



Willingness to Pay for Halal-Certified Livestock Products in South Kalimantan: An Extended Theory of Planned Behavior Approach

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ABSTRACT

Halal certification has become a key signal of religious compliance and quality assurance in Muslim-majority food markets, yet consumers' willingness to pay (WTP) a price premium for certified livestock products remains unevenly understood at the local level. This study examined WTP for halal-certified meat, poultry, eggs, and milk in South Kalimantan, Indonesia, using an extended Theory of Planned Behavior (TPB) that incorporated religious commitment as an additional driver and moderator. Primary cross-sectional data were collected via an online questionnaire from 300 Muslim consumers, screened for recent purchases of livestock products, and were analyzed using partial least squares structural equation modelling. The model connected attitude, subjective norms, perceived behavioral control, and religious commitment with WTP, and examined whether religious commitment enhanced the influence of social pressure and perceived control on WTP. The results showed that attitude was the most robust predictor of willingness to pay, followed by perceived behavioral control and subjective norms, while religious commitment exerted a smaller but significant direct effect on WTP. Religious commitment enhanced the positive relationships between subjective norms and WTP as well as between perceived behavioral control and WTP. These findings indicated that the acceptance of prices for halal-certified livestock products was influenced by positive assessments, perceived purchase convenience, and the extent of consumers' religious commitment. The study concluded that policies and marketing methods that increased the visibility, credibility, and alignment of certification with customers' religious beliefs could elevate WTP for halal-certified livestock products.

Keywords: *halal certified products; price premium; religious commitment; willingness to pay*

INTRODUCTION

In today's global food industry, halal has become a symbol of trust, quality, and ethical assurance beyond its religious meaning. Halal certification serves as an indicator of religious commitment and process quality in credence goods, particularly in livestock products, where consumers are unable to ascertain slaughter compliance, contamination management, and cold-chain integrity at the time of purchase (Koç *et al.*, 2024; Masudin *et al.*, 2020). The global halal food market is expanding, and Indonesia, home to the world's largest Muslim population, is enhancing its Halal Product Assurance framework and associated traceability measures (Muchtart *et al.*, 2024; Vanany *et al.*, 2024). However, the price premiums frequently associated with certified meat raise an important question: under what circumstances are consumers willing to pay a higher price for halal-certified livestock products? Previous research indicates that certification, trust, and religiosity may lead to an increased willingness to pay

(WTP) for halal products (Iranmanesh *et al.*, 2019; Khan *et al.*, 2019).

South Kalimantan provides a relevant context for examining these challenges. According to data from BPS-Statistics of South Kalimantan (2024), over 95% of the population identifies as Muslim; however, the halal status of livestock products is increasingly being questioned due to rising concerns regarding supply chain transparency, slaughterhouse sanitation, and the legitimacy of halal certification (Masudin *et al.*, 2020; Tohe *et al.*, 2021). Research in Indonesian contexts reveals hygiene deficiencies in abattoirs and the necessity for stringent controls to mitigate cross-contamination (Juliani *et al.*, 2021), whereas studies on halal logistics emphasize the significance of supplier service quality, technological preparedness, and cold-chain efficacy for maintaining halal integrity (Talib *et al.*, 2016). Existing evidence on WTP for halal-certified foods in Indonesia has focused mainly on processed foods or urban markets and often treats demand as relatively homogeneous (Alfikri *et al.*, 2019). Much less

is known about WTP specifically for halal-certified livestock products in Muslim-majority but resource-constrained regions, where religious norms are strong but purchasing power may be limited.

The theory of planned behavior (TPB) explains intention through attitude (ATT), subjective norms (SN), and perceived behavioral control (PBC). Prior halal studies generally find strong effects of attitude on intention and mixed evidence for norms and control in influencing willingness to pay (WTP) for certification (Harwati *et al.*, 2023; Iranmanesh *et al.*, 2019; Khibran, 2019). In Muslim-majority settings, religious commitment (RC) may be pivotal. RC can directly motivate WTP for certified meat and condition how social approval and perceived capability translate into premium payments (Julina *et al.*, 2021).

