

Explore the Impact of Cold Chain Logistics Distribution Service Quality on Customer Satisfaction of Fresh Food E-commerce Platform—A Case of Alibaba Hema Fresh

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Abstract: With the enhancement of people's living standards and consumption level, the demand for a variety of food products increases, and the demand for frozen food increases rapidly. Numerous fresh retail e-commerce platforms have emerged, and the online shopping mode of multi-frequency and small batches becomes more popular among people. Therefore, to ensure the quality of fresh products, the requirements for cold chain distribution logistics are constantly increasing. However, there are still a series of problems in China's cold chain logistics distribution system, and the quality of logistics service needs to be improved to meet the needs of the public and improve their satisfaction. This paper takes Hema Fresh as an example which provides a new retail format and uses the questionnaire to explore the relationship between customer satisfaction towards Hema distribution logistics services quality which helps to know the logistics factors that have the greatest impact on customer satisfaction. The results show that timeliness is the most concerning problem for consumers at present. Thus, this paper puts forward targeted strategies to improve the problem of cold change logistics of food retailers so it can provide better service for customers, customers can receive fresh food faster and better, and their overall happiness in life can be improved. At the same time, it also optimizes the cold chain distribution service of e-commerce and reduces the waste of fresh products. It also provides valuable insights into the cold chain logistics distribution industry in China.

Keywords: Cold chain logistics; E-commerce; Fresh food; Logistics service quality; Hema Fresh

1 Introduction

1.1 Background of the Study

With the rapid development of the fresh food e-commerce industry, the national

government is also issuing relevant support policies and opinions. In 2014, guiding opinions issued by the CPC Central Committee and The State Council proposed “strengthening the construction of e-commerce platform for agricultural products” (The Central People's Government of the People's Republic of China, 2014), which further promotes the overall development of fresh food e-commerce. Subsequently, several large companies have established large retail e-commerce platforms to provide users with online procurement of fresh food and agricultural products, and other services, bringing great convenience to people's life. One of the most representative retailers is Hema Fresh, a subsidiary of Alibaba.

Despite the support of the government, it is not easy to get a foothold in this new fresh food e-commerce industry. One of the key factors to success in this industry is cold chain logistics distribution service. The impact of cold chain logistics delivery service quality on customer satisfaction and loyalty as well as potential customers is a crucial issue to be explored for those e-commerce companies to gain an edge.

With the increase in domestic consumption level and the rapid development of fresh food e-commerce, customers gradually make higher and higher requirements for the quality of logistics distribution services (Limbourg et al., 2016). For logistics distribution service quality contains a variety of factors, such as timeliness, order accuracy (Kamble et al., 2021). There are many factors to measure the quality of logistics. Some factors have a large impact on customer satisfaction, while others have a small impact, so the identification and evaluation of the importance degree of all factors is an important step to optimize the cold chain logistics distribution service.

It is necessary to know that due to the particularity of fresh products, the development of fresh food e-commerce is greatly restricted by many factors such as difficult storage, easy loss, and high logistics costs (Wenji. 2021). So, how to keep fresh food fresh is the biggest problem fresh food e-commerce companies face in the process of transportation, and China's cold chain logistics lags far behind that of developed countries (Cai, 2019). Statistics reveal that despite the requirement for refrigeration, only 15% of fresh agricultural products are transported in China under refrigerated conditions, in addition, in the logistics stages such as picking, transportation and storage, the loss rate reaches 25% to 30% (Cai, 2019). Therefore, cold chain logistics distribution service seriously restricts the customer experience and sustainable development of fresh food e-commerce enterprises.

At present, scholars at home and abroad have built different theoretical models to help manage the cold chain logistics to improve efficiency and customer satisfaction, but there is relatively little theoretical knowledge about the management of cold chain in fresh food e-commerce, and there is also a lack of analysis of actual cases in China.

This research will explore the different influence degrees of different factors, take Hema Fresh as an example, use the theoretical knowledge to analyze and evaluate

it, and put forward the optimization strategy for the fresh food e-commerce distribution system.

1.2 Purpose of the Study

The online fresh food platform is a new field and develops fast these years (Hong et al., 2019). But there are still some deficiencies because of the particularity of fresh food such as difficult storage and easy loss, cold chain logistics cannot deliver them completely undamaged (Wenji. 2021), while customers put forward higher and higher requirements for cold chain logistics (Limbourg et al., 2016). So, it is important to know what cold chain logistics service quality factors affect those customers most.

Although there have been relevant discussions in domestic (Dai et al., 2020) and foreign (Huma et al., 2019) research, few of them take fresh food e-commerce platforms such as Hema as the research object.

This research aims to analyze which distribution service quality factors are most important and how to improve cold chain logistics delivery services to better meet the needs of customers from the perspective of local enterprises in China.

1.3 Research Objectives

1.3.1 To Analyze the Impact of Cold Chain Logistics Distribution Service Quality on Customer Satisfaction

There are many factors that affect customer satisfaction in logistics distribution, such as timeliness, synchronization of information in logistics tracking, completeness of logistics, condition of goods. Different factors have different degrees of influence on customer satisfaction. Identifying and evaluating the importance of all factors is a significant link to optimizing logistics distribution services.

1.3.2 The Attraction of Delivery Range to the Potential Customers

As Hema's current delivery range is within three kilometers of its stores, off-line delivery services will not be available in areas beyond that range (Jin et al., 2021). Although this strategy can improve efficiency and ensure the consumption quality of some customers, Hema will lose a large part of potential customers due to the insufficient intensity of stores. This study will explore the impact of expanding the delivery range on existing customers and potential customers, whether it will attract more potential customers, and whether it will reduce the loyalty of existing customers.

1.4 Significance of the Study

1.4.1 For Academic Knowledge

Reviewing the existing academic knowledge about the impact of logistics service quality on customer satisfaction, it is not difficult to find that there are few articles focusing on the distribution link in the cold chain logistics (Zhang et al., 2020). This research can fill the current academic gap. In addition, it is difficult to analyze the results with these two things because customer satisfaction is a concept that is difficult to be measured, and everyone's satisfaction is affected by many different factors with different degrees of influence. This research is devoted to quantifying customers' satisfaction with the cold chain logistics distribution service quality, so it will be convenient for analysis, and that subjective problem can be more easily presented in an objective form and the relationship between them can be better understood.

1.4.2 For the Customers

For Hema online users, better logistics service quality like shorter delivery time is helpful for customers to get fresh ingredients more quickly, obtain the best taste, and improve the quality of life and efficiency. Sitting at home or on the way home from work, they can place an order immediately and get what they need in a short time when they get home. At the same time, providing better service for online orders can reduce the sense of crowding in stores and provide a better user experience for offline users.

