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Country Report

### INVESTIGATION SYSTEM FOR FOODBORNE OUTBREAKS IN JAPAN

#### SUMMARY

Japan has prepared epidemiological investigation and reporting system for foodborne outbreaks at national basis according to the Food Sanitation Law. After the experience of large outbreaks of *E. coli* O157:H7 in 1996, new measures were taken in various field to further improve hygiene status in foods in Japan. Laws were amended, and new notices have been released. Strict hygiene practices have been introduced to abattoirs and meat processing plants, and long-term food saving program has been applied to institutional cooking facilities. Once enterohemorrhagic *E. coli* or *Salmonella* is isolated, they are subjected to genetic or serological typing, which also helps epidemiological investigations. Development of treatment and diagnostic agents has also been encouraged.

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## INVESTIGATION SYSTEM FOR FOODBORNE OUTBREAKS IN JAPAN

### BACKGROUND

Food safety situation in Japan has steadily been improved over the past several decades. According to food poisoning statistics, the number of reported food poisoning cases per year has decreased from about 1,700 (2.0 per 100,000 person per year) in the 1960s to about 700 (0.6 per 100,000 person per year) in the 1990s (except for 1996). Combined with improvements in medical care, deaths caused by food poisoning have decreased drastically from a yearly average of about 150 in the 1960s to 6 in the 1990s (except for 1996).

However, in 1996, many outbreaks of *Escherichia coli* O157:H7 infection, involved 11,826 cases and 12 deaths, occurred in Japan. Sixteen outbreaks among them affected more than 10 people and comprised 10,275 cases. Epidemiological investigations revealed that the sources of infection in these 16 outbreaks included school lunches served at elementary schools and child care centers (9 outbreaks, 9,845 patients), nursing home meals (3 outbreaks, 123 patients), a meal served at an industrial facility (1 outbreak, 47 patients), a commercially prepared box lunch (1 outbreak, 191 patients), and unknown sources (2 outbreaks, 58 patients) (Michino et al. 1998, Michino et al. 1999).

In this report, food poisoning investigation system in Japan and new measures involved in this system since 1996 are summarized.

### INVESTIGATION SYSTEMS AND CONTROL MEASURES FOR FOODBORNE OUTBREAKS

#### *1. Epidemiological investigations and reporting system*

According to Food Sanitation Law, information on foodborne illnesses, including enterohemorrhagic *E. coli*, is gathered on national basis. Medical doctors are required to report cases of such illnesses to the health center of the local government. The health center conducts epidemiological and laboratory investigations with the local institute, and reports the result to the MHLW through the head office of the local government. The MHLW has a nationwide rapid response program on *Yersinia enterocolitica* O8, *Campylobacter jejuni/coli*, *Salmonella Enteritidis*, enterohemorrhagic *E. coli* and *Clostridium botulinum*; patients infected by these pathogens are reported to the MHLW immediately.

#### *2. Emergency control system for large-scale food poisoning*

Food Sanitation Council (FSC) consists of experts in food science, microbiology, and epidemiology and of representatives of consumer. FSC has several committees. Food Poisoning Committee investigates and analyzes the cause of outbreak, collaborating with investigators in local governments, and MHLW has a responsibility to take counter measures against future outbreaks. In case of large-scale outbreaks, Food Poisoning Committee organizes Large-Scale Food Poisoning Subcommittee to investigate the cause of the food poisoning.

### **3. National food monitoring program**

During summer season, nationwide food surveillance program has been conducted every year. In 1996, *E. coli* O157:H7 was isolated from 14 (0.07%) items in 20,918 sampled items; 12 of pre-cooked meat, 1 confectionery item, 1 entree to be included in a boxed lunch.

### **4. New control measures**

#### **(1) Designation of the disease**

In August 1996, enterohemorrhagic *E. coli* infection was designated as a disease requiring mandatory reporting whether it is caused by food or not.

#### **(2) Sanitation guidelines for institutional catering facilities**

A guideline for improving sanitation in large scale catering facilities was prepared, stressing strict management of cooking practices. In accordance with a Japanese notification released in March 1997, large scale cooking facilities which prepare more than 750 meals per day or more than 300 dishes of a single menu at a time are advised to save food for future possible analysis in the event of an outbreak. Fifty gram portions of each raw food material and each cooked dish are should be saved for more than 2 weeks at temperatures lower than  $-20^{\circ}\text{C}$ . This saving system enables us to detect causative agents even if they had long latent period in human. Although this notification is not mandatory, it is also applicable to smaller scale kitchens with social responsibility such as those in schools, daycare centers, and other child-welfare and social-welfare facilities. (Some of the local governments in Japan also have local regulations that require food saving, but the duration and the storage temperature requirements can vary among them).

#### **(3) Distribution of leaflet for the prevention of food-borne illness at homes**

An informational leaflet was prepared in March 1997 to provide instructions for kitchen practices in homes to prevent bacterial infections.

#### **(4) Strict implementation of hygiene standards at abattoirs and meat processing plants**

Abattoirs and meat processing plants shall implement hygienic control program for meat and by-products, according to the concept of HACCP, and a new law became effective on April 1997.

#### **(5) Updating treatment protocols for *E. coli* O157H7 infection**

To encourage rapid diagnosis and appropriate treatment of *E. coli* O157:H7 infection, the treatment protocol should be kept up-to-date and conveyed without any delay to medical facilities.

#### **(6) Trial for new therapeutic agents**

Promising Vero-toxin adsorbents used for preventing the serious complications of *E. coli* O157:H7 infection have been designated as 'therapeutic agents for rare diseases' in March 1997; clinical trials by the facilities started in May 1997. At that time, instructions were given to the trial-participating facilities in all parts of Japan; this trial started immediately after the program of rapid identification of the *E. coli* O157:H7.

## (7) Subtyping of foodborne bacteria

All the local government was advised to send isolated strains of *E. coli* O157:H7 to National Institute of Infectious Diseases to receive genetic analysis. Approximately 1,700 isolates of *E. coli* O157:H7 were collected throughout Japan in 1996 and Pulse Field Gel Electrophoresis (PFGE) patterns were analyzed. The strains found in 16 outbreaks and sporadic cases in 1996 were classified into mainly six sub-categories. Other samples, including those from sporadic cases, allowed the identification of more than 200 different PFGE patterns. These findings indicate that outbreaks and sporadic cases of *E. coli* O157:H7 infection were not due to organisms from a single clone.

Serotyping is conducted for *Salmonella* also in National Institute of Infectious Diseases using phage typing method.

## CONCLUSIONS

According to Food Sanitation Law, Japan has had epidemiological investigation and outbreak reporting system at national basis. Since 1996, when large outbreaks of *E. coli* O157:H7 occurred, new regulatory measures, including developing new laws and notices, were undertaken. Strict hygiene practices have been introduced to abattoirs and meat processing plants, and long-term food saving system has been applied to preparation stage, i.e. restaurants and manufacturers. However, there still are considerable cases of enterohemorrhagic *E. coli* infection. Further improvement of hygiene levels, public education, and coordination of epidemiological and laboratory investigations are required.

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