Study on the Management of Sourcing Uncertainty in Intermediaries Selling Expired Foods

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Abstract. Currently, as the snack food industry in China continues to grow, so does the advent food industry. With increasing academic interest in advent foods, the advent food industry is one of the key research topics today. Today's researchers have made in-depth progress in the direction of selling advent foods. However, there is still a research gap and a uniform interpretation and perception of how to ensure the certainty of the source of advent foods. Therefore, the research topic of this paper is to study the uncertainty of supply governance for the middlemen of the sale of advent foods. The research methodology of this paper is as follows: firstly, the author analyzes the causes of uncertainty in the supply of the middlemen in the sale of foodstuffs in the interim period. Then the author investigates the strategies based on the causes, so as to provide solutions to the uncertainty in the supply of the middlemen in the sale of foodstuffs in the interim period. Based on the technical environment of big data, this paper mainly discusses the uncertainty of the supply of critical food sources and proposes corresponding suggestions for critical food sales intermediaries to solve the uncertainty of the supply of critical food sources.

Keywords: Advent food, big data, uncertain supply.

1. Introduction

Advent foods are foods that are about to reach their shelf life but are still within their shelf life and are in the category of safe foods. Expiry foods include expired staple foods and expire casual foods. Due to the inconvenience of selling expired staple foods, the advent foods currently sold in society are mainly expired casual foods, so the research direction of this paper is expired casual foods. The boom in the consumption of advent food keeps starting to heat up from 2020, and the market size of China's advent food industry reaches 31.8 billion yuan in 2021, which is expected to maintain a 6% growth rate and will continue to grow. By estimation, the market size of China's advent food market will reach 40.1 billion yuan in 2025 [1]. With the continuous expansion of the advent food market, the number of companies wanting to engage in the sales of advent food is also increasing. As of March 2022, there are 188 domestic enterprises specializing in the sale of advent food, of which 122 were established in the past year [2]. According to the analysis of the current situation of the survey, there is still a need to solve the problems of supply of expired food, safety supervision of expired food and marketing and sales of expired food from the perspective of intermediaries of expired food sales. In this paper, the author will mainly consider the issue of supply of advent food. Specifically, the research is to propose a solution to the uncertainty of the supply of advent food for the middlemen of advent food sales based on the support of big data technology conditions and to provide a boost to the development of China's advent food market.

2. literature review

The Ministry of Commerce's "Report on the Development of the Snack Food Industry in the Context of Consumption Upgrading" shows that the total output value of the national snack food industry grew from 424.036 billion yuan to 2,215.64 billion yuan in the 10 years from 2006 to 2016, an increase of 422.5%. In 2018, the country 1 year eats two trillion snacks. In 2020, the total output value of China's snack food industry will exceed 3 trillion yuan, and even at a 1% inventory deposit, the market size of the interim food industry is expected to exceed 30 billion yuan [3]. In 2020, more

than 2 million users will have purchased food with expiry dates, mainly young people, including college students and urban office workers. There are more than 40,000 members of a community on a social networking platform, sharing with each other stores that can buy advent food and their buying experience. When you search for "advent food" on Taobao, you can find thousands of related stores. One four-gold-crown store is in the first place by sales, with 1.55 million followers and tens of thousands of monthly sales for many products. More and more young people are joining the ranks of buying advent food, believing that they can not only buy cheap goodies, but also avoid food waste, and no longer see buying advent food as a sign of being stingy and shabby [4].

Big data is a collection of data that cannot be captured and processed in a short period of time. Big data is representative of information assets, and diversity, complexity, and relatively low-value content are the main characteristics of big data. And big data analysis refers to the analysis of data on a huge scale. Enterprises use the advantages of big data to optimize supply chain management and search for the most valuable data for the enterprise with accurate data content in the massive information. The use of big data can enhance the competitiveness of enterprises while reducing their cost investment. In addition, this approach also improves the efficiency of enterprises, enhances the core competitiveness of enterprises, and provides supply chain assurance for the long-term interests of enterprises [5].