This study addresses these gaps by applying an extended TPB to examine willingness to pay more for halal-certified meat, poultry, eggs, and milk among Muslim consumers in South Kalimantan. South Kalimantan is a Muslim-majority province (>95% Muslim), making halal assurance and certification credibility highly salient in everyday livestock product purchases. Specifically, this study investigates the effects of attitude, subjective norm, perceived behavioral control, and religious commitment on willingness to pay for halal-certified livestock products, and verifies whether religious commitment moderates the relationship between subjective norm and willingness to pay and between perceived behavioral control and willingness to pay.

In this study, halal-certified livestock products refer to products sold under official halal certification, including (i) fresh, chilled, and frozen meat and poultry slaughtered in certified slaughterhouses and processed in accordance with halal requirements (including cold chain management), and (ii) processed livestock products, as well as certified eggs and milk, produced by certified processors. The objectives of this study were to analyze the effects of attitude, subjective norms, and perceived behavioral control on consumers' willingness to pay for halal-certified livestock products, to examine the direct effect of religious commitment on willingness to pay, and to investigate the moderating role of religious commitment in strengthening the relationships between subjective norms, perceived behavioral control, and willingness to pay. This study contributed to enhancing halal-certified livestock consumption by providing empirical evidence to support the formulation of halal certification policies and marketing strategies, particularly in Muslim-majority areas outside major Indonesian metropolitan regions.

METHODS

Research Framework and Hypotheses

Based on the theory of planned behavior (TPB) and prior halal consumer research, the following hypotheses were developed and tested using PLS-SEM. Attitude (ATT) indicates how customers think of halal-certified animal products and is projected to have a favorable correlation with willingness to pay (WTP)

for certification (Iranmanesh *et al.*, 2019). Subjective norms (SN) reflect the sense of social obligation from significant others such as family and society, which may promote adherence to halal criteria and enhance WTP (Chowdhury *et al.*, 2022). Perceived behavioral control (PBC) reflects consumers' perceived capacity to obtain and authenticate halal-certified products, such as accessibility and assurance in identifying certification, which is anticipated to enhance WTP (Arli *et al.*, 2022). This study enhances the TPB by incorporating religious commitment, which indicates the degree to which halal consumption has been integrated into religious practice. An elevated religious commitment (RC) is anticipated to enhance WTP directly and to amplify the influences of SN and PBC on WTP, since social reinforcement and purchasing capacity may hold greater significance for consumers with a heightened religious dedication (Abdou *et al.*, 2024; Memon *et al.*, 2019).

Based on this framework, the study tests the following hypotheses as illustrated in Figure 1:

1. H1: ATT has a positive effect on WTP for halal-certified livestock products.
2. H2: SN has a positive effect on WTP.
3. H3: PBC has a positive effect on WTP.
4. H4: RC has a positive effect on WTP.
5. H5: RC has a positive effect on the relationship between ATT and WTP for halal certification.
6. H6a: RC moderates the effect of SN on WTP such that the effect is stronger at higher levels of RC.
7. H6b: RC moderates the effect of PBC on WTP such that the effect is stronger at higher levels of RC.

Measure of the Constructs

The data were collected through a structured questionnaire. The questionnaire began with prerequisite (screening) questions to confirm respondent eligibility (Muslim identity, age ≥ 18 years, residence in South Kalimantan, and recent purchase of at least one livestock product); details are provided in the "Data Collection and the Sample" section. The variables included in the proposed model were attitude (ATT), subjective norm (SN), perceived behavioral control (PBC), religious commitment (RC), and willingness to pay (WTP) for halal-certified livestock products. In this study, WTP is defined as the stated behavioral intention, that is, the willingness to accept a price premium for halal-certified livestock products, rather than as observed purchasing behavior. Following Iranmanesh's TPB measures and framework (Iranmanesh *et al.*, 2019), each item included a scale for measurement such that the responses given could be measured for each variable on a five-point Likert scale, indicating the degree to which they agreed or disagreed with the statements presented (from strongly disagree = 1 to strongly agree = 5). ATT, SN, PBC, RC, and WTP were measured with eight, four, six, four, and three items, respectively.

