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# Study on Food Safety Based on "Lemons Market" Theory

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**Abstract** In view of frequent occurrence of "lemons market" in food safety, based on past researches of scholars on lemons market and food safety, it provided some recommendations for solving problem of food safety, in the hope of providing certain reference for cleaning up food market.

**Key words** Lemons market, Food safety, Food quality

## 1 General information about Lemons market theory

A lemon means an unsatisfactory or defective thing. The use of the word "lemon" to describe a highly flawed item predates its use can be traced back to the beginning of the 20th century as a British and American slang. The Nobel Economics Winner, Economist George Akerlof in his 1970 paper "*The Market for Lemons: Quality Uncertainty and the Market Mechanism*" identified the severe lemon problems that may afflict markets characterized asymmetrical information. George Akerlof found different knowledge of buyers and sellers in second-hand vehicle market leads to asymmetrical information. And the asymmetrical information finally leads to unfair market transaction. Since buyers are uncertain about real quality of second-hand vehicle, they will fail to objectively judge real value of the second-hand vehicle, and the price they are willing to give will be the average price of all second-hand vehicles at this market. In this situation, low quality vehicles will be sold at the same price as the high quality second-hand vehicles. As a result, higher quality second-hand vehicles fail to be sold at higher price and finally have to exit from second-hand vehicle market. Later, high quality second-hand vehicles also have to quit from second-hand vehicle market. Finally, only vehicles with quality lower than the average level may be sold at second-hand vehicle market. In consequence, the average quality of vehicles at second-hand vehicle market will decline and market scale will gradually decrease. Ultimately, it is a question whether the second-hand vehicle market will survive or not.

Some scholars explain lemons market directly using lemons. They simplify lemons to good and bad lemons. Bad lemons are sold to consumers at price lower than the good ones, leading to consumers assuming that all lemons should be sold at such price. As a result, good lemons will be rejected from market. Similar cases include Sudan Red accident (2003), Melamine accident

(2007), poisonous cow pea accident (2010), Shuanghui Clenbuterol accident (2011), Nanyang poisonous fragrant - flowered garlic accident (2011), and Pingyang nitrite poisoning accident (2011).

## 2 Overview of literature related to lemons market and food safety

**2.1 Overview of literature about lemons market** He Meng (2013) believed that the major reason for lemons market is information asymmetry between food producers and consumers. In the theory of information asymmetry, acts of information asymmetry include concealed act and concealed knowledge. Food quality belongs to typical concealed knowledge. Specifically, when a party knows more than the other party about information of a thing or type of the thing, it is called concealed knowledge. Consumers want to fully know quality of food they are buying, but the cost for searching information is too high and they can not identify specialized knowledge about food quality. Once the information asymmetry of food quality fails to be effectively solved, the result of market competition will probably be such market full of unsafe foods.

Wang Yongqi (2004) reached the conclusion that information asymmetry will lead to reverse selection of market participants, while the result of reverse selection game is complete shrinkage or disappearance of market. Even if there is balance, it will be the balance between speculative act and speculative cost of transaction participants, and the market price at this time will only be the balance point of expected value of speculation results under external conditions of the market. This balance point is unstable balance. Once there is change of external conditions, this balance will be readjusted and reach new balance again. This indicates that once the information asymmetry situation is broken and signal as information is accepted by subjects, the lemons market will evolve. The evolution path of lemons market is realized mainly through signal transmission mechanism. Through release of numerous signals, market still can obtain partial market efficiency damaged by reverse selection.

Ding Yicen *et al.* (2013) believed that the major reason for lemons market in food safety is reverse selection. In other words, low quality foods expel high quality foods, prisoner's dilemma, in-

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crease in supply of low safety foods, and rigid demand of low safety foods.

## 2.2 Overview of literature about food safety

**2.2.1** Causes of problems of food safety. Many scholars take information asymmetry as major cause of problems of food safety. Wang Fang *et al.* (2008) compared domestic and foreign food safety risk analysis system, and believed that low transparency in risk analysis is unfavorable for implementation of effective risk management, while risk management is always an essential part of food safety management. Risks in food safety probably lead to serious consequence, and risk management of food safety is of utmost importance to determining cost and involves benefits of enterprises to a great extent. Tao Lin (2009) contended that existing food safety information is not highly transparent and lacks smooth information communication channel. As a result, the information is not transparent and not symmetrical, thus it is extremely possible to lead to forming lemons market. Wu Linhai (2011) stated that China's existing food safety supervision mechanism just cuts off the integrity of the supply chain system. This will lead to obstruction of supply chain in information transmission and finally cause formation of lemons market.

**2.2.2** Approaches for improving current situation of food safety. Nearly all papers about food safety touch upon approaches for improving current situation of food safety, and major approaches include improving construction of safety information network system and traceable system.

Wu Linhai *et al.* (2011) believed that the supervision of government over food safety should be gradually transformed from traditional direct supervision to organic integration of direct supervision, safety information communication and control, and establishing effective food safety information transmission mechanism. The establishment of information transmission mechanism can not be realized overnight. However, China's food safety information traceability system has been comprehensively launched. For example, thanks to the "quality-assured meat" project, the raw meat can be traced in the whole process by a small bar code. Cheng Qizhi and Li Guangde (2004) proposed removing information asymmetry to realize full delimitation of property right. Suo Shanshan (2004) stated that government should play the role of "Information Bridge" in the market control through improving credit system, and should also establish rapid response mechanism, partially eliminate negative influence of information asymmetry, to provide trustworthy information platform for ordinary consumers. Xu Jinhai (2007), through gaming balance analysis, reached the conclusion that effectiveness of government supervision depends on constant supervision of inspection cost, and the punishment intensity for using defective foods to pass for safe foods and harm consumers. This is also a relatively universal problem put forward by professional scholars, that is, government, as special subject, should implement corresponding supervision and control over other subjects and provide certain platform to remove lemons market to the maximum extent.

