large cities to 71.43% in small towns and 100% in villages. No other associations remained statistically significant after FDR adjustment (Supplementary Table S12). These findings are consistent with the importance of poultry rearing systems in shaping consumer perceptions of meat quality, as discussed by Castellini et al. [26]. The absence of standardized explanations of the chicken production systems in Q12 may have resulted in differences in how respondents interpreted the answer categories.

The factors determining the choice of chicken meat were the subject of Q13. Fifteen factors were listed, and the respondents were allowed to indicate up to 5 answers. The results showed (Figure 3) that the main determining factors for purchasing choices were shelf life and price, indicated by 50.00% and 43.48% of respondents, respectively, followed by colour (32.61%), smell (30.43%), and producer (30.43%). Animal welfare received the fewest selections (2.17%).

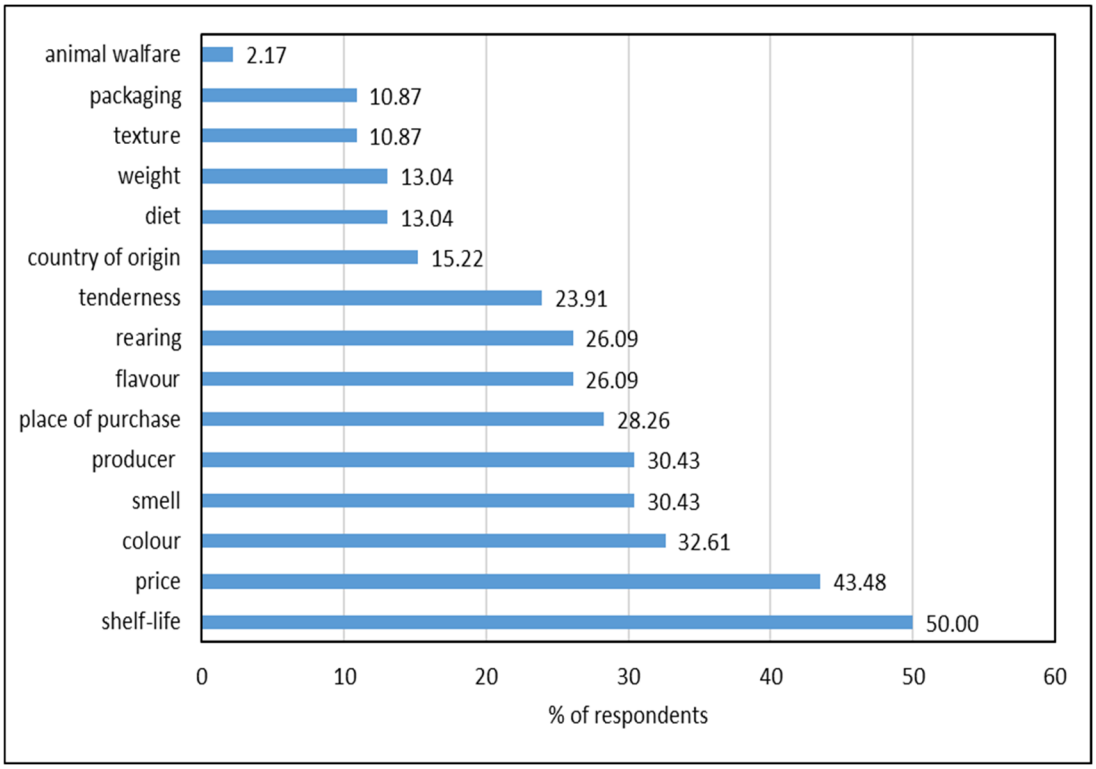

Figure 3. Factors reported by respondents as affecting their choice when purchasing chicken meat.

Age was positively associated with the importance attributed to the rearing system when purchasing chicken meat ($\beta = 0.1068$; raw $p = 6.12 \times 10^{-5}$), and this association remained statistically significant after FDR adjustment (adjusted $p = 0.0052$). Nominally significant associations were also observed between gender and country of origin (raw $p = 0.0470$), education and packaging (raw $p = 0.0485$), marital status and rearing system (raw $p = 0.0463$), place of residence and place of purchase (raw $p = 0.0317$), and income and shelf life (raw $p = 0.0075$). However, none of these five associations remained statistically significant after FDR adjustment (adjusted $p = 0.5153$ for the first four associations and 0.3188 for income and shelf life). No other statistically significant associations were identified after FDR adjustment (Supplementary Table S13).