Data Collection and the Sample

Data were gathered through an online survey designed for adult Indonesian Muslims living in Banjarbaru City, the provincial capital of South

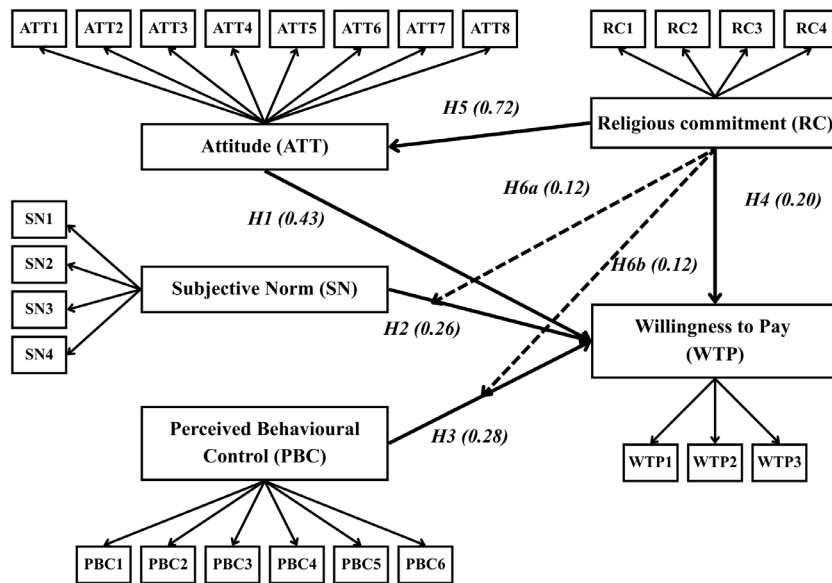


Figure 1. Structural equation model of determinants of willingness to pay for halal-certified livestock products (standardized path coefficients in parentheses). Note: ATT = attitude; SN = subjective norm; PBC = perceived behavioral control; RC = religious commitment; WTP = willingness to pay.

Kalimantan. Prior to the principal survey, the questionnaire underwent a preliminary pilot test to ascertain clarity and face validity. It was subsequently pilot-tested with 20 Muslim customers in South Kalimantan. Minor modifications to phrasing and formatting some small changes were made based on comments. The final version was then distributed through Google Forms. The questionnaire link was sent via community and neighborhood organizations, student and alumni networks, and local social media platforms frequently utilized by Banjarbaru locals. The survey was conducted from July 1, 2025, to October 10, 2025.

Eligibility screening confirmed (i) Muslim identity, (ii) age ≥ 18 years, (iii) current residence in South Kalimantan (Banjarbaru preferred), and (iv) purchase of at least one livestock product (meat, poultry, eggs, or milk) in the past three months; temporary visitors and non-residents were excluded. The final sample comprised 300 respondents (N = 300). This exceeds common adequacy benchmarks for SEM (the 10× indicator rule and Comrey–Lee’s “300 = good”) and provides sufficient statistical power to detect small-to-moderate effects in the proposed model. Participation was voluntary, and informed consent was obtained electronically before respondents could start the questionnaire.

Data quality checks were conducted using attention-check items, logical skip patterns, and minimum completion-time thresholds. Responses failing these criteria were removed, such as straight-line answering or an unrealistic short time in completion. As the survey relied on online voluntary participation, the sample represents non-probability convenience and snowball sampling with eligibility screening, which is suitable for SEM analysis but limits the ability to generalize the findings, as discussed later in this article.

