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Master Thesis

**Exploration of the collaborations between
INFOSAN and authorities
when a food safety crisis happened in China**



WAGENINGEN UNIVERSITY

DEPARTMENT OF LAW AND GOVERNMENT

Xiao Zhou

August 20, 2012

“Only if we act together can we respond effectively to international food safety problems and ensure safety food for everyone”

Dr Margaret Chan – Director – General of WHO

Exploration of the collaborations between INFOSAN and authorities when a crisis happened in China

A thesis submitted in partial fulfilment of the requirements for the Master degree

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Department of Law and Government

Wageningen, the Netherlands

Student: Xiao Zhou

Registration Number: 871126-987-120

Supervisors: Anna, Szajkowska

Meulen, Bernd vander

Teoh, Edmund

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Abbreviations

AQSIQ	Administration for Quality Supervision
CDC	Centre for Disease Control
CNCA	Certification and Accreditation Administration
EFSA	European Food Safety Authority
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FDA	Food and Drug Administration
HHS	Health and Human Services
IHR	International Health Regulation
INFOSAN	International Food Safety Authorities Network
MoH	Ministry of Health
NPS	National People's Congress
PRC	People's Republic of China
RASFF	Rapid Alert System for Food and Feed
SAIC	State Administration of Industry and Commerce
TDI	Tolerable Daily Intake
UN	United Nations
USA	United States of American
WHO	World Health Organization

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Chapter 1. Introduction

1.1 The background information of INFOSAN

The rapid globalization of food production and trade has increased the risk of international public health involving food safety.

To ensure the food safety is an international public health concern. Food safety problems which are discovered and managed in one country often are of interest to other countries. Food safety authorities around the world have acknowledged that the food safety must be tackled at the national level and international closer linkages among national food safety authorities. It is therefore important to have a mechanism for the food safety authorities' global collaboration and share information and experiences in order to manage food safety issues more effectively and efficiently.

The International Food Safety Authorities Network (INFOSAN) is the tailored mechanism to facilitate the exchange of food safety information and the collaboration among food safety authorities at national and international levels (WHO and FAO., 2011). It is a joint programme established in 2004 between the World Health Organization (WHO) and the Food and Agricultural Organization of the United Nations (FAO). INFOSAN is one of the six major communication platforms and technical meetings in WHO¹.

1.1.1 The formation and the development of INFOSAN

The formation of INFOSAN

In March 2004, WHO and FAO initially established the Network of INFOSAN by requesting designated INFOSAN Emergency Contact Point and INFOSAN Focal Points from each Member State. INFOSAN was officially inaugurated at the WHO/FAO Second Global Forum for Food Safety Regulators with approximately 100 members in October 2004 (WHO and FAO., 2011).

Aims and objectives of INFOSAN

In order to prevent foodborne disease and strengthen food safety systems globally, INFOSAN has objectives of promoting the share and exchange of information, promoting partnership and collaboration between countries, and helping countries strengthen their capacity to manage food safety problems.

¹ The six major communication platforms and technical meetings run by the WHO, including International Health Regulation(IHR), International Food Safety Authorities Network (INFOSAN), Global Outbreak Alert Response Networks (GOARN), the Stop TB Partnership, The Framework Convention on Tobacco Control (FCTC) and the International Collaboration and Prevention Combating Counterfeit Drugs (IMPACT) INSIGHTS, T. I. (2009). "Taiwan gains observer status in WHA." Retrieved 09.07.2012, from <http://www.taiwaninsights.com/2009/05/13/taiwan-gains-observer-status-in-wha/>, Shu-Jen, L. (2009). "Taiwan is to attend WHA meetings as an observer under the name "Chinese Taipei" (2009-04-29)." Retrieved 09.07.2012, from http://www.irpma.org.tw/english/cgi/03_leaning_02_01.php?file=1118..

Development of INFOSAN

In May 2009, the World Health Assembly (WHA) adopted a resolution on advancing food safety initiatives, which reinforced the importance of INFOSAN.

In December 2010, WHO/FAO launched the first global meeting of the international Food Safety Authorities Network (INFOSAN) to discuss current approaches and existing mechanisms, as well as potential improvements and future needs of the Network.

The milestone in the development of INFOSAN is shown in Figure 1.

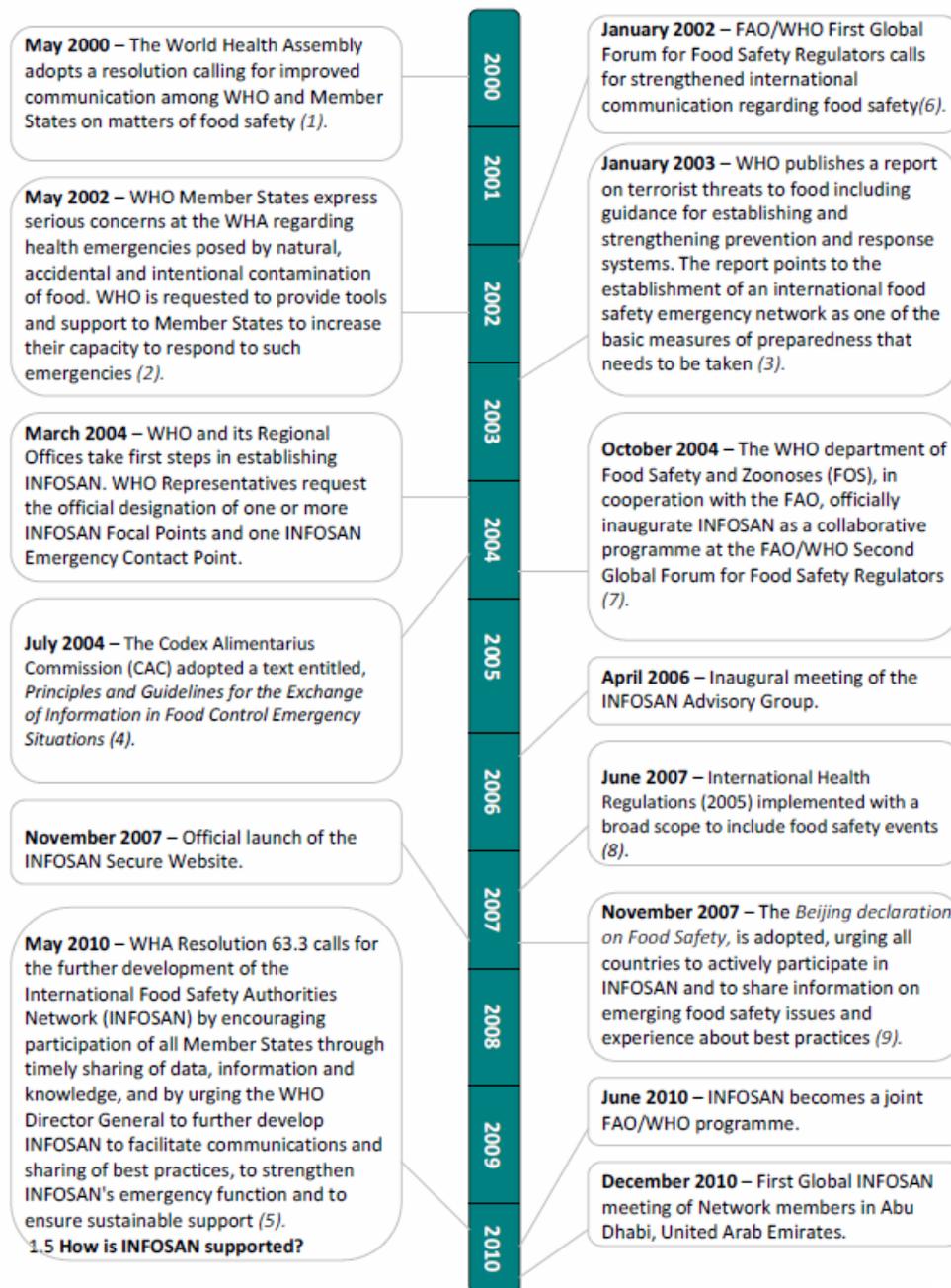


Figure 1: the milestones in the development of INFOSAN (WHO and FAO., 2011)

1.1.2 The structure, membership and actions of INFOSAN

The structure of INFOSAN

The structure of INFOSAN is shown in Figure 2. The INFOSAN Secretariat is based in WHO with a focal points in FAO. The Advisory Group is made of experts from national food safety authorities across the globe to ensure there is geographical coverage and represent various technical aspects of food safety. INFOSAN Focal Points are expected to disseminate information to related stakeholders and public, and contact the INFOSAN secretariat on behalf of their interest. The INFOSAN Emergency Contact Points are expected to be aware of foodborne disease outbreaks or food contamination crisis in their countries and inform the INFOSAN Secretariat. Besides, INFOSAN Emergency Contact Points can request assistance from WHO via the INFOSAN Secretariat to respond to national food safety crisis, if necessary (WHO and FAO., 2011).

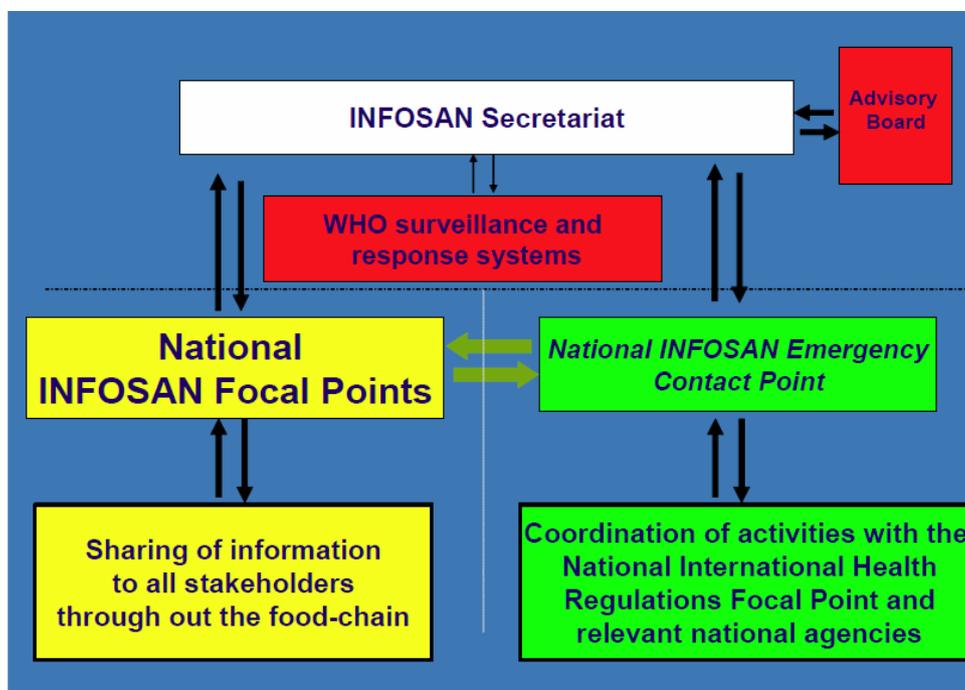


Figure 2: Structure of INFOSAN Network (WHO and FAO., 2007).

INFOSAN Emergency facilitates the identification, assessment and management of food safety crisis under the International Health Regulations (2005) (hereinafter “the IHR (2005)”) (WHO and FAO., 2007), which is the only regulatory framework for global public health (WHO and FAO., 2006). The structure of INFOSAN Emergency Network in a country is in Figure 3. From the figure, INFOSAN Emergency Contact Point is expected to alert food safety authorities within their country, to accept some notification and response responsibility and to facilitate the communication of urgent messages to direct report into INFOSAN Emergency on behalf of the government and to trigger the foodborne disease surveillance and investigation system.

Through this process, countries who receive contaminated food from international distribution or countries that may be associated by cross-border foodborne disease cases outbreaks will receive the Alert information from INFOSAN. Communication on this network is confidential due to the potential sensitivity of information exchanging (WHO and FAO., 2011).

