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Consumers and future Veterinarians: Attitudes of Veterinary students toward welfare–friendly meat products and labelling in Türkiye

Consumidores y futuros veterinarios: Actitudes de los estudiantes de veterinaria hacia los productos cárnicos respetuosos con el bienestar y el etiquetado en Turquía

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ABSTRACT

The animal welfare concept is gaining more importance at the international level in the production process of animal products, to ensure sustainability, ethical production, and food safety. Consumers' sensitivity and approach to animal welfare affect their animal product preferences directly. The present study aimed to uncover the attitudes of veterinary faculty students in Türkiye toward meat products produced considering animal welfare and welfare–friendly labeling and the factors affecting this. To this end, this cross–sectional study was designed by applying a questionnaire to 256 participants. The questionnaire form consisted of 10 sociodemographic questions and 29 5-point Likert–type questions. Explanatory Factor Analysis and Confirmatory Factor Analysis were used along with the varimax rotation method. As a result of these analyses, the Welfare–Friendly Meat Product Scale (WFP–Cronbach alpha: 0.951) and the Welfare–Friendly Labeling Scale (WFL–Cronbach alpha: 0.960) were created. The total average score of the participants from the scales was found to be 71.85 (min: 17, max: 85) for WFP and 50.28 (min: 12, max: 60) for WFL. It was found that women were more sensitive to animal welfare and had higher intentions to purchase ethical products compared to men. Only 1% of participants thought that consumers were responsible for ensuring animal welfare. Interestingly, participants thought that fish had more welfare problems than sheep, goats, and turkeys. It was also found that meat prices had a significant impact on participants' consumption preferences (participants said they would consume more red meat and less chicken if their prices were the same).

Key words: Ethical production; fish welfare; meat product; welfare–friendly product; welfare–friendly labeling

RESUMEN

El concepto de bienestar animal cobra cada vez mayor importancia a nivel internacional en el proceso de producción de productos animales, con el fin de garantizar la sostenibilidad, la producción ética y la seguridad alimentaria. La sensibilidad y el enfoque de los consumidores hacia el bienestar animal influyen directamente en sus preferencias. El presente estudio tuvo como objetivo identificar las actitudes de los estudiantes de Veterinaria en Turquía hacia los productos cárnicos elaborados considerando el bienestar animal y el etiquetado favorable al bienestar animal, así como los factores que influyen en ello. Para ello, se diseñó un estudio transversal mediante la aplicación de un cuestionario a 256 participantes. El cuestionario constaba de 10 preguntas sociodemográficas y 29 preguntas tipo Likert de 5 puntos. Se utilizaron análisis factoriales explicativos y confirmatorios, junto con el método de rotación varimax. Como resultado de estos análisis, se crearon la Escala de Productos Cárnicos Amigables con el Bienestar Animal (WFP–alfa de Cronbach: 0,951) y la Escala de Etiquetado Amigable con el Bienestar Animal (WFL–alfa de Cronbach: 0,960). La puntuación media total de los participantes en las escalas fue de 71,85 (mín.: 17, máx.: 85) para WFP y de 50,28 (mín.: 12, máx.: 60) para WFL. Se observó que las mujeres eran más sensibles al bienestar animal y tenían mayor intención de comprar productos éticos que los hombres. Solo el 1 % de los participantes consideraba que los consumidores eran responsables de garantizar el bienestar animal. Curiosamente, los participantes consideraban que el pescado presentaba más problemas de bienestar que las ovejas, las cabras y los pavos. También se observó que el precio de la carne influía significativamente en las preferencias de consumo de los participantes (los participantes afirmaron que consumirían más carne roja y menos pollo si sus precios fueran iguales).

Palabras clave: Producción ética; bienestar de los peces; producto cárnico; producto respetuoso con el bienestar; etiquetado respetuoso con el bienestar

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INTRODUCTION

Products obtained from animals raised under high welfare standards are called *welfare–friendly products*, meaning that animals are reared under natural living conditions, free from mistreatment, pain, and stress, using production methods that prioritize animal welfare. Protecting and raising farm animals under better conditions is crucial for sustainable animal husbandry, improving productivity, reducing treatment costs, and ensuring food safety [1, 2, 3, 4]. Moreover, the concept of animal welfare has gained global importance due to concerns related to environmental impact, food security, and climate change [5].