Sensory appeal and natural content of the food have been identified as important food choice motives among consumers in several European countries [27]. In their study, Neima et al. [28] reported that freshness ranked first among factors influencing chicken meat purchasing decisions, followed by ease of preparation and tenderness, taste, and appearance. Price ranked fifth according to its mean score, with 43.00% of respondents expressing a neutral opinion about its importance. In an online survey conducted in Germany, Escobedo del Bosque et al. [29] identified the main factors influencing chicken meat purchasing decisions: origin of the product (30%), freshness (30%), appearance (23%, including colour), followed by type of packaging (13%) and brand (3%). Some consumers express concerns about intensive farming practices and express willingness to pay more for food produced under higher animal welfare standards [30–32]. However, higher prices may limit the purchase of products associated with improved animal welfare [33]. More recently, Peschel et al. [34] demonstrated that consumer preferences for animal welfare attributes in meat products differ according to ethical orientation and price sensitivity, highlighting the heterogeneity of purchasing decisions. In the present study, animal welfare was the least frequently selected purchasing factor (2.17%; Figure 3), although the reasons for its low ranking could not be determined from the survey data. A similarly low proportion (3.7%) was reported by Bonamigo et al. [32], who found that animal welfare was initially considered by only a small minority of Brazilian consumers when purchasing chicken meat.

3.3. Panel 3: Attitudes towards the Chicken Products Evaluated in the Survey

Q14 and Q15 examined consumers' attitudes towards the existing practice of culling male layer-type chicks and the possible solutions to this problem. Since meat from male layer-type chickens was used in the preparation of the products evaluated in the survey, these questions were included in this panel to assess respondents' attitudes towards the issue and the proposed alternative. The results and the numerical coding of responses to Q14 and Q15 are presented in Table 5.

Table 5. Distribution and numerical encoding of responses to Q14 and Q15 concerning the culling of day-old male layer-type chicks and the proposed alternative.

Question	Possible Answers	% of Respondents	Numerical Coding
Q14. What is your opinion about the generally accepted practice for culling the one-day-old male layer-type chickens?	I do not approve	84	3
	I do not have an opinion	16	2
	I approve	0	1
Q15. Do you consider the solution proposed by the project appropriate for solving this issue?	Definitely yes	80	5
	Rather yes	20	4
	Cannot decide	0	3
	Rather no	0	2
	Definitely no	0	1

Note: Percentages are based on the responses to each question. Numerical coding corresponds to the response categories used in the questionnaire. Categories with no observed responses were retained to present all possible response options.

The results presented in Table 5 show that 84% of respondents disapproved of the existing practice of culling day-old male layer-type chicks, while 16% expressed no opinion. The solution proposed in the project was considered definitely appropriate by 80% of the respondents. The remaining 20% selected "Rather yes", indicating that all respondents expressed a positive attitude towards the proposed solution. Although 84% of respondents disapproved of the culling of day-old male chicks, animal welfare accounted for only 2.17% of the reported purchasing factors. This difference suggests that expressed ethical concerns may not necessarily translate into purchasing priorities.

The analysis of the answers according to the sociodemographic factors (Supplementary Tables S14 and S15) did not reveal any statistically significant associations after FDR adjustment (all adjusted p-values > 0.05). No significant gender-related differences were observed. Although previous studies have reported that women tend to express greater concern about animal welfare issues [35], the relatively small sample size of the present pilot study limits the interpretation of this finding.

Q16 required consumers to assess the sensory attributes of the ready-to-eat products—smoked chicken and chicken pâté. Seven parameters were evaluated, namely appearance, texture, smell, tenderness, colour, flavour, and overall acceptance of the products on a 9-point scale, with 9 being the highest and 1 being the lowest.