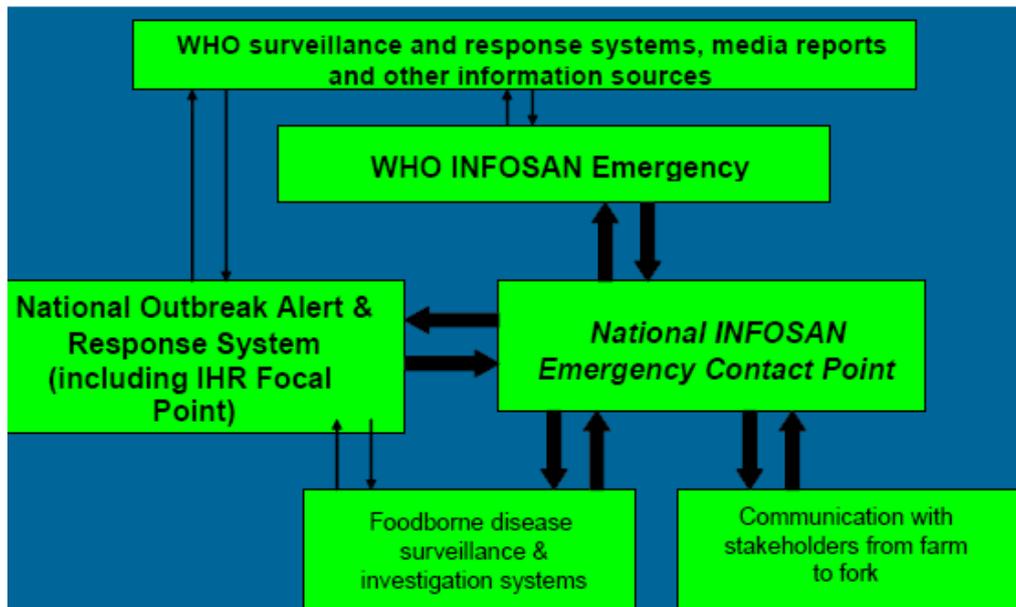


Figure 3: INFOSAN Emergency Network (WHO and FAO., 2007).

The membership of INFOSAN and its roles and responsibilities

Since the launch of INFOSAN in 2004, the membership has grown steadily (WHO and FAO., 2011). There are 177 UN Member States have joined the INFOSAN Network until 2011 while the total number of member states belonging to the UN system is 192 (WHO and FAO., 2011).

At present, there are 178 INFOSAN Emergency Contact Points are designated from various governments sectors in 170 countries and 260 INFOSAN Focal Points in 119 countries. Most of the Contact Points and Focal Points are based in agencies or ministries responsible for health (WHO and FAO., 2011).

The membership of INFOSAN is voluntary and restricted based on their national food safety related authorities, which includes all authorities involved in food legislation, risk assessment, food control and management, food inspection etc.

Actions from INFOSAN

There are two distinct components in activities of INFOSAN. The first component is routine activities, which includes the dissemination of food safety guidelines, questionnaires, newsletters and factsheets within the network, keeping food safety information notes on regular basis, and aiding routine of sharing of national food safety information. The second

component is emergency activities, which including the identification, verification and sharing information on food safety-related incidents, providing technical assistant to national authorities about the management of food safety, and updating information on potentially importing or exporting implicated product (WHO and FAO., 2011).

Once a food-related incident happened, the INFOSAN Secretariat would receive all information about the incident through INFOSAN Emergency Contact Points, Regional Offices, and other partners. Based on the information, further assessment about whether an alert may need to all or part of the Network will be determined. The INFOSAN will also help with further information exchanging and management within countries. The procedure of event identification and management is shown in Figure 4.

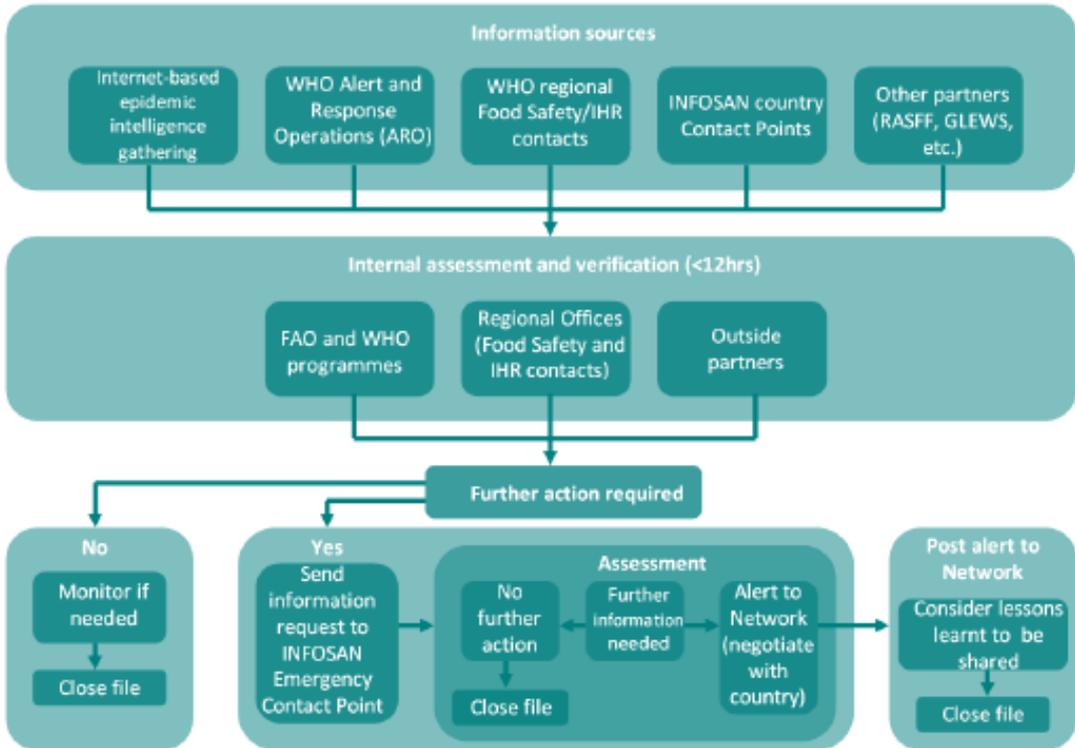
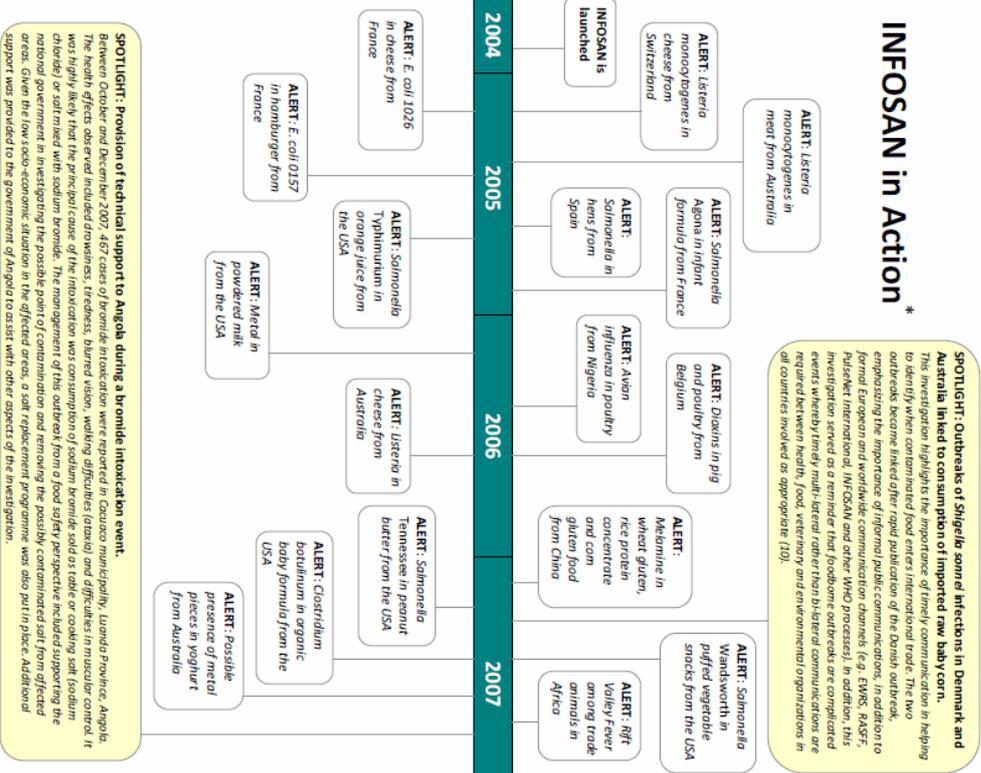


Figure 4: Event identification and management (WHO and FAO., 2011)

Since INFOSAN was established, the network has been operational in many food safety incidents. INFOSAN alerts have been disseminated by the Secretariat into more than 40 crises and 11 crises have been considered Public Health Risks under IHR (2005). Figure 5 is a timeline about the highlights of INFOSAN activities from 2004 to 2010.

Except those emergency actives, INFOSAN also take non-emergency actions to promote collaboration between partnerships and to strengthen the food safety systems. The non-emergency actions includes publishing INFOSAN Information Notes, dissemination technical guidance on food safety emergency, gathering data on emergent food safety issues, promoting collaborative partnerships etc. (WHO and FAO., 2011).

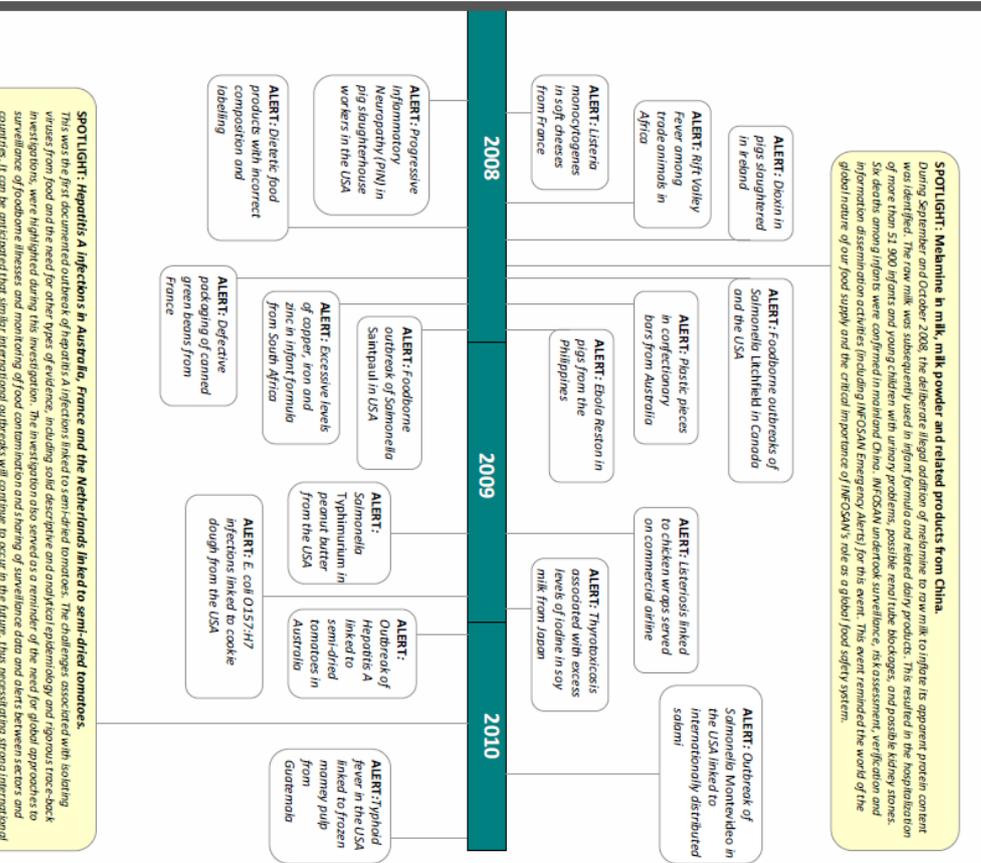
INFOSAN in Action*



SPOTLIGHT: Outbreaks of Shigella sonnei infections in Denmark and Australia linked to consumption of imported raw baby corn.
 This investigation highlights the importance of timely communication in helping to identify when contaminated food enters international trade. The two outbreaks became linked after rapid publication of the Danish outbreak, emphasizing the importance of informal public communication, such as the rapid response of INFOSAN and other WHO partners (e.g., FAO, RAST, PulseNet, and others). INFOSAN and other WHO partners also coordinated the investigation, used as a reminder that foodborne outbreaks are complicated events whereby timely multi-sector (rather than just sectoral) communication are required between health, food, veterinary and environmental organizations in all countries involved as appropriate (10).

SPOTLIGHT: Provision of technical support to Angola during a bromide intoxication event.
 Between October and December 2007, 467 cases of bromide intoxication were reported in Cazombo municipality, Luanda Province, Angola. The health effects observed included droopiness, tiredness, blurred vision, swelling difficulties (edema) and difficulties in muscular control. It was highly likely that the principal cause of the intoxication was consumption of sodium bromide sold as table or cooking salt (sodium chloride) or salt mixed with sodium bromide. The management of this outbreak from a food safety perspective included supporting the national government in investigating the possible point of contamination and removing the possibly contaminated salt from affected areas. Given the low socio-economic situation in the affected areas, a salt replacement programme was also put in place. Additional support was provided to the government of Angola to assist with other aspects of the investigation.

* This timeline provides highlights of INFOSAN activities over the past 6 years. Some events required multiple INFOSAN Alerts which are not represented here.



