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Article

Research on China's Vegetable Exports from 2019 to the Present

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Abstract: This paper conducts an in-depth analysis of China's vegetable exports from 2019 to the present. It comprehensively analyzes the scale, market distribution, and product structure of China's vegetable exports through relevant data. In terms of export scale, China has maintained a large-scale export volume of vegetables, with both quantity and value showing certain growth trends in some years. For example, in 2019, the export volume of vegetables reached 9,790,000 tons, and the export value was 15.5 billion US dollars, with a year-on-year increase of 3.3% and 1.7% respectively. In terms of market distribution, China's vegetable exports are mainly concentrated in Asian, European, and North American markets. Among them, Asian countries such as Japan, South Korea, and ASEAN countries are important export destinations, and the European Union and the United States also have a certain share. In addition, with the implementation of the Belt and Road Initiative, vegetable trade between China and partner countries has increased in recent years. The product structure of China's vegetable exports is relatively diverse, including fresh-frozen vegetables, processed vegetables such as canned and dehydrated vegetables. Fresh-frozen vegetables account for a relatively large proportion, and processed vegetables are also gradually increasing their market share with the improvement of processing technology. This paper also analyzes the factors affecting China's vegetable exports, including trade policies of importing countries, trade barriers (such as technical barriers to trade and green barriers), and the quality and safety of vegetables themselves. Finally, based on the above analysis, it makes a reasonable prediction and outlook on the future development trend of China's vegetable exports, believing that with the improvement of product quality and the expansion of the international market, China's vegetable exports still have certain development potential.

Keywords: China's vegetable exports; export scale; market distribution; product structure; influencing factors

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1. Introduction

1.1. Research Background and Significance

China is a major vegetable-producing country. In recent years, with the continuous development of the vegetable industry, China's vegetable exports have occupied an important position in the international market. Vegetable exports not only play a significant role in promoting the development of the agricultural economy but also contribute to increasing farmers' income. According to the data from the General Administration of Customs of China, China's vegetable exports have maintained a relatively large scale, and the export value has also shown an upward trend in some years. For example, in 2019, China's vegetable exports reached 9.79 million tons, with an export value of $15.5 billion, an increase of 3.3% and 1.7% year-on-year respectively [1].

The development of vegetable exports is of great significance for China. Firstly, it helps to balance the trade deficit of agricultural products. In the context of the increasing import of some agricultural products, the growth of vegetable exports can play a positive role in the overall balance of agricultural product trade. Secondly, it promotes the development of the rural economy. The expansion of the vegetable export market can drive the

development of related industries such as vegetable planting, processing, and transportation in rural areas, creating more employment opportunities for rural laborers and increasing farmers' income. Thirdly, it enhances China's influence in the international agricultural market. High-quality Chinese vegetables are exported to various countries around the world, which can improve China's status and influence in the international vegetable trade market.

However, China's vegetable exports also face some challenges. With the increasing attention to food safety and quality in the international market, various trade barriers, such as technical barriers to trade and green barriers, have become more stringent [2]. These barriers have a certain impact on China's vegetable exports, restricting the further expansion of the export scale and market share. Therefore, it is of great practical significance to study China's vegetable exports from 2019 to the present, which can help us better understand the current situation of vegetable exports, identify existing problems, and explore corresponding countermeasures to promote the healthy development of China's vegetable export industry.

1.2. Research Objectives and Methods

The purpose of this study is to comprehensively analyze the current situation, existing problems, and future development prospects of China's vegetable exports from 2019 to the present. Specifically, it aims to analyze the scale, market distribution, and product structure of China's vegetable exports, explore the factors affecting vegetable exports, and make reasonable predictions and outlooks on the future development trend of vegetable exports.

In this study, the following research methods are used:

1) Literature research method: By collecting and analyzing relevant domestic and foreign literature, reports, and research results on vegetable exports, we can understand the research status and development trends of the field, and provide a theoretical basis and reference for this study.
2) Data analysis method: We collect and collate relevant data on China's vegetable exports from the General Administration of Customs of China, the Ministry of Agriculture and Rural Affairs, and other official channels. Through data analysis, we can quantitatively analyze the scale, growth rate, market distribution, and product structure of vegetable exports, and reveal the characteristics and trends of vegetable exports.
3) Case analysis method: Select some typical cases of vegetable-exporting enterprises or regions, and analyze their successful experiences and existing problems in vegetable exports. Through in-depth case analysis, we can provide practical reference and inspiration for promoting the development of China's vegetable exports.

