

Research Article

A Study on the Influence of Structural Model Food Safety Issues on the Athletes

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Abstract: Food safety is the goal of service-oriented government, which is to achieve one of the main functions. Food safety is not only a political issue related to national security and social stability, but also an economic problem. This study makes the general theories analysis for the food safety to the athletes by describing the various factors affecting food security and builds interpretive structural model to analyze the relationship between various factors. Meanwhile, it is to identify measures to address food safety issues.

Keywords: Food safety, measures, structural model, various factors

INTRODUCTION

With the development of society, food safety issues become more and more serious. In recent years, food contamination problem has greatly influenced the health of athletes. Because of eating contaminated food, such incidents as food poisoning and positive doping tests often occur on athletes after they eat them. This has brought huge threat to the fairness of the competitive sports. There are factors that influenced the food safety problems of athletes in our country. If the two factors are directly related, then we mark their relationship as “1”; if they are not directly related or not related, then we mark it as “0”. The main problem existing in food safety (factors that influence food safety) that researches from home and abroad have found can be generalized as follows.

Environmental pollution: The source pollution of agricultural planting and breeding; food additives (preservative); Food borne disease that caused by microorganism; Food safety problem resulted by new material and new craft occurring with the development of technology (such as genetically modified food); The failing measures of the market and the government, such as forged and fake commodity, the abuse of food identification, the illegal production and business operation and so on; The influence of the outside food safety problems.

MATERIALS AND METHODS

Environmental pollution: At present, environmental pollution has caused new threat to food safety; for example, industrial “three wastes” containing toxic metals are indiscriminately discharged into the rivers and lakes, which have led to water, aquatic plants and

animals, soil pollution (Janero, 1991). The function of the biological enrichment of the food chain has caused the higher concentration of these harmful ingredients in the bodies of organisms. It has been reported that the amount of mercury and picks has exceeded bid badly in aquatic products such as fish and shrimp. The intake of this kind of food will lead to the human body in acute and chronic poisoning; some can even cause cancerous distortion and mutation (Halliwell and Gutteridge, 1999).

The source pollution of agricultural planting and breeding: The extensive and large use of pesticides will increase crop production but at the same time will cause the residue of pesticide leading to food pollution. For example, organic phosphorus, the current most widely used pesticide, is a kind of nerve poison, once it has some residues in vegetables and other crops, it will inhibit organisms bladder alkaline lipase activity, causing body sweating, muscle tremor, heart beat faster, myosis and even some serious disorders of central nerve system. Clenbuterol hydrochloride, commonly known as “lean meat powder” can make a lean increase more than 10%. Once people eat animal food containing “clenbuterol”, they will suffer symptoms such as muscle tremor, fluster, trembling, headache, nausea vomiting and so on. In some cases, the doping test of athletes are even positive when they eat pork filled with clenbuterol hydrochloride. In the process of food processing and manufacturing, the illegal use and add of medicals that beyond the scope of food laws and regulations does greater damage to human bodies. Adding prohibited colorants such as lemon yellow and carmine and the excessive use of chemical synthetic sweeteners in drink pose a potential threat to human body, so athletes should be on guard against the buying and taking of food (Yu, 1994).

Food additives: Food additives have been widely used as the development of food processing technology (Raue *et al.*, 2001). According to incomplete statistics, the total number of food additives has reached over 1.4 million ton and the annual production is 13 million in our country. Part of the production is biotechnological, which has made the eating safety issues of food additives become more and more serious.

Food-borne diseases caused by microorganisms: Biological pollution of food includes the pollution of bacteria, bacterial toxins, parasites and viruses, etc. The microbial pathogens which are easy to cause food poisoning mainly include enteropathogenic *Escherichia coli*, *Staphylococcus aureus*, *Salmonella*, etc. Food poisoning incidents caused by contaminated food from enteric pathogen have been frequently reported. For example, there are *Escherichia coli* incident happened in Japan in 1996 and the 7-day epidemic outbreak of *Listeria* contaminated food incident in France from the end of 2000 to the beginning of 2001 (Short and Short, 1983). And in 1999 National City Sports Meeting of China, there were 51 athletes who affected *Staphylococcus aureus* toxins, causing the cancel of some sports events. Although technology has been highly developed at present, food-borne disease still cannot be effectively controlled. Therefore, athletes shouldn't treat this problem lightly.