1.4.3 For the Company

It helps Hema company to provide higher quality service and distribution efficiency, and better understand what their customers need.

By improving the cold chain logistics service quality, the company can get more potential customers to become real customers, and increase sales.

With the above improvement targets, the company can improve its reputation and popularity to a greater extent, improve customer satisfaction and loyalty, increase sales volume, improve profit margin, improve the core competitiveness, and make it gain a foothold in the fiercely competitive market.

1.5 Theoretical Framework

1.5.1 Logistics Service Quality (LSQ)

LSQ is a model which includes various dimensions such as information quality, ordering procedures, order release quantities, timeliness, order accuracy, order quality, order condition, order discrepancy handling and personal contact quality (Kamble et al., 2011).

For different industries, the requirements for logistics are different. For example, this research focuses on the fresh food industry and it must have different needs from other ordinary industries. Due to the particularity of fresh products, easy loss, transportation difficulties and other characteristics, the requirements of logistics timeliness must be higher. This research will explore the proportion of Hema's customers' requirements on the above 9 indicators, and find out the more important influencing factors, to improve Hema's logistics and distribution system more targeted, so as to improve customer satisfaction.

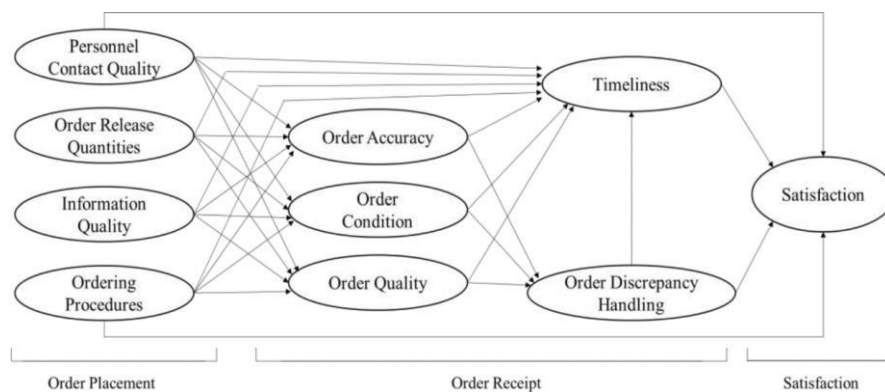


Figure 1

LSQ & customer satisfaction

1.6 Case Profile

The cold chain is a supply chain with perishable products that must be stored and transported under a specific range of temperature and humidity conditions (Bogataj et al., 2005).

China now is the country that produces the most perishable fruits and vegetables worldwide (Zhao et al., 2018). China cold chain infrastructure is incomplete (Zhao et al., 2018).

In China, many fresh food e-commerce platforms use cold chain logistics transportation. Hema mentioned in this article is one of them which started its business in January 2016 (Wang & Coe, 2021). The business, which is owned by Alibaba Group Holding LTD, pioneers an integrated online and offline retail strategy that enables users to order things online from retailers or restaurants in their area for quick delivery — in some circumstances, within as little as 30 minutes after placing the order (Hu et al., 2022). Hema had opened 341 stores, as of July 8, 2021 in China (Jin et al., 2021), and far outperform long-standing rivals such as Wal-Mart in terms of store sales (Wang & Coe, 2021). But Hema still has problems in some parts of the supply chain that needs to improve.

2 Literature Review

2.1 Fresh Food E-Commerce Platform in China

Fresh agricultural products e-commerce refers to using the Internet to sell fresh products like fruits and vegetables, seafood, aquatic products, cooked food, and meat products. The need for fresh food is rising as social economy and living standards grow. Fresh food e-commerce offers several benefits and has progressively grown to be a necessary component of everyone's convenient life. (Lingyu et al., 2019). For instance, consumers can get fresh food directly from the Internet without leaving their homes to visit the farmer's market or the grocery store.

The fresh food e-commerce market began to develop in 2012, and after 2014, the development of the fresh food e-commerce market also ushered in a new situation.

In the realm of e-commerce, fresh food e-commerce is described as the new "blue ocean." The volume of national fresh food e-commerce transactions reached 13 billion yuan in 2013 and 26 billion yuan in 2014, according to the monitoring data from China Electronic Commerce Research Center. Comparing 2014 to 2013, there was a 100% increase. A new high of 56 billion was attained in 2015. In 2018, it is estimated to generate 128.3 billion. Major Chinese e-commerce enterprises have frequently taken actions to raise investment, driven by the strong market. But fresh food e-commerce is still in a less than optimal state of growth. In China, there were more than 4,000 fresh e-commerce suppliers as of 2016, however just 1% of them were profitable, 4% were flat, 88% were in the red, and the remaining 8% suffered significant losses. (Bai & Guo, 2017).

The existing state of cold chain logistics development is primarily limiting the quick expansion of fresh food e-commerce. Only with the rapid development of fresh cold chain logistics can consumers really rest assured to buy fresh goods from the e-commerce platform, thereby promoting the rapid development of fresh food e-commerce.

Major e-commerce platforms such as JD.com, Alibaba, Amazon, and Suning Supermarket, as well as traditional corporate giants, have also seized the fresh food e-commerce market (Liu & Walsh, 2019).

Fresh food e-commerce is mainly divided into different modes such as vertical B2C, comprehensive B2C and e-commerce platforms. SF Express, No. 1 Orchard, Jingdong Fresh Channel and Tmall Mall are typical representatives (Zhang, 2016).

2.2 Cold Chain Logistics—Fresh Food E-Commerce Platform in China

The development of cold chain logistics was born under the demand of the fresh food e-commerce market. In order to prevent product deterioration during shipping, storage, and other chain links prior to product sales, a supply chain system known as "cold chain logistics" places products in a low temperature environment. (Wang,

2022). The logistics of the cold chain and the e-commerce of fresh foods are therefore closely related.

In recent years, although cold chain logistics in Chinese fresh food e-commerce market has achieved certain development, it is undeniable that there are also drawbacks and problems in this process. Among them, the unscientific distribution mode of cold chain logistics is one of the problems.

The randomization of fresh products in critical links including packing, transportation, storage, and distribution is caused by the lack of standardization of cold chain logistics in the e-commerce context. Lack of regulation and poor corporate governance, and the infrastructure are seriously insufficient, and the infrastructure such as refrigerated trucks and refrigerated containers is far from being able to keep up with the rapid growth of e-commerce. Cold chain logistics has relatively high requirements for talents. However, the majority of professionals in our nation did not obtain the proper cold chain logistics training prior to work, and many of them made the switch from ordinary logistics companies to cold chain logistics without any intermediate steps. They lack the corresponding professional knowledge and skills, resulting in a generally low service level in the cold chain logistics industry (Bai & Guo, 2017).