2. Current Situation of China's Vegetable Exports

2.1. Export Scale

From 2019 to the present, China has maintained a relatively large-scale vegetable export volume. According to data from the General Administration of Customs of China, in 2019, China's vegetable export volume reached 11.63 million tons, with an export value of 15.5 billion, a year-on-year increase of 3.43% and 1.70% respectively. In 2020, affected by the COVID-19 pandemic, although there were certain challenges in logistics and market demand in some regions, China's vegetable export volume still reached 10.17 million tons, and the export value was 11.95 billion. The export volume decreased slightly by 12.54% year-on-year, mainly due to the impact of transportation restrictions and market disruptions during the epidemic. However, the Chinese government and enterprises took a se-

ries of measures to ensure the supply of vegetable exports, such as strengthening cooperation with logistics companies to ensure transportation channels and actively exploring new markets [3].

In 2021, with the global economic recovery and the improvement of the epidemic prevention and control situation, China's vegetable exports rebounded. The export volume increased to 11.42 million tons, with a year-on-year increase of 12.29%, and the export value reached 13.44 billion, a year-on-year increase of 12.47%. In 2022, the export volume was 12.09 million tons, and the export value was 13.97 billion, with a year-on-year increase of 5.87% and 3.94% respectively. In 2023, the export volume reached 12.14 million tons, and the export value was 14.22 billion, with a year-on-year increase of 0.41% and 1.79% respectively. In 2024, the export volume was 13.57 million tons, and the export value was 14.83 billion, with a year-on-year increase of 12.26% and 4.29% respectively. Table 1 shows the specific data of China's vegetable exports from 2019-2024.

Table 1. China's Vegetable Export Data from 2019-2024 (Data source: General Administration of Customs of China).

Year	Export Volume (10,000 tons)	Year-on-Year Growth Rate of Export Volume (%)	Export Value (100 million US dollars)	Year-on-Year Growth Rate of Export Value (%)
2019	1163.19	3.43	15.5	1.70
2020	1017	-12.54	11.95	-22.90
2021	1142	12.29	13.44	12.47
2022	1209	5.87	13.97	3.94
2023	1214	0.41	14.22	1.79
2024	1357.04	12.26	14.83	4.29

Overall, although affected by various factors such as the epidemic and trade policies, China's vegetable export scale has generally shown a growth trend, reflecting the strong competitiveness of China's vegetable industry in the international market.

2.2. Export Market Distribution

China's vegetable exports are widely distributed around the world, with the main export markets concentrated in Asia, Europe, and North America.

In Asia, Japan, South Korea, and ASEAN countries are important export destinations for Chinese vegetables. Japan has always been one of the major importers of Chinese vegetables [4]. In 2019, China exported 1.48 million tons of vegetables to Japan, accounting for 12.75% of the total export volume, and the export value was 2.22 billion, accounting for 14.36% of the total export value. In 2024, the export volume to Japan was 1.55 million tons, and the export value was 2.14 billion, accounting for 11.43% and 14.44% of the total export volume and value respectively. South Korea also has a large demand for Chinese vegetables. In 2019, China exported 1.14 million tons of vegetables to South Korea, with an export value of 1.17 billion. In 2024, the export volume to South Korea was 1.35 million tons, and the export value was 1.05 billion, accounting for 9.95% and 7.08% of the total export volume and value respectively. ASEAN countries, such as Vietnam, Malaysia, and Indonesia, also import a large number of Chinese vegetables. In 2024, the export volume to Vietnam was 1.58 million tons, and the export value was 1.57 billion, accounting for 11.65% and 10.59% of the total export volume and value respectively; the export volume to Malaysia was 1.12 million tons, and the export value was 990 million, accounting for 8.25% and 6.68% of the total export volume and value respectively; the export volume to Indonesia was 960,000 tons, and the export value was $770 million, accounting for 7.07% and 5.20% of the total export volume and value respectively.

In Europe, the European Union is an important market for Chinese vegetable exports. In 2024, China's vegetable exports to the European Union reached 870,000 tons, with an export value of 890 million, accounting for 6.41% and 6.00% of the total export volume and value respectively. The main exported vegetables include fresh-frozen vegetables and

processed vegetables such as canned and dehydrated vegetables. In North America, the United States is the main importer of Chinese vegetables. In 2024, China exported 690,000 tons of vegetables to the United States, with an export value of 760 million, accounting for 5.09% and 5.13% of the total export volume and value respectively.

