Reviews on the Quality of China's Agricultural Products Export to United States

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Abstract. The export of characteristic superior agricultural products plays an important role in realizing China's agriculture going out and realizing the transformation from total expansion of agricultural products to quality expansion. This paper systematically combs the relevant literature at home and abroad from three aspects: the theory of agricultural trade, the gap between the quality of agricultural products between China and the United States and the factors affecting the quality of agricultural products. The progress and shortcomings of the research on quality control of agricultural products in China were compared and commented, based on the systematically combing of the relevant literature at home and abroad from two aspects: the gap between the quality of agricultural products between China and United States, and the factors affecting the quality of agricultural products. Then three research directions were put forward: promoting the quality upgrading of agricultural products, differentiating the export quality of different agricultural products, and then formulating national export standards for agricultural products, and realizing the transformation and upgrading of agricultural products in export competition. This research would be useful for the exploration and practice of the export quality of agricultural products in China.

1. Introduction

According to Shi Bingzhan's research, the biggest difference about trade export between China and developed countries is the quality. As early as the 1990s, some scholars explored the export situation of "homogeneous and heterogeneous" enterprises. We can see that China's export competitiveness for agricultural products is not limited to the "cost" advantage, but more importantly, the "quality" advantage. Melitz once put forward the theory of "enterprise production efficiency differentiation", which coincides with Krugman's "homogeneous enterprise" framework model [1]. Both these theory promotes the field of international trade into a new era of trade theory [2]. Then more and more scholars began to explore the internal biochemical problems of product quality heterogeneity. The purpose of this paper is to conduct a comprehensive review of the domestic and foreign literature related to agricultural products export, and summarize the results of the previous research in three
directions: agricultural products export trade, the quality gap between China and United States, and the factors affecting quality of agricultural products. The reason why the United States is selected here is that, first the United States has higher and stricter standards and regulations on the quality and safety of imported agricultural products [3]. Another reason is in the face of the same social preferences, national income, consumption habits and market rules, the price and quality of similar products exported are more comparable, from a microcosmic perspective. In macro terms, there are many kinds and large scale of agricultural products imported from the United States, it's worthy for further discussion because of the universal trade and the sufficient data.

The proportion of China's export of agricultural products to the United States increased from 7.44% in 2000 to 10.24% in 2016, which means the United States has become the third largest destination of China's export of agricultural products. However, the bilateral trade deficit in agricultural products is serious. For example, in 2016, China's total export to the United States was $7.3 billion, while the total export from the United States to China reached $24.7 billion. It was difficult for China's trade situation to ease by expanding quantity only [4]. The research on product quality is of great significance. Therefore, studying the quality evolution of China's agricultural products exported to the United States can accurately reflect the market positioning of China's agricultural product quality level.

2. Competitiveness of agricultural products -- the quality gap of China's export of agricultural products

As for the research of agricultural products, the academic circle also goes beyond the assumption of homogeneity of agricultural products in traditional economics, and believes that there are quality differences between agricultural products and food. Vadivambal and Jayas pointed out that food quality characteristics include nutritional value, consumer satisfaction and safety. Good quality involves many factors such as freshness, expected appearance, taste and texture. However, the recognition of consumers to food is not limited to low price, but high quality, high price, high cost-effective agricultural products can get more recognition from consumers. The competitiveness of agricultural products has changed from price to quality and safety. It can be seen that quality has become one of the important manifestations of the competitiveness of agricultural products.

2.1. Based on reality

The quality gap of exported agricultural products has become an important problem in China's foreign trade, and China has made remarkable achievements in other aspects. In 2018, China's total exports of agricultural products reached 89.99 billion dollars, accounting for 5.17% of the world's exports, up two percentage points from 3.16% in 2002, and has become the world's fifth largest exporter of agricultural products. In 2016, China's trade breadth was 660, and the indicators of the United States, France and Brazil were 728, 691 and 555, respectively. The structure of China's export of agricultural products is becoming more reasonable, and the trend of diversified development is gradually obvious. The concentration of export products is relatively low. In 2016, the top 10 agricultural products with the largest export value accounted for 27.68% of China's exports, while the indicators of the United States, France and Brazil were 40.53%, 37.54% and 76.57% respectively, Chusheng Ye and Xin Zou proposed that China's agricultural products export trade should respond to external shocks and have strong stability.