SPOTLIGHT: Melamine in milk, milk powder and related products from China.
 During September and October 2008, the deliberate illegal addition of melamine to raw milk to inflate its apparent protein content was identified. The raw milk was subsequently used in infant formula and related dairy products. This resulted in the hospitalization of more than 51,900 infants and young children with urinary problems, possible renal tube blockages, and possible kidney stones. Six deaths among infants were confirmed in mainland China. INFOSAN undertook surveillance, risk assessment, verification and information dissemination activities (including INFOSAN Emergency Alerts) for this event. This event reminded the world of the global nature of our food supply and the critical importance of INFOSAN's role as a global food safety system.

SPOTLIGHT: Hepatitis A infections in Australia, France and the Netherlands linked to semi-dried tomatoes.
 This was the first documented outbreak of hepatitis A infection linked to semi-dried tomatoes. The challenge associated with isolating viruses from food and the need for other types of evidence, including solid descriptive and analytical epidemiology and genome sequence investigations, were highlighted during the investigation. The investigation also served as a reminder of the need for global approaches to surveillance of foodborne illnesses and monitoring of food contamination and having of surveillance data and alerts between sectors and countries. It can be anticipated that similar international outbreaks will continue to occur in the future. Thus, necessitating strong international and intersectoral collaboration in the rapid identification, effective management and prevention of such risks.

Figure 5: Actions from INFOSAN (WHO and FAO., 2011)

1.1.3 The relationship between INFOSAN and IHR

As mentioned before, IHR (2005)² was the only regulatory framework for global public health. It was adopted by the Fifty-eight World Health Assembly on 23 May 2005 and entered into force on 15 June 2007. The purpose and scope of IHR (2005) are described in Article 2: “to prevent, protect against, control and provide a public health response to the international spread of disease in ways that are commensurate with and restricted to public health risks, and which avoid unnecessary interference with international traffic and trade.” (WHO, 2005).

IHR (2005) is an international legal instrument for INFOSAN with the aim to prevent, protect against, control and provide a public health response to the international food safety problems (WHO and FAO., 2006). IHR (2005) is legally binding on all WHO Member States , including all INFOSAN members, and it has been in operated in 11 food safety crisis (WHO and FAO., 2010).

The interface between the IHR (2005) and INFOSAN is obligation of countries and WHO apply to food safety crisis (WHO, 2007). The cooperation of IHR (2005) and INFOSAN Emergency Network is shown in Fig 3. The identification, assessment and management of food safety from INFOSAN is required to under IHR (2005) (WHO, 2007). The requirements are as follows:

Notification and communication

It is required that firstly, the notification and reporting by countries, as well as other urgent IHR communications, generally be transmitted through National IHR Focal Points and IHR Contact Points within 24 hours of assessment (WHO, 2007)³.

Secondly, the communications should be available at all times((WHO, 2007))⁴.

Thirdly, countries should report the evidence of public health risks occurring outside the country’s territory (WHO, 2007), which includes the imported or exported human cases, or contaminated goods including foodstuffs⁵.

Fourthly, the State Party shall assess and notify WHO within 24 hours of assessment of public health information through the National IHR Focal Point⁶.

Fifthly, the notification including:

“case definitions, laboratory results, source and type of the risk, number of cases and deaths, conditions affecting the spread of the disease and the health measures employed; and report, when necessary, the difficulties.....”(IHR (2005) Article 6.2).

² Further information on the IHR (2005) can be found on the WHO website: <http://www.who.int/ihr/en>

³ See IHR (2005) Article 6.1

⁴ See IHR (2005) Article 4.2

⁵ See IHR (2005) Article 9

⁶ See IHR (2005)Article 6.1

Sixthly, in addition to notification, the countries are allowed to initiate 'consultations' with WHO when information is insufficient⁷.

The notification is the beginning of the assessment dialogue (WHO, 2007). The combination of country and WHO in notification and consultation is significant for determining the nature of crisis and the appropriate response.

INFOSAN Emergency Contact Point

The IHR (2005) requires that the communication between WHO and countries must occur through the National Focal Points and IHR Contact Points, which includes the technical discussion between national food safety authorities and WHO's programme on food safety, including the INFOSAN respect to the crisis (WHO, 2007). In order to fulfil this requirement, as well as to ensure national and international public health security, it is important that the National IHR Focal Points and the INFOSAN Emergency Contact Point to collaborate closely.

The duties of INFOSAN Emergency Contact Point are in Appendix I. The duties of IHR Focal Points are to transmit health relevant notification and reports between WHO and countries, as well as other urgent communications with 24 hours of assessment⁸.

Improvement on national food control systems

The INFOSAN Users Guide in 2006 says:

"INFOSAN is designed to complement national food control systems. While the government structures and agencies that deal with food safety differ from one country to another, a modern national food control system must ensure the production and distribution of safe food". The food control system refers to "the essential integration of all parties involved in the production and distribution" (WHO and FAO., 2006).

Therefore, the INFOSAN have duty to improve national food control systems with national authorities. The INFOSAN Users Guide also points out that a document named "Assuring Food Safety and Quality: Guidelines for strengthening national food control systems (FAO. and WHO, 2002)" can provide a detailed description of elements and guidance for building the national food control system. According to this document, the food control system including three strategies. Chinese national food control system can be built or enhanced refer to it.

The first strategy is primary prevention programmes, such as HACCP system, which is aimed at preventing the initial contamination (FAO. and WHO, 2002).

The second strategy is preventing contaminated food from reaching markets or consumes. Food recall plans is one of the important strategy (FAO. and WHO, 2002). INFOSAN

⁷ See IHR (2005) Article 8

⁸ See IHR (2005) Article 6

Emergency Network can help the industry and government recall contaminated products, which have been distributed internationally, through the Emergency Contact Points (WHO and FAO., 2006).

The tertiary strategy is to minimize the impact on the public health (FAO. and WHO, 2002). INFOSAN plays an important role in this strategy by helping countries to identify and prevent contaminated food product from entering into international market. It is critical of accessing to timely and accurate information about the contamination, distribution of products and the affected persons in an emergency response via INFOSAN Emergency network. Besides, INFOSAN encourages member states on building or strengthen their National Food Control System as a basic means in food safety emergencies response (WHO and FAO., 2006).

1.2 Chinese food safety situation and INFOSAN in China

1.2.1 The food safety issue in China and governments efforts

The food industry is one of the fastest growing industries in China, which benefits from a buoyant economy and supportive government policies. China's principal crops are rice, corn, wheat, soybeans, and cotton in addition to apples and other fruits and vegetables. China's principal livestock products include pork, beef, dairy, and eggs (USDA, 2012). Except the domestic consumption, more and more food products are exported to global trading. Thus, the safety of Chinese exported food products have more and more impact on global food safety.

However, the food safety situation in China is not satisfied by public. The food safety problem is still a most concerned topic in China. An investigation found that most of world consumers felt food safety was unchanged or a bit improved in recent years, only Chinese consumers felt their food safety situation, both fresh and processed foods, had been worsened (Flynn, 2012). A poll conducted by Chinese university also showed the public generally has a negative attitude toward food safety in China. There were more than 73% interviewers said they believe the food was unsafe, of which 27.8% chose 'extremely unsafe'(Hongyi, 2012).

The low consumer credit results from the more and more food safety scandals in recent years (Table1). The Chinese authorities have been under heavy pressure, from consumers and media to solve scandals and the requirement of international trading, to improve Chinese food safety situation. The efforts from Chinese government are described in below text.

The Change in authority structure

In 2003, a department called the State Food and Drug Administration of China was created in attempting to better control of food safety.

The development of Chinese Food Safety related Law and regulations

Major legislations in China about food safety are listed as follows:

- **Frontier Hygiene and Quarantine Law of the People's Republic of China** (Law; Promulgation Date: 1986-12-02; Effective Date: 1987-05-01).
- **Food Hygiene Law of the People's Republic of China** (Law; Promulgation Date: 1995-10-30; Effective Date: 1995-10-30).
- **Food Produce Safety Law of the People's Republic of China** (Law; Promulgation Date: 2005-04-29, Effective Date: 2006-11-01).
- In response to the outbreak of new food safety problems, the State Council issued **the Decision on Further Strengthening Food Safety Supervision** in 2004. This Decision stated that the Department of Agriculture, Quality Supervision and Inspection, Industry and Commerce, and Health are four food safety supervision authorities in China. Every monitoring link in food chain is supervised by one government department. Sectional supervision is the main means of safety control for different varieties of food.
- After five years of drafting, the China's National People's Congress (NPS) Standing Committee passed the first comprehensive **Food Safety Law** (Law; Promulgation Date: 2009-02-28, Effective Date: 2009-06-01). The key changing elements in the latest Food Safety Law is about the penalty for default, the supplementary Art.99 provision Definitions, and labelling, supervision, import and export, safety standard.
- Shortly after the launch of Food Safety Law, the State Council published the related **implementation regulation**, which is followed by regulations by the Administration for Quality Supervision, Inspection, and Quarantine (AQSIQ), State Administration of Industry and Commerce (SAIC), and the Certification and Accreditation Administration (CNCA) of China (Francesca Pavoni and Poto., 2009).

To improve the food control system

The enactment of legislation is only the first step in the way of improving Chinese food safety situation. The subsequent steps are as following.

- The Chinese government is expected to adopt the Good Agricultural Practices (GAP) as well as the Good Manufacturing Practices (GMP) in the whole food chain and follow HACCP at firm level (Pei, Tandon et al., 2011).
- The State Council have a plan to establish a food safety credit file. The credit file would be issued to public regularly in attempting to create a credit and honest marketing situation (Xintian, 2012).

- The State Council have required food relevant authorities and local government to improve the local food safety standards system and risk monitoring and evaluation system (Xintian, 2012).
- The Chinese national Development and Reform Commission has promised to build the food safety risk monitoring and evaluation online system, which would include the tracing and tracking system, recalling information system, credit evaluation and trustworthy information system, food and additives safety certification system and so on (GOSC, 2012).
- Official national level and department level of food safety websites are established by authorities. Except for those official websites, there are also other special food safety concerned websites⁹.
- The State Council issued a Decision on reinforcement of food safety supervision on 23rd June 2012. The Decision points out that the food safety supervision would be one of the standards of the evaluation of officers' performance (Council, 2012).

Table 1: Food safety incidents in China from 2003 to 2009 (Wikipedia, 2012).

Year	Food Safety Incidents
2003	Poisonous Jinhua ham
2004	Counterfeit baby formula Adulterated pickled vegetables Counterfeit alcoholic drinks Soy sauce made from human hair
2005	Sudan I Red Dye
2006	Counterfeit drugs School food poisoning Contaminated turbot fish Pesticide residue on vegetables Infected snail meat Poisonous mushrooms
2007	Counterfeit drugs Alleged carcinogen used in frying oil Contaminated wheat gluten and rice protein used or export Sewage used in tofu manufacturing Cardboard bun hoax
2008	Tainted Chinese dumplings Contaminated powdered ginger

⁹ The national official website: <http://foodsafety.ce.cn/>

An example of the department level official website: <http://www.nfgs.com.cn/>

Other food safety concerned websites, like: <http://www.prcfood.com/>, <http://www.cfsiw.com/>

	Contaminated baby formula
	Contaminated egg products
2009	Plastic tapioca pearls
	Pesticide in mantou
	Goat urine duck meat
	Formaldehyde blood pudding

1.2.2 The food safety control network in China and the collaboration with INFOSAN

In response to the variety food safety issues and incidents in China and the global trading pressure, the Chinese government need international collaboration more than it ever need before.

China has been a member of INFOSAN Network since the INFOSAN was established and China announced that apply to IHR in next year, which is the legal framework of INFOSAN. According to the announcement, the government of the People’s Republic of China decided that the IHR should be applied to the entire territory of People’s Republic of China, including the Hong Kong Special Administrative Region, the Macau Special Administrative Region and the Taiwan Province (WHO, 2005).

The IHR (2005) and INFOSAN all require national collaboration points to communicate with WHO. IHR requires national IHR Focal Point¹⁰ and WHO IHR Contact Point¹¹. INFOSAN requires Focal Point and INFOSAN National Emergency Point.

Each country is required to have one INFOSAN Emergency Contact Point, which is expected to notify INFOSAN of food safety problems and urgent messages during food safety emergencies. The INFOSAN Emergency Contact Point operates under IHR (2005) and coordinates with the National IHR Focal Point (MoH in China) and other relevant national agencies. Generally, the INFOSAN National Focal Point including: AQSIQ, SAIC, MoH, CNCA, Food and Drug Administration, and relevant institutes on the basis of following law, regulation or decision (Textbox 1).

According to *the Decision on Further Strengthening Food Safety Supervision* (2004) issued by the State Council, the food safety supervision departments are the Department of Agriculture, Quality Supervision and Inspection, Industry and Commerce, and Health.

¹⁰ “National IHR Focal Point “ means the national centre, designated by each State Party, which shall be accessible at all times for communications with WHO IHR Contact Points under these Regulation (IHR article 1).

¹¹ “WHO IHR Contact Point” means the unit within WHO which shall be accessible at all times for communications with the National IHR Focal Point (IHR article 1).