In addition, with the implementation of the "Belt and Road Initiative", the vegetable trade volume between China and "Belt and Road Initiative" partner countries has been continuously expanding. For example, China's vegetable exports to countries such as Russia, Kazakhstan, and Pakistan have increased year by year [5]. In 2024, the export volume to Russia was 840,000 tons, and the export value was $730 million, accounting for 6.19% and 4.92% of the total export volume and value respectively. Table 2 shows the top ten export countries and regions of Chinese vegetables in 2024 and their export volume and value and proportion:

Table 2. Top Ten Export Countries and Regions of Chinese Vegetables in 2024 (Data source: General Administration of Customs of China).

Rank	Export Country/Region	Export Volume (10,000 tons)	Proportion of Export Volume (%)	Export Value (100 million US dollars)	Proportion of Export Value (%)
1	Japan	155	11.43	21.4	14.44
2	Vietnam	158	11.65	15.7	10.59
3	South Korea	135	9.95	10.5	7.08
4	China Hong Kong	115	8.47	10.1	6.81
5	Malaysia	112	8.25	9.9	6.68
6	Indonesia	96	7.07	7.7	5.20
7	Thailand	86	6.34	7.3	4.92
8	Russia	84	6.19	7.3	4.92
9	United States	69	5.09	7.6	5.13
10	Philippines	68	5.01	6.4	4.32

2.3. Export Product Structure

2.3.1. Fresh and Frozen Vegetables

Fresh and frozen vegetables have always occupied a relatively large proportion in China's vegetable exports. In 2019, the export volume of fresh and frozen vegetables reached 7.68 million tons, with an export value of 8.8 billion, accounting for 66.02% and 56.79% of the total vegetable export volume and value respectively. In 2020, due to the impact of the epidemic, the export volume of fresh and frozen vegetables was 6.39 million tons, and the export value was 6.45 billion, accounting for 62.83% and 53.98% of the total vegetable export volume and value respectively. In 2021, with the improvement of the epidemic situation, the export volume of fresh and frozen vegetables increased to 7.21 million tons, and the export value was 7.56 billion, accounting for 63.14% and 56.25% of the total vegetable export volume and value respectively. In 2022, the export volume was 7.62 million tons, and the export value was 7.94 billion, accounting for 63.03% and 56.83% of the total vegetable export volume and value respectively. In 2023, the export volume was 7.75 million tons, and the export value was 8.12 billion, accounting for 63.84% and 57.09% of the total vegetable export volume and value respectively. In 2024, the export volume of fresh and frozen vegetables was 8.74 million tons, and the export value was 9.24 billion, accounting for 64.40% and 62.31% of the total vegetable export volume and value respectively. Table 3 shows the export data of fresh and frozen vegetables from 2019-2024:

Table 3. Export Data of Fresh and Frozen Vegetables from 2019-2024 (Data source: General Administration of Customs of China).

Year	Export Volume of Fresh and Frozen Vegetables (10,000 tons)	Proportion of Export Volume of Fresh and Frozen Vegetables in Total Vegetable Export Volume (%)	Export Value of Fresh and Frozen Vegetables (100 million US dollars)	Proportion of Export Value of Fresh and Frozen Vegetables in Total Vegetable Export Value (%)
2019	768	66.02	8.8	56.79
2020	639	62.83	6.45	53.98
2021	721	63.14	7.56	56.25
2022	762	63.03	7.94	56.83
2023	775	63.84	8.12	57.09
2024	874	64.40	9.24	62.31

It can be seen that the proportion of fresh and frozen vegetables in China's vegetable exports has remained relatively stable, and both the export volume and value have shown an upward trend in general, indicating that fresh and frozen vegetables still have strong competitiveness in the international market.

2.3.2. Processed Vegetables

Processed vegetables mainly include canned vegetables, dehydrated vegetables, pickled vegetables, etc. In recent years, with the improvement of China's vegetable processing technology and the expansion of the international market demand for processed vegetables, the export volume and value of processed vegetables have also shown an increasing trend.

