

# Study on the current situation and development strategy of soybean import trade in Shandong Province

Xiaotong Wang \*

School of Business Administration, Qingdao City University, China

\*Corresponding author

**Abstract:** In recent years, the tourism industry has created numerous job opportunities and significantly contributed to regional economic development. However, China's tourism service quality still faces multiple challenges. Issues such as subpar management standards, inadequate regulatory measures, and insufficient accountability in scenic area administration remain key constraints on service quality. Building upon previous research, this study proposes hypotheses and a theoretical framework demonstrating how tourist experience mediates the relationship between service quality and scenic area attractiveness. The questionnaire design primarily employs Likert scales to measure critical variables including service quality, attraction level, and visitor experience. A total of 240 questionnaires were distributed, with 231 returned. After reliability and validity validation, hypothesis testing was conducted using SPSS software. Results indicate a positive correlation between service quality and scenic area attractiveness, with empirical evidence revealing that tourist experience acts as a mediating factor (accounting for 28.145% of the impact). To enhance this mechanism, enterprises should implement service quality accountability systems, prioritize cultivating high-caliber professionals, and provide premium tourism services.

**Key words:** Tourist service quality; tourist experience; scenic spot attraction

## 1. Introduction

With China's rapid economic growth and evolving consumption patterns, domestic demand for soybeans continues to rise, particularly in feed and edible oil markets. As one of the country's major soybean-consuming provinces, Shandong's soybean import trade significantly impacts regional agricultural economy and food security. However, the province faces multiple challenges including insufficient production capacity, increased external dependence, international price volatility, trade policy adjustments, and environmental changes. Therefore, conducting an in-depth analysis of Shandong's soybean import trade status and exploring development strategies holds crucial significance for promoting sustainable regional economic growth, ensuring national food security, and advancing agricultural modernization. While existing research on soybean import trade is substantial, most focus on global market dynamics with relatively limited studies specifically addressing Shandong. This study aims to systematically review theoretical frameworks and developmental trends in soybean import trade, analyze market supply-demand

relationships and policy environments, thereby providing theoretical references and practical guidance for Shandong's soybean import trade. Through multidimensional research, this study seeks to offer actionable policy recommendations for the healthy development of Shandong's soybean import trade.

The theoretical significance of this study lies in systematically organizing relevant literature to establish a theoretical analytical framework, clarifying the theoretical foundation of research questions, and providing theoretical support for subsequent PEST model analysis. The practical significance is reflected in proposing response strategies through analyzing the current status of soybean import trade in Shandong Province, enhancing market responsiveness of related enterprises, promoting local agricultural industry chain development, improving supply chain conditions, and offering references for management and researchers. The research methodology includes literature review, PEST analysis, and quantitative data analysis. The literature review establishes a theoretical analytical framework by organizing domestic and international literature; PEST analysis

examines challenges in Shandong's soybean import trade from four dimensions: Political, economic, social, and technological Perspectives; Quantitative data analysis enhances argument objectivity through visualization, Quantifying Policy effects and market trends. The research approach focuses on in-depth exploration of the current status and development strategies of Shandong's soybean import trade, Proposing optimization suggestions based on supply chain management theory. Specific objectives include identifying influencing factors such as international market fluctuations and Policy environment changes, and exploring how to enhance trade efficiency and ensure supply chain stability to Promote local soybean industry development. Ultimately, recommendations are Proposed to address current soybean import trade issues, Providing theoretical support and Practical guidance for Policymakers and industry Practitioners.

## 2. The current situation of soybean import trade in Shandong Province

### Soybean import scale and structure

Soybean imports have maintained steady growth, with Shandong Province consistently ranking among the top in China. Over the past five years, the Province's soybean imports have grown at an average annual rate of 5%, reaching 18 million tons in 2023—a 22% increase from 2018. This accounted for 18% of national soybean imports, placing it second nationally after Guangdong Province. In terms of import value, 2023 saw \$8.5 billion worth of soybeans imported. Despite a slight 3% decrease compared to 2022 due to international price fluctuations, the import volume remained robust. Industrial applications include: 75% used for feed processing (meeting the soybean meal demand for 42 million pigs and 800 million poultry), 15% for food production (tofu, soybean oil), and 10% for emerging industries (biodiesel, pharmaceutical raw materials). Core ports Qingdao and Rizhao handled 15 million tons of soybeans in 2023, accounting for 83% of provincial imports. Leveraging port advantages, these areas formed an integrated "unloading-storage-processing" industrial chain.

