

Research Article

Design of Low Temperature Logistic System for Meat Product and Its Benefit

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Abstract: With the constant development of economy, income level of citizens increases day by day and more and more people change consumption quality, level, concept and means of food. To ensure food quality during transportation, emergence of low temperature logistic system makes up the consumption of meat product during transportation in time. Based on the concept and characteristics of low temperature logistic system, this study analyzes the design of current low temperature logistic systems for meat product combining with the production situation of meat product production in China and development trend of low temperature logistic systems, finds out existing problems as well as corresponding solutions, in order to optimize low temperature logistics system and promote continuous development of meat product market.

Keywords: Low temperature logistic system, meat product, problem, solution

INTRODUCTION

Since reform and opening up, food industry in China has changed dramatically. Food industry gains a booming development during this period with the enlargement of supply ability and diversity of food. Benefiting from the development, the current food industry in China still accounts for a large proportion in national economy, which improves people's living level and income. Improvement of living quality promotes the perfect of food consumption concept. People pursue for fresh and diverse products without any pollution but with timely delivery service, especially to food such as milk, meat, fruits and vegetables which greatly concern freshness retaining. To satisfy customers and realize market value of products, low temperature logistic systems draw attention from merchants. Logistic city and market are about to be subdivided and become the important components of logistic field and a special subject for researching as logistics and supply chain management deepen. Yanping and Ruhe (2006) once pointed out that, people focused on product process when it comes to food safety problem but ignored food safety during logistics process. Yuxia and Xuexin (2009) analyzed major problems existing in food logistics in food safety aspect. Moreover, Hua and Zhenhong (2009) studied problems existing in logistics of fresh food as well as solutions. Based on the understanding of low temperature logistic system, this study reveals drawbacks of low temperature logistic systems for meat product and improves them with corresponding measurements, which is benefit to optimize low temperature logistic system, effectively promote development of meat product and thus realize market value.

METHODOLOGY

Overview of low temperature logistics:

Concept of low temperature logistics: Low temperature logistics is a rapid and effective mobile service process for low temperature products which can connect main body of supply and demand subject together and overcome barrier of time, space and temperature, including cold working, cold storage, low temperature transportation and delivery as well as low temperature sale. China yields a large amount of meat product. As output of meat product gradually increases, low temperature preserved meat tends to sell more in China. In Table 1, it refers to some countries or organizations that have relative standard specification such as CAC, EU, USA and Japan.

Characteristics of low temperature logistics:

Perishability of goods delivered in low temperature: Goods delivered in low temperature are usually perishable food. During transportation, they are easy to be affected by time and climate (Zhiyong and Kan, 2007). These foods require a low temperature transportation environment to ensure food quality, thus to satisfy customers. Storage effect of perishable foods depends on the temperature in storage environment. Lower temperature would prolong refreshing time of product quality. From production to consumption, frozen foods suffer from different temperature in different stages.

Timeliness of good delivered in low temperature:

Due to short life cycle, meat product requires to be stored in low temperature during transportation. Time

Table 1: Yield of meat from year 2010 to 2014

	2010	2011	2012	2013	2014
(Ten thousand tons)	6865	8051	7756	7276	7089
Pork	4287	5197	5010	4776	4623
Beef	613	750	718	658	630
Mutton	382	469	436	360	354
Poultry	1097	1692	1470	1365	1369

of transportation and temperature both affect the quality of products, but people are hard to distinguish whether products are fresh or not by naked eyes during purchasing. But once people find the problem, sales rate would greatly reduce, which brings loss to merchants. Therefore, meat product merchants adopt high-level service to achieve high profits. To be specific, goods are usually limited by time windows before reaching sales end and deliverers are required to delivery goods within speculated time.

Informatization of low temperature logistics: Particularity of low temperature logistics determines sensitivity of products to temperature (Limin *et al.*, 2013). Goods are required to be delivered by refrigerator car and temperature is monitored in whole course. Logistics center need to scientifically figure out delivery route, number of cars to realize high-efficient operation and profits of logistics center. Thus it is necessary to use informatization means to realize real-time monitoring of logistics process, ensure quality of goods and deliver goods with the best quality to customers.

Overview of production of low temperature preserved meat product:

Production status of meat product: Since 1990s, animal husbandry has been the support of agriculture and agricultural economy and the important industry promoting adjustment of agricultural structure and income increase of farmers (Mingbao and Weishen, 2012) (Table 1).

Problems existing in construction of low temperature preserved meat product logistics in China:

Immature logistic systems for low temperature preserved food: To date, fruits and vegetables in America only have 2-5% of rate of waste in logistic process such as picking, transportation and storage (Weishen and Mingbao, 2013). According to statistics, about 90% of meat is delivered without low temperature condition and total amount of foods that are degenerative during transportation reach 70 billion Yuan, because of lagging road construction and modern infrastructure for cold storage and transportation. Due to high loss during transportation, logistics fee accounts for 70% of cost of perishable goods, which is far more than 50%, the international standard. Slow development of low temperature logistics severely threatens the development of food industry in China.

