

Taste and trust: The impact of psychographics on certified meat demand

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ABSTRACT

The growing global demand for certified meat, driven by safety, quality, and sustainability concerns, poses unique challenges in fragile economies such as Afghanistan. This study investigated how psychographic variables such as religiosity, health consciousness, and price sensitivity influence Afghan consumers' preferences and willingness to pay (WTP) for chicken meat attributes. These attributes include Halal certification, freshness, antibiotic-free claims, and packaging. A discrete choice experiment (DCE) was conducted in Kabul with 400 participants. Data were analyzed using a mixed logit model to measure heterogeneous preferences and a two-stage framework to quantify psychographic impact. In this fragile environment, Halal certification commands the highest premium (175.5 AFN), highlighting its dual role as a religious imperative and a trust heuristic. Freshness (50.5 AFN) and antibiotic-free claims (26.5 AFN) were both valued. Health consciousness played an important role in shaping these preferences. Surprisingly, higher price sensitivity increased demand for Halal certification and freshness, emphasizing their indisputable cultural and safety value. The findings show that Halal certification serves multiple functions as a signal of both religious compliance and safety. This study contextualizes psychographic models in collectivist, post-conflict settings, providing policymakers and industry stakeholders with valuable insights for promoting certified products in fragile markets.

1. Introduction

Driven by growing consumer awareness of safety, quality, and sustainability issues, the worldwide food sector has witnessed a notable rise in demand for certified products, especially meat (Török et al., 2022; Chatterjee, 2024). Consumers' demand for certified meat products, from organic and animal welfare labels to Halal certifications and safety-assured certifications, has surged globally over the past decade (Henchion et al., 2021). Despite the rising popularity of plant-based diets in certain Western nations, a significant portion of consumers persists in meat consumption, increasingly favoring products that adhere to ethical, health, and environmental criteria. This shift is motivated by a growing awareness of health risks, ethical concerns, and environmental sustainability (Nie et al., 2021; Ajith and Rasheed, 2024). Certifications such as USDA Organic or EU Animal Welfare Approved have grown frequent in developed countries as driven by consumers' wish to pay premiums for perceived quality and ethical assurance (Gorton et al., 2023; Gaspar et al., 2022; Truong et al., 2022). However, in developing and post-conflict economies, certifications can serve two functions: one of safety in markets struggling with distrust and the other of cultural or religious identity (Taufique et al., 2015; Khan et al., 2018; Rani et al., 2018; Timilsina et al., 2024). Afghanistan, a nation grappling

with institutional fragility, food insecurity, and cultural variety, aptly exemplifies this. While increasing demand for additional labels, e.g., government-approved, organic, underscores changing consumer priorities, Halal certification is a baseline expectation for meat consumption here (Nasiri et al., 2023).

The meat market in Afghanistan presents a unique paradox. On one hand, religious beliefs significantly influence food selections; Halal compliance is a non-negotiable standard ingrained in social and religious identity (Fathima et al., 2024). On the other hand, decades of war have undermined public confidence in institutions, including food safety controls (Bradbury et al., 2024). This mistrust, combined with economic uncertainty, creates difficult trade-offs for consumers: balancing safety, affordability, and respect for cultural values. These conflicts reflect broader issues in fragile economies, where certifications must navigate competing forces of tradition, trust, and financial access (Slosse et al., 2023).

Afghanistan's cultural, economic, and institutional factors influence meat consumption. Most consumers, especially Muslims, consider Halal certification non-negotiable because it ensures Islamic dietary compliance (Nasiri et al., 2023). Due to limited confidence in formal certification systems, many consumers prefer conventional butcheries for their perceived freshness and cultural fit (Nasiri et al., 2023). A study on food

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production and consumption in Bamyān Province, Afghanistan, found that livestock are important in diets, especially during the lean season when crop diversification is limited (Poole et al., 2019). Helgi Library data suggests that Afghanistan consumed 1.71 kg of poultry meat per capita in 2023, a small but significant dietary contribution (Helgi Library, 2023). Afghanistan has become a net meat importer due to years of violence and insufficient local production to meet demand for meat-based diets (Food Navigator, 2014). Afghan consumer behavior is complex, with cultural norms, poor faith in official institutions, and economic restrictions influencing meat product selections. Afghan consumer behavior research, notably on verified meat, are scarce, leaving a gap in the literature.

Particularly regarding meat consumption, psychographics, such as consumers' lifestyles, values, attitudes, and interests, are major determinants of food choices (Valli et al., 2021). Studies show that many societies have a long-standing habit of eating meat, which is sometimes linked to wealth, nutrition, and social standing, making it a challenging practice to shift (Modlinska and Pisula, 2018). Reflecting ideological views about eating animals, consumers often employ rationalizations like the "4Ns" (natural, normal, necessary, and nice) to justify meat consumption (Piazza et al., 2020). Meanwhile, an increasing portion of consumers is becoming concerned about the ethical, health, and environmental consequences of meat production, driving a movement towards certified meat products that align with sustainability and animal welfare ideals (Webb and Webb, 2022). Particularly regarding meat consumption, psychographics, defined as the quantitative study of consumer lifestyles, values, attitudes, and interests, are major determinants of food choices (Valli et al., 2021; Begho and Zhu, 2023). Understanding consumer preferences for certified meat relies on these psychographic elements, including trust in certification systems and cultural fit, especially in contexts where conventional and modern food systems coexist.

Furthermore, discrete choice experiments (DCEs) have enhanced our understanding of food attribute trade-offs (Lancsar and Louviere, 2008; Johnson et al., 2013), previous applications often overlook how cultural and psychographic diversity, particularly in understudied collectivist societies, affects preferences (Rozin, 2015). In post-conflict, Muslim-majority countries like Afghanistan, religiosity, trust deficits, and communal identity are powerful but frequently ignored influences on food choices (Enriquez and Archila-Godinez, 2022; Owais et al., 2024). Existing studies on certified meat mainly concentrate on individualistic, Western consumers (Lusk et al., 2018; Einhorn, 2021), neglecting how group values (e.g., Halal compliance as a social norm) and institutional distrust interact with psychographics (e.g., health consciousness) to affect choices (Hakiki and Priantina, 2024).

In addition, although trust is acknowledged as a mediator in food choices (Kimartha Putri and Yusup, 2024), its role in linking psychographic characteristics (e.g., religiosity) and certification preferences remains uninvestigated in fragile economies, where trust dynamics are particularly fractured by conflict and weak governance (Seyoum, 2024). Three primary factors render this gap significant. The socio-cultural fabric of Afghanistan, characterized by collectivism, tribal connections, and post-conflict skepticism, contrasts sharply with the individualistic and trust-rich environments typically analyzed in behavioral food studies (Stent, 2021). Limited research exists on the effects of psychographics, such as religiosity and distrust, within a DCE framework; yet these factors may influence certification premiums positively or negatively (Sharma et al., 2022). Third, while DCEs operate under rational choice paradigms (Lancsar and Louviere, 2008), they occasionally fail to incorporate cultural values as moderating factors, which can compromise the precision of demand forecasts in non-Western contexts.

Despite the growing body of research on certified meat demand and psychographics globally, empirical studies specific to Afghanistan are scarce. Integrating a discrete choice experiment with psychometric measures, this paper fills in this gap by looking at how psychographic variables affect Afghan consumers' preferences for certified meat.

Focusing on Afghanistan's cultural and institutional setting helps this study to clarify consumer behavior in developing nations and provide useful consequences for industry players and legislators seeking to support certified meat products in such markets. The objectives of this paper are twofold: first, to investigate how psychographic factors affect Afghan consumers' preferences and willingness to pay for certified meat, and second, to add to the small body of research on consumer behavior in Afghanistan and comparable developing nations. By means of these objectives, the research aims to provide practical ideas for marketing certified meat products in areas where cultural and institutional elements have a major influence.

