

On the Twain Food Supply Chain in China
--Impact of Supermarket Development on
Agricultural Sector and Agrifood safety in China—

Dinghuan Hu

**Invited paper prepared for presentation at the
International Association of Agricultural Economists Conference,
Gold Coast, Australia, August 12-18, 2006**

Copyright 2006 by Dinghuan Hu. All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means, provided that this copyright notice appears on all such copies.

On the Twain Food Supply Chain in China

--Impact of Supermarket Development on Agricultural Sector and

Agrifood safety in China—

*Dr. Dinghuan Hu*¹

Abstract

Food safety is attracting more and more attention by sectors of various kinds. However, the contradiction faced by China is the continuous growing safety and quality agrifood market and export demand together with large volumes of distributed and un-organized small-scale rural household production. If we cannot effectively organize agrifood production of distributed rural households, provide technical guidance, and exercise supervision during the production process, it is obvious that it is difficult to supply safety and quality agrifood in large volumes, sustainably and steadily. In the first place, this study has put forward the fact that the rapid development of supermarket in China has created favorable and irreplaceable objective conditions for safety and quality agrifood production in China. The management and supervision costs over supermarket supply chain by the society and government departments are much lower than those in traditional country fairs and wholesale markets. We can adopt the model of “supermarket + leading enterprises (agrifood suppliers) + rural households”, to guide thousands of small-scale rural households to access to supermarket supply chains so as to speed up the pace of the popularization of safety and quality agrifood.

Key words: safety agrifood; agrifood distribution; supermarkets; agrifood supply chain; small-scale farmers

I. Introduction

Since mid-1990s, supermarket has gain its rapid development in China and the operated agrifood varieties and quantity have continuously increased (Dinghuan Hu, Thomas Reardon, Frank Fuller, 2004). The chained supermarket owns thousands of stores and exercise concentrated procurement of agrifood, which has not only reduces operation costs, but also increased control and representation force over the upper flow of agrifood supply (Bill Vorley, 2004).

At present, the issue of agrifood safety has been attached even more importance. Along with input increase of pesticide, chemical fertilizer and herbicide in the process of agricultural production, and expansion of environment pollution during the industrialization progress, the consumers are more worried about the safety of agrifood and the voice for safety and quality agrifood is continuously increasing. The agrifood production and distribution model of small-scale rural farmer is broadly applied and based on rural household operation. Due to the fact that there

¹ Dinghuan Hu: Professor of Institute of Agricultural Economics & Development, Chinese Academy of Agricultural Sciences. E-mail: dhhu@163bj.com

are some congenital shortcomings in small-scale agrifood production (Chen Yuefeng, 2004/China News Network, 2003), it becomes more difficult to provide “safety and quality” agrifood for the consumers, if we ignore system reform. Although the government institutions can play certain role in supervision in the aspect of controlling agrifood safety and quality, yet if we establish effective safety and quality agrifood production and distribution system in different periods, the government supervision cost will become very high with unoptimistic effect. In addition, the huge legal team might bring out additional burden for agrifood production, distribution and consumers.

This paper attempts to explore the fact that the supermarkets under rapid development (Dinghuan Hu, Thomas Reardon, Scott Rozelle, Peter Timmer & Honglin Wang, 2004) might help the establishment of safety and quality agrifood production and distribution systems.

II. Documentation Review

The issue of agrifood safety is attached importance from various sectors (Chen Xiwen, Han Jun, et al., 2004). The factors influencing agrifood safety can be summarized as follows: (1) Environment pollution (Zhang Shanling, Zhang Jianhui, 2004). (2) Unconscious pollution during the process of cultivation and husbandry (Fu Guiping, Liang Guimei, 2004); (3) Conscious pollution (China News Network, September 2003); (4) Microorganism pollution during the process of processing (Department of Hygienic Regulation and Supervision, 2004), etc. The pesticide and veterinary drug residue left in agrifood has not only influenced agrifood export (Chen Rongjie, 2004) but also become the major “killer” for the health of the consumers (Department of Hygienic Regulation and Supervision, 2004).

Problems related to agrifood safety and quality management have become the hot spot of numerous studies. Shang Jie, et al. put forward the thought that the issue of knowledge and acceptance of “safety agrifood” by consumers has become “the maximum obstruct in opening up domestic safety agrifood market” (2002 to be consulted). Li Yong, et al. holds the view that “information asymmetry will cause harm of safety agrifood market”. It needs government interference so as to gradually make safety agrifood market in an information symmetry state (Li Yong, Ren Groyuan and Yang Wanjiang, 2004). Zhang Yunhua, et al. pointed out that “longitudinal direction contract coordination” would be the “major cooperation form among companies and between company and rural farmers in the supply of safety agrifood in food industry in China” (Zhang Yunhua, Kong Xiangzhi, Luo Dan, 2004). In the aspect of agrifood safety and quality management, the opinions of the Chinese researchers tend to strengthen the management function and effective policies of the government departments. They pointed out that we need to (1) Legalization of food quality and safety; (2) Implementation of origin labeling system; (3) Strengthening consumer education; (4) Improving examination system and certification system (Zhou Jie, Qian Fengyan, Ma Chengwu, 2004).

