

Research Article

Analysis of Transmission Model of Consumers' Risk Perception of Food Safety based on Case Analysis

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Abstract: In recent years, food safety incidents frequently occurred in China, the people paid more and more attention on the importance of food safety and brought out higher and higher demands on the quality of food. Especially, after the incidents came to light, consumers became increasingly wary of the market, the government increasingly lacked credibility in the minds of consumers. The consumers' perceived risks continue to pass down which slowly expands the perceived risks groups. The study proposes the transmission path of risks perception and taking "Sanlu milk powder", "Nongfushangquan" and "Jinhao tea" for examples, analyzes the tripartite behaviors of the corporate, the government and the consumer in the three events and sums up the transmission path of consumers' risk perception of food safety incident.

Keywords: Food safety, risk perception, transmission mechanism

INTRODUCTION

Since the 1990s, the dioxin, the mad cow disease (BSE) and other food safety incidents out broke in the worldwide caused the great importance to food safety issues in the world. With economic development and people's income levels increasing, more and more emphasis is paid on food safety by consumers. The saying goes, "Food base, food security first", in recent years, major food quality and safety incidents occurred frequently in China, such as "waste oil", "clenbuterol", "tainted milk", "Red Duck" events, not only caused physical harms to consumers, but also brought psychological panic, which resulted in the consumers' risk perception of food safety increased significantly. Under the buyer's market environment in the market economy, business activities of any enterprise must focus on consumers, so it will help the enterprises to develop more targeted marketing programs to analyze perceived risks transmission process of consumers' purchase behavior and reduce consumers' risk perception level.

The concept of consumers' risk perception was introduced by Bauer (Raymond Bauer) into the marketing field from psychology introduced in 1960. He believed that any consumer subjective cannot be determined whether the ultimate consequences of their buying behavior were in line with expectations, the uncertainty about the outcome is that consumers' perceived risk (Hongwei, 2007). He indicated the perceived risk included two aspects, namely the uncertainty of the buying results and the seriousness of the consequences. Mitchell (1999) proposed that

perceived risk is consumers' subjective determination of the expected loss. Cox (1967) explained that every consumer consumed for a certain goal, if the consumer was feeling subjectively that his buying behavior would not meet his expectations, or the purchasing results might have some negative consequences, it would produce the perception risk. Stone and Gronhaug (1993) gave a simple definition of perceived risk that was risk perception was the expected loss of purchasing behavior.

In summary, the perceived risk is a static concept, is a description of the uncertainty purchasing behavior results. This study is to study the consumer's risk perception, risk perception is a dynamic concept, refers to the process of risk perception.

Consumers' risk perception process is influenced by many factors. Many studies have consistently shown that the consumer's personal characteristics importantly influence on their risk perception, such as the consumer's gender, age, level of education, occupation, income, etc. At the same time, consumers' purchasing experience also affects their risk perception process. Purchase experience will help consumers understand the properties of products and improve the consumers' ability to use the product label to rich product attributes of knowledge which make consumers get a more profound understanding of the differences between the products and when they buy similar products again, they can reduce the purchasing decision errors and reduce the perceived risk. In addition, the product knowledge, the purchase motivation, consumers' estimation of the risk and purchase involvement are different, which will also produce different degrees of

impact to consumers' risk perception. Different consumers even to buy the same products maybe have the different degree of risk perception and one consumer to buy different products will have the same different degree of risk perception.

Consumers to buy different products have a different risk perception, but their risk perception concepts (risk perception dimensions) are broadly consistent, the dimensions of risk perception are namely the type of risk perception. Cunningham (1967) indicated the risk perception included the social consequences, the loss of money, the physical loss, the loss of time and the loss of product performance. Jacoby and Kaplan (1972) and other scholars had proposed five-dimensional view of the risk perception: the financial, the functional, the psychological, the physical and the social. Although the dimensions of the risk perception of multiple perspectives, but so far, the academia agreed with Stone and Gronhaug who proposed six dimensions in 1993, namely the financial risk, the functional risk, the social risk, the psychological risk, the physical risk and the time risk. The explanatory power of six perceived risk to the overall perceived risk dimensions is up to 88.8%.