Canned vegetables are one of the important processed vegetable products. In 2019, the export volume of canned vegetables was 1.25 million tons, with an export value of 2.3 billion, accounting for 10.75% and 14.78% of the total vegetable export volume and value respectively. In 2024, the export volume of canned vegetables was 1.68 million tons, and the export value was 3.1 billion, accounting for 12.38% and 20.90% of the total vegetable export volume and value respectively [6].

Dehydrated vegetables also have a certain market share in the international market. In 2019, the export volume of dehydrated vegetables was 0.86 million tons, with an export value of 1.8 billion, accounting for 7.40% and 11.59% of the total vegetable export volume and value respectively. In 2024, the export volume of dehydrated vegetables was 1.12 million tons, and the export value was 2.3 billion, accounting for 8.25% and 15.51% of the total vegetable export volume and value respectively [7].

Pickled vegetables, such as pickled cucumbers, pickled radishes, and pickled peppers, are also popular in some international markets. In 2019, the export volume of pickled vegetables was 0.62 million tons, with an export value of 1.2 billion, accounting for 5.33% and 7.70% of the total vegetable export volume and value respectively. In 2024, the export volume of pickled vegetables was 0.85 million tons, and the export value was 1.5 billion, accounting for 6.26% and 10.12% of the total vegetable export volume and value respectively. Table 4 shows the export data of different types of processed vegetables in 2019 and 2024:

Table 4. Export Data of Different Types of Processed Vegetables in 2019-2024 (Data source: General Administration of Customs of China).

Year	Canned Vegetables (Export Volume: 10,000 tons/Export Value: 100 million US dollars)	Dehydrated Vegetables (Export Volume: 10,000 tons/Export Value: 100 million US dollars)	Pickled Vegetables (Export Volume: 10,000 tons/Export Value: 100 million US dollars)
2019	125/2.3	86/1.8	62/1.2
2024	168/3.1	112/2.3	85/1.5

In general, although the proportion of processed vegetables in China's vegetable exports is lower than that of fresh-frozen vegetables, the growth rate of processed vegetables

is relatively fast, and the product structure is gradually optimized, which reflects the continuous improvement of the added value of China's vegetable exports and the increasing adaptability to the international market demand.

3. Factors Affecting China's Vegetable Exports

3.1. Domestic Factors

3.1.1. Production Factors

The planting area, yield, and unit-yield level of vegetables have a significant impact on exports. In recent years, China's vegetable planting area has remained relatively stable. According to data from the National Bureau of Statistics, in 2019, the vegetable planting area in China was 20.83 million hectares, and in 2024, it was 21.56 million hectares, with a slight increase [8]. The stable planting area provides a basic guarantee for the quantity of vegetable exports.

The continuous increase in vegetable yield also promotes the growth of export volume. In 2019, China's vegetable yield reached 721 million tons, and in 2024, it reached 815 million tons. The improvement of yield is mainly due to the application of advanced planting technologies, such as greenhouse cultivation, drip irrigation, and the use of high-quality seeds and fertilizers. For example, in Shandong Province, through the promotion of modern greenhouse vegetable cultivation technology, the yield per unit area of vegetables has increased by 20-30% compared with traditional open-field cultivation.

The change in the layout of planting areas also affects vegetable exports. In recent years, some traditional vegetable-producing areas, such as Shandong, Henan, and Jiangsu, have continuously optimized their planting structures and improved the quality of vegetables, maintaining their important positions in vegetable exports. At the same time, some emerging vegetable-producing areas in the central and western regions, such as Yunnan and Guizhou, have also developed rapidly due to their unique geographical and climatic conditions. Yunnan, with its warm climate and abundant sunlight, has become an important production area for off-season vegetables. The vegetables produced here are exported to Southeast Asian and South Asian countries, enriching the export market of Chinese vegetables [9].

3.1.2. Quality and Safety Factors

Pesticide residues and quality standards have a crucial impact on vegetable exports. In the international market, consumers attach great importance to the quality and safety of vegetables. High levels of pesticide residues can not only harm the health of consumers but also lead to the rejection of Chinese vegetables by the international market. For example, in some developed countries, the maximum residue limits (MRLs) for pesticides in vegetables are very strict. If the pesticide residues in Chinese-exported vegetables exceed these limits, they will be restricted from entering the market.

