

Consumer preferences for animal welfare-friendly products in Türkiye: an extended theory of planned behavior approach

Preferencias de los consumidores por productos favorables al bienestar animal en Türkiye: un enfoque basado en la Teoría del Comportamiento Planificado ampliada

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ABSTRACT

This study aimed to examine the attitudinal, socio-demographic, and economic determinants of consumers' willingness to pay for animal welfare-friendly products in Türkiye using an extended Theory of Planned Behavior framework. A cross-sectional online survey was conducted in 2022 with 245 consumers residing in Samsun province. Binary logistic regression analysis was employed to evaluate the influence of attitudinal, socio-demographic, and economic variables on stated willingness to pay. The results indicated that pro-welfare attitudes significantly increased the likelihood of premium payment (odds ratio = 2.145, 95% confidence interval: 1.612–2.851, $P < 0.001$), emerging as the strongest predictor in the extended model. Annual household income was positively associated with willingness to pay (odds ratio = 1.713, $P = 0.001$), whereas price sensitivity significantly reduced premium-paying intention (odds ratio = 0.620, $P = 0.002$), highlighting the persistence of the attitude-behavior gap. Female consumers were significantly more likely to express willingness to pay compared to male consumers (odds ratio = 3.401, $P = 0.001$), while higher education level was negatively associated with premium willingness (odds ratio = 0.425, $P = 0.001$). Among middle- and high-income consumers, greater concern for improvements in housing, feeding, transport, slaughter, and farm environmental conditions was associated with increased willingness to pay (odds ratio range: 1.298–2.342). The extended Theory of Planned Behavior model improved explanatory performance (Nagelkerke $R^2 = 0.197$; Area Under the Curve = 0.710), indicating the additional explanatory value of attitudinal and economic variables. The findings demonstrate that welfare-oriented consumption in Türkiye is shaped by the interaction between ethical commitment and economic feasibility. The study provides implications for welfare certification, market segmentation, and evidence-based pricing strategies for welfare-friendly products.

Key words: Animal welfare; willingness to pay; ethical consumption; theory of planned behavior

RESUMEN

El objetivo de este estudio fue examinar los determinantes actitudinales, sociodemográficos y económicos de la disposición de los consumidores a pagar por productos favorables al bienestar animal en Türkiye, utilizando un marco ampliado de la Teoría del Comportamiento Planificado. Se realizó una encuesta transversal en línea en 2022 con 245 consumidores residentes en la provincia de Samsun. Se empleó un análisis de regresión logística binaria para evaluar la influencia de variables actitudinales, sociodemográficas y económicas sobre la disposición de los consumidores a pagar declarada. Los resultados indicaron que las actitudes favorables al bienestar animal aumentaron significativamente la probabilidad de pagar un sobreprecio (razón de probabilidad = 2,145; intervalo de confianza del 95%: 1,612–2,851; $P < 0.001$), constituyendo el predictor más fuerte del modelo ampliado. El ingreso anual del hogar se asoció positivamente con la disposición de los consumidores a pagar (razón de probabilidad = 1,713; $P = 0,001$), mientras que la sensibilidad al precio redujo significativamente la intención de pagar un sobreprecio (razón de probabilidad = 0,620; $P = 0,002$), lo que evidencia la persistencia de la brecha actitud-comportamiento. Las mujeres mostraron una probabilidad significativamente mayor de expresar disposición de los consumidores a pagar en comparación con los hombres (razón de probabilidad = 3,401; $P = 0,001$), mientras que un mayor nivel educativo se asoció con una menor disposición a pagar un sobreprecio (razón de probabilidad = 0,425; $P = 0,001$). Entre los consumidores de ingresos medios y altos, una mayor preocupación por las mejoras en las condiciones de alojamiento, alimentación, transporte, sacrificio y ambiente de las explotaciones se asoció con un aumento de la disposición de los consumidores a pagar (rango de razón de probabilidad = 1,298–2,342). El modelo Teoría del Comportamiento Planificado ampliado mostró un mejor desempeño explicativo (Nagelkerke $R^2 = 0,197$; área bajo la curva = 0,710), indicando el valor explicativo adicional de las variables actitudinales y económicas. Los hallazgos demuestran que el consumo orientado al bienestar animal en Türkiye está determinado por la interacción entre el compromiso ético y la viabilidad económica. El estudio proporciona implicaciones relevantes para la certificación de bienestar animal, la segmentación de mercado y las estrategias de fijación de precios basadas en evidencia para productos favorables al bienestar animal.