New raw material, new craft: With the application of new technology, new raw material, new craft, a great number of new high-tech products have sprung up continuously. At present, various kinds of Genetically Modified Food (GMF), such as genetically modified cattle and sheep, fish, fruit and vegetables have been put into the market. However, there are some potential dangers existing in GMF. Firstly, it may cause acute and chronic poisoning, cancer, aberrations and choppy effect to human beings; Secondly, it will cause the

organism of humankind become abnormal or suffer allergic reaction, which will damage immune system. Thirdly, it will reduce the nutrition values of food and make their nutritional structure out of balance. Although no case where GMF pose danger to human body has been detected, long-term monitor should be adopted to ensure its appropriacy.

There is a phenomenon in the health care product market that around half of the products have quality problems. The products designed for athletes to against fatigue and obesity contain irregular medicine such as caffeine, appetite inhibitor, male hormone, IIR adrenocorticotrophic hormone, etc. Western medicine ingredients have been added to some traditional Chinese medicine while some other traditional Chinese medicine for health care contain natural medical elements-IOC forbidden medicine like strychnine and ephedrine, etc. All these may cause athletes screened positive in drug-testing.

Forged and fake commodities: The damage caused by forged and fake commodities cannot be neglected. During food manufacturing process, inferior or disqualified raw materials are used to produce and process food, for example, people use sick or dead animals to make cooked meat product, use chemically synthesized material to make soy sauce and vinegar and formaldehyde brewed sea food and shoddily manufactured beverage and cold food and so on (Jones *et al.*, 2003).

Structural model: According to adjacent matrix, reachable matrix, regionalism and hierarchically directed graph, one can get the Interpretative Structural Modeling as long as one input the name of the relative elements into it (Fig. 1).

Through analyzing the influence of various elements in structural model on food safety issues, we can find out the following solutions to solve the problem.

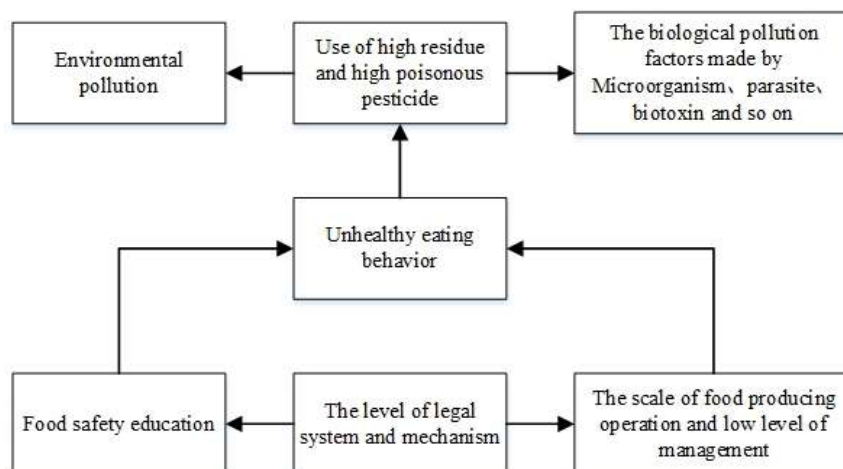


Fig. 1: Interpretative structural modeling

RESULTS AND DISCUSSION

Improve laws and regulations: The most fundamental factors that affect food safety is the imperfection of laws and regulations, so we must improve the laws and regulations of food safety and enact complete food safety regulations to making legal basis. Food safety issues have something to do with the market surveillance and regulations of our country, so we should rely on the government to solve the food safety issues of athletes. Moreover, we should strengthen the supervisory control on the production, processing, selling, monitoring and administration of food industry and establish and improve the system, regulations and criteria of food safety supervision and management. Furthermore, some laws and regulations of food safety are issued in the planned economy era, confined by the legislative point of view, legislative environment and legislative techniques of that time and thus cannot satisfy the need of socialist market economy. However, our country does not keep pace with the times and has a certain degree of lagging behind. At the same time, we should intensify the punishment of law, eliminating the intention of those who are always putting profit first. Besides, we can guarantee the food safety through enacting legislation on the procedures of planting, breeding, processing, packaging, storing, transporting, selling and consuming food. Apart from this, we can regulate the supervisors of food safety and define the supervision responsibilities of every department, forming a united, coordinated, authorized and effective supervision mechanism of food safety to ensure the safety and hygiene of food. At last, we should pay attention to the public's right to be informed, forming a situation of food safety where there are social concern, union of each party and support from everybody through propaganda and education and improving the safety awareness and self prevention capacity of the public. Moreover, we should increase the criteria of food industry.