In recent years, society has become increasingly sensitive to animal welfare for ethical, humanitarian, and food safety reasons [6]. Studies show that consumers generally believe that poor conditions for animals are also harmful to themselves [7]. Therefore, ethical considerations increasingly influence purchasing behavior, and demand for welfare–friendly products has encouraged a shift from traditional to more responsible production systems [1, 8, 9].

In several countries, companies have adopted animal welfare principles to enhance their brand image and meet consumer expectations, transforming welfare into a value–added product [7, 8]. For instance, a growing number of consumers in the United States [8, 10, 11, 12], Mexico [13], and Italy [14] are willing to pay more for animal products from welfare–friendly systems. According to European Union data, 59% of Europeans are willing to pay more for such products, and 52% consider welfare–related labels when purchasing [15].

Because consumers cannot directly observe production conditions, certification and labeling systems serve as key references for welfare standards. Welfare–friendly labels indicate that products are ethically and sustainably produced according to minimum welfare criteria, building trust among conscious consumers [7, 16, 17]. Internationally recognized certification programs include the Royal Society for the Prevention of Cruelty to Animals (RSPCA), Animal Welfare Approved, Certified Humane, Better Leven, and Global Animal Partnership (GAP) [3].

In Türkiye, although there is no specific labeling system for animal welfare, Veterinary Health Certificates are issued by the Ministry of Agriculture and Forestry. In addition, “free range” and “organic” labels appear on the market but do not fully reflect welfare–friendly standards. Despite increasing global interest, the welfare–friendly product market in Türkiye is still emerging, and consumer awareness remains uncertain [18].

Although several studies have examined welfare–friendly products in different countries including research involving veterinary students in other contexts [21], no study has investigated consumer attitudes in Türkiye toward such products and labeling. The present research is original in that it focuses on Türkiye, where welfare–friendly labeling practices have not yet been established, offering a unique regional contribution to the literature [7, 13, 17, 19, 20, 21].

Accordingly, the present study aimed to assess the attitudes of Veterinary faculty students in Türkiye (student consumers) toward meat products produced with animal welfare considerations and welfare–friendly labeling, and to identify the factors influencing these attitudes. Since welfare–friendly labels are not yet common in Türkiye, veterinary students—both as consumers and as future professionals in animal production—were selected as the study group. Their perspectives are expected to provide insights into future trends in consumer behavior and the development of welfare–friendly products in Türkiye.

MATERIALS AND METHODS

Ethical approval

The ethics committee’s approval for the study was obtained from the Kafkas University Non–Interventional Ethics Committee (Approval date 02.05.2024; no: 4). Also, permission was obtained from the Dean of the Faculty of Veterinary Medicine on 07.05.2024.

Research questionnaire design

The questionnaire consisted of three parts. The first part of the questionnaire consisted of 6 demographic questions (gender, undergraduate level, animal husbandry history, income level, taking animal welfare courses, owning a pet) and 4 field questions (Who is responsible for ensuring welfare–friendly meat production? Which animal group has the most welfare problems? Which animal meat do you consume the most? Which animal meat would you consume if the price per kilogram was the same?).

In order to formulate the statements included in the second and third sections of the questionnaire, an extensive review of the existing literature on consumer attitudes towards animal welfare and welfare–friendly products was carried out. To ensure the clarity and content validity of the statements, a panel of seven experts – including two in veterinary ethics, one in food science, one in animal science, one in physiology and two in livestock economics – assessed each of the proposed items. The experts provided comments on their relevance and wording, and as a result three statements were rephrased and two were merged to avoid redundancy.

Several authors have underlined that animal welfare is increasingly perceived as an integral part of meat production [7, 17, 19], therefore we propose the following hypothesis:

- **H1.** Animal welfare is a feature to be included in the meat product during the production process.

Previous empirical studies have shown that consumers are positively influenced by the presence of welfare–related labels and that labeling increases their willingness to pay for such products [3, 13, 22]. Therefore:

- **H2.** Participants support welfare–friendly labels on meat products.

Research conducted on veterinary students reveals that students who receive animal welfare training have a more positive attitude toward both animal welfare and welfare–friendly production practices [23]. Based on these findings, this hypothesis was developed:

- **H3.** Having taken an animal welfare course among consumers who are veterinary faculty students increases

their support for animal welfare and welfare–friendly products in the production process.

In addition, studies have reported a positive association between pet ownership and sensitivity to animal protection issues [24], which leads to the following hypothesis:

- **H4.** Pet ownership increases sensitivity to animal welfare and welfare–friendly products in the production process.