Palabras clave: Bienestar animal; disposición a pagar; consumo ético; teoría del comportamiento planificado

INTRODUCTION

Animal welfare has become a major issue in modern livestock production and has received increasing attention in scientific research and consumer studies. Over time, the concept of animal welfare has evolved beyond a purely biological perspective, with growing recognition that animals are sentient beings capable of experiencing both physical and psychological states. Today, animal welfare is regarded as a multidimensional concept shaped by ethical, cultural, and societal factors [1, 2, 3].

In recent years, consumers have increasingly demanded greater transparency in the production processes of animal-based foods, while concerns about animal welfare have also intensified, particularly regarding the conditions experienced by animals in intensive farming systems [4]. The welfare standards established by the European Union have played a key role in increasing consumer awareness regarding the ethical dimensions of animal production systems [5]. In addition, the principles of the “Five Freedoms” contributed to the broader recognition of animal welfare in food production systems [1, 2, 5].

Previous studies indicate that consumers often associate improved animal welfare practices with higher product quality [6, 7, 8]. Although concern for animal welfare varies across demographic groups, taken together, public support for welfare-oriented practices continues to increase. However, positive ethical concern does not always correspond to actual consumption of welfare-friendly products [9, 10, 11].

Evidence from consumer behavior research indicates that positive attitudes toward animal welfare significantly influence product preferences and willingness to pay (WTP) for welfare-friendly products [12, 13]. Previous studies also demonstrate that socio-demographic characteristics influence ethical purchasing behavior, with women and higher-income consumers generally showing greater sensitivity toward animal welfare concerns [14, 15, 16].

Although consumer interest in animal welfare and ethical food consumption is increasing, its effect on actual purchasing behavior remains inconsistent [15,16]. Some studies report that welfare improvements positively influence consumer responses, whereas higher income levels are associated with greater WTP for welfare-friendly products [17, 18].

Previous studies consistently report that consumers may be willing to pay price premiums for products produced under improved animal welfare standards [19, 20, 21]. However, several studies also emphasize the existence of an “attitude-behavior gap,” where positive ethical attitudes do not always translate into actual purchasing behavior due to economic and practical constraints [21, 22]. In this context, factors such as income level, price sensitivity, product information, and welfare certification labels have been identified as important determinants of welfare-oriented purchasing behavior [20, 23, 24].

In Türkiye, empirical research examining consumers’ WTP for animal welfare-friendly products remains limited. Understanding the determinants of welfare-oriented purchasing behavior is important for both market development and evidence-based animal welfare policies. Therefore, this study aimed to investigate the

attitudinal, socio-demographic, and economic factors influencing consumers’ WTP for welfare-friendly products in Türkiye within an extended Theory of Planned Behavior (TPB) framework.

Within this framework, attitudes toward animal welfare represent the attitudinal component, annual household income reflects perceived behavioral control, and price sensitivity is considered a behavioral constraint. Gender and education level were included as background socio-demographic variables that may influence behavioral intention and purchasing decisions [25, 26]. Based on this theoretical framework, the following hypotheses were proposed:

- H1: Positive attitudes toward animal welfare significantly increase consumers’ WTP for welfare-friendly products.
- H2: Higher annual household income positively influences consumers’ WTP for welfare-friendly products.
- H3: Price sensitivity negatively influences consumers’ WTP for welfare-friendly products.
- H4: Female consumers are more likely than male consumers to exhibit WTP for welfare-friendly products.
- H5: Education level significantly influences consumers’ WTP for welfare-friendly products.

The conceptual framework of the study is presented in FIG. 1. Developed by the authors based on the Theory of Planned Behavior, proposed by Ajzen [25] and extended TPB applications described by Armitage and Conner [26].

The model assumes direct effects of attitudinal, economic, and socio-demographic variables on consumers’ WTP for welfare-friendly products. These hypotheses were empirically tested using multivariate statistical methods.