2. Methodology

2.1. Theoretical underpinnings: random utility theory and Lancaster's model

This study is grounded in the microeconomic theoretical framework of Random Utility Theory (RUT) (McFadden, 1974), which provides the scientific basis for modeling discrete choices. RUT posits that an individual n derives utility U_{ni} from choosing an alternative i , which is composed of a systematic, observable component V_{ni} and a random, unobservable component ε_{ni} :

$$U_{ni} = V_{ni} + \varepsilon_{ni} \quad (1)$$

The systematic component V_{ni} is a function of the attributes (X_k) of the alternative. The design of our choice experiment is further guided by Lancaster's Theory of Value (Lancaster, 1966), which states that consumers derive utility not from a good itself, but from the bundle of characteristics or attributes that constitute that good. This justifies the decomposition of chicken meat into the key attributes studied here: Halal certification, freshness, antibiotic-free claims, packaging, and price.

This leads to our study's conceptual framework, depicted in Fig. 1. We first employ a DCE to estimate the random utility parameters for each attribute (Stage 1). Crucially, we then model these individual-specific utilities as a function of psychographic variables (Stage 2). This two-stage approach allows us to not only measure preference heterogeneity but also to explain its psychographic drivers, moving beyond a simple black-box model.

The Discrete Choice Experiment (DCE) methodology is the direct empirical application of this theoretical framework. It allows researchers to present respondents with alternatives defined by these attributes and observe their choices, thereby estimating the parameters of the utility function. The mixed logit model (see Section 2.2) is then used to account for the random component ε_{ni} and to capture the unobserved preference heterogeneity across individuals, a key advancement over simpler models that assume homogeneous preferences.

While the RUT framework allows us to *measure* heterogeneous preferences (through the mixed logit model), it does not, on its own, *explain* what drives this heterogeneity. To address this, we integrate psychographic characteristics into our conceptual model. We conceptualize these psychographics as latent psychological constructs that systematically moderate the marginal utilities of the product attributes. For instance, we hypothesize that the utility weight for Halal certification will be significantly higher for individuals with high levels of religiosity. This integration of psychology into the economic model of choice provides a more complete, nuanced explanation of consumer decision-making.

2.2. Model Specification: The Mixed Logit Framework

Operationalizing the RUT framework described above requires a specific econometric model. This study employs a Mixed Logit (MXL) model, also known as a Random Parameters Logit model, which is highly flexible and accounts for unobserved preference heterogeneity across

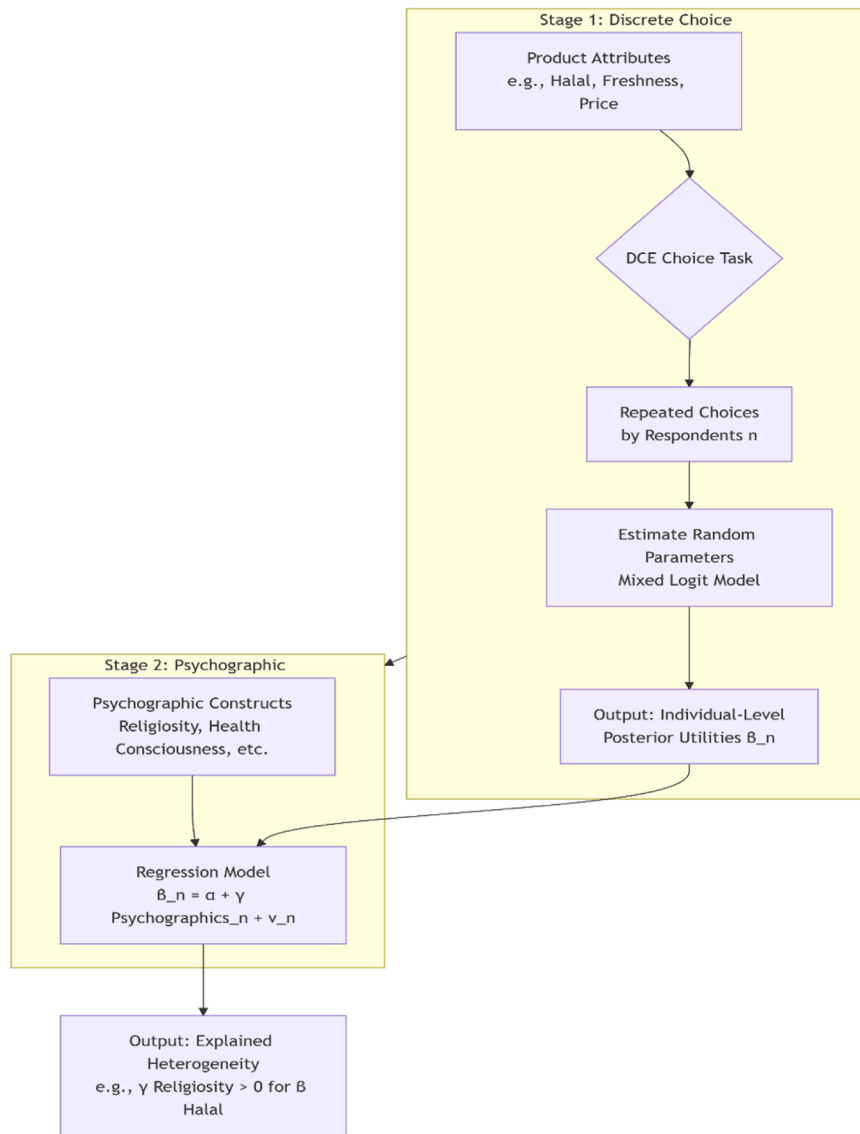


Fig. 1. Conceptual model of the two-stage analysis integrating DCE and psychographics.

respondents (Train, 2009). The cognitive processes of consumers in decision-making are influenced by these traits. Researchers can utilize DCE to integrate product features and simulate real-world purchasing situations (Halabi and Hands, 2018; Zhang et al., 2021; Rolfe et al., 2023; Yuting and Mohamed, 2023; Chuah et al., 2024). Participants are required to negotiate compromises among the attributes within the available options (Park et al., 2022; Banerjee et al., 2023). This study utilized the DCE method to determine the marginal willingness to pay for the safety attributes of chicken meat. The evaluated safety factors encompassed the antibiotics usage in chicken meat, Halal certification, its freshness, and packaging. The participants were directed to select the option they considered most favorable. The random utility framework underpinning discrete choice experiments assumes that an individual n derives utility U_{nm} from selecting alternative m in the choice set K_n , such that:

$$U_{nm} = X_{nm}\beta_n + \varepsilon_{nm} \quad (2)$$

Where X_{nm} is a vector of observed attributes (e.g., Halal certification, freshness, price), β_n represents individual-specific preference parameters, and ε_{nm} is an independently and identically distributed (i.i.d.) extreme value error term. Unlike the Conditional Logit Model (CLM), which assumes homogeneous preferences ($\beta_n = \beta$), the Mixed Logit

Model (MXL) explicitly accounts for unobserved preference heterogeneity by specifying β_n as random parameters following a distribution (e.g., normal, log-normal):

$$\beta_n = \beta + \eta_n \quad (3)$$

Where β denotes the population mean preference, and η_n captures individual deviations from this mean. The probability P_{nm} that individual n chooses alternative m is given by:

$$P_{nm} = \int \frac{\exp(x_{nm}\beta_n)}{\sum_{j \in K_n} \exp(x_{nj}\beta_n)} f(\beta_n|\theta) d\beta_n \quad (4)$$

where $f(\beta_n|\theta)$ is the density function of β_n , and θ represents distributional parameters (e.g., mean and variance). The integral is approximated via maximum simulated likelihood using 500 Halton draws, a method that balances computational efficiency and accuracy (Train, 2009).