Finally, several studies have shown that price remains one of the most important drivers of consumers' purchasing decisions [7, 19]. On this basis we propose:

- **H5.** Meat prices change consumers' meat preferences.

Before the study was initiated, a pilot study was conducted with 5 students for preliminary evaluation of the length of the questionnaire and the comprehension of the scales. Based on the feedback from the students, three items were rearranged in terms of language and meaning, and the questionnaire form took its final form.

Participants and data collection

The study was conducted with veterinary faculty students in Türkiye. It is reported that because of reasons such as technological advances in the new world order, the familiarity and interest of young generations in using the internet, ease of use, low cost, speed and wider reach paper–based studies in social sciences have been replaced by electronic media via the internet and social media [25].

In the present study, participants were contacted online through Google Forms. The questionnaire link was shared in WhatsApp groups of each class and communicated to students through word–of–mouth. The study was planned on a voluntary basis, and an informative text was added to the questionnaire form to this end.

Participants were informed about the study on the first page of the questionnaire form. It was also stated that no identity information would be requested, the study findings would be used for scientific purposes only, and that they could withdraw from the study without encountering any negative consequences if they wished. Students who were at least 18 years old and actively enrolled in the veterinary faculty undergraduate program constituted the inclusion criteria for the study.

The questionnaire questions were designed to be opened if participants selected the option indicating that they were volunteers. A questionnaire was given to 256 students in the study. The questionnaire was shared with the students outside of class hours to prevent disruptions in the lessons and to prevent them from being influenced. The data were collected between 09/05/2024 and 21/06/2024. The full questionnaire (in Turkish) has been made publicly available in the Data Availability Statement section to allow readers to review the complete instrument (responses are disabled).

Statistical analysis

The data was transferred to Excel software through Google Forms and then to the IBM SPSS Statistics 26.0 program and the analyses were performed. The results were evaluated at a 95% confidence interval and a significant level of $P<0.05$. Descriptive statistics (mean, median, standard deviation, skewness, kurtosis, frequency, percentage), histogram, and boxplot were examined for the distribution of the data, and the Kolmogorov–Smirnov Test was performed, and it was found that the data were not normally distributed.

The Mann–Whitney U–Test was used for 2-group comparisons, which are non–parametric tests, and the Kruskal–Wallis Test was used for 3-group comparisons. The relationship between judgments and demographic questions was examined with Chi–Square Analysis, and Pearson Chi–Square or Fisher's Exact Test was used based on the relationship between the observed value and the expected value.

In evaluating the Likert–type questions in the second and third parts, Exploratory Factor Analysis (EFA) was used to evaluate whether the scales were suitable for the dataset. For structural evaluation, data suitability was performed using Bartlett's Test of Sphericity ($P<0.001$) and Kaiser–Meyer–Olkin (KMO ≥ 0.5) Tests.

Items with factor loads of 0.4 and above were kept in the scale. The varimax rotation method was employed to see the optimum number of factors in the scale and scree plot, eigenvalue, and the contribution rate of the factor to the total variance were considered. Cronbach alpha value was examined for reliability. Confirmatory Factor Analysis (CFA) was used to determine the structural validity of the scales and to reveal latent variables that were not seen in the model.

To this end, X^2/df (degrees of freedom), Tucker–Lewis Index (TLI), Comparative Fit Index (CFI), and Standardized Root Mean Square Residual (SRMR) fit indices were used. The JAMOVI 2.2.5 (The Jamovi Project, Sydney, Australia) package program was used for EFA and CFA.

RESULTS AND DISCUSSION

A total of 256 people participated in the questionnaire (244 of the participants chose the option of "I approve" (95.3%) and 12 people chose the option of "I do not approve" (4.7%)).The sociodemographic information of the participants is presented in TABLE I.