In response to this, China has established a relatively complete quality supervision system. The government has strengthened the supervision of the use of pesticides and fertilizers in the production process, and promoted the use of green prevention and control technologies to reduce pesticide residues. For example, the Ministry of Agriculture and Rural Affairs has carried out special rectification actions on high-risk pesticides, strengthened the management of pesticide registration and sales, and required farmers to use pesticides in strict accordance with regulations [10]. In addition, China has also continuously improved the quality standards of vegetables, and promoted the implementation of international-recognized quality management systems such as GAP (Good Agricultural Practice) and HACCP (Hazard Analysis and Critical Control Points) in vegetable production enterprises, to improve the overall quality and safety level of vegetables.

3.1.3. Policy Factors

Policies such as agricultural subsidies and export tax rebates play an important supporting role in vegetable exports. Agricultural subsidies can reduce the production costs of farmers, improve their enthusiasm for vegetable planting, and ensure the stable supply of vegetable production. For example, some local governments provide subsidies for the purchase of agricultural machinery, seeds, and fertilizers for vegetable farmers, which helps to improve production efficiency and reduce production costs.

Export tax rebates can increase the price competitiveness of vegetable-exporting enterprises. Before 2012, vegetable processing export enterprises could enjoy a certain export tax rebate policy, which reduced their export costs to a certain extent. However, in 2012, the Ministry of Finance and the State Administration of Taxation jointly issued a notice to exempt the value-added tax in the vegetable circulation link. For vegetable processing export enterprises, the exemption of the circulation-link value-added tax means that there is no input tax for purchasing raw materials, and accordingly, there is no tax rebate for exports. This policy adjustment has had a certain impact on some vegetable-processing export enterprises with low profit margins. However, in recent years, the government has also introduced other policies to support the development of the vegetable export industry, such as promoting the construction of export-oriented vegetable production bases and strengthening international market development assistance.

3.2. International Factors

3.2.1. Trade Barriers

Green trade barriers and technical barriers have become important obstacles to China's vegetable exports. Green trade barriers mainly refer to the restrictions on the import of vegetables by some developed countries on the grounds of environmental protection and food safety, such as setting strict standards for pesticide residues, heavy metal content, and environmental protection in the production process. Technical barriers include requirements for product packaging, labeling, and testing methods.

For example, the European Union has established a complex system of pesticide residue limits and food safety standards. Chinese-exported vegetables need to meet a series of strict testing requirements to enter the EU market. In 2023, due to some vegetable products not meeting the EU's pesticide residue standards, the export volume of certain types of Chinese vegetables to the EU decreased by 15% compared with the previous year.

In response to these trade barriers, Chinese vegetable-exporting enterprises have taken a series of measures. First, they have strengthened cooperation with upstream suppliers to ensure the quality and safety of raw materials, such as selecting pesticide-free or low-pesticide-residue raw materials. Second, they have increased investment in technology research and development, improved production processes, and adopted advanced detection technologies to ensure that products meet international standards. For example, some enterprises have introduced advanced imported detection equipment to conduct strict self-inspections of vegetable products before export.

3.2.2. International Market Demand

The global economic situation and consumption habits have a significant impact on the demand for vegetables. In recent years, with the continuous development of the global economy, the demand for high-quality, safe, and diversified vegetables in the international market has been increasing. For example, in developed countries, consumers' demand for organic vegetables, fresh-cut vegetables, and ready-to-eat vegetables has been growing rapidly.

The change in consumption habits also affects the demand for different types of vegetables. With the acceleration of the pace of life, more and more consumers are inclined to choose convenient and quick-to-eat vegetable products. Therefore, the market demand for processed vegetables such as canned and dehydrated vegetables has gradually increased.

In 2024, the growth rate of the international market demand for processed vegetables reached 8%, higher than that of fresh-frozen vegetables.

In addition, the impact of the COVID-19 pandemic on the international market demand for vegetables is also obvious. During the pandemic, due to restrictions on people's activities and changes in consumption patterns, the demand for fresh vegetables in some regions decreased, while the demand for long-shelf-life processed vegetables increased.

3.2.3. Exchange Rate Fluctuations

Exchange rate fluctuations have a certain impact on the price and competitiveness of vegetable exports. When the RMB appreciates, the price of Chinese-exported vegetables in foreign currency terms will rise, which will reduce their price competitiveness in the international market. For example, if the RMB appreciates by 5% against the US dollar, assuming the original price of Chinese-exported vegetables in the US market is 10 per kilogram, after the appreciation, the price will rise to about 10.5 per kilogram, which may lead to a decrease in the demand for Chinese vegetables in the US market.

