

Measure research to improve the teaching effect of Food Standard and Regulation Course

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Abstract: The curricular features of food standard and regulation were analyzed in this paper and the measures of improving teaching effect were proposed based on current food safety situation. These measures included elaborate choice of teaching contents, statement with the recent case, emphasis of the inherent relationship of knowledge, enhancement of the classroom interaction and increasing students' interest through practice. After the implementation of provided measures, classroom atmosphere was enlivened, learning interest was increased, and students effectively mastered the knowledge of food standard and regulation. Moreover, student application ability was enhanced. Those measures might create a good win-win situation among college, student, and employer in current job market full of fierce competition.

Keywords: Food standard and regulation; teaching measure; teaching effect

INTRODUCTION

Food standard and regulation is an elective course and is offered in recent years by many universities for students majoring in food science and engineering specialty. Its application is very wide and quite strong. As for the quick development of the food industry, offering the course is an inevitable requirement [1]. At present, food safety situation is extremely severe. Some wicked food safety incidents such as lean meat issue, dyed buns, plasticizing agent event and drainage oil, appeared subsequently in China since 2011 [2]. The occurrence of these events requires the joint efforts of the whole society to ensure the diet safety. Meanwhile, the teaching of food standard and regulation needs to be constantly deepened in the college to train high quality talents who might supervise the complicated food safety in the future [3]. According to the characteristics of the course and some experience of authors, this paper proposed some measures to improve the teaching effects of food standard and regulation. The objective is to promote the teaching effect and train high quality talents for food specialty.

Curricular features of food standard and regulation Classroom atmosphere is tedious owing to abstract knowledge

Much knowledge involved in food specialty belongs to natural science, and the students traditionally received the knowledge of natural science. However, food standard and regulation attributes the knowledge of technical management, quite differing from other

curriculum of food science or engineering specialty. Its many contents are embodied through definition, requirement or specification. For example, production of pollution-free, green food and organic food are defined by means of detailed specifications. Afterward, many requirements for production process management followed [4]. During the teaching process, students passively accept the contents. And it seems that not much can be said. Unlike the knowledge of beverage browning or precipitation, the reaction mechanism is usually very clear, and students may easily master the spirit of contents. In view of the feature of food standard and regulation, teachers must constantly endeavor to explore the teaching method. If they just echo what the book says, students undoubtedly are uninterested. Moreover, after repeated nag with long time, teacher will feel tedious eventually.

There are some difficulties to form a complete knowledge system.

The course of food standard and regulation usually consists of many trivial contents including the basic knowledge of law and standard, domestic and international food standards, and complex food laws and regulations. So its contents are quite complicated. If the knowledge points were mechanically explained one after another, students only mastered superficial knowledge owing to accepting fragmented contents. Further, currently facing the situation to compress class hours in food science specialty, tedious lectures don't surely meet the requirement of the course. In addition,

deletion of some contents is not advisable considering the whole structure of the course. Deletion probably affects the students to master the overall knowledge. Meanwhile, this course is offered in senior class, and many students will apply the contents when they are interviewed. Deletion to some knowledge might influence their employment.

Textbook is not fully synchronized with fast updated contents.

Food standard and regulation has been updated owing to the quick development of food industry. However, this brings certain difficulty to choose adaptable textbook for students. As for the development view of food industry, all textbooks of food standard and regulation are out of date and the obsolescent stage. For example, Food Sanitation Law in the textbooks of 2008 had been replaced by Food Safety Law promulgated by The National People's Congress of the People's Republic of China on February 28th, 2009 [5]; ISO 9000 of 2008 version substituted the ISO 9000 of 2000 version as well. Moreover, to effectively promote the development of food industry, many food standards were revised or released every year by national related bureau. The standard of solid beverages was released on July 19th, 2013, and National food safety standard-Maximum residue limits for pesticides in food was revised on March 20th, 2014.

Requirement to apply course knowledge is much higher

The knowledge of food standard and regulation has been popularized in food factory at present. After graduation, students working on food whether in enterprise or government will certainly use related knowledge. Different from the general food technology courses such as fruit and vegetable, grain and oil, and animal products, students only center on a certain category in the future. Likewise, unlike food analysis, food machinery or food engineering course, students after graduation practically focus on a specific aspect in contrast from the whole food process chains. Modern food company holds Total Quality Safety Management and Total Employee Training as management principle[6]. Thus, every student enrolled into the food enterprise needs to master the basic food standard and regulation, flexibly apply this knowledge, and earn benefit for food factory. For some enterprises dealing in import or export food cope with various auditing required by important customers and government, applying ability of food standard and regulation is especially paid attention to in teaching.