TABLE I
Sociodemographic distribution of participants

Variables		Frequency (n)	(%)
Gender	Female	101	41.4
	Male	143	58.6
Animal husbandry history	Yes	122	50.0
	No	122	50.0
Undergraduate level	1-3 terms	93	38.1
	4-6 terms	81	33.2
	7-10 terms	70	28.7
Income level	Low	39	16.0
	Medium	135	55.3
	High	70	28.7
Taking animal welfare courses	Yes	230	94.3
	No	14	5.7
Owning a pet	Yes	127	52.0
	No	117	48.0

In terms of gender parameters (TABLE II), both Welfare–Friendly Product (WFP) and Welfare–Friendly Labeling (WFL) scores of female participants were found to be higher compared to males (P<0.05). Also, 'have a moral obligation toward animals' (P=0.008), 'to pay more for meat produced from animals raised in line with animal welfare standards' (P=0.001), 'prefer meat products produced with animal welfare in mind' (P=0.004), 'to see the welfare–friendly label on meat products' (P=0.000) judgments were agreed by women more than men (TABLE III). This is consistent with the results reported in the literature that women have more positive attitudes towards animals compared to men [26, 27] are more empathetic [28, 29], more sensitive to animal welfare [30, 31] and having a more positive attitude towards sustainable and ethical consumption [13, 32]. This may have caused women to adopt ethical production systems and policies more and to prefer welfare–friendly products more.

TABLE II
Comparison of WFP and WFL scores with gender variation

	Gender	N	Mean	U	Z	*P*
WFP	Female	101	80.1485	4676.00	-4.695	0.000
	Male	143	73.0140			
WFL	Female	101	52.7624	5428.00	-3.325	0.001
	Male	143	48.5385			

WFP: Welfare–Friendly Product, WFL: Welfare–Friendly Labeling, *P*: Probability

No significant differences were detected between the WFP and WFL scores of the participants in terms of the parameters of dealing with animal husbandry, taking welfare courses, pet ownership, undergraduate level, and income status (P>0.05). It is already known that people who own pets have high sensitivity and empathy towards living things.

Pet owners who can experience the emotions and needs of animals more closely strengthen their emotional bond with animals and have a wider awareness of animal welfare than people who do not own pets. According to the 'Pets as ambassadors' hypothesis', it is speculated that pets encourage their owners to have more positive attitudes towards other animal species, reduce speciesism and increase awareness about animal welfare [33, 34].

In parallel with this, studies have reported that consumers who own a pet are more willing to support animal welfare and animal welfare–certified products [24, 26, 35]. In this study, unlike the literature data, it was found that there was no significant difference between pet ownership and WFP and WFL (P>0.05). For this reason, hypothesis H4 (Pet ownership increases sensitivity to animal welfare and welfare–friendly products in the production process) in the study was rejected. This interesting situation may be associated with the type of animal owned and the time spent with the animal, or it may be because of another unknown reason.

The concept of animal welfare, which began to gain importance, especially after the second half of the 20th century, was systematically included in the curriculum of veterinary faculties in the world and Türkiye after it was accepted as a field of science [30]. Previous studies

TABLE III
Chi-Square analysis results of some judgments

		Female	Male	Total
I think we have a moral obligation towards animals (*P*=0.008)				
Strongly agree	n (%)	72 (71.2)	76 (53.1)	148 (60.7)
Agree	n (%)	25 (24.8)	43 (30.1)	68 (27.9)
Undecided	n (%)	2 (2.0)	13 (9.1)	15 (6.1)
Disagree	n (%)	1 (1.0)	3 (2.1)	4 (1.6)
Strongly disagree	n (%)	1 (1.0)	8 (5.6)	9 (3.7)
Total	n (%)	101 (100)	143 (100)	244 (100)
I am willing to pay more for meat produced from animals raised in line with animal welfare standards (*P*=0.001)				
Strongly agree	n (%)	30 (29.7)	33 (23.1)	63 (25.8)
Agree	n (%)	38 (37.6)	32 (22.4)	70 (28.7)
Undecided	n (%)	24 (23.8)	41 (28.7)	65 (26.6)
Disagree	n (%)	8 (7.9)	20 (14)	28 (11.5)
Strongly disagree	n (%)	1 (1.0)	17 (11.8)	18 (7.4)
Total	n (%)	101 (100)	143 (100)	244 (100)
If I have a choice in my shopping, I prefer meat products produced with animal welfare in mind (*P*=0.004)				
Strongly agree	n (%)	49 (48.5)	44 (30.8)	93 (38.1)
Agree	n (%)	42 (41.6)	61 (42.7)	103 (42.2)
Undecided	n (%)	8 (7.9)	24 (16.8)	32 (13.2)
Disagree	n (%)	0 (0.0)	5 (3.5)	5 (2)
Strongly disagree	n (%)	2 (2.0)	9 (6.2)	11 (4.5)
Total	n (%)	101 (100)	143 (100)	244 (100)
I would like to see the welfare–friendly label on meat products (*P*=0.000)				
Strongly agree	n (%)	54 (53.5)	50 (35.0)	104 (42.6)
Agree	n (%)	46 (45.5)	61 (42.6)	107 (43.9)
Undecided	n (%)	0 (0.0)	22 (15.4)	22 (9.0)
Disagree	n (%)	0 (0.0)	3 (2.1)	3 (1.2)
Strongly disagree	n (%)	1 (1.0)	7 (4.9)	8 (3.3)
Total	n (%)	101 (100)	143 (100)	244 (100)