Analysis

Given the exploratory nature of this study, the partial least squares (PLS) structural equation modeling (SEM) technique was employed using SmartPLS version 4.0, which was deemed the most suitable method for testing the proposed research model. Following the recommendation of Hair *et al.* (2014), a two-step analytical approach was adopted. The initial step involved the assessment of the measuring model, continued by an examination of the structural links among the latent constructs (Iranmanesh *et al.*, 2017; Soltanian *et al.*, 2016; Zainuddin *et al.*, 2017). This method guaranteed the establishment of the reliability and validity of the measurement indicators prior to examining the hypothesized relationships within the model.

RESULTS

All indicators showed robust loading on their designated constructs (all outer loading’s, λ > 0.82). Composite reliability values were elevated for each construct, and all AVEs surpassed the suggested 0.50 threshold, signifying robust convergent validity and internal consistency (Table 1). At the indicator level, each item set demonstrated robust outer loading’s on its respective construct, affirming that the indicators consistently measure their hidden variables.

Discriminant validity was evaluated using HTMT; all ratios fell below the 0.85 threshold (Table 2), hence showing sufficient discriminant validity. The data in Table 2 indicate predominantly favorable assessments: respondents express good attitudes and supporting societal norms about halal eating, along with a robust sense of control and significant religious devotion. WTP is positive but comparatively the lowest among the construct variables (ATT, SN, PBC, RC, WTP).

Table 1. Convergent validity of the measurement model for determinants of willingness to pay for halal-certified livestock products in South Kalimantan, Indonesia

Construct	Items	FL	CR	AVE
ATT	I believe that deciding to purchase halal food is a very wise decision.	0.966	0.990	0.928
	I enjoy consuming halal livestock products.	0.973		
	I believe that buying halal food reflects quality.	0.966		
	I believe that the halal food I eat is generally high-quality and beneficial.	0.955		
	I feel that consuming halal food gives me a pleasant impression.	0.960		
	I feel emotional comfort when choosing and consuming halal food.	0.952		
	I believe that choosing halal food aligns with my Islamic values.	0.962		
	Overall, I see halal food as highly beneficial.	0.972		
SN	My social environment supports the consumption of halal food.	0.860	0.929	0.766
	My family traditions encourage me to choose halal food products.	0.842		
	My community (family/neighborhood) tends to prefer halal food.	0.893		
	Local cultural traditions in my area encourage halal consumption.	0.904		
PBC	I have the ability to choose products that meet halal standards.	0.935	0.962	0.808
	I know how to spot halal-compliant livestock products.	0.900		
	I can make sure that the food I buy meets halal criteria.	0.854		
	I find it easy to find food products that meet halal standards.	0.886		
	I know where to obtain food that follows halal principles.	0.929		
	I have no difficulty obtaining information about halal products.	0.886		
	Consuming halal food is part of my religious commitment.	0.969		
	I feel guilty when consuming products whose halal status is doubtful.	0.969		
RC	My daily food choices reflect my religious values.	0.864	0.964	0.871
	Religious teachings encourage me to choose certified halal products.	0.926		
	I am willing to pay a higher price for halal-certified products.	0.827		
WTP	I would still choose halal-certified products even if non-halal alternatives are cheaper.	0.889	0.886	0.721
	I intend to pay a price premium to purchase halal-certified products	0.830		

Note: FL = factor loading; CR = composite reliability; AVE = average variance extracted; ATT = attitude; SN = subjective norm; PBC = perceived behavioral control; RC = religious commitment; WTP = willingness to pay; TPB = theory of planned behavior. Items adapted from Ajzen (2002), Arvola et al. (2008), Iranmanesh et al. (2019), and Worthington et al. (2003), with minor wording adjustments for halal-certified livestock products.