However, considering from the angle of agrifood supply chain, we put forward a point of view of establishing a complete safety and quality agrifood supply system including production and distribution, but up to now we have not seen it.

III. Dual Structure of Agrifood

To study the issue of agrifood safety and quality, we must first differentiate “safety and quality agrifood” from general agrifood. Today when agrifood is more and more easily polluted by pesticides, chemical fertilizers, water sources, air and other environment factors (Song Ming, 2003; Jiang Jinbiao, Xie Guojing, 2002; Xiao Min, Ma Weikun, He Deqiang, 2004), we can not easily distinguish two kinds of quality agrifood in appearance. One kind is the “safe and quality agrifood” and the other is “common agrifood”. The “safe and quality agrifood” refers to agrifood that is distinguished from other agrifood, in which cultivation environment has strictly recognized safe, scientific cultivation methods have been adopted, rational application of pesticide (not applying pesticide that will cause residue problems and environment pollution) and chemical fertilizer has been practiced, the edible part is free from toxin, hazards and demand of nutrition requirements are met, agrifood has normal color, fragrance, taste characters, and it is proven non-pathogenic and hazardous after normal ingestion by human beings. While the “common agrifood” refers to agrifood that the growing environment and production method cannot be determined safe, and we could not determine the current and potential pathogenesis and hazard of agrifood after ingestion by human beings.

Although there exists the possibility of the fact that the latter agrifood has equal nutrition or matched nutrition with the former agrifood, yet due to the fact that safe and quality agrifood has been proved safe and common agrifood could not provide effective proof. Therefore, we cannot make equal of the two kinds of agrifood and they belong to different quality agrifood. As for mastering general knowledge of safety, for consumers with certain purchasing power, the consumption of agrifood should not only meet the requirements of vision, taste and stomach, but more importantly to acquire “safety” guarantee through effective means, so as to make them feel safe after consumption of the agrifood. However, due to the fact that quality and safety agrifood is produced by adopting a production and distribution pattern different from general agrifood, in the introduction phase the production volume is small and technique is in need of maturity, with high material cost input and high management cost, and high risk cost, therefore it is natural that their price is higher than general; agrifood.

IV. Certification System of Agrifood Dual Structure

The determination of safety and quality agrifood needs reliable basis; therefore, quality certification system is essential. At present, in China the extensively adopted agrifood safety and quality certification system includes GMP (good management practice), HACCP (hazard analysis critical control point), ISO9000 (quality guarantee system), as well as EUROGAP, etc. (Li Zhengming, Lu Lin, Li Qiu, 2004). In addition to GMP, HACCP, ISO9000, and EUROGAP certification systems imported from abroad, the Chinese quality certification system is now under establishment. (Li Zhenming et al., 2004). In general, a safety and quality agrifood certification system can be broken down into two categories: “estimated quality and safety system” and “retrospective quality and safety system”. The adoption of “estimated quality and safety system” has the aims of estimating various major links that would produce unsafe factors before the

production of agrifood. Hence, we could strengthen an effective control over these links, so as to control or reduce the source of producing these unsafe factors. The aim of “retrospective quality and safety system” is to keep records of production process and when unfavorable results occur, we can trace their source and find out the problem and responsibility. Therefore, we could effectively stop the source of unsafe factors. Some safe food safety certification systems have both functions, for example, the EUROGAP (Wu Shuangmin, Ouyang Hong, 2003; Li Huailin, 2002).

Safe food certification system is essential for the determination of agrifood safety. However, to introduce a whole set of safety and quality certification system, it is essential to invest large quantities of funds and manpower. These input include the approval of the system by the government or third party institutions, the training of safety implementers, etc. In addition to fund input, it needs, in general, several months of labor before the establishment of such certification system. However, if we do not establish this set of systems, we could not determine the actual nature of “safety and quality” of safety and quality agrifood. The safety and quality agrifood that has been authenticated has even higher added value, but, for single small-scale rural households, it is not economical and a heavy burden.

In reality, the certification system of safety and quality agrifood only belongs to a tool. If we do not have a good system and mechanism to support it, even if we have advanced certification system and examination means we could not obtain scientific conclusion, on the contrary, it will cause even greater loss for the state and the consumers.

V. Dual Consumption Structure of Agrifood

In market economy, the varieties and quality of supplied agrifood are restricted by its consumption demand. However, the relation between the two is unity of opposites. If agrifood producers and distributors have no courage to innovation, they do not develop new products and then put them into the market, the consumers could not produce new consumption desire because of not in contact with the new products. At present, safety and quality agrifood belongs to a kind of “new emerging things”. Due to the fact that safety and quality agrifood is difficult to distinguish from general agrifood in appearance, and the price is higher than general agrifood, or several folds higher price than general agrifood, therefore it is irrefutable that the consumers will doubt or wait and see when they first contact with it. It needs a gradual course for the consumers to accept safety and quality agrifood. Because: (1) The consumers need time to recognize the internal value and significance of safety and quality agrifood, including the social significance of environment protection and sustainable agricultural development; (2) The consumers should fully believe the actuality of safety and quality agrifood and they should be genuine goods at a fair price. In other words, we should enable the consumers to fully recognize the safety and quality agrifood. Due to the fact that restricted by budget, the consumers might purchase the higher priced safety and quality agrifood after meeting the basic living demand.