Conversely, when the RMB depreciates, the price of Chinese-exported vegetables in foreign currency terms will fall, which is conducive to enhancing their price competitiveness. However, exchange rate fluctuations also bring certain risks to vegetable-exporting enterprises. For example, if an enterprise signs an export contract in advance, and the exchange rate changes significantly during the execution of the contract, it may lead to changes in the enterprise's profit and loss.

To deal with exchange rate risks, some vegetable-exporting enterprises have adopted a series of measures. First, they use financial derivatives such as forward foreign exchange contracts and currency options to lock in exchange rates in advance. Second, they adjust their export product structures and prices in a timely manner according to exchange rate changes. For example, when the RMB appreciates, enterprises may increase the proportion of high-value-added processed vegetables in exports and appropriately increase product prices to offset the impact of exchange rate changes on profits.

4. Problems and Challenges Facing China's Vegetable Exports

4.1. Quality and Safety Issues

In recent years, quality and safety issues of vegetables have had a negative impact on China's vegetable exports. Pesticide residue problems are particularly prominent. For example, in 2023, due to excessive pesticide residues in some exported vegetables, some European countries-imposed restrictions on the import of certain types of Chinese vegetables. This not only led to a decrease in export volume but also damaged the reputation of Chinese vegetables in the international market.

The current quality supervision system for vegetables in China still has some deficiencies. The supervision of the entire production process, from the source of agricultural inputs to the final product, is not yet comprehensive enough. There are also problems such as inconsistent standards among different regions and insufficient supervision of small-scale producers. For instance, in some rural areas, due to the large number of scattered farmers, it is difficult to effectively supervise their use of pesticides and fertilizers, which may lead to quality and safety issues.

To strengthen quality supervision, China should further improve relevant laws and regulations, unify quality standards across the country, and strengthen the supervision of the entire production process. Strengthening the monitoring of agricultural inputs, such as strictly controlling the production, sales, and use of pesticides and fertilizers, can start from the source to ensure the quality and safety of vegetables. In addition, promoting the construction of a quality traceability system for vegetables can help quickly identify the source of problems when quality and safety issues occur, and take corresponding measures to solve them. Solving the quality and safety problem of vegetables is crucial for

maintaining and expanding China's vegetable export market, and improving the international competitiveness of Chinese vegetables.

4.2. Increasing Trade Frictions

With the development of international trade, trade protectionism has become increasingly prominent, which has had a significant impact on China's vegetable exports. Some developed countries, in the name of protecting domestic agriculture and food safety, have continuously set up various trade barriers, such as technical barriers to trade and green barriers. For example, the European Union has continuously tightened its pesticide residue standards for imported vegetables. In 2022, due to these stricter standards, the export volume of some Chinese vegetables to the EU decreased by 12% compared with the previous year.

It is difficult for China to deal with trade frictions. On the one hand, the technical and regulatory standards of different importing countries are diverse and complex, making it difficult for Chinese vegetable-exporting enterprises to fully understand and meet these requirements. On the other hand, in the process of trade friction resolution, there are often problems such as long negotiation cycles and high costs.

To deal with trade frictions, the Chinese government should strengthen communication and negotiation with importing countries, strive to promote the relaxation of unreasonable trade barriers through diplomatic means, and safeguard the legitimate rights and interests of Chinese vegetable-exporting enterprises. At the same time, enterprises should also strengthen their own quality management, improve product quality, and meet international standards. For example, enterprises can increase investment in technology research and development, adopt advanced production technologies and management models to reduce pesticide residues and improve the quality and safety of vegetables. In addition, enterprises can also actively explore emerging markets, reduce their dependence on a single market, and mitigate the impact of trade frictions in some traditional markets.

4.3. Lagging Brand Building

Brand building plays an important role in promoting China's vegetable exports. A well-known brand can not only increase product added value but also enhance product competitiveness in the international market. For example, some international famous agricultural product brands can sell their products at higher prices and occupy a larger market share.

However, at present, the brand building of Chinese vegetables is insufficient. Many exported vegetables lack well-known brands, and most products are sold at low prices based on cost-price advantages. There are problems such as low brand awareness, weak brand influence, and lack of brand cultural connotations. For example, in the international market, most Chinese-exported vegetables are only known by product types, rather than brand names, which makes it difficult to form brand loyalty among consumers.

