Research on Supply Chain Development of Traditional Chinese Medicine

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Abstract

The supply chain of traditional Chinese medicine refers to the production of intermediate products and final products from the core enterprises, through the control of business flow, logistics, information flow and capital flow, from the cultivation of Chinese medicinal materials. Finally, the functional network chain structure that connects the suppliers, manufacturers, distributors, retailers and end-users to the consumers by the sales network. This paper expounds the problems existing in the supply chain of traditional Chinese medicine in planting, harvesting, processing, packaging, storage and marketing of Chinese medicinal materials. It also points out that China can learn from the success of the supply chain of Chinese herbal medicine in Japan. Experience strengthens the standardization of Chinese herbal medicine planting and quality control of Chinese herbal pieces and promotes the development of Chinese medicine industry.

Keywords

Chinese medicine supply chain; Standardization of Chinese medicinal materials planting; Quality control of Chinese herbal pieces

Introduction

Traditional Chinese medicine is the treasure and crystallization of the Chinese nation. In the long term development practice, Chinese medicine has fully absorbed the core concept of Chinese traditional culture, with its rich natural resources, remarkable curative effects, strong national characteristics, unique diagnosis and treatment methods, systematic theoretical system and vast historical data. The Chinese medicine industry is very important in the field of global medical research. Chinese herbal medicine is the foundation of the Chinese medicine system. In recent years, with the rapid growth of the public's demand for Chinese medicine services, the cultivation, circulation and production of Chinese herbal medicines have become an important

part of the Chinese Medicine industry. In order to enhance the competitiveness of Chinese medicine production enterprises and Chinese herbal medicine planting enterprises, they must cooperate closely and fully rely on the market to improve the overall efficiency of the supply chain. Therefore, strengthening the research on the supply chain of Chinese medicine is of great significance for the development of traditional Chinese medicine system and the inheritance of Chinese traditional culture.

Connotation of Traditional Chinese Medicine Supply Chain

The concept of supply chain originated from the English "Supply Chain", which was born and developed in 1980s. Many scholars have put forward the definition of supply chain from different angles and levels: Harrison thinks that the supply chain is a functional network chain which includes raw materials, production, and finally sold to users; Evens thinks that supply chain flows through information flow and feedback. The suppliers, manufacturers, wholesalers, retailers and end consumers are linked into a whole. Charles C. Poirier defines the supply chain as a system network composed of wholesalers, suppliers, manufacturers, retailers and consumers, and can transfer products or services to consumers. Johnson Wood believes that the supply chain is a product or service system that includes all the manufacturers in the upper, middle and lower reaches. Ma Shihua, a domestic scholar, thinks that the supply chain is mainly centered around the central enterprise, which controls the logistics, information flow and capital flow together, and integrates material supply, production, processing, transportation and sales. The functional network chain structure is composed of suppliers, manufacturers, distributors, retailers and end-users (Wang, 2014; Wang, 2015). Combined with the research findings of the above scholars, according to the circulation process of Chinese herbal medicines, including Chinese herbal medicine planting, harvesting, processing, packaging, storage, transportation, sales and other links, Wang Xianju, a domestic scholar, simply defines the supply chain of traditional Chinese medicine as the core enterprise. Through the control of business flow, logistics, information flow and capital flow, starting from the cultivation of Chinese medicinal materials, the intermediate products and final products are made, and finally, the functional network chain structure of the suppliers, manufacturers, distributors, retailers and end-users is sent to the consumers by the sales network.