Before the popularization of safety and quality agrifood, or even within a very long period of time, there have co-existed two types of consumption populations, one is a stable “safety and quality agrifood” consumption population and another is a general agrifood consumption population. The characters of the “safety and quality agrifood” consumption population are as follows: (1) High income and well-off living; (2) Fairly high culture and educational level that is

easy to accept new things and new conception; (3) Those who pay attention to living quality and stress on health; (4) Those who live in environment where they can conveniently make use of “safety and quality agrifood”. As for a consumption population, the “safety and quality agrifood” consumption population is a gradual growing and expanded population. At first it is the few innovators who dare to attempt new things, then forming increasingly large and stable “safety and quality agrifood” consumption population. In addition to economic development and the improvement of consumer’s payment capacity, more importantly the expansion of the “safety and quality agrifood” consumption population is the transformation of consumption consciousness. As an important public undertaking, the government, educational institutions, media and relevant enterprises have the propagation responsibility and obligations. Because, the production of safety and quality agrifood is favorable for strengthening Chinese people’s health, and plays an active role in improving existing environment and increasing the international competitiveness of agrifood. It is also the symbol of social advances and civilization. If it is impossible to popularize the safety and quality agrifood products among the consumers and producers in a country, it is impossible for a country to produce safety and quality agrifood products of international competitiveness to meet the increasing demand for safety and quality agrifood products in both domestic and foreign markets.

VI. Dual Retail Structure of Agrifood

On the agrifood supply chain, the retail phase is very essential to the safety and quality of agrifood. On one hand, because of the “dual value” of the safety and quality agrifood during this phase, i.e., the process of realizing commodity value and safety and quality value. Their “safety” and “quality” need to be recognized by the terminal consumers. On the other hand, retail situation per se exists qualification issues of operated safety and quality agrifood, in other words, the conditions for the consumers to believe the commodity is safety and quality agrifood.

Since the 1980s, along with the withdraw of state and collective vegetable market as well as food stores from the agrifood retail sector, country fairs with private peddlers has gradually dominated agrifood retail sector. Although country fairs may better serve more “relatively poverty population” (Bill Vorley, 2004), provide employment opportunities and reduce agrifood retail cost, yet the private peddlers in the country fairs has the following shortcomings: (1) Too small operation scope with distributed people and is difficult to exercise control over the safety and quality of agrifood; (2) Higher mobility. Once problems occur, it is difficult to find out the responsible people; (3) Less input. It is short of hardware equipment to guarantee the safety and quality of agrifood. Such as clean marketing environment, reliable cold chain equipment; (4) It is difficult to trace the source of agrifood marketed here; (5) It is difficult for the small-scale peddlers to control the upper flow departments of the supply chains; (6) The quality of private peddlers is uneven. Individual peddlers are lack of commercial moral and some of them have fraudulent behaviors; (7) Consumers have low confidence in private peddlers; (8) The objective market of private peddlers is the general agrifood consumption population who pays more attention to agrifood price. In fact, the traditional country fairs with individual peddlers as the main body are unsuitable for marketing safety and quality agrifood, only it important reforms are undertaken.

Since mid-1990s, the development speed of supermarket has exceeded that of any country in the world (Dinghuan Hu, Thomas Reardon, Frank Fuller, 2004). The supermarket in China has expanded from large cities to majority of medium- and small-size cities, even to townships in rural areas. In quantity, China had the first supermarket in 1991, and expanded to have 74 000 supermarket stores in 2003. Among the total marketing amount of 460 billion RMB yuan by supermarkets in China, about 300 billion RMB yuan were food while 125 billion RMB yuan were fresh and raw food, including fruits, vegetables, aquatic products and meat (Dinghuan Hu, Thomas Reardon, Scott Rozelle, Peter Timmer & Honglin Wang, 2004).

The greatest difference between supermarkets and wet market lies in that the former has the capacity of controlling the whole agrifood supply chain while the latter does not have. Because: (1) As compare with the wet markets, the supermarkets adopt organized and systematic management; (2) Supermarkets have fairly perfect transportation conditions, have the capacity of assured agrifood safety and quality during the whole process of transportation via refrigeration method. (Guijun Zhuang, 2004); (3) The supermarkets adopt a systematic and labeling system for all commodities, obvious labeling and sale region can distinguish safety and quality agrifood from the common ones; (4) The supermarkets adopt computer labeling system, and can provide tracing service of safety and quality agrifood for the consumers; (5) The supermarkets have strong negotiation capacity, and can have direct and indirect control of the upper stream departments, including the suppliers and contracted rural farmers; (6) The supermarkets can establish their own agrifood safety and quality standards; (7) The supermarkets can use their enterprise reputation to guarantee the safety and quality of the agrifood. The supermarkets will suffer from even greater losses in case of contract violation; and (8) In the competition with private peddlers, the supermarkets can bring into full play its advantages, only when operating safety and quality agrifood. Due to the fact that operation of safety and quality agrifood can become a “selling point for the consumers, under the drive of maximum profit, supermarket can take the initiative to introduce and expand the business scope of safety and quality agrifood.

