

**THE WHO FIVE KEYS TO SAFER FOOD:
A TOOL FOR FOOD SAFETY HEALTH PROMOTION**

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ABSTRACT

Foodborne diseases continue to be significant causes of morbidity and mortality within the African Region. Many cases of foodborne disease occur due to basic errors in food preparation or handling either in food service establishments or at home. Educating food handlers, including consumers, therefore, can significantly reduce the chances of contracting food-borne illnesses and the effects of outbreaks, as well as improve public health. Food safety education programmes need to particularly target certain segments of the population who, either directly have a role in food preparation and/or have increased vulnerability to foodborne diseases. In response to the increasing need to educate food handlers, including consumers about their responsibilities for assuring the safety of food, the World Health Organization (WHO) initiated a health promotion campaign around five simple rules, "the five keys to safer food" to help ensure food safety during food handling and preparation. The core messages of the WHO five keys to safer food are: keep clean; separate raw and cooked; cook thoroughly; keep food at safe temperatures; and use safe water and raw materials. These messages have been adapted to different target audiences and settings such as healthy food markets; emergency situations such as prevention of outbreaks; food safety for travellers; preparation of mass gathering events; street-vended foods; training of women; and growing of safer fruits and vegetables. Educational projects targeting different types of food handlers, high-risk groups and settings are being implemented in several countries in the African Region. This article discusses how the WHO five keys to safer food have been used as a tool for food safety education. Experiences of selected countries in the African Region in the promotion of the WHO five keys to safer food in different settings are presented. It further discusses opportunities and future perspectives in the promotion of the WHO five keys to safer food in the African Region.

Key words: Food safety; Food hygiene education; Food handling

INTRODUCTION

Foodborne illnesses constitute a widespread public health problem within the African Region with major socio-economic implications [1]. Reported outbreaks of foodborne illness and the high incidence of diarrhoeal diseases in African children are indications of the magnitude of the problem associated with food as a vehicle for disease transmission.

Even though the contamination of food can occur at any stage of the food chain, a high level of foodborne diseases is caused by foods improperly prepared, or mishandled at home or in food service establishments [2]. Many foodborne diseases could be avoided if those who prepare meals follow simple steps needed to prepare food safely.

Education of food handlers, including consumers is recognized as an important strategy to improve food safety and reduce the impact of foodborne diseases. The education of mothers and care-givers in food safety principles is vital if there is to be a substantial improvement in prevention of diarrhoeal diseases in infants and children [3]. The fall in the incidence of foodborne diseases observed in some Latin American countries after the outbreak of cholera in the early 1990s, has been attributed to the intensive educational activities that took place in response to the epidemic [4].

Certain groups, either because of their direct role in food preparation and/or increased vulnerability to foodborne diseases need to receive greater emphasis in food safety education programmes. These groups include [3]:

- *Domestic food handlers.* Domestic food handlers are persons who prepare food for consumption by their families. Education of this target group (particularly expectant mothers and mothers with small children) will help them to protect themselves and their family members.
- *Professional food handlers.* Professional food handlers such as street food vendors, catering personnel and those working in the food processing industry are a critical group for food hygiene education in view of the large numbers of people they feed and the potential impact on food safety.
- *High-risk groups.* Although everyone is susceptible to foodborne illness, certain segments of the population are particularly at risk of contracting a foodborne illness. This includes young children, the elderly, pregnant women, the immuno-compromised and travelers. Young children are at greater risk to foodborne diseases because their immune systems are still developing and the protection afforded by the resident gut flora is not as effective as in adults [5]. Educating children is an effective strategy for preventing foodborne diseases as the children not only learn about food safety themselves but also communicate the need for food hygiene to their parents, other family members and peers. Older persons, the immuno-compromised, pregnant women and travelers should also be seen as an important target for educational interventions [3]. The natural defenses or

ability to fight diseases lessens with age, making older people more susceptible to foodborne illness than other groups. Due to the weakened immune systems, individuals suffering from chronic illness such as HIV/AIDS are also more prone to foodborne illness [4]. For pregnant women, hormonal changes during pregnancy can have an effect on the mother's immune system, resulting in increased susceptibility to foodborne infections [6]. International travelers easily contract diarrhea through consumption of contaminated food due to low level of immunity, changes in diet and climate.