(*P*: Probability, n: number).

reported that people who are knowledgeable about animal welfare give more importance to the living conditions of animals and have a more sensitive and ethical approach to animal welfare [36, 37].

In the study, it was found that there were no significant differences between the students who took the welfare course and the WFP and WFL scores (P>0.05). H3 (Having taken an animal welfare course among consumers who are veterinary faculty students increases their support for animal welfare and welfare–friendly products in the production process) was rejected. This is an unexpected result, as the 'Animal Welfare' course is offered in the first year of Veterinary education in Türkiye and is designed as the initial course to raise students' awareness of animal protection.

Several factors may explain the lack of a significant difference. First, the course curriculum may be insufficient to create strong

awareness. The 14-week course is jointly delivered by the departments of Veterinary Ethics (2 weeks), Physiology (5 weeks), and Animal Science (7 weeks), including one theoretical and one practical session.

The relatively small share of ethics content, which covers ethical production systems, may not provide adequate exposure to animal welfare principles. Moreover, the concept of animal welfare has gradually been incorporated into veterinarians' professional oaths in several countries, such as the USA, the UK, Canada, and New Zealand, to formally emphasize the responsibility of veterinarians to protect and promote animal welfare [38, 39].

In Türkiye, the Veterinary oath includes a statement regarding the protection of animal health; however, the term 'animal welfare' is not explicitly mentioned. This result highlights the importance of integrating animal welfare awareness into professional training processes. Finally, the fact that both student groups are enrolled in the veterinary faculty and that 94% of the participants had already taken a course on animal welfare may have contributed to the absence of differences between groups, as their prior awareness and sensitivity toward animal welfare were already high.

This interpretation is consistent with the acceptance of H1 and H2, as discussed in the following section, which indicated that participants generally had positive attitudes toward animal welfare and welfare–friendly products.

Consumers' demand for sustainable, ethical, and environmentally friendly products directs businesses to marketing strategies accordingly, which triggers a transformation in the market with the supply–demand balance, and thus the market for welfare–friendly products grows. In the long run, this will cause welfare–friendly products to cease to be 'special' and become 'normal' [40].

The fact that only 1% of the participants answered 'consumers' to the question "Who is responsible for ensuring welfare–friendly meat production?" in the study can be interpreted as the fact that they are not aware that they can contribute to improving animal welfare as consumers (FIG.1).

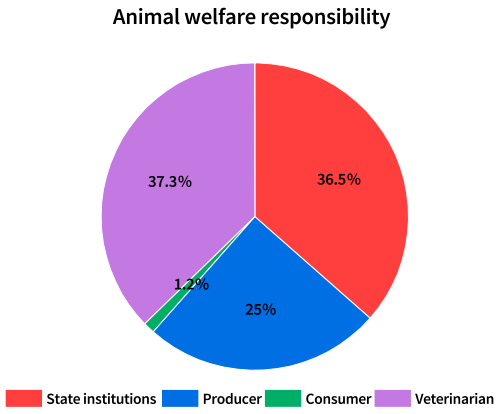

FIGURE 1. Distribution of participants' responses to the question on responsibility for ensuring welfare–friendly meat production

This result is associated with the fact that there is no significant difference between the WFL and WFP scores of the participants who took the animal welfare course discussed above. It can be said that it is necessary and urgent to review the animal welfare course curriculum in veterinary faculties in Türkiye and to rearrange it, especially in terms of welfare–friendly production.

The FIG. 2 shows participants ranked the animals raised for meat consumption as having the most welfare problems as chicken (*Gallus gallus domesticus*) 48%, cattle (*Bos taurus*) 41%, fish (*Pisces*) 4.9%, sheep (*Ovis aries*) 4.1%, goat (*Capra hircus*) 0.8%, and turkey (*Meleagris gallopavo*) 0.8%. Similarly, other studies reported that the animals with the most welfare problems are primarily cattle and chickens, followed by sheep and goats [30, 41].