Severe situation of hygiene and food safety of low temperature logistics: Transportation and storage fee of low temperature logistics accounts for a large part in cost. Considering economical benefits, many merchants deliver frozen cargo by cars with normal temperature or refrigerator cars which cannot function, or rent refrigeration house with low price, which severely damages food quality. Moreover, in food sales process, most enterprises have no specialized food and non-food sales platform; platforms they use are without temperature isolation. As a result, external temperature interferes refrigerant temperature and refrigerant temperature also sends out. That not only causes energy consumption but also cannot ensure food safety.

Low marketization degree of logistics for low temperature preserved foods and little interference from the third party. Except foreign trade export, most perishable foods which circulate at domestic are delivered by producers and dealers. The third part logistics for low temperature preserved food develops slowly and moreover, service network and information system are not complete. That greatly influences quality on passage, accuracy and timeliness of food logistics and meanwhile, cost and wastage are high.

Imperfect technical standard and difficult monitoring: Under the effect of different consumption habits in low temperature logistics industry and large influence of market area, there are few regulations for low temperature logistics management. Making use of it, not a few merchants adopt improper means to sell customers with food in poor quality and high price. On the other hand, though China has speculated relatively perfect standard system for food quality (Qingquan, 2014) hidden danger of food safety has not been solved in a good way, as food logistics enterprises have not incorporated into the standard formally and monitoring system for logistics process of food is lack of.

Lacking of overall planning in low temperature preserved food logistics: In China, though meat has a large output, comprehensive professional talents concerning low temperature preserved food logistics are lack of and meanwhile, supply chain is not overall planned and coordinated, resulting in severe imbalance and inconsistency in local development and affecting resource integration of low temperature preserved food logistics and promotion of the industry.

Necessity of establishing low temperature logistics system for meat:

Ensuing meat safety: Beside effective control of hazardous substance or toxic substance content in meat, safety of meat also depends on temperature control during processing, storage and transportation and sales (Maoyun, 2010). According to general process of low

temperature logistics, low temperature logistics system for meat has hidden dangers from raw materials to cold treatment process, from cold treatment to cold storage process, from cold storage to delivery terminal, from delivery terminal to terminal of low temperature logistics.

Remaining meat quality: Compared to other foods, meat containing abundant nutritional components is benefit for the growth and reproduction of bacterial; as a result, meat is easy to be rotten. But reproduction of bacteria and performance of enzyme activity require proper temperature and water condition. Under low temperature, storage time prolongs as reproduction of bacteria and functions of enzyme are inhibited. Compared to other meat products, chilled meat and low temperature preserved meat products are more popular in market as they are of less damaged nutritional components and high nutritional value.

ASSUMPTION OF STRUCTURE OF LOW TEMPERATURE LOGISTICS SYSTEM FOR MEAT

Strengthening the formation of relevant support policies for low temperature logistics industry for meat: Frequently fluctuated price results in high operational risk and low profit of low temperature logistics for meat. Meanwhile, meat is the main component in citizen's shopping basket. Thus optimized construction of low temperature logistics system for meat cannot do without supports from government. For instance, government offers financial support for public information platform construction, logistics standardization construction, logistics statistical system and input and training of personnel in model low temperature meat logistics enterprise and low temperature meat logistics projects.

Offering financial support and tax preference from government and attracting more enterprises to involve in competition of low temperature logistics market: Development of low temperature logistics for meat cannot stand away from financial support of government. Low temperature logistics should be regarded as national investment, policy guidance and strategic focus attracting foreign investment. Government should offer concentrated support and incline in budget arrangement and industrial and agricultural construction plan, consider to relief added-value tax and income tax of cold chain logistics enterprise, wholesale market and distribution center and carry out preferential loan policies for cold agricultural product cold chain logistics industry including low interest, interest subsidy, relaxing repayment deadline and supporting foreign investment interference.

Strengthening the supervision of low temperature logistic for meat: It is necessary to get a general knowledge of overview of current meat industry and low temperature logistics mode and operational means, thereby providing practical basis for improving low temperature meat logistics. During optimization of meat logistics, government and enterprise should put emphasis on green safety management, promote unified technical standard and performance standard which are in line with the international world and ensure quality of meat during delivery.

Integrating the third part resources of low temperature meat logistics: Compared to traditional self-running logistics pattern of meat, the third party logistics mode has better logistics network. For small and medium size meat production enterprises and dealers, outsourcing of logistics business to the third part logistic supplier is the best choice. That is because meat logistics business with larger value-added space not only reduces funding but also helps those enterprises to pay more attention to core business, i.e., production, marketing and purchasing and strengthen core competition.

CONCLUSION

With the increase of meat consumption market, low temperature meat draws attention from merchants for its advantages and becomes the mainstream form of meat consumption. Due to regional difference, meat usually gets bad during delivery; therefore, low temperature logistics becomes the necessary requirement for ensuing safety and quality of meat. We should strengthen monitoring of meat quality, integrate resources of the third party logistics, perfect informatization platform of low temperature meat logistics, improve level of technologies and equipments, optimize construction of low temperature meat logistics system and promote sustainable development of meat market, thus to realize the final economical benefits under the premise of maximum customer satisfaction.

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