The results of the sensory evaluation are shown in Figures 4 and 5. Of the 41 respondents who participated in the sensory evaluation, 32 provided an overall acceptance score for each product. The number of valid assessments for the remaining sensory attributes ranged from 39 to 41, depending on the attribute and product. Both products received high sensory scores, indicating favorable acceptance among the respondents. The mean sensory scores for smoked chicken ranged from 8.09 to 8.44, and for chicken pâté ranged from 7.73 to 8.38.

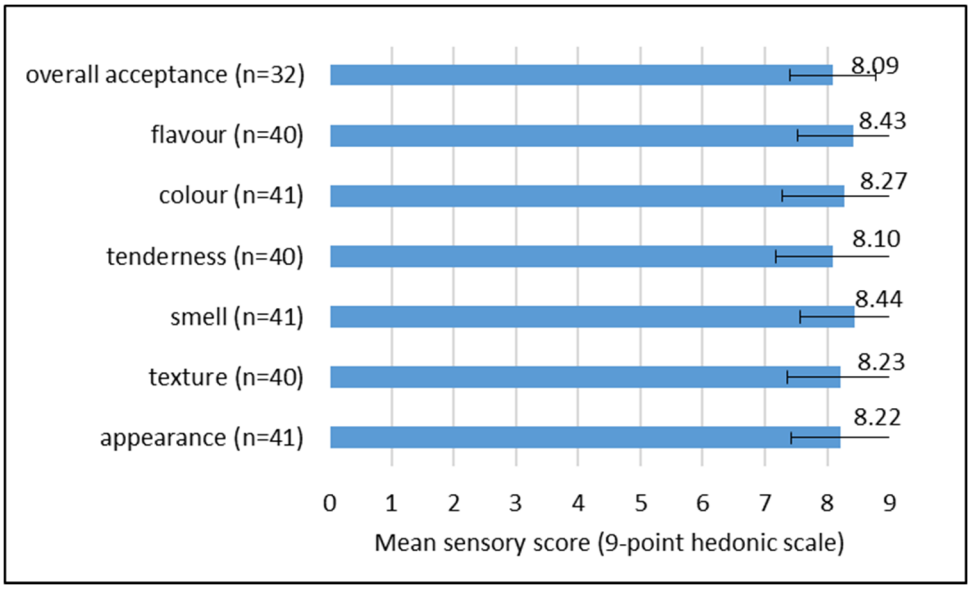

Figure 4. Mean sensory scores of smoked chicken. Error bars represent standard deviations (SD).

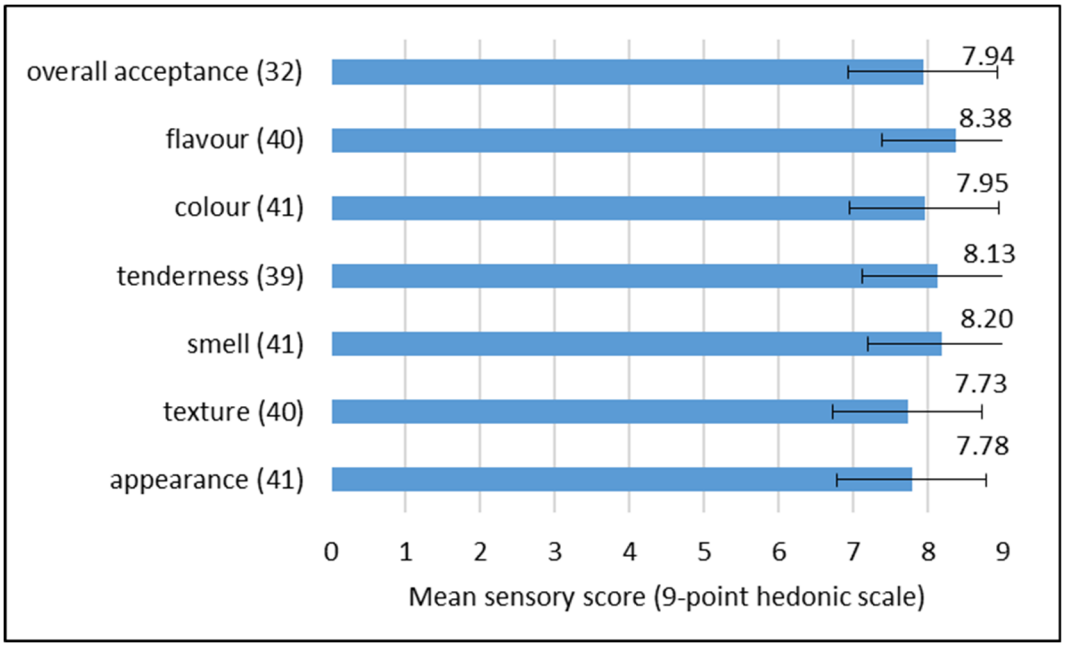

Figure 5. Mean sensory scores of chicken pâté. Error bars represent standard deviations (SD).

