

The Cause

of

Food Scandals

Our Food

Food Safety and Control System

Food Scandals

- Food borne diseases and food poisoning have always threaten humanity.
- Lack of knowledge and low level of ethics are the causes of food scandals.
- Scandals with organics: Dioxine in free outlet eggs in Germany.
- One-third of global meat exports are being affected by animal disease outbreaks. Trade losses mount up to US \$10 billion .
- High lobbying in detriment of food safety.
- Due to ongoing scandals with chicken in Europe and Asia Brazil increases its output by 5 to 6 per cent in 2004. Food scandals cause heavy change in the international economy.

Food Scandals

Actual European BSE scandals to cut costs

- Labels applied to the wrong product.
 - Products from farms that weren't inside the scheme.
 - Poor segregation of products.
 - Farms sold more products than their animals could produce.
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- BSE and vCJD have an extraordinarily long incubation period.
 - vCJD, infection must be traced to twenty years earlier.
 - Trying to reduce costs, minimize losses and produce meat at low price the BSE catastrophe came under way.

Food Scandals

- Cattle sheep and goats may be susceptible to BSE through contaminated food.
- Most cases show a gradual development of symptoms over a period of several weeks or even months, although some can deteriorate very rapidly.

Symptoms of the BSE disease in cattle

- Apprehension and nervous disposition,
- excessive sensitivity to stimuli (light, noise, touch),
- manic kicking when milked,
- occasional aggression directed at other cattle or humans,
- swaying gait, sometimes with high stepping of the feet, particularly the hind legs,
- difficulties in walking or getting up,
- loss of condition, weight or milk yield.

Food Scandals

- As the epidemics is slacking down, safety checks on meat were sometimes dropped to save costs of the tests.
- Food quality and food safety must be a part of the production calculation.

Low level of ethics

Japan, Dec. 28. 2002: Major meat companies' mislabeling of imported beef as domestic meat to cheat subsidies under a program aimed at helping industry.

Collapse of one of the companies Snow Brand Food Co. Nippon Meat Packers, Inc.

Snow Brand repacked 13.8 tons of Australian beef into domestic beef boxes because of the difficulties in selling overstocked beef within a depressed market. The Snow Brand Food Co. is an affiliate of Snow Brand Milk Products Co, which was responsible for a mass food poisoning outbreak in 2000 due to tainted milk products.

Food Scandals

Poisoned Mussels

It is very difficult to keep food safe. Even cultured marine food may bear hazards : According to the Canadian Food Inspection Agency six people fell ill with paralytic shellfish poisoning after eating cultured Gallo mussels (*Mytilus galloprovincialis*) sold in August 2003.

Major food safety problems linked to the animal production chain

Safety Problem	Explanation	Occurrence
Salmonella Enteritidis In eggs	Spread through infection of centralized units for production of day-old chicken.	Pandemic, spread by trade, not in Sweden and Norway.
Salmonella in poultry, Pork and beef	Feed contamination, low standard of hygiene, large production units.	Pandemic, spread by trade, not in Sweden and Norway.
Multi-resistant Salmonella Thyphimurium	Use of antibiotics as growth promoters, spread through live animals and animal products.	Pandemic
Campylobacter in poultry Enterohemorrhagic E.coli (EHEC)	Intensive husbandry intensive cattle production, trade on live animals and beef.	Major problem in some European countries and the US.
BSE	Intensive husbandry, feeding animals with contaminated feeds	Spread to >100 countries because of export of contaminated feed from UK.

Cheese and Pathogenic Bacteria

- Italian cheese is produced from unpasteurized milk. Incidents usually involve *Staphylococcus aureus* and its production of a food-poisoning toxin during the fermentation period.
- *Listeria monocytogenes*, *Salmonella* and *Yersinia enterocolytica* were also causes of increased infections with Italian cheese.
- **Listeria:** *Listeria* have been found in all types of soft, semi soft and hard cheeses, including grade A milk and cole slaw made with contaminated cabbage sausage and ice cream.
- **Salmonella:** The incidence *Salmonella*-contaminated cheese is significantly lower than that of *Listeria*-contaminated cheese.