In the current study of supply chain management, new obstacles to supply balance and demand matching among member firms in the supply chain have emerged due to the emergence of new business models and corporate behaviors. It has become more difficult for enterprises to grasp the market demand situation, which has led to the frequent occurrence of distorted demand information, inventory backlogs or shortages, extended production cycles, and other phenomena that are not conducive to the effective operation of the supply chain [6]. However, this situation exists not only in the enterprises' prediction of market demand, but also in the midstream enterprises of the supply chain's prediction of the supply stability of their upstream enterprises. Therefore, the ability of a company to capture relevant information through big data is crucial to its viability of a company. The effective transmission of information in the supply chain network is the key factor for the rational operation of the whole supply chain and to guarantee the stability of the supply chain operation. Among them, the effective transfer of information plays an important role in the development of the food industry. According to today's research on the stability of big data in supply chain management, Zhang Dongxiang proposed the hypothesis that "big data-based information collaboration has a significant positive impact on supply chain optimization results" using structural equation modeling and confirmed this conclusion by analyzing the conceptual model with AMOS software [7]. He believes that big data-based information collaboration promotes supply chain optimization, and in future research, big data should be applied to supply chain management in a more detailed way to control the market and improve service quality through the collection of massive data. By using the technology of big data analysis, enterprises can use the information to find stable sources of supply at their supply side, thus ensuring the smooth operation of their own enterprises' daily production.

Unstable supply sources and uncertain quantities are extremely dangerous for the survival and development of a company. For a food company, securing the supply of raw materials will stabilize the manufacture of the company's products. The impact of this situation is even stronger for the intermediaries who sell food in the interim. Based on the perspective of the middlemen of advent food sales, from the supply side, the supply of advent food mainly comes from the products removed from the shelves of large commercial supermarkets, the returned products from e-commerce platforms and the stocked products from food distributors. Based on the available literature, it can be seen that the supply of advent food products is not stable and mainly depends on the sales of food products in the regular season. If a product sells well during the regular season, then the supply of food products within a critical period will be reduced accordingly [3].

In the existing literature, there is a lack of techniques to combine big data analytics with stabilization of the supply of advent foods. By exploring the technology of using big data analysis to capture data based on the perspective of advent food intermediaries and seeking the stability of supply

sources in the supply chain for advent food intermediaries, the study can, to a certain extent, promote the survival of advent food intermediaries and thus the development of the advent food market in China.

3. Reasons for uncertainty in the supply of advent food

3.1. Internal reasons

First of all, what things need to be clear is that advent food products are not produced and sold by food manufacturers on their own initiative, but are goods left behind because they cannot be sold at the best time due to various unfavorable factors in the market. The existence of a large number of expired products is the basis for the survival of the expired business. Without the presence of expired products, the expired business cannot be carried out successfully. This is because food manufacturers do not take the initiative to produce advent foods just to deal with the business of advent foods trading. Hence, it can be said with certainty that advent food is not produced by the producers on their own initiative. Expired goods are the undesirable consequence of the adverse market factors for initial food sellers. Therefore, the amount supply of advent food products is negatively related to the sales of advent food products. If the sales of the product are high in the positive period, then the source of supply of advent food will be reduced, and vice versa [3]. Thus, the reason for the uncertainty of the supply of adventitious food is innate and is a defect brought about by its essential properties.

3.2. Reasons for information asymmetry

Asymmetry of information due to non-disclosure or unreliability of information [8]. One of the main source suppliers of advent food is the numerous offline sales entities and stores in society. It is known that the actual sales situation faced by different offline sales entities is different. Moreover, there are a large number of sellers of different volumes in the market. As a result of this situation, each offline sales entity has a different type, brand and quantity of food in its backlog. At the same time, these offline sales entities rarely or hardly announce their inventory of backlogged products to the outside world in order to protect their trade secrets, which creates a situation of non-disclosure of information; there may also be a situation where the original backlogged products are sold due to instant changes in the market, and the information of backlogged products is transmitted with a certain lag, which leads to unreliable information of middlemen selling backlogged foods. The information available is unreliable. This information, which is of doubtful credibility, is not only numerous, but also complicated and small. It is difficult for a small middleman to analyze and handle the information correctly and scientifically, which creates a situation of information asymmetry.