2.2. Based on the quality gap

In terms of quality gap, a series of facts reflect the seriousness of quality problems of agricultural products in China. At home, consumers are willing to pay a premium for higher quality agricultural products after frequent quality and safety events such as "melamine incident" in agricultural products industry. At the international point, China's agricultural products are increasingly detained, rejected and notified due to quality and safety issues, resulting in huge direct and indirect trade losses. During 2009-2016, the growth rate of China's agricultural exports slowed down significantly, with an average annual growth rate of only about 13%, far behind 22% in 2001-2008. Quality upgrading is a new
driving force for the growth of China's agricultural exports. Therefore, quality is undoubtedly the most important research perspective to study the export trade of Chinese agricultural products.

3. China's export of agricultural products to the United States: based on the new new trade theory
With the development of the new new trade theory, product quality difference has been one of the research frontiers. The research on product quality mainly focuses on the quantification of quality index and the power of quality upgrading. Scholars have explored the quantification methods and influencing factors of quality from multiple perspectives.

3.1. Research on the quantitative method of export quality of agricultural products
Due to the limitation of data sources and different research purposes, there are also differences in the choice of quantitative methods of product quality between domestic and foreign scholars. Sutton, Kulger & Verhoogen regard industrial R & D density and advertising density as quality proxy variables. Hong Cheng takes the 'superior product rate' in the industrial enterprise database as the quality data. The disadvantage of the above product quality proxy variables is that they cannot realize the comparison of quality levels of non-similar products, but they cannot completely separate the unit value changes caused by non-quality factors such as production cost and price strategy. In order to overcome these shortcomings, scholars try to measure the product quality scientifically. Hallak & Schott uses the maximum likelihood estimation method and the industry non pure price index method, which requires high data index and complicated calculation process. Amit & Khandelwal, Shizheng, etc. assume that the market share of high-quality products will be larger under a certain price. The nested logit method is used to measure the product quality, and the results are consistent with Schott's. Khandelwal uses the demand framework model to calculate the quality of export products. This method is based on the same assumptions as the nested logit method. The data requirements are simple and scientific, but there may be endogenous problems between quality and unit value. Therefore, when adopting this method, the successor scholars choose the appropriate instrumental variables and regression methods to solve the endogenous problem.

3.2. Factors affecting the quality of agricultural products
Domestic and foreign scholars' research on the influencing factors of product quality is mainly based on three dimensions. First, scholars from the perspective of supply believe that an enterprise can improve its product quality by improving the quality of production factors without advanced technology and a large number of technical talents. At the same time, the heterogeneity of its export products is affected by the factor density and ownership quality of the export enterprises. Second, from the perspective of demand, scholars have found that the core factor affecting the quality of export products is the degree of preference of consumers in trading partner countries for the quality of products in the source countries of import. Thirdly, from the perspective of trade, it is found that the intensity of trade competition is also the influencing factor of product quality upgrading. Unfortunately, the above researches are all aimed at manufacturing products, while the researches on the quality of agricultural products are relatively lagging behind and not systematic enough. For example, Olper, Curzi & Pacca and Jan respectively discussed the impact of EU food standards, trade costs and institutional differences on the quality upgrading of agricultural products.