Cheese and Pathogenic Bacteria

- An outbreak of salmonellosis in natural cheddar cheese manufactured in Canada infected approximately 1,500 people.
- The organism occurs in fresh milk. Unlike Listeria, Salmonella does not grow in nature. It can grow in the gut of many different beings (insects, snakes, frogs, birds, chickens, pigs, cows, man).
- It can survive but not grow in low acid or high salt environments. Its occurrence in cheese reflects post-pasteurization contamination. 10 to 100 organisms are required for an infection. It is also being told that one germ alone can cause an infection.

Cheese and Pathogenic Bacteria

Staphylococcus aureus: Staphylococcus aureus is relatively rare, representing process failure like improper storage of starter cultures improper scale up or handling of starters or bacteriophage may afford the growth of this organism. The germ can survive in cheese for years.

Contaminated cultures: Cheeses such as Mozzarella, Pizza cheese and the hard Italian varieties rely heavily on cultures and milk quality for final flavor development. Contaminated cultures are often the cause of spreading of pathogenic bacteria.

Enzymes and rennet pastes: Lipase enzymes and/or rennet pastes are used in the production of Provolone, Romano, Parmesan, and Asiago. These enzymes and pastes are often contaminated with pathogenic bacteria.

Cheese and Pathogenic Bacteria

- Cheese made with raw milk or milk which has been heated but below pasteurization conditions can be contaminated with pathogens.
- However an important fact is not sufficient hygiene during the production and storage of these types of cheese. Cleaning and disinfection of all dairy utensils, pipelines and storage tanks are often neglected.

Vegetables and Seafoods

There is a growing concern linked to spread of agents through vegetables using low-standard irrigation water, parasites on tropical fruits and seafoods harvested in polluted sea water.

Animal products - Health hazards may be reduced by intervention into the production chain itself.

Vegetables and sea-food - Intervention must be on the communal level, a general improvement of hygiene and pollution control.

Food Scandals

Animal by-products

Bones, skin, meat trimmings and offal are processed further to create MBM (Meat and Bone Meal).

Within the EU over 10 million tons of animal by-products are produced annually. It has been estimated that only 68% of a chicken, 62% of a pig, 54% of a bovine, and 52% of a sheep or goat are consumed directly.

Rendering

Tallow - candles and soap, greaves and animal feed.

MBM (Meat and Bone Meal) - animal feed and in fertilizer.

Gelatin - human foods, coatings of tablets, cosmetics, glue, bone china, and photographic chemicals. With these products the spread of BSE is possible.

Predictive Bacteriology

<http://www.ifr.ac.uk/combase/>

The Pathogen Modeling Program PMP

- The new Common Database for Predictive Microbiology was launched in June 2003. It is a virtual solution helping to increase food safety. The database already contains around 20,000 growth and survival curves and 8,000 records containing growth rates.
- ComBase develops a new set of predictive models known as ComBase-PMP, which will produce predictions based on all the data on the site. (www.arserrc.gov/mfs/pathogen.htm)
- http://www.arserrc.gov/mfs/PMP7_download.htm

Animal Science and Ethics

Animal Science and Ethics

Bernard Rollin

“ If scientists decided to clone or bioengineer cattle and discovered that technology results in a complication rate that would be considered unacceptable or cruel in humans, it's also unacceptable for cattle. “

- 1981 - He published his book “ *Animal Rights and Human Morality*”
- 1998 - “*The Unheeded Cry: Animal Consciousness, Animal Pain, and Science*”:

Rollin highlights two contradictory levels. On one level animal scientists can love and respect animals. On another level, they can go off to work and deny the pain they may be causing to them.

Animal Science and Ethics

Martha Crouch, and ethics in science

Ph.D. Martha Crouch a pioneering biotechnologist dedicated to plant research gave up here research because she had decided that it was unethical.

- In 1989 Unilever used her tissue culture research to expand its palm-tree farming operations in the tropics.

Genetically uniform oil palm trees can now be industrialized by Unilever.

- Crouch believed that mechanized and chemical agriculture of the Green Revolution had resulted in an incredible *increase* in hunger around the world.

Food Warnings



Dyes

Sudan 1 and Sudan IV

Butter yellow and nitroanilin red

Both are azo dyes, toxic and are found in spices. All these dyes are not permitted in foodstuffs. They are being used in spices of the Orient because of their colour stability.

Food Warnings

- Dioxin:** The dioxin scandal first came to world's attention in January 1999 when dioxin polluted a storage tank of fats and oils at Verkest. The fat was sold for use in animal feed and the dioxin found its way onto an estimated 1,400 Belgian farms damaging the Belgian food industry around BEF 30 billion.
- One theory is that used transformer oil, rich in PCBs, was dumped in a public recycling container for used frying oil.