In addition, the lack of a cold chain logistics distribution center further causes problems such as unscientific transportation and distribution route planning, which greatly wastes transportation time, makes it difficult to improve work efficiency, and increases costs. More seriously, it may cause customers of dissatisfaction.

2.3 Theoretical Framework

2.3.1 Logistics Service Quality

Initially, Professor Smackie's 7RS theory advanced the idea of logistics service quality. Delivering the appropriate items to the appropriate consumer at the appropriate price, via the appropriate shipping method, at the appropriate time, and at the appropriate address is the theory's simple summary. The 7RS theory summarizes the key nodes in the logistics service process. With the diversification of logistics operation modes and the rise of customized services, the definition of logistics service quality is constantly enriched, and logistics service quality covers more and more elements (Bienstock et al., 2008).

Since the 1960s, the research direction of the development of logistics service quality has undergone different changes. From the 1960s to the 1980s, the research on logistics service quality started from the definition represented by the 7R theory, to the definition of logistics service quality as the marketing direction represented by La Londe and Zinzez, and then to the definition represented by Mentzes. Scholars define logistics as the two main directions of marketing and distribution, and they are more completely defined by Tennessee University in the United States. Scales have been studied since the late 1980s. The most representative ones are

SERVQUAL scale and LSQ scale, which are also two scales recognized by academic circles. By the 1990s, the emphasis of logistics service quality study has gradually changed to include the viewpoint of customer satisfaction. Through research, we found that for different customers and different marketing and distribution models, the logistics service quality model will be different (Mentzer et al., 2001).

2.3.2 Service Quality and Customer Satisfaction

Customer satisfaction and service quality are theoretically distinct but closely connected notions (Sureshchandar et al., 2002).

Current research has emphasized the above premises from various perspectives, taking into account various elements of service quality and customer satisfaction and designing various models in order to shed more light on the distinctiveness of the service quality and customer satisfaction structure, as well as the relationship between them. According to existing researches, overall service quality has a considerable beneficial impact on overall customer satisfaction (Afthanorhan et al., 2019). As a result, they are truly independent, and their bond is strong.

2.3.3 Fresh Food E-Commerce Platforms' Logistics Distribution & Customer Satisfaction

Customers view logistics service as a crucial criterion for evaluating the dependability of fresh food e-commerce, and there is a strong link between the performance of e-commerce in direct sales of fresh goods and the quality of logistics service. (Hong et al., 2019).

People are concerned about the quality of services and products in the fresh food e-commerce area in the context of the new era, so the platform must adhere to customer-centricity, whether before or after the sale, to enhance user stickiness, thereby increasing buyers repurchase rate and increase corporate profits. One of the aspects influencing a consumer's decision to repurchase or consume something is customer satisfaction, which will directly affect customers' loyalty to the platform. When customer satisfaction reaches a certain high value, customer loyalty will also become very high.

Liu Xinyi and Gao Zhiping believe that the quality of fresh agricultural products, brand image, e-commerce platform, and logistics and distribution are positively affecting customer satisfaction (Liu & Kao, 2022). Fresh e-commerce provides customers with a safe, convenient, and diversified purchasing platform, which not only solves the problem of customers' daily purchasing needs, but also saves a lot of purchasing time and physical exertion for customers.

According to Ye and Chen's investigation and research, due to the particularity of fresh products, customers place great importance on the arrival time of fresh products and the quality of the products when they receive them after placing an order. If the delivery service is not in place, it will cause the loss of goods, leading

to bad customer experience and affecting customers' willingness to repeat purchases and customer loyalty (Ye & Chen, 2020).

From this, enhancing customer satisfaction and loyalty, ensuring the quality of fresh products, and improving the distribution services of e-commerce platforms are the most essential points.

2.3.4 Hema Fresh Cold Chain Logistics

In the field of online fresh food sales, Hema is one of the top retailers.

Hema employs a model of store-warehouse integration, and both offline stores and orders placed through online platforms count toward sales. At the same time, Hema debuted a brand-new retail concept that mixes fresh groceries and catering together. The majority of traditional fresh food e-commerce businesses, such as Tmall Fresh and JD Fresh, use the Internet to deliver fresh goods to customers via e-commerce warehouses and other conventional rapid delivery methods. Following the user's order, transportation typically takes 1-2 days. It is hard to ensure the quality of those fresh food in this mode and shipping is slow (Liu & Kao, 2022). Hema's unique retail model, which is superior to conventional fresh e-commerce in that it fully utilizes the role of physical storefronts, enhances the customer experience, and increases the availability of fresh goods.

Jin et al. (2021) proposed in Problems and Development Strategies of Freshippo's Fresh Product Supply Chains that Hema's logistics model is an innovative B2C logistics. The author studies and analyzes Hema's cold chain operation structure and advantages and disadvantages through visits, such as insufficient logistics supervision. The distribution of inventory space is unreasonable, and it is concentrated in the first-tier cities and other problems, and proposes an improvement plan for it, to draw lessons from it.

Due to the natural characteristics of perishable and high-water content of fresh agricultural products, there are extremely high requirements for fresh-keeping storage and logistics distribution. Different fresh agricultural products require different temperature ranges for refrigeration and preservation during transportation to ensure product quality (Liu, 2016).

However, Chinese cold chain logistics technology was developed relatively late compared with other countries, and its base is fragile. So far, a complete and autonomous cold chain logistics infrastructure has not yet been established in China, so it is impossible to ensure that most of the fresh agricultural products will be carried out under cold chain conditions as it is being transported. The similar problem is also being faced by Hema's cold chain logistics technology because Hema has not been around for a very long period; although Hema has alleviated it by building its own warehouse, it is difficult to monitor the entire logistics chain, and it is unavoidable to adversely affect the quality of fresh agricultural products due to the improper operation of transport personnel (Jin et al., 2021).

According to the available literature, there are a fair number of research on China's cold chain logistics, and both the benefits and drawbacks of China's fresh food e-commerce are also analyzed in place. There are also corresponding literatures to explain the current situation and advantages and disadvantages of Hema. But there is little targeted analysis, such as which of Hema's delivery services affects customer satisfaction and how, and how platforms like Hema can improve. For the shortcomings of the current research, this paper will do further research and analysis.