3.3. Reasons for supply and demand not to achieve rapid response

One of the disadvantages of advent foods is the short period of edibility. For both the supply and demand sides, how to achieve a rapid response from both the supply and demand sides. This is is one of the directions to solve the uncertainty of the supply of advent food. Firstly, there is no systematic resource integration platform, which makes many information sources scattered and disorderly distributed in the social environment. The supply and demand sides cannot quickly use the information in the market to achieve rapid communication, which reduces the response speed of both sides. Secondly, even if there is a resource integration platform, it is not yet clear whether the relevant departments of such platform are in place to supervise and whether the legal system is perfect. Finally, how to establish trust between the supply and demand sides for transactions basis to promote mutual trust between supply and demand, rather than background checks before each transaction to achieve an efficient and rapid response [8]. All of the above are factors that affect the failure of both supply and demand to achieve rapid response. It is because of the inability of the supply and demand sides to respond quickly that the flow time of the advent food increases. Some of the advent foods may miss the deadline for consumption because of this reason, thus losing the value of secondary sales. In the face of this situation, the middlemen of advent food sales can only look for more goods so as to

solve the situation of their insufficient supply to consumers. Therefore, the uncertainty of the supply of advent foods can only be solved by addressing the factors that influence the supply and demand sides to achieve a rapid response.

3.4. External reasons

The vicious competition in the market for temporary food can also lead to uncertainty in the supply of temporary food. The increase in the number of companies of the same nature in the market will lead to a tighter supply of the already scarce temporary food products and increase the uncertainty of the supply of temporary food products. According to the survey, the temporary food industry began to receive attention from capital and users, and several brands received financing in 2021. The industry is expected to maintain a 6% growth rate and will continue to grow, and the size of China's temporary food market will reach 40.1 billion yuan in 2025 [9]. The increasing number of entrants indicates the increasing number of intermediaries in the sale of advent food. The greater the number of intermediaries in the sale of advent foods, the more competition for the supply of advent foods will definitely be intensified to different degrees. As of the end of 2021, the total number of registered companies related to advent foods in China reached 94, and the competition in the market has increased. The increasing number of intermediaries in the sale of advent foods will lead to competition for the supply of advent foods, which will intensify the competition for the supply of advent foods by intermediaries in the sale of advent foods and worsen the uncertainty of the supply of advent foods to a certain extent.

4. Solution

4.1. Building a platform for information exchange between supply and demand

As mentioned earlier, the lack of a systematic resource integration platform makes many information sources scattered and disorderly distributed in the general social environment. With the increasing popularity of Internet trading, the advantages of rapid, extensive and convenient channel coverage by Internet trading platforms can greatly reduce transaction costs and improve product circulation efficiency [10]. Therefore, it is essential to build a platform for both the supply and demand sides to realize the information exchange of the advent food, which is greatly beneficial to the development of the advent food industry in China. Through the platform, the supply side can provide the demand side with a series of information about the advent food, including but not limited to the brand, quantity and shelf-life time of the advent food, so as to provide data support for the demand side's purchase; the demand side can also analyze the advent food that its customers want to buy through its downstream market analysis, and seek supplies from the supply side by collecting market information to meet its own customers' needs. The demand side can also analyze its customers' desire to buy advent foods through its downstream market analysis and seek supplies from the supply side by collecting market information to meet its customers' needs. In the process of building the information exchange platform between the supply and demand sides, the offline sales entity, as the party with the backlog of advent food, needs to upload the information of advent food to the platform and update the information in a timely manner. Thus, the platform can provide the demand side with a series of information about the advent food products, including but not limited to the brands and quantities of the advent food products as well as the time when the food products reach the shelf life, so as to provide data support for the demand side's stocking. The demand side can carry out two activities through this platform: firstly, it can publish the information of the required sources on the platform, i.e., its own user demand through market research and market analysis; secondly, it can order the sources published by the supply side on the platform, so as to find sources for the advent food products it sells and maintain the stability of the sources.

