

Article

The Dilemma of the Sustainable Development of Agricultural Product Brands and the Construction of Trust: An Empirical Study Based on Consumer Psychological Mechanisms

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Abstract

In the context of China's increasingly competitive agricultural product branding, authenticity has become a pivotal mechanism for shaping consumer trust and willingness to pay. This study takes Perceived Brand Authenticity (PBA) as its focal construct and builds a chained mediation framework incorporating experiential quality (EQ) and consumer trust. Employing a dual-evidence strategy that combines structural discovery and causal validation, the study integrates Jaccard similarity clustering and PLS-SEM to examine both behavioral patterns and psychological mechanisms. Drawing on 636 valid survey responses from across China, the results reveal clear segmentation in channel choice, certification concern, and premium acceptance by gender, age, income, and education. Younger and highly educated consumers rely more on e-commerce and digital traceability, while middle-aged, older, and higher-income groups emphasize geographical indications and organic certification. The empirical analysis confirms that PBA has a significant positive effect on EQ and consumer trust, and that the chained mediation pathway "PBA → EQ → Trust → Purchase Intention" robustly captures the transmission mechanism of authenticity. The findings demonstrate that verifiable and consistent authenticity signals not only shape cross-group consumption structures but also strengthen trust and repurchase intentions through enhanced experiential quality. The core contribution of this study lies in advancing an evidence-based framework for sustainable agricultural branding. Theoretically, it reconceptualizes authenticity as a measurable governance mechanism rather than a rhetorical construct. Methodologically, it introduces a dual-evidence approach integrating Jaccard clustering and PLS-SEM to bridge structural and causal analyses. Practically, it proposes two governance tools—"evidence density" and "experiential variance"—which translate authenticity into actionable levers for precision marketing, trust management, and policy regulation. Together, these insights offer a replicable model for authenticity governance and consumer trust building in sustainable agri-food systems.

Keywords: brand perception authenticity; experience quality; consumer trust; willingness to pay; PLS-SEM/Jaccard similarity analysis



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1. Introduction

In China's agricultural market, brand development has undergone cyclical phases of "sloganization—over-marketing—trust erosion [1]." Although policies have consistently

promoted agricultural branding, and academic research has confirmed the positive correlation between branding, price premiums, and farmers' income, many "internet-famous landmarks" have experienced rapid decline. The root cause lies in insufficient supply capacity and experiential gaps, which ultimately erode consumer trust. Accordingly, brands should be understood not merely as marketing tools but as governance mechanisms grounded in information credibility and experiential consistency.

At the institutional level, geographical indications (GI) and traceability systems provide the structural foundation for brand authenticity. As of July 2025, China has recognized 2861 GI products, with more than 9700 included under trademark protection, reflecting the rapid growth of public brand assets [2], as shown in Appendix A, Figure A1. However, implementation discrepancies and "last-mile" gaps continue to cause consumers to question the reliability of traceability systems [3]. Recent studies highlight that digital traceability and blockchain technologies can enhance transparency and reduce information asymmetry in agri-food supply chains, yet challenges of adoption and consumer interpretation remain [4,5].

On the demand side, the popularization of short videos and livestream e-commerce has reshaped consumer behavior. By the end of 2023, the number of livestream users in China had reached 816 million, accounting for over 70% of internet users. While such "short-chain + strong-visual" models improve communication efficiency, they also intensify information asymmetry and experiential mismatches. Recent research on livestreaming commerce suggests that authenticity cues and interactive communication significantly influence consumer trust and conversion behavior [6]. Similarly, studies on digital transparency in agricultural e-commerce show that verifiable traceability and information disclosure can strengthen trust and perceived value [7]. In response to these challenges, regulatory authorities issued the Draft Regulations on Livestream E-Commerce Supervision in 2025, marking a shift in governance priorities from "development-oriented" to "precision governance."

In high-noise markets, label-driven naming may stimulate short-term sales but often results in inconsistent experiences and negative spillovers, which can escalate into skepticism toward the origin as a whole [8–10]. Interviews with enterprises and industry experts consistently highlight that while "first-purchase conversion rates are high, repurchase rates are declining," indicating a structural issue—experiential quality serves as the key mediator linking authenticity and trust. Consumer trust ultimately depends on whether the product's origin is verifiable, the process is transparent, and the cultural narrative resonates with consumers' values. Recent works on digital authenticity and influencer marketing further confirm that perceived transparency and credibility are critical psychological mechanisms shaping trust in digital environments [11,12].

Despite the growing body of research on agricultural branding, several gaps remain. First, most prior studies emphasize institutional or technological mechanisms of authenticity—such as geographical indications, certification systems, or blockchain-enabled traceability—while paying far less attention to the psychological mechanisms through which consumers perceive authenticity and transform it into trust and purchase intention. Second, existing studies are predominantly based on Western contexts, leaving limited empirical evidence on how these mechanisms operate in China, where livestreaming e-commerce and digital consumption dominate. Third, methodological approaches often rely on single-path SEM or regression analyses, overlooking the potential of combining structural discovery with causal validation to capture heterogeneity in consumer behavior.

To bridge these gaps, this study constructs a psychological mechanism framework centered on Perceived Brand Authenticity (PBA) [13–16], modeled as a second-order latent construct composed of origin cognition, cultural identification, and brand transparency. Experiential quality (EQ) is similarly conceptualized as a second-order construct encompass-

ing brand, service, and post-purchase experience, working jointly with trust to influence purchase intention [17]. Within this framework, authenticity functions as the upstream variable driving experience and trust: when evidential signals are consistent, cultural identification is reinforced, and transparent disclosure is achieved, consumers are more likely to form stable trust and repurchase intentions; conversely, inconsistent or unverifiable signals can trigger distrust and negative spillovers.

Based on this framework, the present study adopts a dual-evidence strategy integrating Jaccard similarity clustering and PLS-SEM to connect structural discovery and causal validation [18]. This approach allows both macro-level pattern recognition and micro-level mechanism testing within the same empirical design. The study further introduces two novel governance tools—“evidence density” and “experiential variance”—to operationalize brand authenticity governance. “Evidence density” captures the concentration and consistency of authenticity signals (e.g., certification, origin disclosure, traceability), while “experiential variance” reflects the degree of stability in consumer experience across multiple touchpoints (brand, service, post-purchase). Together, they form the empirical basis for precision governance in agricultural branding.

Accordingly, this paper addresses three key research questions:

RQ1: How do consumers form perceived brand authenticity through origin cognition, cultural identification, and transparent traceability cues?

RQ2: How does perceived brand authenticity influence purchase intention through experiential quality and consumer trust?

RQ3: Do these paths vary across different consumer groups and contexts?

The contributions of this study are threefold:

- (1) Theoretical contribution: It reconceptualizes authenticity as a second-order, evidence-based construct, revealing the governance logic of the “authenticity–experience–trust” mechanism and offering a testable psychological pathway for sustainable brand trust formation.
- (2) Methodological contribution: It employs a dual-evidence approach that combines Jaccard similarity clustering and PLS-SEM, bridging structural pattern discovery and causal mechanism validation.
- (3) Practical contribution: It introduces two actionable governance tools—evidence density and experiential variance—that translate authenticity into measurable and implementable mechanisms for precision marketing, digital traceability, and sustainable brand governance under the frameworks of SDG 12 (Responsible Consumption) and SDG 8 (Decent Work and Economic Growth).

2. Theoretical Basis and Research Hypothesis

2.1. The Evolution and Reconstruction of Brand Cognitive Authenticity

From “historical authenticity” to the shift toward “perception–relation–evidence.” Early studies conceptualized authenticity as the continuity of brands with history, tradition, or core values [19], emphasizing supply-side consistency and the preservation of identity. With the advancement of measurement frameworks, the literature gradually moved toward a consumer-centered perspective, defining authenticity as a perceptual construct that depends on whether a brand remains true to itself, maintains narrative–behavioral coherence, and provides verifiable evidence of its claims [20–22].

In the domain of agricultural and food products—where most quality characteristics are credence attributes that consumers cannot directly verify—origin cues, certifications, and traceability systems become crucial for constructing credible signals that mitigate uncertainty and opportunism [23,24]. Recent developments in digital traceability and

blockchain technology have accelerated this transition from symbolic to evidence-based authenticity. Blockchain-based agri-food systems provide immutable, transparent records that enhance traceability reliability and consumer confidence [25–27]. Moreover, empirical studies integrating technology acceptance and trust frameworks demonstrate that consumer adoption of blockchain-enabled traceability depends on perceived usefulness, reliability, and trust in digital information sources [28].

For regional foods, geographical indications (GI) serve as both institutional safeguards against misleading claims and instruments that convert “territorial embeddedness” into public brand assets. Research consistently shows that regulated GI use enhances trust, willingness to pay, and welfare outcomes [29]. Consumers exhibit psychological proximity effects toward “hometown GIs,” which strengthen cultural identity and purchase inclination [30]. Meta-analyses and systematic reviews confirm that GIs are strongly associated with perceptions of quality, authenticity, and cultural meaning, significantly improving purchase intention [31,32].

Research on food trust underscores that transparency and traceability remain central pathways for building consumer confidence. Transparency involves not only information disclosure but also clarity, consistency, and verifiability [33]. Empirical evidence indicates that consumers are willing to pay a premium for traceable products and that transparent supply chains have significant positive effects on trust and purchase intention [34–36]. In recent years, this relationship has been further contextualized within digital marketplaces. Studies show that livestream e-commerce and platform interactivity significantly shape consumer trust by enabling real-time evidence verification and authentic engagement [37,38]. Similarly, digital authenticity—defined as perceived transparency and credibility in online interactions—has emerged as a key driver of trust formation in virtual brand ecosystems [11,39].

Synthesizing the above research, the authenticity of agricultural brands enters the consumer’s perceptual system through three primary channels: Perceived Origin Cognition (POC): Geographical indications and origin labels evoke a sense of “place–product–people” unity, reducing uncertainty and reinforcing typicality. Cultural Identification (CI): When regional culture resonates with consumer identity, perceived authenticity and willingness to pay are enhanced. Brand Transparency/Traceability (BT): Consistent and verifiable disclosure of production origins and processes strengthens trust and mitigates experiential gaps [40,41].

These three dimensions jointly constitute Brand Perception Authenticity (BPA), whose impact can be amplified or weakened across the experience chain—from brand encounter to service interaction and post-purchase evaluation—ultimately influencing consumer trust and purchase or repurchase intention. Empirical findings further show that regional branding significantly enhances purchase intention and consumer loyalty, confirming that brand-level trust functions as the key mediator linking authenticity and behavioral outcomes [42,43]. Beyond individual products, institutional accountability and platform-level governance mechanisms also play essential roles in sustaining long-term consumer trust.

Building on these insights, this study conceptualizes BPA as a second-order reflective construct comprising POC, CI, and BT. As an upstream governance mechanism, Perceived Brand Authenticity (PBA) influences trust and purchase intention through Experiential Quality (EQ). In increasingly digitalized, high-noise, and visually saturated markets, authenticity must be maintained through the triadic integration of institutionalized signals (GIs and certification enforcement), evidence-based disclosures (digital traceability and transparency), and cultural embeddedness, thereby avoiding the “display–experience gap” that leads to trust dilution and brand erosion.

2.2. The Evolution of Experience Quality in the Context of Digitalization and Fast Consumption

Early conceptualizations of experience quality were rooted in service quality frameworks such as SERVQUAL, emphasizing reliability, responsiveness, and assurance at specific service encounters [44]. As digital commerce developed, the notion of experience quality expanded from a single-point evaluation to a multi-stage, cross-channel process encompassing cognitive, affective, and behavioral responses throughout the entire customer journey [45,46]. This paradigm shift highlights that consumer experience is not confined to transactional contact but unfolds dynamically across pre-purchase, purchase, and post-purchase stages, shaping perceptions of authenticity and trust over time.

In the digital era, experience quality has evolved from functional reliability to algorithmic orchestration. Artificial intelligence (AI), recommender systems, and data-driven personalization now mediate how consumers form expectations and emotional anticipation before any direct brand contact. Studies show that AI-enabled personalization and algorithmic curation enhance relevance and satisfaction, yet also raise expectations for transparency and fairness [47,48]. Short video platforms and livestream commerce further extend experiential processes into immersive, pre-contact environments, where narrative framing and emotional storytelling cultivate pre-experiential trust [49].

Accordingly, this study conceptualizes Experiential Quality (EQ) as a second-order construct comprising three interrelated dimensions: Brand Experience (BE): sensory, emotional, and cognitive reactions to brand stimuli [50]; Service Experience (SE): perceived reliability and responsiveness of service delivery, logistics, and payment systems; Post-Purchase Experience (PP): evaluations of product integrity, after-sales service, and feedback diffusion [51,52]. This structure aligns with the customer journey perspective, recognizing that experience quality is accumulated and reinforced through successive touchpoints rather than isolated moments.

Recent research emphasizes that experience quality is increasingly co-created within platform ecosystems, where consumers participate in shaping meaning and value. Studies on digital co-creation demonstrate that interactive authenticity and consumer participation enhance perceived experience quality and trust [53,54]. In livestream-driven agricultural commerce, narrative immersion and interaction design also play crucial roles in fostering emotional continuity and cognitive absorption [55]. Algorithmic storytelling and content personalization thus transform experience quality into a jointly produced outcome between brands, platforms, and users.

Within agricultural e-commerce contexts, procedural transparency and technological reliability are now integral to service experience. Evidence indicates that platform justice and data accountability significantly influence perceived fairness and service trust [56]. Meanwhile, AI-enabled logistics and blockchain-based verification systems enhance consumers' confidence in fulfillment accuracy and timeliness, establishing the foundation for trust transfer across stages of the purchasing cycle [57].

