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China: The Present Situation of Food Additive Problems and Countermeasures

Food being the basic material of human survival and development, human beings on the food never meet demand, and also continue to promote and develop the food production. The pursuit of happiness through the enjoyment of food is a centuries old human endeavor. Taste, texture, freshness and eye appeal are major contributors to such an enjoyment, made possible in our modern lifestyle through the use of highly specialized ingredients known as food additives. Food additives afford us the convenience and enjoyment of a wide variety of appetizing, nutritious, fresh, and palatable foods. Their quantities in food are small, yet their impact is great. Without additives, we would be unfortunately lacking in the abundant and varied foods that we enjoy today. (foodadditive.org)

First, it is crucial to clarify the definition of food additive. The term "food additive" means any substance the intended use of which results or may reasonably be expected to result, directly or indirectly, in its becoming a component or otherwise affecting the characteristics of any food (FDA).

According to the "Hygienic Standards for uses of food additives"(GB 2760-2011), food additives are divided into 22 categories: (1) preservative (2) antioxidant (3) chromogenic agent (4) bleaching agent (5) sour agent (6) coagulant (7) osteoporosis agent (8) thickening agent (9) defoaming agent (10) sweeteners (11) colorants (12) emulsifier (13) quality improver (14) anticaking agent (15) flavor agent (16) enzyme preparation (17) coating agent (18) foaming agent (19) antistaling agent (20) spices (21) nutrition enhancer (22) other additives. (Wei)

Chemical raw materials are always wrongly misused as food additives, which contributes to a multitude of food problems. Sanlu Milk Powder Scandal in 2008 is a typical instance, involving milk and infant formula, and other food materials and components, adulterated with melamine. By November 2008, China reported an estimated 300,000 victims, (Tania) with six infants dying from kidney stones and other kidney damage, and an estimated 54,000 babies being hospitalized. (McDonald) The higher content of nitrogen atoms in food, the higher is the protein content. Melamine's biggest feature is the high nitrogen content (66.6%). In this way, because its nitrogen atom contains more, this little-known melamine, coupled with its simple and low cost production process, appears in milk producing. Adding 0.1 g of melamine into 100g of milk, in theory, can increase the protein content of 0.625%. (Zhang)

However, melamine is not a kind of food additive in a way, while it is combined with formaldehyde to produce melamine resin, a very durable thermosetting plastic used in Formica™, melamine dinnerware, laminate flooring and dry erase boards. (Miller) International Programmer on Chemical Safety and the European Commission edited the "International Chemical Safety Manual," Volume III, and International Chemical Safety Cards", which declared that a large number of long-term or repeated intake of melamine may have an impact on kidney and bladder, leading to stone.

People misunderstand the two concepts of non-edible substances and food additives constantly. Hence, food additives are considered risky. Shuanghui Lean Meat Powder Incident added fuel to it.

In the first place, I would like to analyze a typically medium-sized piggery's profit in China. The piggery at present possessed approximately 100 commodity pigs in around five years.

- (1) The cost of fostering a sow to breed. (A sow newly brought in is around 4 months old. After 3 months' raise it could breed, in whose process it consumes the reserve feed totally 600yuan. Plus the transportation expense, each year costing 160yuan.)
- (2) A piggy's birth and appearing on the market. (A sow can healthily breed lasting 5 years, during which it consumes gestation feed and lactation feed totally 2816yuan. A sow can basically breed 20 piggies. After apportionment, a piggy's appearance needs around 148.8yuan. The piggy that grows up to 108kg can be on the market. In this process, altogether 542.2yuan are paid for the feed.)
- (3) Fixed cost due to its properties of the scale. (The artificial expense, the floor space tax, the depreciation of the fixed assets, the repair and renewal of the equipments)
- (4) Profit.(The final cost for breeding a commodity pig is 991yuan.The price of a commodity pig weighing 108kg in the market in average is 15yuan per kg, totally 1620yuan. So, in summary, a commodity pig can make profits of around 629yuan.)
- (5) Analysis. (The cost of feed occupies 54.7% of the final cost, 86.1% of the profit. The less cost of feed they pay, the more profits they will earn.)

The fabricants of the lean meat powder began to announce the efficacy of cultivating the lean for pigs, which would take the place of regular feed. In China, the main material of the lean meat powder is clenobuterol. "Clenobuterol" can promote protein synthesis and accelerate the transformation and decomposition of fat. Pigs will only grow lean meat but not fat, so it is called "lean meat powder". According to the study, each ton of pig fed with just 18.5 grams clenbuterol, can yield an increase of 24% protein, and while to reduce 34% of fat. These kinds of pigs look vigorous, so the price is relatively high, indirectly enhancing farming profits. (Wu)

Clenbuterol is a kind of analeptic, but not a food additive, even not a feed additive. In 2010,the International Judo Federation Council, held in Tunis, decided to punish the Chinese athlete, Beijing Olympic champion, Tong Wen a two years' suspension(from 2009-2011). Her personal coach Wu once insisted that she had ate the pork ribs with lean meat powder by mistake, which caused the consequence of the test appearing positive.