The differences in the respondents' sensory evaluation of smoked chicken and chicken pâté according to gender, age, education, marital status, place of residence, and income are presented in Supplementary Table S16.

The sensory evaluations of smoked chicken and chicken pâté did not differ significantly between female and male respondents after FDR adjustment (Supplementary Table S16).

Regarding age, a nominally significant negative correlation was observed between age and smell scores for smoked chicken (Spearman's $\rho = -0.3649$; raw $p = 0.0436$). However, this association did not remain statistically significant after FDR adjustment (adjusted $p = 0.4578$). No statistically significant associations between age and sensory evaluations of chicken pâté were identified after FDR adjustment (Supplementary Table S16).

No significant differences were found in the scores of respondents with higher and secondary education after FDR adjustment (Supplementary Table S16). As mentioned above, students and people with primary education were excluded from the comparisons due to their small numbers.

For smoked chicken, a nominally significant association was observed between marital status and smell scores (Kruskal–Wallis test; raw $p = 0.0041$). However, this association did not remain statistically significant after FDR adjustment (adjusted $p = 0.0861$). No statistically significant associations between marital status and the sensory evaluations of chicken pâté were identified after FDR adjustment (Supplementary Table S16).

For smoked chicken, nominally significant associations were observed between place of residence and appearance (raw $p = 0.0032$) and consistency (raw $p = 0.0249$). However, neither association remained statistically significant after FDR adjustment (adjusted $p = 0.0861$ and 0.3486, respectively). No statistically significant associations between place of residence and sensory evaluations of chicken pâté were identified after FDR adjustment. Similarly, no statistically significant associations were observed between income and the sensory evaluations of either product after FDR adjustment (Supplementary Table S16).

The comparison of the perceived quality of the tasted products with similar products usually purchased by the respondents indicated favorable evaluations of both products (Table 6). Only 5.41% of respondents reported no difference, and only for one of the products. All respondents rated smoked chicken as "better" (56.76%) or "much better" (43.24%). For chicken pâté, 54.05% selected "better", 40.54% selected "much better", and 5.41% reported no difference. No respondent rated either product as "worse" or "much worse".

Similar consumer preferences have been reported in studies comparing products from different poultry genotypes. In a study conducted with 100 consumers of fast-growing (Vencobb) and slow-growing (Indbro) broilers, Devatkal et al. [4] reported that 67% of consumers preferred meat and meat products prepared from the slow-growing Indbro genotype ($p < 0.05$). No statistically significant associations between the comparative product assessments and the examined sociodemographic characteristics were identified after FDR adjustment (Supplementary Table S17).

Table 6. Comparative assessment of the perceived quality of smoked chicken and chicken pâté relative to similar products usually purchased by respondents.

Question	Possible Answers	% of Respondents		Numerical Coding
		Smoked Chicken	Chicken Pâté	
Q17. Please compare the quality of the products from this survey with other similar ones that you usually purchase.	Much better	43.24	40.54	5
	Better	56.76	54.05	4
	No difference	0	5.41	3
	Worse	0	0	2
	Much worse	0	0	1
	I have not consumed such a product	0	0	no value

Questions 18 and 19 examined respondents' willingness to pay and intended purchase frequency for the proposed products. The possible answers and the numerical coding are presented in Table 7.

Table 7. Numerical encoding of possible responses to Q18 and Q19 concerning willingness to pay and intended purchase frequency for the proposed products.