The post-purchase stage has become a vital arena for trust reinforcement and reputation signaling. Reviews, ratings, and user-generated videos constitute public evidence of experiential outcomes. Research suggests that the emotional tone and diagnostic clarity of these feedback signals are crucial in shaping subsequent purchase intentions [58]. Positive post-purchase evaluations transform individual satisfaction into collective trust assets, while discrepancies between promotional narratives and actual performance generate trust backlashes.

Hence, EQ functions as the transformative mechanism linking perceived authenticity (PBA) to consumer trust. Its strength lies in the consistency of evidence—the degree to which brand promises (BE), service performance (SE), and consumer verification (PP) remain coherent and verifiable. In fast and visually saturated digital markets, only when these

stages align can authenticity be internalized as experienced truth. Conversely, any rupture between displayed and delivered authenticity triggers an “expectation–gap–erosion” cycle, weakening both trust and long-term brand relationships [59,60].

2.3. Consumer Trust: The Cognitive Anchor of Brand Relationship Structure

In relationship marketing, commitment–trust theory positions trust, together with relational commitment, as the cornerstone sustaining relational stability [61]. At the brand level, trust is defined as “the subjective expectation of a brand’s reliability and integrity,” which enhances attitudes, loyalty, and market performance [62]. Within this study’s framework, trust acts as the cognitive anchor linking perceived brand authenticity (PBA) and experiential quality (EQ) to purchase and repurchase intentions (PI).

Consequently, trust in digital agricultural branding can be defined as the context-dependent willingness to assume relational risk under uncertainty. Its mediating role in the pathway “BPA → EQ → Trust → PI” ensures that only when authenticity cues are verifiable and experiences consistent can trust effectively translate into purchase and repurchase intentions. In volatile livestream markets, this cognitive anchor is crucial: once transparency weakens or fairness perceptions falter, trust spillover rapidly transforms localized dissatisfaction into broader skepticism toward both brand and origin, exposing the fragile equilibrium of digital consumer trust. See Figure 1 for details.

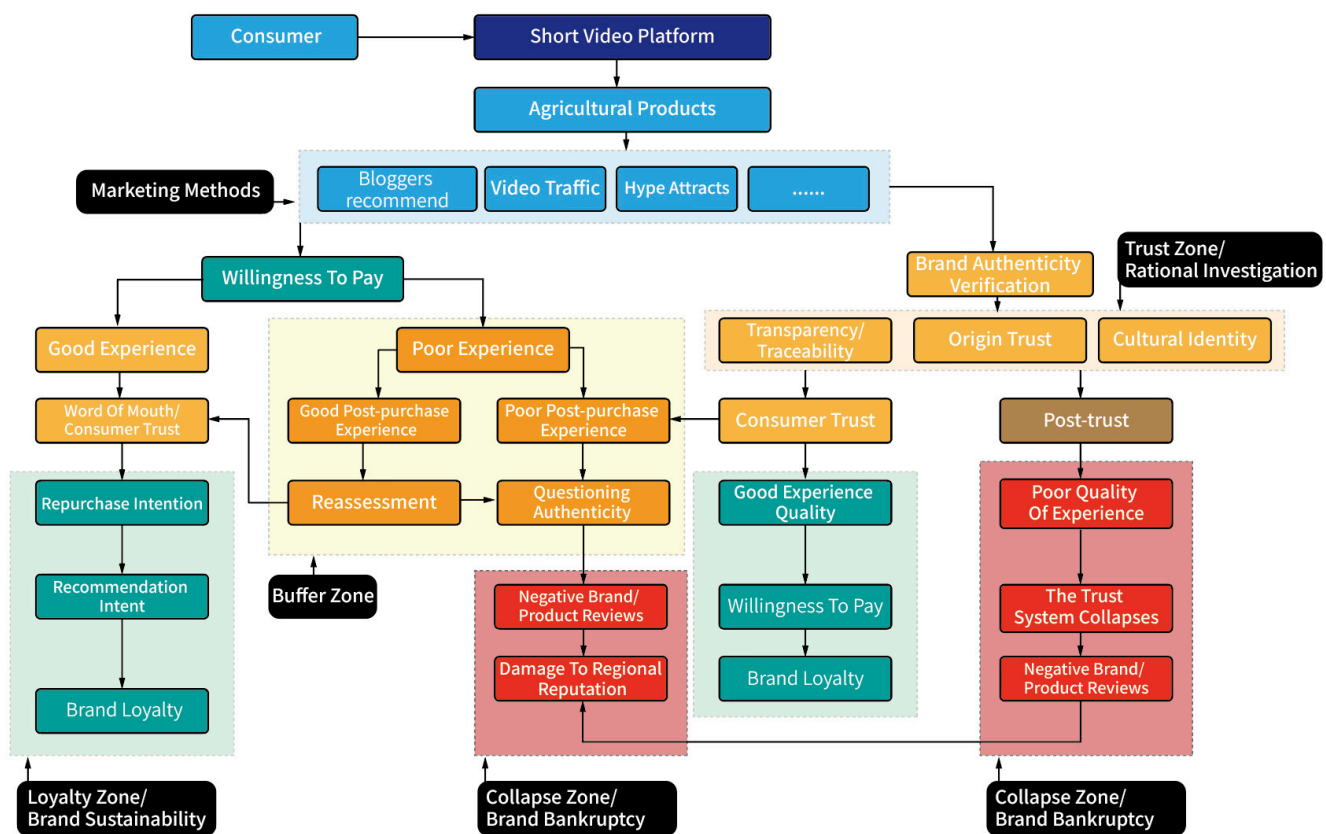


Figure 1. Consumer psychological processes in live streaming environments.

2.4. Research Hypothesis

Based on the research framework and given the interconnected and progressive relationships between perceived brand authenticity (PBA), experiential quality (EQ), consumer trust (CT), and purchase intention (PI), this article adopts a step-by-step approach. Ten research hypotheses (H1–H10) are proposed, allowing for a more transparent and rigorous examination of each link in the chain mediation mechanism.

In consumer journeys dominated by social media and e-commerce, consumers form an “expected experience framework” before engaging with a brand. When a brand is perceived as being true to its origin and culture and its information is consistent and verifiable, this framework is more likely to translate into positive experience evaluations (across multiple touchpoints such as brand, service, and fulfillment) [63]. Numerous studies have found that perceived brand authenticity (PBA) is not only a symbolic narrative but also enhances the quality of experience in interactions and services through consistency and credibility cues (e.g., reliable delivery and visible and verifiable traceability information) [64,65]. This effect is particularly significant in categories with prominent “credit attributes” such as agricultural products/food: consumers rely more on three types of cues: origin, transparency, and culture to reduce uncertainty, thereby giving higher tolerance and correcting expectations for subsequent experiences [66]. Authenticity perception, as a “cognitive anchor,” can significantly enhance brand trust (subjective expectations of reliability and integrity), and thus promote relationship quality, willingness to pay, and willingness to recommend. In the credit attribute scenario of food/agricultural products, consumers’ trust in certification, traceability, and origin is particularly critical, and authenticity cues make “trust at first contact” possible [67]. Based on these insights, the following hypotheses are proposed:

H1. *Brand perceived authenticity has a significant positive impact on experience quality.*

H2. *Brand perceived authenticity has a significant positive impact on consumer trust.*

Customer journey literature suggests that the consistency and continuity of experience across multiple touchpoints determines whether trust is precipitated into a stable relationship [58,67]. In a Chinese sample, the reliability of service experience (SE) in areas such as logistics and after-sales service significantly increases satisfaction and re-use intention, thereby reducing uncertainty and translating into trust in the brand and platform [68]. Furthermore, positive experiences significantly boost purchase/repurchase intention in the food and fresh produce context (this effect is also amplified by word-of-mouth communication) [51]. Based on these insights, the following hypotheses are proposed:

H3. *Experience quality has a significant positive impact on consumer trust.*

H4. *Experience quality has a significant positive impact on purchase intention.*

Research on relationship marketing and green/organic food generally demonstrates that trust is a critical threshold connecting perception and behavior, and is particularly crucial in situations of high uncertainty and price premiums [23]. In the context of social e-commerce/livestreaming of agricultural products, trust plays a significant mediating role in the path from livestream quality/social presence to purchase intention, further highlighting its power to transform behavior [69]. Based on these insights, the following hypothesis is proposed:

H5. *Consumer trust has a significant positive impact on purchase intention.*

Authenticity enhances consumers’ sense of “situational credibility” during brand interactions and improves overall experience quality, particularly through positive feedback in service and interaction stages [70]. Tangnatthanakrit (2019), in a study of the Thai organic food market, further found that brand authenticity helps consumers attain psychological safety and strengthens trust, suggesting that authenticity has a leading effect on

experience quality, while experience quality in turn serves as the critical channel for trust formation [71]. Consumer trust often depends on “perceived consistency” and the “accumulation of positive experiences,” with authenticity being the necessary precondition for this process [72]. Thus, authenticity improves sensory, interactive, and service experiences, ultimately forming a chain mechanism that drives trust.

Authenticity also reinforces consumers’ perceptions of the brand’s “genuine commitment” and “absence of fraudulent intent,” making trust a cognitive prerequisite for purchase [73]. Li et al. (2019) further found that in dynamic environments, trust grounded in authenticity significantly increases repurchase and recommendation intentions [74]. In digital agricultural e-commerce, authenticity cues such as origin disclosure, traceability, and third-party endorsements serve as key inputs for building trust and directly influence purchase decisions [75]. Loebnitz & Grunert (2022) confirmed that brand authenticity drives purchase intention through trust [70], while Calvo Porral & Levy-Mangin (2016) found that trust is a stable mediator between brand loyalty and purchase behavior [76]. Taken together, these findings suggest that authenticity does not directly drive purchase, but rather operates through the chained mechanism of “experience perception → trust construction,” enabling the migration from cognition to attitude and ultimately to behavior. This logic is particularly applicable in high-uncertainty contexts such as e-commerce platforms, where it represents a critical pathway for cultivating consumer loyalty and purchase intention. Based on these insights, the following hypotheses are proposed:

H6. *Perceived brand authenticity indirectly and positively impacts consumer trust by enhancing experience quality.*

H7. *Perceived brand authenticity indirectly and positively impacts consumer purchase intention by enhancing consumer trust.*

H8. *Brand perceived authenticity indirectly positively affects purchase intention by improving experience quality.*

H9. *Perceived brand authenticity positively impacts consumer purchase intention by improving experience quality, thereby enhancing consumer trust and ultimately positively impacting purchase intention, demonstrating a chain mediating effect between experience quality and consumer trust.*

When consumers consistently receive positive, authentic, and coherent services, information, and product experiences during brand encounters, they are more likely to develop a stable structure of trust. Mohd Salim et al. (2024), in the context of green consumption, validated the “experience–trust–intention” chain, showing that authentic experiences can significantly enhance purchase intention through trust [77]. Similarly, Gajdić (2024) found in research on organic agricultural products that consistent feedback across the service chain strengthens consumer identification and trust stickiness, thereby promoting sustained consumption [78]. Margariti (2021) further emphasized that the overall satisfaction derived from multi-touchpoint experiences—such as packaging, communication, interaction, and service—constitutes the core mechanism linking trust to purchase intention [79]. Taken together, these findings suggest that experience quality is not merely a perceptual outcome but a critical mediator driving trust formation and behavioral intention. Based on these insights, the following hypothesis is proposed:

H10. *Experience quality indirectly and positively affects consumer purchase intention by enhancing consumer trust.*

In summary, this study takes perceived brand authenticity as the antecedent variable and positions consumer experience quality and trust as mediating variables to examine their effects on purchase intention. The research model integrates insights from the Consumer Geographical Indication Agricultural Products Model [80], the Experience Quality Model [81], and the Consumer Purchase Intention Model [82,83]. Building on these foundations, we propose a brand authenticity–purchase intention framework tailored to the agricultural context (see Figure 2). The proposed model not only refines the chained logic between authenticity and consumer behavior but also provides theoretical support for subsequent brand design and managerial practice.

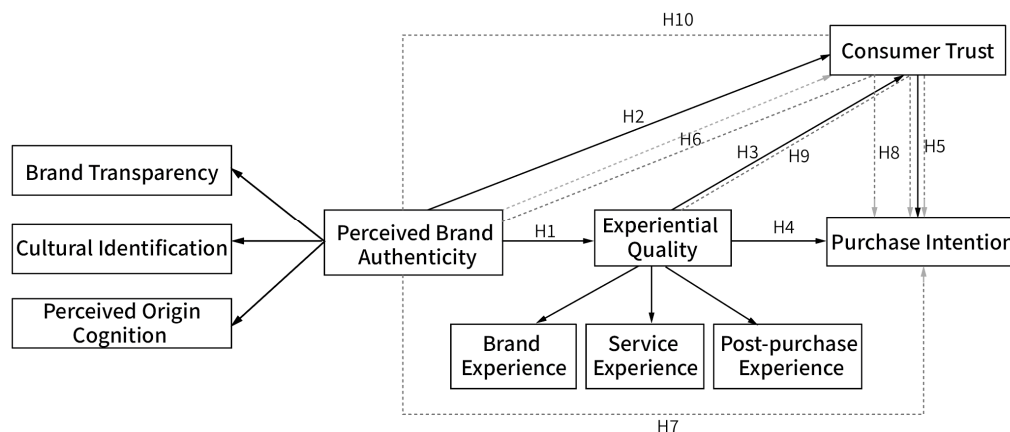


Figure 2. Structural model of brand perception authenticity.