3.3. The evolution trend of the quality of agricultural products with different processing degrees
Datas describes the evolution path of the quality of China's bulk agricultural products, intermediate agricultural products and consumer oriented agricultural products (covering the six major agricultural products exported by China), which mainly takes into account the heterogeneity of demand substitution elasticity in different processing levels (similar to the HS2 quantile level classification). The comparison shows that: (1) the quality of China's major agricultural products exported (0.72) is
the highest, followed by The quality of consumer oriented agricultural products (0.62), the quality of intermediate agricultural products (0.26) is the lowest, and the quality gap between consumer oriented agricultural products and bulk agricultural products is gradually narrowing; (2) the export quality of bulk agricultural products has declined from 0.83 in 2000 to 0.63 in 2015, with a decline rate of 24 percentage points, showing a linear downward trend as a whole; (3) the quality of intermediate agricultural products has declined from 2000 From 0.25 in 2002 to 0.15 in 2002, since 2003, it has maintained a rising trend of fluctuation. After reaching the quality extreme point of 0.32 in 2010, it slowly fell back to the initial level of 0.28 in 2015, with a large fluctuation. There is basically no obvious quality upgrading during the sample period; (4) the average quality of consumer-oriented agricultural products has remained around 0.63, but in 2002 and 20 respectively In 2009, it reached a quality peak, showing a steady fluctuation trend of first rising, falling, then rising, then falling and then rising, which is consistent with the overall quality fluctuation trend of China's agricultural products exported to the United States.

The quality fluctuation trend of export agricultural products may be affected by the quality fluctuation of main export products or the structural change of export products. Figure 1 shows the "pure" quality change, i.e. depth, ignoring the structural change, i.e. breadth, of agricultural products with different processing degrees. However, it is an indisputable fact that China's export of agricultural products with different processing degrees has a low share in the U.S. market and its structure is unbalanced. The proportion of China's export of large agricultural products, intermediate agricultural products and consumer oriented agricultural products in the U.S. import market is 1.21%, 4.81% and 3.32% respectively, and the proportion of China's export of agricultural products to the U.S. is 2.3%, 15.59% and 39.69% respectively, which shows that China's export of agricultural products to the U.S. The problem of structural disequilibrium is obvious. This paper further concludes that the fluctuation of the quality of consumer oriented agricultural products, which account for 39.69% of the total export, between 2000 and 2015 is the leading factor that causes the overall "W" fluctuation of China's export of agricultural products to the United States.

**Table 1. Structure proportion of agricultural products with different processing degrees exported by China to the United States in 2015**

| BICO                  | Attribute             | HS2 Quantile                     | US import structure in 2015 | China's export structure to U.S. in 2015 | World export structure to U.S. in 2015 |
|-----------------------|-----------------------|----------------------------------|-------------------------------|------------------------------------------|----------------------------------------|
| Bulk Agricultural Product | Bulk products        | HS10/HS12/HS13                   | 8.64%                         | 2.30%                                    | 1.21%                                  |
| Intermediate Agricultural Product | Intermediate products | HS01/HS05/HS09/HS10/HS11/HS12/HS14/HS15/HS17 | 14.81%                       | 15.59%                                   | 4.81%                                  |
| Consumer Oriented Agricultural Product | Consumer oriented products | HS02/HS04/HS05/HS06/HS07/HS08/HS09/HS16/HS17/HS18/HS19/HS20/HS21/HS22/HS23 | 54.32%                       | 39.69%                                   | 3.32%                                  |

4. Conclusion

The conclusion of this research has some enlightening significance to China's export policy of agricultural products, which is mainly reflected in the following three aspects.

First of all, we should improve the export structure of agricultural products with different processing levels, stabilize the quality fluctuation of bulk agricultural products, and accelerate the quality upgrading of processed agricultural products such as consumer oriented agricultural products and intermediate agricultural products; the state should analyze specific issues in formulating domestic standards, technical support, subsidy policies and other aspects to comprehensively promote the efficiency of resource factor allocation. Finally, enterprises should conscientiously implement the actions to enhance the export of advantageous agricultural products, actively create the brand of
characteristic agricultural products, and avoid China's export of agricultural products falling into the vortex of low price competition.

In view of this, we should effectively promote the improvement of the export structure of agricultural products with different processing levels, clearly define the quality echelon of China's export of different types of agricultural products, accelerate the quality upgrading of advantageous agricultural products from the two dimensions of breadth and depth, fundamentally maintain the sustainability of the overall quality upgrading of China's export of agricultural products, and more confidently respond to the international trade protectionism. We will reduce the domestic dependence on imported high-quality agricultural products and realize the supply side reform of agriculture.

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