Significant Regional Economic Synergy Soybean imports directly boost local food processing and livestock farming sectors. Clusters in Linyi and Zaozhuang generate over 30 billion yuan annually in soybean product processing. Leading enterprises like Yiwang Group and Bohai Industrial export soybean derivatives (e.g., soy protein and phospholipids) to Europe and America, achieving 1.2 billion yuan in 2023 exports. Through logistics

networks like bulk-to-container conversion and road-to-rail transport, soybeans are distributed to neighboring provinces including Henan, Hebei, and Jiangsu, with an annual external transfer volume of 5 million tons, solidifying Shandong's status as a key soybean distribution hub in North China.

### Overall characteristics of soybean import

Brazil dominates soybean imports, accounting for half of Shandong Province's total. In 2023, the three major sources—Brazil, the United States, and Argentina—collectively accounted for 85% of imports, with Brazil alone contributing 62% (11.16 million tons), the U.S. 15% (2.7 million tons), and Argentina 8% (1.44 million tons). Amid Sino-US trade tensions, U.S. soybean imports dropped from 30% in 2017 to 15% currently, while Brazil's share has steadily increased due to stable production and competitive pricing. Emerging regions like Russia's Far East and Ukraine account for less than 3% of imports in 2023, failing to establish significant substitutes.

Product Structure Shows Pyramid Characteristics Low-end bulk products dominate: Genetically modified soybeans (GMOs) make up 88% of imports, primarily sourced from Brazil and the U.S., used for oil extraction and soybean meal production. Their average import price reached \$480 per ton in 2023. High-end specialty products grow rapidly: Non-GMO soybean imports totaled 2.16 million tons (12%), mainly from Canada and Ukraine, used for infant food and organic bean products. Their average price hit \$650 per ton in 2023, up 10% year-on-year. Organic soybean imports reached 300,000 tons, representing 14% of non-GMO soybeans, primarily supplying premium markets like Qingdao and Jinan.

## 3. Challenges facing soybean import trade in Shandong Province: A multidimensional Perspective based on PEST analysis framework

As a major agricultural province and a key hub for grain processing, Shandong Province plays a vital role in soybean import trade, ensuring industrial chain stability and meeting diversified consumer demands. However, the Province's soybean import trade currently faces multifaceted challenges that intertwine across political, economic, socio-cultural, and technological dimensions, collectively forming a complex trade environment. Firstly, from a political perspective, fluctuations in international policies have significantly disrupted supply chains. For instance, Sino-US trade friction has increased costs for US

soybean exports to China, leading to notable fluctuations in both import volumes and prices. Meanwhile, policy changes in major exporting countries – such as Brazil's restrictions on soybean exports and Argentina's adjustments to export tariffs – have heightened market uncertainties. Domestically, although the government has increased subsidies for soybean cultivation, limited arable land resources and prioritization of staple crops make it difficult to substantially expand soybean planting areas, making short-term import dependence hard to alleviate. Additionally, technical trade barriers impose extra compliance costs and challenges on importing enterprises. Economically, structural contradictions between supply-demand mismatches and cost transmission have become increasingly prominent. Fluctuations in domestic and international production—such as droughts in Brazil and floods in Argentina—have impacted supply chains. Meanwhile, growing soybean demand in Shandong Province, particularly from livestock farming and food processing industries, is pressuring import structure transformation. Furthermore, the development of biodiesel production has affected industrial soybean demand. Socio-culturally, consumption upgrades and industrial transformations are driving iterative updates in imported product structures. The growing demand for quality consumption among residents has led to an increase in the import ratio of non-GMO soybeans. Meanwhile, the application of soybeans in emerging industries such as biopharmaceuticals and cosmetic raw materials has raised higher requirements for soybean quality. However, the lack of a coordinated system in the upstream domestic industrial chain has hindered the pace of industrial upgrading.