In February 2002, the Ministry of Agriculture, Ministry of Health, and State Drug Administration jointly issued a "ban on animal feed and drinking water varieties of drugs used in the directory" (Ministry of Agriculture Bulletin No. 176). In April 2002, the Ministry of Agriculture issued "food animal veterinary drugs and other compounds banned list" notice "(Bulletin No. 193) (Tian)

3.15 Shuanghui pork event has a large impact on Shuanghui Group. It was reported that, according to "the voice of Chinese economy", the sudden scandal would not only hinder the process of restructuring and listing, but also hinder the sustainable development of Shuanghui. (Voice of Chinese economy) Shuanghui Group Chairman Wanlong recognized the tremendous impact on the group: March 15 Shuanghui development share dropped 10%, and the market value lessened 10.3 billion yuan, affecting sales of 1.5 billion yuan; Jiyuan Shuanghui meat processing fresh and frozen products directly lost more than 3000

million; since "lean" pigs are supposed to change to be tested throughout the year, it is expected to increase inspection fees to more than 300 million yuan; brand reputation suffers great harm.(Wan)

Excessively adding the food additives into food and using beyond the scope of the standard also become main factors leading to food problems. In early April 2011, the "Consuming Advocateship" program pointed out that, in the Pudong District, Hualian Supermarket and Lianhua Supermarket there was a kind of steamed bun, namely, corn steamed bun. (Consuming Advocateship) They were stained by the colorant and added the sweetener and the preservative, which should have been available to occur in food according to GB 2760-2011 mentioned above. However, the colorant involved comprises tartrazine, which is only in the legitimate use of frozen drinks, candied preserved fruits, jam, jelly, puffed food etc. The sweetener comprises sodium cyclamate, also illegal in the scope of steamed buns. Jinhao tea seed oil produced in Hunan was also tested, the result showing that the benzopyrene was 6 times overused. Jinhao tea seed oil benzopyrene's content was up to 60 micrograms / kg, and edible vegetable oil health standard specified the maximum of edible oil benzopyrene's content as 10 micrograms / kg. Evidence exists to link benzopyrene to the formation of lung cancer. (Tang)

It's common that some small enterprises in the production of food, only record the main ingredients in the label, almost no food additive compositions and contents; there are also some enterprises printing "this product does not contain any food additive" in advertisements or on the label to flaunt that their products are harmless, which sends consumers a wrong signal, that food additives are risky. According to the general of the "Food labeling regulations", food labeling contents shall be illustrated as follows: (AQSIQ)

- (1) Accurate, easy to understand, and scientifically legal.
- (2) It shall adopt national and industry standards for the name.
- (3) Name and address of the producer, net weight ,the production date and shelf life
- (4) The additive list(descending order in adding amount, using specific name, category or code)

Based on the problems and factors illustrated above, it is apparent to strengthen the management of food additives in a versatile and appropriate way.

GB2706-2011 is a basic standard. It regulates the use of food additives in order to achieve scientific supervision and standardize food productions and operations. The Ministry of Health in China developed the program and set up the working group to amend standards and clarify principles and priorities. The updater 2011 was completed. The working group analyzes the current effective combing edible agricultural products quality and safety standards, food hygiene standards, food quality standards and industry standards related to food. It also analyzes the Codex Alimentary Commission, the EU, Australia and New Zealand, Japan, the United States and other international organizations, national and regional food safety standards. According to China's food safety monitoring results and dietary exposure, it carefully listens to and accepts all views, reflecting the food Safety standards open and transparent system standard principles. (The Ministry of Health)

For food and food additive producing enterprises, it is effectual to accumulate the statistics of the food additive standard into a data base of the principle of business, and of routinization. Additive producers should base the food producers' quantities and types of food (providing documents of evidence on what they produce) on what and how many food additives they should purchase. Also, it is essential to ban

producing or selling other additives (melamine, clenobuterol, etc.). Food additive producers should also freely provide the printed handbooks of the abstract food additive standards in their fields of food according to the data base. GB2760 is an updater, so the data base is not set in stone. The Ministry of Health should declare when it is updated and help the enterprises to update the previous base. The data base must be possessed by all food enterprises when they are successfully in motion. The food producers should well-comprehend what kinds of food additives their food needs and how much they should correctly add by testing or popularizing. Mastering the specialized knowledge of food they produce is quite vital for food security and consumers' ease.