3 Research Method

3.1 Research Methodology

Based on relevant research on the cold chain industry (Ashok et al., 2017; Shashi et al., 2020), this paper uses the survey research approach to investigate the satisfaction of Hema Fresh users of different ages and incomes towards Hema logistics service quality. Since China's cold chain logistics is still in the development stage, there are still many deficiencies in the logistics system (Zhao et al., 2018). Although Hema Fresh already has a certain status in the fresh food retail industry, there are still cases of dissatisfied customers, and some logistical problems still need to be resolved (Feng & Zhu, 2019). This paper will take Hema as an example. As a relatively typical Chinese retail e-commerce company, Hema is highly representative. Analyzing such successful enterprise will be helpful for the cold chain system to improve for reference.

3.2 Data Collection and Analysis

This study adopts the survey research approach, and all the data come from the results of the questionnaire survey.

3.2.1 Design of the Questionnaire

Through the second chapter, the evaluation model of cold chain logistics service quality for fresh products on e-commerce platform is preliminarily determined. In this chapter, the data will be collected by questionnaires, and then exploratory analysis will be carried out on the data.

The formal questionnaire is divided into three parts: the first part is the collection of personal information including gender, age, city of residence, income, and other items. The second part is some general questions about Hema Fresh. The third part is related to the consumers' evaluation of the fresh product cold chain logistics service quality of Hema e-commerce platform. Nine dimensions and forty-five indicators in terms of personnel communication quality, information quality, product accuracy rate, timeliness, etc. are contained in the third part. Among them, in terms of satisfaction with the fresh food delivery platform, the questionnaire uses a 7-point Likert scale (1~7 is an evaluation dimension ranging from very dissatisfied to very satisfied to measure the respondents' perception of the fresh products of

Hema e-commerce platform). The respondent are customers from all social classes and age groups. The content of the final questionnaire is detailed in Appendix B.

3.2.2 Distribution and collection of questionnaires

Online questionnaires are made from the official website of WJX.cn and are distributed randomly through social network platforms such as email, QQ, WeChat groups, and Microblog. A total of 124 valid questionnaires are collected eventually after screening and evaluating conscientiously. The main targets are residents in first- and second-tier cities who have used Hema.

3.2.3 Statistical Analysis of Questionnaire Sample Data

Part 1: Demographic Questions:

Part 1 illustrates demographic information in detail. Including 60 males and 64 females, the male-female ratio is relatively balanced, making it more in line with the actual situation of shopping. Among the people surveyed, there are 47 people aged 19-28, accounting for the largest proportion of 37.9%; followed by a total of 30 people aged 39-48. The age of the respondents ranges from 19 to 58 years old, which is also consistent with that of the main consumer group of fresh products on the e-commerce platform. Moreover, the user-distribution (more than half of them live in first-tier cities, accounting for 50.81%, followed by those in second-tier cities, accounting for 33.06%, and the rest are residents in third tier and other cities) is very consistent with the distribution of cities Hema users live in because the distribution of Hema stores is mainly concentrated in first- and second-tier cities.

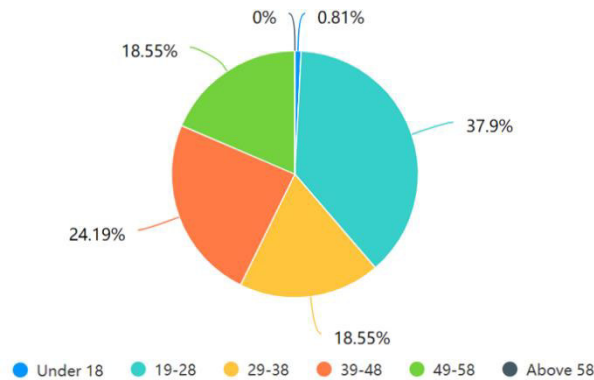


Figure 2

Pie chart of age distribution

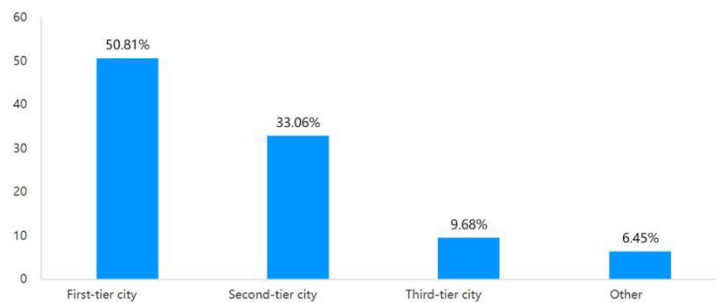


Figure 3

Bar chart of residential city level

Part 2: General Questions about Hema Fresh:

Among the respondents, 39.52% of them shop at Hema once or twice a month, sometimes even once a week; and 44.35% of them buy Hema products occasionally. 55 users live within three kilometers from the nearby Hema retail stores, while the rest of the users reside three kilometers or even further away.

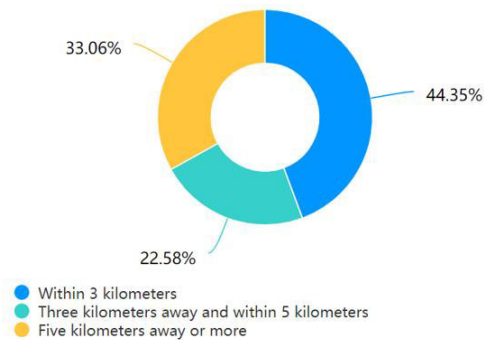


Figure 4

Donut chart of consumer distance from Hema

According to the survey results, fresh food is the most purchased product on Hema, followed by snacks and refrigerated or quick frozen products. These most purchased products have certain requirements for transportation conditions, such as refrigerated transportation.

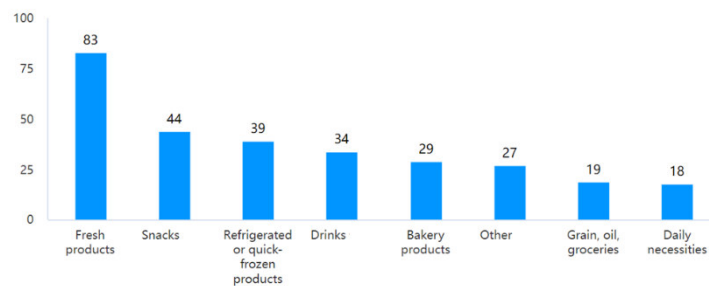


Figure 5

Bar chart of purchased product types

More users, up to as high as 84 people, make their purchase decisions on account of the fresh ingredients provided by Hema. There is a huge decrease in the number of people who choose other reasons, and a few people choose Hema because it is close to home and office.