2.3. Food safety attributes of chicken meat

This study primarily focuses on identifying the food safety attributes of chicken meat and their respective levels. The values of these attributes

are essential for generating various sets of hypothetical choices. Each attribute is associated with distinct levels, and the interplay among these levels may influence personal preferences that shape the decision-making process (Johnson et al., 2013). The selection of appropriate attributes and levels for DCE can be accomplished through expert interviews, literature reviews, focus group discussions (FGD), and a combination of FGD and literature reviews, according to Poder et al. (2019), Steiner et al. (2016), and Mangham et al. (2009). This study employs a combined Focus Group Discussion (FGD) and literature review methodology.

2.4. Focus group discussion

The Focus Group Discussion (FGD) occurred in January 2025 at Afghanistan International Islamic University. Two trained research assistants, instructed by the author and equipped with a standardized questionnaire guide, conducted the session, managed digital audio recording, and generated verbatim transcripts. The author subsequently examined, categorized, and analyzed all data. A total of 34 adult participants engaged in the focus group session, encompassing a diverse array of genders, ages, education levels, and ethnic backgrounds, including lecturers, students, university staff, and laborers, to effectively represent the Afghan community. The focus group discussion was conducted to identify the key safety attributes of chicken meat preferred by consumers. The safety attributes and levels employed in the FGD were derived from comprehensive literature reviews (Abbas et al., 2017; Allan et al., 2018; Ding, 2020; Katiyo et al., 2020; Li et al., 2020; Sohaib et al., 2020; Chowdhury et al., 2023). The participants were assigned the task of prioritizing the essential safety attributes related to chicken meat. The results of the focus group discussion (FGD) identified antibiotic use, Halal certification, freshness, packaging, and product pricing as essential safety attributes. Antibiotics use in chicken meat can be classified into two categories: those without antibiotic use and those with antibiotic use. Chicken meats are categorized based on their Halal certification status, which may be either certified or non-certified. Chicken meat freshness is categorized into two types: fresh and frozen. Chicken meat can be categorized into two distinct types based on their packaging: packed and unpacked. This study included all five safety attributes deemed desirable by consumers in the focus group discussion.

Table 1
Safety attributes of chicken meat as developed from the focus group.

Attribute	Levels	Description
Antibiotics Use	No antibiotics used	The chicken was raised without antibiotics, ensuring a more natural product.
	Antibiotics used	The chicken was raised with antibiotics, a common practice to prevent disease.
Halal Certification	With Halal certification	The chicken is certified as Halal, indicating it was slaughtered according to Islamic principles and meets religious standards for consumption.
	Without Halal certification	The chicken does not have Halal certification.
Freshness	Fresh	(slaughtered within 24 h) The chicken is freshly slaughtered and has never been frozen.
	Frozen	(stored for extended periods) The chicken has been frozen for preservation, which ensures a longer shelf life.
Packaging	Packed	The chicken is hygienically packed, ensuring better protection from contamination and maintaining freshness.
	Not packed	The chicken is sold unpacked, which may be traditional in local markets but could raise concerns about hygiene and contamination.
Price	400 AFN/Kg	
	350 AFN/Kg	
	300 AFN/Kg	
	250 AFN/Kg	

Table 1 outlines the attributes and their respective levels considered in this study.

2.5. Data collection procedure

The study was conducted in the Kabul city region, involving 400 respondents through a choice experiment. Data were collected through a self-administered questionnaire. The survey was conducted in wet markets and supermarkets situated in the urban areas of Kabul city. Data collection was conducted in various market settings, including supermarkets and wet markets, to ensure comprehensive coverage of all three income groups: low, middle, and high-income. The duration of the survey ranged from 15 to 25 min. The questionnaire comprised two sections tailored for the respondents. Section A included questions pertaining to the safety attributes of chicken meat as a food product. Section B concentrated on two parts: collecting demographic data and psychographic data regarding the respondents. Fifteen enumerators, all graduate students proficient in both Persian and Pashto, were recruited for data collection. They received training to enhance their understanding of the survey questions.

Table 2 presents the descriptions of the respondents. The participants were categorized into various age brackets, with the predominant segment (40 %) falling between the 18–28 age range. The subsequent age groups were 29 to 39 years (21.25 %), 40 to 50 years (13.5 %), and individuals above 50 years (25.25 %). The gender composition comprised 52.5 % males and 47.5 % females. The racial demographics of the respondents reveal that the predominant group (46.25 %) identifies as Tajik, followed by Pashtoon (25 %), Hazara (21.75 %), and Uzbek (7 %). Over fifty percent of the individuals were married, while 38.5 % were single. The respondents' educational backgrounds were categorized into three levels: primary education, secondary education, and tertiary education. Most participants (48.75 %) attained higher education, 36.25 % completed secondary education, and 15 % finished basic

Table 2
Socio-demographic characteristics of the study sample (N = 400) in Kabul, Afghanistan.

Demographic profiles	Categories	Frequency	Percentage	Mean
Group of Age (years old)	18–28	160	40	36.29
	29–39	85	21.25	
	40–50	54	13.5	
	Over 50	101	25.25	
Gender	Male	210	52.5	47.5
	Female	190	47.5	
Ethnic	Tajik	185	46.25	25
	Pashtoon	100	25	
	Hazara	87	21.75	
	Uzbek	28	7	
Marital status	Single	154	38.5	61.5
	Married	246	61.5	
Education Level	Primary School	60	15	36.25
	Secondary School	145	36.25	
	University Degree	195	48.75	
Employment Status	Government sector	72	18	52.5
	Private sector	202	52.5	
	Student	90	22.5	
	Housewife	36	9	
Income	Low (<10000AFN)	230	57.5	12,586.21
	Medium (10001AFN–20000AFN)	130	32.5	
	High (>20000AFN)	40	10	
Household number	1–4	203	50.75	6.28
	5–8	139	34.75	
	9–12	48	12	
	>12	10	2.5	

education. A significant proportion of individuals (52.5 %) were employed in the private sector, followed by the government sector (18 %), students (22.5 %), and housewives (9 %). The mean monthly household income was 12,586 AFN, with the majority of respondents (57.5 %) indicating earnings below 10,000 AFN, followed by 32.5 % reporting earnings between 10,000 AFN and 20,000 AFN, and 10 % reporting earnings beyond 20,000 AFN. 50.75 % of participants indicated that their households comprised one to four individuals, whereas 34.75 % reported a household size of five to eight individuals. Furthermore, 12 % of respondents reported a household size ranging from nine to twelve, whilst merely 2.5 % indicated having more than twelve individuals.

The participants were inquired about the type of chicken meat they would consider buying. This was achieved by offering orthogonally designed choice sets, each comprising various chicken meat alternatives characterized by specific levels of safety attributes. The safety attributes encompass the chicken meat's antibiotics use, Halal certification, freshness, packaging, and price-related factors. The MktEx function in SAS version 9.4 (SAS Institute Inc., 2020) was employed to generate 16 choice sets as an efficient design to guarantee diverse possibilities. Table 3 demonstrates examples of the choice sets utilized in the study to evaluate quality and safety attributes.

2.6. Specifications and techniques for modelling and estimation

This research analyzed two models: Model 1 and Model 2. The first model used a two-stage econometric framework that combines discrete choice experiments (DCEs) with psychometric survey data to look at what consumers prefer in terms of food safety attributes in chicken meat and the psychological factors that affect those attributes. Initially, a mixed logit model, also known as random parameters logit, was employed to estimate heterogeneous preferences among respondents, taking into account the panel structure of the DCE data. The subsequent model sought to identify the sociodemographic factors that could affect consumers' willingness to pay for these attributes.