3. Research Methods and Data Collection

To strengthen contextual validity, the questionnaire was not designed as a purely abstract survey. Instead, it incorporated prompts of well-known agricultural brands (e.g., Jainong, Dole, Joyvio, Zespri) that possess clear origin backgrounds, established brand systems, and sustained presence across both online and offline channels. Furthermore, the measurement items explicitly included institutional and technological authenticity cues, such as geographical indication (GI) marks, organic/green certifications, and traceability QR codes. This design ensured that consumer evaluations were not detached perceptions, but rather judgments anchored in real institutional signals and technological practices. In this way, the data capture the interface between “objective authenticity mechanisms” and “subjective consumer perception.”

To ensure the contextual validity and practical relevance of the questionnaire measurement, this study introduced brand prompts before the formal survey design in order to simulate respondents’ processes of brand perception, experience, and trust construction in realistic consumption scenarios. Since the study had not yet carried out field promotion for any new brand, four representative fruit brands in both the Chinese and international markets—Jainong, Dole, Joyvio, and Zespri—were incorporated as reference objects to reduce respondent burden and stimulate actual consumption memory. These brands were selected because they possess clear origin backgrounds, relatively mature brand systems, and sustained presence across both online and offline channels, thereby enabling respondents to provide evaluations based on authentic or familiar experiences. In designing the questionnaire, the research team also considered category coverage (e.g., bananas, apples, kiwifruit), origin recognizability, and market trust foundations, all of which enhanced the contextual reliability and external validity of the measurement. The research model and questionnaire design process are illustrated in Figure 3.



Figure 3. Agricultural Products-Fruit Brand Introduction.

Before beginning the questionnaire, respondents were first asked to confirm whether they were familiar with and had previously purchased any of the listed brands. This design ensured consistency in measurement while partially reconstructing the natural process through which brand perception and purchase intention are formed, thereby enhancing the psychological validity of the data. The approach avoided the imaginative burden associated with entirely hypothetical brands and minimized potential systematic bias arising from individual brand preferences, thus providing a robust contextual foundation for subsequent structural equation modeling and path analysis. In addition to collecting respondents' demographic information, the questionnaire also captured their agricultural product consumption characteristics, including primary purchasing channels and product attributes of concern, in order to provide a more comprehensive profile of consumer behavior.

3.1. Study Design

This study employed a structured questionnaire, designed on the basis of the theoretical framework and operational definitions of variables, to systematically capture consumers' psychological response paths within the trust mechanism of agricultural product brands. The overall questionnaire was adapted from established scales and localized through semantic refinement and pilot interviews, ensuring the appropriateness and reliability of the instrument in terms of content validity, construct validity, and discriminant validity.

The questionnaire was organized into four sections: Brand Introduction: Presentation of typical agricultural product brand information to enhance contextual immersion. Demographic Information: Including gender, age, income, household size, and related characteristics. Consumption Characteristics: Covering family roles, primary purchasing channels, and concerns regarding agricultural product certifications. Measurement of Model Variables: Operationalization of core constructs based on validated scales within the research framework. For details, see Appendix A, Table A1. Scale Design.

The specific measurements are as follows:

Antecedent Variable—Perceived Brand Authenticity (PBA): Conceptualized as a higher-order construct comprising three first-order dimensions:

- Place-of-Origin Cognition: adapted from van Ittersum et al. (2003) [84] and Loureiro & McCluskey (2000) [85], emphasizing consumers' knowledge of origin information, regional associations, and perceptions of authenticity;
- Cultural Identification: based on Bhattacharya & Sen (2003) [86] and Tuškej et al. (2013) [87], assessing whether consumers internalize the cultural attributes embedded in agricultural brands as part of their self-identity;
- Brand Transparency: adapted from Schnackenberg & Tomlinson (2016) [88], combined with traceability and information disclosure requirements in the agricultural sector, measuring consumers' perceptions of brand openness, consistency, and verifiability.

Mediating Variable—Experience Quality (EQ): Modeled as a reflective second-order construct following Brakus et al. (2009) [89], Lemke et al. (2011) [90], and McColl-Kennedy et al. (2015) [91], comprising three dimensions:

- Brand Experience;
- Service Experience;
- Post-purchase Experience.

Mediating Variable—Consumer Trust: adapted from Chaudhuri & Holbrook (2001) [92], Morgan & Hunt (1994) [93], and Sirdeshmukh et al. (2002) [94], emphasizing consumers' confidence in a brand's fulfillment ability, reliability of promise-keeping, and willingness to reduce perceived risk.

Outcome Variable—Purchase Intention: based on Dodds et al. (1991) [95] and Yoon (2002) [96], measured from three aspects: purchase propensity, preference, and recommendation intention.

All items were measured using a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree), which enhanced response sensitivity and variability in accordance with statistical requirements for factor analysis [97]. Each latent variable contained 3–5 measurement items, yielding an initial pool of 40 items, with the pilot data sources presented in Figure 4. After two rounds of expert interviews (one each from brand management, agricultural marketing, and consumer psychology) and a small-scale pilot test (n = 56), the clarity of semantics and discriminant validity of the items were confirmed. Ultimately, 34 items were retained, as shown in Table 1.

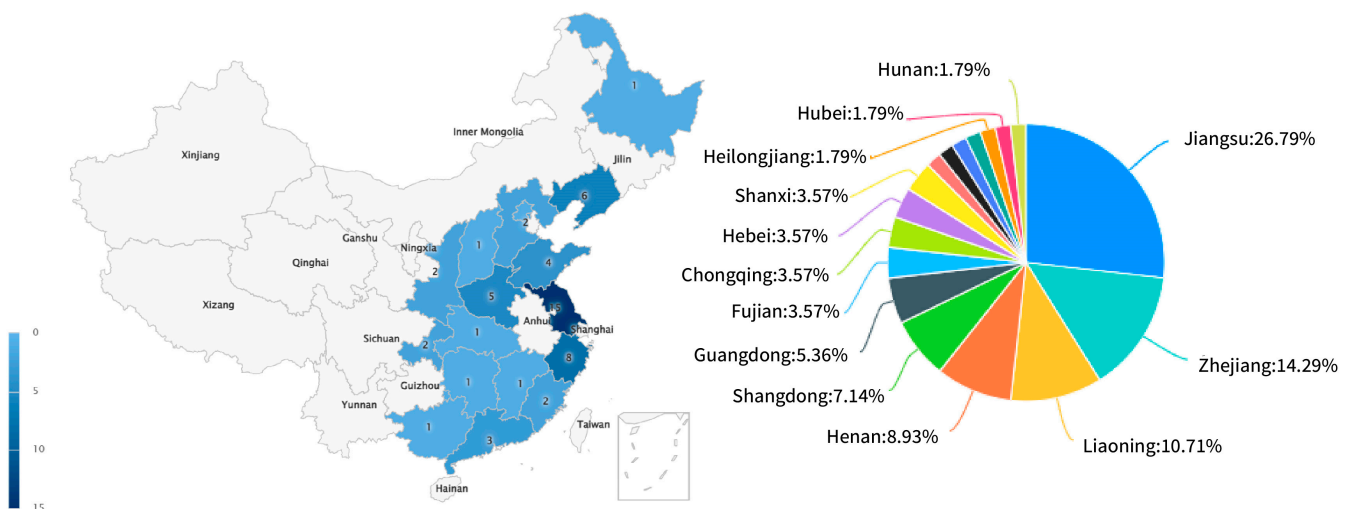


Figure 4. Pre-test data sources.

Table 1. Analysis of questionnaire prediction reliability and validity.

Variables:	Number of Items	KMO Value	Cronbach Alpha	Significance
Brand authenticity	11	0.934	0.967	0.000
Source of perception	4	0.842	0.909	0.000
Cultural identity	3	0.751	0.914	0.000
Brand transparency	4	0.829	0.909	0.000
Experience quality	9	0.915	0.956	0.000
Brand experience	3	0.723	0.845	0.000
Service experience	3	0.758	0.912	0.000
Post-purchase experience	3	0.724	0.876	0.000
Consumer trust	4	0.826	0.903	0.000
Purchase intention	4	0.844	0.901	0.000
Overall validity	28	0.943	0.986	0.000
Total variance explained		total 20.415	Percentage of variance 72.91	Cumulative % 72.91

Extraction method: principal component analysis.

3.2. Data Collection

This study used a structured questionnaire survey to collect data. The questionnaire design was based on an extensive literature review and variable operationalization, covering seven core concepts: perceived origin, cultural identity, brand transparency, perceived brand authenticity, experience quality, consumer trust, and purchase intention. Data were collected between 5 June and 22 August 2025, using a cross-sectional random sampling method through online channels (Wenjuzhixing, social media platforms, and WeChat groups). To improve response quality and participation, small cash incentives ranging from 0.1 to 3 RMB were offered through the online survey platform. Incentive amounts were intentionally kept modest to avoid response bias and excessive incentives. The total expenditure (RMB 1146.2) represented less than 1% of the research budget, meeting ethical standards for non-mandatory remuneration in academic research. This design adhered to the principle of minimal incentives, encouraging genuine participation without altering respondent behavior or response patterns.

In total, 814 questionnaires were obtained, of which 636 valid responses were retained after rigorous screening (validity rate = 78%). The exclusion criteria included: (1) completion time less than 90 s; (2) failure to pass attention-check items; and (3) respondents younger than 18 years old, in order to ensure ethical compliance and the independence of consumer decision-making. The final sample covered 28 provinces, municipalities, and autonomous regions in mainland China, ensuring broad geographic distribution and enhancing the external validity of the study (see Figure 5).

As summarized in Table 2, the sample characteristics were as follows: gender distribution—female 58.3%, male 41.7%; age structure—19–30 years (38.8%), 31–40 years (29.1%), 41–50 years (14.6%), and 51 years and above (17.5%), reflecting cross-generational coverage; monthly income—the largest group was RMB 6500–7500 (29.7%), followed by RMB 5500–6500 (20.9%) and RMB 4500–5500 (18.4%), indicating a predominantly mid-to-lower income structure; education—bachelor’s degree (41.4%) and master’s degree (21.4%), with more than 60% of respondents holding higher education qualifications, reflecting strong information-processing capacity and decision-making ability; household size—three-person households (42.8%) and households with four or more members (23.4%). These demographic characteristics closely mirror the profile of China’s online population. According to the China Internet Network Information Center [98], as of June 2024, China had 1.10 billion internet users and an internet penetration rate of 78%. The latest data reported by China Global Television Network [99] show that by June 2025, the number of

internet users had further increased to 1.12 billion, with a penetration rate of 79.7%. Meanwhile, over 70% of these users regularly engage in online shopping and livestream-based consumption [100]. Livestream e-commerce has rapidly become mainstream, accounting for approximately 31.9% of China's total online retail GMV in 2023, up from 17.9% in 2021 [101]. In addition, China's e-commerce market continues to expand, with an expected compound annual growth rate (CAGR) of 9.9% between 2024 and 2028 [102].

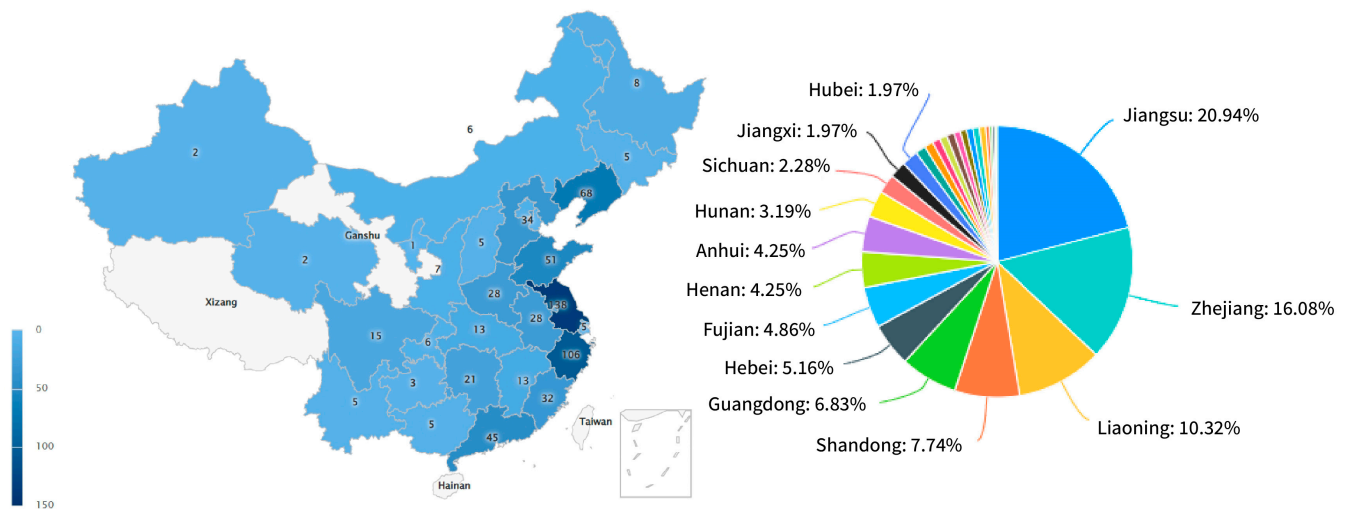


Figure 5. Pre-test data sources.

Table 2. Descriptive statistics, n = 636.

Variables	Item	Frequency	Percentage
Gender:	Male	265	41.7
	Female	371	58.3
Age:	19–30	247	38.8
	31–40	185	29.1
	41–50	93	14.6
	51–60	76	11.9
	60 and above	35	5.5
Monthly Income:	Under 4500 RMB	85	13.4
	4500–5500 RMB	117	18.4
	5500–6500 RMB	133	20.9
	6500–7500 RMB	189	29.7
	7500–8500 RMB	68	10.7
	Over 8500 RMB	44	6.9
Education:	High school or below	84	13.2
	Junior college	153	24.1
	Bachelor's degree	263	41.4
	Master's degree	136	21.4
Permanent Household Residents	1	27	4.2
	2	188	29.6
	3	272	42.8
	4 or more people	149	23.4

Given these statistics, the composition of the present sample—mainly digitally active, mid-income consumers—closely aligns with China's current online consumer structure and the research context of livestream agricultural branding, providing strong external validity for the empirical analysis.