According to the **implementation regulation** (2009) related to the **Food Safety Law** (2009), the food safety law will be followed by the Department of Agriculture, Quality Supervision and Inspection, Industry and Commerce, and Accreditation Administration (CNCA) of China.

According to Article 5 of the **Food Safety Law** (2009), the local level of food safety information network including AQSIQ, SAIC, and Food and Drug Administration Department. According to Article 9 of the **Food Safety Law** (2009), the technical institution which in charge with the food safety risk monitoring program, is working together with the administrative entities.

The corresponding authorities in People’s Republic of China are summarised in following box. And each agency functions are listed in Figure 6.

Textbox 1: the corresponding authorities in China

National IHR Focal Point _ the Ministry of Health of the People’s Republic of China (MoH in short). The local health administrative authorities are the implemental agent in their respective jurisdictions.

INFOSAN National Focal Point_ located in several food safety ministries, including ministries of health, food , agriculture and trade (WHO, 2009). The authorities are AQSIQ, SAIC, MoH, CNCA, Food and Drug Administration, and relevant institutes.

INFOSAN National Emergency Contact Point_ the Ministry of Health of the People’s Republic of China.

Regulation agency	Main food safety problems in the link
New food safety commission under the State Council	Co-ordinate and oversee the new food supervision apparatus
Ministry of Health (MOH) under which is the State Food and Drug Administration (SFDA)	Assess food safety risk, set national standards of food safety, release information relating to food safety, regulate food safety testing, and investigate serious food safety incidents
Administration for quality, supervision, inspection and quarantine (AQSIQ)	Supervision of food production and food export/import
State Administration for Industry and Commerce (SAIC)	Supervise the domestic wholesale and retail food sectors
Ministry of Agriculture (MoA)	Responsible for non-processed farm products

Figure 6: Responsibilities of China's food agencies under the 2009 law. (Pei, Tandon et al., 2011)Source: New Food Law China 2009

There were totally two alerts in China from INFOSAN from 2004 to 2010. The first alert was Melamine in wheat gluten, rice protein concentrate and corn gluten food from China. Another alert was a highlight alert, which was about Melamine in milk, milk powder and related products from China. The second alert was chosen as case study to illustrate how INFOSAN worked in China in below text.

1.3 Purpose

1.3.1 Problem formulation

As it is mentioned in section 1.2.1, China has many food safety problems. On one hand, the government is trying their best to improve the food safety situation in China. On the other hand, more and more complicated food safety problems have risen up. The food safety problems in China can greatly impact on other countries from global trading, vice versa.

Therefore, it is significant to study the International Food Safety Authorities Network in China, which can provide assistant and cooperation with Chinese authorities when the food safety emergency happens.

1.3.2 Research objective

This study is to find out how the INFOSAN works in China when a food safety emergency happens. and to analysis the collaboration with authorities.

Specific research objectives:

- ✚ To know more about INFOSAN, especially the INFOSAN in China.
- ✚ To figure out the actions that the INFOSAN took in crisis of China.
- ✚ To dig out the collaboration between INFOSAN and authorities.

1.3.3 Research questions

With the aim of accomplishing the proposed research objectives, the following research questions are formulated:

- ✚ How is the substructure of INFOSAN in China like?
- ✚ What are actions that INFOSAN taken in China when a food safety emergency happens?
- ✚ What is the impact on other countries via INFOSAN when a food safety emergency happened in China?
- ✚ How about the collaborations between INFOSAN and authorities?

Chapter 2. Methodology

This thesis is mainly a desk study with literature reviews.

A case study was used here to illustrate the reflections from Chinese authorities, impacts on other countries and reflections from INFOSAN when a food safety emergency happened in China. Since the melamine contamination crisis in China in 2008 was a highlight Alert and this crisis had great influence in Chinese public, the case of melamine contamination crisis in China in 2008 was used in this thesis.

More specific information is asked from relevant people by email or online interview.

Chapter 3. Thesis framework

Firstly, the background information of the INFOSAN and Chinese food safety situation were introduced in Chapter 1. The functions of Chinese food safety control authorities and the connection between INFOSAN and Chinese authorities were also introduced.

Then, a case study of melamine contamination crisis in China in 2008 was used to illustrate how INFOSAN works in China in Chapter 4. This section included the relationship between Chinese authorities and the crisis, the impact on other countries and the function of INFOSAN in the crisis.

Afterwards, the effectiveness of reactions from Chinese authorities and other countries were discussed. The duties and effectiveness of INFOSAN actions were also discussed via comparison with INFOSAN Users Guide and INFOSAN’s legal framework IHR (2005). Those discussions were in Chapter 5.



Figure 7: Framework of the thesis

Chapter 4. Case study

4.1 General description of Melamine-contamination crisis

In 2008, China witnessed one of the most serious food-safety lapses, that was the melamine contamination crisis. The melamine, which could lead to serious, or even fatal renal and kidney failure, was used as an additive in milk to increase the measured protein level.

Thousands of people were victims of this crisis. It was reported that the contaminated products led to the death of 6 infants and hospitalization of 52,000. Furthermore, 250,000 children were estimated to have suffered mild kidney and urinary problems. The immediate cost to the health system were about 58 million Euro (Pei, Tandon et al., 2011).

The melamine-contamination crisis was broadly noticed by public from media report, because many babies became serious ill due to the long-term consumption of Sanlu brand infant formula. Then, more products from at least 22 dairy manufacturers across China were found to have been contaminated from following inspections conducted by China's national inspection agency (WHO, 2008) (GRA and WHO, 2008). The contamination levels varied between 0.09mg/kg and 2.560 mg/kg (GRA and WHO, 2008).

It was uncertain how long the Melamine-contaminated products had been on the Chinese market. Complaints about the milk powder made by Sanlu were reported as early as March 2008 and to AQSIQ at June 2008 (WHO, 2008). Since the contamination appeared in primary production, the contaminated ingredients had been distributed to a wide range of food products, which were most probably manufactured using ingredients made from melamine contaminated milk (WHO, 2008). This crisis caused a panic in China. No one dared to consume milk products at that time (WHO, 2008).

This crisis attracted attentions on safety of dairy products in national and international level and triggered a comprehensive reform for the Chinese food safety system. Those aspects will be included in following text.

4.1.1 Description of Melamine as a health hazard

Melamine is a name used both for the chemical and for the plastic made from it. In this crisis, all references are to the chemical (WHO, 2008).

Melamine is an organic base and a trimer of Cyanamid, with a 1, 3, 5-triazine skeleton. The chemical structure is shown as Fig. 4-1. Melamine combines with cyanuric acid and related compounds to form melamine cyanurate and related crystal structures, which have been considered as contaminants in the Chinese melamine-contamination crisis (Céline Marie-Elise Gossner, Jørgen Schlundt et al., 2009).

Melamine has both acute and chronic toxicity. There were 2 outbreaks of melamine contamination in pet feed in 2004 and 2007 in USA (Jeong, Sun et al., 2006; Anonymous, 2007; Brown, Jeong et al., 2007; Burns, 2007). Melamine has low acute toxicity. There are no exact data of lethal dose for human. But an oral LD₅₀ in the rat is 3161 mg/kg body weight (WHO and FAO., 2009) (Bradley, 2008). Acute symptoms can cause renal failure in infant and young child. Chronic exposure may cause cancer or reproductive damage.

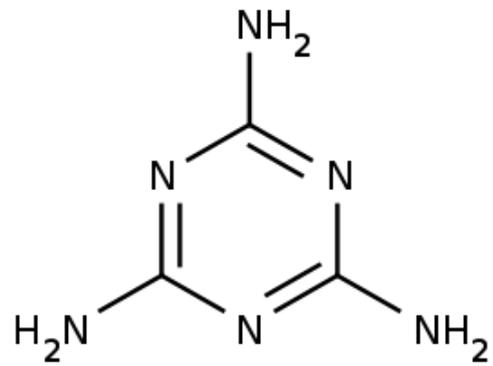


Figure 8: Chemical structure of melamine (Chiesa, 2008).

4.1.2 Description of Melamine in the crisis

Melamine has several other industrial uses, including glues, dinnerware, molding compounds etc. (Wikipedia; WHO, 2008). Melamine is also a pesticide, it has been reported that cyromazine can also be converted to melamine in plants (Lim, Scherer et al., 1990; FAO., 1999; EMEA, 2001). However, there are no approved direct food uses, nor there are any recommendations in the Codex Alimentarius (WHO, 2008).

Why add to food

Melamine is illegally added to raw milk to inflate the apparent protein content of food products due to the fact that melamine is high in nitrogen (66% nitrogen by mass), the addition of melamine to a food artificially increases the apparent protein content when measured with standard tests (WHO, 2008) (Wikipedia; WHO, 2008) (Bradley, 2008). How the melamine get access to milk is illustrated in Figure 4-2.

Spread of contamination

As mentioned before, there were at least 22 dairy manufacturers across China were found been contaminated. The contaminated products were not only in Sanlu brand infant formula, but also in liquid milk, frozen yogurt dessert and in coffee drink etc. most of the contaminated products were manufactured using ingredients made from melamine contaminated milk (GRA and WHO, 2008; WHO, 2008). A succinct list of melamine contaminate food can be found in Appendix II (Bradley, 2008).

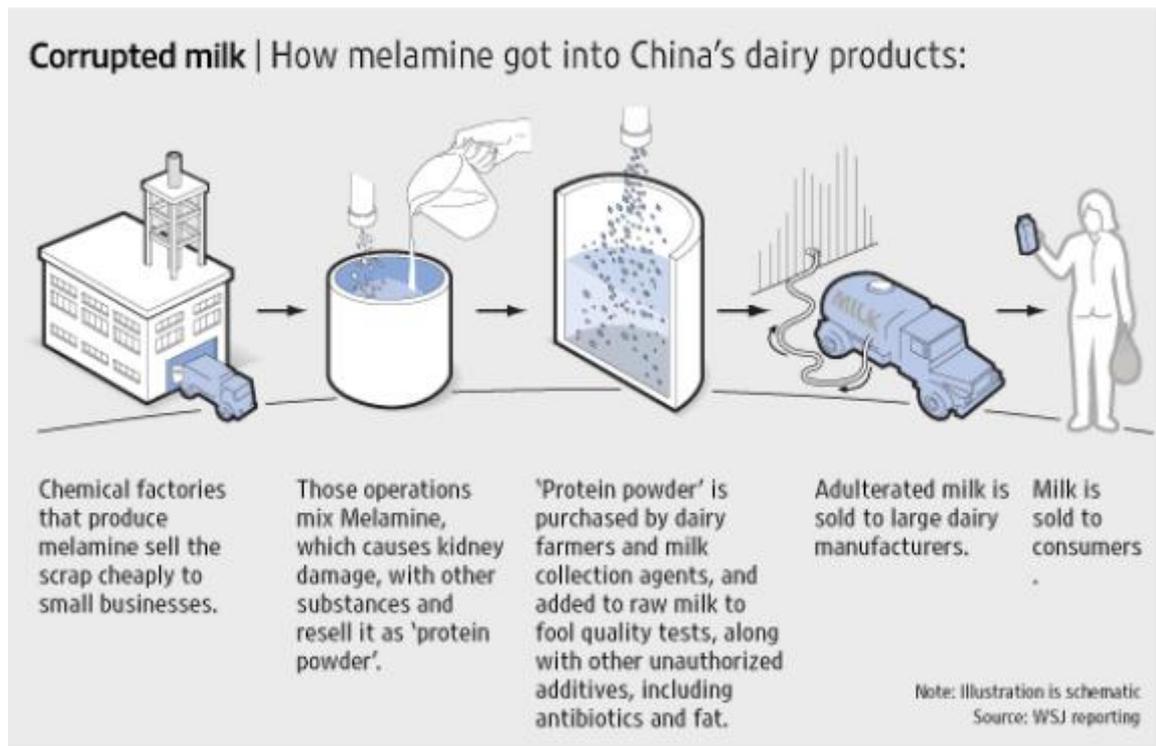


Figure 9: The process of melamine access to dairy products (FAIRCLOUGH, 2008).

4.2 The relationship between Chinese authorities and melamine contamination crisis

4.2.1 The causes from Chinese authorities for the crisis

Direct cause

The defective enforcement in dairy industry from Chinese authorities is one of the most important direct cause for the crisis.

Melamine was illegally added into raw milk to increase the measured protein content in quality test. The defective supervision and inspection of dairy product was one of the most important causes of melamine contamination crisis. There were many reasons that contributed to the failure detection by the authority.

Firstly, the melamine was not specifically listed as illegal additive before the crisis because it was not suspected to be added as ingredient. Therefore, it was not specifically tested in formula milk (Bradley, 2008; Pei, Tandon et al., 2011).

Secondly, based on Chinese regulation, some products may be exempted from inspection of authorities if they are approved by the State Administration for the Inspection of Import and Export Commodities (China, 10.12.2989). Many dairy companies were exempted from official control during the crisis, which including the main distributor of the contaminated

milk, Sanlu Company. This is also a reason why inspection from government was not work promptly.