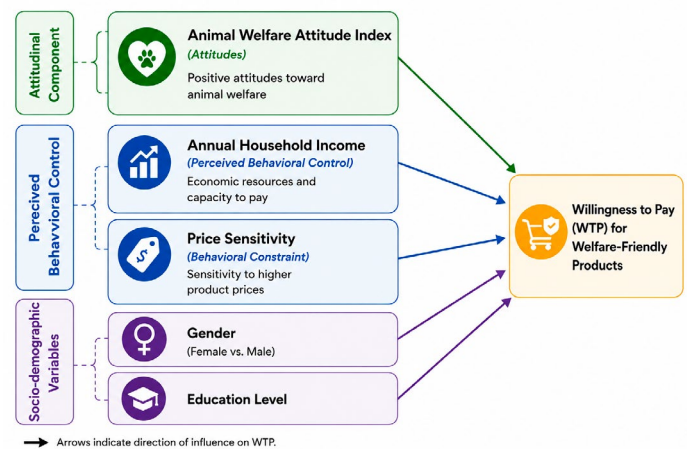


FIGURE 1. Conceptual framework of determinants influencing consumers’ willingness to pay (WTP) for welfare-friendly products in Türkiye based on an extended Theory of Planned Behavior (TPB)

MATERIALS AND METHODS

Study design and theoretical framework

This study employed a cross-sectional survey design conducted in 2022 among consumers residing in Samsun province, Türkiye. This approach was considered appropriate for examining the relationships between attitudinal, socio-demographic, and economic variables and consumers' stated WTP for welfare-friendly products.

The study was grounded in the TPB, which suggests that behavioral intentions are influenced by attitudes toward the behavior, perceived behavioral control, and subjective norms. TPB has been widely applied in studies of ethical consumption and pro-social purchasing, as it provides a useful framework for linking psychological factors to behavioral intentions.

Given that the study focuses on individual purchasing decisions rather than social or normative pressures, subjective norms were not explicitly included in the model. Instead, an extended TPB framework was adopted, placing greater emphasis on attitudinal and economic factors as key determinants of market-based ethical behavior.

Within this framework, attitudes toward animal welfare represent the attitudinal component of the TPB. Annual household income is used as a proxy for perceived behavioral control, reflecting consumers' economic capacity to translate ethical preferences into actual purchasing decisions. Price sensitivity is treated as a behavioral constraint that may weaken the translation of pro-welfare attitudes into WTP.

Gender and education level were included as background socio-demographic variables that may influence behavioral intention. The primary dependent variable was consumers' WTP for welfare-friendly products, which was operationalized as a dichotomous outcome reflecting behavioral intention.

Sample and data collection

Data was collected between January and June 2022 using an online questionnaire administered via the Google Forms® platform. This approach was chosen to reach a wider range of participants, access diverse consumer groups, and allow for efficient and cost-effective data collection.

A combination of purposive and convenience sampling techniques was used to recruit participants from diverse socio-economic backgrounds across central districts (İlkadım, Atakum, Canik) as well as surrounding districts of Samsun province (Tekkeköy, Bafra, Çarşamba, Havza, and Vezirköprü). This approach allowed for the inclusion of urban, peri-urban, and rural consumer profiles.

The study targeted individuals aged 18 years and older who were responsible for household food purchasing decisions. A total of 288 responses were initially collected. After data screening, questionnaires with substantial missing data or inconsistent responses were excluded, leaving 245 valid observations for analysis.

The final sample size meets the recommended minimum thresholds for binary logistic regression analysis, exceeding the commonly cited rule of at least 10–15 observations per

independent variable. Although the non-probability sampling design limits the generalizability of the findings at the national level, the inclusion of multiple districts representing different settlement types increases the heterogeneity of the sample and enhances the exploratory value of the study.

Ethical approval for the study was obtained from the Ondokuz Mayıs University Ethics Committee (Approval No: 2019/62). Participation was voluntary and anonymous, and informed consent was obtained from all participants before completing the survey.