Therefore, in the retail phase, there are two different retail systems, one is the common agrifood retail system represented by the country fairs and another one is the safety and quality agrifood retail system represented by supermarkets. Although in order to attract more consumers of different consumption levels, the supermarkets operate safety and quality agrifood while operate general agrifood, yet, the reason for supermarkets to market safety and quality agrifood is that the supermarkets have the capacity to control agrifood quality. The small-scale private peddlers at the country fairs do not have this capacity.

VII. Dual Distribution Structure of Agrifood

The distribution phase of agrifood refers to the whole process from the end of agrifood production phase to the beginning of the retail phase. The distribution phase of traditional agrifood needs to be completed through experiencing several times of “buys” and “sells”.

Take the wholesale process in vegetable marketing in Shouguang Prefecture, Shandong Province as an example. After the rural farmers harvested spring onion in this region, the spring onions were transported to the country fairs nearby (partial spring onions were purchased by private peddlers in the field). The private peddlers collected spring onions from various rural

farmers and then transported to the local country fairs. In Phase II, partial large-scale regional peddlers purchase spring onions from the country fairs distributed in various parts and then transported them to the wholesale markets in the producing areas (such as the Shouguang Vegetable Wholesale Market) for marketing. In Phase III, the trans-provincial or trans-regional vegetable peddlers bought large quantities of spring onions from the local wholesale markets and then long distance transported to the wholesale markets in consumption region (such as the Xinfadi wholesale market in Beijing) for marketing. In Phase IV, in the wholesale market in consumption region, after several transactions, these spring onions were marketed to the private individual peddlers (see Fig. 1)

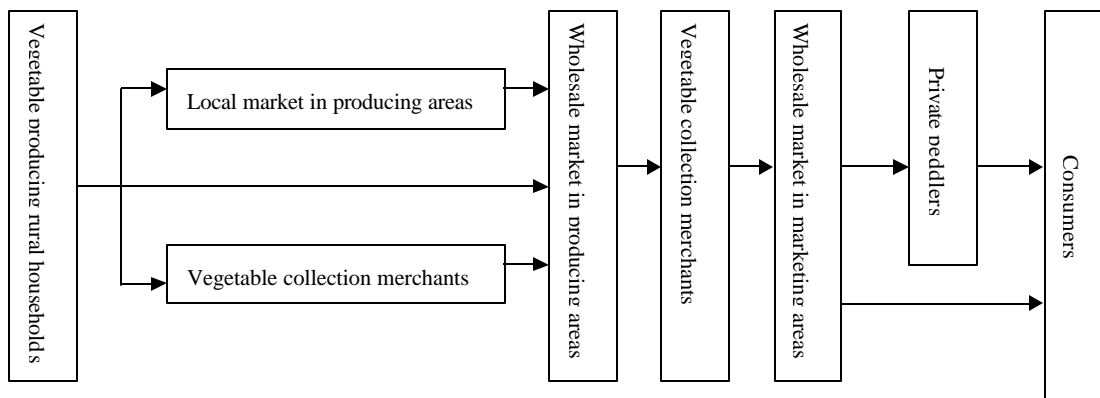


Fig 1. Traditional vegetable distribution channel

The shortcomings of traditional agrifood wholesale phases are as follows: (1) Through several collections and distributions it is difficult for the agrifood trace back their source. Once safety and quality problems occur, it is difficult to find out the source of the matter; (2) During the distribution process of agrifood from the producers to the retailers, through several times of loading and unloading, the probability of agrifood getting polluted has been increased; (3) All the relevant staffs in each link of the whole supply chain are relatively independent. There is no one that can exercise supervision on or be responsible for agrifood safety and quality during the whole distribution process. Obviously, it is difficult for the traditional agrifood distribution system to support the distribution of safety and quality agrifood. (Dinghuan Hu, 2004).

The development of supermarket in China can be broken down into 3 phases.

The beginning phase of supermarket (1990~1998), the agrifood marketed in supermarkets are mainly procured through farm produce wholesale market. In addition, most supermarkets rent agrifood operation right to external enterprises or private operators, because supermarkets at that time are lack of experience and funds in operating agrifood.