Table 2. Descriptive statistics and discriminant validity (HTMT) of constructs influencing willingness to pay for halal-certified livestock products in South Kalimantan, Indonesia

Constructs	Mean	SD	ATT	PBC	RC	SN	WTP
ATT	4.137	0.929					
PBC	4.092	0.973	0.719				
RC	4.066	0.831	0.742	0.655			
SN	4.234	0.985	0.782	0.756	0.784		
WTP	3.838	0.905	0.843	0.780	0.741	0.829	

Note: SD = standard deviation; HTMT = heterotrait–monotrait ratio. ATT = attitude; SN = subjective norm; PBC = perceived behavioral control; RC = religious commitment; WTP = willingness to pay.

Structural Model Results

Table 2 reports the descriptive statistics and the HTMT matrix. Mean scores for attitude (M = 4.137), subjective norms (M = 4.234), perceived behavioral control (M = 4.092), and religious commitment (M = 4.066) are above the scale midpoint, while willingness to pay is comparatively lower (M = 3.838), suggesting greater price sensitivity. All HTMT values are below 0.85, supporting discriminant validity.

Bootstrapping (n = 300; 5,000 resamples) confirms that all hypothesized paths are positive and significant (Table 3). The standardized coefficients (β) indicate effect direction and strength: attitude has the largest effect on willingness to pay (β = 0.426, p<0.001), followed by perceived behavioral control (β = 0.281,

p<0.001) and subjective norms (β = 0.265, p<0.001). Religious commitment shows a smaller direct effect on willingness to pay (β = 0.197, p = 0.005) and a strong effect on attitude (β = 0.721, p<0.001). The interaction terms (RC×SN and RC×PBC) are positive and significant, indicating that religious commitment strengthens the effects of subjective norms and perceived control on willingness to pay. Figure 2 illustrates these moderation effects: the SN → WTP and PBC → WTP relationships are stronger at higher levels of religious commitment, supporting H6a and H6b.

DISCUSSION

This study extends the theory of planned behavior (TPB) to halal livestock products and shows that

Table 3. Structural model hypothesis testing for determinants of willingness to pay for halal-certified livestock products in South Kalimantan, Indonesia

Hypothesis	Relationships	Path coefficient (β)	t-value	p-value	Effect size (f^2)	Decision
<i>Main model</i>						
H1	ATT \rightarrow WTP	0.426	7.692	<0.001***	0.217	Supported
H2	SN \rightarrow WTP	0.265	4.185	<0.001***	0.082	Supported
H3	PBC \rightarrow WTP	0.281	5.452	<0.001***	0.114	Supported
H4	RC \rightarrow WTP	0.197	2.778	0.005**	0.048	Supported
H5	RC \rightarrow ATT	0.721	16.701	<0.001***	1.081	Supported
<i>Moderating effect of religious commitment</i>						
H6a	RC \times SN \rightarrow WTP	0.117	2.389	0.017*	0.028	Supported
H6b	RC \times PBC \rightarrow WTP	0.116	3.123	0.002**	0.037	Supported

Notes: t-values are computed through a bootstrapping procedure with 300 cases and 5,000 samples; *p < 0.05; **p < 0.01; ***p < 0.001 (Two-tailed); β = path coefficient; f^2 = effect size. ATT = attitude; SN = subjective norm; PBC = perceived behavioral control; RC = religious commitment; WTP = willingness to pay.