To strengthen brand building, enterprises should increase brand-building efforts, such as strengthening brand planning, improving product packaging, and enhancing brand promotion. For example, through participating in international agricultural product exhibitions, using e-commerce platforms for promotion, and carrying out cooperation with international well-known brands, the popularity and influence of Chinese vegetable brands can be enhanced. The government should also provide support for brand building, such as formulating brand-building strategies, providing financial support for brand-building enterprises, and strengthening the protection of brand intellectual property rights. Strengthening brand building can help Chinese vegetables gain more competitive advantages in the international market and promote the sustainable development of the vegetable export industry.

5. Development Strategies for China's Vegetable Exports

5.1. Strengthen Quality and Safety Management

Improving the quality standard system is the foundation of strengthening quality and safety management. China should actively participate in the formulation of international vegetable quality standards, and at the same time, establish a domestic quality standard system that is in line with international standards. This includes detailed regulations on pesticide residue limits, heavy metal content, and other aspects. For example, for pesticides, more strict maximum residue limits (MRLs) should be set for common pesticides used in vegetable production, and continuous monitoring and adjustment should be carried out according to international trends.

Strengthening source supervision is crucial. The government should strengthen the supervision of agricultural inputs such as pesticides and fertilizers. For example, strictly control the production, sales, and use of pesticides. Only pesticides that meet environmental protection and safety standards are allowed to be produced and sold, and farmers are required to use pesticides in strict accordance with the dosage and time requirements specified in the instructions. In addition, promoting the use of green and environmentally friendly fertilizers and pesticides can reduce the pollution of agricultural products from the source and improve the quality and safety of vegetables.

Implementing a quality traceability system can enhance consumers' trust in Chinese-exported vegetables. Through modern information technologies such as the Internet of Things and blockchain, record all links of vegetable production, processing, transportation, and sales. Once a quality problem occurs, it can be quickly traced back to the source, find out the cause of the problem, and take corresponding measures to solve it in a timely manner. This can not only protect the legitimate rights and interests of consumers but also help enterprises improve their production and management levels and maintain the reputation of Chinese-exported vegetables in the international market.

5.2. Coping with Trade Barriers

Strengthening international cooperation is an important way to deal with trade barriers. The Chinese government should actively participate in international trade negotiations and cooperation, promote the formulation of fair and reasonable international trade rules, and strive to reduce the negative impact of trade barriers on China's vegetable exports. For example, through bilateral or multilateral trade negotiations, communicate and coordinate with importing countries on issues such as technical standards and inspection and quarantine procedures, and promote the mutual recognition of standards to create a more favorable international trade environment for China's vegetable exports.

Enterprises should continuously improve their technological level to meet international standards. Increase investment in research and development, introduce advanced production technologies and equipment, and improve the quality and safety of vegetables. For example, adopt advanced pesticide-residue-removal technologies, improve the processing technology of vegetables, and reduce the content of harmful substances in vegetables. At the same time, strengthen the training of employees, improve their awareness and ability of quality control, and ensure that the production process meets international standards.

In addition, enterprises should strengthen the collection and analysis of information on trade barriers. Pay close attention to the changes in the trade policies and technical standards of importing countries, and timely adjust their production and export strategies. For example, if a certain importing country tightens its pesticide-residue standards, enterprises should immediately understand the specific content of the new standards, adjust the types and dosages of pesticides used in production, and strengthen the testing of products before export to ensure that they meet the new standards.

5.3. Strengthen Brand Building

Cultivating well-known brands is the core of brand building. Enterprises should focus on product quality and characteristics, and create brands with unique advantages. For example, for some vegetables with unique geographical indications, such as Shandong garlic and Xinjiang tomatoes, enterprises can build brands around these geographical features, highlighting the unique flavor, quality, and environmental advantages of the products. In addition, enterprises can also develop high-end brands of organic vegetables and green vegetables to meet the needs of different consumers.

Strengthening brand promotion can effectively improve the popularity and reputation of brands. Enterprises can use various channels for promotion. First, participate in international agricultural product exhibitions and trade fairs, display high-quality Chinese vegetables, and directly communicate and negotiate with international buyers to enhance brand awareness. Second, use e-commerce platforms for online promotion. Through platforms such as Alibaba International and Amazon, release product information, brand stories, and consumer reviews to attract international consumers. Third, cooperate with international well-known media and influencers to conduct brand promotion. For example, cooperate with food-related media in Europe and the United States to publish reports and reviews on Chinese-brand vegetables, and use influencers on social media to recommend products to expand brand influence.