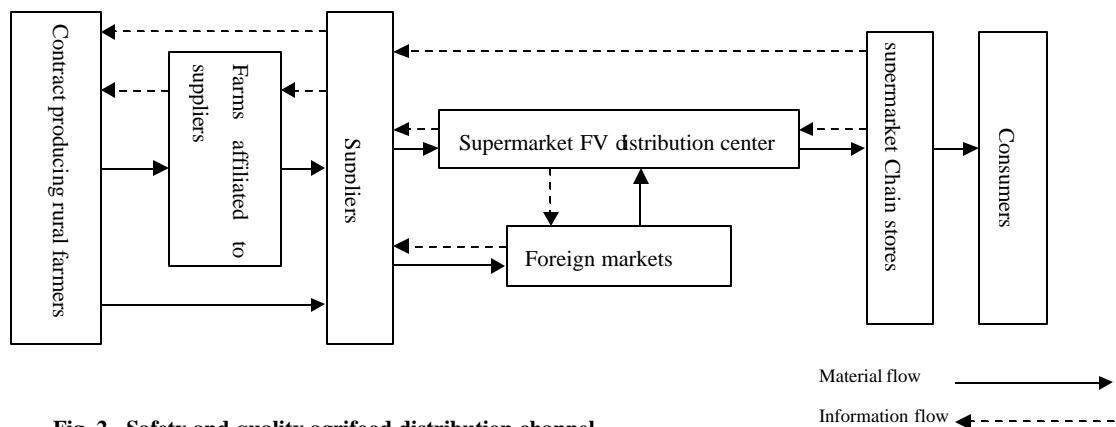


Fig. 2. Safety and quality agrifood distribution channel

In phase II (1999~2002), China has some large scale chained supermarkets, such as “Lianhua Supermarket”, “Hualian Supermarket”, “Agricultural, Industrial and Commercial Supermarket” “Carrefour Supermarkets” and other “Foreign Direct Invested (FDI) Supermarket” and implemented agrifood internalization process. In order to reduce procurement and distribution cost, these supermarkets have established agrifood distribution centers and started to use agrifood suppliers to substitute wholesale market for agrifood supply.

In phase III (2003~), in addition to the agrifood distribution centers established by even more supermarkets, agrifood suppliers corresponding to supermarkets have gradually formed scales. The ratio supplied by agrifood suppliers has increased; so as to reduce many intermediate distribution links, reduce distribution cost and narrow distribution time. Partial suppliers started to establish direct run farms and agrifood production bases, producing safety and quality agrifood directly supplying the supermarkets or meeting the export demand. (See Fig. 2) (Dinghuan Hu, 2004/ Dinghuan Hu, Thomas Reardon, Scott Rozelle, Peter Timmer & Honglin Wang,2004). ?

In agrifood wholesale phase, large-scale chained supermarkets provide agrifood through the agrifood suppliers while the private peddlers in the country fairs buy agrifood from the wholesale markets. The differences between the supermarket agrifood suppliers and traditional wholesale

markets are as follows: (1)The suppliers have the capacity of controlling upper flow commodity supply departments while the wholesale markets don't have such capacity; (2) The suppliers can master the source of agrifood while the wholesale market cannot; (3) The suppliers can formulate agrifood quality and safety standards for the commodity supply departments. At the same time, they also exercise checks during the implementation process; (4) Suppliers must be responsible for the supermarkets they supply the commodity. Due to continuous changes of wholesale merchants, the wholesale markets have no way to be responsible for the private individual peddlers. During the wholesale phase of agrifood, there have co-existed two wholesale systems: **(1) The safety agrifood wholesale system** represented by supermarket suppliers; and **(2) The common agrifood wholesale system** consisted of goods collection merchants in producing areas, transportation people and wholesale merchants. The development of supermarket and the increase of safety and quality agrifood supply will cause revolution in agrifood distribution system. The agrifood suppliers will gradually replace goods collectors, transporters and wholesalers in the producing area. Thus, the agrifood distribution phase has been narrowed and intermediate distribution links have been laid off, as such the whole phase of agrifood distribution will gain even more effective control. If we could not achieve this, there is now way to control the safety and quality of agrifood from field to table.

VIII. Dual Production Structure of Agrifood

In the production phase of agrifood, there is also a dual production structure. One is the production system of producing safety and quality agrifood and another is the production system of producing general agrifood. The production system of producing safety and quality agrifood is restricted by environment requirements. The producers (1) need to form certain production scale, acquire the safety food certification qualification and spare large quantities of manpower and material input to establish the safety and quality management system. If the producers do not have certain scale, even if they have acquired these qualifications, they could not produce economic efficiency; (2) have safety and quality agrifood production and management technology as well as equipment, facilities and manpower; (3) have fairly rich fund strength as social relations; (4) acquire safety food production certification qualification approved by relevant department; (5) have their own product brand; (6) have fairly good social reputation; (7) have a firm conviction of producing safety and quality agrifood.