Thirdly, the rapid automated testing systems of ingredients and specific tests for milk quality, such as freezing point depression, specific gravity analysis and fat content, should have detected the contamination. But these tests were either not used properly or were ineffective (Pei, Tandon et al., 2011).

Indirect cause:

The improper encouragement of dairy industry from Chinese authorities is one of the most important indirect cause for the crisis.

The dairy industry is in a surge demanding with great support from government while relatively few of Chinese farmers, most of them were small-scale, have the capital and good dairy-farming practices (Fairclough, 2008).

The dairy industry was largely supported and encouraged by Chinese government. There were various programs that activate the dairy products consumption, including allocation of farmland for raising cattle, improvement of quantity and quality of grasslands, economic stimulating like decreasing the fee of land use or providing the farmers with discount loans. Moreover, the Chinese government had also actively promoted the consumption of milk to children through a school milk scheme (Pei, Tandon et al., 2011). All programmes and support from government had driven rapid growth of dairy industry, with an annual growth rate of over 20% (Hongjie, 2009), as well as the market demand.

However, the government did not consider actual producing capability of dairy farm. Most of raw milk (more than 70%) was produced from small-scale dairy-farmers, with only 2-4 cows. Even worse, the raw milk production conditions were critical. Farmers were lacking of hygiene awareness and household farms were in poor safety control (Hongjie, 2009), together with cheap feed and other factors leading to low quality of raw milk, even failed to meet the dairy companies' standards (Fairclough, 2008). Thus, farmers added so-called "protein additives", what actually was melamine, into raw milk to improve milk quality without knowing how serious it was.

4.2.2 Government's reaction during the crisis

The government established an emergency task force to solve the problem. The actions from Chinese authorities are described in this section.

Recall of contaminated products. The authority seized and ordered a recall of formula produced by Sanlu Co. Ltd., 2176 and 8218 tons respectively, on 6 August 2008. It was reported that the contaminated milk had been used to produce formula in Sanlu company since March to 5 August 2008 (WHO, 2008). In addition, a recall from Chinese government

had been ordered in those countries who probably exported contaminated products (GRA and WHO, 2008).

To inform public. This crisis triggered a panic in public and great concerns on food safety situation in China. The authorities disseminated information about contaminated products to the public and to ensure that affected infants would be able to receive treatment in time. Media also played a significant role in update and dissemination of information during this crisis. The State Council of China has held two press conferences on 13 September 2008 and 15 September 2008. The Council promised that they would immediately announce new development (WHO, 2008).

Free treatment for affected babies. Specialists were dispatched to visit villages and rural areas for investigations of the crisis and to ensure that affected babies would be transferred to hospital for proper treatment. Trainings was being provided to paediatricians and radiologists. Free treatment was announced to provide to affected patients by authorities (WHO, 2008). Besides, every affected infants got RMB2000 as financial compensation from report on 28th December 2008 (Jin Sun and Wang, 2009), while the average yearly salary is RMB29,229 for Chinese urban citizens in 2008 (News, 2009).

Inspection. An investigation had been conducted in milk relevant food chain, including the primary producers, milk relevant processing companies. Milk powder stocked in the whole country was examined. Wholesalers and retailers are requested to conduct self-inspection. The seller of contaminated milk in Gansu were arrested (WHO, 2008).

To communicate with INFOSAN. The MoH had been keeping WHO informed of the crisis via INFOSAN and directly via the WHO China office. Other countries can share information through the INFOSAN network to prevent their citizen from contaminated products.

Punishment to crime. In January of 2009, 15 people were imprisoned up to 15 years due to crime in melamine contaminated crisis, 1 received a suspended death sentence and 3 received life sentences. In November of 2009, two more persons were executed due to the sale of more than 3 million pounds of contaminated products in the crisis (LaFRANIERE, 2009).

To launch new law. The melamine contamination milk crisis had triggered a comprehensive reform of the Chinese food safety regime. Chinese government promised to set up new food regulations soon after the crisis was reported. In 2009, a new food safety law was launched followed by an implement regulation for official control agents (see section 1.2.1).

Reflections from top leaders of authorities. the Chinese premier, Wenjiabao, has apologised for the Chinese government's complacency in the crisis (Bradley, 2008). The head of China's food quality watchdog, Li Changjiang, resigned due to this scandal in September 2008 (Fan, 2008).

4.2.3 The impact on China after the crisis

On Chinese dairy industry

The melamine contamination crisis was a wakeup call for the dairy industry in China. The negative influence included that the entire dairy industry had an almost devastated blow and there was a serious consumer credit crisis due to the melamine contamination crisis (Gaga, 2010). Consumers had less confidence in the safety of dairy products, even the whole food industry, which was a critical problem bothering Chinese authorities until now (Yun, 2012).

However, the dairy industry in China is gradually recovering due to the support from authorities and the big demand from Chinese market (Teo, 2009).

On setting the dairy standard

After the melamine contamination crisis, there was a voice about increasing the requirement on standard of dairy products in public.

However, the revised dairy standards in China had caused a polarization in the dairy industry. There was a great gap in the requirement of milk quality between rural area and urban area in China. The people from urban area which was generally richer than rural area insisted to have a strict or high requirement on the quality of dairy products. It is difficult for the people from rural area to offer the cost of high level standard dairy products (Pinghui, 2011; Sneha, 2011; Woke, 2011). Experts insisted that it was more important for people to have milk than to have high quality milk.

The country admitted the standard in milk quality was still a further question of food-safety (Daily, 2011) (Wenting, 2011).

4.3 The impact on other countries

4.3.1 Impact during the crisis

Impact on possible health risk

During the investigation of melamine contamination crisis in 2008, there were two companies, Guangdong Yashili and Qingdao Suokang had exported their possible contaminated products to five countries, **Bangladesh, Burundi, Myanmar, Gabon and Yemen**. (GRA and WHO, 2008). The public in these five countries had possible health risk from exported products.

Besides, many countries were worried about the potential risk when products were made from ingredients imported from China, or risk from potential global trading. Countries that received melamine contaminated products were marked in yellow color in Figure 10 (Lo-Fo-Wong, 2008).

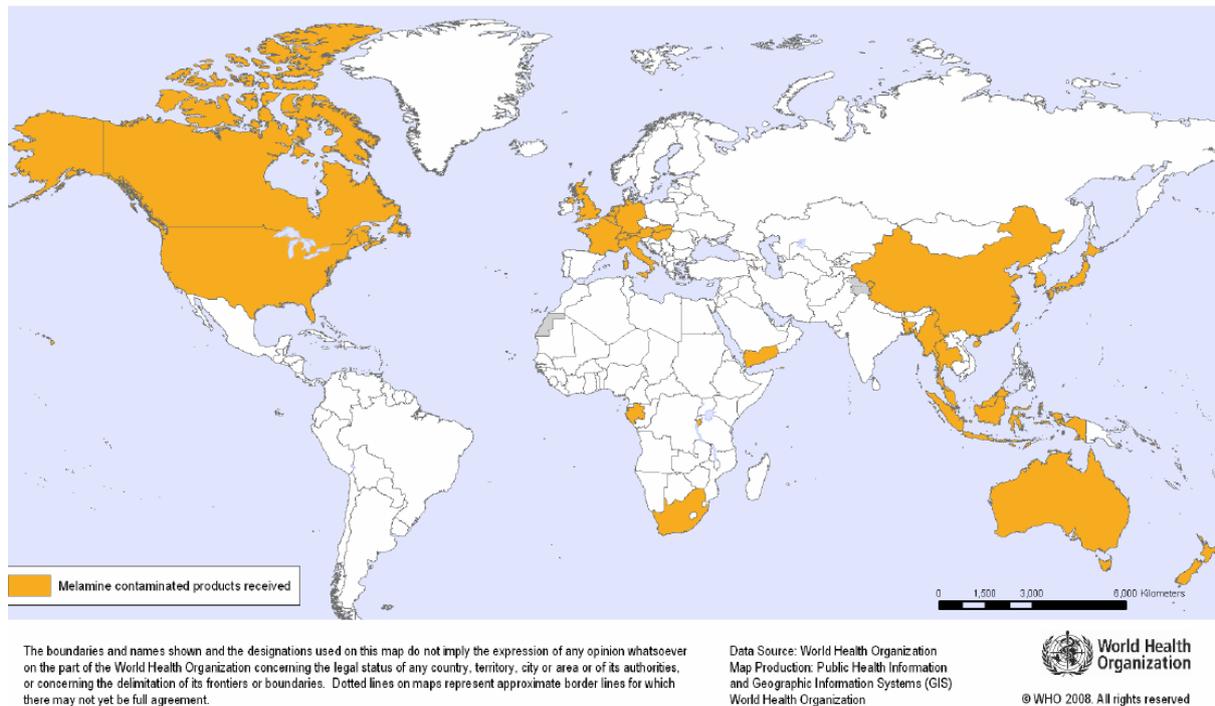


Figure 10: Country received melamine contaminated products (Lo-Fo-Wong, 2008).

*yellow colour marked countries stands for the countries that received melamine contaminated products.

Impact on authorities' management

- **Recall of contaminated products**

The countries which had imported possible contaminated products or ingredients, had ordered food recalls and provided consumers with information or brand about safe food. For example, the USA had ordered food recalls on FDA websites (26th September, 3th October, 10th October, 17th October, 29th October, 5th December, 9th December and 19th December) (FDA, 2008).

- **Changing of the melamine standard in dairy products**

Many countries had changed the standard of allowed melamine level of products. For example, the TDI of melamine in USA had been changed from 0.63 mg downwards to 0.063 mg melamine/kg-bodyweight/day. the TDI of melamine in EU standard had also been reduced (FDA, 2009; EFSA, 2010).

- **Testing dairy related product to ensure the safety**

For example, the EU authorities announced to test all imported Chinese product containing more than 15% of milk powder on 26th September 2008. The FDA and HHS described the actions taken by USA authorities on testing milk and milk-derived products from China for melamine (Teoh, 2008).

- **Communication with public**

Sciences and experts issued statements about the safety of dairy food in their market to the worried public. For example, there are scientific statement about the melamine in chocolate and biscuits in Europe market were not exceed the TDI, even in worst case scenarios (EFSA, 2008).

Authorities provided advice on protecting consumer health from melamine contamination via different ways. For example, FDA in USA issued an open letter to food manufacturing industry. CDC released a travel advisory regarding the crisis. FDA together with HHS, issued a Health Information Advisory to the public (Teoh, 2008).

- **Communications and collaborations between different organizations and authorities**

Communications and collaborations between different authorities and food safety related organizations in scientific level were frequently. The WHO provided risk assessment about the toxicology of melamine (WHO, 2008). FDA provided an interim safety and risk assessment of melamine and its analogues in food for humans (FDA, 2009). EFSA published scientific opinion on melamine in food and feed (EFSA, 2010). The Europe Commission had instructed its Member States to report and update identification of melamine in products via RASFF to share information and responsibility (Teoh, 2008).

In addition, communications are not only in scientific aspect, but also in global trading aspect. WHO urged national food safety authorities to test Chinese dairy products first before slapping on import bans or recalls on 25th September 2008 (Reuters, 2008).

INFOSAN contributed a lot in the dissemination of information of the crisis, collaboration and communication between different authorities and organizations through the INFOSAN network. The contributions from INFOSAN will be illustrated in section 4.3.

4.3.2 Impact after the crisis

This crisis provided opportunity for foreign companies entering into Chinese market. The melamine contamination crisis benefited some companies which had been eager to open the Chinese dairy markets for a long time. For example, the Fonterra company was brought down by Chinese companies in the competition of markets before the crisis, while the melamine contamination crisis gave them a good opportunity to extent in Chinese market (News, 2008; Swann, 2008).

4.4 The reactions of INFOSAN in melamine contamination crisis

INFOSAN was working directly with Ministry of Health (MoH) during the crisis. Chinese government was in collaboration with the WHO Country Office in China. Actions taken in the crisis were as follows:

Communication with Chinese government

- on 11 September 2008, the crisis that infant formula was contaminated with melamine was communicated to WHO through INFOSAN Emergency surveillance system (WHO, 2008). Then, further information was requested by WHO.
- On 12 September 2008, WHO received a description of update of the crisis and MoH confirmed that contaminated products had not been exported to other countries (WHO, 2008).

Dissemination of information of the crisis through the INFOSAN network

- on 16 September 2008, an INFOSAN alert was distributed to the entire network because of other potential uses of contaminated milk powder and the probability of illegal distribution of contaminated products (WHO, 2008).
- In order to keep the entire network informed of developments in relation to this crisis, the INFOSAN Emergency Alert Updates had been issued regularly (WHO, 2008). As of 3 December 2008, there were totally 11 INFOSAN Emergency Alert Updates in relation to the melamine crisis, including the lists of contaminated products, analytical methods, laboratories, limits set by authorities (Lo-Fo-Wong, 2008; WHO, 2008).
- Setting up and continuously updated dedicated websites (Lo-Fo-Wong, 2008) about information related with the crisis¹².