Problems in the Supply Chain of Traditional Chinese Medicine

Planting management of Chinese medicinal materials is not scientific

The resources of Chinese medicinal herbs are abundant in China. According to the survey results of nearly 10 years (1983-1993) organized by the National Census Office of traditional Chinese medicine resources, there are 12807 kinds of medicinal plants, animals and minerals in China. About 11,146 species of medicinal plants are in the majority. Most of the medicinal plants are applied in China, among which 1200 are wild herbs, and 20% are cultivated medicinal materials. The use of cultivated medicinal materials is about 3 times that of wild herbs. This shows the importance of cultivating medicinal materials (Yang & He, 2020). At present, there are still some deficiencies in the cultivation of Chinese medicinal materials in most parts of China. Because most of them are farmers, they mainly rely on accumulated experience to cultivate medicinal materials, and the level of science and technology is not high enough to pursue the output and quantity of Chinese medicinal herbs too much. The lack of rationality in the use of pesticides and fertilizers leads to a series of quality

problems such as heavy metal content, pesticide residue and quality of Chinese herbal medicines.

Chinese medicine collection is not scientific

There are many kinds of traditional Chinese medicine with different uses, and the best harvest time is also different. The best harvest period is for the quality of traditional Chinese medicine. The quality of Chinese medicinal materials depends on the content of effective ingredients. Some Chinese medicinal materials have the highest content of active ingredients in specific seasons or a certain period of time, and less effective components in other periods. With the increase of growth years, some Chinese medicinal herbs will gradually increase their effective components. Some Chinese medicinal herbs will reach peak value when they grow to a certain period, and then gradually decrease. The harvest time of medicinal herbs will directly affect the yield, quality and harvest efficiency of medicinal materials. Suitable harvest has a good effect on the yield, quality and harvest efficiency of medicinal materials. However, some medicinal herbs are used to extract medicinal materials more often or earlier than harvest time, so that the quality of medicinal materials is affected and the clinical efficacy is affected.

Quality problems of Chinese herbal pieces

Traditional Chinese medicine doctors believe that only after fire processing can traditional Chinese medicine meet the theory and requirements of the use of traditional Chinese medicine. After scientific and standardized fire preparation, prepared slices can reduce the toxicity, enhance the curative effect and reduce the clinical adverse reactions at the same time (Li, Li, Chen & et al., 2019). Chinese herbal pieces can be used in the clinical formula of Chinese medicine, and also in the production of medicine production. Its quality directly affects the clinical efficacy of Chinese medicine and the quality of proprietary Chinese medicines. Strengthening the management of Chinese herbal pieces and ensuring the quality and safety of Chinese herbal pieces are of great significance for maintaining public health and promoting the sustained and healthy development of Chinese medicine industry. In recent years, the quality of Chinese herbal pieces has improved over the past few years through the vigorous supervision of drug supervision departments at all levels. However, there are still a lot of irregular processing methods in Chinese herbal medicine processing, which hinders the clinical application of Chinese medicine.

A. There is a lack of uniform standard for processing slices

The standards of Chinese herbal medicines and Chinese herbal medicines are divided into national standards (namely *Chinese Pharmacopoeia*), ministerial standards and local standards. Under such circumstances, the national standards and local standards coexist. The contents of the two standards differ greatly, and the processing methods and processing specifications of different places are different. For example, in the case of using sophora charcoal for fire, there are the following regulations on the fire: Beijing regulates the use of big fire to stir-fry until scorched brown, Anhui regulates the use of medium fire (Wang & Zhao, 2019).

There is also the cutting of herbal pieces, in addition to horizontal slices, slicing, slicing, there are also a large number of longitudinal slices widely used in the market, but the specifications of longitudinal slices are not included in the current standard of traditional Chinese medicine, so how to determine whether the slices are

qualified or not is a problem to be solved (Zhang, Li, Shi & et al., 2018). At present, the standard of Chinese medicine slices does not contain the specifications of herbal pieces. How to determine whether the chips are qualified is a problem to be solved. The level is uneven and needs to be improved (Guo & Liu, 2016).