3.3. Data Processing and Tool Selection

This study adopted a multi-stage data processing strategy to conduct multi-level analyses on the valid samples. First, for the multiple-choice items in Sections 2 and 3 of the questionnaire, the Jaccard similarity coefficient was applied to examine the correlations between demographic characteristics and agricultural product consumption traits [103]. This method helps identify consumers' combinational preferences across multiple selected factors. Data visualization was performed using R 4.4.3 software. Specifically, a binary matrix was constructed for each multiple-choice item:

$$X \in \{0, 1\}^{n \times m} \quad (1)$$

where “ n ” is the sample size and m is the number of options. If the sample chooses an option, the value is assigned to 1, otherwise it is assigned to 0. Then, the Jaccard similarity coefficient is calculated between any two options to measure their “co-occurrence” in consumer choices:

$$J_{ij} = \frac{|A_i \cap A_j|}{|A_i \cup A_j|} = \frac{n_{11}}{n_{1\cdot} + n_{\cdot 1} - n_{11}}, J_{ij} \in [0, 1] \quad (2)$$

Here, “ n_{11} ” denotes the number of respondents who selected both option “ i ” and option “ j ”, while “ $n_{1\cdot}$ ” and “ $n_{\cdot 1}$ ” represent the number of respondents selecting each option individually. When the union is zero, the value is treated as missing. From this, a symmetric matrix “ J ” was constructed and visualized as a heatmap to illustrate the strength of co-selection relationships. A higher “ J ” value indicates stronger co-occurrence between two behavioral or perceptual variables. To ensure interpretive rigor, we applied a cut-off threshold of $J \geq 0.25$, following previous studies on similarity-based clustering in consumer behavior [104,105]. Pairs exceeding this threshold were included in the network clustering analysis, while weaker associations were filtered out. The results were visualized through a two-mode co-occurrence network, facilitating the identification of dominant consumer configuration clusters [101]. When necessary, hierarchical clustering was applied to reorder rows and columns (distance = $1 - J$) in order to highlight cluster structures. Larger values indicate stronger co-selection. Empirically, $J \approx 0.10$ – 0.20 is considered weak, 0.20 – 0.30 moderate, and ≥ 0.30 relatively strong, which allows for the identification of “high-frequency co-occurrence” information patterns [106,107].

In addition, to examine heterogeneity, subgroup analyses were conducted by gender, age, income, education, and household size. Within each subgroup, the selection rate for each option was calculated to form a population $\times$ option matrix, which was then visualized using heatmaps. For each “population category $\times$ single option (0/1)” contingency table, Cramér’s V (range: 0–1) was computed based on χ^2 statistics, and options were reported in descending order of V to highlight those with the most significant differences.

In the fourth part of the structured questionnaire analysis, this study employed SPSS 26.0 and SmartPLS 4.0 for data processing and model testing to ensure both the reliability and validity of the measurement scales and the overall model fit. First, SPSS was used to conduct descriptive statistics, item analysis, internal consistency testing (Cronbach’s α), and exploratory factor analysis (EFA), thereby providing a foundation of data cleaning and reliability for subsequent model construction. Next, Partial Least Squares Structural Equation Modeling (PLS-SEM) was applied to validate the theoretical model. This method systematically examines the path relationships, explanatory power, and mediation effects among latent variables. PLS-SEM has been widely applied in marketing and management research, particularly in studies exploring emergent constructs and predicting behavioral outcomes [108]. Given that the objective of this study is to reveal how consumers’ per-

ceptions of agricultural brand authenticity influence the formation of trust and purchase intention, PLS-SEM offers a robust modeling framework with strong explanatory and predictive capabilities.

4. Empirical Analysis and Interpretation of Results

To identify structural patterns in consumers' multiple-choice questions, we applied the Jaccard similarity coefficient, a nonparametric metric that measures the degree of co-occurrence between category choices. The Jaccard similarity coefficient is particularly well-suited to multi-response survey data because it focuses only on common positive choices, avoiding inflation caused by common missingness. It is commonly used in fields such as data mining, text analysis, and bioinformatics.

In this study, each multiple-choice item (e.g., preferred purchase channels, certification types, or product attributes) was transformed into a binary vector, where "1" indicates the option was selected and "0" indicates it was not.

And where " a " represents the number of options both respondents selected, and " b " and " c " represent the number of options selected by only one of the two. The resulting similarity matrix (values ranging from 0 to 1) reflects how closely respondents' choice patterns align.

Using this matrix, we performed hierarchical clustering to group respondents with similar decision profiles. For example, consumers who frequently selected "e-commerce," "livestreaming," and "traceability QR codes" exhibited high Jaccard similarity and were clustered together, whereas those selecting "supermarkets," "community outlets," and "organic certifications" formed a separate cluster. This method helps reveal the underlying preference structure in multiple-choice data without relying on distributional assumptions, and can be displayed through a correlation heat map: the darker the color, the more common options there are among the respondents, and the higher the similarity.

4.1. Group Decision Analysis

This study constructed a structural evidence framework across five dimensions: population $\times$ shopping role/purchasing channel/certification preference/decision-making factors/premium acceptance. The core methods included selection-rate heatmaps and Jaccard co-occurrence analysis of multiple-choice items. The framework is designed to systematically capture stable patterns and gradient differences among consumer groups (by gender, age, education, and income) in agricultural product purchasing, thereby addressing the questions of "who buys, where, for what reasons, to what extent of premium acceptance, and which factors tend to co-occur." Compared with approaches that rely solely on means or regression analysis, this method reveals deeper structural information and provides reproducible and quantifiable evidence for subsequent theoretical testing and contextual interpretation.

4.1.1. Comparison of Household Agricultural Product Purchasing Roles by Group

As shown in Figure 6, household agricultural product purchasing follows a typical "information–decision–execution" chain. In terms of gender, women are more frequently the decision-makers (DC) and purchasing executors (BUYERS), while men are more often engaged as information providers (IP) and simple consumers (SC). Quality supervisors (QS) do not play a central role for either gender. Age analysis indicates that "decision authority rises with age": older generations are more prominent in DC, while younger cohorts take the lead in BUYERS and IP, forming a collaborative pattern in which "the young gather information, the elders make the final call." From an education perspective, highly educated individuals are more inclined to participate in IP and decision-making processes, reflecting

stronger information search and joint decision-making capacities. Income effects display a “U-shaped” pattern: low-income groups exert greater decision-making authority due to budget constraints, while high-income groups assume stronger leadership because of preferences for health and quality. Overall, this pattern aligns with classical theories of household decision-making and resonates with the digital customer journey: information is “pre-configured” through livestreaming and user-generated content (UGC), transmitted by household influencers, and finalized by decision-makers. Prior studies similarly confirm that in agricultural livestreaming contexts, social presence and interactivity significantly enhance purchase intention through the mediation of trust, which explains the coexistence of “youth as information suppliers” and “elders as ultimate decision-makers.”

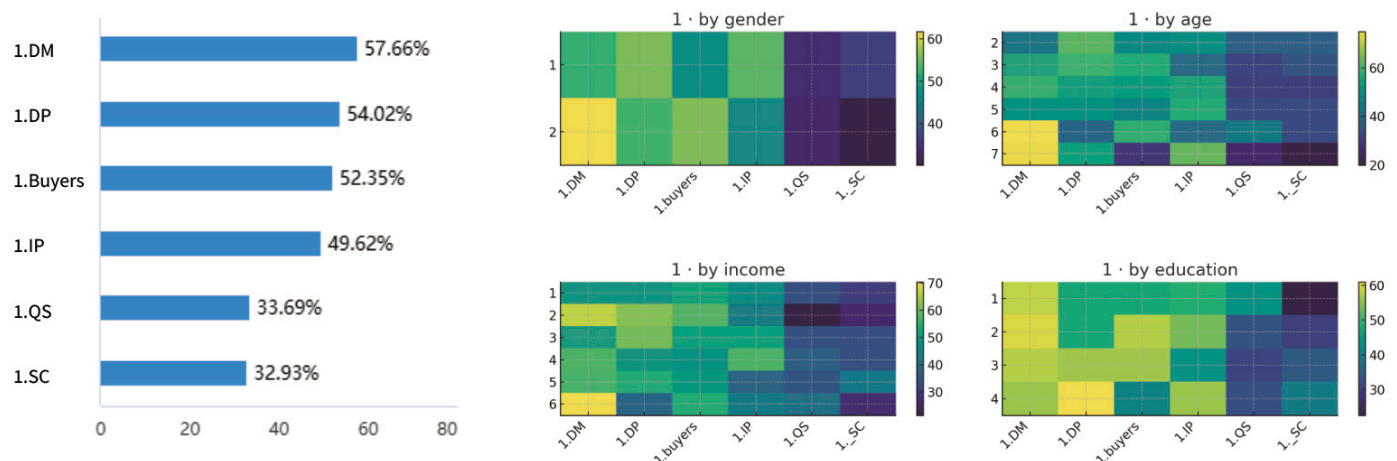


Figure 6. Heat map correlation analysis of household agricultural product purchasing roles.

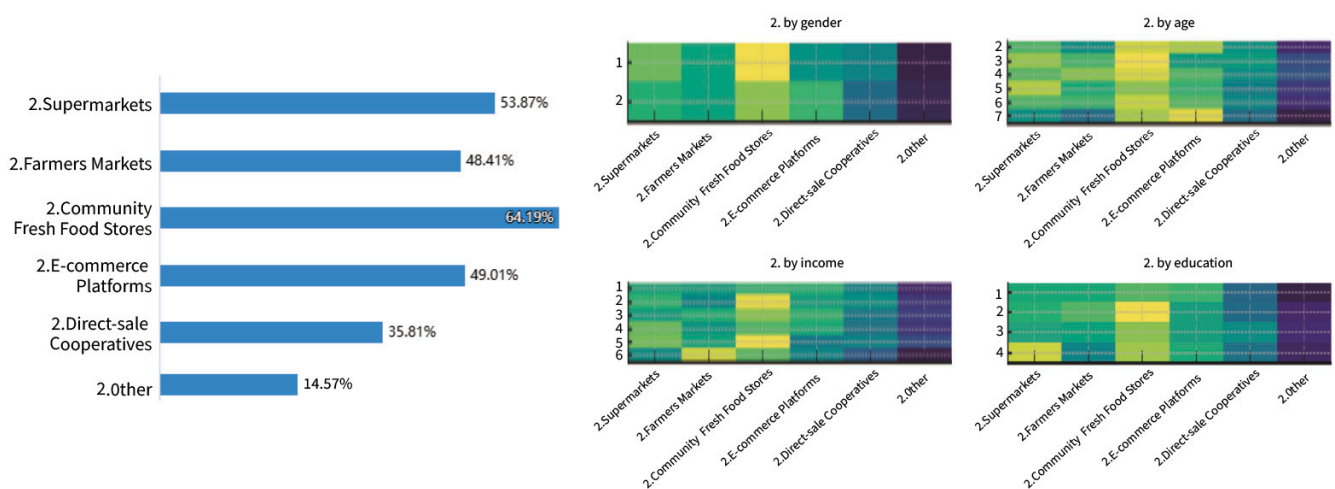
Further analysis, as presented in Table 3, shows that QS and SC occupy relatively minor roles across all groups, suggesting that “quality control” has shifted from intra-household responsibilities to institutional and platform mechanisms. Origin labels, traceability systems, and disclosure of inspection results provide verifiable quality assurance, while reliable logistics and after-sales services transform this assurance into experience quality and trust. Thus, the focus of brand governance lies not in “persuasion techniques” but in the “clarity and consistency of evidence.” Research in food systems also corroborates that consumer trust is jointly constructed through product-assurance pathways (origin, certification, traceability) and system-assurance pathways (accountability of platforms and institutions), with transparency serving as a key input. Particularly in the Chinese context, logistics and after-sales experience significantly improve satisfaction and repurchase intentions, constituting a hard constraint for transforming livestream-driven impulses into stable cross-generational repurchase behavior.

4.1.2. Comparison of Channel Preferences by Group

As shown in Figure 7, the overall channel structures for men and women are broadly similar, with community fresh markets and e-commerce forming the dual core. The difference lies in that women rely more on offline, immediate-access channels such as supermarkets and community fresh outlets, while men are more active in e-commerce and direct-from-origin purchases. This aligns with the earlier findings on household roles: women dominate decision-making and execution, whereas men and younger members primarily contribute as information providers.

Table 3. Contingency tables and Cramér's V/χ^2 .

Option	Gender		Age		Income		Education	
	Cramér's V	χ^2	Cramér's V	χ^2	Cramér's V	χ^2	Cramér's V	χ^2
Decision-maker Purchaser(buyers)	0.096	5.898	0.181	20.871	0.135	11.537	0.025	0.405
Information Provider	0.092	5.326	0.137	11.963	0.067	2.836	0.13	10.812
Simple Consumer	0.078	3.831	0.154	15.045	0.134	11.339	0.103	6.762
Decision Participant	0.063	2.56	0.084	4.45	0.099	6.188	0.109	7.55
Quality Supervisor	0.03	0.567	0.129	10.532	0.138	12.16	0.105	7.065
	0.008	0.045	0.102	6.635	0.128	10.402	0.09	5.139

**Figure 7.** Cluster heat map correlation analysis of channel preference.

As detailed in Table 4, clear generational differences emerge in age-related patterns: younger and middle-aged consumers prefer e-commerce (including livestreaming and instant delivery), older consumers are concentrated in supermarkets and community fresh markets, while the elderly retain a preference for traditional wet markets, reflecting their habits of “visual inspection and on-the-spot selection.” Education and income further accentuate channel differentiation: highly educated consumers are prominent in both e-commerce and community fresh markets, pursuing efficiency and information density on the one hand, while valuing immediacy and quality assurance on the other. High-income groups show stronger preferences for direct-sales cooperatives and specialty channels, emphasizing origin-based ties and typicality, whereas middle-income groups exhibit greater elasticity between community fresh markets and e-commerce. Overall, this structure resonates with customer journey research on cross-touchpoint trade-offs and aligns with the “short supply chain–localized trust” literature: offline channels fulfill the need for visual verification and instant access, while online channels attract younger and highly educated consumers through information integration and convenience.