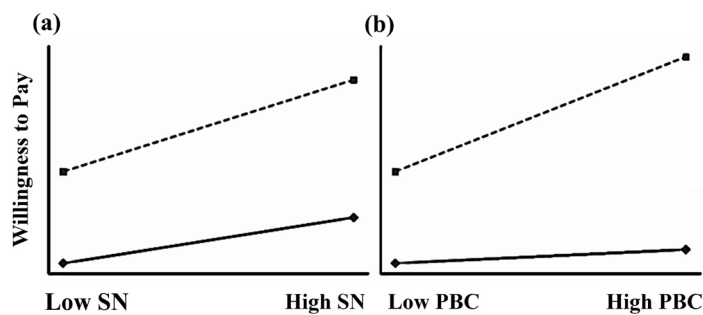


Figure 2. Interaction effects of religious commitment with subjective norms (a) and perceived behavioral control (b) on willingness to pay for halal-certified livestock products. Note: \blacklozenge Low RC; \blacksquare High RC; RC = religious commitment; WTP = willingness to pay.

attitude (ATT) is the most influential antecedent of consumers' willingness to pay (WTP) for certification, while perceived behavioral control (PBC) and subjective norms (SN) make smaller but positive contributions. This pattern is consistent with recent TPB applications to halal food, where positive evaluations of certified options typically dominate intention or WTP, and SN and PBC remain context dependent (Nora & Sriminarti, 2023). Religious commitment (RC) adds a modest direct effect on WTP and strengthens the TPB system by shaping attitudes and by moderating the SN \rightarrow WTP and PBC \rightarrow WTP paths (Abdou *et al.*, 2024; Hanafiah & Hamdan, 2020). Overall, price acceptance for certified meat appears to be jointly shaped by evaluation, perceived social approval, perceived efficacy, and faith-related motivation that increases the salience of certification. Although some studies report weak or non-significant SN or PBC effects, the present results align with the broader literature in which ATT is the most stable driver, and RC clarifies when and for whom social and control cues translate into WTP (Khan *et al.*, 2020; Khibran, 2019).

Two mechanisms are particularly noteworthy. First, the strong RC \rightarrow ATT path suggests that commitment influences how consumers appraise the quality, safety, and moral assurance signaled by certification before price-related judgments are formed. In this sense, religious commitment shapes the evaluative lens through which certified livestock products are judged

as appropriate, beneficial, and trustworthy (Usman *et al.*, 2021). Second, the positive RC \times SN and RC \times PBC interactions indicate that social encouragement and verification capability matter most at higher levels of commitment, while their influence is weaker when commitment is lower. This helps to explain why community cues, religious endorsements, and clear verification tools convert more efficiently among highly committed segments, and why religiosity often amplifies the effects of attitudes and social pressures on halal purchase intentions (Ashfahany *et al.*, 2024; Julina *et al.*, 2021; Kurniawan, 2024; Soon & Wallace, 2017)

Descriptive statistics support the structural picture: ATT, SN, PBC, and RC are all above the scale midpoint, whereas WTP is comparatively lower. Substantively, the psychological climate is favourable, since consumers like certified products, perceive social approval, and feel able to choose them, but price sensitivity still constrains decisions at the point of purchase. This gap between intention and price acceptance is common for credence goods and signals the need to reduce translation losses between intention and WTP. Designing the point of sale around verification, for example, clear certification logos and simple QR traceability checks, and pairing this with visible social endorsement can raise perceived control and legitimise small premiums without eroding trust. This is consistent with recent evidence linking labelling and traceability to higher WTP for certified meat (Dewi *et al.*, 2022; Garg & Joshi, 2018). Finally,

the measurement model is sound. At the indicator level, all reflective items loaded strongly on their intended constructs ($\lambda > 0.82$), indicating that the observed indicators reliably represent their respective latent variables, and no items were removed (Table 1). Internal consistency was supported by high composite reliability values, and convergent validity was confirmed because all AVE values exceeded 0.50. Discriminant validity was also supported, as HTMT values were below 0.85 (Table 2), which is consistent with recommended PLS-SEM practice in halal consumer research (Awan *et al.*, 2015; Fauzi, 2022). The structural inferences, therefore, rest on reliable measures rather than artefacts.