Model 1

2.6.1. Stage 1: mixed logit model for preference estimation

The utility function for the respondent n choosing alternative m in choice task K was specified as:

$$U_{nm} = \beta_{0n} + \beta_{1n} \cdot \text{Antibiotic}_{nm} + \beta_{2n} \cdot \text{Halal}_{nm} + \beta_{3n} \cdot \text{Freshness}_{nm} + \beta_{4n} \cdot \text{Package}_{nm} + \beta_{5n} \cdot \text{Price}_{nm} + \varepsilon_{nm} \quad (5)$$

Where:

- β_{0n} : Alternative-specific constant (ASC) for the "no-choice" option.
- $\beta_{1n}, \beta_{2n}, \beta_{3n}, \beta_{4n}$: Random parameters capturing individual-specific preferences for Antibiotic use, Halal certification, freshness, and packaging (assumed normally distributed).
- β_{5n} : Fixed price coefficient (to ensure identifiability of WTP).
- ε_{nm} : i.i.d. extreme value error term.

To guarantee numerical stability, parameters are estimated using 1000 Halton draws and maximum simulated likelihood (Train, 2009).

2.6.2. Stage 2: psychographic drivers of preference heterogeneity

Individual-level posterior coefficients $\hat{\beta}_n^{\text{Attribute}}$ from Stage 1 are regressed against psychographic factors to explain heterogeneity:

$$\hat{\beta}_n^{\text{Attribute}} = \alpha + \gamma_1 \cdot \text{ReligiousCom}_n + \gamma_2 \cdot \text{HealthConsc}_n + \gamma_3 \cdot \text{EnvironmentCon}_n + \gamma_4 \cdot \text{Trust}_n + \gamma_5 \cdot \text{PriceSen}_n + \nu_n \quad (6)$$

Where, $\gamma_1, \gamma_2, \gamma_3, \gamma_4, \gamma_5$, quantify how psychographics amplifies or dampen preferences, and ν_n is the error term.

To capture unobserved preference variance, the coefficients $\hat{\beta}_n^{\text{Attribute}}$

were modelled as random parameters following normal distributions. This flexible method circumvents the limiting independence of irrelevant alternatives (IIA) assumption inherent in standard logit models (Train, 2009). Using maximum simulated likelihood with 500 Halton draws, a simulation technique guaranteed to produce accurate and consistent estimates, parameters were estimated ((Loureiro and Umberger, 2007)). With choice tasks grouped by respondent ID to address within-individual correlation, the model was applied in STATA 18 using the mixlogit package (Hole, 2007).

Using empirical Bayes techniques via the mixlbeta command, individual-level posterior coefficients ($\hat{\beta}_n^{\text{Attribute}}$) were extracted following the preference estimate. Dependent variables in the second-stage study were these coefficients measuring each respondent's marginal utility for antibiotic use, Halal certification, freshness, packaging and price. These coefficients were regressed against five psychographic constructs, health consciousness, religious commitment, environmental concern, trust in food safety, and price sensitivity, to help explain variation in preferences. With composite scores computed as respondent-level means following validating internal consistency using Cronbach's alpha ($\alpha > 0.7$ for all scales), psychographic variables were derived from multi-item Likert scales (1 = Strongly Disagree to 7 = Strongly Agree). For example, religious commitment was operationalized as the mean of three items (e.g., "My religious beliefs influence many decisions"). Achieving $\alpha = 0.89$, health consciousness ($\alpha = 0.82$) aggregated responses to items such "I avoid products harmful to my health."

Variance inflation factors (VIFs) were used to evaluate multicollinearity; all values below 2.5, well under the conservative threshold of 5 (O'Brien, 2007), so confirming that collinearity did not inflate standard errors or bias coefficients. Estimates of willingness to pay (WTP) were computed as $WTP_{\text{Attribute}} = -\frac{\hat{\beta}_{\text{Attribute}}}{\hat{\beta}_{\text{Price}}}$, so offering monetary interpretations of utility weights.





Using a fractional factorial design, the DCE design followed orthogonality and level balance with attributes including antibiotic use, Halal certification, freshness, packaging (present/absent) and price (250–400AFN) systematically across choice sets. With three alternatives per 16-choice task, two chicken meat profiles and a "none" option, each respondent completed 16 choice tasks, producing 6400 observations for 400 respondents. Separately collected psychographic data were combined with DCE data using respondent IDs to guarantee alignment between psychographic variables and preference.

Although computationally demanding, this two-stage method has clear benefits: it separates preference estimation from psychographic explanation, so lowering endogeneity risk associated with direct interaction between psychographics and DCE attributes. First, deriving individual-level utilities helps the model to avoid conflating attribute effects with respondent-level characteristics, so addressing a constraint of single-stage interactions. Moreover, the use of random parameters helps to accommodate relationships between attributes, so providing a more realistic picture of the decision-making procedures.

Psychographic scales were operationalized as follows. Health consciousness was assessed using a three-item scale adapted from Gould (1990), with respondents indicating agreement on a seven-point Likert scale (1 = Strongly Disagree to 7 = Strongly Agree); a sample item is "I make special efforts to avoid products that may harm my health." In the original validation, internal consistency was $\alpha = 0.85$. Religious commitment was measured via a three-item subset of the Religious Commitment Inventory-10 (RCI-10; Worthington et al., 2003), administered on the same seven-point scale; for example, "My religious beliefs influence many of my decisions in life." Whereas the full RCI-10 exhibits $\alpha = 0.90$, the three-item version employed here attained $\alpha = 0.81$ in pilot testing. Environmental concern was captured with three items drawn from the revised New Ecological Paradigm (NEP) Scale (Dunlap et al., 2000), also on a seven-point agreement scale; a representative item is "I am willing to pay more for products that are environmentally friendly."

Table 3

Example of a choice set task presented to survey respondents.

Q. Options A and B each describe different types of chicken meat. Please choose ONE option that you prefer the most to purchase.			
Attributes	Option A	Option B	Option C
Antibiotics Use	<input checked="" type="checkbox"/> No Antibiotics Used	<input checked="" type="checkbox"/> Antibiotics Used	<input type="radio"/> Both A and B are equally undesirable
Halal Certification	<input checked="" type="checkbox"/> Without Certification	 With Certification	
Freshness	<input checked="" type="checkbox"/> Fresh	 Frozen	
Packaging	 Packed	 Not Packed	
Price	250 AFN	350 AFN	
I would buy...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The original 15-item NEP demonstrates $\alpha=0.81\text{--}0.83$. Trust in food safety was evaluated via three items adapted from [Wales et al. \(2006\)](#), with statements such as “I rely on certifications to guarantee the safety of the food I consume”; the source scale reported $\alpha = 0.86$. Finally, price sensitivity was measured using three items from [Lichtenstein et al. \(1993\)](#), including “I usually choose the lowest-priced option when shopping for meat,” yielding $\alpha = 0.79$ in the five-item original and $\alpha=0.82$ for the three-item subset in pretesting.