Also:

- (1) Keep close contact with other countries' administrations of food and food additives. Establish collecting and updating international system.
- (2) Not circumscribe new kinds of food additives' research, but each shall be safely-tested. Once a new kind is in motion or a previous one is changeable to danger, activate or cancel the listed additive promptly.
- (3) Research funds shall be only offered to experts (both chemical and technical) qualified. Unqualified research shall be regarded illegal. The experts' duty is to renovate lists at regular intervals, and amend classifications. Risk potentially dangerous and unknown additives.

The factories of the producing process should be decorated with precautions of the food on attentive boards. The label and package should mark the content of all the additives with bold lines. The producers should also have the duty to clarify what food additive is to dispel consumers' concerns.

Also:

- (1) Establish food additives sending and receiving accounting. Implement purchase inspection system not to use what do not meet the quality and safety requirements. Sales records should indicate the name of them, size, batch number, purchase unit name, sales amount and date content. Save the purchase and sale records, production records, inspection records and quality of safety-related information. Food quality and safety file should be kept for 3 years.
- (2) Food additives should be placed on workshop materials, with configuration accuracy of 0.1g scales. Ingredients personnel should correct measurement with the material allotted. Workshop staff by picking single-ingredient review, feeding. To improve efficiency, food additives of the workshop materials amount is suggested to accumulate by each pre-weighed package; distinguishing by colors or words.
- (3) Nutritional labels shall be produced at the same time when the relevant food is produced. Register at the certification body and gain the QS (Quality Standard) logo.

For the supervision system, besides enforcing the law justly and fairly, they should also spur the enterprises to declare their food information independently. They should assess the reality of information by means of inferring about other cases from one instance and investigating openly and secretly. Based on the assessment, the supervision system and the government release the security report. The inspections and tests should immediately notify the enterprises to cease production for rectification, and put this illegal enterprise blacklist to the public, allowed to incur high losses so that these companies recognize what the abuse of food additives brought if finding out the phenomena of illegal use of food additives,

Also:

- (1) Avoid "Ma Hou Pao"(马后炮) method(Law enforcement after the media exposure)

- (2) Avoid “Mao Shu Jie Qin”(猫鼠结亲)method(supervisory personnel bought off by the companies)
- (3) Avoid “Yang Yu Shi”(养鱼式)method (Not dealing with the source of the risk till it expands)
- (4) Review any case of food additive problem. Continue its survey about each link in supervising after exposure. Find out which link was doubtfully put off so that it caused larger harm or risk to consumers. Find out the person in charge and address inquires to him. Improve the mechanism of rewards and punishments for supervisory personnel.
- (5) Screen typical restaurants and record common loopholes. Utilize the competitive mechanism to balance similar restaurants with inter-supervision.

Media are playing a more and more powerful role in China. Not only 315 gala, but also the programs like “consumer advocateship” can also take effects on supervision. Making the typical occurrence of food additives on TV or headlines of news is meaningful to raise consumers’ awareness of consuming rights.

Also:

- (1) Strengthen reporters’ professional ethics and prevent malicious press speculations. Only when media that hold public resources hold a socially responsible attitude, could speculations, sensationalism, and seeking commercial interests be prevented on behalf of the public interest.
- (2) Report excellent enterprises’ cases to cultivate trusted brands and to enhance consumers’ confidence. (In order to distinguish from ordinary advertisements, only governmental media shall own the right to cover without any profits)
- (3) Encourage consumers to spontaneously lodge complaints to the consumers association.(Protect their privacy)
- (4) Encourage inner producers to spontaneously report to the industrial and commercial bureau. (Protect their privacy and ensure job security owing to the potential layoff)
- (5) Accelerate China's food safety emergency response mechanism.(the infrastructure investment in media)

There is a saying “Min Yi Shi Wei Tian”(民以食为天) in China meaning that food should be the basic material of individuals’ life but not the potential murderer of our body. With the development of food industry, food additives also expand themselves. However, till now, food additives are regarded as a two-edged sword. When they are abused in food, they just lose their missions. Food Additive that is subject of an effective notification can be called “safe food additive”. From the lessons of Sanlu and Shuanghui, we can conclude that any illegal and transgressed behavior, especially in food, may lead to huge crisis and, even bankrupt. Any food producer is the first hand of food security. Any food additive producer is the second-hand of food security. Any food is supplied for consumers. Only when we make a bond of guaranteeing food additive problems, can food industry burgeon sustainably and prosperously.

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