Olive Oil Scandals

Olive oil scandal: Olive trees growing the Mediterranean Basin, amount about 84% of total olive production coming from the European Economic Community (Spain, Italy, Greece, Portugal, and France), and the Middle East and North Africa.

- Olive oil sells for roughly 5 times the price of other vegetable oils.

Oil USD	Price per 100 kg oil (1999)
Olive, virgine	2600
Olive, refined	2450
Olive, pomace	1200
Canola	690
Corn	530
Soybean	400
Sunflower	470

Olive Oil Scandals



The Codex Alimentarius Draft Standard defines 4 olive oil products:

Virgin olive oil: It is obtained by mechanical or other physical means such as washing, decanting, centrifuging, and filtration and heat not leading to alteration of the oil. No other treatments are allowed.

Refined olive oil: It is obtained from virgin olive oils by refining methods which do not lead to alterations in the initial glyceride structure.

Olive oil: It is a blend of refined olive oil and virgin olive oil.

Olive Oil Scandals

Olive pomace oil: This is not a Codex Alimentarius specified product because all pomace oils are refined. Olive pomace oil is obtained by extracting olive pomace with solvents but not subjected to reesterification (which alters the initial glyceride structure).

Refined olive pomace oil: Obtained from crude olive pomace oil by refining methods which do not lead to alterations in the initial glyceride structure; is intended for human consumption as it is or in blends with virgin olive oil.

Olive Oil Scandals

Adulteration of olive oil

- Adulteration of virgin olive oil with refined olive oil, olive pomace oil, and esterified oil prepared by re-esterifying low-grade olive oils with glycerol, tea seed oil, corn oil, cottonseed oil, rapeseed oil, sunflower oil, and soybean oil have been made.
- The Codex and IOOC standards for olive oil products specify that seed oils are detected by observing the maximum difference between the actual and theoretical ECN (equivalent carbon number) 42 triglyceride (0.2 for virgin olive oil).

Olive Oil Scandals

Squalene content in oils: Olive oil contains 136–708 mg squalene per 100 g oil, while other common vegetable oils contained 3 to 47 mg per 100 g.

1946, squalene by-product of shark liver fractionation of the production of vitamin A was used to adulterate olive oil using cheaper oils.

1976, widespread mislabeling of vegetable oil blends which contained less than labeled amounts of olive oil were reported.

1978, esterified olive oil were put to sale.

1981, in Madrid (Spain) intoxication caused by consumption of aniline-laced industrial rapeseed oil sold as olive oil and cooking oil. More than 20,000 people were affected and 800 died.

Olive Oil Scandals

Sterols

A recent type of fraud involves destruction of sterols during refining to mask the presence of other vegetable oils in olive oil. This is accomplished by bleaching the vegetable oil with high concentrations of activated clay at elevated temperatures.

The result is destruction (dehydration) of the sterols (β -sitosterol) which are converted to hydrocarbons (sterenes). In 1989, Lanzon et al. proposed that stigmastadiene (the dehydration product of β -sitosterol) be determined to detect the presence of desterolized vegetable oil in virgin olive oil.

Olive Oil Scandals

IOOC Proposal	Stigmastadiene
Virgin olive oil	1.- No more than 0,15 mg/kg
Blend of refined and virgin olive oil	1.- No more than 50 mg/kg 2.- Ratio 3,5-stigmastadiene to 3,5 campestadiene= at to 3,5 campestadiene= at 3.-no less than 4 mg/kg of 3,5 stigmastadiene
Desterolized rapseed or canola oil	Presence of campestatriene, dehydated brassicasterol, absent in olive oil.
Desterolized Sunflower oil	7-Stigmasterol characteristic of sunflower oil. Determination of 8(14) Sterols.

Olive Oil Scandals

- The latest olive oil fraud is the substitution of hazelnut oil for olive oil (hazelnut oil has a composition similar to that of olive oil).
- There were also differences noted in the levels and ratios of tocopherols in olive and hazelnut oils. In addition, alfa-tocopherol, present in hazelnut oil, is only found in olive oil in trace amounts.
- The use of LC/GC as a screening method for detection of hazelnut oil in blends with olive oil were reported.