Model 2

The model specification of Model 2 is as follows:

$$U_{nm} = \beta_{0n} + \beta_{nm}X + \alpha(X_{nm} \times \text{Age}) + \alpha(X_{nm} \times \text{Education}) + \alpha(X_{nm} \times \text{Household Size}) + \alpha(X_{nm} \times \text{Income}) \quad (7)$$

let $n = 1, \dots, N$ represent the number of respondents, m denotes options A, B, or C; U_{nm} signifies individual utility; and β_{0n} indicates an alternative-specific constant associated with the “no-buy” option. X represents a vector of safety attributes defined within the basic model. “ β ” and “ α ” stand for the coefficients that need to be estimated. We developed dummy variables for age, education, household size, and income to analyze the impact of socio-demographic factors on individuals’ willingness to pay for the safety attributes of chicken meat. The variables were utilized to classify the participants into distinct groups. If a respondent’s age falls within the range of 18 to 28, the variable *Age1828* is assigned a value of 1. If not, it is assigned a value of 0. This was similarly accomplished for the age groups of 29–39, 40–50, and over50. In the context of educational variables (primary, secondary, and higher education), a value of 1 is assigned to *Edu.Primary* if the participant has completed primary education, and 0 if not. The same was done for the other two educational levels. Household size is represented by four dummy variables. *Size_1_4* is assigned a value of 1 for households with 1–4 members and 0 for all other cases; *Size_5_8* is valued at 1 for households containing 5–8 members and 0 otherwise; *Size_9_12* is marked as 1 for households with 9–12 members and 0 otherwise; and *Size_12plus* is defined as 1 when the household has >12 members and 0 otherwise. Each household observation will have precisely one of these indicators set to 1, thus categorizing it into a single size category. The monthly income of the household is indicated by three dummy

variables: Low, Medium, and High. *Inc.Low* is assigned a value of 1 when income is below 10,000 AFN and 0 in all other cases. *Inc.Med* equals 1 when income ranges from 10,001 AFN to 20,000 AFN; otherwise, it equals 0. *Inc.High* is assigned a value of 1 when income surpasses 20,000 AFN and 0 in all other cases. Interaction terms were generated by integrating the dummy and independent variables, as specified in the model (Eq. (4)). The categorization approach provides a framework for analyzing the relationship between socio-demographic factors and the willingness to pay for food safety attributes of chicken meat.

3. Results

3.1. Estimation outcomes from mixed logit analysis

The mixed logit model revealed significant heterogeneity in consumer preferences for certified chicken meat attributes, with Halal certification, freshness, and antibiotic-free claims emerging as key drivers of choice, while price exerted a strong negative influence on utility. Sample-level mean estimates (Table 4) demonstrated that Halal certification had the largest positive effect on utility ($\beta=1.52$, $p = 0.001$), followed by freshness ($\beta=0.43$, $p = 0.001$) and packaging ($\beta=0.23$, $p = 0.001$). Antibiotic-free claim also positively influenced preferences ($\beta=0.23$, $p = 0.004$), though its impact was comparatively smaller. The “none” alternative, representing an opt-out option, significantly reduced utility ($\beta=-1.55$, $p = 0.001$), confirming respondents’ general preference for meat products over abstaining. Price exhibited a robust negative coefficient ($\beta=-0.008$, $p = 0.001$), aligning with economic theory, higher prices decreased the likelihood of selecting a product.

Substantial heterogeneity was evident in the standard deviation estimates. For Halal certification ($\sigma=1.50$, $p = 0.001$) and antibiotic-free claim ($\sigma=1.27$, $p = 0.001$), the large and statistically significant standard deviations indicated pronounced variation across respondents, suggesting that while these attributes were valued on average, their importance differed markedly between individuals. Freshness ($\sigma=0.36$, $p = 0.001$) and packaging ($\sigma=0.27$, $p = 0.001$) also showed significant preference variability, though to a lesser degree. The opt-out option’s standard deviation ($\sigma=1.01$, $p = 0.001$) highlighted divergent baseline

Table 4

Mixed logit model parameter estimates for chicken meat attributes.

Variable	Coefficient
<i>Mean estimates</i>	
Halal Certification (Certified)	1.52*** (0.0919)
Freshness (Fresh)	0.43*** (0.0478)
Antibiotic Use (Antibiotic Free)	0.23*** (0.0805)
Packaging (Packed)	0.23*** (0.0417)
Alternative Specific Constant (None)	−1.55*** (0.1536)
Price	−0.008*** (0.0005)
<i>SD estimates</i>	
Halal Certification (Certified)	1.50*** (0.0961)
Antibiotic Use (Antibiotic Free)	1.26*** (0.0893)
Freshness (Fresh)	0.36*** (0.0816)
Packaging (Packed)	0.27*** (0.0814)
Alternative Specific Constant (None)	1.01*** (0.1676)
Price	−0.006*** (0.0003)

Number of Observation = 19,200.

Log likelihood = −5530.

AIC (Akaike information criterion) = 9217.

Mc Fadden R^2 = 0.3145.

Note: The standard errors are denoted within parentheses. All estimates are statistically significant at the 1 % level.

propensities to choose meat products, with some respondents strongly avoiding the "none" option and others frequently selecting it.

The model's robust fit (χ^2 (8) = 791.06, p = 0.001) and the significance of random parameters validated the use of a mixed logit framework over simpler models. The results collectively highlight two critical insights: first, certifications such as Halal and antibiotic-free serve as potent differentiators in consumer choice, albeit with substantial individual variability; second, freshness and packaging, while less influential than Halal, remain strategically relevant for market segmentation. The negative price coefficient further emphasizes the sensitivity of meat purchases to cost, suggesting that certifications must balance perceived value with affordability.

These findings set the stage for analyzing psychographic moderators of preference heterogeneity, which are explored in subsequent analyses. The significant standard deviations for Halal and antibiotic-free attributes, in particular, imply that psychographic factors such as religiosity or health consciousness may explain why some consumers prioritize these certifications more than others.

3.2. Willingness-to-pay for safety attributes of chicken meat

Derived from the mixed logit model, the willingness-to-pay (WTP) estimates expose notable economic premiums Afghan consumers link with certified chicken meat attributes (Table 5).

Halal certification commanded the highest premium; consumers are

Table 5Estimated willingness-to-pay (WTP) premiums, in Afghani (AFN), for safety attributes of chicken meat.²

Attribute Levels	WTP	Standard Error	95% Conf. Interval	
			Lower	Upper
Halal Certification (Certified)	175.5	13.7444	148.64	202.52
Freshness (Fresh)	50.5	3.2481	38.27	62.77
Packaging (Packed)	27.1	4.0349	17.23	36.96
Antibiotic Use (Antibiotic Free)	26.5	6.4231	8.05	44.99

willing to pay 175.5 AFN¹ (p = 0.001) more for Halal-certified chicken, so underlining its centrality in purchasing decisions within Afghanistan's largely Muslim sociocultural context. This reflects both theological adherence and trust in certification as a proxy for safety and ethical slaughter practices; Halal compliance is non-negotiable for most consumers, in line with religious standards controlling meat intake.

Freshness was identified as the second most valued attribute, exhibiting a willingness to pay of 50.5 AFN (p = 0.001). This prioritization arises from concerns regarding foodborne illnesses and spoilage within a market marked by fragmented cold-chain infrastructure and extended supply chains, where freshness is perceived as an indicator of safety and quality. Packaging produced a significant premium of 27.1 AFN (p = 0.001), likely associated with perceptions of hygiene and product integrity in informal or open-air markets, where contamination risks (e.g., dust, pests) enhance the value of sealed, standardised packaging. Despite being smaller in magnitude, antibiotic-free claims derived a statistically significant premium (26.5 AFN, p = 0.005), indicating emerging awareness of antimicrobial resistance (AMR) risks. The broad confidence interval (e.g., 14.2–38.8 AFN) indicates heterogeneous valuations, likely influenced by variations in health literacy, trust in labelling, or urban-rural divides, with urban and educated consumers potentially placing greater emphasis on antibiotic-free products.

Halal certification's predominance in WTP emphasises how urgently Halal compliance must be given top priority as a market entrance requirement. Freshness and packaging premiums point out chances to invest in standardised packaging and cold-chain infrastructure to reduce post-harvest losses and build consumer confidence. The modest but noteworthy WTP for chicken free of antibiotics points to a growing need for more environmentally friendly manufacturing methods, which justifies focused awareness-raising campaigns. These results highlight in turn how cultural adherence, quality assurance, and growing health consciousness interact to shape Afghan meat preferences.