While these findings are consistent with the literature, it is an unexpected and interesting finding that participants think that fish have more welfare problems than sheep, goats, and turkeys. Fish farming is a complex process. There is limited data on species–specific fish and limited information on welfare in fish farming compared to other land–based farm animals.

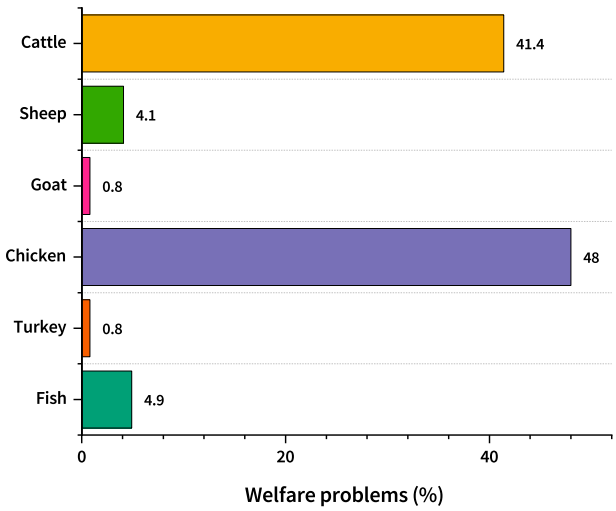

FIGURE 2. Animals with the most welfare problems

Although there is scientific evidence that they feel pain, it is difficult to understand their facial expressions, voices, or body language, making it difficult to know whether or to what extent they are in pain [42]. When the legislation on animal welfare in Türkiye is examined, it is seen that there is no direct legislation specifically associated with fish welfare [43, 44].

This situation contains a large gap in legal and practical terms. Both the legal gaps and the unknowns about fish may have created anxiety in the participants and caused them to think that fish have more welfare problems than sheep, goats, and turkeys. It is important to investigate consumer attitudes specifically regarding fish welfare in more detail and to examine the reasons in future studies.

On the other hand, the motivations of those who ethically prefer the Pescatarian Diet, which is accepted as a sub–branch of vegetarianism, are that they think that creatures living in water have fewer welfare problems compared to creatures living on land [45]. If we interpret the results of this study, the changes that will occur in the diet of pescatarians who consume only fish from animal products in their diets, with the increasing idea that their fish have welfare problems at least as much as animals living on land, can be subject of another study.

The participants were also asked "Which animal meat do you consume the most?" and "Which one would you consume if the price per kilogram was the same?" and the difference was examined. It was found that there was a 217% increase in beef, 254% in lamb, 241% in goat meat, and 470% in fish meat, while there was a 654% decrease in chicken meat (FIG. 3).

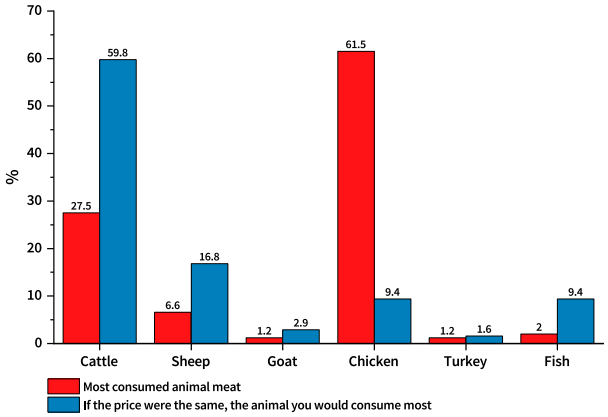

FIGURE 3. Change in consumption preference according to meat price change

Based on these results, the H5 *(Meat prices change consumers' meat preferences)* hypothesis was accepted. The worldwide COVID-19 pandemic and the increased inflation and exchange rate fluctuations in Türkiye in recent years have negatively affected meat prices. It has especially increased red meat prices and chicken meat has remained quite cheap compared to red meat and fish meat [46].

Considering the huge difference between the types of meat that consumers want to consume and the types of meat they must consume, it can be argued that meat prices in Türkiye have a significant impact on consumers' consumption preferences.

When the scree plot graph was examined to determine the ideal factor structure, it was seen that 2 factors with eigenvalues above 1 were formed for both WFP and WFL (FIG. 4).

