

Study of Food Terrorism in Ethiopia

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Abstract: Food terrorism as a global challenge has resulted in the death of millions of peoples and it is one of the major global public health threats in the 21st Century. Most countries especially the United States are on a high alert for terrorist threats. Deliberate food and water contamination remains the easiest way for terrorists to distribute biological or chemical agents for the purpose of food terrorism in the world due to this reason currently food terrorism is burning issue in the glob because all societies are crucially dependent upon the food supply. As past incidents have demonstrated, food terrorism may cause social, economic, and political disruption in one country; therefore it is important to create awareness in the society about the impact of food terrorism. Taking sensible precautions, coupled with establishing and strengthening surveillance and response capacity, constitute the most efficient and effective way of countering food terrorism as well as other food safety emergencies. Prevention is best achieved through cooperative effort between government and industry, given that the primary means for minimizing food risks lie with the food industry.

Key words: Awareness • Biological Agent • Deliberate Contamination • Food Terrorism • Risk

INTRODUCTION

Terrorism represents the use of force or violence against people or property in violation of criminal laws, for the purpose of intimidation, coercion or ransom [1]. Food terrorism is an act of threat of intentional contamination of food for human consumption with chemical, biological or radio nuclear agents for the purpose of causing injury or death to civilian populations and/or disruption of social, economic or political stability [2].

The causes of terrorism appear to be varied. There does not appear to be one factor that leads people to engage in acts of terror. Scholars have categorized motivations for terrorism to include psychological, ideological and theological [3]. According to the world health organization WHO, the contamination of food for terrorist purpose is real and current threat, at the same time, contamination of food at one location could have global public health implication [4]. Because deliberate food and water contamination remains the easiest way to distribute biological, chemical or even physical agents for the purpose of terrorism [5] and all societies are crucially dependent upon the food supply, therefore, its disruption is an obvious prime target for terrorism [6].

Intentional contamination of food by hazardous agents can occur at many points in the food production system depending on the food, the agent and the target population [7]. Bioterrorism is an attractive weapon because biological agents are relatively easy and inexpensive to obtain, can be easily disseminated and can cause widespread fear and panic beyond the actual physical damage [8].

As past incidents have demonstrated, food terrorism may cause social, economic and political disruption [9]. For instance there are approximately 76 million illnesses, 325, 000 hospitalizations and 5, 000 deaths every year due to contaminated food borne illnesses in the United States [10]. Due to its current threat in the world, governments started to protect its natural sources in order to provide safe food & water supplies by putting new roles which helps to any possible contamination through food handling during processing and by developing a Security Plan Development (SPD) which can be realized easily and efficiently by implementing the principles of HACCP [11].

The development, production and use of chemical and biological agents as weapons are covered by international and national laws and agreements. These are essential to protect the public against hostile release of such agents. Governments also have a role in promoting

preventive food safety through established voluntary and regulatory mechanisms [11]. In U.S. Of America, FDA is responsible for protecting public health from the potentially harmful effects of accidental, as well as intentional contamination of the food supply. FDA works collaboratively with its partners to coordinate food defense efforts, including prevention, response, recovery and communication [12]. On a regional level, African countries under the shadow of the African Union coordinates together to fight against food terrorism [13].

Therefore, the objective of this paper is:

- To review the potential effect of food terrorism

Meaning of Food Terrorism: As it is define by the FBI, terrorism is the unlawful use of force to intimidate the government and civilian population for the seek of political or social objectives or goals [14]. Food terrorism is defined as an act or threat of deliberate contamination of food for human consumption with biological, chemical and physical agents or radio nuclear materials for the purpose of causing injury or death to civilian populations and/or disrupting social, economic or political stability. The biological agents are pathogenic microorganisms, including viruses, bacteria and parasites. The chemical agents in question may be manmade or natural toxins. Physical agents can include a wide range of objects including glass, needles and metal fragments. Radio nuclear materials are defined as radioactive chemicals capable of causing injury when present at unacceptable levels [15].

Food terrorism (FT) is also defined as the intentional contamination of the food or water supply [1].