Mechanistically, channel choice can be interpreted as a trade-off among verification costs, time costs, and experiential certainty. Younger and highly educated consumers, with higher levels of digital literacy, rely more heavily on reviews, price comparisons, and traceability disclosures in e-commerce. However, for platforms to convert “impulse buying” into repurchase, stable fulfillment and after-sales services are required to reduce experience volatility. Middle-aged and older consumers prefer supermarkets and community fresh

markets, reflecting their need for immediacy and visual assurance. Meanwhile, high-income consumers rely on the relational and place-based trust embedded in direct-sales cooperatives to secure authenticity and typicality.

Table 4. Contingency tables and Cramér’s V/χ^2 .

Option	Gender		Age		Income		Education	
	Cramér’s V	χ^2	Cramér’s V	χ^2	Cramér’s V	χ^2	Cramér’s V	χ^2
2. Community Fresh Food Store	0.089	5.054	0.074	3.449	0.17	18.347	0.105	6.967
2. E-commerce Platform	0.087	4.777	0.14	12.446	0.122	9.401	0.046	1.322
2. Direct Sales Cooperative	0.07	3.145	0.081	4.202	0.095	5.754	0.097	6.014
2. Supermarket	0.061	2.349	0.117	8.703	0.13	10.778	0.155	15.196
2. Other	0.028	0.511	0.154	15.013	0.124	9.721	0.071	3.173
2. Farmers’ Market	0.001	0	0.16	16.279	0.16	16.264	0.113	8.063

4.1.3. A Clustered Comparison of Attention Differences in Agricultural Product Certification Marks

As shown in Figure 8, based on the “population $\times$ certification” heatmap, consumer concerns reveal a three-tiered structure:

- Safety and Health Evidence-Oriented: Organic (OC), Green Food (GF), Pesticide Residue Certification (PRC), and Pollution-Free Agricultural Products (PFAP);
- Origin and Verifiability-Oriented: Geographical Indication Products (GIP) and Traceability QR Codes (TQR);
- Non-Certification Concerned (NCC): serving as the negative baseline.

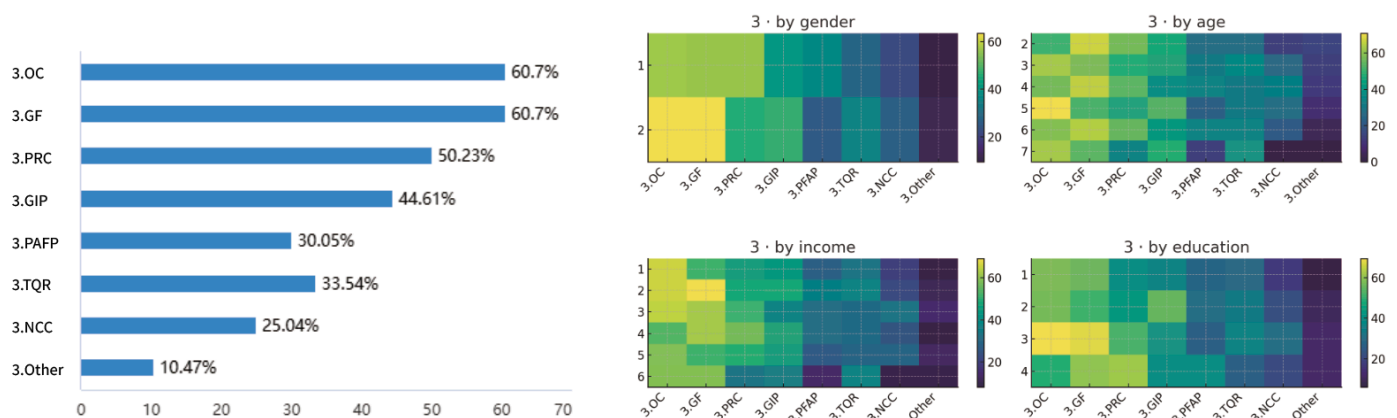


Figure 8. Heatmap correlation analysis of agricultural product label preferences clusters.

As detailed in Table 5, Gender differences show that women pay significantly greater attention to OC, GF, PRC, and PFAP compared with men, while the proportion of NCC is lower, indicating stronger safety sensitivity and preference for evidence. GIP and TQR display limited gender differences, though women still hold a slight advantage.

In terms of age, a clear “life-cycle effect” is observed: middle-aged and older consumers place greater emphasis on OC, GF, and GIP, reflecting experience and health concerns; younger consumers stand out in TQR, relying more heavily on digital traceability; NCC declines steadily with age.

Table 5. Contingency tables and Cramér’s V/χ^2 .

Option	Gender		Age		Income		Education	
	Cramér’s V	χ^2	Cramér’s V	χ^2	Cramér’s V	χ^2	Cramér’s V	χ^2
Pollution-Free Agricultural Products	0.125	9.945	0.122	9.445	0.115	8.469	0.113	8.11
Pesticide Residue Certification	0.106	7.188	0.11	7.724	0.12	9.145	0.152	14.704
Traceability QR Code	0.085	4.57	0.073	3.408	0.073	3.395	0.082	4.262
Green Food Organic Certification	0.071	3.182	0.109	7.528	0.12	9.167	0.142	12.835
Geographical Indication Product	0.067	2.853	0.115	8.342	0.104	6.855	0.164	17.016
Not Certified	0.065	2.667	0.103	6.77	0.092	5.382	0.133	11.193
Other	0.061	2.348	0.184	21.517	0.142	12.91	0.126	10.076
	0.038	0.941	0.137	11.926	0.086	4.672	0.065	2.697

Income and education jointly drive a “preference for evidential signals.” Higher income levels correspond to stronger concern for OC, GF, PRC, and GIP, while TQR is more salient among middle- and high-income groups, accompanied by reduced NCC. Similarly, higher education strengthens attention to TQR, PRC, and OC, while significantly lowering NCC. Consumers with mid-to-high levels of education are especially sensitive to GIP, interpreting it as a dual signal of both origin identity and quality assurance.

Overall, the heatmap highlights three differentiated mechanisms:

1. Evidence-Oriented (OC/PRC/TQR/PFAP): concentrated among higher-education, higher-income, and middle-aged/older groups;
2. Identity-Oriented (GIP/GF): combining origin and cultural recognition, favored by middle-to-high income and higher-education groups;
3. Non-Certification Concerned (NCC): more prevalent among younger, less-educated, and lower-income consumers, reflecting stronger reliance on convenience and price.

4.1.4. Differences in Attention Paid to Factors in Agricultural Product Decision-Making

As shown in Figure 9 and Table 6, the heatmap reveals a stable “quality–price dual-core” structure: across all groups, freshness and price are consistently prioritized, followed by safety. Convenience and promotion function as tactical levers with varying intensity across groups, while brand trust, origin, and eco-friendly packaging serve as supplementary cues.

By dimension, women, while equally emphasizing freshness and price, place slightly more weight on convenience, promotion, and safety/origin compared with men. Age exhibits a life-cycle gradient—freshness and price are most salient among young and middle-aged consumers, while older groups emphasize convenience and de-emphasize promotion. Income patterns show that price sensitivity is strongest among lower- and middle-income groups, whereas higher-income consumers prefer freshness and convenience and show somewhat greater concern for brand trust and origin. Education enhances preferences for “evidence + efficiency”: highly educated groups continue to prioritize freshness and price while also valuing convenience, with slight increases in safety, origin, and eco-friendly packaging.

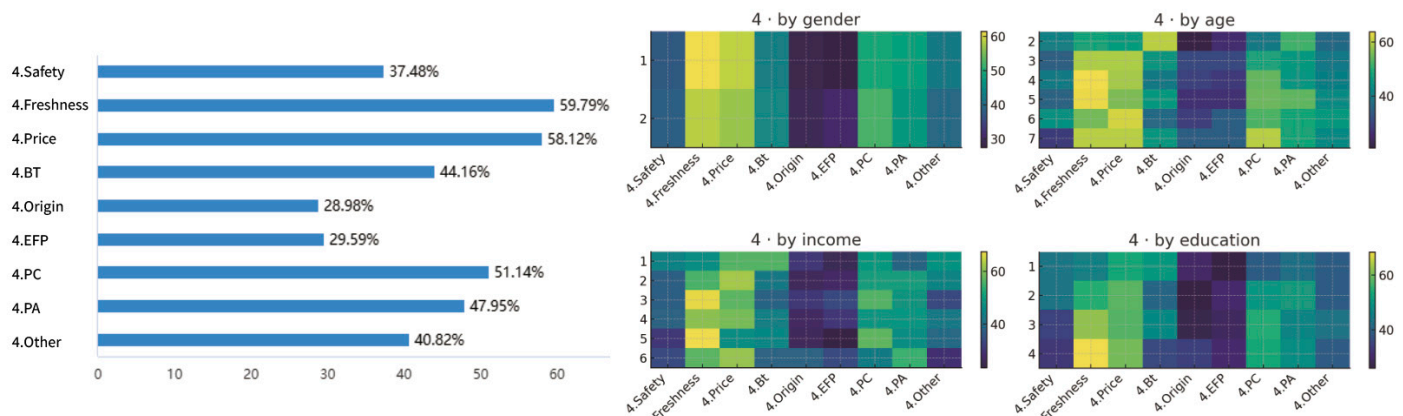


Figure 9. Heatmap correlation analysis of agricultural product attribute preferences clusters.

Table 6. Contingency tables and Cramér's V/χ^2 .

Option	Gender		Age		Income		Education	
	Cramér's V	χ^2	Cramér's V	χ^2	Cramér's V	χ^2	Cramér's V	χ^2
Environmentally friendly packaging	0.037	0.884	0.058	2.169	0.077	3.731	0.033	0.681
Freshness	0.03	0.586	0.094	5.61	0.134	11.404	0.141	12.651
purchasing convenience	0.024	0.38	0.097	6.041	0.081	4.214	0.099	6.212
Other	0.024	0.36	0.054	1.839	0.114	8.263	0.042	1.131
Price	0.017	0.189	0.079	3.983	0.086	4.708	0.039	0.971
Brand trust	0.013	0.114	0.124	9.803	0.11	7.749	0.108	7.38
Origin	0.012	0.087	0.068	2.935	0.071	3.248	0.069	3.01
Promotional activities	0.012	0.095	0.061	2.371	0.079	3.998	0.053	1.791
Safety	0.009	0.055	0.083	4.392	0.073	3.419	0.096	5.895

Based on these insights, an operational and communication framework can be summarized as “hard values as the foundation, tactical adjustments by segment, and values as supplementary signals.” Specifically:

- At all touchpoints: consistently highlight freshness evidence, clear price anchors, and fulfillment commitments;
- For elderly groups: emphasize at-home convenience;
- For young and middle-aged consumers: combine limited-time promotions and membership-based repurchase incentives;
- For lower-income groups: stress price comparisons and bundled offers;
- For high-income and highly educated consumers: integrate brand endorsements, origin cues, and environmental packaging to reinforce trust and values.

4.1.5. Group Differences in Willingness to Pay a Premium for Branded Agricultural Products

As shown in Figure 10 and Table 7, consumer acceptance of price premiums follows a three-tiered structure: the majority accept moderate premiums (brightest in column 2), a minority reject premiums (darkest in column 1), while acceptance of high premiums increases progressively with higher education and income levels (brightening in column 3). Gender differences are overall limited, indicating that willingness to pay brand premiums is not gender-driven. By age, middle-aged consumers cluster around moderate premiums,

while both elderly and some younger consumers show considerable acceptance of high premiums, reflecting a cross-generational consensus around “health/safety–certainty.” Education and income display a monotonic progression: the higher the level, the lower the share rejecting premiums, and the higher the proportion accepting high premiums. This aligns with prior China-based evidence, which finds that higher education and income enhance awareness of safety and organics, thereby strengthening premium tolerance (e.g., double-hurdle models for organic fruits and discrete choice experiments for certified pork both confirm the positive effect on willingness to pay, WTP). Overall, the branded agricultural product market exhibits a stratified structure: the mass market generally accepts moderate premiums, while highly educated and high-income groups are willing to pay higher premiums for “stronger endorsements.”