Although the small-scale rural household operation mode determined at the beginning of the 1980s had increased farmer's production initiative and reduced management cost, yet, their operation scale is too small, lack of fund, and unable to undertake investment in advanced production equipment and tools. Due to the inadequate in production and management technology, if we could not organize them well, it is difficult to meet the requirements of safety and quality agrifood production (Niu Ruofeng, Xia Ying, 2000; Hu Dinghuan, 1998)

“Speculation consciousness” is the fatal weakness of distributed small-scale farmers to produce safety and quality agrifood under the precondition of no supervision. Restricted by single crop production and farmland area, it is difficult for most regions to adopt rotational cropping system, resulting in increasingly stronger insecticide resistance of crop disease and pests. The cost of adopting bio-insecticide and low residue insecticides is higher than high toxic insecticides. The

effect of killing insects and disease prevention is not significant. Under the precondition of inadequate examination means and inadequate penalty on violation in using insecticide by farmers¹, we must thoroughly stop this phenomenon. It is not only difficult to stop thoroughly the use of high toxic and high residue insecticides by independent small-scale rural farmers under the drive of maximum motives, but also a very high management cost. Since the accession to the WTO, Chinese exported agrifood have failed to enter the developed countries because of problems in pesticide residue, which has posed losses to exporting enterprises. The reason has always been individual rural household's improper use of pesticide. Because of difference in the consciousness of safety and quality agrifood and un-unified technical level, it is very difficult to undertake safety and quality management for agrifood of thousands of rural households.

To counter this problem, partial agricultural enterprises oriented to the production of safety and quality agrifood have adopted innovation in production organization systems. One innovation is to establish farms of theirs. The enterprises rent farmland in large patches and hire local rural households to be the farm workers after equipment investment, and undertake agrifood production under the instruction and management of technical workers. This is a model that has the most effective control of agrifood safety and quality, but the disadvantage is higher operation cost. Another model is that the enterprises sign production contract with rural farmers, the enterprises will provide seed or seedlings, pesticide, chemical fertilizers and other means of production, send technicians to provide technical instructions to rural farmers, then purchase agrifood produced by rural farmers. The latter model has controlled agrifood safety and quality to certain extent, with low management cost, which is appropriate for the production in fairly large scale of safety and quality agrifood that has not very strict requirements in safety and quality. We would like to introduce these two models by referencing "Fufazhongji" and "Xincheng Food Co. Ltd."

Fufazhongji is a large fruit merchant in the Singapore. The Company was established in 1965. In 1992, Fufazhongji had invested 640 million RMB yuan to build the Singapore Fufazhongji industrial garden of 1600 *mu* in Longkou City of Yantai City, Shandong Province. The main business is fruit and vegetable production, canned food, beverage, foods, refrigeration storage, packing and other projects. Meanwhile, it has established necessary hotels, stores and residential areas. The Company has organized fruit production from seedling nursery to cultivation, collection, packing, cold storage, and distribution. It operates a vertical integration model of transporting and marketing agrifood to stores of large-scale supermarket chains in China and exporting agrifood to various parts of the world. In order to undertake agrifood quality control from the beginning, the Fufazhongji Company had adopted two kinds of models. One model is to adopting internal farm management; in other words, it is to contract fruit gardens around the garden area for its own operation and management. Since 1997, Fufazhongji has rented 6 000 *mu* of land from the rural households in the Yeji Village, Zhuyouguan Township, Longkou City. The terms of rent is 20 years and the rented land is all used for developing quality apple base. Farmers for male under 60 years old and female under 55 years old can work in the farm. Now there are over 400 farmers from the village working in the farm; they have a salary of 450~600 RMB yuan

¹ In the Shouguang agrifood wholesale market, China has destroyed agrifood of over-standard insecticide application. Due to too big obstruction, we have to adopt a compromising means that it is now allowed to internal transact the prohibited over-standard insecticide residue vegetables within the wholesale market. Due to the fact that these vegetables have not been destroyed, the operators will make the insecticide over-standard vegetables to enter the markets other than the originally wholesale market. An investigation in 2005 by the author.

per month. Another model is to adopt the model of “Company + rural households”. The Company signs contract with fruit farmers of over 500 *mu* of cultivation area. However, it has the following requirements for these fruit farmers: (1) Cultivate the same variety; (2) in the same region; and (3) Should be linked up into one large patch of land in geographic location. The Company provides fruit tree detoxified seedlings, cultivation and management technologies, and chemical fertilizer and fruit bags for these fruit farmers. In addition, the Company will directly send people to control insects. The Company purchases all products meeting the requirements of the Company. In order to undertake strict quality control measures, the Company has introduced ISO9000 and HACCP quality management system. In the aspect of product marketing, the Company mainly has two blocks, one is the export international market and another block is marketing to large-size domestic chained supermarket. The supermarkets cooperated with the Company include Hualian, Yohan, and Walma in Shanghai. In 2000, the Company had successfully exported Shandong Pear to Australia, which has fairly high inspection requirements in the world. And in 2001, the Company had exported fruits to the North American market headed by Canada. Up to now the Company is trying to enter the market in the U.S. The Company has established fruit chained supermarket in the Singapore and has fairly large market shares in the markets in Malaysia, Thailand, Indonesia, the Philippines, Brunei, etc. (Hu Dinghuan, survey investigated in August 2004)