The World Health Organization places emphasis on health promotion targeting food handlers, including consumers about their responsibilities for food safety. After nearly a year of consultation with food safety experts and risk communicators, WHO introduced, in 2001, a global health message with five steps to prevent foodborne disease, the "five keys to safer food." The WHO five keys to safer food message are based on scientific evidence and can be promoted in all settings. Food safety health promotion campaigns using the WHO five keys to safer food are being implemented in settings such as homes, schools, hospitals and other health facilities, food markets, food establishments and vending sites.

The WHO five keys to safer food and food safety promotion

Recognizing the need to communicate simple and clear messages based on evidence as well as the need to provide countries with materials they can easily use, reproduce and adapt to different target audiences, WHO introduced the five keys to safer food poster in 2001. The poster outlines the essential requirements to preventing foodborne illness. It has been translated into more than 40 languages globally and is currently being used to spread WHO's food hygiene message throughout the world [2].

Food safety education is most effective when messages are targeted toward changing behaviours most likely to result in foodborne illness [7]. The core messages of the WHO five keys to safer food are: keep clean; separate raw and cooked; cook thoroughly; keep food at safe temperatures; and use safe water and raw materials.

Along with the five keys to safer food poster, WHO also developed a generic training manual based on the five keys messages as a framework for food safety professionals, teachers and other interested institutions to use in developing training materials and programmes for high risk groups [8].

WHO has further adapted the five keys message to different settings and target groups, such as:

- *Healthy Food Markets.* While food markets are considered to be dynamic commercial centres for local communities, these markets have been implicated in the spread of epidemic diseases including foodborne diarrhea, Avian Influenza and other emerging diseases. WHO has developed the healthy food markets approach to improve the safety and nutritional quality of foods sold in markets.

A guide has been developed for local community leaders, market vendors and other market stakeholders for improving food safety and related environmental health issues in markets. An adaptation of the five keys messages has been included in the guide. Each key message is accompanied by a number of possible specific measures that need to be tailored to the conditions in the market, the food commodities being sold and the intended target group [9].

- *Emergency situations such as prevention of cholera outbreaks, prevention of Avian Influenza and prevention of outbreaks after natural disasters.* WHO has developed a guide for public health and other authorities to plan and respond to food safety concerns in the aftermath of natural disasters. It provides guidance for the development of simple food safety messages to those involved in food handling and preparation in disaster situations and is modeled after the five keys messages [10]. The five keys messages have also been adapted to specifically address the health concerns associated with handling and preparing poultry and poultry products potentially infected with pathogenic Avian Influenza (HPAI) virus.
- *Mass gathering events.* The five keys to safer food messages have been adapted for use in preparation of mass gathering events, especially sporting events. Based on the success of the five keys to safer food, WHO extended the five keys concept to offer broader advice to people to improve their health by providing simple messages on healthy diets and physical activity. The 3 Fives (Five Keys to Safer Food, a Healthy Diet and Appropriate Physical Activity) concept was initially tailor-made for major sporting events and was launched in China to promote healthy lifestyles during the Beijing Olympics [11].
- *Street vended foods.* A guide has been developed for training in the street food sector to improve the conditions in which street food is prepared and sold. It centres on the principles of good hygienic practices outlined in the five keys messages and provides details on the specific food hygiene measures tailored to the street food sector, the food commodities being sold and the specific factors of the food vendors themselves [12].
- *Training course for women.* A train the trainer course was developed for public health professionals, health educators, community leaders and government officials interested in providing safe food handling education and promoting behavioural change in women. It builds upon the safe food handling behaviours articulated in the five keys to safer food messages and the concepts of the communications for behavioural impact method. The course is designed to provide the scientific information and behavioural tools to promote the adoption of safe food handling behaviours [13].
- *Five keys for growing safer fruits and vegetables.* A training course has been developed for community educators who are in the position to share the five keys messages and promote behavioural change in rural workers who are growing fruits or vegetables for themselves or others. The five keys for growing safer

fruits and vegetables provides key behaviours for limiting microbial contamination of fresh fruits and vegetables during planting, growing, harvesting, and packaging that are critical for reducing foodborne disease [14].