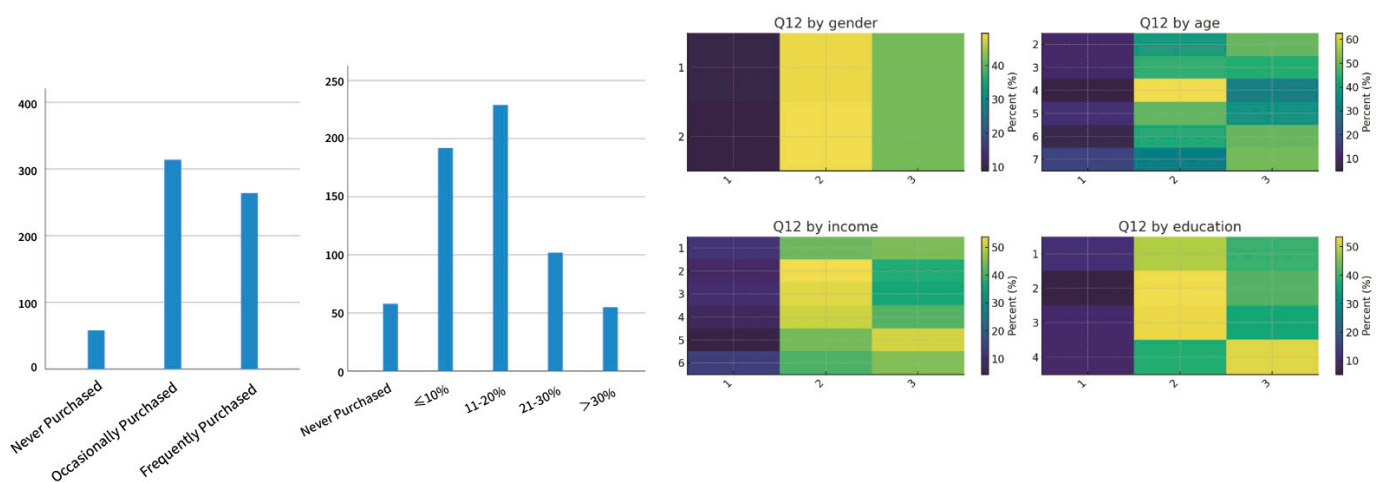


Figure 10. Cluster heat map of consumers' acceptance of price premium.

Table 7. Contingency tables and Cramér's V/χ^2 .

Option	Cramér's V	χ^2
Gender	0.01	0.06
Age	0.147	27.57
Income	0.086	9.48
Education	0.103	13.49

Mechanistically, three payment logics can be identified:

1. **Strong Endorsement Labels → Instant Trust → Premium.** Government or third-party certifications, food safety statements, and traceability disclosures significantly raise WTP, with high-trust consumers showing larger premiums.
2. **Origin and Typicality → Perceived Brand Authenticity (PBA) → Premium.** Origin-based signals such as geographical indications consistently elevate premiums, particularly among highly educated and urban consumers.
3. **Digital Verifiability → Reduced Uncertainty → Migration from Moderate to High Premiums.** Meta-analyses of traceability reveal a sustained global increase in WTP; when platforms ensure stable disclosure and logistics fulfillment, the majority of “moderate-premium” consumers can be shifted into the “high-premium” market segment.

4.2. Model Checking

4.2.1. Reliability Test

To ensure that the measurement scales employed in this study demonstrate satisfactory construct reliability and validity, SmartPLS 4.0 was used to evaluate the measurement model of all latent variables. The assessment included tests of indicator reliability, internal consistency reliability, convergent validity, and discriminant validity. The results of these tests are presented in Table 8. See Appendix A for the scale.

Table 8. Latent variable model indicator test.

Path	Loading	Cronbach's Alpha	Composite Reliability (rho_a)	CR	AVE
BE1	0.927	0.93	0.932	0.956	0.878
BE2	0.937				
BE3	0.947				
BT1	0.9				
BT2	0.849	0.891	0.892	0.925	0.754
BT3	0.87				
BT4	0.854				
CI1	0.882				
CI2	0.947	0.909	0.91	0.943	0.847
CI3	0.93				
CT1	0.862				
CT2	0.873				
CT3	0.831	0.882	0.884	0.918	0.738
CT4	0.869				
OR1	0.829				
OR2	0.874				
OR3	0.879	0.888	0.888	0.922	0.748
OR4	0.877				
PI1	0.894				
PI2	0.897				
PI3	0.832	0.913	0.916	0.939	0.794
PI4	0.938				
PP1	0.887				
PP2	0.88				
PP3	0.903	0.869	0.871	0.92	0.792
SE1	0.902				
SE2	0.877				
SE3	0.885				

In terms of indicator reliability, all standardized factor loadings of the measurement items were significantly above the threshold of 0.70, ranging from 0.827 to 0.947, indicating that each item effectively reflects its corresponding construct and demonstrates strong indicator reliability [19]. Regarding internal consistency, all latent variables achieved Cronbach's α values exceeding 0.85, while Composite Reliability (CR) values were all above 0.90, substantially higher than the recommended thresholds of 0.70 and 0.80. These results confirm that the constructs exhibit excellent internal consistency and stability [93,94]. Furthermore, convergent validity was assessed using the Average Variance Extracted (AVE). The results show that the AVE values of all constructs ranged between 0.738 and 0.878, well above the minimum benchmark of 0.50 [94], suggesting that the constructs successfully capture sufficient variance from their measurement items. Taken together, these findings demonstrate that all latent variables in this study meet the requirements of reliability and convergent validity, providing a solid foundation for subsequent structural model analysis.

4.2.2. Validity Testing

To ensure the discriminant validity of latent variables in the structural model, this study employed two approaches: the Fornell–Larcker criterion (Fornell & Larcker, 1981) and the Heterotrait–Monotrait Ratio (HTMT) of correlations [95]. First, according to the Fornell–Larcker criterion, discriminant validity is established if the square root of the Average Variance Extracted ($\sqrt{\text{AVE}}$) for each construct is greater than its correlations with other constructs. As shown in Table 9, the $\sqrt{\text{AVE}}$ values (bold diagonal elements) for all constructs were substantially higher than their inter-construct correlations, indicating good discriminant validity.

Table 9. Effectiveness Fornell-Larcker test.

	BE	BT	CI	CT	POC	PI	PP	SE
BE	0.937							
BT	0.482	0.869						
CI	0.569	0.554	0.920					
CT	0.455	0.575	0.512	0.859				
OR	0.506	0.569	0.541	0.581	0.865			
PI	0.404	0.502	0.494	0.514	0.537	0.891		
PP	0.447	0.372	0.562	0.410	0.414	0.548	0.890	
SE	0.415	0.443	0.546	0.456	0.422	0.573	0.547	0.888

Second, the HTMT criterion was further applied. Henseler et al. (2015) [95] suggest that HTMT values below 0.85 indicate satisfactory discriminant validity, while values between 0.85 and 0.90 may still be acceptable. In this study, all constructs exhibited HTMT values well below 0.85, as reported in Table 10, further confirming that adequate discriminant validity was achieved. Taken together, these results demonstrate that the research model exhibits robust discriminant validity, thereby ensuring the reliability of subsequent structural path analyses.

Table 10. Effectiveness HTMT test.

	BE	BT	CI	CT	POC	PI	PP	SE
BE								
BT	0.529							
CI	0.618	0.616						
CT	0.502	0.647	0.571					
OR	0.557	0.640	0.602	0.656				
PI	0.438	0.556	0.543	0.571	0.596			
PP	0.495	0.422	0.631	0.466	0.472	0.614		
SE	0.461	0.504	0.616	0.520	0.482	0.644	0.628	

4.2.3. Multicollinearity Test

In examining the relationships between second-order constructs and their first-order dimensions, PLS-SEM has been widely applied in complex model analysis, theory extension, and small-sample research, demonstrating strong applicability. In this study, Perceived Brand Authenticity (PBA) and Experience Quality (EQ) were specified as second-order constructs. PBA was modeled with three first-order dimensions—Brand Transparency (BT), Cultural Identification (CI), and Place-of-Origin Cognition (POC)—while EQ was modeled with three dimensions—Brand Experience (BE), Service Experience (SE), and Post-purchase Experience (PP). A reflective–reflective-type modeling approach was adopted to construct the latent variable paths.

As reported in Table 11, for measurement evaluation, outer weights, variance inflation factors (VIF), and t-value significance were employed to test the contribution and significance of first-order constructs to their second-order counterparts. The results indicate that all first-order dimensions exhibited outer weights greater than 0.3, with t-values significant at the $p < 0.001$ level, demonstrating their strong representativeness and statistical power within their corresponding second-order constructs. In addition, all VIF values were well below the threshold of 5, indicating no multicollinearity and confirming the structural stability of the model [18]. Collectively, these findings validate the interpretability and rationality of the second-order latent constructs. Thus, the design and evaluation logic of the second-order constructs in this study are supported by solid theoretical and methodological foundations.

Table 11. Multicollinearity test.

Path	Outer Weight	VIF	T-Value	Significance
BT <- PRA	0.382	1.694	37.324	0.000
CI <- PRA	0.419	1.619	31.264	0.000
POC <- PRA	0.392	1.660	36.907	0.000
PP <- EQ	0.407	1.556	26.280	0.000
SE <- EQ	0.432	1.505	26.363	0.000

4.2.4. Explanatory Power Test

To evaluate the explanatory power of the structural model for endogenous variables, the coefficient of determination (R^2) was calculated for each latent construct. The results show: Brand Experience (BE) $R^2 = 0.607$, Brand Transparency (BT) $R^2 = 0.728$, Cultural Identification (CI) $R^2 = 0.661$, Consumer Trust (CT) $R^2 = 0.454$, Experience Quality (EQ) $R^2 = 0.498$, Place-of-Origin Cognition (OR) $R^2 = 0.718$, Purchase Intention (PI) $R^2 = 0.437$, Post-purchase Experience (PP) $R^2 = 0.675$, and Service Experience (SE) $R^2 = 0.656$. According to Chin's (1998) criteria (0.19 = weak, 0.33 = moderate, 0.67 = substantial) [96], most constructs (e.g., BT, OR, PP, SE) exhibit substantial explanatory power, while CT and PI fall into the moderate-to-high range. These results indicate that the overall structural model demonstrates strong explanatory validity and practical significance, particularly in predicting key behavioral outcomes such as purchase intention.

Further analysis of effect sizes (f^2) reveals that Perceived Brand Authenticity (PBA) has a medium-to-large effect on Experience Quality (EQ) ($f^2 = 0.995$). Its effects on Brand Transparency (BT), Cultural Identification (CI), and Place-of-Origin Cognition (OR) are $f^2 = 2.678$, 1.956, and 2.549, respectively, all at substantial levels, underscoring the prominent contribution of these three dimensions to the overall perception of authenticity. Similarly, Experience Quality (EQ) demonstrates strong explanatory power for Brand Experience (BE) ($f^2 = 1.547$) and Service Experience (SE) ($f^2 = 1.911$), confirming its critical role across stages of the experiential chain. Consumer Trust (CT) exerts a smaller but statistically significant effect on Purchase Intention (PI) ($f^2 = 0.072$), validating its role as a key mediator in the behavioral conversion process.

4.2.5. Direct Effect Test

In the structural path analysis, the direct effects of the key hypothesized paths were examined. As shown in Table 12, all path coefficients were statistically significant, indicating that Perceived Brand Authenticity (PBA), Experience Quality (EQ), and Consumer Trust (CT) exert direct effects on Purchase Intention (PI). These results provide strong support for both the theoretical logic and empirical robustness of the model.

Table 12. Direct effect test.

Hypothesis	Coefficient	T-Value	S.D.	LLCI	ULCI	Significance	Result
H5: CT → PI	0.239	6.148	0.039	0.165	0.318	0.000	Support
H4: EQ → PI	0.503	11.968	0.042	0.417	0.581	0.000	Support
H3: EQ → CT	0.153	3.626	0.042	0.074	0.237	0.000	Support
H2: PRA → CT	0.553	10.261	0.054	0.446	0.654	0.000	Support
H1: PRA → EQ	0.714	25.397	0.028	0.655	0.767	0.000	Support

Specifically, the effect of PBA on EQ was significant ($\beta = 0.714$, $t = 25.397$, $p < 0.001$), suggesting that stronger perceptions of authenticity lead to higher perceived experience quality in subsequent brand encounters. PBA also demonstrated a significant positive effect on CT ($\beta = 0.553$, $t = 10.261$, $p < 0.001$), showing that authenticity effectively reduces perceived risk and fosters trust in the highly uncertain context of agricultural products. In addition, EQ exerted a significant positive influence on CT ($\beta = 0.153$, $t = 3.626$, $p < 0.001$), validating the role of high-quality experiences in the trust-building mechanism.

Most importantly, both EQ and CT had significant positive impacts on PI. The path coefficient of EQ → PI was $\beta = 0.503$ ($t = 11.968$, $p < 0.001$), while CT → PI was $\beta = 0.239$ ($t = 6.148$, $p < 0.001$). These findings confirm the chained mediation mechanism whereby brand authenticity influences purchase intention through experience quality and trust, offering both theoretical explanation and practical implications for agricultural brand management.

4.2.6. Mediation Effect Test

To further validate the mechanism through which Perceived Brand Authenticity (PBA) influences Purchase Intention (PI), this study employed the bootstrapping method (5000 resamples) to test mediation and chained mediation effects. The results indicate that multiple indirect paths were statistically significant (see Table 13).

Table 13. Mediation effect test.

Hypothesis	Effect	T-Value	LLCI	ULCI	Significance	Result
H6: PRA → EQ → CT	0.110	3.486	0.052	0.173	0.000	Support
H7: PRA → EQ → PI	0.359	12.215	0.300	0.415	0.000	Support
H8: PRA → CT → PI	0.132	4.815	0.083	0.190	0.000	Support
H9: PRA → EQ → CT → PI	0.026	2.945	0.012	0.046	0.003	Support
H10: EQ → CT → PI	0.037	3.114	0.017	0.062	0.002	Support

First, along the path PBA → EQ → CT, the indirect effect was 0.110 ($t = 3.486$, 95% CI [0.052, 0.173], $p < 0.001$), suggesting that authenticity can indirectly enhance consumer trust through improved experience quality. Second, the indirect effect of EQ → CT → PI was also significant (effect = 0.037, $t = 3.114$, 95% CI [0.017, 0.062], $p = 0.002$), indicating that experience quality mediates the effect of trust on purchase intention.

