

FOOD SAFETY CHALLENGES IN THE PACIFIC: THE CASE OF FIJI

J. Lako¹, A. N. Mutukumira^{2*}, A. Jokhan¹, H. Peter³, B. Samuela⁴

¹*School of Biological and Chemical Sciences, Faculty of Science and Technology, The University of the South Pacific, Suva, Fiji*, ²*Institute of Food and Nutrition Human Health, Massey University, Albany, Auckland, New Zealand*, ³*World Health Organization, Division of Pacific Technical Support, Fiji*, ⁴*Food Unit, Ministry of Health, Fiji*

*Corresponding author. E-mail: a.n.mutukumira@massey.ac.nz

Abstract. Foodborne disease and food contamination continue to be significant public health issues in the Pacific. The exact number of people suffering from foodborne diseases is unknown due to many unreported cases and that monitoring and surveillance systems remain weak. Food safety is a shared responsibility between all stakeholders along the food chain including producers, processors, distributors, retailers, and consumers. Assuring food safety in the Pacific is a great challenge due to weak national food control systems, limited awareness of food safety risk factors among consumers and limited compliance capacity among food businesses. Most countries in the region either have or are in the process of developing risk-based food legislation in line with Codex and a common Pacific approach. However, enforcement and compliance need substantial improvements and considerable capacity building of food inspectors is needed. In the case of Fiji, the "Food Safety Regulation 2009" came into effect in 2010 after some life-threatening food poisoning episodes resulting in hospitalization of several people and death of one person. Food safety and quality challenges for Fiji include the control of cyanide in cassava, cadmium in taro, mercury, histamine and ciguatera in fish and *Escherichia coli* in green leafy vegetables as well as contamination of ready-to-eat foods. Aggravation of microbial contamination is mainly due to poor handling practices, improper preparation and storage as well as time-temperature abuse. Food quality issues include inadequate labeling, poor grading and packaging compliance. Some major challenges for Fiji to be addressed include poor hygienic practices among food handlers, limited capacity and resources as well as unclear division of roles and responsibilities between town/city councils and the Food Unit of the Ministry of Health. The control of imported foods is also an enormous challenge for Fiji which needs greater coordination and harmonization of food regulatory systems between Fiji and its trading partners.

Keywords. Food poisoning, cyanide, histamine, heavy metals, food safety regulation.

Introduction

Foodborne disease and food contamination continue to be significant public health issues in Fiji. Consumption of unsafe food can cause many acute and lifelong diseases, ranging from diarrheal diseases to various forms of cancer. The precise number of foodborne cases in the Pacific remain unknown due to poor surveillance

data. However, available information indicate that foodborne diseases have significant public health impact (United Nations, 2008) which may contribute to difficulties in achieving the Millennium Development Goal (MDGs) of eradicating extreme poverty and hunger in Fiji. This paper outlines some of food safety challenges facing Fiji

Food Safety Legislation

In Fiji, the Pure Food Act that enacted in 1926 was in operation up to 2003 without much impact. It was only in 2003 that the Government endorsed the Food Act (FA) and in 2009 the Food Safety Regulation (FSR) was gazetted. However, the enforcement of the legislation only began in 2010 after several life-threatening food poisoning episodes.

Even though the FSR (2009) clearly stipulates Good Hygienic Practices (GHPs) in handling and processing of all food products intended for export and domestic markets, enforcement was focused on the export market. This was demonstrated by the Ministry of Health's attempt to monitor and supervise cold chain compliance of fisheries products. This involved sampling of fish for microbial and histamine analysis at off-loading large commercial fishing vessels and at fish processing industries involved in export. Emphasis on export market industries was mainly due to financial and resource constraints coupled with the European Union (EU) threatening to ban Fiji fish exports in 2008 (Ministry of Health, 2011).

Despite the enforcement of FSR by the Ministry of Health, it appears that most retailers and vendors, especially artisanal fishers, and egg vendors are not familiar with the regulations. According to vendors, no training was conducted on the FSR, good food handling practices, food safety or good hygienic practices before obtaining their operating licenses. It appears that the issue of unclear division of roles and responsibilities between town/city councils, fisheries department and the Ministry of Health may be one of the difficulties faced by vendors. In most cases, vendors do not have information about where to obtain assistance and the system is perceived to be complicated to understand. This therefore requires a coordinated effort between the city/town councils, Department of Fisheries, and Ministry of Health to clearly document demarcations of roles/activities and inform the vendors. Further, to ensure food safety, the three authorities need to implement a clear and simple system for market vendors to obtain information on FSR. For example, production of simple manuals for vendors, fishers, etc; possible vernacular translations of the FSR; conducting food safety training prior to issuance of food business license and regular monitoring system of food sold in the country.