B. Excessive use of sulfur fumigation

Sulphur Fumigation is one of the most commonly used methods to preserve Chinese herbal medicine. It can prevent insects, mildew, whiten and store. However, excessive use of sulphur to treat Chinese herbal medicine will definitely affect the quality and efficacy of medicinal materials, and also cause great harm to human health. Chinese herbal medicines and Chinese herbal medicines such as Radix Paeoniae Alba, Radix Angelicae Dahuricae, Lily rhizome, Pinellia ternata, Ginseng and Fritillary Bulb were found to have exceeded the standard of sulfur dioxide due to excessive sulphur fumigation (Wei & Ma, 2019). With the strengthening of supervision, the Sulphur Fumigation situation has been reduced in recent years, and some scientific and feasible processing and storage technologies have been gradually promoted and used in the industry.

C. Processing is not standardized

Dialectical treatment is the essence of Chinese medicine, and "medicine" and "disease" are identical. Only in this way can we produce "syndrome differentiation and treatment". Therefore, if we do not produce according to the standard of processing, there will be more problems. For example, rhubarb has different processing methods, such as "rhubarb", "cooked rhubarb", "rhubarb charcoal" and so on. Different processing methods will change its sex, taste, meridian tropism and functional indications. If we do not pay attention to differentiation when processing, it will lead to "drug evidence does not match" and affect the curative effect (Li, Li, Chen & et al., 2019). Monkshood and Radix Aconiti are toxic Chinese medicines, which need to be processed to reduce toxicity. However, it is found that there is excessive processing in production, although excessive processing can reduce toxicity, but at the same time, the effective ingredients of the drugs will change, so that the tablets will lose efficacy (Wei & Ma, 2019).

Packaging is not standardized

In 2004, the State Food and Drug Administration issued the notice on promoting the implementation of GMP in Chinese herbal medicines and other categories of drugs. It established an admittance system for the production of Chinese herbal pieces, and gradually standardized the production of Chinese herbal pieces. However, there are still many problems in the production process of Chinese herbal pieces, such as outer packing, according to the literature survey. The following problems are found in packaging: (1) The packaging materials are not suitable for the properties of Chinese herbal pieces. The State Food and Drug Administration clearly stipulates that the packaging materials and containers that are compatible with the nature of the medicine and conform to the quality requirements of the medicine should be selected. However, some enterprises have not selected the packaging materials that are suitable for the properties of Chinese herbal medicines. Instead, it is difficult to guarantee the quality of Chinese herbal pieces in the shelf life by using polyethylene plastic film as packing material; (2) Incomplete labeling items of herbal pieces. The implementation of the drug administration law clearly stipulates that the packaging of Chinese herbal pieces must be printed or labelled, and the origin, production date, product batch number, production enterprise,

name and specifications of the pieces should be marked on the label, and packaging must be made in the course of shipment. Some companies have to fill in the contents of the labels of Chinese herbal medicine randomly after they have been disassembled. Some companies only fill in the name of the Chinese herbal pieces on the zero packing bags, and do not specify the information of the manufacturers, production numbers, etc., which affect the storage of the drinking pieces; (3) The processing standard of Chinese herbal pieces is not indicated on the label; (4) The name of Chinese herbal medicine is confused with the name of medicinal material, such as the name of the kernel (the name of the tablet) is ginkgo (medicinal name); (5) Different labels of the same Chinese herbal pieces. Although some Chinese medicine pieces belong to the same piece, their labels are inconsistent. For example, the specification mark of Caulis Sargentodoxae is "uniform" and "uniform (film)". This problem is mainly caused by different quality inspectors in different ways, which reflects that the Chinese herbal pieces produced by the manufacturers are not standardized according to the standard procedure (Wu, Zhou & Wang, 2015).

Improper storage of Chinese medicinal materials

Chinese herbal medicine and decoction pieces are various and different in composition. If they are not handled properly during storage, they are likely to be spoiled by factors such as humidity, temperature, light, moisture content of the medicinal materials, processing and packaging methods, such as dangshen, astragalus, ginseng and so on. Insects, such as coix seed, nutmeg and woodlouse worm, are liable to mold. Improper storage not only affects the quality and curative effect of Chinese medicine, but also causes the waste and economic loss of medicinal materials (Wei & Ma, 2019). How to do well in the storage management of Chinese herbal pieces and ensure the quality of medicinal materials and pieces has become a common problem faced by the Chinese medicine industry.