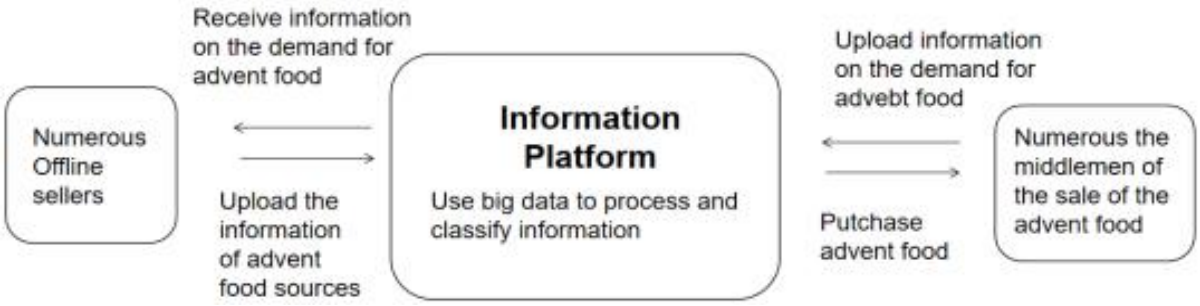


Figure 1. Demonstration of the above process

4.2. Big Data

As mentioned earlier, advent food is food that is about to reach its shelf life. Therefore, in order to ensure the edibility of the advent food within a certain period, it is essential to achieve intelligent and fast matching between supply and demand through big data. What is intelligent matching? According to the definition of this paper, it is to achieve the optimal supply of advent food for regional buyers under the technical condition of using big data. In short, it is to locate different sources in each region through big data intelligent matching and provide different options for buyers in different regions with information on the supply of advent food. As we all know, due to the taste of the population in each region, the brand of food has a different degree of preference. Then as a whole, the inventory squeeze of offline snack selling entities in each region is not the same. Through big data technology, we collect different information from each region and implement differentiated pages on the platform for each region's advent food sales intermediaries, i.e., intelligently match the sources of goods that can be provided quickly within a certain period of time by region, thus reducing the occurrence of cross-regional transfer of goods. Because the time consumed by cross-regional transfer reduces the flow time of secondary sales, which is unfavorable to the re-selling of advent foods. Through big data intelligent matching, we can provide the middlemen with certainty of supply or provide the choice of supply of different brands of the same type, thus helping to ensure the stability of supply and the time from finding to receiving the supply of the middlemen of the sale of the advent food.