In general, terrorist may use one or more of the following tactics in order to attack food resources or water supplies. Attack facility from outside, gain access to facilities by forced entry and insider compromise using someone with legitimate access [4]

Agents That Cause Food Terrorism: There are different types of agents a terrorist might use to contamination of food. These agents include nuclear, chemical and biological. Nuclear weapons have a great killing capacity, but they are very difficult to acquire. Chemical weapons are easy to acquire, but can lack the capacity to achieve mass destruction. Biological agents, on the other hand, have both qualities, ease of acquisition and the potential to affect a large number of people [16].

Biological Agents: The biological agents are pathogenic microorganisms, including viruses, bacteria and parasites introducing to food for terrorist purpose [15]. Terrorists use these agents because of relatively easy and inexpensive to obtain, can be easily disseminated and can cause widespread fear and panic beyond the actual physical damage [8].

Critical biological agents for public health preparedness can be listed in the following three categories in food terrorism (FT). Agents can easily cause high mortality and morbidity and produce social disruption. These agents include *Clostridium botulinum* and food-borne anthrax. The second biological agent can cause moderate morbidity and low mortality. This category includes several food borne pathogens such as *Salmonella* spp., *Shigella* spp. and, *E. coli* and finally there are various food -borne pathogens that could be used also including viral and parasitic agents such as hepatitis A. [17].

Chemical Agents: A chemical attack is the spreading of toxic chemicals to food with the intent to do harm to people or to environment on our planet. A wide variety of chemicals could be made stolen or otherwise acquired for use in an attack. Industrial chemical plants or the vehicles used to transport chemicals could also be sabotaged. Harmful chemicals that could be used in a terrorist attack include, Chemical weapons (warfare agents) developed for military use, Toxic industrial and commercial chemicals that are produced and used for making of petroleum, plastics, fertilizers, paper, foods, pesticides and other products and finally chemical toxins of biological origin such as ricin [4].

In addition, the CDC identified certain chemicals as possible agents for a terrorist attack. Those included heavy metals, such as arsenic, lead and mercury and pesticides, dioxins and furans, all of which may be used to contaminate food [18].

Perspectives of Food Terrorism: Groups with political, religious and criminal motivations, or fanatically devoted to a single issue, all might turn to food terrorism. Therefore, perspectives of food terrorism may be ideological, theological and criminal motivations or psychological [3].

Ideological Perspective: Violent groups with political goals will find it difficult to attract as much attention, create as much economic chaos and suffer as few

consequences by employing any other type of weapon. Many terrorists want autonomy for a disenfranchised ethnic group, the release of prisoners sympathetic to their cause, or a change in what they view as an oppressive government. To effect these changes, these groups need the support of the population. The use of indiscriminate violence, however, tends to harden the resolve of the populace to fight against those causing the bloodshed instead of against the terrorists intended targets [19].

Theological Perspective: Many terrorist groups are not fettered by the same constraints that shape the tactics of terrorists with political goals. These groups have no political agenda that would suffer because of public backlash against violent attacks. These are terrorists with religious motivations. These groups may attempt to use biological weapons by poisoning food to kill people on a massive scale. It is fortunate, therefore, that religious motivation is behind only a minority, albeit a growing one, of terrorist attacks [20].

Criminal Motivations or Psychological Perspective: Terrorism will be pursued not only by those who have ideological or theological goals, but also those groups whose concerns are more pragmatic and mercenary. Those who engage in terrorism may do so for purely personal reasons, based on their own psychological state of mind [21].

Impacts of Food Terrorism: The impact of such an attack will obviously be on the public health, economy and may even cause political destabilization. Under such an attack, public health services are likely to halt, as they are not prepared to respond effectively in many countries, for their emergency plans do not usually cover food terrorism and this may lead to errors in diagnosis and in the identification of the infected food [22].

Economic and Trade Impact: Intentional contamination of food also may have enormous economic implications in the U.S., where one out of every eight Americans is estimated to work in an occupation directly linked to food production [23]. Indeed, food terrorists may have economic disruption as their primary motive. For example in 1998, a company in the U.S. recalled nearly 16, 000 metric tons of frankfurters and luncheon meats potentially contaminated with *Listeria monocytogenes*, at a total cost of \$50 million to \$70 million [24]. The company reported spending more than \$100 million in the following two years to improve food safety and convince consumers

that its products were safe [25]. Indirect costs can be staggering as well. The outbreak from Salmonella-contaminated ice cream, discussed above, was estimated to have cost the U.S. economy about \$18.1 million in medical care and time lost from work [26].