Measurement of variables

Willingness to pay (dependent variable)

Consumers' WTP for welfare-friendly products was measured using a dichotomous question that asked whether participants would be willing to pay a higher price for products produced under improved animal welfare standards. Responses were coded as 0 = would not pay or undecided and 1 = would pay.

Modeling WTP as a binary outcome is consistent with previous research on ethical purchasing intentions and allows for straightforward interpretation within a logistic regression framework commonly applied in consumer behavior studies [15, 21]. Although WTP may reflect varying degrees of intention, a binary specification was preferred to distinguish respondents with a clear intention to pay a premium from those without a definite positive commitment.

Given the hypothetical nature of survey-based WTP measures, the responses are interpreted as stated behavioral intentions rather than actual economic behavior. This distinction is recognized as an inherent limitation of self-reported ethical consumption studies.

Animal welfare attitude index

Attitudes toward animal welfare were measured using seven Likert-type items assessing perceptions related to the implementation of welfare practices, improvements in animal health, slaughter and transport conditions, on-farm care, feeding and environmental conditions, and the consideration of welfare in red meat and poultry purchasing decisions. All items were rated on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). Although Likert-type scales are widely used in consumer behavior research, they may be subject to certain limitations, including avoidance of extreme response categories, selection of neutral responses for convenience, and limited ability to capture the underlying reasons behind participants' attitudes.

Internal consistency was evaluated using Cronbach's alpha ($\alpha = 0.82$), indicating good reliability. Sampling adequacy was assessed using the Kaiser-Meyer-Olkin (KMO) measure (KMO = 0.84), and Bartlett's test of sphericity was statistically significant ($P < 0.001$), confirming suitability for factor analysis.

Exploratory Factor Analysis (Principal Component Analysis with varimax rotation) revealed a unidimensional structure, with factor loadings ranging from 0.61 to 0.83. The extracted component explained 58% of the total variance, supporting the presence of a coherent attitudinal construct.

A composite Animal Welfare Attitude Index was calculated by averaging the scores of the individual items. Higher index values indicate stronger pro-welfare attitudes.

Price sensitivity

Price sensitivity was defined as a behavioral constraint within the extended TPB framework, reflecting the extent to which consumers prioritize price over welfare attributes when purchasing animal-based products. Participants rated the importance of price in poultry purchasing decisions on a five-point Likert scale (1 = not important at all, 5 = very important), with higher scores indicating greater price sensitivity. Although this variable was measured using a single item, such measures are considered acceptable for capturing specific and clearly defined constructs in applied consumer behavior research. Within the theoretical framework, price sensitivity is treated as a factor that may weaken the relationship between pro-welfare attitudes and WTP.

Statistical analysis

To test the proposed hypotheses (H1–H5), binary logistic regression analysis was conducted because the dependent variable-WTP for welfare-friendly products-was dichotomous (0 = would not pay/undecided; 1 = would pay).

Independent variables included the Animal Welfare Attitude Index, annual household income level, price sensitivity, gender, education level, and living environment. Gender was coded as 0 = male and 1 = female. Education level and annual household income were treated as ordinal predictors reflecting increasing education (1 = high school, 2 = bachelor’s degree, 3 = master’s degree) and increasing income (1 = ≤ \$6000, 2 = \$6001–12000, 3 = \$12001–24000, 4 = ≥ \$24001), respectively. Living environment (urban, peri-urban, rural) was included as a categorical predictor. The Animal Welfare Attitude Index and price sensitivity were treated as continuous predictors derived from Likert-type measures.

Multicollinearity was assessed using Variance Inflation Factors (VIF), and no problematic multicollinearity was detected (VIF < 2.5). Model fit was evaluated using the Hosmer-Lemeshow goodness-of-fit test and Nagelkerke R². Discriminatory performance was assessed using “the area under {the receiver operating characteristic (ROC)}” curve [AUC]”. Results are presented as odds ratios (OR) with 95% confidence intervals (CI). Statistical significance was set at P<0.05. All analyses were performed using IBM SPSS Statistics (Version 25).

Logistic regression model:

$$\log \text{it} \left(P_i \right) = \ln \left(\frac{P_i}{1-P_i} \right) = \beta_0 + \sum_{k=1}^6 \beta_k X_{ki}$$

where denotes the probability that individual *i* is WTP for welfare-friendly products; represents the explanatory variables (attitude index, annual household income, price sensitivity, gender, education level, and living environment); is the intercept term; and are the regression coefficients associated with each predictor variable. The exponential form of corresponds to the OR.