Based on consumers' perception risk theory, any consumer's buying behavior can be seen as a risk-taking behavior, as well as the purchase of food. Along with the frequent occurrence of food safety incidents, when consumers buy food, concerns of food security and the uncertainty of purchasing results are proposed, on the basis of these uncertainties, making some judgments, evaluation and attitude is namely the process of food safety risks perception. So this study, taking the practical events as cases, analyzes the transmission model of consumer's risk perception and it is expected to provide reference to food safety risk management.

LITERATURE REVIEW

After Food safety incidents, from the exposure of the event to lead to consumer panic, this is the process of a food safety risk perception and passed. Consumers perceived of food safety risk are not the passive acceptance of risk, they will find a way to take measures of reducing and eliminating to reduce the risk potential losses first, only when does the perceived risk exceed a certain range, the risk perception will be passed to consumers around. The transmission of the food safety risk perception refers to the process, in which a consumer by certain ways and means takes use of a certain carrier to pass the uncertainty of buying food process-aware to other consumers.

Characteristics of transmission of food safety risk perception:

Mutagenicity: Mutation means when the food safety risk limit is over consumers' bearing range, the risk

perception bursts to break through the boundaries. The risk perception of food safety will not immediately be spread to the people around, every consumer has their own risk tolerance boundaries, when the possible consequences of the risk are within an acceptable range and consumers will digest it and not pass it to other people. Only the expected consequences of the risks at the limit are beyond the affordability of consumers, consumers have powerless of risk control and they will pass this risk perception out by some way.

Selective: Selectivity means, during the transmission of the risk perception of food safety, due to the complexity of the passing network, as well as the variability of its environment, there will have more than one choice in the passing direction, but consumers tend to pass the risk perception to those with their own more intimate relations and with poor ability to resist risks.

Progressive: Progressive degree of risk perception of food safety in the transfer process tends to crescendo or diminuendo characteristics. Degree of the perception of the food safety is not stable, with the incidence of transmission of information and communication, the degree of risk perception will change accordingly.

Chain: The chain is the continuity of inter-related transfer reaction of the risk food safety perception, which will produce a series of causality chains consequences. A consumer's risk perception after passing will trigger another consumer's risk perception; every consumer will make different behavioral responses according to their own situation which will finally spark other risks.

Type of risk perception transmission of the food safety: The risk perception is the subjective feelings of consumers, it initially presents in the individual inside and then passed through a certain medium to another or more different perception levels of consumer or not perception. The consumer with a high degree of risk perception passes the perceived risk to consumers with low risk perception to improve risk perception, slowly, the perceived risk of consumers in the whole market will tends to be average and the transfer activity will tend to peaceful.

Risk transfer is started from a risk source, a food safety accident occurred, under the role of a booster, through the medium of the news, network, the risk is passed out. At the same time, due to the phenomenon of information distortion in the transfer process, the amplification is prone to be led to, which will trigger a large earthquake for the food industry. The transmission of food safety risk perception is typed as the following according to different delivery path.

Chain transfer: Chain transfer refers that consumers, after perceived food safety risks, pass directly the risk,

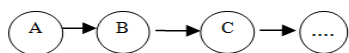


Fig. 1: Chain transfer of food safety risk perception

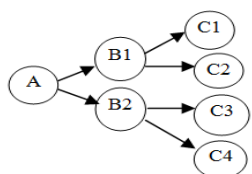


Fig. 2: Radiation transfer of food safety risk perception

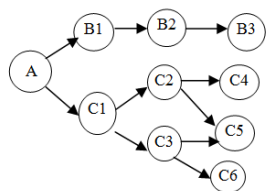


Fig. 3: Chain with radiation transfer of food safety risk perception

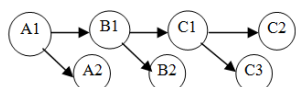


Fig. 4: Migration transfer of food safety risk perception

no other branches occur next consumers who contact in direct with him and do not perceive risks, there is only one path (as shown in Fig. 1. Such a delivery method is simple, in reality, it generally co-exist with other delivery methods.