Question	Possible Answers	Numerical Coding
Q18. What price would you be willing to pay for the proposed products, smoked chicken and chicken pâté?	>7.50 €	5
	6.00–7.50 €	4
	4.50–6.00 €	3
	3.00–4.50 €	2
	<3.00 €	1
Q19. How often would you be willing to purchase the proposed products, smoked chicken and chicken pâté?	several times a week	7
	once a week	6
	several times a month	5
	once a month	4
	once every few months	3
	less than once every few months	2
	never	1

The most frequently selected price ranges for the proposed products were €4.50–6.00 for smoked chicken (51.11%; Figure 6) and €6.00–7.50 for chicken pâté (46.67%; Figure 7), with these two price categories together accounting for approximately 75% of responses for each product. The analysis of sociodemographic characteristics revealed a significant positive association between age and the price category selected for chicken pâté (Spearman's $\rho = 0.7035$; FDR-adjusted $p = 4.24 \times 10^{-5}$), indicating that older respondents tended to select higher price categories. No statistically significant associations were found for smoked chicken or for the other sociodemographic factors after FDR adjustment (Supplementary Table S18).

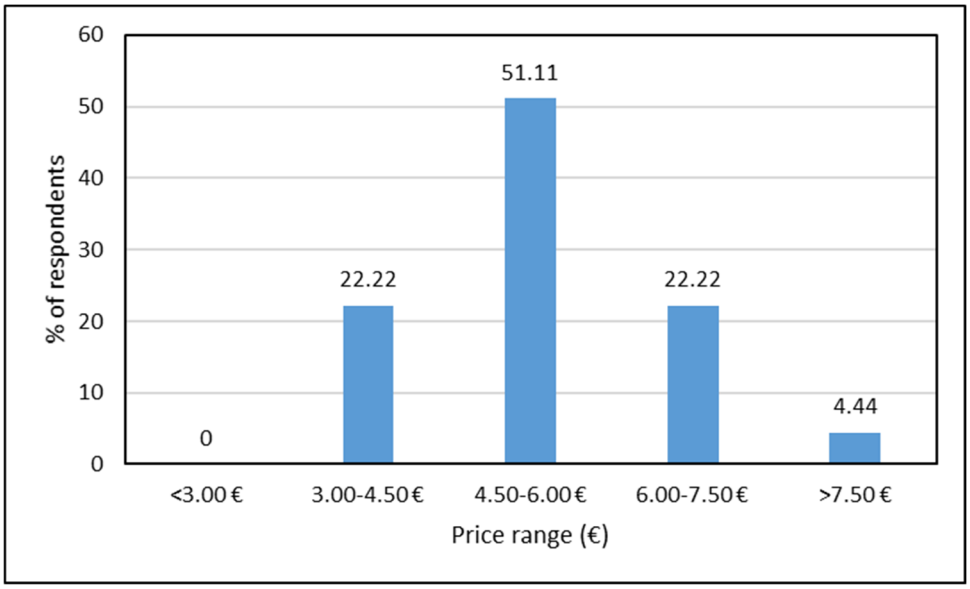

Figure 6. Respondents' willingness to pay for smoked chicken.

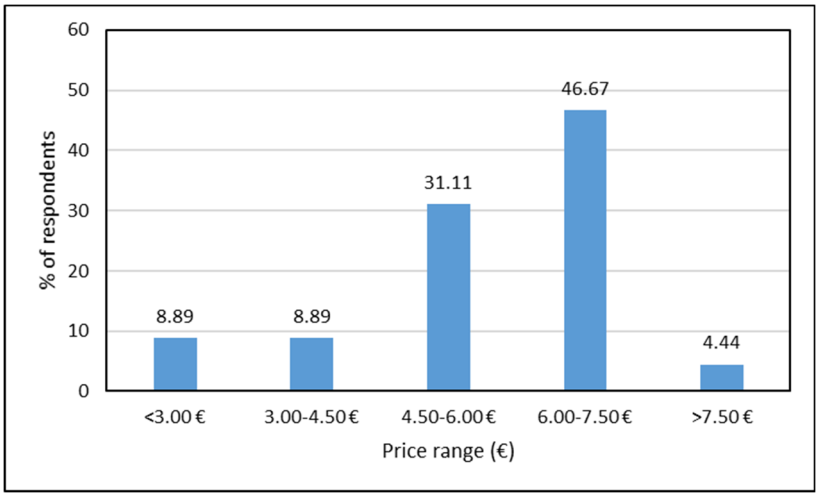

Figure 7. Respondents' willingness to pay for chicken pâté.