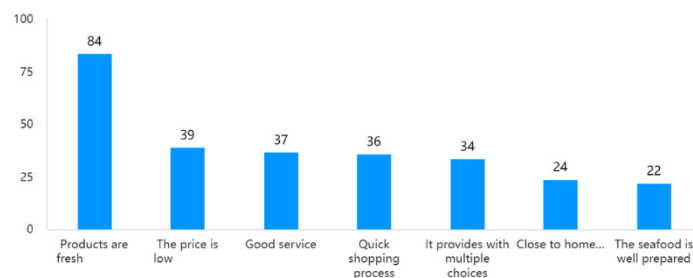


Figure 6

Bar chart of Hema's attracting factors

Promised by Hema that the delivery takes no longer than 30 minutes, 41.94% of consumers claimed that occasionally it costs them more than half an hour to receive the products.

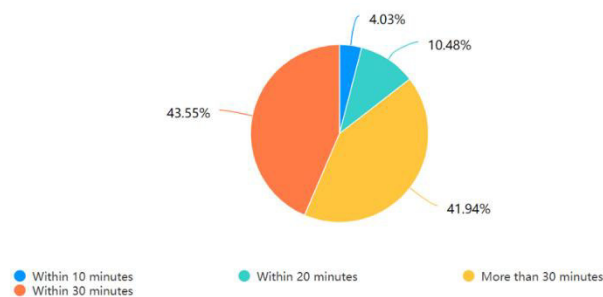


Figure 7

Pie chart of delivery time

Part 3: Logistics Service Quality (LSQ) and Customer Satisfaction

① Personnel Contact Quality

By Personnel Contact Quality, it means whether the logistics personnel can meet the needs of customers and provide good services (Mentzer et al., 2001). Here are the five corresponding questions in the questionnaire and the results of the satisfaction survey:

1. How professional, friendly, and timely are the customer service staff of Hema?
2. How satisfied are you with the efficiency and results of communication with the service staff of Hema?
3. Can Hema customer service staff timely give feedback and deal with customers' needs, opinions, and problems?
4. How satisfied are you with Hema courier service quality and attitude?
5. Can Hema courier deal with problems that you have?

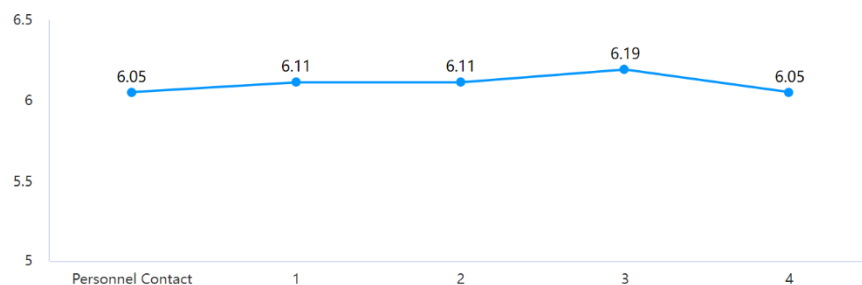


Figure 8

Satisfaction towards Personnel Contact Quality

The overall satisfaction rate for this item was 75.6%, with an average score of 6.10.

② Order Release Quantities

This refers to the logistics company releasing (reducing) the order quantity of some orders according to the actual situation (Mentzer et al., 2001), and whether it can complete the order quantity required by customers on time will affect customer satisfaction. Here are the five corresponding questions in the questionnaire and the results of the satisfaction survey:

1. Normally, when placing an order, can Hema meet your required quantity and deliver it?
2. What is your attitude towards Hema in case of a stock shortage?
3. Orders are usually delivered together by Hema, not in batches

4. Hema can restock in a short time if there is a shortage problem
5. During the pandemic, Hema was able to meet the massive demand and supply of customers.

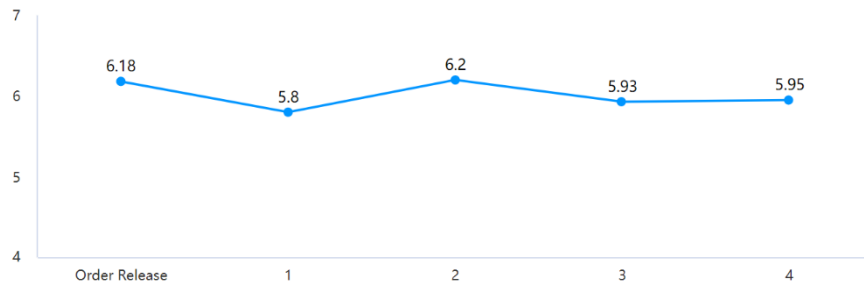


Figure 9

Satisfaction towards Order Release Quantities

The overall satisfaction rate for this item was 71.2%, with an average score of 6.01.

③ Information Quality

This refers to how much information about products is provided by logistics companies from the customer's point of view (Mentzer et al., 2001). Here are the five corresponding questions in the questionnaire and the results of the satisfaction survey:

1. How satisfied are you with the quality of information currently provided by Hema?
2. How do you feel about tracking Service information provided by Hema about the accuracy and real-time data?
3. Do you think the information provided by Hema about the product is not comprehensive enough to influence your decision?
4. The message of the shopping interface of Hema is updated timely (whether there is a situation that is out of stock but not displayed)
5. The Hema logistics information is comprehensive enough to meet your needs

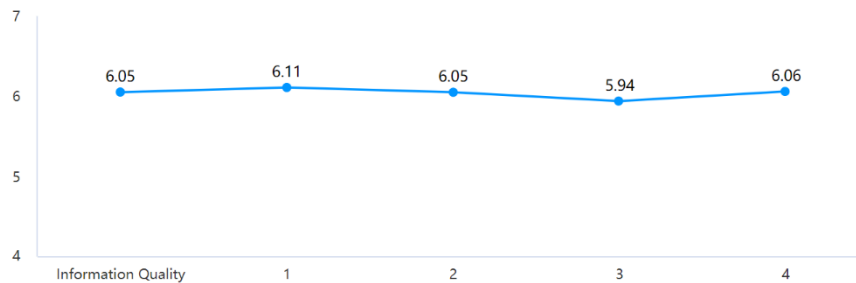


Figure 10

Satisfaction towards Information Quality

The overall satisfaction rate for this item was 75.0%, with an average score of 6.04.

④ Ordering Procedures

This refers to the efficiency and success rate of logistics companies in accepting customers' orders and processing the ordering process (Mentzer et al., 2001). Here are the five corresponding questions in the questionnaire and the results of the satisfaction survey:

1. Ease of procedure in the ordering process using Hema
2. Efficiency and effectiveness of Hema's order processing and success rate
3. Is the process of Hema complicated if you want to cancel or change an order or make a complaint?
4. The order in Hema is processed in a timely manner, and there will be no case that the order cannot match the Courier
5. Multiple payment options are available with Hema.