RESULTS AND DISCUSSION

Descriptive findings

A total of 245 valid questionnaires were included in the final analysis (TABLE I). The sample consisted of 61.2% female (n = 150) and 38.8% male (n = 95) participants. Educational attainment was distributed as follows: 41.2% high school graduates (n = 101), 26.5% bachelor’s degree holders (n = 65), and 32.2% master’s degree holders (n = 79).

Annual household income levels reflected socio-economic heterogeneity within the sample, with 33.1% earning ≤ \$6000, 13.9% earning \$6001–12000, 31.0% earning \$12001–24000, and 22.0% earning ≥ \$24001. Living environment was distributed as 38.8% urban (n = 95), 34.7% peri-urban (n = 85), and 26.5% rural (n = 65). Regarding WTP, 64.1% of respondents indicated WTP for welfare-friendly products, whereas 35.9% reported unwillingness or indecision.

The mean Animal Welfare Attitude Index score was 3.17 (SD = 0.55), indicating moderately positive attitudes toward animal welfare practices. The highest mean agreement was observed for improvements in on-farm care and feeding conditions, followed by slaughter standards.

The socio-demographic distribution of the sample reflects a relatively heterogeneous structure in terms of gender, education, and income levels. The higher proportion of female respondents is consistent with previous studies reporting greater female participation in food-related surveys and higher sensitivity to animal welfare issues [14,18]. The diversity in income distribution

TABLE I
Socio-demographic characteristics of the participants

Characteristics	(n = 245)	%
Gender		
« Female	150	61.2
« Male	95	38.8
Education		
« Master’s degree	79	32.2
« Bachelor’s degree	65	26.5
« High school	101	41.2
Living environment		
« Urban	95	38.8
« Peri-Urban	85	34.7
« Rural	65	26.5
Annual household income (\$)		
« ≤ 6000	81	33.1
« 6001–12000	34	13.9
« 12001–24000	76	31.0
« ≥ 24001	54	22.0

Percentages are calculated based on the total sample (n = 245). Income categories are expressed in annual household income levels

enhances the robustness of the analysis by allowing the examination of willingness to pay across different economic segments. Price sensitivity exhibited greater variability ($M = 2.88$, $SD = 0.89$), suggesting heterogeneity in the relative importance attributed to price considerations among respondents.

Bivariate associations

Chi-square analyses demonstrated statistically significant associations between WTP and gender ($P < 0.001$), education level ($P < 0.001$), and annual household income ($P < 0.001$). Living environment was not significantly associated with WTP ($P = 0.084$).

Given the non-normal distribution of the Animal Welfare Attitude Index, the non-parametric Kruskal-Wallis test was employed to examine differences in welfare attitude scores across WTP categories. The analysis indicated a statistically significant difference between groups ($P < 0.001$), with higher attitude index scores observed among respondents willing to pay compared to those unwilling or undecided. These findings indicate that both socio-demographic characteristics and welfare attitudes are significantly associated with stated WTP at the bivariate level.

Logistic regression analysis

Binary logistic regression analyses were conducted to examine the determinants of consumers’ WTP. Two models were estimated: Model 1 (Baseline Demographic Model) included socio-demographic variables (baseline demographic model), while Model 2 (Extended TPB Model) incorporated the Animal Welfare Attitude Index and price sensitivity within the extended TPB framework. The results of both models are presented in TABLE II.