IMPROVEMENT MEASURES

Elaborately select teaching contents and gradually form logic system.

Firstly, the fundamental food standards and regulations were selected. These contents included the methods and principles of standardization, food

standards of China, the fundamental knowledge of law, and the current food law and regulation of China. Through lecturing the basic knowledge, students acquainted the legislation procedure or setting criteria process, and knew the current food standards and regulations of China. Secondly, the thought of students were extended out via introducing the global situation of food standard and regulation. These teaching contents involved the food standard and regulation of international and developed countries such as USA and EU, the principles and methods of adopting foreign standard and regulation, literature search in relation to food standard and regulation, and so on. After learning these contents, students might observe the global food standard and regulation, and thoroughly understood the food situation in the world today. Meanwhile, teacher guided students to distinguish between Chinese and foreign food standard and regulation, recognized the level of Chinese food standard and regulation in the world, and consciously learned advanced food standard and regulation of international and developed countries. Last but not the least, according to the principle to learn in order to practice, some common knowledge of current food factory were specially taught in class. These contents consisted of Quality Management System (ISO9000), Good Manufacturing Procedure (GMP), Sanitation Standard Operating Procedures (SSOP), Food Safety System (HACCP), 5S management, and so on [7]. This part knowledge closest to food factory could supply the opportunity for students to contact food factory with zero distance. Students seemed that were personally on the scene of food factory, promoted to enhance the applying ability of food standard and regulation.

Explain knowledge with latest cases and deepen knowledge comprehension.

Usually, students maintain lively interest to recent cases which can enhance their identification ability. If the recent cases are brought into classroom, the learning positivity of students is very high. For example, when the chapters of food law legislation and operation were lectured, the latest law and regulation were chosen, especially the food law promulgated by the National People's Congress of the People's Republic of China every year. During the teaching process of food administration and law enforcement, the recent events were taught as cases. And students were asked to analyze the sequence of events. With their detailed analysis guided by teacher, they subliminally grasped the knowledge of food administration, law enforcement, law supervision, and so on. The cases were constantly changed with condition variation. The infant formula of melamine contamination of China was selected in 2009, the lean meat issue of China and the contaminated cucumber of European Union were used as case in 2011, and Fonterra milk powder contamination of New Zealand was chosen in 2014[8]. In the teaching of food standard, we insisted to choose just promulgated

standard or upcoming standard (Draft) as example. Through contact with latest standard or case, students conveniently understood the knowledge which always synchronized with times, even if the textbook objectively fell behind the times.

Concern inherent relationship of knowledge and grasp essentials through framework.

Though the knowledge of food standard and regulation seems trivial, it is a complete whole, having inherent relationship. For example, pollution-free food, green food, and organic food compose a pyramid system (Figure 1). From bottom to top, the requirement is higher than that of adjacency. Once each food was lectured, students were guided to analyze the differences among the three foods through a pyramid diagram. And their differences were quite clear. In the teaching of ISO9000, a complete loop diagram might clearly demonstrate the involved knowledge (Figure 2): compiling documents, executing documents, recording execution and auditing implementation. Students gradually understood that execution was based on documents, the done work should be truly recorded, and the implementation of documents would be audited. If the documents were not effectively carried out, the reason had to be found with the aid of PDCA cycling model [9]. Afterward, the documents might be revised or some new measures were taken to improve the implementation of documents. Our course group found that much knowledge of food standard and regulation could be displayed by means of pyramid, central ray, or loop diagram. Students clearly understood the logic system of knowledge and mastered the essential knowledge through these diagrams.

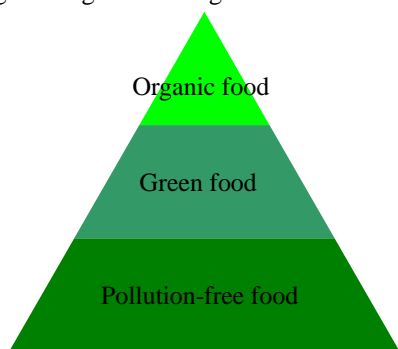


Fig-1: Pyramid diagram of three foods

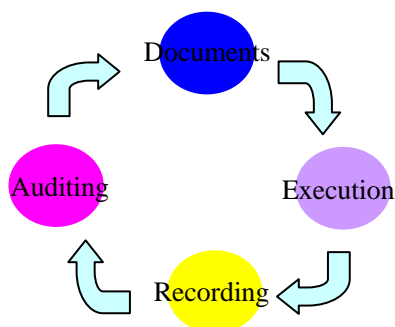


Fig-2: Loop diagram of ISO9000 implementation

Strengthen classroom interaction and inspire students to express view through debate.