For direct mediation, the most pronounced result was observed for PBA → EQ → PI (effect = 0.359, $t = 12.215$, 95% CI [0.300, 0.415], $p < 0.001$), demonstrating that authenticity significantly promotes purchase intention through experience quality. Similarly, the path PBA → CT → PI also showed a significant indirect effect (effect = 0.132, $t = 4.815$, 95% CI [0.083, 0.190], $p < 0.001$), confirming that authenticity can drive purchase behavior through trust.

Finally, the chained mediation effect PBA → EQ → CT → PI was also statistically supported (effect = 0.026, $t = 2.945$, 95% CI [0.012, 0.046], $p = 0.003$), further validating

that authenticity indirectly influences consumer purchase intention via the sequential transmission of “experience quality → trust.”

In summary, all mediation and chained mediation effects within the model were statistically confirmed, indicating that perceived brand authenticity not only exerts a direct influence on purchase intention but also indirectly shapes consumer behavior through multiple transmission paths involving experience quality and trust. These findings underscore the central mechanism of authenticity in agricultural brand consumption decisions.

5. Discussion

5.1. Based on Clustering and Co-Occurrence (Jaccard) Heat Map Analysis

Synthesizing five heatmaps—household roles, core channels, certification preferences, key attributes, and premium acceptance—a consistent evidence gradient emerges. Consumers first anchor their choices in the triad freshness–price–safety, then in institutionalized endorsements (organic, green, pesticide-residue, GI/origin) and traceability QR codes. These signals flow through household decision hierarchies—younger members gather information; elders decide; women execute purchases—into actual buying behavior.

In online environments, the credence attributes of agricultural products intensify reliance on verifiable information and consistent fulfillment to reduce uncertainty [41]. When origin, traceability, and testing align with reliable delivery and after-sales service, trust strengthens, shifting consumers from moderate to high premium acceptance [52]. Conversely, a single fulfillment failure may, through social-media amplification, spill over into skepticism toward the entire brand or origin [49].

This structure parallels the central mechanism PBA (origin cognition × cultural identification × transparency) → EQ (brand/service/post-purchase) → CT → PI, explaining why higher-income and better-educated groups are more responsive to strong endorsements and traceability. The experience-closure loop acts as a bridge that converts perceived into validated authenticity.

Based on the above findings, we propose three testable breakthroughs:

- **Evidence Density Hypothesis:** At equivalent prices, the density of evidence (“origin certification + traceability availability + third-party inspection” in conjunction) positively drives Trust and willingness to pay (WTP) in a nonlinear manner, with a steeper slope observed in online channels;
- **Dual-Person Funnel:** In household decision-making shaped by livestreaming and short videos, information providers (younger members/men) pre-frame expectations through User Generated Content (UGC) and interactive engagement, while decision-makers/executors (women/elders) determine conversion and repurchase based on fulfillment consistency;
- **Trust Externalities:** A single negative post-purchase experience exerts stronger category-level spillover (brand → origin → product type) when tied to high-salience certifications or strong regional brands, whereas a “traceability–compensation–reinspection” mechanism can substantially mitigate such spillovers.

These propositions align with recent findings in livestream commerce (trust mediation), traceability meta-analyses (positive WTP effects), and dual-path food-trust research (product × system assurances). They offer directions for robustness and multi-group analyses (MGA).

Toward a sustainability-oriented action framework (Brand × Platform × Policy):

1. **Live-to-Proof Systems:** Ensure that every promise made in livestreaming or product detail pages is mapped to batch-level digital twins (GI/origin → inspection ID → cold-chain trajectory → delivery temperature zone), with scannable traceability

- cards (TQR) serving as intra-household “secondary persuasion” tools. Public-facing SLA-style KPIs (punctuality, intactness, response speed) should also be disclosed.
2. Evidence Scoreboards and Trust-Recovery Processes: Standardize scripts such as “guaranteed compensation for damage,” “mandatory refunds for mismatches,” and “return of reinspection reports,” transforming negative experiences into learnable service evidence.
 3. Certification Simplification and Disclosure Enhancement: Streamline overlapping labels, unify core disclosure fields (origin, inspection frequency, key flavor/nutritional indicators), and replace “label stacking” with clarity and accuracy.
 4. Lightweight Blockchain/Trusted Database Deployment: Implement these systems within cooperatives and regional public brands, showing only essential public fields externally while ensuring full accountability internally, and integrate with platform risk-control mechanisms to reduce verification costs and suppress “low-quality noise.”

Such governance mechanisms can stabilize the translation of authenticity (PBA) into consistent experience quality and sustainable trust, thereby supporting SDG 12 (Responsible Consumption) and SDG 8 (Decent Rural Employment). Their technological and governance feasibility has been supported by existing research on transparency, traceability, and trust.

Future research can proceed along two directions: Conduct contextualized experiments or quasi-natural experiments manipulating “evidence density” ($GI \times \text{traceability} \times \text{inspection} \times \text{price}$) and “fulfillment consistency” to identify the causal strength and thresholds of the $PBA \rightarrow EQ \rightarrow CT \rightarrow PI$ pathway. Construct a “Trust Behavioral Dataset” by combining platform-side algorithmic and governance data (complaint rates, risk-control flags, cold-chain logs) to test the cross-brand and cross-origin propagation of “trust externalities,” and evaluate the marginal benefits of governance interventions (inspection frequency, disclosure standards).

These approaches not only respond to the core pain point of online retail—“seeing is believing”—but also provide quantifiable institutional levers for the sustainable development of agricultural brands.

5.2. Path Test Analysis Based on PLS-SEM

With the rapid development of the socio-economic environment and the deep penetration of digital marketing, brand communication strategies and consumer touchpoints are undergoing unprecedented restructuring. However, this transformation has also been accompanied by a decline in brand integrity and consumer trust [1]. In the agricultural sector—closely tied to livelihoods—brands relying on rhetoric or price competition without verifiable support from origin, culture, and values are particularly vulnerable to trust crises [67].

Against this backdrop, this study proposed and tested ten hypotheses along the pathway “Perceived Brand Authenticity $\rightarrow$ Experience Quality $\rightarrow$ Consumer Trust $\rightarrow$ Purchase Intention.” The PLS-SEM results confirmed significantly positive paths for $PBA \rightarrow EQ$, $PBA \rightarrow CT$, $EQ \rightarrow CT$, $EQ \rightarrow PI$, and $CT \rightarrow PI$, revealing two mediation effects: “authenticity $\rightarrow$ experience $\rightarrow$ trust” and “authenticity $\rightarrow$ trust $\rightarrow$ intention.” The strongest links, $PBA \rightarrow EQ$ and $EQ \rightarrow CT$, correspond with the high co-occurrence clusters of “e-commerce $\times$ verifiable cues” identified in the network analysis, suggesting that greater evidence density and fulfillment stability enhance the conversion of authenticity into trust and purchasing willingness.

These results demonstrate that agricultural consumption follows an integrated psychological chain—initiated by authenticity perception, reinforced by experiential quality, and driven by trust formation—echoing multi-stage, multi-dimensional processing models in contemporary consumer behavior theory [70].

Furthermore, this study conceptualizes sustainable brand competitiveness as a progressive logic of evidence assetization (EA) → experiential closure (EC) → trust accumulation. Policy and industry collaboration—such as GI enforcement, label reduction, and enhanced platform disclosure—enable educated and high-income consumers to pay premiums for high evidence density, supporting early investment recovery. For price-sensitive consumers, strategies like smaller packaging and price protection ensure stable experiences and gradually build trust, converting short-term premiums into long-term relational assets.

In conclusion, this study extends the theoretical boundary of perceived brand authenticity (PBA) by verifying its central role in mediating experience and trust mechanisms, and provides actionable pathways for agricultural brands as trust-oriented categories. Practically, brands should begin with authenticity, establish full-chain governance integrating origin, culture, and transparency, and prioritize authentic consumer experiences to achieve sustainable market recognition and long-term value creation.

5.3. Implications for Fresh Produce Marketers and Growers

This study provides several practical insights that can guide agricultural enterprises, cooperatives, and local brand managers in improving trust and market performance. The core logic is summarized in a simple sequence—“Authenticity → Experience → Trust → Purchase/Repurchase.” Figure 11 presents this relationship as an intuitive cycle of value creation for agricultural brands.

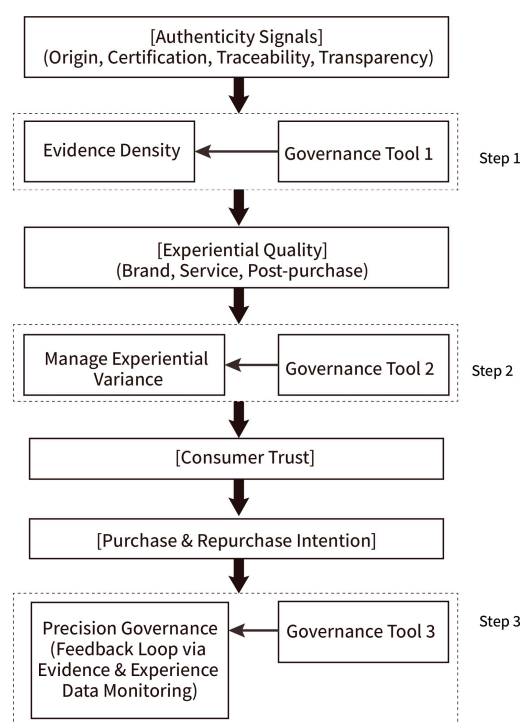


Figure 11. Applied governance framework linking authenticity, experience, and trust in agricultural branding.

This figure illustrates how perceived brand authenticity shapes consumer trust and purchase behavior through experiential quality. The framework identifies three actionable governance tools—evidence density, experiential variance management, and precision governance—which together establish a closed-loop mechanism for sustainable agricultural brand development.

1. Build “Evidence Cards” for Products. Integrate origin, certification, inspection, and traceability data into a unified digital or physical evidence card (e.g., a QR code on

- packaging). This enables instant verification, reduces confusion from overlapping labels, and strengthens consumer confidence in authenticity.
2. **Stabilize Consumer Experience Across Touchpoints.** Consistency outweighs perfection. Product quality, packaging, delivery, and after-sales service should meet uniform standards. Fresh produce enterprises can formalize these through service-level agreements (SLAs) with logistics and retail partners, complemented by instant compensation or reinspection for service failures.
 3. **Segment and Target Consumers Precisely.** Consumers differ in how they interpret authenticity signals. Younger and educated users value digital traceability and interactive storytelling; middle-aged and older consumers prefer authoritative endorsements and offline assurances; lower-income households prioritize affordability and reliability; and higher-income, sustainability-conscious groups demand eco-friendly packaging and verified certifications. Tailored communication and certification strategies enhance both trust and premium acceptance.
 4. **Implement Data-Driven Precision Governance.** Enterprises and local authorities should establish a data-feedback loop to monitor authenticity indicators—such as label density, consumer feedback, and complaint ratios—and continuously optimize governance performance. Tools like an Evidence Density Index can quantitatively assess how authenticity signals reinforce trust.

Applying the authenticity–experience–trust framework can shift agricultural branding from short-term promotion to long-term, trust-based value creation, reducing redundant marketing while fostering sustainable competitiveness in China’s fresh produce sector.

Although this study is grounded in China’s agricultural branding and livestreaming e-commerce, its theoretical mechanism extends beyond this context. The authenticity–experience–trust pathway reflects general consumer psychology, but its manifestations are context-dependent. In the European Union, geographical indications (GI) are institutionalized under the Common Agricultural Policy; in North America, consumers rely more on third-party certifications such as USDA Organic or Non-GMO Project. In contrast, Chinese consumers—immersed in livestreaming and digital traceability ecosystems—exhibit heightened sensitivity to real-time verification and service fulfillment.

These variations suggest that while the core pathway from authenticity to trust is generalizable, the specific forms of authenticity signaling (e.g., GI marks vs. blockchain traceability) and channels of experience delivery (offline certification vs. online livestreaming) remain context-dependent. Future research should therefore undertake cross-national comparisons to test the robustness of the evidence density–experimental variance framework across different cultural and institutional settings.

6. Conclusions

This study integrates Jaccard similarity co-occurrence analysis with PLS-SEM path modeling, providing dual evidence of structural discovery and causal verification along the mechanism “Perceived Brand Authenticity → Experiential Quality → Trust → Purchase Intention.”

Two dominant consumer configurations emerge:

- (i) E-commerce/livestreaming × traceability QR codes × geographical indications × young, educated consumers; and
- (ii) Supermarkets/community outlets × organic/green certifications × middle-aged and elderly female decision-makers.

Findings confirm that clear origin cues, cultural alignment, and verifiable signals enhance experiential quality and trust, reinforcing purchase and repurchase intentions. In

credence-based categories, institutionalized evidence exerts stronger effects on trust than narrative persuasion.

The study advances three theoretical frontiers.

First, it redefines brand authenticity as a governance mechanism rather than a symbolic attribute. By introducing evidence density and experiential variance, it extends marketing theory beyond symbolic communication toward an information governance paradigm emphasizing verifiable signal consistency.

Second, it enriches consumer psychology by complementing and challenging the expectancy–confirmation paradigm, showing that stability across touchpoints—rather than mean satisfaction—drives enduring trust.

Third, it aligns with emerging models of data-driven and sustainability governance, linking micro-level consumer cognition to macro-level institutional accountability.

While authenticity remains central, it interacts with cultural, economic, and platform-specific factors—such as regional norms, income uncertainty, and KOL endorsements—making it a proximal but context-dependent driver of trust and willingness to pay, see Table 14 for details. Future studies could examine these boundary conditions through cross-cultural or longitudinal designs.

Table 14. Alternative explanations, mechanisms, and implications for our findings.