Yuan Yuwei *et al.* (2004) stated that food labeling system is an important assurance for controlling food safety, and realizing safe consumption, right of being in know and right to make decision. Here, it stresses the elimination of information asymmetry in fact. Wang Huimin and Qiao Juan (2011) interviewed and carried out questionnaire survey for vegetable planting farmers in Beijing, and the results show that production act of those farmers who participated in food quality and safety traceability system was significantly improved, transaction cost was reduced, product price increased, and production benefit also increased. Therefore, eliminating information asymmetry and promoting information transparency are of great significance for many subjects involved in food safety. At the same time, if breach of regulation will be punished severely, farmers will be inclined to observing regulations of food quality and safety traceability system. This also reflects great force of related system in restriction of subjects.

Hong Qunlian (2011) proposed that government should carry out extension and popularization of food safety knowledge and laws in schools, rural areas and communities and encourage healthy diet, to improve the public awareness for food safety and self-protection ability. This is also an important aspect, the project with all people participation will be a hopeful project and its implementation will be supported by the whole society. In the event of finding enterprises producing not in compliance with standards or manufacturing and selling the fake, consumers should actively report to competent authorities in time, to clean up market environment jointly.

## 3 Approaches for solving problem of food quality from lemons market

To eliminate lemons market in food safety, the most direct and effective approach is to reduce or eliminate information asymmetry, connect food suppliers, intermediate traders and consumers together by a series of means, and government or related authorities should formulate related laws and regulations, and establish the long-term food – safety mechanism. Specifically, following approaches can be considered to solve problems of food quality and safety.

**3.1 Formulating code of conduct for limiting various subjects** As the saying goes, nothing can be accomplished without norms or standards. Frequent occurrence of food safety problems at present is rooted from imperfect laws and regulations. If there is code of conduct for limiting various subjects involved in food safety, conduct of various subjects will have rules to follow and have laws to comply with. And there will be no shirking of responsibilities when food safety problem appears.

Certainly, apart from formulating code of conduct for limiting subjects, it is required to punish parties violating laws, regulations or related provisions. Punishment method and degree should also be specified and all subjects have common and fair standard.

Local government can formulate local regulations in accordance with national laws and regulations on the basis of local situa-

tions, but local regulations should not be less strict than national laws and regulations, and the implementation of local regulations should be flexible and applicable.

**3.2 Improving administrative supervision system** As supplement of corresponding laws and regulations, the administrative supervision system is particularly important. Thus, apart from necessary laws and regulations, it is required to establish appropriate administrative supervision system.

Administrative system mainly includes three systems: administrative guidance system, administrative supervision system and administrative punishment system. These systems have different functions and scope of application. Administrative guidance system is mainly the system of administrative organs using persuasion, education, instruction, advice, negotiation, and reminding means on the basis of national laws or policy provisions. Apart from mandatory means such as laws and regulations, administrative guidance system can be used for conduct of less severity, small scope of influence or not intentional conduct. Administrative supervision system directly influences specific administrative act of rights and obligations of administrative counter-person. Specifically, administrative organs address inquires to administrative counter-person whose failure to perform mandatory duties exerts serious influence or consequence, or the breach of laws is outstanding. This system can be also applied in instructing or addressing inquiries to responsible person. Administrative punishment system is a system used by administrative organs when parties at interest violate laws and regulations related to food safety. Administrative law enforcement procedure can be divided into 2 stages: (i) before a punishment decision is made, administrative organs notify facts, basis of punishment of law breakers, and listen to understanding and opinions of law breakers about their offence against laws and regulations; (ii) when the punishment decision is made, administrative organs warn law breakers to implement consolidation within a specified time, stop illegal activity and circulate a notice of illegal situation in accordance with the principle of "combining punishment and education".

**3.3 Implementing enterprise self-inspection system** The state, government at all levels and related departments should fully implement related laws, regulations, policies and systems, to create favorable and excellent environment for process control. It is feasible to periodically or non-periodically spot check implementation of enterprises in related policies. For enterprises fulfilling the requirement, it can give award or make public notice; for those failing to conform to the specified requirement, it is required to ask them to make consolidation within the specified time.

Apart from implementing corresponding laws and regulations, enterprises can conduct periodical and non-periodical self random

inspection. Using self-inspection system, enterprises can spot check products produced or processed by themselves. The inspection ability of enterprises must be confirmed by quality technical supervision department and be inspected regularly by quality technical supervision department for their food quality and safety.

**3.4 Launching all-people participation activities** Food safety is a great issue concerning people's livelihood, so it should be a large project with all-people participation. All related subjects should play positive role in the market. If producers comply with related provisions and provide acceptable requirements, intermediate traders conduct various activities in accordance with specific rules and regulations, and consumers exercise their right to supervise, to make their own contribution to food safety. Finally, as special subject, government should actively guide various subjects to know related policies, laws and regulations, and encourage all parties to actively participate in the great project of cleaning up food market and eliminating lemons market.

## 4 Conclusions and prospect

In conclusion, appearance of lemons market not only damages benefits of consumers, but also causes some conscientious enterprises losing market due to intervention of lemons market, or probably makes them become "bad lemons" enterprises in the situation of high exit barrier, and finally it will lead to decline and shrinkage of the entire market. At bigger international market, if certain food becomes bad lemons completely, it will influence international market of similar products and ultimately weaken national image. Therefore, eliminating lemons market is an essential part in setting up excellent market order. Especially with frequent occurrence of food safety problems in recent years, all related parties will pay close attention, so we can be assured that lemons market will be eliminated in the near future.

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