Foodborne diseases

Foodborne diseases are a serious food safety issue world-wide, in particular, for countries with weak food safety regulations. In Fiji, accurate data are scarce and difficult to obtain. Furthermore, poor diagnosis of food poisoning cases resulting in misclassification of food borne diseases. This therefore requires government to improve the system for better identification of the causes and recording of foodborne diseases.

This suggests that food poisoning incidences in Fiji maybe under-reported. It is estimated that the factor for under-reported food poisoning incidences in Fiji could be between 5 and 100 (Lewis, 1986). According to the Ministry of Health (2012), the majority of reported fish poisoning cases are mainly ciguatera fish poisoning.

In 2010, a suspected case of food poisoning involved one female death and two others were hospitalized after consumption of mud lobster bought from the Suva Market (25 January 2010, Fiji Times Online). The mud lobster was presumed to be contaminated with Janola bleach used by harvesters to paralyse the lobsters before catching them. This incident resulted in the ban of all pre-packed seafoods and cooked foods sold in the market for a period of six months (May 25, 2010, Fiji Times Online). The ban by the authorities was however thought to be reactionary which could have been prevented by effective use of the FSR.

Microbial contamination of food, water and fish poisoning are major causes of food poisoning. In Fiji, there have been cases of typhoid, hepatitis and leptospirosis especially after natural disasters such as flooding. However, most food poisoning records in Fiji are mainly fish poisoning especially ciguatoxin. It is apparent that even though most fishermen are aware that seafood or fish can be poisonous at certain seasons of the year and from certain harvest places, but they continue to harvest and sell them. Moreover, considering the high humid of tropical weather, coupled with poor handling practices and incidence of electrical power failures, the rate of food spoilage is much greater. Therefore, better preservation techniques and good storage facilities for retailers and vendors especially those selling raw animal protein related food products are required.

Supply Chain and Potential Hazards in Fish

In Fiji, biological hazards are the major sources of contamination of fish while heavy metals may be present at minimum levels in certain species of fish. Microbiological hazards are mainly caused by time-temperature abuse and poor handling practices

from point of harvest to the consumer. A study conducted by Tall (unpublished) showed that microbial contamination was the major hazard of fish sold at the main fish market at Suva-Nabukalou creek in Fiji.

The major sources of microbial contamination or cross contamination were storage and transportation facilities, display counters, foodhandlers' hands, handling equipments and water system. There is clear indication that the government or the authorities should intervene in order to improve food safety at the fish market in Fiji. Recommendations include use of cold chain storage facilities at all times and good hygienic practices.

Natural Disasters and Food Safety

Fiji is a cyclonic and natural disaster prone country including flooding and hurricanes which aggravate food safety issues. In the recent floods (February and March 2012), most shops and restaurants in Western Fiji went under water, which was worsened by electricity power supply failure for 2-3 weeks. Suspected contaminated foods were discarded as instructed by the Health Inspectors. These included canned and ready-to-eat foods, cool stored products exposed to power failure for over 2 hours, frozen meat and fish exposed power failure for over 7 hours. However, some of these disposed foods were picked by "waster-pickers", resulting in food poisoning and death of one person.

Food Safety Concerns for Export Market

Fiji has great potential to export high quality and safe food in international markets, but the country suffers from inadequate food safety management systems. Major food safety hazards include cyanide in cassava, heavy metals, histamine and ciguatera in fish, and *E.coli* on fresh vegetables (Food Security Pacific, 2010).

Cyanide in Cassava

Cassava is now the staple crop in Fiji, thus replacing taro and yams. It is being exported to Pacific islanders living overseas. However, one of the major obstacles in exporting frozen cassava is its cyanide content. Cyanide content in cassava vary widely between cultivars (Aalbersberg, 1991).

Although data is scanty, it seems Fijian cultivars consumed in the country have low levels of cyanide due to apparently low cyanide-related health problems. It is however, important to note that consumption of 50 to 100 mg of cyanide has been associated with acute poisoning depending on individual tolerance levels (Aalbersberg, 1991).

Histamine, Heavy metals and Ciguatera in Fish

Fijian fish was banned in the European Union (EU) from 2007–2011 after non-compliance with the Common Fisheries Policy ((Ministry of Health, 2011). As expected, this affecting export earnings from fish. In 2008, Ministry of Health Food Unit was established to facilitate fish export inspection and certification of fish and fisheries products to ensure safety of the seafood.