3.3. Descriptive statistics for psychographics

Table 6 presents the descriptive statistics and reliability of psychographic factors. For the sample of chicken-meat consumers, the psychographic scales shown reasonable internal consistency and meaningful dispersion. Exceeding the traditional threshold of 0.70, Cronbach's alpha values ranged from 0.80 (Environmental Concern) to 0.83 (Price Sensitivity), so confirming the reliability of each multi-item construct. In later choice modelling, this reliability coefficients help to support the use of scale means as stable indicators of underlying attitudes.

Religious Commitment demonstrated the highest mean (6.86, SD=1.01), with scores clustered around the maximum of 7.00 and a

Table 6

Descriptive statistics and reliability coefficients for psychographic constructs.

Factors	Mean	SD	Min	Max	Cronbach's α
Religious Commitment	6.856	1.008	2.00	7.00	0.81
Health Consciousness	6.011	0.977	2.33	7.00	0.82
Environmental Concern	4.514	1.218	1.00	7.00	0.80
Trust in Food Safety	5.326	1.015	1.00	7.00	0.81
Price Sensitivity	5.505	1.117	1.67	7.00	0.83

¹ The average exchange rate was 74.8 AFN per USD (January 2025).

² The Krinsky-Robb parametric bootstrap approach is utilized for estimating the associated standard errors using STATA 18 software.

³ The Krinsky-Robb parametric bootstrap approach is utilized for estimating the associated standard errors using STATA 18 software.

minimum of 2.00. This pattern indicates a sample that is largely religiously observant or one that significantly values faith-based food attributes. The high internal consistency ($\alpha=0.81$) indicates that the scale accurately measures the aspect of religiosity pertinent to Halal preferences. The increased mean supports the interpretation of the substantial, positive coefficient for Halal certification in the mixed logit model.

On a 7-point system, Health Consciousness registered a high mean score of 6.01 (SD=0.98), meaning that, on average, respondents self-identified as highly motivated towards health considerations in food purchase decisions. The rather low standard deviation (0.98) and minimum of 2.33 point to few participants scoring themselves as minimally health-conscious. This concentration at the top end of the scale highlights the salience of health issues in the decision environment for chicken meat and corresponds with its major positive impact on utilities for freshness and claims free of antibiotics.

With a mean of 4.51 (SD=1.22), Environmental Concern indicated rather moderate sample environmental attitudes. This construct has both enough variability and dependability with scores ranging the whole scale (Min=1.00, Max=7.00) and an α of 0.80. Consistent with its non-significant coefficients across all four attribute utilities, the mid-range average indicates, however, that environmental motives may be secondary to other psychographic drivers in shaping chicken-meat choices.

Furthermore, with a mean of 5.33 (SD=1.02), Trust in Food Safety reflected generally high confidence in regulatory and industry practices linked to food safety. The range (1.00–7.00) and an α of 0.81 show that although most respondents believe the safety system is reliable, a significant minority voices doubt. Although in our choice model, trust did not notably predict preferences for the tested attributes, this variability is crucial for identifying any moderating effects on attribute utilities.

The mean Price Sensitivity was recorded at 5.51 (SD=1.12), with a minimum of 1.67 and a maximum of 7.00. This suggests that, on average, respondents displayed a moderate level of attention to price factors when buying chicken meat. The elevated reliability ($\alpha=0.83$) indicates a strong measurement of price-related concerns. The observed dispersion indicates the existence of both highly price-sensitive and less price-sensitive segments, which is crucial for comprehending the unexpected positive relationship between price sensitivity and the utilities for Halal and freshness attributes.

In summary, the psychographic measures demonstrated robust reliability and exhibited distinct distributional properties: strong central tendencies for health consciousness and religiosity, moderate orientation toward environmental concerns and price sensitivity, and generally high trust in food safety. These descriptive findings provide a solid foundation for interpreting how these constructs drive heterogeneous preferences in the discrete choice experiment.

3.4. Psychographic drivers of preferences

Table 7 illustrates results from a two-stage mixed logit model based on 400 observations, demonstrating the influence of religiosity, health awareness, and price sensitivity on the demand for Halal certification, antibiotic-free claims, freshness, and packaging, key attributes in Afghanistan's developing food markets. Baseline utility (constant) indicates consumer preference in the absence of psychographic covariates.

Religious commitment was identified as the primary factor influencing preferences for Halal certification ($\beta=0.37$, $p=0.001$), highlighting Afghanistan's deeply rooted Islamic values, where Halal compliance extends beyond dietary selection to represent a commitment to religious identity and community standards. This corresponds with the nation's socio-religious structure, wherein 99 % of the populace is Muslim, and Halal certification operates as an essential indicator of legitimacy and trust. Furthermore, health consciousness significantly increased the preference for Halal ($\beta=0.18$, $p=0.05$), indicating that Afghan consumers connect Halal practices with both religious adherence and considerations of hygiene and food safety. This association is

Table 7

Psychographic drivers of food safety preferences.

Variables	Hala Certification	Antibiotic-Free	Freshness	Packaging
Religious_Commitment	0.37*** (0.1153)	−0.12 (0.1123)	−0.02 (0.0198)	−0.018 (0.0150)
Health_Consciousness	0.18** (0.1060)	0.19** (0.1040)	0.14** (0.0182)	0.006 (0.0139)
Environmental_Concern	0.01 (0.0835)	0.003 (0.0813)	0.002 (0.0144)	0.013 (0.0109)
Trust_Food_Safety	0.03 (0.0853)	−0.06 (0.0830)	−0.01 (0.0147)	0.001 (0.0111)
Price_Sensitivity	0.05*** (0.0514)	−0.04 (0.0514)	0.04** (0.0288)	0.001 (0.0067)
Constant	0.03 (0.5908)	0.57 (0.5752)	0.39 (0.1018)	0.03** (0.0771)
Observations	400	400	400	400
R ² / Pseudo-R ²	0.21	0.19	0.22	0.14

Standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Dependent variables: Utility coefficients for Halal certification, antibiotic-free claims, packaging, and freshness.

Estimation: Two-stage mixed logit model with 500 Halton draws.

Baseline utility (constant) reflects preferences when all attributes are absent.

likely strengthened by the lack of regulatory oversight in local markets. Price sensitivity was found to positively influence Halal preferences ($\beta=0.05$, $p=0.01$), a finding that highlights the cultural significance of Halal consumption. Cost-conscious consumers still prioritize Halal-certified products, indicating that religious obligations take precedence over budgetary constraints. This contrasts with global trends in which price frequently dictates trade-offs, underscoring the distinctive market dynamics of Afghanistan.

Antibiotic-free claims were primarily influenced by health consciousness ($\beta=0.19$, $p=0.05$), suggesting that health-conscious consumers, likely from urban and educated demographics, prioritize mitigating antibiotic resistance risks. The lack of substantial effects from religiosity, environmental concern, or trust in food safety indicates a potential knowledge gap or the presence of competing priorities. In a country facing conflict and poverty, immediate survival concerns could overshadow environmental and long-term health issues. Only 35 % of Afghans have access to basic healthcare, potentially restricting awareness of antibiotic resistance as a significant concern.

Health consciousness ($\beta=0.14$, $p=0.05$) and price sensitivity ($\beta=0.04$, $p=0.05$) influenced preferences for freshness. Health-conscious consumers believe that freshness is crucial for the safety of foods. This is due to the belief that fresh chicken meat possesses greater nutritional value and is less processed. Conversely, price-sensitive individuals, typically from lower-income brackets, perceive it as an indicator of value and avoid supply chains that lack adequate refrigeration to mitigate spoilage risks. The elevated temperatures in Afghanistan, combined with compromised cold-chain infrastructure, accelerate food spoilage, posing a significant challenge for individuals across all income groups.