Food Terrorism

Russia

- In 1997, more than 400 people suffered food poisoning in Russia's south territory of Krasnodar.
- It was believed the products were poisoned by a factory worker.
- An official note, however blamed two female workers to be responsible for the poisoning as they were found positive for the bacteria in question.

Japan

- Glico-Morinaga case in Japan: A wealthy young executive of Glico, a leading candy company, was kidnapped by two masked men.
- It involved a series of assaults involving kidnapping, extortion and food poisoning targeted at rich companies.
- A 17 month long series of extortion attempts aimed at Glico and other food companies followed threatening to place poison laced foods in stores.

Food Terrorism

Germany: A series of food poisoning using herbicides were practiced in Germany an even a deadly poisoning of orange juice using thallium is reported.

- Most food terrorists are never arrested and they appear to be highly sophisticated in what they do.



A high sophisticated system of safety closures was the response of the food industry.

Food Terrorism

WHO Food Safety Response to Terrorist Threats

- Outbreaks of both unintentional and deliberate foodborne diseases can be managed by the same mechanisms.
- Sensible precautions, coupled with strong surveillance and response capacity, constitute the most efficient and effective way of countering all such emergencies, including food terrorism.
- The Food Safety Department of the WHO published a Guidance for Establishing and Strengthening Prevention and Response Systems to Terrorist Threats to Food.
- Prevention is the first line of defence. Prevention is best achieved through a cooperative effort between government and food industry.

Food Terrorism

- The role of the World Health Organization (WHO) is to provide advice on strengthening of national systems to respond to food terrorism.
- Deliberate contamination of food may have enormous economic implications.
- Extortion threats directed at specific organizations, particularly those in the commercial sector, are more common than is generally believed.
- 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.

Food Terrorism

- An alleged contamination of Chilean grapes with cyanide in 1989.
- In 1998, a company in the USA recalled 14 million kilograms of frankfurters and luncheon meat potentially contaminated with *Listeria*.
- An outbreak of *E. coli* O157:H7 infection in the USA in 1997 resulted in the recall of 11 million kilograms of ground beef.
- The crisis in Belgium in which dioxin-contaminated meat and dairy products were recalled around the world demonstrates the extensive costs and disruption of global trade .

Food Terrorism

- Consumer concern about BSE is still disrupting trade world-wide, with costs yet to be calculated and a significant long-term impact on meat production in many countries.
- The outbreak of foot-and-mouth disease in the United Kingdom in 2000 is another example of a major economic and trade dislocation.
- Therefore, deliberate sabotage of food could have serious economic and trade repercussions.

Food Terrorism

Motives: Revenge or political destabilization



Bacillus anthracis

- Deliberate contamination of food may have enormous economic implications.
- Extortion threats directed at specific organizations, particularly those in the commercial sector, are more common than is generally believed.
- 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.



Food Terrorism

Chemical and biological agents and radionuclear materials that could be used in food terrorism

- Access to chemical and biological agents and radionuclear materials that have been developed as weapons is limited.
- More readily available toxic chemicals, including pesticides, heavy metals and industrial chemicals as well as naturally occurring microbiological pathogens, could be used as agents in terrorist threats to food.

Food Terrorism

National prevention and response systems

The food industry has the primary responsibility for assuring the safety of the food they produce and can do so using already existent systems of good agricultural practice, good manufacturing practice and 'hazard analysis and critical control point' (HACCP).

Food Terrorism

- Surveillance, preparedness and response elements specific to food safety, should be included in existing national emergency response plans.
- Vulnerability should be assessed in order to evaluate the most likely risks for food sabotage and to set priorities for risk management.
- Response includes all measures to identify, contain and minimize the impact of a food terrorist incident.

Food Terrorism

- Once a terrorist attack is known or suspected to have occurred, it is vital that the response to the situation be speedy and effective.
- A system for responding to food sabotage should incorporate laboratory capacity for analysing uncommon agents in food. It should also have close links with food tracing and recall systems.
- With the globalization of the world's food supply, an attack on one country's food supply cannot be seen in an isolated manner.
- Consequently, the response to a terrorist threat to food will require collaboration with United Nations specialized agencies such as WHO and FAO, and possibly other international organizations.

Food Terrorism

Prevention

Safeguarding chemical, biological or radionuclear agents before they can be used is important.