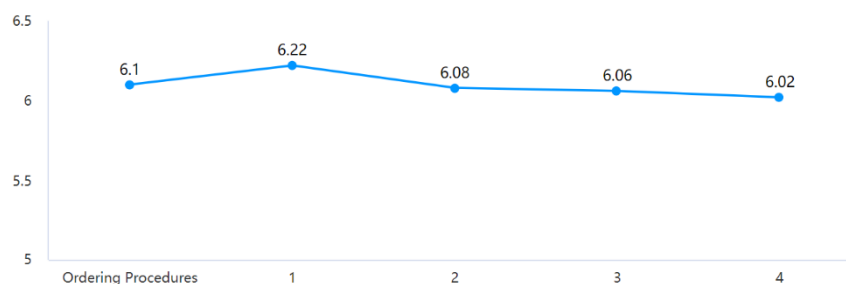


Figure 11

Satisfaction towards Personnel Ordering Procedures

The overall satisfaction rate for this item was 77.4%, with an average score of 6.10.

⑤ Order Accuracy

This refers to the degree to which the actual delivered product matches the product described in the order (Mentzer et al., 2001). Here are the five corresponding questions in the questionnaire and the results of the satisfaction survey:

1. The number of goods served by Hema matches orders exactly.
2. The model of goods served by Hema matches orders exactly.
3. Can the goods be served within the place as you required?
4. Can the goods be served within the time as Hema promised?
5. Fresh products that need to be processed in Hema can be processed as required.

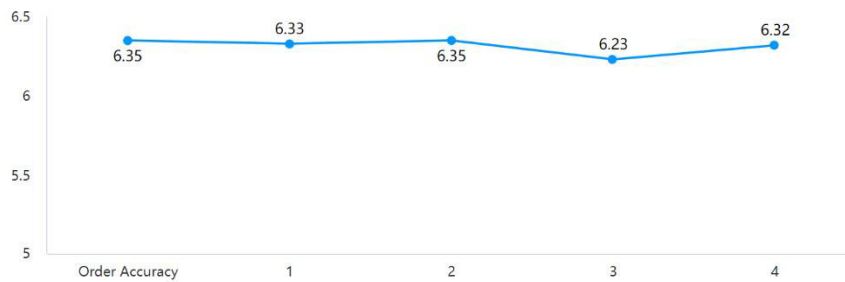


Figure 12

Satisfaction towards Order Accuracy

The overall satisfaction rate for this item was 84.8%, with an average score of 6.32.

⑥ Order Condition

This refers to the extent to which the item is damaged during the delivery process (Mentzer et al., 2001). Here are the five corresponding questions in the questionnaire and the results of the satisfaction survey:

1. The packing of Hema is beautiful and helps to protect the goods
2. The product order in Hema is intact without damage?
3. Hema doesn't provide excessive packing?
4. Hema provides different packaging for different orders.
5. Hema packaging is always in good condition.

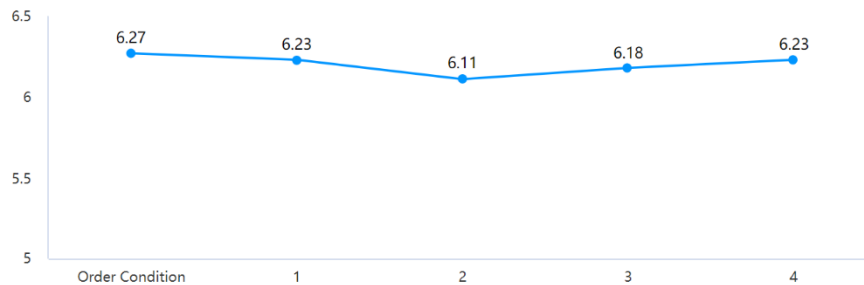


Figure 13

Satisfaction towards Order Condition

The overall satisfaction rate for this item was 78.6%, with an average score of 6.20.

⑦ Order Quality

This refers to the quality of use of the goods, including the extent to which the functionality of the product is in line with the needs of consumers (Mentzer et al., 2001). Here are the five corresponding questions in the questionnaire and the results of the satisfaction survey:

1. Overall quality of products from Hema is good.
2. The goods of Hema are in accordance with the pictures, product introductions and prices.
3. Fresh food is fresh from Hema.
4. The product ingredients are safe and harmless when you order from Hema.
5. Hema always makes sure the product they provide are not expired or nearly expired.

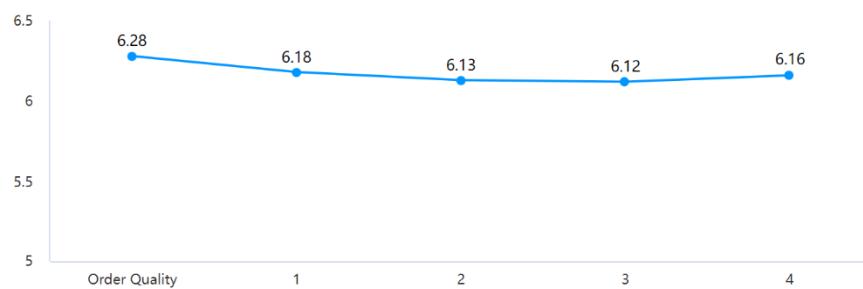


Figure 14

Satisfaction towards Order Quality

The overall satisfaction rate for this item was 78.4%, with an average score of 6.17.

⑧ Timeliness

This refers to whether the goods arrived at the designated place on time (Mentzer et al., 2001). Here are the five corresponding questions in the questionnaire and the results of the satisfaction survey:

1. Does the order arrive at the designated place within 30 minutes as promised every time by Hema?
2. Do you think the delivery time of Hema should be reduced, less than 30 minutes?
3. While receiving goods within 30min, you hope Hema can expand the distribution range (really desired-7, undesired-1).
4. Compared with other fresh retail e-commerce platforms, satisfaction with the delivery speed of Hema.
5. Satisfaction with delivery timeliness of Hema during the pandemic

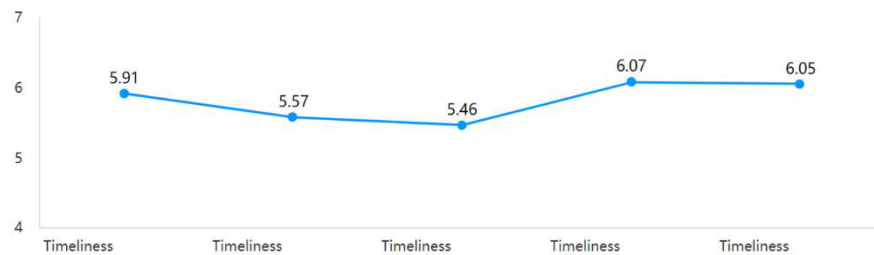


Figure 15
Satisfaction towards Timeliness

The overall satisfaction rate of the item was 70.0%, with an average score of 5.81.