Baseline demographic model

The baseline demographic model included variables of gender, education level, living environment, and annual household income to examine their independent effects on consumers’ WTP. The model was statistically significant ($P < 0.001$), indicating that the included predictors collectively contributed to explaining variation in WTP. The model explained 16.5% of the variance in WTP (Nagelkerke $R^2 =$

0.165) and demonstrated acceptable discriminatory performance (AUC = 0.704), suggesting fair classification ability. Gender emerged as a strong and statistically significant predictor (OR = 3.401, 95% CI: 1.990–5.815, $P = 0.001$). Female consumers were more than three times as likely as male consumers to report WTP for welfare-friendly products. Annual household income was positively associated with WTP (OR = 1.713, 95% CI: 1.357–2.163, $P = 0.001$), indicating that higher income levels increased the likelihood of premium-paying intention. Education level showed a statistically significant negative association (OR = 0.425, 95% CI: 0.277–0.653, $P = 0.001$), suggesting that higher educational attainment reduced the probability of WTP in this sample. Similar findings have been reported in previous studies, indicating that more educated consumers may critically evaluate price premiums and the credibility of welfare-related claims and labeling systems [18, 20]. Living environment was not statistically significant (OR = 1.458, 95% CI: 0.950–2.238, $P = 0.084$). In general, the baseline model demonstrates that socio-demographic characteristics explain a meaningful but limited proportion of variation in consumers’ premium-paying intentions.

These findings highlight that gender and income are key socio-demographic determinants of willingness to pay, while education level may reflect a more critical evaluation of price premiums rather than reduced concern for animal welfare. Similar associations between female gender, higher income, and increased willingness to pay for welfare-friendly products have been reported in previous studies [14, 18, 27]. In contrast, the negative association observed for education level may indicate that more educated consumers critically evaluate welfare-related claims and pricing strategies, as suggested by Yang and Renwick [20].

The extended theory of planned behavior model

In the extended TPB model, the Animal Welfare Attitude Index and price sensitivity are included in the regression analysis alongside socio-demographic variables, within the extended TPB framework. The inclusion of attitudinal and economic constraint variables improved the overall explanatory performance of the model. The Nagelkerke R^2 increased from 0.165 to 0.197, indicating additional explanatory contribution beyond socio-

TABLE II
Binary Logistic Regression Results for Willingness to Pay for welfare-friendly products

Variables	Model 1 OR (95% CI)	P-value	Model 2 OR (95% CI)	P-value
Gender (1= Female)	3.401 (1.990–5.815)	0.001	3.115 (1.821–5.325)	0.001
Education level	0.425 (0.277–0.653)	0.001	0.461 (0.297–0.716)	0.001
Living environment	1.458 (0.950–2.238)	0.084	1.312 (0.936–1.841)	0.112
Annual household income	1.713 (1.357–2.163)	0.001	1.654 (1.298–2.107)	0.001
Animal Welfare Attitude Index	–	–	2.145 (1.612–2.851)	0.001
Price sensitivity	–	–	0.620 (0.457–0.842)	0.002
Nagelkerke R^2	0.165	–	0.197	–
AUC	0.704	–	0.710	–

B = unstandardized regression coefficient; OR = odds ratio; CI = confidence interval. The dependent variable was WTP for welfare-friendly products (0 = would not pay/undecided; 1 = would pay). OR > 1 indicates a positive association with WTP, whereas OR < 1 indicates a negative association. Statistical significance was set at $P < 0.05$. Reference categories were male (gender), high school (education), rural (living environment), and ≤ \$6000 (annual household income)

demographic characteristics alone. The model’s discriminatory ability also improved, with the AUC increasing from 0.704 to 0.710.

The Animal Welfare Attitude Index emerged as a strong and statistically significant positive predictor of WTP (OR = 2.145, 95% CI: 1.612–2.851, $P < 0.001$). A one-unit increase in pro-welfare attitude more than doubled the odds of being willing to pay a premium. This finding supports H1 and highlights the central role of attitudinal commitment within the TPB framework.

Price sensitivity was negatively associated with WTP (OR = 0.620, 95% CI: 0.457–0.842, $P = 0.002$), indicating that stronger prioritization of price significantly reduced the likelihood of premium payment. Thus, H3 was supported, confirming the constraining effect of economic considerations. Annual household income remained statistically significant in the extended model, reinforcing its interpretation as a proxy for perceived behavioral control within the TPB framework.

Model fit and explanatory power

The baseline demographic model, including gender, education level, and income, yielded a Nagelkerke R^2 of 0.165, indicating that approximately 16.5% of the variance in WTP was explained by socio-demographic factors alone. The model demonstrated acceptable discriminatory ability, with an AUC of 0.704, suggesting fair classification performance.