These WHO five keys to safer food materials have been adopted and adapted by a number of countries globally and serve as the basis for health promotion programmes for health educators, food handlers, school-children, women and other target audiences involved in food preparation and handling.

Food safety educational projects using the WHO five keys to safer food: Experiences in the African Region

The need to strengthen food safety education programmes for the prevention of foodborne diseases is increasingly being recognized by countries in Africa. Five keys to safer food educational projects have been established or are being carried out in several countries in the African Region (figure 1). The strategies being used by the countries involve addressing several levels of intervention, targeting different settings, high-risk groups as well as professional food handlers including street food vendors. Emphasis has also been placed by some of the countries to develop and implement the educational projects in partnership with other non-health sectors. Where this was implemented, it has strengthened the reach and impact of the programmes.

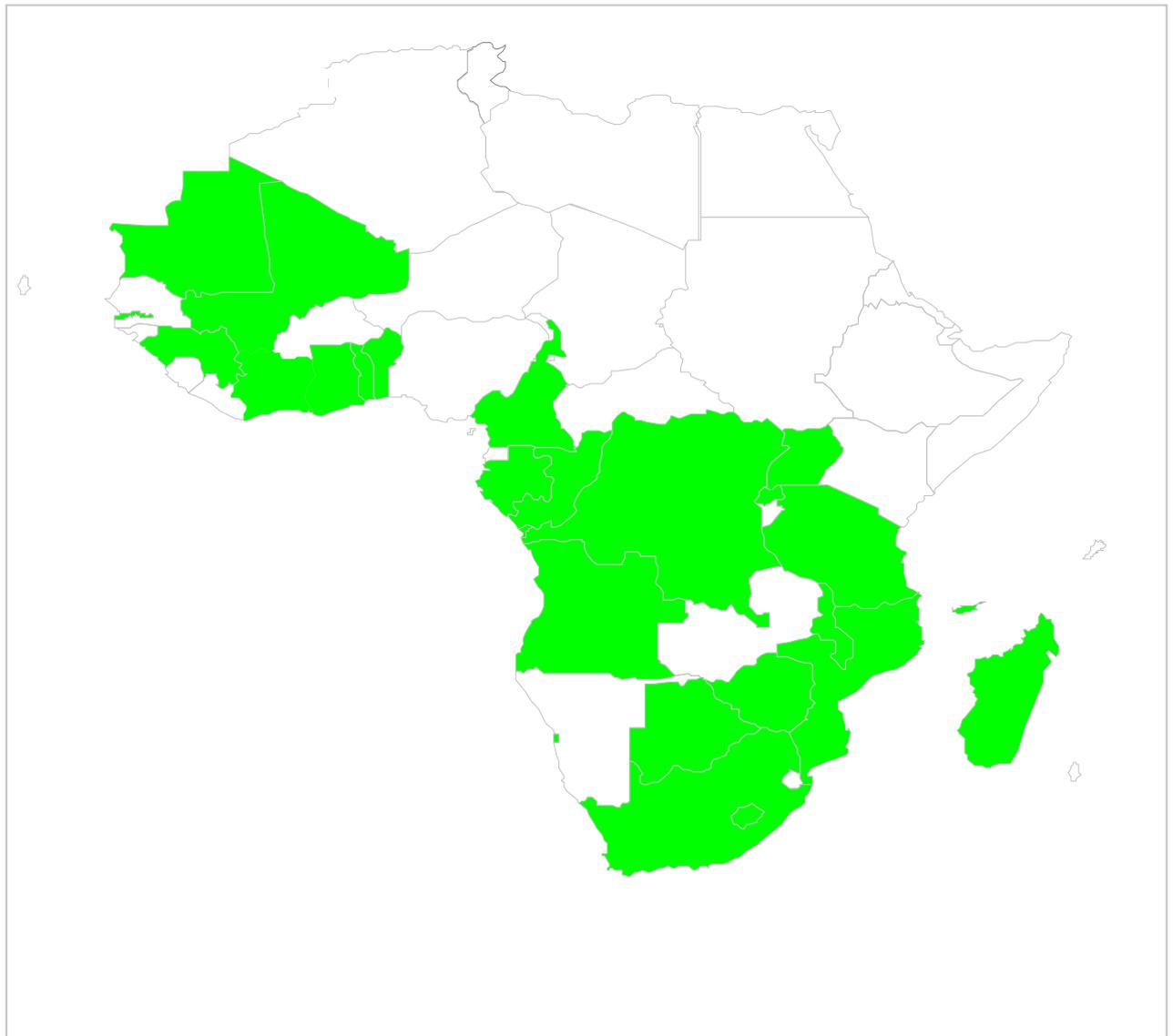


Figure 1: Countries in the WHO African Region with Five Keys Educational initiatives

