



# CREDENCE ATTRIBUTES AND CONSUMER WILLINGNESS TO PAY: A CROSS-COUNTRY ANALYSIS OF DRIED FRUIT AND NUT MARKETS IN CENTRAL ASIA

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# INTRODUCTION

**Dried fruits and nuts** are vital for nutrition and incomes in rural **Central Asia (CA)**:

- Mainly collected in **wild forests** and cultivated in intensive **orchards**
- Rarely in sustainable **Agroforestry Systems (AFS)**

The expansion of AFS is slow and hindered due to:

- Lack of knowledge,
- Poor processing,
- Absence of **Environmental and Social Standards (ESS)**





# PROBLEM STATEMENT



Food processing SMEs in CA often do not fully exploit and benefit from ESS

- Growing demand for sustainable and ethical food
- Rising living standards of populations across the world
- Institutional market transformations in Central Asian food markets



High costs of adopting ESS create uncertainties among food processing SMEs.



Despite the **global demand** for sustainable food and the **benefits of ESS**:

- Unclear whether consumers in CA follow modern consumption practices and sustainability trends
- Existing demand for products with sustainable attributes remains uncertain



# LITERATURE SUPPORT

- Credence attributes - product attributes not directly observable, even after purchase
  - Food safety, environmental sustainability, ethical labor, origin
- Rely on third-party assurance (certification, labeling, branding)
  - Requires institutional trust and consumer awareness.
- Drivers of credence attribute valuation:
  - Individual level: Income, education, values urban vs. rural location
  - System-level: market regulation, certification systems, cultural food norms
- In emerging markets like Central Asia:
  - Hybridization of preferences: mix of traditional values and modern quality concerns.
  - Weak regulatory institutions – high reliance on informal trust (e.g. local vendors and visual inspection)
  - But growing awareness of health risks sustainability and fairness in food production

# PRODUCT ATTRIBUTES

## Product attributes

**Food Safety** – the degree to which a product adheres to food safety standards

**Environmental attributes** – the extent to which production contributes to soil and water conserv.

**Social attributes** – fair distribution of benefits, wages, and work safety

**Country of origin** – region of production

**Price per 500 gr.**

## Attribute levels

1. **Low:** uncertain food safety compliance
2. **Medium:** compliance with national minimum standards
3. **High:** Certification according to EU food safety standards.

1. **Low:** unknown compliance with environmental safety
2. **Medium:** adherence to basic legal environmental regulations
3. **High:** advanced practices promoting soil and water conservation

1. **Low:** unknown compliance with labor regulations
2. **Medium:** compliance with national minimum regulations
3. **High:** ensuring fair benefit-sharing and ethical labor conditions

1. **Low:** origin is unknown
2. **Medium:** local
3. **High:** imported

Five levels

Credence attributes

# TIMELINE OF THE RESEARCH PROCESS

## Literature review



- Identified food attributes;
- Selected key attributes relevant to dried fruits and nuts;
- Defined attribute levels

March  
2023

## Expert Interviews with industry professionals



- Validated attribute and levels;
- Assessed clarity and contextual fit;
- Identified urban/rural distinctions.

October  
2023

## Questionnaire development

- Analyzed pros and cons of various methods: DCE & CV;
- Key methods to develop and analyze DCEs;
- Pilot-tested at HSRW.

April-May  
2024

## Data collection #2 (Kazakhstan)



- Pilot-test: 10 respondents
- Refining questionnaire
- Survey: 400 respondents

November-February  
2024-2025

## Field trip #1 (Kyrgyzstan):



- Study regions: Bishkek, Batken, Jalal-Abad and Osh;
- Key processors;
- Study products.

## Field trip #2 (Kyrgyzstan):

- Observed retail settings: supermarkets, organic shops, open bazaars;
- Identified existing Environmental and Social Standard types;
- Identified product price ranges.

## Data collection #1 (Kyrgyzstan)



- Pilot-test: 10 respondents
- Refining questionnaire
- Survey: 400 respondents

## Data collection #3 (Uzbekistan, Tajikistan)

- Survey: 600 res. in each country
- + 200 in rural areas of Kazakhstan and Kyrgyzstan

2022-2023

June-July  
2023

January-March  
2024

June-July  
2024



# METHODOLOGY

## Consumer survey

- Kazakhstan, Kyrgyzstan, Uzbekistan and Tajikistan – 2500 urban and rural respondents

**Multi-stage stratified sampling** to ensure national and regional representativeness

- **400 urban** respondents
- **200 rural** respondents



## Questionnaire:

**Section 1 - Discrete Choice Experiments**

**Section 2 - Eating context and buying habits**

**Section 3 – Socio-demographic characteristics**



# METHODOLOGY

## Step 1:

- 405 combinations of attributes and levels

## Step 2:









- Removed unrealistic combinations (e.g., international certifications at low prices, uncertain attributes at high prices).
- Reduced to 80 combinations.