The Shanghai Xincheng Food Co., Ltd. (hereinafter refers to Xincheng) is located in the Longdong Avenue of Pudong New Region of Shanghai, about 20 km away from the Shanghai Pudong International Airport. At present, Xincheng has become one of the largest supermarket agrifood suppliers and one of the most important vegetable export enterprises. The Xincheng Company was established in 1992. At that time it was a township enterprise, which was invested by the government and was a village run enterprise of producing pot vegetables. In 1997, Xincheng started to supply goods for the supermarket and the first supermarket was the “Agricultural, Industrial and Commercial Supermarket” in Shanghai. Up to 2003, Xincheng had established over 500 marketing networks in Shanghai supermarket chains, such as Nonggongshang (Agricultural, Industrial and Commercial Supermarket), Hualian, Hualian Wumart, Daruifa, Jiadeli and Legou Supermarket (Taiwan).

In the end of the 1990s, supermarkets started to pay attention to the quality and safety issues of marketed raw and fresh agrifood. The Xincheng holds the view that it is very difficult to guarantee the agrifood quality it is purchased from the agrifood wholesale market. In 1998, Xincheng was the first company to establish agrifood raw material production and processing base in Fengxian County, Shanghai Municipality. They rent 200 *mu* of land from the village government and built vinyl-houses to grow vegetables. Afterwards, Xincheng had rented 1 000 hectares of farmland in the Pudong Region. After they had rented farmland from the local village government, they built vinyl-houses and let farmers from other parts of the country to contract those vinyl-houses. Xincheng provided vinyl-houses, seeds, chemical fertilizer and pesticide for the farmers and sent technicians to instruct their production. The farmers who had rented land from the Company were responsible for vegetable cultivation and field management. Farmer’s production must be controlled strictly by technicians according to technical requirements. All vegetables harvested must be sold to Xincheng Company. In addition to its own farms, Xincheng had also purchased needed vegetables from 4500 rural households around the Xincheng Company. These rural households must produce vegetables according to the stipulations of the Xincheng

Company and must use pesticides and vegetable seeds provided by Xincheng Company. In the aspect of agrifood export, in the beginning of 2002, Xincheng had established over 5000 *mu* of agrifood export cultivation base in Shanghai Airport, and Heqing and Caolu townships in Chuansha County. The main cultivated vegetables include white onion, broccoli, cabbage, purple cabbage, leaf onion, etc. After harvest, these vegetables enter the Xincheng processing plants to go through the process of cleaning, sorting, cutting and packing and are exported to Japan and Southeast Asian countries in 6~7 containers everyday. In order to control agrifood quality, the Xincheng Company had established HACCP and ISO9000 systems in 2003 (Hu Dinghuan, two survey investigated in March and August 2004).

At present, a considerable proportion of supermarkets and agrifood suppliers of exporting enterprises have adopted the safety and quality agrifood operation models of the “Fufazhongji” and Xincheng Food Co. Ltd. (Hu Dinghuan, investigations in Shandong, Jiangsu, Zhejiang, Fujian, Shaanxi, and Shanghai Suburbs during the period from January to October, 2002)

Production of safety and quality agrifood cannot do without a centralized management of agrifood production technology and production means, which is contradicted with current small-scale rural household distributed operation. Therefore, the extension and popularization of safety and quality agrifood needs innovation on traditional agrifood production model system, introduce new management organization system and establishment an affective safety and quality agrifood production system.

IX. Summary

Promoted by economic and social development, safety and quality agrifood has increasingly attracted high attention by the Chinese consumers, government and related departments, as well as agrifood importing countries in the world. However, the problems faced by China are the increasing market demand for safety and quality agrifood and the contradiction among the production by large number of distributed and unorganized small-scale rural farmers. If we cannot effectively organize the distributed thousands of rural farmers in agrifood production, provide technical assistance and exercise supervision during the whole agrifood production process, obviously it is difficult to produce safety and quality agrifood in large quantity in a sustainable and stable manner. The extension and popularization of safety and quality agrifood not only needs the supervision mechanism established by the government departments, but also needs institutional innovation in agrifood production and in the distribution sector. The appearance and rapid development of supermarket has created objective conditions for the production, processing and distribution of safety and quality agrifood in China. As an enterprise, the ultimate objective of supermarket is to seek for the maximum profit. Just driven by this motive, in order to reduce cost and operation cost, it is essential to strengthen the control of the upper flow departments in the agrifood supply chain. The establishment and improvement of supermarket procurement system and supplier's commodity supply system has not only improved the profit and competitiveness of the enterprises, but also created objective conditions for the establishment of safety and quality agrifood supply system. Once the market appears the demand of safety and quality agrifood, and once the supermarkets found that safety and quality agrifood can bring even more profit, they can produce it within the supply chain conveniently and supply safety and quality agrifood. This

capacity cannot be realized in the traditional agrifood supply chain based on wholesale market and country fairs. The development of supermarkets has created objective conditions for the production and distribution of safety and quality agrifood while the establishment, extension and popularization of safety and quality agrifood production system has promoted agricultural production system in China toward the development orientation of large-scale and modernization.