Food Markets

The market has been used as an important setting for educating market stakeholders of the principles of food hygiene and their role in ensuring food safety. This has involved the participation of the local government, related departments, and organizations of market communities. In the Democratic Republic of Congo, a social mobilization campaign for the improvement of food hygiene in markets in Kinshasa was conducted [15]. The campaigns contributed to raising awareness among the local population, authorities, vendors and consumers for improvement of environmental health and food safety conditions in the markets and facilitated action to address some of the critical issues in the markets.

In Togo, the Sokodé market was chosen to serve as a pilot market site. The Sokodé market is located at the heart of Sokodé city and has roughly 1700 vendors. Vendors market a mixed range of products including fish, meat, poultry, fruits and vegetables, cereals, spices, ready-to-eat foods, canned foods and other industrial products. Advocacy meetings and campaign were used to raise awareness of the need to improve market conditions. As a result, an action plan for the market was developed by the Sokodé healthy food market task force in collaboration with the market community. The action plan addresses improvement of physical environment and infrastructure in the market; improvement of operations and services in the market and promotion of food safety. A training of trainers was held for social mobilization agents on the WHO five keys to safer food. The specific role of the agents is to facilitate the mobilization of vendors and other members of the market community in the implementation of the pilot project as well as to facilitate the promotion of food hygiene in the market. With the Sokodé healthy food market taskforce, the market community organized mass cleaning campaigns and efforts are underway to rehabilitate the sanitary facilities in the market. Efforts are also underway to constitute a market committee in charge of monitoring the cleanliness of the market and food handling practices of vendors.

School settings

The school setting has been an effective setting for communicating the food hygiene principles outlined in the five keys to safer food. In addition to schoolchildren, food handlers in and/or near the schools and teachers represented an important category of personnel that were trained on the WHO five keys safer food. In Guinea, training was conducted for women street food vendors near schools in 2007 [15]. The main objectives of the activity were to sensitize and train women food vendors in school surroundings and within schools on the protection of food; equip and demonstrate to street food vendors, materials for the conservation and protection of food; and sensitize school children and teachers on proper food hygiene practices. The activity involved different actors concerned in child health and in the field of public hygiene.



Figure 2: Award ceremony in Lesotho following food safety competitions

In Angola, Lesotho and Mali, food safety competitions in schools have been used as an innovative way of communicating food safety [15]. In Lesotho school competitions were conducted through a consultative process involving the WHO country office, Environmental Health Division, the District Environmental Health Office together with other stakeholders and the schools. The competition focused on the promotion of food handling in schools through the WHO five keys to safer food. The process was successful in terms of improving the overall environmental cleanliness of the schools and in creating awareness on measures to be taken to improve safe food handling among school communities. The competition created a high level of interest in different sectors including the district government institutions, schools, pupils and the communities surrounding the schools.

Food establishments

Professional food handlers in food and catering establishments, including street food vendors, have been an important target group for training and education in food safety. In Lesotho, a food safety campaign was conducted in Maseru's Hoek district with the theme "Food Safety in All Food Establishment: A Key to Good Health" [15]. The district was among, five districts that were involved in a baseline study on food safety in 2005. The findings of the study formed the basis for planning of the food safety campaign [15]. The overall objective of the campaign was to communicate the importance of food safety to owners of food establishments, food handlers as well as street food vendors.



Figure 3: Inspection of food establishments in Lesotho as part of the food safety campaigns

The food safety campaign sought to achieve its objectives through a coordinated campaign involving inspection of food establishments, production and distribution of educational materials and posters, and educational sessions with personnel of food establishments.