Histamine

Histamine poisoning or scombrototoxin is mainly due to temperature-time abuse and poor hygienic practices which often occur when cold chain is broken within the supply chain. From 2007 to 2011, Fijian fish were banned from the EU market as they were considered unsafe, but without apparent scientific evidence (Ministry of Health, 2011). Instead, the perceived non-compliance of EU requirements that justified the ban was due to non-compliance of the cold supply chain and laboratory requirements. The ban was subsequently lifted when cold chain was strictly followed and the testing facilities were upgraded at the University of South Pacific in Suva.

Ciguatera and Heavy Metals

Ciguatera poisoning related to benthic dinoflagellate (*Gambierdiscus toxicus*) has become a significant and common public health problem in Fiji especially during hot and dry summer. This has become a consistent threat to fisheries development especially to those who derive their livelihood from it. Most ciguatoxins are common in fish such as red snapper, barracuda and rock cod which have been banned for export. Reef fish such as grouper and emperor are now allowed for export.

Analysis of cadmium and mercury in fish samples from fish industries are conducted once a year by the Ministry of Health; only low levels of heavy metals have been reported in the samples of fish from sampled sites.

Safety and Quality Imported Foods

While Fiji acknowledges the importance of food importation to ensure food security, the local Food Act has been violated. These include the use of foreign languages other than English or local vernaculars; Fijian or Hindi on food labels; and date codes less than 30 days. Better border control system in the major ports of Suva, Lautoka and Labasa and shop surveillance during supermarket peak hours have resulted in the confiscation of most violated foods. The most common imported foods that have been confiscated are food products labeled in Chinese.

Improving Food Safety Management System

In Fiji, food control is still under-developed, it therefore needs to adopt the framework developed by FAO (2006). Perhaps, a preliminary study to describe, characterize and assess the existing food control system currently being used by the municipalities, Ministry of Health Food Unit and quarantine services of the Ministry of Primary Industries is desirable. The data may then provide meaningful information as basis for any future developments in food control system in Fiji. It is envisaged that by 2015, the full coordinated food safety system in Fiji would be implemented in all commercial food establishments including HACCP (Food Safety Regulation, 2009). In order to strengthen the food system of any country, proactive and preventative approaches have to be adopted. These include food safety education and industry training of all stakeholders, frequent use of media to promote and highlight food safety issues, as well as inclusion of food safety components into school curricula.

Conclusions

Food safety and control systems in Fiji are generally weak, and therefore resources should be made available to improve skills and infrastructure. Surveillance data should be used to facilitate targeted improvement of food safety systems. A coordination approach to better food safety systems is recommended since currently there are many players involved in food control.

References

- Aalbersberg, B. (1991). Cyanide in Fiji Cassava. In: Jansen, A. (Editor). Food and Nutrition in Fiji: A Historical Review. Volume 2. Nutrition-Related Diseases and Their Prevention, pg 584-587. ISBN 982-02-0060-x.
- FAO. 2006. S Strengthening national food control systems: Guidelines to assess capacity building needs. . Food and Agriculture Organization of The United Nations, Rome, Italy.
- Fiji Times Online. <http://www.fijitimes.com/story.aspx?id=138289>, retrieved, 2 May, 2012.

- Food Safety Regulation. 2009. Fiji Islands Government Gazette Supplement 2009. Government Printers, Suva, Fiji. pg 246.
- Food Security Pacific, (2010). Pacific Food Summit: Summit Outcomes Document. Vanuatu.
- United Nations. (2008). Advancing Food Safety in China. www.un.org/public/.../2aebcd033e3334d961feb1588b70f2ab.pdf, retrieved 4 May, 2012.
- Lewis, N.D. (1986). Epidemiology and Impact of Ciguatera in the Pacific: A Review. *Marine Fisheries Review*, 48; 4:6-13. spo.nmfs.noaa.gov/mf484/mf4843.pdf, retrieved 4 May, 2012.
- Ministry of Health, (2011). Aid for trade Case Story Fiji's Competent Authority, Fiji- Pg 12.
- Ministry of Health, (2012). Operation Garauna, Central Board of Health Food Unit; Fiji. Vol 1:1. Pg 4.
- Tali, W. (2010). Fish Handling Practices at the Nabukalou Creek Fish Market. Undergraduate Dissertation. The University of the South Pacific, Fiji (unpublished).