Radiation transfer: The radiation transfer mean, when a food safety event happens, consumer perceive of food safety risk, at the same time pass to more consumers around, which could lead to a series of other risks. This risk perception, in the transmission process, not only passes to the consumer groups who don't perceive risk and also to the consumer groups who have perceived risk and its transfer targets are multiple (Fig. 2). Consumers in Fig. 2 are those of buying the same products, when the food security incident occurs, the risk perception will be rapidly improved.

Chain with radiation transfer: In reality, consumer risk perception transmission often combines chain with radiation type (Fig. 3). In the risk perception transfer process, some consumers only pass it to one consumer and some consumers will pass it to multiple consumers at the same time, mixed with the occurrence of two ways, the transfer process is more complicated.

Migration transfer: The type of migration transfer refers the risk perception transmission of consumer not

only occurs in food consumers and potential consumers groups in some a kind of food safety incidents, will slowly spread to other similar food consumers and lead to other bigger range of consumer risk perception. Migration transfer can be analyzed from groups' angle based on the above several transfer ways. As shown in Fig. 4, consumer A is the consumers or potential consumers of brand A, consumer B is the consumers of brand B which is similar to brand A, consumers C are the consumers of brand C which are another foods in the same industry to brand A and brand B. take the Sanlu Milk as an example, firstly consumers of Sanlu milk brand are impacted, secondly, consumers who consume other products of Sanlu brand are also impacted, finally, the impact were expanded to other consumers of other milk brands.

The above four risk perception transmission types are not independent, sometimes simultaneously occur, especially the first two types. When a food safety incident occurs, the consumer's risk perception is passed through several ways. With the evolution of the events at the same time, the risk perception transfer trends to develop into the migrate style.

CASE ANALYSIS

The study takes three representative events to analyze the consumers' risk perception transmission mechanism.

The sanlu milk powder event: Sanlu milk powder incident occurred in 2008 which resulted in hundreds of sick children and even death. After the incident, a statement of Sanlu milk powder is announced to recall substandard products, the government also attaches great importance to conduct a thorough investigation into the poisoning incident. In this event, the consumer risk perception transfer took a look of migrate style (Fig. 5), among individuals of every kind of consumer groups, the chain transfer and the radiation transfer mainly happen, Figure 5 gives an analysis from the groups angle of this transfer process.

As shown in Fig. 5, the parents of sick infants are the earliest groups' perceived physical risk of milk powder products. The melamine detonated the potential risks of milk powder products and it was spread through media reports and consumer oral mode of transmission, risk perception groups in the Sanlu milk consumers gradually expanded and slowly proliferated to the other consumers of Sanlu brand. With the development of the event, the consumers' risk perception of the milk industry gradually rose and began to suspect that melamine not only exist in the Sanlu milk powder, also in other milk powder products. At the same time, the government's quality inspection departments began a thorough investigation of all the milk products in the market, the results were informed and even the famous brands such as Yili, Mengniu, their products were detected melamine. So far,

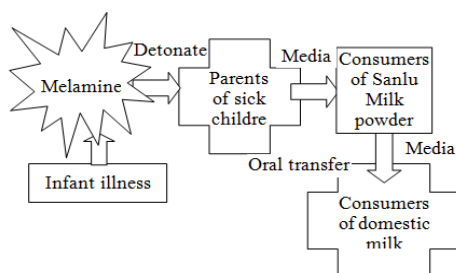


Fig. 5: Risk perception transmission in the event of Sanlu milk powder

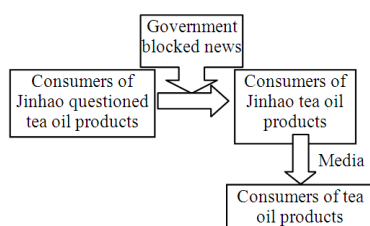


Fig. 6: Risk perception transmission in the event of Jinhao tea oil event

consumers have lost confidence in domestic milk industry, the risk perception groups spread to all domestic milk consumers. In this event, the Government is also trying to take measures to reduce the consumers' risk perception, but it played fewer roles.