Q19 from the third panel refers to the frequency of purchase of the offered products—smoked chicken and chicken pâté. The results are presented in Figures 8 and 9.

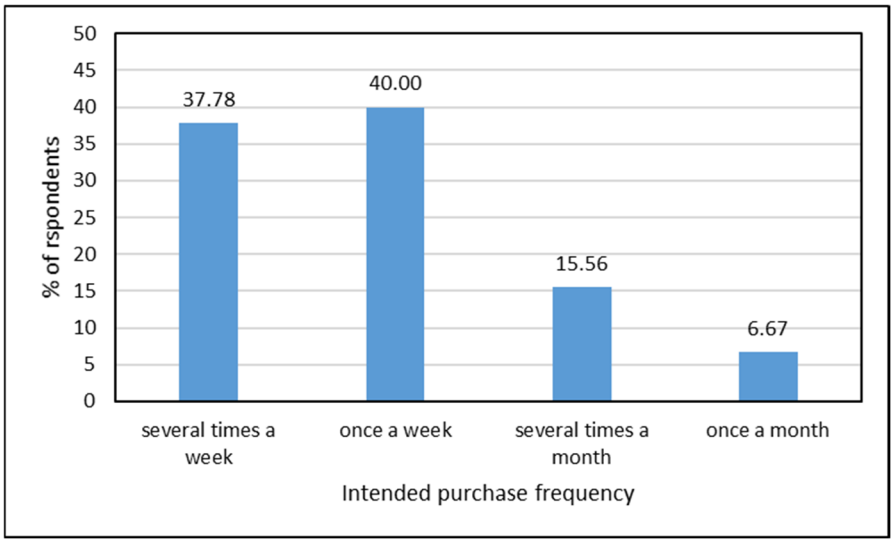

Figure 8. Intended purchase frequency of smoked chicken.

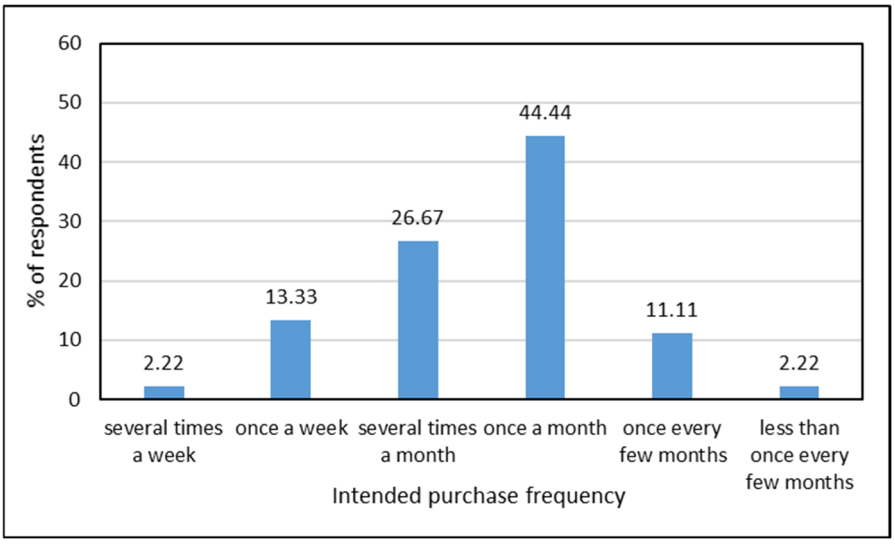

Figure 9. Intended purchase frequency of chicken pâté.

A total of 78% of respondents indicated that they would be willing to purchase smoked chicken at least once a week (37.78% several times per week and 40.00% once per week) (Figure 8), while for chicken pâté the most frequently selected answers were once a month and several times a month (Figure 9). The analysis of sociodemographic characteristics revealed a statistically significant positive association between age and intended purchase frequency for chicken pâté (Spearman's $\rho = 0.5101$; FDR-adjusted $p = 0.0171$), indicating that older respondents tended to report a higher intended purchase frequency. No statistically significant associations were identified for smoked chicken or for the other sociodemographic factors after FDR adjustment (Supplementary Table S19).