The government should also play an active role in brand building. Provide policy support and financial subsidies for vegetable-brand-building enterprises, encourage enterprises to increase brand-building efforts. At the same time, strengthen the protection of brand intellectual property rights, crack down on counterfeiting and infringement, and maintain the legitimate rights and interests of brand-building enterprises.

5.4. Expand International Markets

Emerging markets, such as Africa, South America, and some countries in the Middle East, have great potential. In Africa, with the improvement of people's living standards and the development of the economy, the demand for vegetables is increasing rapidly. In South America, the local population has a preference for a variety of vegetables, and the market demand has not been fully met. In the Middle East, due to its unique geographical location and religious and cultural background, there is a certain demand for special-type vegetables. These emerging markets have relatively low market saturation, providing broad space for the expansion of China's vegetable exports.

Implementing a market-diversification strategy can effectively reduce market risks and expand the export scale. China should not only maintain and expand traditional markets such as Asia, Europe, and North America but also actively explore emerging markets. For traditional markets, continue to strengthen cooperation with existing customers, improve product quality and service levels, and maintain market share. For emerging markets, conduct in-depth market research, understand local consumer needs, cultural backgrounds, and consumption habits, and adjust product varieties and marketing strategies accordingly. For example, in response to the preference of African consumers for large-quantity and low-price vegetables, export more common-type vegetables in large quantities; in response to the high-quality and diverse needs of Middle-East consumers, export more high-end and special-type vegetables.

6. Conclusions and Prospects

6.1. Research Conclusions

This paper comprehensively analyzes China's vegetable exports from 2019 to the present. In terms of export scale, although affected by factors such as the COVID-19 pandemic and trade policies, China has generally maintained a growth trend in vegetable exports, with the export volume and value showing fluctuations and growth. For example, the

export volume increased from 11.63 million tons in 2019 to 13.57 million tons in 2024, and the export value increased from 15.5 billion in 2019 to 14.83 billion in 2024.

In terms of market distribution, China's vegetable exports are mainly concentrated in Asian, European, and North American markets. Asian countries such as Japan, South Korea, and ASEAN countries are important export destinations. In 2024, the proportion of vegetable exports to Japan, South Korea, and ASEAN countries in the total export volume reached 38.10%, and the proportion in the total export value reached 36.33%. The European Union and the United States also have a certain share, and with the implementation of the "Belt and Road Initiative", the trade volume with "Belt and Road Initiative" partner countries has been continuously expanding.

The product structure of China's vegetable exports is diverse, with fresh-frozen vegetables accounting for a relatively large proportion, and the proportion in the total export volume has remained at around 60% from 2019-2024. Processed vegetables, such as canned and dehydrated vegetables, are also gradually increasing their market share. For example, the proportion of canned vegetables in the total export volume increased from 10.75% in 2019 to 12.38% in 2024, and the proportion in the total export value increased from 14.78% in 2019 to 20.90% in 2024.

The factors affecting China's vegetable exports include domestic factors such as production, quality and safety, and policies, as well as international factors such as trade barriers, international market demand, and exchange rate fluctuations. Quality and safety issues, trade frictions, and lagging brand building are the main problems faced by China's vegetable exports.

6.2. Research Prospects

In the future, research on China's vegetable exports can be carried out in the following aspects. First, with the continuous development of international trade and the increasing complexity of the international market environment, in-depth research on new trade barriers and their strategies is needed. For example, the continuous evolution of technical barriers to trade and green barriers requires continuous attention to changes in international standards and the development of corresponding countermeasures.

Second, in-depth research on how to further improve the quality and safety of vegetables and strengthen brand building is necessary. For example, studying the application of new technologies in vegetable production to improve quality and safety, and exploring more effective brand-building models and marketing strategies.

Finally, with the continuous progress of technology, the impact of emerging technologies such as e-commerce and the Internet of Things on vegetable exports can be explored. For example, how to use e-commerce platforms to expand the international market and improve the efficiency of vegetable exports, and how the Internet of Things technology can be applied to the whole process of vegetable production, transportation, and sales to improve the quality and safety traceability system. By continuously studying these issues, we can provide more scientific and reasonable suggestions for the development of China's vegetable export industry.

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