## Step 3:

- Final set: 45 combinations (3 x 15 choice tasks + opt-out in each)

**Multinomial logit model** - analysis

## Example of choice set

	Dried apricot 1	Dried apricot 2	Dried apricot 3
Food Safety	 EU-Level Safety Standards	 National Standards	? Unclear Compliance
Environment	 Soil, water, and eco-conservation	 National Standards	? Unclear Compliance
Society	 Fair benefit-sharing among farmers	 National Standards	? Unclear Compliance
Region	 Local Product	 Imported Product	? Unclear Origin
Price (500 gr.)	<b>437 KGS</b>	<b>350 KGS</b>	<b>262 KGS</b>





## Central Asia

- **Women** show **higher MWTP** for food safety than men in all countries
- **Higher-educated** consumers value certification
- **Higher-income** consumers prioritize food quality
- **Urban consumers** show greater trust in certified food safety claims



**UZBEKISTAN** - Highest MWTP: €1.21

- Preference for external certification (e.g., EU);
  - **public concerns over pesticide use.**



**KAZAKHSTAN** - MWTP: €0.73

- Higher trust in local certified safety claims
  - Consumers value perceived health guarantees



**KYRGYZSTAN** - MWTP: €0.64

- Less driven by formal certification.
- Urban and educated segments are more **open to certified claims**



**TAJIKISTAN** – MWTP: not significant

- Majority of consumers are price-sensitive



# ENVIRONMENTAL SAFETY

## Central Asia

- **Educated respondents** in all countries show a significant MWTP for environmental protection.
- **Women**, especially those in education and healthcare sectors, exhibit higher valuation of eco-friendly attributes.
- **Middle- and high-income groups** demonstrate stronger preferences.



**KYRGYZSTAN** - Highest MWTP: €0.73

- **Concern** for environmental issues, especially in rural areas affected by **land degradation and water scarcity**.



**KAZAKHSTAN** - MWTP: €0.49

- Preference driven by **urban, educated consumers**



**UZBEKISTAN** - MWTP: €0.43

- Consumers value sustainability **when it is framed in health-related or food quality terms** (e.g., pesticide-free)



**TAJIKISTAN** - MWTP: not significant

- **Due to low environmental awareness**, limited eco-label exposure, and greater focus on basic food access.



# SOCIAL RESPONSIBILITY



## Central Asia

- **Women** display consistently higher MWTP, particularly in Kyrgyzstan and Uzbekistan.
- Awareness of labor rights, fairness, and ethical labels is higher among university-educated.
- **Middle-income and higher-income** consumers show willingness to pay more for fairness.



**KYRGYZSTAN** - MWTP: €1.35

- Express strong concern for **fairness** in **local food chains**



**KAZAKHSTAN** - MWTP €0.92

- Among **educated** and **urban consumer**.



**UZBEKISTAN** - MWTP: €1.15

- Demand is especially among **younger urban consumers**.



**TAJIKISTAN** - MWTP: not significant

- **Informal market structures** dominate; social responsibility is not yet an active consumer concern.



# COUNTRY OF ORIGIN



## Central Asia

- **Male** consumers are more likely than females to prefer locally produced dried fruits and nuts
- **Urban**, higher-income dwellers prefer imported, certified, and globally sourced food products



**KAZAKHSTAN** - MWTP: €0.42

- Local production – **freshness and quality**



**KYRGYZSTAN** - MWTP: €0.36

- Local production – **cheaper, fresh** and **support for local farmers**



**UZBEKISTAN** – MWTP: €0.92

- **Urban** consumers prefer **imported** fruits and nuts



















**TAJIKISTAN** - MWTP: not significant

- **Older** consumers prefer **locally produced** fruits and nuts



# COMPARATIVE HEATMAP

Country	Food safety	Environmental sustainability	Social responsibility	Country of origin
Kazakhstan	 €0.73	 €0.49	 €0.92	 Local
Kyrgyzstan	 €0.64	 €0.73	 €1.35	 Local
Tajikistan	 Not significant	 Not significant	 Not significant	 Not significant
Uzbekistan	 €1.21	 €0.43	 €1.15	 Not significant

# CONCLUSION

- **Food safety** is the **most valued credence attribute** across Central Asia
  - Especially in **Uzbekistan** and **Kazakhstan**
- **Environmental sustainability** is **moderately valued**, but uneven across countries:
  - most relevant in **Kyrgyzstan** and **Kazakhstan**
- **Social responsibility** shows **high willingness to pay**,
  - particularly in **Kyrgyzstan**
- **Country of origin (COO)** reflects trust in local food and cultural importance
  - only in **Kazakhstan** and **Kyrgyzstan**
- **Women, urban, educated**, and **middle-to-higher-income** consumers consistently show **higher MWTP** for credence attributes.
- **Rural** and **low-income** consumers remain less responsive to labeling

# CONCLUSION — RECOMMENDATIONS:

- **Enhance food safety labeling** and certification visibility, especially in Uzbekistan and Kazakhstan.
- Introduce **social responsibility certifications** tied to farmer welfare and fair labor, with emphasis in Kyrgyzstan.
- **Educate consumers** on environmental and ethical labels through targeted campaigns and retail partnerships.
- Develop **local and regional COO labels** to support trust in domestic products—especially where formal standards are weak.
- Promote **affordable and credible labeling schemes** tailored to **low-income and rural populations**.

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With funding from the:

