China's Food Safety Problems and Regulation in Law and Economics

Junfeng Wang
China University of Political Science and Law Civil, Commercial and Economic Law School, Beijing100088, China

Abstract

How to assume tort liability for food safety and obtain food safety information directly impact on behavioral choices of food producers and sellers, and clear and effective food safety tort liability and adequate food safety information can directly change the activities of producers and sellers about food production and sales, for which this paper reviews the regulatory system of our current food safety tort liability, and studies the behavioral choices of the parties and changes of the social costs and information costs by the model of behavioral choices under the different sets of tort liability, and analyzes the advantages and weaknesses of the current food safety tort liability, at the last puts forward the specific comments for improving China's food safety tort liability system.

Keywords: Food Safety Information, Food Safety Regulation, Behavioral Choices, Food Safety Tort Liability System.

1. INTRODUCTION

In recent years, countless food safety incidents in China such as Shouroujing incident, Sudanhong Incident, Sanjuqingan Incident and Poisoned Capsules Incident have affected people's fragile nerves from time to time. Numerous food safety incidents continue to torture China’s existing food safety regulatory system. How to effectively regulate food safety incidents, and ensure that people can eat safe food becomes the primary point of food safety regulation. Scholars are also constantly rethinking China's food safety regulation.

From the perspective of food safety regulation, scholars point out that the reason food safety incidents are frequent in China is that the traditional food regulatory model cannot adapt to the social environment under the concept of service administration (Cui and Song, 2011). They also point out that in the new situation, it must emphasize the diversity of the main body of food safety regulation, improve the regulation methods with specialized regulation, pay attention to the non-compulsory regulation process and the application of incentive mechanism. Scholars discussed the regulation mode of food safety in China from the perspective of multiple governance, analyzed the respective roles of government, food industry and society in the process of food safety regulation, and tried to perfect China’s Food safety regulation mode from the three dimensions of government, food industry and society (Chen and Liu, 2010). Scholars analyzed the efficiency of China's food safety regulation by DEA and put forward suggestions on how to integrate regulations, rationally allocate resources and enlarge the scale of regulations so as to improve the efficiency of food safety regulation in China (Wang and Ren, 2011).

From the perspective of food safety information, scholars discussed the two-tier proxy relationship between the central regulation agencies, local regulation agencies and food enterprises (Xiao and Hu, 2010). They believe that the information asymmetry has led to the differences in interest structure among different subjects, and puts forward the policy recommendations that makes the regulation responsibility clearly and makes the penalties severely. Scholars attribute food safety problems to inadequate disclosure and they believe that consumers are not judicious for food safety because of inadequate disclosure and ultimately they distrust of the food in the market (Gu and An, 2012). And then they analyze the equilibrium between consumers and producers with the signaling model, and conclude that the disclosure of information about food safety should be strengthened and the mechanism of information disclosure should be improved. Scholar summarized the issues of food safety information from the aspects of food safety information economy theory, food safety information with the supply chain subjects, and information tracking system (Wang, 2012).

From the perspective of food safety regulation, scholar proposed two modes of food safety regulation in China by inspecting different subjects of food safety: top to down mode and mutual cooperation mode (Qi, 2011). He
believes that China’s existing food safety regulation mode belongs to the top to down mode, and it has many difficulties in the dissemination of food safety information, risk assessment and risk management. China’s existing food safety regulation mode should be amended according to the mode of mutual cooperation. Scholar puts forward to construct China's food safety regulation mode on risk society theory (Liu, 2012). He believes that China should establish the risk assessment mechanism by separating the functions of the risk assessment and risk management, promote the dissemination of food safety risk information, and establish the coordinated food safety regulation mode with the administrative regulation, economic regulation and social regulation. Scholars also carry out an in-depth analysis of food safety issues from the perspective of criminal sanctions for food safety (Tian et al., 2009, 2012). Scholar analyzes the problem of food safety in China from the perspective of punitive damages (Zhou et al., 2010a, 2010b).

Although the regulation mode of multivariate subjects, non-mandatory regulation and incentive mechanisms, the transparent information sharing and mutual cooperation mode can regulate and manage the food safety issues to a certain extent on different aspects, the choice of different tort liability settings have the direct impact on the behaviors of food producers and sellers, and the clear and effective liability of food safety tort can directly change the producers and sellers of food production and sales behavior, which is the core crux should be solved on the food safety problem. In this paper we examine the behavioral choices and the changes of social costs and information costs under different tort liability settings by the behavioral choice model after combing the existing regulation system of food safety tort in China, and then analyze the advantages and disadvantages of the existing food safety tort liability system in China, and then put forward specific suggestions on how to perfect the food safety tort liability system in China.

2. THE PRESENT SITUATION OF CHINA’S FOOD SAFETY TORT LIABILITY SYSTEM

After the reform and opening up, China gradually formed a food safety tort liability system based on the "General Principles of Civil Law", "Consumer Protection Law", "Product Quality Law" and other laws and regulations, and they provide a certain degree of food safety protection to the consumers in China. However, in the new century food safety incidents in China occurred frequently, and the original system for food safety tort liability cannot effectively regulate food safety problems in the new situation. Therefore, the "Product Quality Law", "Consumer Protection Law" and other law and regulations are gradually revised. The promulgation of the "Food Safety Law" in 2009 and the subsequent "Tort Liability Law" has further perfected China's food safety tort liability system. China's food safety tort liability system is mainly included the following aspects.

2.1 The subjects of food safety tort liability

Perfect rules of the subjects of food safety tort liability can disperse the tort liability, and ensure that consumers can get compensation timely and effectively, but also contain the effective incentive for food producers and consumers to ensure food production and sales safely. According to the "Tort Liability Law", "Food Safety Law" in 2009 and other regulations, the subjects of food safety tort liability in China include food producers, food sellers, and third parties who transport and store food. If the food producer damages others caused by the product defect or fails to timely recall or warn of the defect after the food is put into circulation, the food producer shall undertake the tort liability. If the food seller causes food defects and causes damage to others by fault, or if the food seller cannot indicate the producer or worker of the defective product, or if the food has been put into circulation and the defects are not timely recalled or warned, the seller shall undertake the tort liability. In addition to food safety tort liability of food producers and sellers, the "Tort Liability Law" also stipulates the third party's tort liability. According to the law, the third party, such as food transporter or warehousemen, causes defects and causes damages to others by fault, Food producers and sellers have the right of indemnity after compensating the consumers. Consumers who suffer damages due to food defects may either request compensation from the producers or from the sellers, and the "Tort Liability Law" also stipulates the internal compensation relationship between food producers and sellers.

2.2 The principle of food safety attribution

The fault liability principle is the main principle of tort liability law. However, due to the improvement of modern production technology and the internal characteristics of business management, victimized consumers often cannot prove the fault in the process of food production. Therefore, the fault liability principle of food safety tort cannot effectively protect the rights of consumers. In this case, most countries gradually take the no-fault liability principle for food safety tort liability. And then the food safety tort liability principle in China has been made a certain distinction, that is, the producer assumes to apply the no-fault liability principle and the other parties, such
as the seller, the transporter and the warehousemen, assume to apply the fault liability principle. Specifically, if there is a defect in food, even if the producer has no fault on the defective food, the producer still needs to undertake the tort liability for the damage caused by the defective product, and the consumer does not need to prove that the producer is in fault in producing the food. At the same time, the "Tort Liability Law" also provides that if the food was put into circulation and was found the defect but it was not promptly recalled or warned, the food producer should undertake the tort liability; The food sellers are different from the food producers because one of the premise that they undertake the tort liability is that the defective products damage by their faults. The faults here include two aspects, one is that the defect of food was caused by the food sellers’ faults; the other is that the food seller cannot point out the producer of the defective food or cannot point out the supplier of the defective food. The last aspect can also be classified into the presumed fault. Although the "Tort Liability Law" stipulates that third parties such as food transporters and warehousemen undertake the food safety tort liability, the way that the third party undertakes the food safety tort liability is different from the food producers and the food seller. According to the law and other regulations, food safety victims may claim for damages to the food producers or sellers, and then the food producers or sellers can claim compensation from the third party.

2.3 The scope of food safety tort liability

The scope of food safety tort liability generally includes personal injury and property damage. However, each country has the different provisions on the scope of food safety tort liability because of the differences in reality, such as whether it includes non-property damage and whether it includes the defective product itself and whether it should be limited the amount of compensation, etc. In China the scope of food safety tort liability includes the personal injury and property damage caused by defective food according to the existing legal provisions, which is consistent with the general cognition of food safety tort liability in other countries. However, according to the "Product Quality Law", China's compensation for property damage is limited to the other property, not including the defective product itself. Defective food damage includes two aspects, one is the property damage caused by defective food, such as medical expenses, repair expenses, etc.; the other is non-property damage caused by defective food, such as mental damage and others. According to China's current law and regulations, the food safety tort liability includes not only the property damage but also the major non-property damage. The controversy over limits for the food safety tort liability is manifested in two aspects, one is to set the minimum compensation limit so as to maximize consumer protection, the other is to set a maximum compensation limit so as to avoid huge compensation to cause the food production companies bankruptcy. Although it has controversy over the issue of compensation limits, the current legal system in China does not stipulate the limitation on the amount of food safety tort liability.

2.4 Punitive damages

In order to regulate food safety tort more effectively and protect the rights and interests of consumers completely, China’s existing legal system stipulates several punitive damages. Such as in China's "Tort Liability Law", if the food producers or sellers clearly know that the product is defective and continue to produce or sell, resulting in death or serious health damage, the victim has the right to claim for punitive damages. This article stipulates the conditions for punitive damages, firstly the producers and sellers know that the food is defective, secondly the defective food results in death or serious health damage and then it requires the victim to claim for punitive damages, so the conditions for punitive damages is very strict. The Food Safety Law of China also stipulates the content of punitive damages. According to the law, a victim may claim for ten times punitive damages if the producing food that does not meet the food safety standards or the food sellers have known the producing food does not meet the food safety standards and continue to sell. The article stipulates that a victim claims for punitive damages just because the producing food that does not meet the food safety standards or the food sellers have known the producing food does not meet the food safety standards and continue to sell, with no other limitations, and the victim can claim compensation for ten times, so China’s Food Safety Law of protects the rights and interests of consumers completely than others. In addition, China's Consumer Protection Law also stipulates that operators sell the goods with fraud, they should increase three times compensation to the purchase price of goods in accordance with the requirements of consumers, or increase the amount of compensation to 500 yuan. If the operators have known the product is defective and continue to sell, resulting in death or serious health damage to the consumer, the victim may claim for punitive damages that are less than twice by the suffered loss.

2.5 Food safety exemption clause

Even though the development of science and technology has brought about tremendous changes in the production of food, and the production of food has been constantly expanding in scale, technology and specialization, the
development of science and technology is also limited. It arbitrarily blames all food safety responsibilities on food producers, which is harmful to the continuous development of the food industry, but also harmful to the economic development. In order to reasonably balance the responsibility of non-fault liability principle for food producers, China's "Product Quality Law" stipulates the exemption clause of food producers. According to the exemption clause, the food producers are not liable for compensation if the defective food is not put into circulation, or the defect of the food is in the absence when the defective food is put into circulation, or the defect of the food cannot be found by science and technology when it is put into circulation. To some extent, the exemption clause of food safety weakens the rigidness of the non-fault liability principle for food producers, and avoids blaming for food producers when the food defect cannot be reasonably expected, and it is a balance of responsibilities, while it can also be seen as positive incentives to food producers to ensure that food producers are motivated to produce food.

3. THE MODEL

The acquisition of food safety information, the level of caution and the expected loss are the three most important aspects in the food safety tort liability, since these three aspects directly affect the behavior choices of the food producers and consumers under the different attribution principles and these three aspects also directly affect the realization of social costs minimization. However, the core of food safety tort liability problems is how to motivate producers and consumers to obtain more food safety risk information under different liability principle, so as to take precautionary measures to reduce social losses and minimize the social costs, finally to achieve social welfare improvement. Therefore, this article focuses on the allocation of food safety tort liability and then to build the model, examines the behavior choices of food producers and consumers under different liability principles, and further discusses how to motivate food producers and consumers to obtain food risk information, and take the effective preventive measures.

The basic idea of building a model in this paper is to minimize the social costs according to the rules of social welfare. The social costs in this paper include the cost of obtaining food safety information, the cost of fulfilling the obligation of paying attention to food safety and the social loss caused by food safety. Therefore, we assume that $c$ is the cost of obtaining food safety information, and it help to know if there is a food safety risk and $c\geq0$ based on common sense. Suppose that $p$ is the possibility of food safety risk, so the possibility of food safety risk exists $1>p>0$. Suppose that $x$ indicates the level of attention, it can also be called the cost of attention, so the level of attention should be $x\geq0$. Suppose that $h(x)$ represents the expected loss, that is, it is the number of damage that can be expected if the level of attention is $x$ in the case of risk. According to the actual situation of food safety accidents, $h(x)>0$, $h'(x)<0$, $h''(x)>0$.

3.1 The optimal level of social attention

The so-called optimal level of social attention in food safety refers to the attention level when the total social cost is minimized. Specifically, if it is not necessary to obtain food safety information, $ph(x)$ represents the expected loss when the food safety risk is $p$, and $x$ is the cost of attention, then the total social cost $C_t$ can be expressed as:

$$C_t= x + ph(x) \tag{1}$$

In this case, the social optimal choice of food safety $x$ depends on its first-order condition $-ph'(x) = 1$. We denote the $x$ in this condition as $x_1^*$, and $x_1^*$ is the general attention level of the food safety. If you need to obtain food safety information, and it can be known that there is no risk, then the social optimal choice $x = 0$. If you need to get food safety information, and you know there is a risk, then the total social cost can be expressed as:

$$C_t = x + h(x) \tag{2}$$

In this case, the social optimal choice of food safety $x$ depends on its first-order condition $-h'(x) = 1$, and we denote $x$ in this condition as $x_2^*$ because $h''(x)>0$. It is not difficult to conclude that $x_2^* > x_1^*$. $x_2^*$ indicates a higher attention level of food safety. In addition, we can see from the expression $C_t = x + h(x)$ that if the food producer or consumer clearly knows that there is a food safety risk, it may be worthwhile to take higher attention level because the attention level can reduced the total social costs. If the food producer or consumer knows there may be no food safety risk, implementing higher levels of attention is a loss of value because the extra attention costs increase the total social costs.
We assume that the value of food safety information is \( V \), and then the value of food safety information \( V \) is equal to the total social cost in the absence of food safety risk information minus the total social cost in the presence of food safety risk information, which can be expressed as:

\[
V = [x_1^* + ph(x_1^*)] - p[x_2^* + h(x_2^*)]
\]  

(3)

The equation can be changed to:

\[
V = p [x_1^* + h(x_1^*)] - [x_2^* + h(x_2^*)] + (1 - p)x_t^*
\]  

(4)

The expression \( p[x_1^* + h(x_1^*)] - [x_2^* + h(x_2^*)] \) is a positive number because it represents the information advantage in the presence of a food safety risk, that is the total social cost difference at the attention level \( x_1^* \), \( x_2^* \). The expression \( (1 - p)x_t^* \) represents the information advantage in the absence of risk, saving the attention cost \( x_t^* \). To sum up, in the case of \( V > C_t \), the optimal social choice is to obtain food safety information.

### 3.2 The influence of the no-fault liability on the level of attention

Under the no-fault liability, food producers undertake the tort liability for any losses that may be caused by the food they produce, so food producers minimize the total social cost, meaning that food producers will make the risk information cost, the cost of attention, and the expected loss minimized, in which case the attention level of the food producers is consistent with the optimal level of social attention. So we can conclude that under no-fault liability, food producers will make the optimal social choices whether to get risk information and what level of attention will be taken.

### 3.3 The influence of complete negligence liability on the level of attention

Under the complete negligence liability, if the food producers obtain the food safety information is the optimal social choice, but they don’t obtain the information, then they should bear the loss; if the consumers obtain food safety information is the optimal social, but they don’t obtain the information, then they should bear the loss; if the food producers obtain the food safety information is the optimal social choice, but they take the social attention level below the optimal condition, then they should bear the loss; if consumers obtain the food safety information is the optimal social choice, but they take the social attention level below the optimal condition, then they should bear the loss. In other words, although one party obtains food safety information is not the optimal social choice, but the party takes the attention level less than the general attention level \( x_t^* \), then he should bear the loss. If obtaining the food safety information is the optimal social choice, but one party does not obtain the risk information then he should bear the loss. Even if he has obtained the risk information, but he has not taken the attention level higher than the general attention level \( x_t^* \), they also needs to bear the loss.

Specifically, if obtaining the food safety information is not the optimal social choice, that is, \( V < C_t \), then food producers and consumers will choose to pay attention to the level \( x_t^* \) because they choose a level of attention less than \( x_t^* \), according to the complete negligence liability principle, they should bear the loss. If the chosen level of attention is greater than \( x_t^* \), then their high cost at the level of attention will not be rewarded, meaning that the gains they make is the same to the choice that they pay attention at the level of \( x_t^* \), so they will not choose the level of attention above \( x_t^* \). In this case, the value of food safety information is \( \langle (1 - p)x_t^* \rangle \), less than the value of information in general, because they save the expected cost of risk. Because of \( V < C_t \), the food producers and consumers will not choose to obtain food safety information. If obtaining the food safety information is the optimal social choice, that is \( V > C_t \), then if the food producers or consumers will not obtain the food safety information, they will bear the loss. Even if they exercise a certain level of attention because of their expected cost is \( C_t = x + ph(x) \), then they will implement the optimal attention level \( x_t^* \). After obtaining the information, if there is a risk, the party will implement the attention level \( x_t^* \), and if there is no risk, the party will not take any attention obligations. In this case, the value of the information is \( p[x_1^* + h(x_1^*)] - C_t + x_t^* \), which is larger than the information value \( V \) in the general case. After the party will implement the attention level \( x_t^* \), there is no need to undertake liability for the damage. Because of \( V > C_t \), the food producers or consumers will obtain the food safety information.

### 3.4 The influence of attention level-based negligence liability on the level of attention
Under the attention level-based negligence liability, if food safety information is not the optimal social choice, food producers or consumers bear the loss if they have taken the attention level less than \(x_1^*\); if obtaining information is the optimal social choice, and the risk does exist, if the food producers or consumers take an attention level less than \(x_1^*\), then they will bear the loss, that is, they will be liable under the attention level-based negligence liability just because of the level of attention paid by food producers and consumers and does not require liability for failure to obtain food safety information, as long as it is exercised to the appropriate level of attention, as they don’t obtain the food safety information, they are not liable for it. It is different from the complete negligence.

Specifically, obtaining food safety information is not the optimal social choice and is consistent with the choice of food producers and consumers under the complete negligence, they do not obtain food safety information but take a level of attention \(x_1^*\). If food safety information is the optimal social choice then \(V_i > C_i\), where the food producers or consumers choose not to obtain risk information and take the attention level less than \(x_1^*\), then they should undertake the liability for this risk. The party’s expected liability is \(C_i = x + ph(x)\), where the minimum attention level is \(x_1^*\). If one has taken a level of attention \(x_1^*\), the party will not be liable even does not obtain food safety information. At the same time, the party will not take a level of attention that exceeds \(x_1^*\) because he will incur additional costs. Since we cannot determine the value greater or less of \(x_1^*\) and \(x_1^* + ph(x_1^*)\), we have to discuss the case where \(x_1^*\) is greater than \(x_1^* + ph(x_1^*)\) and \(x_1^*\) is less than \(x_1^* + ph(x_1^*)\) respectively. If a party obtains information on food safety under the general negligence liability, and there is a food safety risk, this party will take the attention level \(x_1^*\). If there is no food safety risk, the party will choose not to take precautionary measures against food safety risks. When \(x_1^*\) is greater than \(x_1^* + ph(x_1^*)\), if one party does not obtain food safety information, the party will choose to take the attention level \(x_1^*\), because \(x_1^*\) is greater than \(x_1^* + ph(x_1^*)\). At this time, the value of risk information is greater than the value of general information \(V_i\) and \(V_i > C_i\), so the fact is that the party will get the information. When \(x_1^*\) is less than \(x_1^* + ph(x_1^*)\), if the party does not obtain food safety information, the party will choose to take the attention level \(x_1^*\), because \(x_1^*\) is less than \(x_1^* + ph(x_1^*)\). The value of the information at this time is also greater than the general information value \(V_i\) and \(V_i > C_i\), so the fact is that the party will also get the information.

4. THE ANALYSIS OF CHINA’S FOOD SAFETY TORT LIABILITY BASED ON THE MODEL

Under the different liability principles, because of the changes in the cost of obtaining information, the cost of attention and the expected cost, the behaviors of food producers and consumers are also changes. The current tort liability system of food safety in China differentiates the liability condemnations of food producers and food sellers, that is, the food producers assume no-fault liability and the food sellers assume the fault liability. At the same time, China’s food safety liability system also stipulates the third party takes the fault liability. With the help of the above model, we analyze the current norm of tort liability in China with a view to discovering its existing problems and proposing corresponding solutions.

4.1 The analysis on norms of subjects for food safety tort liability

In the above model, we set the subjects of food safety tort liability only including the food producers and consumers; we consider minimizing the cost of information obtaining, the costs of attention and the expected loss, that is, when minimizing the total social cost \(C_i\), what is the impact of different attribution principles on food producers and consumers. From the model if the no-fault liability principle is applied, both the level of attention of the food producers and the consumers should be consistent with the level of optimal social attention. However, in real life, food producers are easier to obtain food safety information. Firstly, food producers experience the whole process of food from raw materials to finished products, and they have direct information on whether they meet the food safety standards. Secondly, most food producers are relatively strong in terms of production scale and economic strength, and under conditions of large-scale production they have the ability to obtain more food safety information through special inspection and other means. Finally, for the consumers, under the conditions of modern production, it is very difficult to prove the fault of the food producers. Therefore, in China's food safety tort liability system, requiring the food producers to assume no-fault liability has certain rationality. However, it is disadvantageous to require food producers to assume no-fault liability because by comparing the behavior choices of food producers and consumers under the no-fault liability, complete negligence liability and attention-based negligence liability, we can find that, no-fault liability requires food safety information to be obtained by food producers under any circumstances, a level of attention that food producers are not able to handle because food producers have no control over food, access to food, under other conditions such as food transport and warehousing safety information costs more. Based on the above considerations, China in the food safety legislation requires the third party, such as food transporters and warehousemen to assume the fault liability, which
to some extent alleviates the producers’ duty of attention and reduces the cost of obtaining the food risk information, and also reduces the total social costs. However, this does not mean that China’s food safety tort liability system is perfect. From the model we can see that food producers will only take the attention at the level \( x^*_2 \). Under the condition of \( V \leq C_l \), and only if \( V > C_l \), the food producers have the will to obtain food safety information, so in determining the food safety tort subjects should also compare with the value of food safety information and the total social costs.

4.2 The analysis on norms for food safety tort liability principles

By the model we examined the different effects of non-fault liability, complete negligence liability, and attention level-based negligence liability on the behavior of food producers and consumers. Under the no-fault liability, the attention level of food producers should be the same as the social attention level. This should be the attribution principle of food safety tort liability. However, we can see from the model that in the case of complete negligence liability and attention level-based negligence liability, food producers may not obtain food safety information when \( V \leq C_l \) because this will increase their production costs, but under the no-fault liability, because the attention level of food producers and the optimal social attention level are the same, therefore, food producers should devote more cost to obtaining food safety information. Under such circumstances, the enthusiasm of food producers will be greatly affected and they will withdraw from the food production and reduce the total social welfare level.

Therefore, the complete negligence liability and attention level-based negligence liability are also two options that we can consider in perfecting China’s existing food safety tort liability system. If choosing these two attribution principles, it can reduce the total social cost of \( C_l \), and then it does not have to adhere to the no-fault liability principle. Of course, we should also notice the difference between the complete negligence liability and attention level-based negligence liability. Under the complete negligence liability, food producers should not only obtain food safety information, but also take corresponding attention obligations, otherwise they should undertake the corresponding liability, and under attention level-based negligence liability, the food producers and consumers whether to undertake the liability just can be judged by the attention level, as long as they have taken appropriate attention levels, even they do not obtain the food safety information, it is not necessary to undertake the liability. Therefore, what attribution principle should be applied to the food safety tort liability should consider the total social cost \( C_l \), the value of the food safety information \( V \), compared with the total social cost \( C_l \) and the attention level \( x^*_2 \) compared with the expected liability \( x^*_2 + \phi h(x^*_2) \).

4.3 The analysis on norms of the scope for food safety tort liability

In the model we assume that the food producers or consumers are responsible for the losses due to food safety, so the losses here should include all losses due to food safety, but in real life, the loss due to food safety is variety, including the direct loss and the indirect loss. If all the associated damage was put into the scope of food safety tort, then the expected loss \( h(x) \) will be incredible, and its final result will be that the total social cost \( C_l \) will climb unlimited. So, in China’s current food safety tort liability system, all losses related to food safety tort will not be included in the scope of the losses. According to the current laws and regulations, China’s food safety tort liability mainly includes direct damage caused by food that does not meet the safety standards, which includes the property damage and personal injury, but it should be noted that property damage here does not include the food itself.

As far as personal injury is concerned, China’s current law and regulations on food safety tort liability not only covers the loss of right to life and health, but also covers mental damage, which undoubtedly greatly expands the scope of compensation for the food safety tort liability in China. Therefore, in China's current legal system, the expected loss \( h(x) \) is a relatively high value, which leads to a relatively high of the total social cost \( C_l \) in the model. At the same time, due to the expected loss \( h(x) \) changes, the information value \( V \) will also change, which resulting in food producers and consumers behavior changes in different liability principles. In particular, under no-fault liability, the increase in the total cost of food producers is a result of the increases of the anticipated loss, which poses a certain burden on food producers. Under the complete negligence liability and attention level-based negligence liability, it is expected that the increase of loss will not only affect the choice of food producers and consumers to obtain food safety information, but also affect the level of attention paid by food producers and consumers on the different options. In addition, the discussion of whether compensation limits for food safety tort liability should be set, it is in line with changes in expected loss \( h(x) \), which can also lead the food producers and consumers to change in the availability of information and attention level, so it cannot be arbitrarily to make the decision that should or should not to set the limit.

4.4 The analysis on norms of punitive damages for food safety tort liability
Although the punitive damages have a certain deterrent effect on food producers, and in China's food safety tort liability system different punitive damages are stipulated, the effect of punitive damages is mainly achieved by changing the expected loss \( h(x) \). According to China's current food safety tort liability system, if the food does not meet the food safety standards or it is known that the food does not meet the food safety standards and continued to sell, the victim can request ten times compensation; The operators provide goods with fraud, should be in accordance with the requirements of consumers to increase three times compensation for the purchase price of goods, or increase the amount of compensation to 500 yuan. Since the price of food is generally not high, the expected loss \( h(x) \) for food producers is insignificant even if the producers are required to provide three times or ten times compensation.

Further in the model we can see that \( C_t = x + ph(x) \), the total social costs are affected by the level of attention of food producers and consumers, the probability of occurrence of food safety incidents, and the expected loss. Since punitive damages have little effect on the expected loss of food producers and consumers \( h(x) \), and their impact on the level of attention of food producers and consumers is negligible, in which there will be no significant increase in total social costs \( C_t \), so punitive damages will have no significant effect on the comparison of the total social costs \( C_t \) and the food safety information value \( V \), between food producers and consumers. Therefore, we can develop an answer to our current food safety that the punitive damages stipulated in tort liability system are of little significance in raising the level of attention of food producers and consumers, encouraging food producers and consumers to obtain food safety information and avoiding food safety incidents. We can understand that, from a deterrence point, three times or even ten times more punitive damages do allow people to feel the power of deterrence, but analysis by model, we understand that if ignoring the fact that food prices themselves are relatively low, punitive damages run counter to legislators.

4.5 The analysis on norms of the exemption clause

In China's food safety tort liability system, food producers do not need to undertake the liability for compensation, if the food has not been put into circulation, or it is no harmful effects when it is put into circulation, or it is not yet found in science and technology when it is put into circulation. We can understand this clause as an extension of the scope of the compensation, but its mechanism is just the opposite of the mechanism of the scope of the compensation and the provisions of the punitive damages. To a certain extent, the provisions of the exemption clause reduce the expected loss of the food producers \( h(x) \), thereby reducing the liability of food producers to pay, further reducing the level of attention of food producers. From the model in this paper, we can observe the specific mechanism of the exemption clauses of food safety tort liability. As a result of the current system that exempts food producers from liability, the direct result of this is a decrease in the expected loss \( h(x) \) of food producers. From the model \( C_t = x + ph(x) \), we can see that the decrease of expected loss resulting in a reduction in level \( x \) that food producers pay attention to, because of the expected loss, they also lead to inadequate incentives for food producers to obtain food safety information, as a whole, a reduction in the overall social cost. At this level, the exemption clauses on food safety tort liability can reduce the total social cost, that is, this clause has positive meaning. We can also interpret the exemption clause from the perspective of collecting information on the cost of food safety. As food is not in circulation, or no defect before the circulation, or the existing technology cannot detect it, in which food producers are forced to undertake the liability, it is dramatically increasing the cost of food producers to obtain the food safety information, eventually leading to food producers withdrew from production. In this view, the exemption clause has positive meanings, but the broad exemption clause has the effect that reducing the level of attention of food producers. Therefore, an exemption clause should be determined after weighing the total social costs and information values.

5. CONCLUSION

China has established the food safety tort liability system by the "Tort Liability Law", the "Food Safety Law" and the "Product Quality Law". Even though there are many laws and regulations, the current food safety incidents in China still occurred frequently, which makes the people want to re-examine the formulation and implementation of China's food safety laws and regulations. In this paper, by building the food safety model, reexamines the food safety tort liability, the principles of food safety tort liability, the scope of food safety tort liability, the punitive damages of food safety tort liability and the exemption clause of food safety tort liability and the China's existing food safety tort liability system. On the analysis we can draw up the conclusion that the subjects of food safety tort liability, the principle of liability, the scope of responsibility, punitive damages and the reasons for exemption should meet the requirements of social welfare, that is, to minimize the total social costs. And in this process we need to consider the impact of the above matters on the level of attention, the cost of information obtaining and the expected loss, we also need to compare the relationship between the value of information and the total social
costs, and then further establish the subjects of food safety tort liability, the scope of liability, punitive damages and exemption clause in China.

REFERENCES