The items were examined as part of the EFA. The initial questionnaire consisted of 18 items; however, the item "I think that the legal regulations regarding animal welfare are not strict enough" was removed because it loaded under two factors during the EFA. The final dataset was therefore arranged with 17 items

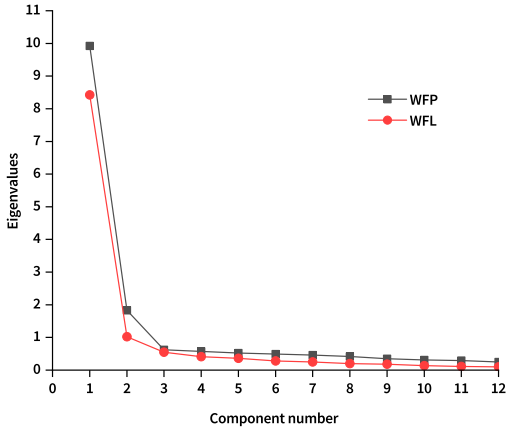

FIGURE 4. Scree plot chart of components in welfare–friendly products (WFP) and welfare–friendly labeling (WFL)

(referred to as the Welfare–Friendly Product – WFP). The EFA for the WFP scale identified two factors.

Factor 1, named Welfare–Compliant Production Standards, reflects participants' ethical and professional attitudes toward ensuring animal welfare during the meat production process. The items with the greatest weights were "Animals must be free from disease and suffering" (0.908) and "Animals must not suffer from hunger or thirst" (0.900). Factor 2, named Purchase Intent & Willingness to Pay, represents participants' behavioral and economic attitudes toward supporting welfare–friendly products. The items with the greatest weights were "I feel it is my moral duty to purchase meat products that are produced with animal welfare in mind" (0.850) and "I am willing to pay more for meat produced from animals raised in line with animal welfare standards" (0.803). The load values of the formed factors are shown in TABLE IV. The total variance explained was calculated as 69.2%. Cronbach alpha for WFP was calculated as 0.951.

For the dataset of 12 questions regarding the inclusion of animal welfare labels on products (referred to as Welfare–Friendly Labeling–WFL), the KMO value was calculated as 0.944 and The Bartlett's Test of Sphericity value as $P<0.001$, and the data were found to be suitable for EFA. The load values under the items and factors are shown in TABLE V. The EFA for the WFL scale identified two factors.

Factor 1 – Trust and Transparency in Labeling reflects participants' confidence in the reliability and informative value of welfare–friendly labels. The item with the highest loadings in this factor was "Selling meat with a Welfare–Friendly Label gives me more confidence in meat products" (0.837). Factor 2 – *Label Recognition and Purchase Intention* represents participants' behavioral tendencies to recognize, prefer, and purchase meat products carrying such labels. The item with the highest loadings in this factor was "The label must indicate the transport conditions of the animal" (0.826).

Internal consistency was examined for WFL and Cronbach alpha was calculated as 0.960. Since Cronbach alpha values were above 0.70 for both groups, it was determined that WFP and WFL had 'high' reliability and consisted of items measuring the targeted structure.

TABLE IV
Results of exploratory factor analysis and confirmatory factor analysis for welfare–friendly product

Variables/Question Items	Mean	Standard deviation	Standardized Factor Loading		Total variance (%)
			Factor 1	Factor 2	
WFP	75.96	12.89			69.2
1. High animal welfare increases the taste of the meat	4.23	0.94	0.670	–	
2. I think we have a moral obligation to animals	4.40	0.95	0.719	–	
3. Animal welfare increases production performance	4.38	0.87	0.798	–	
4. Farm animals must be raised, fed, and slaughtered under friendly treatment conditions	4.46	0.88	0.826	–	
5. Animals must not suffer from hunger or thirst	4.63	0.83	0.900	–	
6. Animals must be free from disease and suffering	4.57	0.85	0.908	–	
7. Animals must be free from physical and mental stress	4.55	0.79	0.867	–	
8. Tax deductions must be applied to costs incurred to improve animal welfare.	4.34	0.92	0.696	–	
9. Animals must have adequate space to express their normal behavior	4.47	0.89	0.810	–	
10. An animal raised according to animal welfare standards is a happy animal	4.21	0.96	0.569	–	
11. I am willing to pay more for meat produced from animals raised in line with animal welfare standards	3.54	1.20	–	0.803	
12. When purchasing meat products, the way the animals are kept affects my choice	3.78	1.11	–	0.791	
13. I am concerned about the welfare of animals raised for meat	3.97	1.00	–	0.666	
14. I feel it is my moral duty to purchase meat products that are produced with animal welfare in mind	3.85	1.05	–	0.850	
15. If I have a choice in my shopping, I prefer meat products produced with animal welfare in mind	4.07	0.99	–	0.742	
16. Stress during animal production and transportation can affect the quality of meat products	4.34	0.84	0.721	–	
17. The increased costs resulting from expenditures made to improve animal welfare must be financially compensated to producers	4.00	1.02	–	0.661	