Providing expert consultation

- in December 2008, The advisory group from INFOSAN helped Chinese government and other Member States better understand and assess the potential risks associated with contaminated products.
- On 5 December 2008, the International experts had established a tolerable daily intake (TDI) for melamine, which was 0.2 mg/kg body weight to melamine alone¹³.

¹² WHO melamine website including:

the Secure INFOSAN website for food authorities in Member States, the open website for general public: http://www.who.int/foodsafety/fs_management/infosan_events/en/index.html,
the disease outbreak news website: http://who.int/csr/don/2008_09_19/en/index.html and
http://who.int/csr/don/2008_09_22/en/index.html,
and WHO regional and country offices website: <http://www.searo.who.int/> and
http://www.wpro.who.int/china/media_centre/press_releases/pr_20080926_04.html.

This TDI was meant to help national authorities set safe limits in products (WHO, 2008).

- The INFOSAN Emergency Alert Updates, which were issued by WHO, also provided additional information about the crisis and assess the potential risks associated with the melamine contaminated products to all Member States (WHO, 2008).
- INFOSAN provided Member States the analytical methods and a list of international laboratories to test melamine (WHO, 2008).

Special alert or cooperation with the involved countries

- Thanks to the further investigation, Chinese authorities found out that two contaminated products had been exported to five countries. Therefore, INFOSAN specifically alerted the five countries and informed other countries of the situation (GRA and WHO, 2008). As of 3 December 2008, there were 4 specific alerts to food safety authority in targeted countries respected to the crisis (Lo-Fo-Wong, 2008; WHO, 2008).
- The FDA of USA had posted interim safety and risk assessments of melamine and its analogues in food for humans on its website on 3th October 2008 and 28th November 20. INFOSAN was made aware of the assessments.

To close and archive the crisis

- Last but not least, the crisis would be closed if the INFOSAN Emergency Contact Point indicated that further involvement of INFOSAN was unnecessary (WHO and FAO., 2006). After the melamine crisis, the INFOSAN Secretariat archived all communications and notes relating to the melamine incident into a CD (Teoh, 2012).

4.5 Follow-up crisis

The melamine crisis attracted the attention of the entire world in 2008. With the time elapse, the degree of attention is not as much as it was before. However, the melamine contamination products were found to be reused after 2 years of the last crisis. This section will focus on this follow up crisis.

it was reported that some contaminated products which should have been removed from shelves in China were reused instead of destroyed as ordered in late 2010 and early 2011 (Times, 2011).

¹³ The TDI for cyanuric acid alone remains at 1.5 mg/kg body weight WHO. (2008). "Experts set tolerable level for melamine intake." Retrieved 20.07.2012, from <http://www.who.int/mediacentre/news/releases/2008/pr48/en/index.html..>

The reused melamine crisis appeared in Gansu, Qinghai and Jilin provinces (Zhou, Zhu et al., 2010). On 3rd July 2010, the company was closed down due to reusing melamine contaminated products. On 7th July 2010, a national emergency notice which required supervision and inspection in dairy industry was distributed to local authorities from AQSIQ (the Administration for Quality Supervision, 2010). Shortly after the notice, local authorities had carried out a throughout supervision targeted in relevant dairy companies.

In addition, aimed to improve the consumer credit on food safety, the local authorities in Jiangsu province issued a regulation on classification and grading supervision system of food production and processing companies. This regulation including classification on food products, companies, and supervision based on the risk degree, and letter of commitment (Jiangsu, 2010).

Above are reflections from Chinese authorities in the follow up crisis. If this crisis attracted attention of INFOSAN and if any interaction between INFOSAN and national authorities await further discussion when more information could be accessed to.

Chapter 5. Discussion

In this section, the method of source collection, the effectiveness of reactions from both Chinese authorities and other countries, the duties and effectiveness of INFOSAN in the crisis are all discussed.

5.1 Discussion on the method of source collection

The case study of melamine contamination crisis was illustrated in Chapter 4. The information was collected from various websites and media reports. While the official documents were not available. No recordings about INFOSAN routing activities or any contact messages between INFOSAN and the authorities can be accessed. Thus, some crisis facts in this thesis might not as credible as they were from the official documents. This is a defective point in this thesis on method of source collection.

Actually, all notes and official information on actions from INFOSAN were confidential in the case. Therefore, it was difficult to analysis effectiveness of actions in individual researches, unless the study was conducted from the inside of INFOSAN.

5.2 The effectiveness of Chinese authorities' reflections

Firstly, there were two causes contributed by Chinese authorities in the crisis, which were the improper encouragement in diary industry and defective enforcement. The authorities realised that supervision and inspection system needed technical improvement until crisis happened with hundreds of victims. There should be more self-reflections for future improvement.

Secondly, when the crisis was highlighted by authorities and public, it had already taken several months after the contamination was been firstly complained. It implied that the national food safety warning system was not functioning well. This delay caused serious results of more affected infants. It also shows the obtuse reactions on unexpected crisis of authorities as well as lacking crisis risk assessment.

Thirdly, the incident compensation system was not satisfied by public or victims. The compensation fee of one affected infant was only RMB2000, which was too low and too late. The recent Chinese food safety law was lacking of food safety incident compensation articles, which built no incident compensation system in China.

Fourthly, the reactions from authorities in the follow-up crisis were promptly, which prevented contaminated products from spreading. It was a sign of the improvement on authorities' reaction and food safety alert system.

5.3 The effectiveness on reactions from other countries

Authorities in other countries kept close contact with INFOSAN, which was an effective way to get the latest and most comprehensive information on contaminated products or crisis.

The authorities informed public about possible contaminated products, warned relevant manufactures and provided timely advices via many ways. All actions had great effect on protecting public from contaminated products.

There were technical collaborations between different authorities with WHO. The collaborations were examples of positive interaction through the INFOSAN network because they promoted a better understanding and more controls on food safety emergencies on both national and international levels.

5.4 The duties and effectiveness of INFOSAN in the crisis

In the below discussions, INFOSAN Users Guide is used as comparison standard to see if INFOSAN fulfil its responsibility in the melamine contamination crisis. Besides, the IHR (2005) as legal framework of INFOSAN is used as comparison standard as well.

5.4.1 Before the crisis

As mentioned in section 4.1, there were complaints about contaminated infant formula months earlier than the crisis. Those complaints could have chance to trigger INFOSAN Emergency Network earlier to prevent many infants from being affected. But the network was just started until the melamine contaminated crisis was broadly noticed by public in September 2008. According to INFOSAN Emergency Network (Figure 3 in section 1.1.3), at least one of the following linkages was not functioning well.

(a) Linkage between WHO INFOSAN Emergency Network and National INFOSAN Emergency Contact Point;

(b) Linkage between National INFOSAN Emergency Contact Point and Foodborne disease surveillance & investigation system;

(c) Linkage between Foodborne disease surveillance & investigation system and National Outbreak Alert & Response System and IHR focal point;

(d) Linkage between National Outbreak Alert & Response System and IHR focal point and WHO surveillance and response systems, media reports and other information sources.

The criteria and implement of alert triggering system of INFOSAN, including IHR Focal Point needed to be checked (ANNEX III & IV). The surveillance and verification parts of INFOSAN also needed to be checked, because they were designed for verifications from various information sources and considered more information other notification or official reports and communications.

In fact, the national authorities had more chance to get information of food safety and activate INFOSAN Emergency Network than WHO. If the national authorities blocked food safety information from WHO on purpose, there would be more difficult for WHO to activate the Network. Thereafter, another emergency network (Figure 11) was designed to increase the chance to activate the Emergency Network regardless of the blocking from national authorities by directly contact for WHO with Foodborne disease surveillance and investigation system.

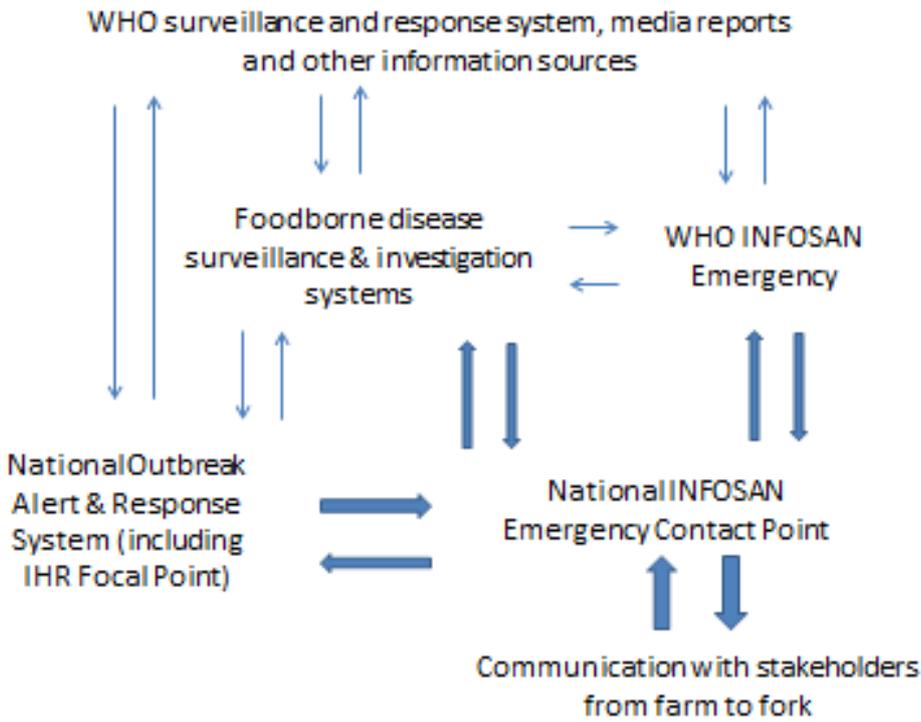


Figure 11: The redesigned INFOSAN Emergency Network.

**5.4.2 During the crisis
Notification and communication**

Since INFOSAN works under the IHR (2005), the requirement of identification, assessment and management of food safety crisis under the IHR (2005) applied to or refer to the requirement of INFOSAN, which was shown in section 1.1.3. The collaboration of country and WHO in the work of notification and consultation is significant for determining the nature of crisis and the appropriate response.

It was recalled that the MoH, which was the INFOSAN Emergency Contact Point in China, kept INFOSAN Secretary and WHO informed of the crisis directly via the communication of message (Teoh, 2012).

However, there were language problems that decreased the effectiveness of communication. The official languages for UN are Arabic, Chinese, English, French, Russian, and Spanish. They were allowed to be used in the communication within UN, as well as WHO (UN). INFOSAN received message in Chinese character from focal point in China, but no one in INFOSAN Secretary Office was good at Chinese at the moment of melamine contamination crisis. This inconvenient delayed response time from INFOSAN and probable decreased the effectiveness of communication.

There should be more discussion on the effectiveness of the communication and notification. But they can only be discussed when more information are accessed.

INFOSAN Emergency Contact Point

The duties of INFOSAN Emergency Contact Point and IHR Focal Point, share several parts in transmitting food safety emergency information (section 1.1.3). However, no more detailed information about how to distinguish the crisis which should be within the scope of IHR and which should be within the scope of INFOSAN. Neither the IHR (2005) nor the INFOSAN Users Guide mentions about this problem.

In the melamine contamination case, the INFOSAN Emergency Contact Point and IHR Focal Point in China are both in MoH in China. It was also recalled that the communication between INFOSAN and its focal points and contact point in China generally worked well (Teoh, 2012). However, if the IFOSAN Emergency Contact Point and IHR Focal Point are set in different departments in a country, the similar and unclear duties between them could be a potential problem for close cooperation.

Membership of INFOSAN

Some messages sent by INFOSAN were not replied promptly while the INFOSAN cannot require compulsory replying since the Member States were voluntary to collaborate with INFOSAN while national interests ranked the first (WHO and FAO., 2011; Teoh, 2012).

“Keeping contact information for INFOSAN members up to date” and “Enhancing response times to INFOSAN information requests” are considered as challenges that need to be improved in the INFOSAN Progress Report 2004-2010. To keep good communication with INFOSAN is fundamental in meeting the challenges mentioned above. However, the voluntary membership is not in favour of the effectiveness communication.

5.4.3 After the crisis

First of all, INFOSAN Secretariat archived all communications and notes relating to the melamine incident into a CD after the crisis, which is a good way to save information and it is a duty after the crisis (Teoh, 2012).

Afterwards, the INFOSAN has duty to improve national food control systems with national authorities (section 1.1.3). INFOAN could play an important role through the three strategies on preventing food safety emergency and indirectly improving national food control system consequently. But due to its voluntary technical network, the contribution for the food control capacity of national authorities is limited. Since IHR (2005) can require the national authority in improving the food safety controls capacity with time limitation. IHR (2005) can also place obligations upon WHO on providing support to national response or collaboration on crisis assessment if national authorities require it. Consequently, it is significant that INFOSAN works closely with IHR (2005) to improve national food control systems with national authorities together.

Chapter 6. Conclusions and Recommendations

6.1 Conclusions

Firstly, the reflections from Chinese authorities were not satisfied by public. The national food safety warning system, the food safety accident compensation system and the enforcement from authorities were all desired. The Chinese food safety situation leaves much to be desired.

Secondly, other countries kept close contact with INFOSAN to get the latest and most comprehensive information on contaminated products or crisis. The efforts contributed for preventing public from contaminated products.

Thirdly, INFOSAN contributed a lot in preventing the contaminated food from public with collaboration with Chinese authorities and other countries. The contamination information were updated and disseminated through the whole network promptly. The importing involved countries were specially alerted. All countries were easy to get access to the latest information from the INFOSAN Network. There were a lot of collaborations between INFOSAN and different authorities and organizations.

However, the effectiveness of INFOSAN was limited by its voluntary membership, not well functioned structure and undistinguished emergency triggering system and duty scope with IHR (2005).

6.2 Recommendations

Firstly, to establish more strong links between INFOAN and IHR (2005).

INFOSAN need more collaboration with IHR in building of national food safety control system and when requiring supporting from national authorities and WHO. Besides, the differences between INFOSAN and IHR in emergency triggering system need to be declared, so it is in the focal point.

Secondly, to change the structures of INFOSAN.

The WHO INFOSAN Emergency should contact with Foodborne disease surveillance and investigation systems directly in order to get more chance to activate the Emergency Network. In addition, more multi-lingual stuffs are need for better communication with national authorities.

Thirdly, to publish more information.

Most of the INFOSAN notes and communication recordings are confidential, which is unnecessary when it is will not cause public panic. The published information will help public aware of the situation or emergencies.

Reference

- Anonymous (2007). "104 deaths reported in pet food recall." *New York Times*: 13.
- AQSIQ. (2008). "The companies names that produced melamine contaminated infant formula." Retrieved 02.08.2012, from <http://www.aqsiq.gov.cn/>.
- Bradley, D. (2008). "Melamine Apology." from <http://www.sciencebase.com/science-blog/melamine-apology.html>.
- Bradley, D. (2008). "Melamine Contaminated Food List." from <http://www.sciencebase.com/science-blog/melamine-contaminated-food-list.html>.
- Bradley, D. (2008). "Melamine in Milk." Retrieved 19.06.2012, from <http://www.sciencebase.com/science-blog/melamine-in-milk.html>.
- Brown, C. A., K. S. Jeong, et al. (2007). "Outbreaks of renal failure associated with melamine and cyanuric acid in dogs and cats in 2004 and 2007." *Journal of Veterinary Diagnostic Investigation* **19**(5): 525-531.
- Burns, K. (2007). "Recall shines spotlight on pet foods." *Journal of the American Veterinary Medical Association* **230**(9): 1285-1288.
- Céline Marie-Elise Gossner, Jørgen Schlundt, et al. (2009). "The Melamine Incident: Implications for International Food and Feed Safety."
- Chiesa, L. (2008). "Chemical structure of melamine." from <http://en.wikipedia.org/wiki/File:Melamine.svg>.
- China, P. s. R. o. (10.12.2989). MEASURES FOR EXEMPTION FROM INSPECTION OF IMPORT AND EXPORT COMMODITIES t. S. A. f. t. I. o. I. a. E. Commdities.
- Council, t. S. (2012). the Decision from State Council about reinforcement on food safety supervision [2012] 20. t. S. Council.
- Daily, C. (2011, 21.04.2011). "China Sets Melamine Level Limits In Food Products." Retrieved 28.07.2012, from http://www.chinadaily.com.cn/china/2011-04/21/content_12365592.htm.
- EFSA. (2008). "EFSA assesses possible risks related to melamine in composite foods from China." Retrieved 27.07.2012, from <http://www.efsa.europa.eu/en/press/news/contam080925.htm>.
- EFSA (2010). "EFSA reduces tolerable intake level for melamine".
- EFSA (2010). "Scientific Opinion on Melamine in Food and Feed".
- EMEA. (2001). "Committee for veterinary medicinal products cyromazine summary report." Retrieved 16.06.2012, from http://www.emea.europa.eu/docs/en_GB/document_library/Maximum_Residue_Limits_Report/2009/11/WC500013083.pdf.
- FAIRCLOUGH, G. (2008). "Tainting of Milk Is Open Secret in China ", from <http://chinh dangvu.blogspot.nl/2008/11/tainting-of-milk-is-open-secret-in.html>.
- Fairclough, G. (2008). "Tainting of Milk Is Open Secret in China " Retrieved 27.07.2012, from <http://online.wsj.com/article/SB122567367498791713.html>.
- Fan, M. (2008). "Top Chinese Food Inspector Resigns Amid Milk Scandal."
- FAO. (1999). "CYROMAZINE." Retrieved 16.06.2012, from <http://www.fao.org/aq/AGP/AGPP/Pesticid/JMPR/Download/92/Cyromazi.PDF>.
- FAO. and WHO. (2002). "Assuring food safety and quality: guidelines for strengthening national food control systems." from http://www.who.int/foodsafety/publications/capacity/en/Englsih_Guidelines_Food_control.pdf.
- FDA. (2008). "News&Events." from <http://www.fda.gov/NewsEvents/default.htm>.
- FDA. (2009). "External Peer Review of the FDA/CFSAN Draft Report Interim Safety and Risk Assessment of Melamine and its Analogues in Food for Humans (October 3, 2008) and Update (November 28, 2008)." Retrieved 23.07.2012, from <http://www.fda.gov/Food/FoodSafety/FoodContaminantsAdulteration/ChemicalContaminants/Melamine/ucm174165.htm>.
- FDA. (2009). "Melamine Contamination In China." Retrieved 02.08.2012, from <http://www.fda.gov/NewsEvents/PublicHealthFocus/ucm179005.htm>.
- Flynn, D. (2012). "World Consumers Doubtful About Food Safety, UL Study Finds." Retrieved 30.07.2012, from <http://www.foodsafetynews.com/2012/02/consumers-doubtful-about-food-safety-ul-study-finds/>.
- Francesca Pavoni and M. Poto. (2009). "Food Safety is Peeping from the Chinese Corner." *EFFL*(06/2009): 9.
- Gaga. (2010). "Wang Ding Cotton: China's Dairy Industry In 2009, "events" Inventory - Milk Powder, ." Retrieved 23.07.2012, from <http://milk.ezinemark.com/wang-ding-cotton-china-s-dairy-industry-in-2009-events-inventory-milk-powder-319f20bde68.html>.
- GOSC. (2012). "China will establish the food safety risk monitoring and evaluation online system." Retrieved 31.07.2012, from http://www.sxslszl.org.cn/Particular.aspx?newsid=4536&sort_id=17.
- GRA and WHO. (2008). "Melamine-contaminated powdered infant formula in China." Retrieved 17.06.2012, from http://www.who.int/csr/don/2008_09_19/en/index.html.
- Hongjie, W. (2009). Understanding technological and managerial factors affecting quality of dairy product in the supply chain in China. *Food Quality Management* Wageningen University.
- Hongyi, W. (2012). "Most people uneasy about what they eat." Retrieved 31.07.2012, from http://www.chinadaily.com.cn/cndy/2012-05/31/content_15430539.htm.
- INSIGHTS, T. I. (2009). "Taiwan gains observer status in WHA." Retrieved 09.07.2012, from <http://www.taiwaninsights.com/2009/05/13/taiwan-gains-observer-status-in-wha/>.
- Jeong, W. I., H. D. Sun, et al. (2006). "Canine renal failure syndrome in three dogs." *Journal of Veterinary Science* **7**(3): 299-301.
- Jiangsu, A. i. (2010). regulation on classification and grading supervision system of food production and processing companies. *AQSIQ in Jiangsu* [2010] 158. AQSIQ.

- Jin Sun and J. Wang. (2009). "Discussion on the funding and establishment of food safety accident compensation system in China." Retrieved 12.08.2012, from http://article.chinalawinfo.com/Article_Detail.asp?ArticleId=49425.
- LaFRANIERE, S. (2009). "2 Executed in China for Selling Tainted Milk " Retrieved 19.07.2012, from <http://www.nytimes.com/2009/11/25/world/asia/25china.html?ref=melamine>.
- Lim, L. O., S. J. Scherer, et al. (1990). "Disposition of cyromazine in plants under environmental conditions." *Journal of Agricultural and Food Chemistry* **38**(3): 860-864.
- Lo-Fo-Wong, D. (2008). "INFOSAN ", from <http://www.goglobalnetwork.eu/NR/rdonlyres/672227DE-D207-412D-BF10-766938BFCE14/124737/DRDANILLOLOFOWONG.pdf>.
- News, B. (2009). ""China average daily salary is RMB 111.99???" Chinese netizens challenge government statistics." Retrieved 12.08.2012, from <http://www.littleredbook.cn/2009/04/22/china-average-daily-salary-chinese-netizens-challenge-government-statistics/>.
- News, F. N. (2008). "Crime link to tainted milk ", from <http://www.stuff.co.nz/world/678926>.
- Pei, X., A. Tandon, et al. (2011). "The China melamine milk scandal and its implications for food safety regulation." *Food Policy* **36**(3): 412-420.
- Pinghui, Z. (2011). Quality of Raw Milk 'among the worst' *South China Morning*.
- Reuters (2008). Countries should test Chinese dairy products.
- Shu-Jen, L. (2009). "Taiwan is to attend WHA meetings as an observer under the name "Chinese Taipei" (2009-04-29)." Retrieved 09.07.2012, from http://www.irpma.org.tw/english/cgi/03_leaning_02_01.php?file=1118.
- Sneha, A. (2011). "Food Safety Standards & the Dairy Industry in China: Impact of Regional Divide and Income Inequalities." Retrieved 23.07.2012, from <http://www.csc.iitm.ac.in/?q=node/68>.
- Swann, A. (2008). "Comment: Killer milk forces rethink for Fonterra." *The National Business Review*.
- Teo, C. (2009). "China's Dairy Industry: A Contaminated Goldmine." Retrieved 23.07.2012, from <http://www.thecattlesite.com/articles/2212/chinas-dairy-industry-a-contaminated-goldmine>.
- Teoh, E. (2008). Risk Management and Risk Communication during the Melamine Contamination Event: A Case Study of Four Countries. Wageningen, Wageningen University.
- Teoh, E. (2012). INFOSAN note.
- the Administration for Quality Supervision, I., and Quarantine (2010). a national emergency notice about supervision and inspection in dairy industry. *AOSIQ[2010]141*. AOSIQ.
- Times, T. N. Y. (2011). "Melamine — China Tainted Baby Formula Scandal." Retrieved 23.07.2012, from <http://topics.nytimes.com/top/reference/timestopics/subjects/m/melamine/index.html>.
- UN *General Assembly of the United Nations – Rules of Procedure*. UN Department for General Assembly.
- USDA (2012). USDA Economic Research Service_China.
- Wenting, Z. (2011, 27.06.2011). "Ministry Denies Lower Dairy Standards." Retrieved 28.07.2012, from http://www.chinadaily.com.cn/china/2011-06/27/content_12780270.htm.
- WHO (2005). INTERNATIONAL HEALTH REGULATIONS (SECOND EDITION).
- WHO. (2007). "The identification, assessment and management of food safety events under the International Health Regulations (2005)." Retrieved 01.07.2012, from http://www.who.int/foodsafety/fs_management/No_04_IHR_May07_en.pdf.
- WHO. (2008). "Expert meeting to review toxicological aspects of melamine and cyanuric acid, 1-4 December 2008." from http://www.who.int/foodsafety/fs_management/infosan_events/en/index4.html.
- WHO. (2008). "Experts set tolerable level for melamine intake." Retrieved 20.07.2012, from <http://www.who.int/mediacentre/news/releases/2008/pr48/en/index.html>.
- WHO (2008). INFOSAN Emergency Alert Melamine-contaminated powdered milk.
- WHO. (2008). "Melamine -contamination event, China, September 2008." 16.06.2012, from <http://toxipedia.org/download/attachments/7143778/WHO.Melamine.2008.pdf?version=1&modificationDate=1316451582000>.
- WHO. (2008). "Melamine and Cyanuric acid: Toxicity, Preliminary Risk Assessment and Guidance on Levels in Food " Retrieved 27.07.2012, from http://www.who.int/foodsafety/fs_management/Melamine.pdf.
- WHO. (2009). "INFOSAN and INFOSAN Emergency 177 Member States enrolled as at 28 April 2009." Retrieved 06.07.2012, from http://www.who.int/foodsafety/fs_management/countries_en.pdf.
- WHO and FAO. (2006). "The International Food Safety Authorities (INFOSAN) Users Guide." Retrieved 06.07.2012, from http://www.who.int/foodsafety/publications/fs_management/INFOSAN_User_Guide_Final.pdf.
- WHO and FAO. (2007). International Food Safety Authorities Network (INFOSAN).
- WHO and FAO. (2009). "Toxicological and Health Aspects of Melamine and Cyanuric Acid." Retrieved 08.08.2012, from http://whqlibdoc.who.int/publications/2009/9789241597951_eng.pdf.
- WHO and FAO. (2010). Report of the first global meeting of international FOOD SAFETY AUTHORITIES NETWORK (INFOSAN): 11.
- WHO and FAO. (2011). The International Food Safety Authorities Network (INFOSAN) Progress Report 2004-2010.
- Wikipedia. "Melamine." from <http://en.wikipedia.org/wiki/Melamine>.
- Wikipedia. (2012). "Food safety incidents in the People's Republic of China." from http://en.wikipedia.org/wiki/Food_safety_incidents_in_the_People%27s_Republic_of_China.
- Woke, L. (2011). Imported formula milk sees price hike. *China Daily*.
- Xintian. (2012). "the State Council : plan to establish the food safety credit file." from http://food.youth.cn/mszht/201206/t20120614_2221425.htm.
- Yun, w. (2012). "【2012 中国人最关心的十大问题】内销食品合格率也能 99%吗." Retrieved 27.07.2012, from <http://www.infzm.com/content/67222>.

Zhou, L., G. Zhu, et al. (2010). Melamine contaminated milk was found in Gansu, Qinghai and Jilin. Xinhua Wang.

APPENDIX

Appendix I: Terms of INFOSAN Emergency Contact Point and Focal Points

Each member country in the INFOSAN Network must designate one INFOSAN Emergency Contact Point. The INFOSAN Emergency Contact Point retains all of the [responsibilities](#) of and access to information as an INFOSAN Focal Point, but additionally must be able to identify a food safety emergency and respond by acting as the authoritative liaison between their national government and INFOSAN.

In fulfilling this role, INFOSAN Emergency Contact Points shall

1. Notify INFOSAN Emergency of food safety emergencies as soon as the event occurs, even when action by INFOSAN is not required.
2. Provide INFOSAN Emergency with the information needed to determine whether or not a food safety emergency of international significance has arisen including information on
 - a. International distribution, b. Public health significance and c. Societal impact
3. Approve INFOSAN Emergency ALERT messages for distribution.
4. Act as the liaison between the national authority and the INFOSAN Secretariat during food safety emergencies of international significance.
5. Coordinate with INFOSAN if international expert support is required.
6. Provide INFOSAN with details of actions taken as a consequence of receiving an INFOSAN Emergency ALERT message.

Additional duties required to implement INFOSAN at the national level:

1. Developing a coordination system among relevant national authorities including those involved in emergency response.
2. Ensuring coverage in the event of absence.
3. Informing INFOSAN of any change in contact details.

Figure 12: Terms of Reference for INFOSAN Emergency Contact Point

INFOSAN Focal Points are officials appointed by their government to serve as a liaison between their counterparts and the INFOSAN global network.

In fulfilling this role, INFOSAN Focal Points:

1. Receive and review information from INFOSAN including
 - a. INFOSAN Information Notes & Messages
 - b. Food Safety Surveys and Questionnaires
 - c. Food Safety Information requiring international distribution.
2. Distribute INFOSAN information to their counterparts throughout the farm-to-table continuum.
3. Provide comments (on WHO guidelines, surveys and questionnaire) that reflect scientific opinion and national perspectives.
4. Contact the INFOSAN Secretariat for assistance in:
 - a. Dealing with ongoing food contamination and foodborne disease problems
 - b. Creating of an INFOSAN Information Note on a particular subject
 - c. Disseminating material for comment by part of or all of the international community
 - d. Obtaining more information on a particular food safety issue.
5. Communicate directly with other INFOSAN Focal Points
 - a. To effectively deal with regional food safety issues
 - b. To share national experiences related to managing food safety problems with other members of the network, especially those in developing countries.

Additional recommended duties to improve the implementation of INFOSAN include:

1. Developing a list of counterparts who are interested in receiving INFOSAN documents.
2. Developing a coordination system between the national INFOSAN Focal Points.
3. Ensuring coverage in the event of prolonged absence.
4. Informing INFOSAN of any change in contact details.

Figure 13: Terms of Reference for INFOSAN Focal Points, sources from: (WHO and FAO., 2006).

Appendix II: The products that have been contaminated by melamine

Companies name that have been tested to have melamine in infant formula in China (AQSIQ, 2008).

The General Administration of Quality Supervision, Inspection and Quarantine named the firms in order of the prevalence of melamine contamination found in samples of their product (AQSIQ, 2008), as follows:

- 1 Shijiazhuang Sanlu Group
- 2 Shanghai Panda Dairy
- 3 Synutra International Inc
- 4 Shanxi Gucheng Dairy
- 5 Jiangxi Bright & Hero Dairy
- 6 Baoji Huimin Milk
- 7 Mengniu Dairy
- 8 Duojiaduo Dairy Industry (Tianjin)
- 9 Guangdong Yashili Group
- 10 Hunan Peiyi Dairy
- 11 Heilongjiang Qining Dairy
- 12 Shanxi Yashili Dairy
- 13 Shenzhen Jinbishi Milk
- 14 Guangzhou Shien Dairy
- 15 Guangzhou Jinding Dairy
- 16 Inner Mongolia Yili Industrial Group Co
- 17 Ausmeadow Nutriment Co Ltd
- 18 Qingdao Suncare Nutritional Technology Co Ltd
- 19 Xi'an Baiyue Dairy
- 20 Yantai Leilei Dairy Products
- 21 Shanghai Bao'anli Dairy
- 22 Fuding Chenguan Dairy

FDA's warnings of possible melamine contaminated products (FDA, 2009).

The FDA is advising consumers not to consume the following products because of possible melamine contamination:

- Topaz Wafer Rolls with Chocolate Flavored Cream Filling
- Topaz Wafer Rolls with Hazelnut Chocolate Flavored Cream Filling
- Topaz Wafer Rolls with Vanilla Flavored Cream Filling
- Topaz Wafer Rolls with Mocha Cappuccino Flavored Cream Filling
- G&J Hot Cocoa Stuffer Item 120144

G&J His and Hers Hot Cocoa Set Item 120129
G&J Cocoa item 120126, sold in 2 flavors: French Vanilla Cocoa and Double Chocolate Cocoa
Wonderfarm "Successful" Assorted Biscuits
Wonderfarm "Royal Flavour" Assorted Biscuits
Wonderfarm "Lovely Melody" Assorted Biscuits
Wonderfarm "Daily Life" Assorted Biscuits
Topaz Hazelnut Wafer Rolls with Hazelnut Chocolate Flavored Creme Filling
Sweet Time Christmas Dressy Bear with Chocolate Bar
Fresh and Crispy Jacobina Biscuits
Koala's March Crème filled Cookies
YILI Brand Sour Milk Drink
YILI Brand Pure Milk Drink
Blue Cat Flavored Drinks
White Rabbit Candies
Mr. Brown Mandehling Blend Instant Coffee (3-in-1)
Mr. Brown Arabica Instant Coffee (3-in-1)
Mr. Brown Blue Mountain Blend Instant Coffee (3-in-1)
Mr. Brown Caramel Macchiato Instant Coffee (3-in-1)
Mr. Brown French Vanilla Instant Coffee (3-in-1)
Mr. Brown Mandheling Blend instant Coffee (2-in-1)
Mr. Brown Milk Tea (3-in-1)
Infant formula manufactured in China

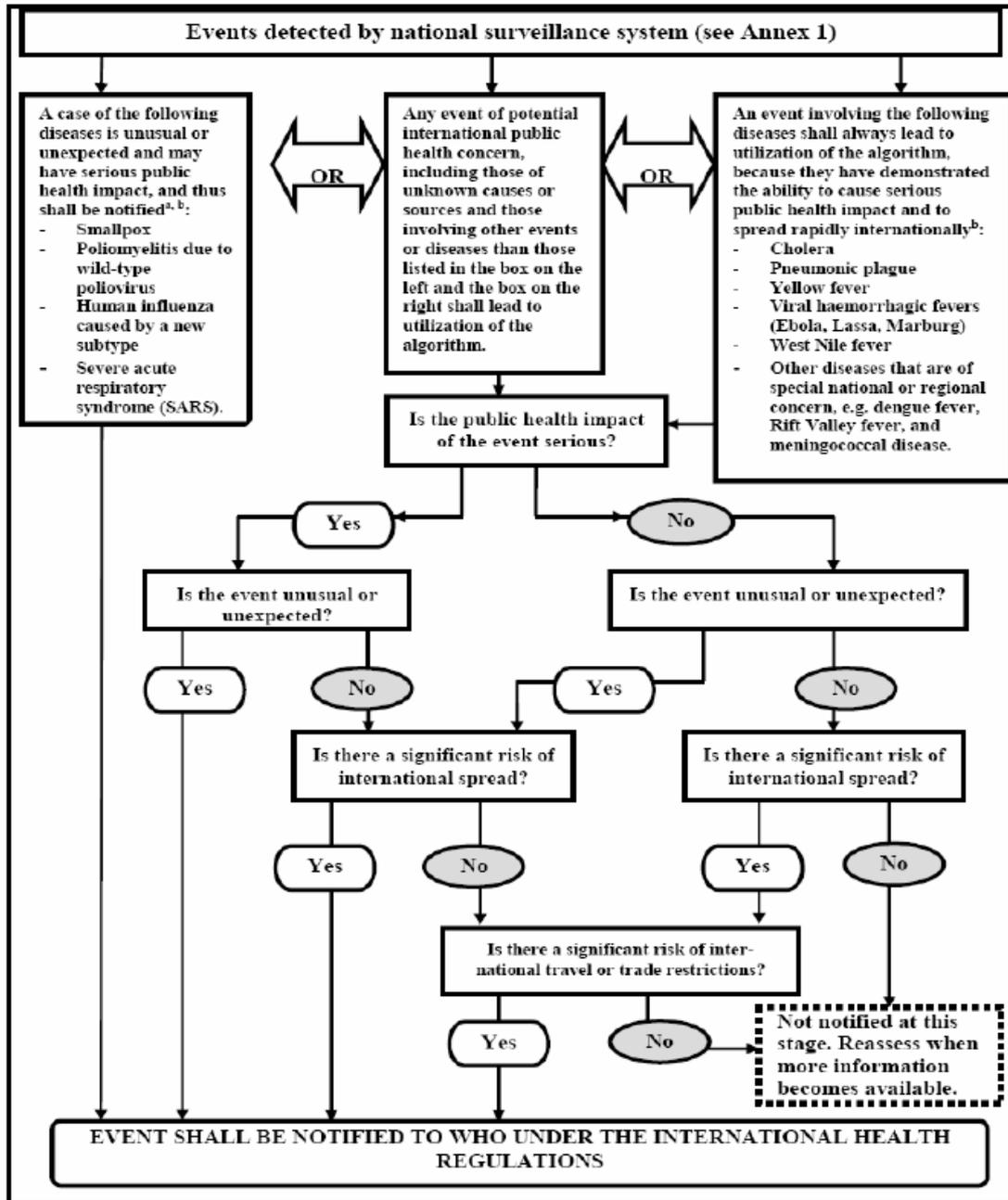
Appendix III: The information Patterns used to classify INFOSAN

Emergencies

Information Pattern	Further Action Required
<i>Distribution</i>	
Export is indicated or clearly stated	Yes (if public health impact criteria is met)
No information on export but the type of product is likely to be internationally distributed	Yes (if public health impact criteria is met)
Local distribution only	Generally No, unless societal impact criteria is met. WHO may provide support to the country.
"No export" clearly stated	Generally No, unless societal impact criteria is met. WHO may provide support to the country.
<i>Public Health Impact</i>	
Information suggests a serious acute illness, serious harm or death caused by the contaminated food item	Yes (if distribution criteria is met)
No information on public health impact of the contaminated food item but the type of contamination is known to be associated with serious illness or death	Yes (if distribution criteria is met)
No information on public health impact of the contaminated food item and the type of contamination is insufficiently specified or the association with serious illness is uncertain	Maybe - dependent upon distribution and societal Impact
The type of contamination is known not to be associated with serious illness or death	Generally No
<i>Societal Impact</i>	
Surveillance information indicates that inappropriate or wide spread product embargos or mass panic, which could destabilize the country or the economy, could occur due to the presence of contaminated food items in the international marketplace	Yes

Figure 14: : Information Patterns Used to Classify INFOSAN Emergencies (WHO and FAO., 2006).

Appendix IV: The criteria and procedure of crisis detected by national surveillance system



a As per WHO case definitions.

b The disease list shall be used only for the purposes of these Regulations (IHR(2005)).

Figure 15: Decision Instrument for the assessment and notification of crisis that may constitute a public health emergency of international concern. (source from: ANNEX 2 of the IHR (2005))