Role of the food industry

Where food changes hands, are the most vulnerable points to sabotage, increasing as it comes near to the points of production and distribution. The threat increases the closer the agent is introduced to the point of consumption.

Sources of raw materials and storage facilities and transport systems might have to be safeguarded.

Screening the staff to ensure that their qualifications and background are compatible with their work and responsibilities.

Food Terrorism

Agricultural production

- Recent incidents of contamination of bovine feed with the causative agent of BSE and contamination of poultry feed with dioxins illustrate the national and international effects that contamination has had on national economies.
- Safety assurance systems could be included in the control of animal feed and feed ingredients.
- Recent programmes to promote good agricultural practice explicitly include concern for food safety.
- Attention should be paid to possible substitution of pesticides with more toxic agents and contamination of irrigation water.

Food Terrorism

- As fruits and vegetables are consumed directly, with minimal processing, there are few critical control points for detection or removal of contamination.

Food Terrorism

Processing

- The slaughterhouse stage in the food production chain can be vulnerable, particularly if it is not covered by food safety management programmes or comparable systems.
- Certain harvesting practices, such as open-air drying, offer opportunities for deliberate contamination. Controlling access to and monitoring of agricultural production areas could be considered, particularly in response to known or likely threats.
- Protection and inspection of facilities, including water sources for food industry use. Water sources may be located far away from the processing plant.
- Air systems in processing plants could also be sources of inadvertent or deliberate contamination.
- In many food-processing systems, heat treatment is a critical control point for microbiological contaminants.

Food Terrorism

- The normal time and temperature treatments at these control points might not be adequate for all microbiological agents that could be used and would have little or no effect on reducing contamination by toxic chemicals.
- Access to all critical areas and equipment, including storage areas and water and air systems, could be controlled and monitored.
- Closed systems are often perceived to be less vulnerable and are therefore often subject to less surveillance.

Storage and transport: Fencing and locks, can be used to secure and prevent unauthorized access to storage facilities and transport containers. These could be supplemented with on-site security personnel, intrusion detectors and alarms. Temperature controls and monitoring devices on refrigerated containers could be constructed to prevent unauthorized access.

Food Terrorism

Retail distribution

- Tamper-resistant and tamper-evident containers have proved to be extremely useful in reducing deliberate contamination.
- Bulk foods are particularly vulnerable to deliberate contamination in many markets.
- Buyers should be suspicious of food being sold under unusual circumstances, e.g. at much lower prices than normal or outside normal distribution channels.
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Food Service

- Automatic dispensing equipment, including vending machines, may also be vulnerable to contamination.

Food Terrorism



- Washing and cooking food adequately before consumption can help to reduce inadvertent contamination.
- Careful attention could be given to tamper-resistant or tamper-evident seals.



Food Terrorism

Reducing access to chemical and biological agents and radionuclear materials

- Limiting access to chemical and biological agents and radionuclear materials that could be used to contaminate the food supply deliberately can contribute to counterterrorism.
- Pathogenic microbiological agents are present in clinical and other laboratories, including laboratories involved in food control.
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- Guidance already exists on the safety and security of laboratory materials. Governments and commercial organizations should increase the security of stores of toxic drugs, pesticides, radionuclear materials and other chemicals.

Food Terrorism

Surveillance, Preparedness and Response **Surveillance**

A number of Member States already maintain surveillance systems to detect and investigate foodborne disease. Statistical analysis of information from such systems can reveal unusual clustering of diseases by time or geographical area .

Unfortunately, most of these systems are not designed to provide rapid or real-time information on foodborne disease outbreaks.

- Deliberate contamination of food is difficult to recognize. It may reveal itself through disease clusters in animals.
- Contamination of animal feed in Belgium with dioxin was detected because of disease clusters in animals.

Food Terrorism

Surveillance, Preparedness and Response

- Absenteeism from schools and the workplace, can also trigger investigation.
- Routine monitoring for chemical, biological and radionuclear contaminants in food could act as a deterrent to food terrorism.
- Monitoring provides information on the baseline levels of contaminants in food and can be a good source of information about unusual food contamination.

Epidemiological investigations

The objectives of an epidemiological investigation of an outbreak are the same whether they are due to unintentional or intentional contamination of food.

Identification of the causative agent, the vehicle and the manner of contamination is the most important aspect of the investigation.

Food Terrorism

Surveillance, Preparedness and Response

Preparedness

The effectiveness of a response depends to a great extent on preparedness plans.