The significance of this study is that it is essential to effectively implement safety and quality agrifood production in China. In addition to introducing advanced production technology, we need to adopt system innovation. Only when we guarantee the safety of safety and quality agrifood production system from the whole agrifood supply chain, under the trend of rapid supermarket development and a gradual substitution of traditional agrifood distribution system by supermarket, we can rely on supermarket supply chain to provide safety and quality agrifood for the consumers and export. The society and government departments have the lowest management cost in supermarket supply chain, but with the maximum profit. We can adopt the model of “supermarket + leading enterprise (agrifood supplier) + rural farmers”, to guide thousands of small-scale rural farmers to enter the supermarket supply chain so as to accelerate the pace of the popularization of safety and quality agrifood in China.

Reference:

1. Dinghuan Hu, Frank Fuller and Thomas Reardon, “ **Effect of rapid development on dairy industry in China**”, “Rural Economy in China”, 235(7), pp.12~18, 2004
2. Bill Vorley, “**Regoverning Markets e-conference**”, www.regoverningmarkets.org., October 10-20, 2004.
3. Chen Yuefeng, Agrifood retail terminal: “**Country fair and supermarket, which one is better**”, “Supermarket Weekly”, December 7, 2004.
4. Zhang Shanling, Zhang Jianhui, “**Study on producing environment and food safety**”, “Study on food safety strategy in China”, Chemical Industry Press, 2004.
5. Li Yong, Ren Guoyuan and Yang Wanjiang, “**Information Asymmetry of Safety Agrifood Market and Government Interference**”, “Agricultural Economic Issues”, 2004 (3) : pp. 62~64.
6. Zhang Yunhua, Kong Xiangzhi, Luo Dan, “**Contract Analysis of Safety Food Supply**”, “Agricultural Economic Issues”, 2004 (8) : pp. 25~28.
7. Zhou Jie, Qian Fengyan, Ma Chengwu, “**Advances of Food Safety Management Issues**”, “Agricultural Economic Issues”, 2004 (4) : pp. 26~29.
8. Li Zhengming, Lu Lin and Li Qiu, “**Development and quality management of safety food**” China Light Industry Press, 2004.
9. Wu Shuangmin, Ouyang Hong, “**Application of HACCP system in food safety control**”, Shaanxi Sci-Tech Press, 2003.
10. Li Huailin, “**Food Safety Control System HACCP Teaching Material**”, China Standard Press, 2002.
11. Dinghuan Hu, T. Reardon, Sigao Luo, Peter Timmer, Honglin Wang, “ **Challenges and opportunities brought by supermarket for Chinese agricultural development**”, “Chinese

- Review of Agricultural Economy”, No. 3, pp. 304-328, 2003.
12. Dinghuan Hu, Thomas Reardon, Scott Rozelle, Peter Timmer & Honglin Wang, **“The Emergence of Supermarkets with Chinese Characteristics: Challenges and Opportunities for China’s Agricultural Development”**, “Development Policy Review”, 22 (5), pp. 557-586,, 2004.
 13. Niu Ruofeng, Xia Ying, **“Organization Model and Operational Mechanism of Agricultural Industrialized Operation”**, Beijing University Press, pp. 28- 30, 2000.
 14. Dinghuan Hu, **“ Comparative Study on the Integrated Operation of Agricultural Industries”**, in “Study on Agricultural Economics and Sci-Tech Development, 1998”, China Agricultural Press, pp.94-105, 1998.

Short Biography

Dr. Dinghuan Hu

Professor, Institute of Agricultural Economics and Development, Chinese Academy of Agriculture Sciences.

He received his PH. D. from the Department of Agriculture, Gifu University in Japan in 1996. He was working as senior researcher in the Center for Chinese Agricultural Policy, Chinese Academy of Agriculture Sciences (CAAS) during the period from 1998 to 2000. In 2003, he was working as visiting professor in Kyoto University in Japan. During that period he studied on the food supply chain in Japan. Since 1996, he has taken charge of or taken part in 30 research projects supported by both domestic and foreign foundations. He has published more than 50 papers, with his major research interests in Township Enterprises in China, Market and Supply Chain of Farm Produces, Resource and Environment, and Livestock Economics. Now, he has focused his efforts on the “Research on the Effect of Supermarket Development on Agricultural sector and small scale farmers”, and “ On the Dual Structure of Agrifood–Impact of Supermarket Development on Agricultural Sector and Agrifood safety in China” . His is now teaching “Marketing and Management Courses” in the Graduate School of the Chinese Academy of Agriculture Sciences.

Add: 12 Hao Zhong Guangcun Nandajie Beijing China 100081

Phone 086- 10- 68977323

Cell Phone: 13641211025

E-mail: dhhu@163bj.com