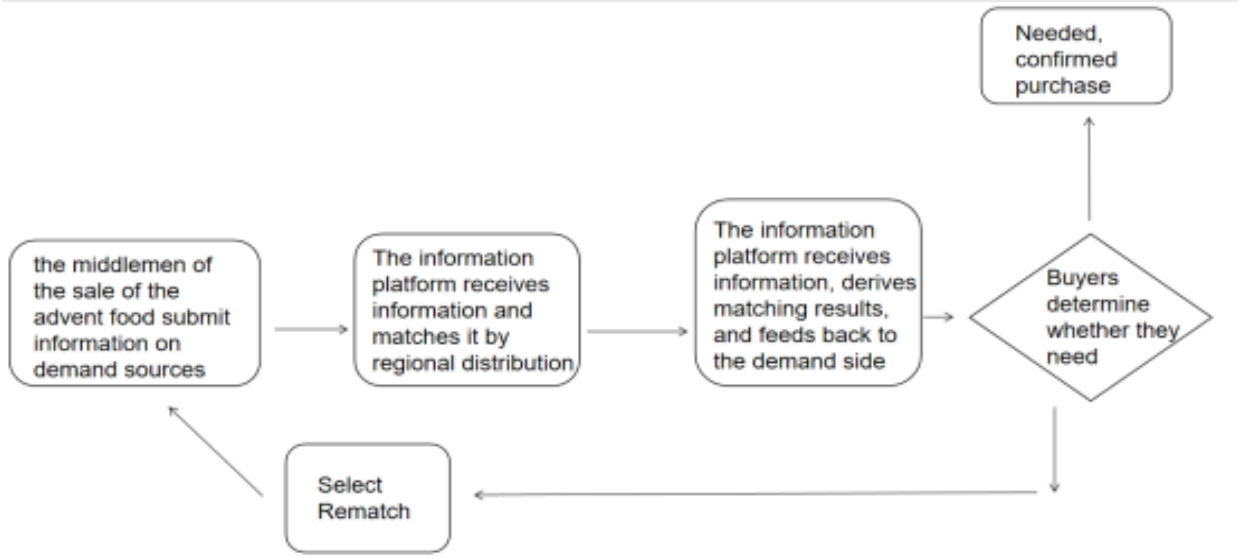


Figure 2. Operation flow chart

The intelligent information exchange platform operates through the process in Figure 2 above to achieve regional intelligent matching of sources for the critical food sales intermediaries, reducing the circulation distance of the critical food, shrinking the time spent on the circulation of the critical food, and at the same time, to a certain extent, guaranteeing the stability results of the sources of the critical food sales intermediaries, and also providing a variety of source choices for the incoming

supplies of the critical food intermediaries, promoting the critical food sales intermediaries to provide more demand solutions for consumers with increasingly sophisticated knowledge of snacks.

4.3. Cooperation between intermediaries in the sale of advent foods

There is an old Chinese saying, called harmony is mutually beneficial, and division is mutually defeating. This saying is used in the enterprise, can get through cooperation can achieve a win-win situation for both sides. With the acceleration of the global economic integration process, the interpenetration between industries, production and business models are constantly evolving, the trend is to fight the world in a group, the big fish eat small fish will gradually evolve into a group of fish eat big fish, have partners to have the market and the future [11]. As mentioned earlier, each offline sales entity faces a different real social demand. Under this condition, the backlog of advent food in each offline sales entity is also different. Faced with the inconsistency of the backlog of advent food inventory, the cooperation space between different advent food sales intermediaries can be fully explored, i.e., using the unique customer demand of the store to seek the backlog of advent food inventory of other offline advent food sales intermediaries, negotiate and cooperate together through the demand side of the information exchange platform, promote the efficient flow of advent food, increase the sales of advent food, and increase the supply of advent food at the same time. The company also promotes the construction of the stability of the supply of advent food through the channels. Through the cooperation between the middlemen of the sales of the advent foods, we seek common development by joint cooperation. In this case, the middlemen who have the market demand for advent foods have the supply and sell to meet the market demand, and the middlemen who face the backlog of advent foods can clear the inventory and run the capital to re-stock. Figure 3 below shown.

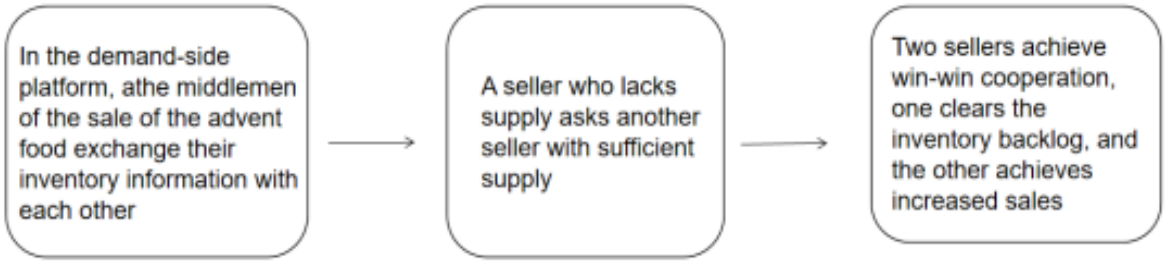


Figure 3. The flow chart of this solution

5. Conclusion

With the development of consumers' consumption ability and consumer thinking, China's advent food industry is also growing with the increase of consumers, but along with it, the uncertainty of supply of advent food industry is increasing. In the face of the growing uncertainty of the supply of advent foods, this paper examines the reasons for this. The inherent quality of advent foods, the information asymmetry and the lack of rapid response between offline physical stores selling advent foods and intermediaries selling advent foods, and the existence of a large number of intermediaries selling advent foods are the reasons for the unstable supply of advent foods. Meanwhile, in the face of these reasons, this paper also provides corresponding solutions, which are the construction of the information exchange platform for advent food, the intelligent matching of advent food sales intermediaries through the information exchange platform, and the win-win cooperation solution among advent food sales intermediaries. In the future, the authors hope to further explore solutions to stabilize the supply of critical food sources in order to promote the smooth, orderly and prosperous development of the critical food industry in China.

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