In this event, the consumer risk perception transfer is migration from a macro point of view, risk perception groups expanded from Sanlu consumers direct to the consumers of all domestic milk powder. Meanwhile, it should also see the joint action of their internal chain and the radiation transfer.

The Jinhao tea oil event: In the Jinhao tea oil event occurred in 2010, the corporate and the government made a collusion of news blockade to consumers. When the news came to light, the government help enterprises make a false prove, these acts of the government and enterprises were intended to reduce consumer risk perception, but the result is not only failed to reduce their risk perception, but it rose the risk perception.

In this event, the consumer's risk perception transmission diagram can be summarized as shown in Fig. 6. The reason of enhancing consumer risk perception is because of asymmetric information. Enterprises blindly blocked information, consumers could not get the information they need, somehow they would fear of the unknown things, the risks they face would be hugely magnified and rapid increased in the degree of risk perception. And because they didn't know what products were in question, they simply considered all brand products had problems. With the spread of information carrier, the risk perception groups were increased rapidly.

When consumers knew this product might bring physical and financial risks, in order to reduce these risks, as a precautionary measure, they would not purchase the related products. Meanwhile, via the normal day-to-day exchange and networking forum, the message that Jinhao tea oil involved carcinogenic materials was passed to the consumers who were not perceived of these risks yet. With the passing of perceived risk, a magnified effect slowly occurred. The transfer path was mainly radiation transfer and the perceived risk groups gradually spread.

According to the three cases, it can be indicated that after every food safety incident occurs, the consumer risk perception will pass by two or more ways, not only one. The development of risk perception transfer are determined according the exposure of events and the measures of behavior taken by the relevant parties and the migration transfer type will appear when events are just serious. The first three transfer types are often throughout the food safety risk transfer process for all the events.

The "arsenic" incidents happened in nongfushangquan enterprises and in the Uni-president enterprise corp: On November 24, 2009, the Bureau of Haikou City issued a warning which said, for three batches products of the Nongfushangquan and the uni-president enterprise, the total arsenic levels were exceeding the standard. The Nongfushangquan Enterprise questioned the test results and sent it to Beijing to re-examination, the results showed that all products of the two enterprises are qualified. The event of "Arsenic" was a false incident from the results, however the effects of consumer risk perception transfer did exist.

Although in the "Arsenic" even, business sector issued a final test results and recognized products of the two companies were qualified, but consumers have failed to trust them again. A survey showed on Sina.com, nearly sixty percent of consumers said they would not buy these products. Consumers were holding a "prefer to believe them untrustworthy free" mentality and considered that "the result is not necessarily the truth. Conflicting test results by the government in the event before made it lose its credibility in front of consumers.

Since the incident eventually was clarified from the Government, to some extent, it played a reduced role of the consumer risk perception and risk perception groups has not spread to other brands consumers, the transmission occurred only in the two products in question consumers within the group. The transmission types not only belonged to the chain transfer, also to the radiation transfer, but there was not a migration transmission occurred. The media became the main passing media, the consumer had access to relevant information through the network or other media.

CONCLUSION AND DISCUSSION

Consumers' risk perception of food safety passes mainly through the news media, the Internet and other media. Consumers, as the recipient of the information, will increase the perceived risk of the related products with occurrence of food safety incidents. Because of the special nature of the food for the people, once there is news that announces a food problem, consumers would immediately collapse nerve to magnify the scope of the questioned products and try to reduce the potential danger of the risk, which will affects the whole industry where the products have questions. The process is shown in Fig. 7.