Lastly, with just the baseline utility reaching significance ($\beta=0.03$, $p=0.05$), no psychographic variable clearly influenced packaging preferences. This implies that more obvious factors like Halal status and freshness are either universally accepted or overwhelm the function of packaging. Standardized packaging may not have cultural resonance or be seen as superfluous for quality assurance in Afghanistan's informal markets, where unpacked fresh meat rules.

3.5. Willingness to pay for interaction terms for food safety attributes of chicken meat

The analysis of willingness-to-pay (WTP) premiums for interaction terms (Table 8) reveals significant variation in consumer perceptions of chicken meat safety attributes based on key demographic characteristics. These findings reach beyond average attribute valuations to reveal

Table 8

Willingness-to-pay (WTP) premiums for significant demographic interaction effects.³.

Variables	WTP	Standard Error
Halal certified x Age4050	AFN73.4	6.1842
Halal certified x Age2939	AFN42.8	4.2196
Halal certified x Income high	AFN55.3	5.8702
Freshness fresh x Education secondary	AFN28.2	3.7035
Freshness fresh x Income high	AFN41.4	4.0359
Freshness fresh x Age4050	AFN34.7	3.2179
Antibiotic-free x Education tertiary	AFN23.2	2.8430
Packaging packed x Income high	AFN19.8	2.0081
Packaging packed x Education tertiary	AFN13.1	2.0042

nuanced preference structures that are essential for market segmentation and targeted product development. The findings show that age, income, and education levels systematically influence the marginal utility that consumers derive from specific safety features.

The highest premiums, which are significantly influenced by age and income, are seen for Halal certification. When compared to the reference age groups (presumably 18–28 and 50+), consumers aged 40–50 years have an exceptionally high WTP premium of AFN73.4, which is significantly higher than the premium of AFN42.8 for consumers aged 29–39. This implies that consumers in their middle years (40–50) place a remarkably high value on religious dietary compliance, which may be influenced by life stage factors like increased religious observance, domestic provisioning duties, or accumulated food safety concerns. Additionally, consumers with higher incomes show a notable premium of AFN55.3 for Halal certification, suggesting that this feature serves as both a religious necessity and a perceived quality signal that consumers from higher socioeconomic segments are willing to pay for.

Significant demographic moderation is also seen in freshness attributes, although typically at lower absolute premiums than Halal. The premium for freshness is AFN28.2 for consumers with secondary education and AFN41.4 for consumers with high incomes. This supports the conclusion that safety and quality signals are consistently more important to higher-income groups. In line with their high regard for Halal, the 40–50 age group's notable premium of AFN34.7 for freshness highlights their increased sensitivity to essential product quality attributes.

Tertiary education is the primary moderator for antibiotic-free claims, driving a premium of AFN23.2. This supports the hypothesis that a higher level of education is associated with a stronger preference for production methods viewed as more sustainable or natural and a greater awareness of public health issues such as antibiotic resistance. The lack of significant age or income interactions here indicates that education, which serves as a proxy for knowledge acquisition, is a more important driver of this particular attribute than either disposable income or life stage alone.

Lastly, more modest premiums are elicited by packaging (specifically packed vs. unpacked), which is largely moderated by tertiary education (AFN13.1) and high income (AFN19.8). This suggests that consumers who are more well-educated and wealthier, who value and can afford these advantages, place a higher value on packaged chicken due to its perceived safety, convenience, and hygiene. Packaging is a secondary, but still important, safety feature for these markets, as evidenced by the comparatively lower premiums when compared to Halal or Freshness.

4. Discussion

This study reveals new insights into consumer preferences for certified chicken meat within a vulnerable, predominantly Muslim context by combining choice-based product attributes weights with psychographic and demographic factors. Our findings significantly contribute to the literature by demonstrating that the drivers of certification premiums in such contexts, particularly profound religiosity and acute

health consciousness, operate fundamentally differently than in the stable, individualistic Western settings that have dominated prior research (Muntaqo et al., 2024; Török et al., 2023; Upenieks and Orfanidis, 2022). The predominant significance of Halal certification extends beyond its function as a simple indicator of religious adherence. In Afghanistan's institutional void, where trust in formal food safety systems is fractured (Saif-Nijat et al., 2023), Halal functions as a critical socio-religious trust heuristic. This concept encapsulates the essence of communal identity, provides assurances regarding ethical slaughter practices, and, crucially, serves as a perceived safeguard against the myriad risks of contamination present in our environment. This dual role (religious imperative and safety signal) challenges Western-centric models where certifications like organic or welfare often reflect individual ethical stances or environmental values, rather than foundational trust and identity (Novi Sekar Sari et al., 2023).

4.1. Interplay of psychographics in a fragile context

1- Religiosity as the Anchoring Force: The finding that Religious Commitment is the primary driver of Halal preference underscores the profound role of faith as the bedrock of consumer choice in Afghanistan, surpassing other attitudinal factors. This aligns with the concept of food consumption as a deeply embedded socio-religious practice within collectivist communities (Abdul Khalek et al., 2023), where adherence to Halal principles carries significant social and spiritual weight. This suggests that in fragile states, religiosity may be the dominant psychographic lens through which food safety is perceived, effectively making religious and safety guarantees inseparable. The non-significant role of Environmental Concern further demonstrates how existential concerns (religious commitment, immediate safety) eclipse larger sustainability reasons in weak economies (Aung et al., 2024).

2- Health Consciousness: Integrating Traditional and Contemporary Approaches. Religiosity underpins Halal demand, whereas Health Consciousness serves as the primary motivator for contemporary attributes such as antibiotic-free claims and freshness (Abdou et al., 2024). A segment of consumers, typically more urban and educated, perceives certifications and visible safety indicators as mechanisms for reducing personal and familial health risks. The significant premium for freshness (50.5 AFN) clearly indicates genuine concerns regarding cold-chain failures and spoilage within Afghanistan's inadequate infrastructure, serving as a concrete measure of safety rather than simply a matter of convenience.

3- The Paradox of Price Sensitivity: The surprising finding that increased Price Sensitivity enhances the preference for Halal and freshness challenges conventional economic theories and results observed in wealthier contexts (Sadali et al., 2024). This paradox illustrates that in Afghanistan, Halal is both non-negotiable and inelastic, representing a cost that must be incurred irrespective of financial limitations. Freshness is considered essential for value and safety; consumers who are sensitive to price prioritise it to reduce waste and health risks, making trade-offs in other areas such as packaging and brand premiums. This highlights the significant role of context in the interaction between economic restrictions and essential cultural and safety imperatives.

4.2. Demographic heterogeneity and market segmentation

The results of this study coincide with prior research, indicating the range of consumers' willingness to pay extra for the safety attributes associated with food items. This difference is dependent upon demographic variables, such as age, income, and educational achievement. The study found that senior consumers (aged 29 to 50) placed a higher value on food safety attributes compared to their younger counterparts (between 18 and 28). This gap can be due to the increasing attention on keeping a healthy diet as people get older. This observation is consistent

with the results of [Alsubhi et al. \(2023\)](#); [Kathiravan et al. \(2020\)](#), and [Katt & Meixner \(2020\)](#), which demonstrated that older consumers are prepared to pay a higher price for safer items. One possible reason for this tendency is because as people grow older, they place more value on their own health and well-being. This perspective grows more dominant with age and differs from the thinking of younger consumers.

The results indicate that consumers with higher education levels, particularly those holding university degrees, and higher incomes are more likely to pay for the safety attributes linked to chicken meat. The results of recent studies ([Silva et al., 2021](#); [El Hadad-Gauthier et al., 2022](#); [Turan and Kadagan, 2023](#); [Alsubhi et al., 2023](#)) support this finding, showing that people with higher incomes and education levels are more willing to pay more for safer and higher-quality foods. As individuals accumulate more cash and reach better levels of education, they become more aware of their health and are more eager to spend money on health-related attributes.