Counterfeiting caused by inadequate supervision on the sale of traditional Chinese medicine

A. Illegal doping, weight gain and dyeing

The *Chinese Pharmacopoeia* stipulates the source of every medicinal herb. The source of Chinese medicinal materials must be consistent with the Pharmacopoeia. However, some illegal traders add inorganic salts, non medicinal parts, sediment and other substances to increase the weight of herbs and slices in the processing of medicinal materials in order to gain benefits. For example, by adding iron nails to gain weight in 37, bupleurum and so on are mixed with more aerial parts. Soaking grass with sulphate or sugar can increase weight. Some illegal businesses even dye their crude drugs with pigments or toxic industrial dyes, and increase the appearance of medicinal herbs to cover up the problems such as character changes, adulteration, inferior quality, mildew and weight gain after being extracted.

B. Counterfeit instead of genuine medicinal materials

Some genuine medicinal materials are usually adulterated with counterfeit or non genuine adulterated adulterant products because of their less sources and shortage of resources. The most prominent problems are:

Fritillaria pallida impersonated Fritillaria thunbergii, ginseng and sweet potato as yam; tiger palm or water Pinellia as a Pinellia ternata; Hubei Fritillaria is mixed with Fritillaria thunbergii, Potentilla chinensis and so on.

Suggestions and opinions

The Chinese medicine in Japan is a traditional Japanese medicine developed on the basis of Chinese traditional medicine. The Chinese medicine is a medicine which is applied under the guidance of the Chinese medicine theory. At present, there are more than 100 manufacturers of Chinese herbal preparations in Japan, and the most famous ones are the Jin Village Shun Hall and the Chung spinning plant society. The village of Jin village is the largest production plant of Chinese medicine in the world, starting in 1976.In the past 11 years, 129 Chinese herbal medicine preparations have been applied, and the license for production and sale has been obtained. By the year 2015, its market share in the field of Chinese medicine in the world has accounted for 84.5%. No one can shake up the monopoly market. The reasons for the great success of Japanese Chinese medicine production enterprises at home and abroad are mainly due to the following reasons. First, attention was paid to the control of the quality, effectiveness and safety of pharmaceutical products. In.1974, the Ministry of health and labor of Japan formulated and implemented the "standards for drug production quality management" (GMP). In 1987, the Japanese side Pharmaceutical Association of Japan formulated the "production management and quality management standard of Chinese herbal extract preparations for medical use" (Han Fang GMP).In 2012, the Federation of pharmaceutical manufacturers of Japan formulated the relevant standards for the manufacture and quality control of pharmacognosy and Chinese pharmacognosy preparations (GMP). Second, all pharmaceutical companies under the Federation must comply with the standards. The research on quality control methods and standards of Chinese herbal medicine production is highly valued. In the field of medicinal plant cultivation, the Chinese herbal medicine enterprises mainly follow the guidelines for the production and quality management of medicinal plants planted and collected by the Ministry of health and labour in 2003 (GAP) and the guidelines for the cultivation, collection and processing of medicinal plants published by the Han Fang Pharmaceutical Association of Japan. Transplant modern agricultural technology to plant medicine, and pay attention to the use of small machinery for intensive cultivation in the field operation, pay attention to the monitoring and tracking of effective ingredients, and try not to use fertilizers and pesticides (Ding, Li, Zhang & et al., 2018; Feng & Luo, 2006). Besides the quality management standard of the whole process of medicinal plants, the Chinese Medicine enterprises also have advanced production equipment, fully automated production processes and processes. All these have made Japanese Han Fang preparations recognized by Japanese people and even part of the international market.