- The components of general preparedness plans that enable an effective emergency response include:
 - →surveillance systems to detect a public health incident → implementation of preparedness planning principles → testing preparedness plans for effectiveness → and assessment of vulnerability to the specific threat or incident.
- Preparedness for response to food terrorist incidents need to be integrated within existing general plans for emergency response.
- Suitable laboratory equipment and certification are also important requirements for preparedness.

Food Terrorism

Surveillance, Preparedness and Response

- Rapid testing for unusual agents, such as dioxin and anthrax presupposes the existence of specialized laboratories. Member States need to inventory their laboratory capacity at national and regional levels.
- **Response:** Response to food terrorism depends on awareness of the possibility of a terrorist act and recognition of the incident as involving food.
- **Vulnerability:** Each Member State must assess its own vulnerability, including the effectiveness of the food safety infrastructure.

Food Terrorism

Surveillance, Preparedness and Response

- **Response:** Response to food terrorism depends on awareness of the possibility of a terrorist act and recognition of the incident as involving food.
- **Vulnerability:** Each Member State must assess its own vulnerability, including the effectiveness of the food safety infrastructure.
- **Communication:** The Codex Guidelines for Food Safety Exchange of Information in Food Control Emergency Situations (CAC 19-1995) should be used.

Food Terrorism

The Role of the World Health Organization

International response to food safety emergencies, including food terrorism

The functions of WHO relevant to food terrorism include:

- Coordination of global surveillance for food safety emergencies and food terrorism.
- Facilitation of responses to food emergencies.
- Provision of technical assistance.

International Health Regulations (IHR)

While the current IHR require Member States to notify WHO of all cases of cholera, plague and yellow fever, the list is being revised to include emerging infectious diseases.

- The capacities of the IHR include rapid detection and reporting of public health emergencies, verification and preliminary control measures and response capacity, including notification to WHO of events or risks of international significance.

Food Terrorism

Radionuclear incidents: The WHO Programme on Radiation and Environmental Health coordinates responses to major nuclear and radiation emergencies, which would include deliberate contamination of food with radionuclear agents.

Food Terrorism

Chemical incidents and emergencies:

- The International Programme on Chemical Safety (IPCS) provides technical advice and assessments of the risks associated with exposure to certain chemicals.
- IPCS also promotes the prevention and treatment of poisoning through its INTOX database.

Food Terrorism

Measures for the Food Industry

Risk awareness

- Review your business and company procedures, physical facility, processes, shipping and distribution systems. Identify and list all areas where you may be vulnerable to a terrorist attack.
- Identify and outline control measures for each of these areas.
- Know the origin of all your raw materials and be aware of the possibilities for contamination.

Food Terrorism

Measures for the Food Industry

General security: Assign responsibility for food security to a qualified person.

- Check all toilets, maintenance closets, personal lockers and storage areas regularly for concealed packages or other anomalies.
- Eliminate potential hiding places within your facility where an intentional contaminant could be placed temporarily before introduction.
- Train all employees in food safety and security procedures. Extend the training to all new employees.
- Train and hold employees accountable for recognizing and reporting suspicious activity and suspect persons, signs of possible tampering with products and equipment and other unusual circumstances.
- Provide instructions for employees who may be threatened or who suspect product tampering by other employees.

Food Terrorism

Measures for the Food Industry

- Use metal or metal-clad doors whenever possible. Establish procedures for after-hours or night-shift security. Account for tools and utensils such as knives used by employees on a daily basis. Account for all keys to the establishment.
- Immediately investigate all reports of unusual or suspicious activity, including those in the immediate vicinity of the facility.
- Watch for unusual behaviour by (new) employees or workers, e.g. staying unusually late after the end of a shift or working day.
- Cordon off the area to limit access.

Food Terrorism

Measures for the Food Industry

Develop a clearly documented, well-rehearsed product recall plan.

Mail handling: Handle mail in a separate room or facility, well away from food handling and processing areas.

Data security: Restrict access to computer process control systems for food products and critical data systems to those with appropriate clearance.

Ensure that all recipes, production data and analytical results are properly backed up.

Threats: Report any threats or aberrant behaviour to the proper authorities.