In terms of technological dimensions, the challenges of aligning detection technologies with international standards and the lag in industrial chain digital transformation currently pose major obstacles. Outdated rapid detection methods and insufficient coverage of multi-residue testing have resulted in inefficient customs clearance processes and a passive position in international trade. Meanwhile, delayed technology adoption leaves enterprises at a disadvantage when responding to market fluctuations. To address these challenges, Shandong Province's soybean import trade requires coordinated efforts across four dimensions: political, economic, social, and technological. Politically, establishing an international trade policy early warning

mechanism and expanding cooperation with emerging production regions are essential. Economically, combining domestic yield increases with diversified imports is crucial for supply chain stability. Socially, enhancing the cultivation and promotion of high-quality soybean varieties helps resolve supply-demand mismatches. Technologically, accelerating R&D in detection technologies and building digital platforms will strengthen industrial chain resilience. Only through constructing a dynamic system integrating policy guidance, market regulation, and technological support can we fortify the security defenses of soybean import trade in complex environments.

#### 4. Development strategies of soybean import trade in Shandong Province – Path optimization based on PEST framework

As a major agricultural province and grain processing hub in China, Shandong Province plays a vital role in ensuring supply chain stability and meeting diversified demands through soybean import trade. This paper employs the PEST analysis framework to propose systematic development strategies across four dimensions: political, economic, socio-cultural, and technological aspects, aiming to resolve supply-demand imbalances and enhance industrial resilience. First, establishing a coordinated policy system and expanding diversified supply networks are crucial. Given Shandong's heavy reliance on soybean imports from Brazil and the United States, geopolitical shifts and trade policy changes significantly impact supply chains. To reduce this dependence, Shandong should actively explore emerging production zones along the Belt and Road Initiative, such as Russia's Far East region, while building global procurement networks with high-quality protein soybean producers like Ukraine and Uruguay. Additionally, leveraging regional trade agreements like RCEP to lower export tariffs on soybean protein products from Southeast Asian countries will support enterprises in expanding high-value-added exports. Second, controlling supply chain costs and strengthening industrial synergy are key priorities. Innovative financial instruments and logistics models—such as tariff guarantee insurance and "futures + insurance" strategies—can mitigate capital lock-up risks and price volatility. Intelligent logistics improvements, including implementing a "release first, inspect later" customs clearance policy, can substantially reduce soybean logistics costs. Furthermore, aligning domestic production with market demand through optimized planting structures, promotion of

high-yield disease-resistant varieties, and establishment of categorized import mechanisms can minimize ineffective inventory and resource misallocation. Third, aligning with consumption upgrades and cultivating local brand value are essential. With growing consumer demand for safe and high-quality soy products, the industry should prioritize developing functional ingredients like soy protein isolate and isoflavones, while promoting "dual-protein" dietary concepts to guide food manufacturers in creating innovative products such as plant-based meat and soy milk. Strengthening benefit-sharing mechanisms – such as deepening contract farming models – can enhance supply-demand coordination and alleviate market imbalances. Ultimately, breaking through technological barriers and establishing digitalized supply chains are crucial for sustainable development. Enhancing detection technologies and processing R&D capabilities will improve efficiency and compliance, while overcoming technical bottlenecks in deep processing can boost industrial value. Implementing digital transformation and smart decision-making, combined with big data early-warning systems and blockchain supply chain management, can accelerate market responsiveness, reduce procurement costs, and effectively combat trade fraud. In conclusion, Shandong Province should adopt multi-dimensional strategies including policy coordination, supply chain cost control, brand value cultivation, and technological breakthroughs to achieve stable development and enhanced global competitiveness in the soybean industry.

## 5. Conclusion

Amid profound adjustments in global agricultural trade patterns and China's advancing food security strategy, Shandong Province's soybean import sector confronts mounting geopolitical risks, acute supply-demand imbalances, low value-added industrial chains, and technological bottlenecks. The traditional single-import model and low-end processing models urgently require transformation. Research indicates that implementing systematic strategies—including establishing diversified supply chain networks in emerging production regions like Russia and Ukraine to mitigate risks, developing branded non-GMO soybeans for high-value-added differentiation, and creating closed-loop ecosystems through blockchain traceability and RCEP policy integration for "international procurement → deep processing → end markets" – can effectively resolve development

challenges. Looking ahead, Shandong should capitalize on the "dual circulation" opportunities by integrating soybean imports with domestic industrial upgrading. Exploring value-added pathways such as biodiesel and functional raw materials, the Province can fortify industrial security through a collaborative model of "policy guidance, technology-driven innovation, and demand-driven adaptation." This approach will establish replicable regional benchmarks for transforming China's agricultural import trade and enhance competitiveness amid evolving global agricultural trade dynamics.

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