In view of the fact that there are some similarities between the Chinese herbal preparations in Japan and the classic prescriptions in traditional Chinese medicine, the development of the industry supply chain is worth learning from in China. The supply chain of the Japanese herbal medicine industry generally has 2 experiences worth learning from. First of all, strengthening the standardization of Chinese medicinal materials planting. There are 12807 kinds of Chinese herbal medicine resources in China. The planting area of medicinal herbs is 19 million 260 thousand mu, and the annual output value of Chinese herbal medicines has reached 3 billion 500 million yuan. So we can see that the varieties, areas and yields of Chinese medicinal

herbs have absolute advantages compared with that of Japan. In addition, due to violation of natural law, reclamation and other reasons, the resources of wild traditional Chinese medicine have been reduced and dried up, and the standardized cultivation management of Chinese herbal medicines is not perfect. In view of these circumstances, we can learn from the development experience of Japanese medicinal plant planting industry, strengthen investment in science and technology, and speed up the formulation and implementation of standards and technical specifications for Chinese herbal medicines, so as to realize the harmless production of Chinese medicinal materials. To ensure the quality and safety of Chinese medicinal materials (Feng & Luo, 2006). Secondly, the quality of Chinese herbal medicine is very important. The Chinese prescription has strict requirements for the quality standard of crude drugs. This is also the key to ensuring the quality of Chinese herbal preparations (Chen, Cai & Zhang, 2018). There are many traditional Chinese medicine manufacturers. The quality and the market competitiveness of Chinese patent medicines can be guaranteed only by ensuring the quality of the important raw materials and the source.

Reference

Wang, J.L. (2014). Study on the competitiveness of Chinese herbal medicine industry in Dingxi, Gansu from the perspective of supply chain. PhD. Dissertation. Lanzhou: LanZhou JiaoTong University, 15.

Wang, X.J. (2015). Research on quality traceability of Chinese herbal medicines from the perspective of supply chain. *Lishizhen Medicine and Materia Medica Research*, 26(10), 2521-2522.

Yang, X., & He, S.W. (2020). Discussion on the current situation of Chinese medicinal plant cultivation and the specific measures to improve the quality of Chinese medicinal materials planting. *Seed Science & Technology*, 2020,5:109-110.

Zhang, P., Li, M.H., Shi, Y., & et al. (2018). Discussion on the quality of Chinese herbal medicines and pieces in 2013-2016 and related issues. *Chinese Pharmaceutical Affairs*, 32(4), 438-444.

Li, B., Li, C.Y., Chen, J., & et al. (2019). Analysis of the current situation and development of Chinese herbal medicine industry. *Chinese Journal of Information on Traditional Chinese Medicine*, 26(4), 10-13.

Wang, H.Y., & Zhao, J.H. (2019). Analysis and Management Countermeasures of nonstandard processing of Chinese herbal pieces. *China Health Industry*, 20, 185-186.

Guo, T., & Liu, Y.Y. (2016). Some thoughts on the current standard of Chinese herbal medicine. *Guiding Journal of Traditional Chinese Medicine and Pharmacy*, 22(8), 62-63, 66.

Wei, F., & Ma, S.C. (2019). Quality and safety profile of Chinese herbal medicine pieces and supervision thinking. *China Food Drug Administration*, 3, 22-29.

Wu, Q., Zhou, J.T., & Wang, S.X. (2015). Problems and management measures in packaging of Chinese herbal pieces. *Pharmacy Today*, 25(5), 385-387.

Ding, T., Li, G., Zhang, H., & et al. (2018). Analysis and Thinking on the development of Chinese herbal medicine industry in Japan. *Modern Chinese Medicine*, 20(7), 785-790.

Feng, G.Z., & Luo, S.N. (2006). The development of Chinese medicine industry from the success of Japanese herbal medicine in Japan. *Chinese Pharmacy*, 17(20), 1526-1528.

Chen, X.M., Cai, Q.J., Zhang, H.M. (2018) The general situation of Chinese medicine in Japan and Its inspiration to the research and development of Chinese ancient classic prescriptions. *Chinese Journal of Library and Information Science*, 42(2), 1-4.