The campaign was carried out in 2006 by the district team comprising the Environmental Health Division, the Lesotho Mounted Police and the national level personnel from the food safety programme. From the inspection of food establishments, a total of 14083 food commodities were seized and destroyed. The implicated commodities were either: expired, dented, contaminated, or packaging had been tempered with and/or contaminated. In addition to the inspections, educational sessions were conducted and centered on the five keys to safer food. A total of 339 food handlers from hotels, butcheries, restaurants and fast food outlets, bakeries and individual vendors were reached during the sessions.

Following the campaign, an assessment on the compliance to the five keys to safer food messages was conducted in Mohale's Hoek town. The exercise focused on the food handling establishments that were trained on the WHO five keys to safer food. The food safety campaign attracted the interest of other districts eager to engage on a similar campaign. A minimum food safety package to be delivered at district level has also been elaborated and introduced in seven of the ten districts of Lesotho.

In Mali, a food safety campaign commenced with the adaptation of the WHO five keys to safer food messages into the socio-cultural context of the country. This was done in the effort to ensure that the messages reached food handlers and the public and are translated into positive actions. The campaign included a baseline study of food safety conditions in food establishments in six districts of Bamako and training on the WHO five keys to safer food messages including educational sessions with the food handlers in the different food establishments [15].



Figure 4: Educational session with a food vendor in Mali

As a result of the initial campaign conducted in the country, the five keys to safer food messages have been applied in different settings. A series of training sessions including training of trainers have been organized in nearly all the Regions. The sessions target representatives from the health sector, consumer associations, radio

presenters and food handlers from hotels, restaurants, pastries, bakeries, cafeterias, and street vendors.

Food safety promotion during outbreaks and mass gathering

Prevention of cholera

Health workers are another category of personnel that have been targeted in food safety training and in the epidemiology of foodborne diseases, especially foodborne routes of cholera and health education in food safety using the WHO five keys to safer food messages. In Angola, a training of trainers was organized in Benguela province by the National Programme on Emergencies of the Ministry of Health in collaboration with WHO, in response to a cholera outbreak [15]. Participants were introduced to the role of food in the transmission of *Vibrio cholera* and the WHO five keys to safer food messages. An action plan was elaborated for food safety education in the respective provinces.

Prevention of foodborne illness following floods

Following flooding in Benin, the five keys to safer food was the tool used to reduce the incidence of potentially lethal diarrhea. The five keys messages were adapted and simplified for community workers having very limited technical background on food hygiene as well as to meet the needs of people living in rural areas. Fifty trainers were trained who in turn trained more than 500 community workers. Following this successful pilot experience, in collaboration with the United Nations Children's Fund in Benin, the five keys to safer food messages were integrated in the national protocol for community interventions. In addition, the messages have been incorporated in the health leaflet for children within the context of the scaling up of the WHO New Growth Curves.

Mass gathering events – Food safety preparations during the 2010 FIFA World Cup

While many pathogenic bacteria, parasites and viruses may be transmitted through food, food may also be a vehicle for hazardous chemicals and toxins. This contamination may be due to inadvertent or intentional contamination and may occur at any point in the food supply. It was also recognized that a major foodborne outbreak had the potential to seriously disrupt the 2010 FIFA World Cup and thus appropriate measures had to be in place before the event. During preparations for the World Cup, the South African Government intensified efforts to enforce the provisions of the Cosmetics and Food Stuffs Act (no. 54 of 1972) pertaining to food safety through various strategic planning and interventions.

The 2010 World Cup Operation Plan consolidated collaborative efforts between several key health departments and stakeholders, including the food retail and manufacturing industry, to enhance the safety of food and water. All food and beverage suppliers (including bottled water) and food service establishments are required to hold valid certificates of acceptability under Regulation 918 (R918) of the Health Act (1999) of South Africa to ensure food safety and storage under sanitary

conditions. Under the plan, all food premises and vehicles were inspected and certified 3 months prior to the event including FIFA-certified accommodation and catering establishments. The importation of foodstuffs not in compliance with the Foodstuffs, Cosmetics and Disinfectants Act no. 54 of 1972 was temporarily permitted under certain conditions for the games. Special emphasis was put on the transportation of food to World Cup venues, including pre-notification of shipment, security seals and inspection.