In particular, no statistically significant gender-related differences in intended purchase frequency were observed for either product. Previous studies have also examined gender-related differences in chicken meat consumption. Harvey et al. [36] found no statistically significant gender-related differences in chicken meat consumption. However, in a study conducted in Brazil, Pinto da Rosa et al. [37] reported that women, particularly those over 25 years of age, were among the more frequent consumers of chicken meat. These findings concern chicken meat consumption, whereas the present study assessed stated intentions to purchase specific chicken products; therefore, direct comparisons should be interpreted with caution. The reported willingness to pay and intended purchase frequency reflect stated consumer intentions rather than actual purchasing behaviour. Furthermore, the absence of production cost data does not allow conclusions regarding the economic viability of these products.

In the present study, no statistically significant associations were found between respondents' income and their willingness to pay for either product after FDR adjustment (Supplementary Table S18). Neima et al. [28] also reported no statistically significant association between income and the importance of price as a factor influencing chicken meat purchasing decisions ($\chi^2 = 23.489$; $p = 0.708$). However, their study examined general chicken meat purchasing behavior, whereas the present study assessed stated willingness to pay for specific ready-to-eat products.

4. Conclusions

The pilot survey included respondents with different sociodemographic characteristics, including gender, age, education, marital status, place of residence, and income. The respondents' preferences for different types of meat and, in particular, chicken products were examined, including preferred place of purchase, chicken weight, and product selection criteria. Respondents expressed strong support for raising male layer-type chickens for meat production as an alternative to culling day-old male chicks. The prepared ready-to-eat products received high mean sensory scores of 8.09 for smoked chicken and 7.94 for chicken pâté. Compared with similar products usually purchased by the respondents, both products were generally perceived more favorably. The respondents' willingness to pay and intended purchase frequency indicated favorable purchasing intentions, suggesting potential consumer interest in these products. Respondents' age was positively associated with both willingness to pay and intended purchase frequency for chicken pâté after FDR adjustment. However, given the limited sample size and convenience sampling approach, these findings should be considered exploratory and cannot be generalized to the wider consumer population.

Supplementary Materials

The additional data and information can be downloaded at: https://media.sciltp.com/articles/others/2611260848454183/FSP-26080232-SM.pdf.

Author Contributions

K.D.: methodology, investigation, formal analysis, data curation, writing—original draft preparation; E.P.: conceptualization, investigation, formal analysis, resources; N.K.: investigation, formal analysis, data curation, resources; D.V.-V.: investigation, resources; D.B.: investigation, resources; T.P.: investigation, project administration, formal analysis, writing- review and editing. All authors have read and agreed to the published version of the manuscript.

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Institutional Review Board Statement

The experimental protocol involving the rearing and slaughter of birds was designed in accordance with Directive 2010/63/EU on the protection of animals used for scientific purposes and Bulgarian Ordinance No. 20 of 1 November 2012. The animal experiment was conducted under permit No. 277 issued by the Bulgarian Food Safety Agency, following the opinion of the Bulgarian Animal Ethics Committee (Statement No. 193, Protocol No. 18, 2 July 2020). The consumer survey and sensory evaluation involving human participants were carried out in accordance with the rules of the Declaration of Helsinki (1975, revised in 2013), and approval No. 13 of 15.12.2023 was received based on Art. 28, para. 4 of the Regulations for the Organization of Research Activities at the University of Food Technologies.

Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

Data Availability Statement

The data supporting the findings of this study are presented in the article and its Supplementary Materials. An individual-level dataset, accompanied by a codebook and data-processing notes, has been prepared for confidential editorial and peer-review assessment, subject to applicable ethical and data protection requirements. Requests for access to the data may be directed to the corresponding author. Original handwritten questionnaires are not publicly available to protect participants' privacy.

Conflicts of Interest

The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analysis, or interpretation of data; in the writing of the manuscript; or in the decision to publish the results.

Use of AI and AI-Assisted Technologies

No AI tools were utilized for this paper.

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