Due to the diversity of the transfer type and pathways of food safety risk perception, it leads to the rapid diffusion speed of the risk perception. The risk amplification effect will occur when food safety incident happens, which is not conducive to the stability of the market. In order to ensure the effective operation of the market order and reduce the degree of consumer risk perception of food safety and its passing speed, the enterprises should improve food quality and security. Addition to this, the following aspects can also be implemented.

Enhance the credibility of the government: The government as a service institution for the people has the responsibility for the lives and safety of the people. When food is found harm to human health, the government should stand in a fair and impartial perspective to consider, it will not undermine the credibility of the government and its conclusions will make responsible to confirm the judgment is correct to be cautious, if errors occurs, it should also be promptly corrected and cannot hope to get away. Once the government has gone back on its words, or blocked messages, consumers will propose the suspicion, which may unlimited expand the possible losses of risks. That will not only cause losses to the enterprises, consumers can also cause tension, as well as the stability of the market order.

So, to improve the credibility of the government is able to maintain its authority in the minds of consumers, when food safety incident occurs, the government can maintain the stability of the market order by stabling consumer sentiment taking use of virtue of its authority.

Transparency of information: Transparency of information is the most effective way to reduce consumer risk perception. Only when consumers have more information, they will be more objective view of their surroundings and more rational analysis of the perceived risk of food safety incident. When a food safety incident occurs, the transparency of information prevents consumers indiscriminately suspicion and

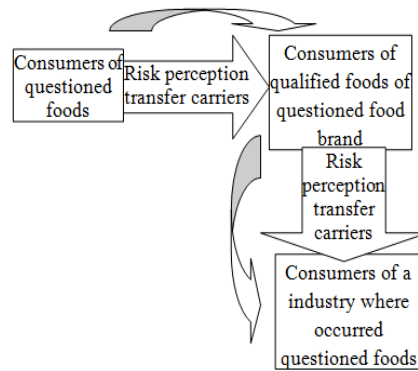


Fig. 7: Risk perception transmission path of food safety

reduce consumers' adverse selection in order to avoid the risk because of information asymmetry.

Transparency of information not only refers to the incident to provide consumers with comprehensive and transparent information and also includes the food sources of raw materials, production processes and other related information should inform consumers to enable them to choose foods according to their own judgment.

Propaganda and improve awareness of food safety risk: Consumer risk perception level has a certain relationship with consumer awareness of food safety. In everyday life, knowledge of food safety should be propagandized to consumer publicity and tell consumers to pay more attention to the relevant information when buying foods and improve the risk awareness.

Food safety is a basic protection for consumer life safety. Food safety accidents not only endanger the health of consumers, with the risk transfer, can also cause social unrest and incite panic. Therefore, it is very necessary and conducive to enterprise and government to study consumers' risk perception transmission path mechanism of food safety. According to the risk transfer path, the government and the enterprise can take measures to reduce risk-transfer speed, limit risk-spread range and control the perceived risk groups within a certain range to avoid consumers' concerns for the industry as a whole and is further conducive to the stability of society.

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REFERENCES

- Cox, D.F., 1967. Risk Taking and Information Handling in Consumer Behavior [C]. Graduate School of Business Administration, Harvard University Press, Boston, pp: 82-108.
- Cunningham, S.M., 1967. The Major Dimensions of Perceived Risk [A]. Risk Taking and Information Handling in Consumer Behavior. Donald, F.C. (Eds.), Harvard University, Boston, pp: 82-108.
- Hongwei W., 2007. Research on perceived risk dimensions in consumer purchasing decisions [D]. Beijing Business University, Beijing.
- Jacoby, J. and L. Kaplan, 1972. The components of perceived risk. Proceedings of the 3rd Annual Convention of the Association for Consumer Research. Chicago, IL, pp: 382-393.
- Mitchell, V.W., 1999. Consumer perceived risk: Conceptualizations and models [J]. *Eur. J. Market.*, 33(1-2).
- Stone, R.N. and K. Gronhaug, 1993. Perceived risk: Further consideration for the marketing discipline. *Eu. J. Market.*, 27(3): 39-50.