The extended TPB model, incorporating the Animal Welfare Attitude Index and price sensitivity, improved model fit and explanatory power. The Nagelkerke R^2 increased to 0.197, indicating an additional explanatory contribution from attitudinal and economic constraint variables. The AUC value increased to 0.710, reflecting enhanced discrimination between consumers willing and unwilling to pay a premium. Hosmer-Lemeshow goodness-of-fit statistics indicated satisfactory model calibration ($P > 0.05$). The ROC curves comparing Model 1 and Model 2 are presented in FIG. 2.

Subgroup analysis (Middle- and High-Income Participants)

A subgroup logistic regression analysis was conducted among middle – and high-income participants to further explore welfare-specific determinants within economically capable consumer segments. The results are presented in TABLE III.

TABLE III
Binary logistic regression results among middle – and high-income participants

Variables	OR (95% CI)	P-value
Improvement of on-farm housing and feeding conditions	1.777 (1.115–2.834)	0.016
Improvement of slaughter conditions	1.351 (1.006–1.814)	0.046
Improvement of farm environmental standards	1.298 (0.991–1.701)	0.059
Welfare conditions are considered during purchase	1.343 (1.018–1.770)	0.037
Willingness to accept higher production costs	2.342 (1.627–3.372)	<0.001
Improvement of transport conditions	1.213 (0.911–1.614)	0.186
Priority given to price	0.620 (0.457–0.842)	0.002

OR = odds ratio; CI = confidence interval. The dependent variable was willingness to pay (WTP) (0 = would not pay/undecided; 1 = would pay). Statistical significance was set at $P < 0.05$

Within this subgroup, improvements in on-farm housing, feeding conditions, slaughter practices, and willingness to accept increased production costs were identified as statistically significant positive predictors of WTP. In contrast, the effect of farm environmental standards was marginally non-significant ($P = 0.059$). These findings suggest that economically capable consumers are particularly responsive to production-stage welfare improvements that are perceived as directly affecting animal well-being.

The increase in AUC values indicates that the inclusion of attitudinal and price-related variables enhances the predictive performance of the model. Similar findings have been reported in previous studies emphasizing the importance of psychological determinants and attitudinal factors in explaining ethical purchasing behavior [15, 25, 26].

Willingness to accept increased production costs arising from welfare implementation emerged as the strongest determinant (OR = 2.342, $P < 0.001$), indicating that cost internalization plays a central role in premium purchase decisions among higher-income consumers. In contrast, transport-related improvements did not demonstrate statistically significant effects. This may suggest that more visible, emotionally salient, and morally intuitive stages of production-such as on-farm care and slaughter conditions-exert a stronger influence on premium-paying intentions than less visible logistical processes.

The subgroup analysis further indicated that improvements in on-farm care, feeding conditions, slaughter practices, and environmental standards exerted stronger effects than transport-related improvements. This pattern suggests that consumers respond more strongly to welfare dimensions perceived as directly

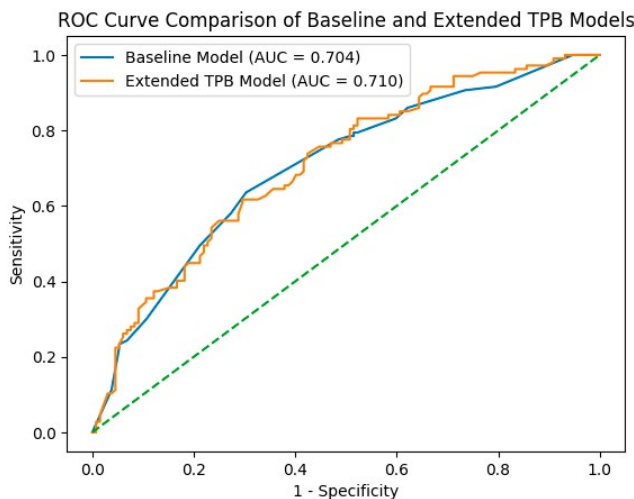


FIGURE 2. Receiver operating characteristic (ROC) curves for Model 1 (baseline demographic model) and Model 2 (extended Theory of Planned Behavior [TPB] model). The extended model demonstrates improved discriminatory performance (area under the receiver operating characteristic (ROC) curve [AUC] = 0.710) compared to the baseline model (AUC = 0.704)

linked to animal well-being [23]. Overall, the subgroup analysis indicates that once economic constraints are reduced, attitudinal commitment and perceived ethical responsibility become stronger drivers of welfare-oriented purchasing behavior.

Annual household income remained a statistically significant determinant of WTP, supporting its interpretation as perceived behavioral control within the TPB framework. Economic capacity enables consumers to act upon ethical intentions, translating moral concern into actual purchasing willingness. This finding corresponds with cross-national evidence [17, 27].

However, the relatively modest explanatory power of the models suggests that income alone does not fully determine WTP. Rather, ethical consumption appears to arise from the interaction between moral commitment and economic opportunity.

Price sensitivity significantly reduced the likelihood of paying a premium, confirming the presence of the widely documented attitude-behavior gap in ethical food consumption [28]. Greater prioritization of price significantly constrained consumers' willingness to pay a premium. Clark *et al.* [21] and Vanhonacker *et al.* [29] observed similar discrepancies between citizens' ethical expectations and consumers' purchasing decisions. The present findings indicate that this gap is also evident in the Türkiye context, particularly among price-sensitive segments. Interestingly, among middle – and high-income consumers, willingness to accept increased welfare-related production costs emerged as the strongest determinant of WTP.

This suggests that once financial constraints are reduced, attitudinal commitment becomes a more decisive factor. Such segmentation patterns resemble the “concerned” versus “price-sensitive” consumer profiles identified in discrete choice experiments [15, 17].

Gender differences were consistent with existing literature, as female consumers were more likely to express WTP. Previous studies attribute this pattern to stronger pro-social and care-oriented value orientations among women [18, 30]. In contrast, education displayed a negative association with WTP. While higher education is often linked to greater welfare awareness, some studies suggest that more educated consumers may critically evaluate price premiums and labeling credibility [20]. The present findings suggest that cognitive evaluation may moderate emotional ethical responses in emerging market settings. Similar findings were reported by Tüfenk and Bozkurt [30], who observed that gender, education level, and income significantly influenced consumer attitudes toward animal welfare and willingness to pay for welfare-friendly products in Türkiye.

The present findings suggest that in Türkiye, welfare-friendly purchasing behavior is shaped by a dual dynamic: ethical concern is present, yet its market realization depends heavily on economic accessibility.

From a sectoral perspective, welfare differentiation strategies should consider income-based segmentation and price communication. Transparent certification systems, credible labeling mechanisms, and information strategies emphasizing tangible welfare improvements may enhance consumer trust and justify price premiums.

Evidence from European markets underscores the importance of institutional credibility and labeling transparency in sustaining ethical consumption [31, 32]. For Türkiye, strengthening welfare assurance systems in line with international standards may enhance consumer confidence and facilitate market differentiation in both domestic and external markets [33, 34].

Collectively, the findings contribute to the understanding of welfare-driven consumption in a rapidly modernizing livestock-producing country and demonstrate that extended TPB models offer a useful analytical framework for examining ethical purchasing dynamics beyond Western markets.

CONCLUSIONS

Animal welfare-oriented purchasing behavior in Türkiye is shaped by the interaction between ethical motivation and economic feasibility. Although consumers generally express positive attitudes toward improved animal welfare standards, willingness to pay a premium remains strongly influenced by income level and price sensitivity. These findings indicate that ethical concern alone is insufficient to ensure market transformation without adequate economic accessibility and consumer trust.

The study demonstrates that attitudinal factors provide important explanatory value beyond socio-demographic characteristics, supporting the usefulness of extended TPB-based approaches in understanding ethical consumption behavior within developing livestock-producing economies.

Overall, animal welfare in Türkiye is increasingly recognized as an economically meaningful product attribute rather than merely a normative ideal. However, its sustained market integration requires the synchronization of ethical motivation, institutional credibility, and economic accessibility. Continued interdisciplinary research integrating behavioral economics, marketing science, and livestock policy will be essential for supporting the transition toward more sustainable and welfare-oriented animal production systems.

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Conflict of interest statement

The authors declare that they have no conflict of interest.

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