Factor	How Could It Explain the Results	Relation to Our Model	What We Did/Future Test
Cultural consumption patterns (gift-giving, face, regional tastes, guanxi)	Increases WTP independent of authenticity signals	Moderates PBA → Trust/PI	Control demographics; discuss boundary; future: include gift-giving propensity/regional taste scales
Macroeconomic context (income uncertainty, inflation, consumer confidence)	Expands/compresses premium acceptance	Moderates Trust → PI	Report period context; future: panel across cycles; IV using local macro indices
Platform & influencer effects (KOL, social proof)	Shifts credibility via endorsements/exposure	Parallel pathway to authenticity	Include channel controls; future: scrape ratings/endorsement data
Supply chain & seasonality	Affects EQ regardless of PBA	Moderates PBA → EQ	Note in limitations: future: logistics KPIs/season dummies
Promotion intensity & price	Drives short-term purchase	Competes with authenticity path	Discuss price sensitivity; experiment: evidence density vs. discounting

Beyond China, the evidence density–experiential variance framework applies to diverse institutional systems, including EU geographical indications, North American certifications, and blockchain-based traceability in emerging markets. Through evidence assetization → experiential closure → trust accumulation, agricultural brands can transform short-term premiums into enduring trust capital, advancing responsible consumption (SDG 12) and rural employment (SDG 8).

6.1. Theoretical Implications

Focusing on Chinese geographical indication agricultural products, this study develops and validates an integrative framework linking Perceived Brand Authenticity → Experience Quality → Trust → Purchase Intention, demonstrating strong explanatory and predictive power. The theoretical contributions are summarized in six aspects.

First, authenticity is repositioned as a governance mechanism that reduces information asymmetry, modeled as a second-order construct comprising origin cognition, cultural identification, and brand transparency. This shifts authenticity from symbolic to evidential consistency. Second, the study uncovers the causal coupling between authenticity and experience: verifiable signals and transparent disclosure enhance cross-touchpoint experience quality, whereas inconsistencies trigger reverse scrutiny and trust erosion. Third, it clarifies the gateway role of trust, verifying that authenticity and experience jointly drive purchase intention through trust, which serves as the psychological threshold linking authenticity to consumers' willingness to pay premiums. Fourth, two new governance constructs are introduced—evidence density and experience variance. Evidence density amplifies authenticity effects, while minimizing experience variance—rather than raising mean satisfaction—more effectively stabilizes trust, transforming it into a manageable process variable. Fifth, the study identifies boundary conditions in digital and e-commerce contexts, where the transmission paths from authenticity to experience and from experience to trust intensify, elevating channel effects from control to moderating mechanisms. Sixth, it offers methodological innovation by integrating co-occurrence network analysis with PLS-SEM, bridging “evidence combinations” with “psychological chains” and mitigating the bias of isolated significance tests.

Overall, this study advances an actionable framework for credence-based products: authenticity functions as a governance resource, experience reflects delivery consistency, and trust evolves into accumulated psychological capital that sustains purchase and premium intention.

6.2. Practical Implications

No universal governance model applies uniformly to agricultural branding; governance strategies must be adapted to contextual realities. The findings of this study confirm that perceived brand authenticity functions not as rhetoric but as a governance mechanism that mitigates information asymmetry. To enhance the linkage between authenticity signals and consumer trust, three interrelated strategies are proposed:

(1) Enhancing Evidence Density.

Consumers respond most positively when multiple authenticity cues—such as geographical indications, organic or green certifications, pesticide testing, and traceability QR codes—appear jointly. Firms and policymakers should therefore consolidate origin, inspection, and disclosure data into scannable and verifiable evidence cards, ensuring alignment between promises and credentials across livestream and online channels. An Evidence Density Index may further quantify signal consistency and be integrated into performance assessments to reduce confusion from label proliferation and superficial marketing.

(2) Reducing Experience Variance.

PLS-SEM results show that cross-touchpoint consistency in experiential quality—spanning brand interaction, service fulfillment, and after-sales handling—critically transforms trust into purchase intention. Consumers are more sensitive to fluctuations than to mean satisfaction levels. Establishing clear KPIs, early-warning systems, and remedial actions—such as instant compensation, reinspection feedback, and batch disclosure—can stabilize expectations and strengthen long-term trust through consistently reliable experiences.

(3) Implementing Precision Governance.

Subgroup analyses reveal significant heterogeneity. Women and older consumers value authoritative endorsements and fulfillment reliability; younger and more educated groups prefer traceability, shareable evidence, and comparative data; lower-income consumers emphasize affordability and price protection, whereas higher-income consumers

prioritize sustainable packaging and third-party certification. Governance strategies should thus differentiate interventions by demographic profile.

In sum, firms should develop a closed-loop governance framework linking evidence density, experiential stability, and trust accumulation to sustain repurchase and premium retention. Policymakers and enterprises, in partnership with cooperatives and regional public brands, should pursue long-term governance characterized by fewer labels, stronger disclosure, and enforceable accountability.

6.3. Limitations and Future Research

This study draws on cross-sectional survey data from China's fresh fruit market. Despite applying randomization, psychological separation, anonymity assurances, and collinearity checks to mitigate common method bias, reliance on self-reported, single-source data may still inflate path coefficients. Future research should integrate multi-source evidence—such as transaction logs, logistics data, and after-sales records—and employ longitudinal or experimental designs to capture the dynamic transmission of authenticity, experience, and trust across the pre-, during-, and post-purchase stages. Cross-regional and cross-category studies should also test measurement equivalence to control for cultural and channel variations.

While PLS-SEM suits prediction-oriented, higher-order models, it remains sensitive to endogeneity. Future research could enhance causal identification through instrumental variables, Copula methods, and multi-method convergence. The proposed concepts of “evidence density” and “experience variance governance” also warrant empirical validation—particularly their nonlinear and threshold effects—using A/B testing, quasi-experiments, or discrete choice designs to assess marginal impacts on willingness to pay and repurchase.

Given that even a single mismatch between promise and fulfillment can spill over to the brand or category, future studies may draw on social network causal inference or event-study approaches to quantify the diffusion and repair effects of negative experiences. Moreover, subsequent work should extend beyond purchase intention to construct a supply-chain indicator chain linking authenticity governance → experiential stability → trust capital → operational outcomes → sustainability performance, incorporating variables such as return rates, recall rates, and order stability to assess the governance contribution to responsible consumption.

Finally, although this study relies on consumer self-reports rather than institutional records, perception itself is foundational to the effectiveness of authenticity mechanisms. The impact of certification or traceability ultimately depends on consumer recognition and trust. Thus, consumer-based data provide a necessary complement to institutional analyses. Future research could triangulate this approach with blockchain transaction data, inspection results, and disclosure records to align consumer perceptions with institutional performance.

7. Patents

Approved by the National Copyright Administration of the People's Republic of China (Lu Zuodeng Zi-2025-G- 00077415).

Author Contributions: Conceptualization, X.L. and X.Q.; Methodology, X.L.; Software, X.L. and X.Q.; Validation, X.L., X.Q. and M.C.; Formal analysis, X.L. and X.Q.; Investigation, X.L.; Resources, X.L.; Data curation, X.L.; Writing—original draft preparation, X.L.; Writing—review and editing, X.L. and Y.C.; Visualization, X.L. and X.Q.; Supervision, Y.C. and M.C.; Project administration, X.L.; Funding acquisition, X.L. All authors have read and agreed to the published version of the manuscript.

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Abbreviations

The following abbreviations are used in this manuscript:

PBA	Perceived Brand Authenticity
BT	Brand Transparency
CI	Cultural Identification
POC	Perceived Origin Cognition
DM	Decision-maker
DP	Decision Participant
BUYERS	Purchasers
IP	Information Provider
QS	Quality Supervisor
SC	Simple Consumer
OC	Organic Certification
GF	Green Food
PRC	Pesticide Residue Certification
GIP	Geographical Indication Product
PFAP	Pollution-Free Agricultural Products
TQR	Traceability QR Code
NCC	Not Certified
EQ	Experiential Quality
BE	Brand Experience
SE	Service Experience
PP	Post-purchase Experience
CT	Consumer Trust
PI	Purchase Intention
BL	Brand Loyalty
EFP	Environmentally Friendly Packaging
PC	Purchase Convenience
PA	Promotional Activities
EA	Evidence Assetization
EC	Experiential Closure
KPI	Key Performance Indicators

Appendix A

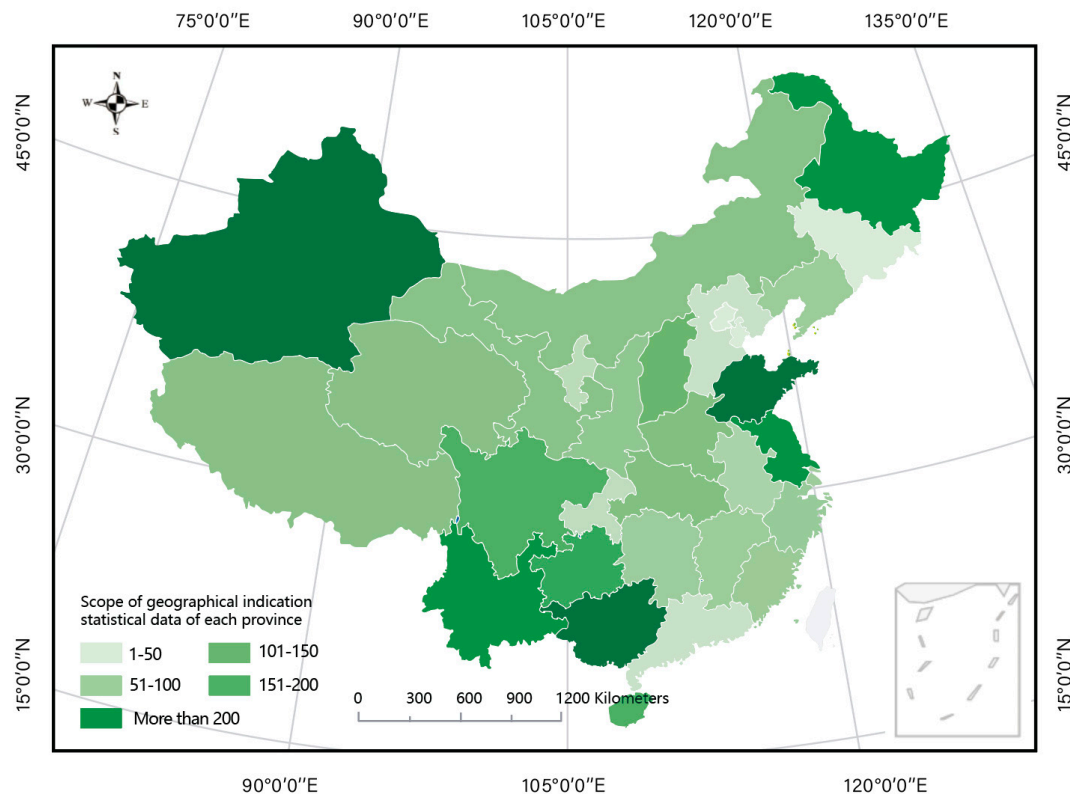


Figure A1. Heat map of the predicted number of geographical indications of agricultural products in various provinces in China.

Table A1. Scale Design.

Variable	Item	Reference
Perceived Origin Cognition (POC)	POC1 I want to clearly understand the origin information of [TARGET BRAND]'s agricultural products.	[78,79]
	POC2 The place of origin of [TARGET BRAND] makes me associate it with uniqueness, which increases my purchase intention.	
	POC3 Because the place of origin has a good reputation, I trust [TARGET BRAND] more.	
	POC4 When choosing [TARGET BRAND]'s agricultural products, I pay special attention to their place of origin.	
Cultural Identification (CI)	CI1 I identify with the local/region-based culture behind [TARGET BRAND].	[80,81]
	CI2 The culture expressed by [TARGET BRAND] gives me a sense of belonging.	
	CI3 The cultural symbols/images presented by [TARGET BRAND] clearly distinguish it from other brands.	
Brand Transparency (BT)	BT1 [TARGET BRAND] clearly explains its production process and sources.	[82]
	BT2 I can easily obtain [TARGET BRAND]'s product information and test reports.	
	BT3 [TARGET BRAND]'s stated values are consistent with its actual practices.	
	BT4 The information communicated by [TARGET BRAND] seems truthful and credible to me.	

Table A1. Cont.

Variable	Item	Reference
Brand Experience (BE)	BE1 I have a positive impression of [TARGET BRAND]’s overall image and interactions.	[83]
	BE2 [TARGET BRAND]’s communications make it feel authentic and trustworthy.	
	BE3 [TARGET BRAND]’s appearance and packaging, and its emotional appeals, give me a favorable feeling.	
Service Experience (SE)	SE1 During the purchase process, [TARGET BRAND] provides professional service.	[84]
	SE2 The staff of [TARGET BRAND] make me feel respected and understood.	
	SE3 When I make inquiries, I receive timely responses and effective assistance.	
Post-Purchase Experience (PP)	PP1 I am satisfied overall with delivery, packaging, and usage instructions after purchase.	[85]
	PP2 In after-sales service, [TARGET BRAND] shows responsibility and efficiency.	
	PP3 When problems occur, [TARGET BRAND] handles them quickly and with sincerity.	
Consumer Trust (CT)	CT1 I am willing to trust [TARGET BRAND]’s products and related information.	[86–88]
	CT2 I believe [TARGET BRAND] will fulfill its promises to consumers.	
	CT3 [TARGET BRAND] feels reliable and dependable to me.	
Purchase Intention (PI)	CT4 I believe [TARGET BRAND] has strong integrity.	[68,89]
	PI1 I am willing to try products from [TARGET BRAND].	
	PI2 Among similar products, I would give priority to [TARGET BRAND].	
	PI3 If the price is reasonable, I will continue purchasing [TARGET BRAND].	
	PI4 I am willing to recommend [TARGET BRAND]’s products to others.	

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