WFP: Welfare–Friendly Product

TABLE V
Results of exploratory factor analysis and confirmatory factor analysis for welfare–friendly labeling

Variables/Question Items	Mean	Standard deviation	Standardized Factor Loading		Total variance (%)
			Factor 1	Factor 2	
WFL	50.28	9.02			78.0
1. I would like to see the welfare–friendly label on meat products	4.21	0.90	–	0.760	
2. When purchasing meat products, I would like to obtain information on whether the animal was raised in conditions appropriate to animal welfare	4.22	0.88	–	0.813	
3. The label must indicate the transport conditions of the animal	4.21	0.87	–	0.826	
4. The label must indicate the slaughter conditions of the animal	4.35	0.79	–	0.645	
5. The label must indicate where the animal was born, raised, and fed	4.18	0.91	–	0.803	
6. The label must indicate the production system of the animal (intensive, extensive, free–range)	4.30	0.86	–	0.812	
7. The welfare–friendly label shows that the animal has been treated in line with welfare standards	4.09	0.95	0.789	–	
8. I think that having welfare–friendly labels on meat products will contribute to the welfare of farm animals	4.15	0.93	0.716	–	
9. Selling meat with a Welfare–Friendly Label gives me more confidence in meat products	4.21	0.90	0.837	–	
10. Having welfare–friendly labels on meat products will increase the demand for meat consumption	3.93	1.00	0.734	–	
11. If there is a welfare–friendly label, I will feel comfortable about the traceability of the product I buy	4.18	0.90	0.821	–	
12. The presence of a welfare–friendly label on meat products allows the identification of animal rearing conditions	4.19	0.86	0.794	–	

WFL: Welfare–Friendly Labeling

CFA was used to determine whether the scales serve the targeted structure. When the fit indices of the scales were examined, X^2/df values (3.09 for WFP; 4.03 for WFL) were less than 5, CFI (0.92 for WFP; 0.94 for WFL) and TLI (0.91 for WFP; 0.93 for WFL) values were above 0.90, and SRMR (0.06 for WFP; 0.03 for WFL) values were below 0.08, indicating that both models had a good fit with the data set [47, 48].

The total average score of the participants was 71.85 (Max: 85, Min: 17) for WFP and 50.28 (Max: 60, Min: 12) for WFL. Since the scores for both scales were higher than the average, the H1 *(Animal welfare is a feature to be included in the meat product during the production process)* and H2 *(Participants support the welfare–friendly label on meat products)* hypotheses were accepted. Based on these results, it can be argued that Turkish participants have a high sensitivity to animal welfare in the meat production process and support welfare–friendly meat products.

CONCLUSION

In conclusion, the participants, mostly female, perceived animal welfare as an essential feature to be considered during the meat production process, and their attitudes toward welfare–friendly meat products and labeling were quite positive. No significant effects were observed for pet ownership on participants' attitudes toward welfare–friendly product and labeling. This may indicate that emotional attachment to companion animals does not always extend to broader animal welfare concerns related to food production.

Participants were also concerned about welfare practices in fish farms and believed that fish experience more welfare problems than sheep, goats, and turkeys. While these concerns reflect a strong awareness of species–specific welfare issues, economic factors still played an important role in consumption

behavior, as meat prices significantly affected preferences—most participants consumed more chicken meat for economic reasons while preferring to consume more red meat.

The fact that only 1% of the participants held consumers responsible for ensuring animal welfare indicates limited awareness of their potential contribution as consumers, despite their positive attitudes toward welfare–friendly products. Taken together, the results point to the need for strengthening animal welfare awareness and responsibility at both societal and educational levels. Enhancing welfare–related education within veterinary curricula in Türkiye could help foster future veterinarians who are more proactive and responsible advocates for animal welfare throughout the food production chain.

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Data availability statement

The full questionnaire (in Turkish) is available at the following link (view–only access, responses are disabled): https://goo.su/08mGQI

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