Deliberate contamination of food may also have enormous economic implications, even if an incident is relatively minor. In fact, economic disruption may be the primary motive for some deliberate acts, which target a product, a manufacturer, an industry or a country. Mass casualties are not required to achieve widespread economic loss and disruption of trade. Extortion threats directed at specific organizations, particularly those in the commercial sector, are more common than is generally believed. Such real or perceived threats can have a major impact on tourism, which is economically important for many countries. In an effort to damage Israel's economy in 1978, citrus fruit exported to several European countries was contaminated with mercury, which led to significant trade disruption. The alleged contamination of Chilean grapes with cyanide in 1989 led to the recall of Chilean fruit from markets in Canada and the United States of America and the shunning of Chilean fruit by American and other consumers. The resulting damage amounted to several hundred million dollars and more than 100 growers and shippers went bankrupt [27]. In 1998, a company in the United States of America recalled 14 million kilograms of sausages, frankfurters and luncheon meats potentially contaminated with *Listeria*. The parent company closed the plant and estimated their total cost to be US\$ 50-70 million. The crisis in Belgium in which dioxin-contaminated meat and dairy products were recalled around the world demonstrates not only the extensive costs to individual countries, but also the extent of disruption of global trade that can be caused by this type of incident [28].

Generally at least three types of economic effects may be generated by an act of food terrorism, these are direct economic losses attributable to the costs of responding to the act; indirect multiplier effects from compensation paid to affected producers and the losses suffered by affiliated industries, such as suppliers, transporters, distributors and restaurant chains; and international costs in the form of trade embargoes imposed by trading partners [29].

Impact on Public Health: The potential impact of contaminated food on human health from deliberate acts of sabotage can be inferred from reports of unintended food borne disease outbreaks. If the unintentional

contamination of one food, such as clams, can infect 300 000 individuals with a serious debilitating disease, then a concerted, deliberate attack could be devastating, especially if a more dangerous agent was used [27].

Recognizing that food borne illnesses "significantly affect people's health and well-being," the World Health Assembly in 2000 adopted a resolution stating that the assembly was deeply concerned that food borne illness associated with microbial pathogens, biotoxins and chemical contaminants in food represent a serious threat to the health of millions of people in the world [30]. There are approximately 76 million illnesses, 325, 000 hospitalizations and 5, 000 deaths every year due to intentional contaminated food in the United States [10]. Based on current population data, this roughly translates to an estimate that, each year, one out of every four Americans will develop a food borne illness due to food terrorism [31].

Major outbreaks of food borne illness occur all too frequently, sometimes affecting hundreds of thousands of people. An outbreak of hepatitis A caused by tainted clams affected nearly 300, 000 people in China in 1991 and may be the largest food borne disease incident in history [32]. In 1994, an outbreak of *Salmonella enteritidis* infection linked to a contaminated ice cream pre-mix sickened an estimated 224, 000 people in 41 states in the U.S [33]. In 1996, about 8, 000 children in Japan became ill and some died, after eating *E. coli* 0157:H7-tainted radish sprouts served in school lunches [34]. Illnesses from pesticides, mycotoxins, heavy metals, cyanide and other acutely toxic chemicals also have been reported due to food terrorism. In one deadly incident, over 800 people died and about 20, 000 were injured by a chemical agent present in cooking oil sold in Spain in 1981 [35]. In 1985, nearly 1, 400 people in the U.S. reported becoming ill after eating watermelon grown in soil treated with the pesticide aldicarb. In Iraq in 1971-1972, more than 6, 500 people were hospitalized with neurological symptoms and 459 died after eating bread made from mercury-contaminated wheat [36]. In today's global marketplace, the contamination of food in one country can have a significant effect on public health in other parts of the world. In 1989, approximately 25, 000 people in 30 states in the U.S. were sickened by *Salmonella chester* in cantaloupes imported from Mexico [37]. In 1996 and 1997, 2, 500 people in 21 states in the U.S. and two Canadian provinces developed *Cyclospora* infections after eating tainted Guatemalan raspberries [38].