Managerial and Policy Implications

Messaging should make halal certification concrete by highlighting audited slaughter protocols, contamination control, cold-chain integrity, and end-to-end traceability. Clear process information strengthens favourable attitudes, which are the most stable predictors of premium acceptance, and reassures consumers who prioritize integrity in slaughter, hygiene, and safety (Afsari *et al.*, 2017; Irfan *et al.*, 2023; Siska *et al.*, 2020). In practice, communication must continuously associate certification with tangible excellence rather than simply with logos or claims.

Execution should make verification easier and give consumers a stronger sense of control at the retail level. Prominent halal logos, QR codes that link to official registries, color-coded shelf tags, simple "how to verify" instructions, and staff who are able to answer basic inquiries all help customers feel confident that the items are genuinely certified (Alam *et al.*, 2023; Khan *et al.*, 2020; Nawang *et al.*, 2023). Community-oriented strategies can also normalize small premiums over time. Collaborations with mosque boards and religious leaders, alongside doing simple community outreach activities, may provide social proof and strengthen subjective norms, particularly among consumers with higher religious commitment (Abdou *et al.*, 2024; Garg & Joshi, 2018; Memon *et al.*, 2019).

Retailers should additionally use price and information tools that help translate favourable intentions into actual willingness to pay. To encourage trial of premium products, retailers can offer introductory discounts, value packages, and loyalty awards linked to certified products. When communicated at the point of decision, straightforward descriptions of cost factors like dedicated slaughter lines, third-party audits, and cold-chain controls make price differences more acceptable. This aligns with evidence on certified and halal product premiums (Afsari *et al.*, 2017; Cook *et al.*, 2023; Santeramo & Lamonaca, 2020).

Policy instruments should lower certification barriers for smallholders and small and medium-sized enterprises (SMEs) while strengthening public verification systems. Cooperative or group schemes, easier renewals, and focused training with handling and slaughtering animals all help more people get certified and trust the system (Hasan *et al.*, 2020; Murtisari *et al.*, 2024; Rafiuddin *et al.*, 2024). Transparent oversight, joint inspections, and

clear institutional guidance improve confidence in halal governance and support market acceptance (Muhammad *et al.*, 2020; Rahman & Rahman, 2024; Tohe *et al.*, 2021). Investments in standardized QR registries and public reporting of inspection outcomes can further reinforce perceived behavioral control by making verification simple and credible at scale.

Limitations and Future Studies

The evidence is cross-sectional and based on self-reports from a single region, which limits causal claims and the ability to generalize. To improve data quality despite these constraints, we applied eligibility screening and data-quality checks (e.g., attention-check items and removal of straight-line or unrealistically fast responses). Future work should track actual purchases of certified meat, test price frames experimentally, and compare traditional markets with modern retail channels. Incorporating trust in certificate issuer and retailer reputation, as well as objective indicators of cold-chain integrity and animal-welfare compliance, may further sharpen predictions of willingness to pay in the livestock industry.

CONCLUSION

This study met its objective by showing that an extended Theory of Planned Behavior, including religious commitment, can explain why consumers in a Muslim-majority region are willing to pay more for halal-certified livestock products. Attitude toward halal-certified livestock products is the strongest predictor of willingness to pay, followed by perceived behavioral control and subjective norms, while religious commitment has a direct positive effect on willingness to pay and strengthens the effects of norms and perceived control. These findings suggest that paying more for certified meat, poultry, eggs, and milk depends not only on price but also on consumers' confidence in verification and the perceived integrity of slaughter and handling. For the livestock sector, improving halal-compliant slaughter and handling practices, making certification and traceability more visible, and collaborating with religious authorities and retailers can enhance consumer trust and support sustainable price premiums for compliant producers, including smallholders.

CONFLICT OF INTEREST

We certify that there is no conflict of interest with any financial, personal, or other relationships with other people or organizations related to the material discussed in the manuscript.

DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

During the preparation of this work, the authors used ChatGPT to improve readability and language. After using this tool, the authors reviewed and edited the

content as needed and take full responsibility for the content of the publication.

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