College students accept knowledge, and positively think and exert knowledge. In the classroom teaching, some hot topics difficult problems were discussed by students. Through enthusiastic speak and lively debate, the knowledge were highlighted and the ability of students were improved. In the teaching of food law enforcement and supervision, the reason of adverse incidents was asked repeatedly. Why did melamine milk powder case occur in 2008? In 2009, most of students thought the lack of legal support, and a few students attributed to the responsibility fuzzy of supervision departments though there were many government departments such as agricultural, industrial and commercial, health, or technical supervision bureau. After the promulgation of food safety law on February 28th, 2009, I asked why lean meat issue of China appeared in 2011? The answers provided by students were varieties. Some students still thought the responsibility fuzzy of supervision departments, but the others viewed the deficient conditions of food law implementation. The conditions included certified testers, detection equipments, and so on. In short, students might thoroughly acquaint the subjects and supervisions of food law enforcement at China at present, and flexibly apply this knowledge through debate.

Experience knowledge and enhance learning interest in practice.

Senior students had the opportunity to practice in food factories, and the course of food standard and regulation was usually offered in senior class as well. After entering the food factories, students observed the clean and tidy district and experienced the orderly workshop, and then they would identify the tremendous effect of GMP and SSOP at heart. They visited the operating post, carefully reading work instruction book, operation record and repair record. At the same time, they might cordially invite the skilled worker to introduce how to use various records. Thus, the knowledge learned in classroom was integrated into the actual production process. Seeing each CCP (critical control point) sign, students easily think why this procedure should be considered for CCP, which hazard was controlled, how to control the hazard, and who was in charge of CCP [10]. With the train of thought, the HACCP knowledge would be perceived. Every year, some large well-known food enterprises such as beverage, dairy, wine, meat, and baked product companies, will be selected for student practice. Students perfectly put the classroom knowledge into productive practice and are encouraged by infinite learning interest.

IMPLEMENTATION EFFECTS

Students increased enthusiasm and classroom atmosphere livened up

After some measures including selecting recent case, applying diagram, and classroom interaction, were adopted, learning interest was improved. Facing the question provided by the teacher, students actively answered, and the past dull atmosphere in classroom thoroughly disappeared. Moreover, many students had distinctive views or they answered the same question from different angles. Thus, either other students or teacher probably was instructed to varying degrees. Lecturing in interactive, teacher felt relaxed and happy, and might think deeply. Further, they could guide students toward a higher level. Accordingly, the classroom atmosphere would be further enlivened.

Students effectively mastered knowledge.

After the implementation of provided measures, students might more effectively master the knowledge of food standard and regulation. For example, according to the statement of current textbook of China, fruit and vegetable standards are the latest, grain and oil product standards are newer, and livestock product standards are aging. Through discussion, students summarized that standard revision often related to actual living level though national standards should be revised each five years in principle. China solved the problem of food and clothing in 1980's, so the grain and oil standards underwent an extensive revision in the late 1980's and early 1990's. While fruit and vegetable products gradually saturated in late 1990's, their standards were revised after the year of 2000. Accordingly, fruit and vegetable standards are the latest. Livestock production still needs to be further developed in China, and its standards might gradually be revised in future. Through analysis, students understood the text literally, and grasped the deep knowledge that food standards synchronized with the level of social economic level in fact. Only social economic development could supply development space for food standard and regulation.

Application ability of students was enhanced.

Through the visit of graduates, we learned that many graduates engaged in food quality and safety management in companies. They are responsible for production quality and safety. In addition, they were also in charge of food quality and safety auditing carried out by domestic and foreign customers or government officials. Entering food factory, graduates quickly adapted themselves to the post involving food quality and safety because of acquiring solid learning and necessary training in university. And they had earned good evaluation from employers. Now, many graduates had become very capable persons proficient in food quality and safety work.

CONCLUSION

To adapt to the development situation of food safety and food trade, the course of food standard and regulation is offered in recent years. It enriches the knowledge of food standard and regulation for students majoring in food specialty. After the implementation of provided measures, classroom atmosphere was enlivened, learning interest was increased, and students effectively mastered the knowledge of food standard and regulation. Moreover, student application ability was enhanced. Those measures might create a good win-win situation among college, student, and employer in current job market full of fierce competition.

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