Although the Department of Water Affairs and Forestry is responsible for bulk water supplies, Department of Health authorities also supported the monitoring of water quality, waste management and sanitation facilities and investigated possible waterborne outbreaks through the environmental health officers. Training of the master trainers and subsequently food handlers, street food vendors and private sector personnel using the WHO five keys to safer food in local languages, commenced in 2008. While the food industry and food service sectors have achieved a high level of safety, a heightened awareness of food safety, including food defence, during the World Cup was considered prudent. Thus collaboration with the Food Safety Initiative of the Consumer Goods Council, an NGO representing about 80% of the food industry and including 5 000 of the country's estimated 8,000 restaurants, jointly issued reminders to the food processing, retail and food service industry which urged them to take extra precautions in preventing a major foodborne incident during the World Cup. This appears to be successful as there were no major outbreaks of foodborne diseases during the games [16].

Conclusion and future perspectives

Many cases of foodborne disease occur because of basic errors in food preparation, either in restaurants or at home. Good food hygiene can prevent the transmission of pathogens responsible for many foodborne diseases. The importance of food safety education in prevention of foodborne illness is universally recognized. Educating food handlers including consumers can result in improved food safety practices and can significantly reduce the chances of contracting food-borne illnesses and the effects of outbreaks. The WHO five keys to safer food comprises simple messages on food hygiene which are easily comprehensible by all including high risk groups, domestic and professional food handlers.

The WHO five keys to safer food messages have been applied to different settings and target groups. In the African Region, educational projects targeting high-risk groups, including children and women and others involved in food preparation and handling are being implemented in several countries. The WHO five keys to safer food is being used as a tool to raise awareness of consumers, food handlers and policy makers of the need for assuring the safety of the food supply and individual responsibility for food safety. Evaluations to measure behavioral changes are, however, needed to measure the impact of the educational projects at country level, including scaling up implementation.

The WHO Regional Office for Africa will continue to support countries to promote and/or scale up educational projects on hygienic handling of food using the WHO five keys to safer food into settings such as homes, schools, food markets, food establishments and vending sites. The Regional Office particularly plans to extend the adaptation of the WHO five keys to safer food in the African Region to other settings including health facilities and farms that produce vegetables and fruits. The development of training materials to additional target groups including health workers in rural communities, people living with HIV/AIDS is being considered in order to provide countries with appropriate training materials.

REFERENCES

1. **World Health Organization.** Food safety and health: a strategy for the WHO African Region. 2008.
2. **World Health Organization.** International food safety authorities network (INFOSAN) information note no. 5/2006 - Five keys to safer food. 2006.
3. **Adams M and Y Motarjemi** Basic food safety for health workers. World Health Organization. 1999.
4. **World Health Organization.** Foodborne disease: a focus for health education. 2000.
5. **WHO Regional Office for Europe.** Children's health and environment: a review of evidence. 2002.
6. **World Health Organization.** International food safety authorities network (INFOSAN) information note no. 3/2008 – Food safety and nutrition during pregnancy and infant feeding. 2008.
7. **Medeiros LC, Hillers VN, Kendall PA and A Mason** Food safety education: what should we be teaching to consumers? *Journal of Nutrition Education*, 2001; **33**(2):108-13.
8. **World Health Organization.** Five Keys to Safer Food Manual. 2006.
9. **World Health Organization.** A guide to healthy food markets. 2006.
10. **World Health Organization** Ensuring food safety in the aftermath of natural disasters health.
http://www.who.int/foodsafety/foodborne_disease/emergency/en/. Accessed 16 September 2011.
11. **World Health Organization.** The health legacy of the 2008 Beijing Olympic games: successes and recommendations. 2010.
12. **World Health Organization.** International food safety authorities network (INFOSAN) information note no. 3/2010 – Basic steps to improve safety of street-vended food. 2010.
13. **World Health Organization.** The five keys to safer food training course.
http://www.who.int/foodsafety/consumer/keys_training/en/index.html. Accessed 16 September 2011.
14. **World Health Organization.** Five keys to growing safer fruits and vegetables: promoting health by decreasing microbial contamination. 2011.

15. **World Health Organization.** Pilot projects in the African Region. http://www.who.int/foodsafety/consumer/africa_summary_08.pdf. Accessed 16 September 2011.
16. **World Health Organization.** Report on WHO support to the 2010 FIFA World Cup South Africa. 2011.