4.3. Theoretical implications

This study offers several important theoretical contributions to the literature on consumer choice and psychographics in fragile, non-Western contexts. First, by contextualizing psychographic, it empirically supports the criticism levelled against the naive application of psychographic models developed from stable, individualistic economies to collective, fragile states ([Nalle and Ismail, 2024](#)). Religiosity and mistrust manifest particularly in drastically changing trade-off behavior and preference hierarchies. In particular, trust is not abstract institutional faith but is vested in specific, culturally relevant organizations like Halal certification. Second, a successful two-stage integration of psychographics into a DCE framework aids us in closing a significant methodological gap. We extend beyond merely identifying preference heterogeneity (by random parameters) to elucidate its origins using quantifiable psychological characteristics (religiosity, health focus), thus enhancing the predictive power and theoretical richness of DCEs in non-Western contexts. Finally, our findings reconceptualize Halal as a multidimensional construct, our results demand reinterpretation of Halal outside a binary religious trait. Acting as a necessary "trust prosthesis", it fills in for weak formal institutions and gives customers a needed sense of safety and legitimacy among market uncertainties in unstable nations.

4.4. Practical implications and market realities

The results provide industry and policymakers with practical insight. First, strong and trustworthy Halal certification is not a premium approach but rather a basic need for market access in Afghanistan. Priorities are investments in consumer awareness, transparency, and enhancement of certification integrity. Secondly, giving Core Attributes top priority should be efforts to guarantee Halal compliance and increase freshness by means of cold-chain infrastructure investment, therefore improving the meat supply chain. The high WTP for freshness indicates customer eagerness to help such changes.

Furthermore, market segmentation strategies can be tailored to distinct consumer groups. Middle-class and upper income consumers: Emphasizing quality and safety guarantees, targeting top Halal and fresh items. This chapter shows the best WTP. For educated consumers, using their increased health consciousness, educated consumers can create focused messaging connecting antibiotic-free manufacturing to certain health benefits. Finally, for the price-sensitive majority, focus on ensuring basic Halal and freshness at reasonable price points, sensitive to costs. Direct market channels or simplified packaging could help to maximize expenses without sacrificing these basics. Lastly, initiatives integrating Halal certification authorities with public health messaging could use the noted link between Halal and perceived safety to improve general food system trust.

4.5. Limitations and future research directions

Despite its contributions, this study is subject to several limitations that also present opportunities for future research.

First, the study's focus on an urban context, data were collected exclusively in Kabul, limits the generalizability of our findings. Preferences in rural areas, where poverty is more acute, infrastructure is weaker, and traditional practices are potentially stronger, may differ significantly. Future research should explicitly incorporate rural inclusivity to provide a more comprehensive understanding of consumer behavior across Afghanistan's diverse socio-geographic landscape.

Second, the exclusive focus on chicken meat, while providing methodological clarity, constrains category-wide conclusions. The cultural and economic significance of red meats (e.g., beef, lamb) is distinct, and the drivers of certified demand for these products may vary. Subsequent studies should investigate these category-specific dynamics.

Third, the reliance on self-reported psychographic measures, despite demonstrating internal consistency, is susceptible to well-known biases such as social desirability. To gain a deeper, more nuanced understanding of the motivations behind stated preferences, future work could employ mixed-methods approaches, complementing DCEs with qualitative interviews or implicit association tests.

Fourth, the cross-sectional nature of this study captures a snapshot in time within a volatile socio-economic environment. Afghanistan's context is inherently dynamic. Longitudinal research is necessary to track how consumer preferences evolve alongside potential political stability, economic growth, or changes in information flows.

Finally, to enhance the external validity of the findings, testing this conceptual framework in other fragile, Muslim-majority, or highly collectivist economies would be valuable. This would help disentangle context-specific findings from universal principles governing food choice in environments of low institutional trust.

5. Conclusion

This study has investigated how psychographic and demographic factors shape Afghan consumers' preferences and willingness-to-pay (WTP) for certified chicken meat attributes in a fragile, predominantly Muslim context. Employing a two-stage discrete choice experiment (DCE) framework with a mixed logit model, we first demonstrated that Halal certification commands the highest economic premium (175.5 AFN), followed by freshness (50.5 AFN), packaging (27.1 AFN), and antibiotic-free claims (26.5 AFN). Significant heterogeneity in these valuations underscored the necessity of exploring underlying psychographic drivers. In the second stage, religious commitment emerged as the principal driver of Halal preference, while health consciousness most strongly influenced valuations of freshness and antibiotic-free claims. Surprisingly, greater price sensitivity also heightened the salience of Halal and freshness attributes, reflecting the non-negotiable nature of religious compliance and safety cues even among cost-conscious consumers.

Our findings contribute to the literature on food choice in several ways. First, they highlight the inadequacy of Western-developed psychographic models when applied unmodified to collectivist, conflict-affected settings. In Afghanistan, Halal certification functions not only as a religious marker but also as a critical trust heuristic that compensates for weak formal institutions. Second, the study illustrates the value of integrating psychographic constructs into DCEs via a two-stage approach, thereby disentangling attribute utility estimation from the influence of individual-level attitudes. Finally, by documenting demographic heterogeneity, particularly the elevated WTP among middle-aged, higher-income, and more educated segments, this work offers nuanced insights for market segmentation that extend beyond aggregate preference measures.

From a practical standpoint, our results suggest that industry actors and policymakers should prioritize the integrity and visibility of Halal

certification to secure baseline market access. Investments in cold-chain infrastructure and standardized packaging are also warranted to meet consumer demand for freshness and hygiene. Targeted communication strategies can further leverage the link between health consciousness and antibiotic-free production to appeal to educated, urban segments, while low-cost channels should ensure basic Halal and freshness standards reach cost-sensitive groups. Collaborative initiatives between certification bodies and public health agencies may also reinforce broader trust in the food system.

Notwithstanding its contributions, this study is limited by its urban focus on Kabul and the exclusive examination of chicken meat. Future research should extend to rural regions, other protein categories, and longitudinal designs to capture evolving preferences amid shifting socio-political conditions. Mixed-methods approaches, including qualitative interviews or implicit measures, could further validate psychographic constructs and uncover latent drivers of meat choice. By illuminating how religiosity, health concerns, and economic constraints interact in a fragile food market, this research lays the groundwork for more context-sensitive models of certified food demand in similar settings worldwide.

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Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the authors used QuillBot to paraphrase and check grammar. After using this tool/service, the author (s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

Ethical statement

The university's regulations on "Responsible use of freedom in research and minimization of risk" provide that investigators assess potential risks in conducting research involving humans. Providing that no serious threats are found, studies may be exempt from applying for approval by the institutional review board. This exemption typically applies to surveys where no personal data is collected (i.e., participant name, address, date of birth or similar identifiers), just like our study. While exempt from institutional review, the university still expects researchers to act responsibly. Accordingly, the work described has been carried out in full accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki). In particular, participants provided informed consent about data and privacy protection regulations (e.g., remaining fully anonymous, with only aggregated results used for non-commercial purposes) and about their right to withdraw from the study at any time without giving a reason. All participants acknowledged an informed consent statement in order to participate in the study. Meticulous care was taken to ascertain that, despite the low risk assessment, all necessary measures were taken to fully comply with ethics standards. An ex-post evaluation can be obtained from the university's ethics committee upon request.

CRedit authorship contribution statement

Khalid Joya: Writing – review & editing, Writing – original draft, Supervision, Software, Project administration, Methodology, Formal analysis, Data curation, Conceptualization.

Declaration of competing interest

The author declares that he has no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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