⑨ Order Discrepancy Handling

This refers to the processing after an error in the order execution (Mentzer et al., 2001). Here are the five corresponding questions in the questionnaire and the results of the satisfaction survey:

1. How is the speed and quality of service in handling problems with goods received from Hema.
2. How is the Hema service of returning and exchanging goods, if it is simple, convenient, and responsible?
3. Hema's problem-handling system is perfect.
4. Hema logistics staff can contact you face to face and offer help.

5. Hema avoids order discrepancy of handling.

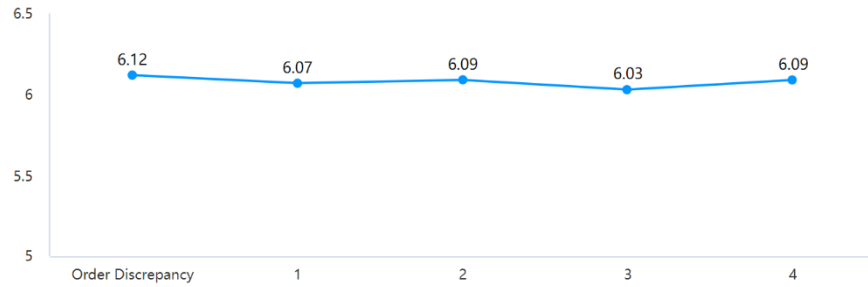


Figure 16

Satisfaction towards Order Discrepancy Handling

The overall satisfaction rate of the item was 73.2%, with an average score of 6.08.

3.3 The Model to Analyze the Case Study

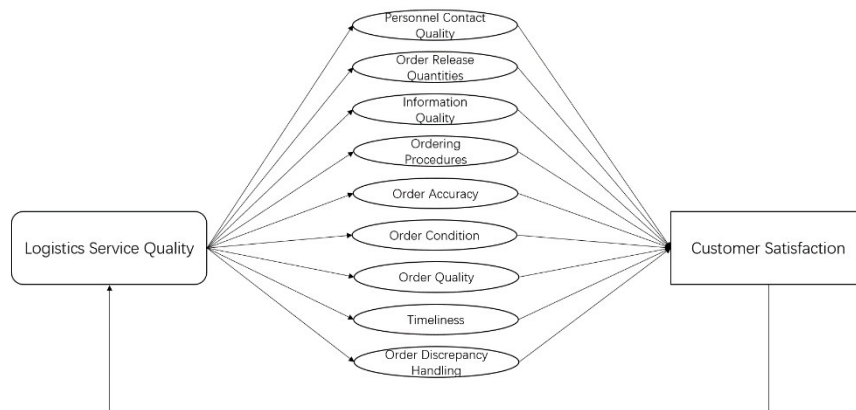


Figure 17

Model of LSQ with customer satisfaction

Each factor in the LSQ model evaluates logistics service quality from the customer's point of view, and each has a direct or indirect impact on customer satisfaction (Huma et al., 2019). Therefore, this study integrates the LSQ model with customer satisfaction to create this conceptual model. Since the position of each indicator in the quality of logistics services will be different according to the difference in market segmentation. This study will explore which indicators will have the greatest impact on fresh food-led retail e-commerce such as Hema based on customer satisfaction surveys, so as to focus on improving the logistics service system according to the level of satisfaction, further improve customer satisfaction, promote sustainable development, improve corporate reputation and interests, and the overall logistics service level of the industry.

4 Results

4.1 Challenges

4.1.1 Freshness of the Products

Questionnaire results show that most customers pay more attention to the freshness of Hema food.

However, due to the factors of the product itself and the limitations of external conditions, most fresh products need fresh-keeping measures during long-distance transportation. However, because of the incomplete cold chain infrastructure, it will cause relatively high transportation loss and limit the circulation radius of transportation to a certain extent (Adekomaya et al., 2016). Since there is currently no comprehensive cold chain transportation system, the majority of fresh food e-commerce businesses in China adopt traditional transportation method (Meng et al., 2022).

Therefore, a long-term difficulty for all fresh food e-commerce companies, including Hema, is how to keep food fresh.

4.1.2 Timeliness

The items on the questionnaire with the lowest scores were delivery effectiveness and timeliness. 40% of participants indicated that they were unable to receive the goods within the guaranteed 30 minutes from Hema. Customers anticipate Hema can deliver on time, or even in less time.

Due to the impact of the epidemic and other problems, Hema's "30-minute delivery service" cannot be guaranteed. Like the shortage of personnel, coupled with the large number of online orders, greatly affected the delivery efficiency (Li et al., 2022).

4.1.3 Size of Distribution Scope

Because Hema is mainly concentrated in the first-tier cities and does not focus more on the development in the second- and third-tier cities, this is an important factor that causes Hema to lose a large number of potential users.

In addition, in the survey on whether to expand the delivery scope, it is found that customers expect Hema to expand within the current delivery time, and think that the current size of delivery range is relatively small.

4.1.4 Stockout

The lowest-scoring issue in Order Release Quantities items is stockout. Out-of-stock phenomenon can affect customers negatively. For example, during the outbreak of the Covid-19 period, the country advocates the policy of less gatherings (Chen et al., 2021). Some areas even require home isolation and homeworking which makes it inconvenient for people to go out. But fresh food are daily necessities, so people's demand for home delivery services has greatly increased.

This has led to insufficient inventory and untimely supply. The large increase in online orders has also greatly increased the requirements for the supply of goods, which has led to the tight inventory of Hema, and the suppliers are unable to supply on time, so that the types of goods are not complete and the supply is unstable (Ma & Guo, 2020).

4.2 Solutions and Strategies

4.2.1 How to Keep Fresh

- Strengthen loss control during transportation and set up multiple key nodes.

There are many important nodes in the whole process of transportation of fresh products from the place of production, processing, distribution, retail to the final consumer, including transportation methods, packaging, distribution, display, marketing, etc (Ren et al., 2022). people should strictly check the key links to reduce the possibility of product quality damage.

- Classify the storage conditions of the product, use different management methods for different categories.

The conditions to store fresh products are different, and can be classified. Uniformly process, transport, and store products with the same level of conditional requirements, like the same refrigeration temperature, integrate and optimize resources, reduce the difficulty of cold chain transportation, and reduce the overall loss rate.