Food Terrorism

Measures for the Food Industry

- Emergency procedures:** Create an emergency response team and develop an action plan to be followed in the event of tampering, terrorist activity or any other type of emergency.
- Prepare and test procedures for emergency evacuation of the facility.
 - Establish procedures with local community emergency personnel to assure proper access to the facility during an emergency.
- Hazardous materials:** Review the hazardous materials stored on the facility and reduce them to the absolute minimum necessary for operations.
- These may include sanitation chemicals, pesticides, laboratory reagents, toxin standards and pathogen cultures.

Food Terrorism

Measures for the Food Industry

Have safety sheets available for all hazardous chemicals stored on site. Control access to any laboratory where hazardous chemicals and live cultures of pathogenic bacteria are stored. Restrict access to specially designated persons.

Maintain an accurate inventory of all hazardous materials. Verify it on a daily basis and immediately investigate missing stock or other irregularities.

Personal items: Restrict the personal allowed in the establishment. Prohibit certain types of personal items (e.g. lunch containers, bags, thermoses and drink containers) in food handling areas.

Food Terrorism

Measures for the Food Industry

- Access:** Clearly define the outer boundary of the facility, within which access should be limited or controlled. Control access to this restricted area, by use of guards, access cards, etc.
- Control entrance to the facility by employees reporting for work, and control the departure of employees leaving the facility during normal working hours.
 - Maintain the legally required number of emergency exits and ensure that these cannot be used as entry points
 - Require positive identification of all visitors, including contract workers, supplier representatives, customers, auditors and data entry and computer support staff.
 - Restrict access of visitors and guests, including friends and relations of employees and applicants for employment.

Food Terrorism

Measures for the Food Industry

- Provide special waiting areas and rest rooms for drivers delivering or collecting goods.
- Periodically reassess levels of access for all employees. Keep vehicle and bicycle parking areas well separated from the production and storage areas, water facilities and fuel tanks.

Food Terrorism

Measures for the Food Industry

Raw and packaging materials: Insure traceability of all lots of ingredients and supplies. Compare transport documents (bills of lading, delivery slips) with the orders made by your company.

- Inspect all incoming materials (ingredients, packaging, labels, supplies) and their shipping containers for signs of tampering, counterfeiting, contamination or other anomalies.

Suppliers: Know your suppliers and purchase only from contracted suppliers, as far as possible.

- Maintain all incoming goods on hold (under quarantine) until formally released for use based on satisfactory inspection and verification results.

Food Terrorism

Measures for the Food Industry

Water:

Identify all sources of water used in the facility (both potable and non-potable sources) and implement appropriate security measures for each source. Secure access to all water wells, storage tanks and handling facilities, to prevent unauthorized entry.

- Inspect potable and non-potable water lines in food processing areas periodically for possible tampering.
- Test potable water regularly. Verify that pH, conductivity, active chlorine (where relevant), odour, appearance (colour, turbidity), taste and total plate count are within the normal ranges.

Food Terrorism

Measures for the Food Industry

Storage areas and warehouses

- Maintain controlled access to all product and ingredient storage areas. Restrict access to storage areas to designated employees.
- Keep labels in a secure area to prevent theft or misuse. Destroy all outdated product labels.

Food Terrorism

Measures for the Food Industry

Processing areas: Identify any areas where employees mix or batch products or ingredients by themselves without supervision.

- Identify points where clandestine access to ingredients or products is possible. Evaluate whether these points can be minimized or monitored.
- Supervise contract workers, maintenance and sanitation staff, cleaning crews and pest controllers who would be able to contaminate a product or an ingredient intentionally.
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Processing systems: Ensure that all processing systems, including automatic control systems, are secure. Identify the persons authorized to access the control systems and to modify the processing parameters.

Food Terrorism

Measures for the Food Industry

Traceability: Ensure complete traceability, from raw materials to finished products and from finished products to raw and packaging materials.
Transport of ingredients and processed products

- Use reputable, reliable transport companies and confirm that they have appropriate controls in place.
- For incoming shipments, require locked and sealed vehicles, containers and/or railcars. Require the seal numbers to be identified on shipping documents.
- Have procedures in place for trucks entering the facility boundaries. Require advance notification from the supplier of all deliveries.
- Introduce special procedures for off-hour deliveries; require the presence of an authorized person to verify and receive the shipment.

Food Terrorism

Measures for the Food Industry

- Introduce special procedures for off-hour deliveries; require the presence of an authorized person to verify and receive the shipment.