Joint supervision of multi-sectors: The influence of joint supervision of multi-sectors on food safety is

reflected in the confusion of the administration of food safety information. At present, there is no administrative organization to regulate food safety information in our country; instead, our country adopts the method of one department taking charge of one segment of supervision, which is, taking segment supervision as the principal thing and variety regulation as the complementary thing. We should formulate a united market access system, implement a regime of certification and promote the scale and grade of enterprises by regulating the production and processing of the new food industry and the original enterprises. This is the need of social civilization (Fig. 2).

Change the bad eating habits of athletes: The athletes should combine their eating habits with the national conditions of our country, changing their unhealthy eating habits. They should prohibit themselves from buying foods in unauthorized market, cultivate their capabilities of identifying good and bad in a mixture of food and strengthen self protection. From the aspect of consumers, we should change our unhealthy eating habits because a right diet is a good way to avoid diseases, as well as avoid eating uncooked or half-cooked aquatic food. Moreover, we can popularize the food safety knowledge among athletes, raising their vigilance and formulate strict regulations to guarantee the food safety of athletes. Furthermore, we should advise the athletes to eat at the mess hall for athletes, not to dine out or eat food without explicit sources, as well as strict the mechanism of purchasing, inspecting and checking, trying to not buy food on the street without health guarantee.

Control the use of food additives: We should strictly regulate the purchase, selling and use of food additives, implement the system of registration for future reference, strengthen the management of pollution source, research and develop low toxicity pesticides and ecological pesticides and adjust the unitary industrial structure of pesticides. The health administrative

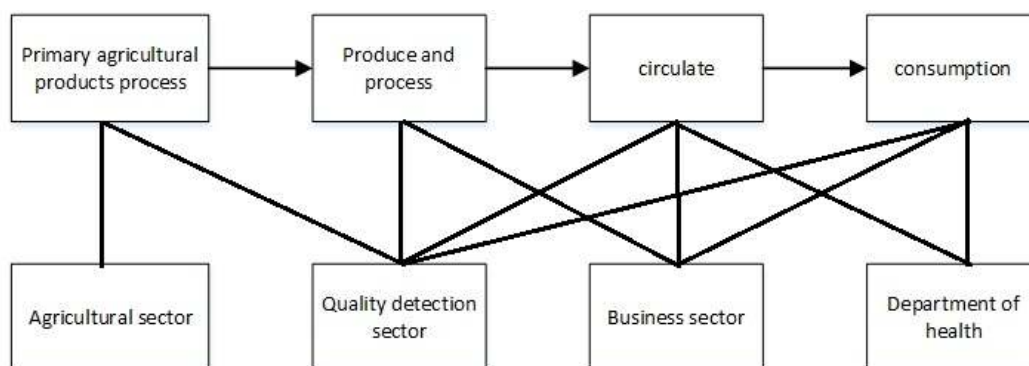


Fig. 2: The functions of supervision department

departments at all levels should take the illegal additives in food as key monitoring item, carefully carrying out the supervision on illegal food additives. Every region should check the food additives if there are food borne abnormal cases and should organize inspection and notify the local administrative department and sports bureau in case of finding illegal additives in food.

CONCLUSION

Our country has established food safety guarantee system for athletes named HACCP which includes the process of standardization of quality control: control over residues of raw materials, control over pathogenic bacteria of raw materials and control over staff health (all kinds of infectious disease), disinfection measures, the standardization and control of storage and transportation. We should furthermore establish standardized methods of analyzing harmful factors to detect the food residues and thereby gain practical conclusions.

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