For example the most well-known incidents include the following:

The 1984 Rajneesh incident in which restaurant salad bars were contaminated with *Salmonella typhimurium* and more peoples were affected [39], a 1996 incident in the Dallas area where a laboratory worker sickened 12 of her colleagues with food intentionally contaminated with *Shigella dysenteriae* type 2 [40], a 1970 incident where people in a Quebec home ate food contaminated with *Ascaris suum* [41], Shanghai, China. 1991. Probably the largest food borne disease incident in history, this was an outbreak of hepatitis A that was associated with consumption of clams. Nearly 300, 000 people were affected [2].

Social and Political Implications: Terrorists may have a variety of motives from revenge to political destabilization. They may target the civilian population to create panic and threaten civil order. As the response to the mailing of envelopes containing *Bacillus anthracis* in the United States of America showed, limited dissemination of biological agents by simple means, causing few cases of illness, can cause considerable disruption and public anxiety. Fear and anxiety may contribute to reduced confidence in the political system and government and may therefore result in political destabilization. When the effects are economic and lead to loss of income for some sectors of society, the political impact can be exacerbated. Finally, while contamination of the entire food supply is unlikely, pre-existing food shortages could be worsened by deliberate contamination, again with an impact on political and social stability [42].

The potential magnitude of social impacts arising from a food terrorism incident may be best illustrated by examining the effects of the Bovine Spongiform Encephalopathy (BSE) (also known as "mad cow disease") crisis in Great Britain in the 1990's. When researchers first discovered BSE in British cattle in 1986, some speculated that BSE could be spread to humans [43]. However, for the next decade British authority's consistently reassured citizens that BSE was only an animal disease. When, in 1996, authorities acknowledged that BSE could be linked to human disease and announced that ten people in the U.K. had been infected or died from a human form of mad cow disease, widespread panic erupted. Even though the toll of human fatalities 137 deaths to date was lower than the death toll from many other diseases, the effects of this public health crisis were widespread and long- lasting [44]. Bans on imports of British beef lasted for several years [43] furthermore, the public's shattered confidence in

government forced the creation of a new food regulatory authority, the Foods Standards Agency. The slaughter of millions of cattle and other BSE control measures, together with depressed markets for British beef, crippled the country's cattle industry [45].

Prevention of Food Terrorism: Acts of food terrorism must first be detected by real-time surveillance and other alert systems, before a response can be mounted. The response may include verification of the threat, including the cause of disease, management of the consequences by aiding the affected population, identification and removal of the food from sale and management of the social, political and economic consequences of the act. Rapid, effective management of the consequences of food terrorism must be based on well-planned links between the existing components of a national emergency response plan and those responsible for food terrorism [46].

The development, production and use of chemical and biological agents as weapons are covered by international and national laws and agreements. These are essential to protect the public against hostile release of such agents [15]. The key to prevention food terrorism is enhancing existing food safety programs and implementing reasonable security measures. Response to food terrorism depends on awareness of the possibility of a terrorist act and recognition of the incident as involving food. Emergency response systems must be developed within preparedness planning and should be maintained, tested and modified continually in order to adjust to new circumstances [6]. Early detection and rapid response to Bioterrorism depend on close cooperation between public health authorities and law enforcement [47]. Prevention and response are the two major strategies for countering the threat of food terrorist [17].

FDA is responsible for overseeing all domestic and imported food sold in interstate commerce, including shell eggs, bottled water and wines. FDA inspections take a broad approach to food inspections to ensure that the overall food production process within a given establishment is functioning appropriately [48].

There is also other ways to minimize the opportunity for intentional contamination of food. Know employees, contractors and their policies, understand the transport and distribution chain before and after your operation [49].

CONCLUSION

Generally intentional contamination of food and water for terrorist purpose is become common in the world. This is something to be taken seriously because all societies are crucially dependent upon the food supply; therefore, its disruption is an obvious prime target for terrorism. The importance of understanding food terrorism is vital in order to keep food from any threat. It can lead to high mortality rate, public unrest, paralyzed health service and negative impact on national economy.

Based on the above conclusion the following recommendations are made:

- As foods are imported they should, special attention should be given to potential occurrence of food terrorism.

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