- Shorten the supply chain distance and reduce loss

A complete supply chain should integrate suppliers, fresh food e-commerce itself and consumers. The higher the degree of integration, the more cost-saving and the higher the efficiency of logistics (Bae, 2011). On the supply side, Hema should choose the nearest agricultural product base or brand supplier, and establish close contact with them to make sure there is no problem with the source of supply. On the demand side, Hema should try their best to make sure they are "closer to users" to facilitate consumers.

4.2.2 How to Improve the Efficiency and Reduce Time

Hema can use robots or UAV (unmanned aerial vehicles) for delivery, which not only improves efficiency, but also saves a lot of labor costs. And this kind of non-contact service is also applicable to the special situation of the epidemic, which can reduce the opportunity of viral transmission and reduce the chance of mutual contact.

In addition, the process of accepting orders and selecting products in stores can also be simplified. At present, online orders are selected by shop assistants in offline stores. Manual selection is time-consuming, and it also creates a sense of crowding for offline customers. Establish a separate intelligent sorting warehouse, use RFID identification technology, intelligent robots accurately pick, pack, and deliver according to order requirements. This will make a huge contribution to saving time.

4.2.3 How to Expand the Size of Delivery Scope

According to the dense distribution of people in the city, increase the store density or expand the delivery range where appropriate.

Make accurate market segmentation, and establish offline stores and warehouses of different sizes for different consumer needs and consumer groups. Segment the market and customers, such as commercial circles and residential circles, establish different store sizes in different geographical locations according to different needs, maximize the scope of target customers, and improve customer satisfaction.

4.2.4 How to Avoid Stockout

Adjust accordingly. For example, during the epidemic period, the average price of per customer transaction of Hema has dropped from 80-90 yuan to 40 yuan (Ma & Guo, 2020). During this period, Hema should reduce high-priced products and increase the vegetables and meat those common products. Make timely adjustment.

At the same time, the shortened supply chain mentioned above is also a solution for timely replenishment supply. The closer Hema is to the supplier, the faster Hema can get the products that are stockout, avoiding the dissatisfaction caused by the out-of-stock situation to some users. Fully investigate customer needs, supply in time, and achieve a balance between supply and demand, and thereby to improve customer satisfaction.

5 Discussion

5.1 discussion

The survey results indicates that among the nine logistics service quality items of Hema, the two dimensions that have the greatest impact on customer satisfaction include timeliness and Order Release Quantities. The current results of these two items are that they make customers relatively dissatisfied, which has a negative impact on their satisfaction and needs to be improved in time. Among these dimensions, the specific impact factors include delivery time and efficiency, food freshness, delivery range, and stockout. Focusing on improving these factors will help improve customer satisfaction, thereby increasing their stickiness of using the platform, and helping Hema and other similar fresh food e-commerce platforms to obtain long-term customers and promote future development.

As a theoretical framework, LSQ can clearly and comprehensively cover the evaluation dimension of an enterprise's logistics, and comprehensively allow customers, e-commerce companies, and even the entire industry to focus on problems in a more targeted point of view, improve problems, and help multiple parties to maximize the value of benefits.

5.2 Implications

5.2.1 Theoretical Implications

This paper makes a theoretical contribution to fill the research gap in the current

logistics distribution system in the field of fresh food e-commerce. This paper uses the LSQ-customer satisfaction framework to understand which factors have the greatest impact on customer satisfaction in fresh food e-commerce logistics distribution services, and explains how they affect them, providing theoretical basis and data support for actual problems. This study is more in line with the current actual situation, and more intuitively reflects customers' requirements and tendencies for delivery services. This article provides scholars, e-commerce managers, cold chain logistics managers, customers, and other parties with better knowledge theory, so that they can more clearly understand the current shortage of logistics, their own needs, and the direction of their efforts.

Secondly, the current literature mainly focuses on analyzing the current challenges and opportunities faced by the whole fresh food e-commerce, the loss problem in cold chain transportation, how to choose the location of e-commerce offline stores and warehouse, and the problems faced by the entire e-commerce field (Song et al. al., 2017; Zhang et al., 2021; Liu & Kao, 2022), and almost all of them are aiming to improve a problem existing in the current logistics system. But there are few literatures that comprehensively evaluate the logistics system through the LSQ model and analyze problems through a specific platform. This study provides another dimension of insights for the fresh food e-commerce field, for scholars to exchange of ideas and discuss.

5.2.2 Managerial Implications

For enterprises, if they want to gain a firm foothold in the fierce competition in the e-commerce field and want to be irreplaceable in the market, improving cold chain logistics is one of the key. The improvement of logistics can not only improve customer satisfaction and enhance the attractiveness of the brand, but also reduce food loss and insist on sustainable development to enhance the brand's reputation, and at the same time increase the profit and influence of the enterprise.

Through this research, managers can find and solve problems in a more targeted angle, making enterprises run more efficiently. For example, combine different technologies, including UAV, robots, RFID, etc., to shorten logistics time; reduce product loss rate and replenishment time by shortening supply chain distance; classify different products according to different storage and transportation conditions, which can save input resources to a greater extent and maximize resource utilization. These measures are of important reference value for e-commerce managers. It helps companies to adjust in time according to the current consumer tendency to encourage them to have a higher degree of affection for the platform.

5.3 Limitations and Future Research

This study is authentic and reliable, but there are still some limitations. For example, some of the users participating in the questionnaire survey are not current long-term users of Hema. Some of them have only used Hema occasionally, and they don't have a deep understanding of it. So, part of the questionnaire results need to be verified. Therefore, the questionnaire should set some stricter constraints, such as

“your understanding of the Hema logistics distribution system” to ensure that the collected data is more effective.

In addition, since cold chain transportation will increase a certain amount of carbon emissions (Zhang et al., 2021), this paper may increase a certain amount of carbon emissions while reducing the food loss rate, which has a negative impact on the sustainable development of the environment. Further investigation is required into how to guarantee effective and practical logistics while the methods are also environment friendly. There is a critical need for future study to strike a balance between the two.

Furthermore, this article only proposes corresponding solutions based on the research results, and fails to fully understand the challenges that Hema and other fresh food e-commerce companies will face if they adopt these strategies, and whether they can be overcome. Fail to adequately investigate the specific implementation difficulties of the solutions. More comprehensive consideration should be done to make it have more reference value.

Conclusions

After learning that the most important factor for Hema Fresh are timeliness and order release quantities, other fresh food e-commerce platforms can take these two factors into account. And adopt and apply the above solutions and strategies, according to their own situation to optimal their distribution systems.

It is better if this research can make a great contribution to the cold chain logistics in e-commerce field, help companies to gain a foothold in the fiercely competitive market, and make the life of customer easier and better.

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