

# Food Safety

The Guyana Goldfields public goods materials addressing food safety are based on the World Health Organization's internationally recognized and implemented "Five Keys to Safer Food".

## 1. Keep Clean

Food can also become contaminated at virtually every step along the supply and production chain.

Pathogens that cause food related diseases can often survive for many days in some environments as shown in the table below.

	Pathogen survival (time in days unless otherwise indicated)			
Organism	Freshwater	Saltwater	Soil	Crops
Viruses	11-304	11-871	6-180	0.4-25
Salmonellae	<10	<10	15-100	5-50
Cholera	30	+285	<20	<5
Faecal coliforms	<10	<6	<100	<50
Protozoan cysts	176	1 yr	+75	ND
Ascaris eggs	1.5 yr*	2*	1-2 yr	<60
Tapeworm eggs	63*	168*	7 months	<60
Trematodes	30-180	<2	<1	130**
ND No data; * Not considered an important transmission pathway; ** Aquatic macrophytes				

Dangerous microorganisms are found in soil, water, animals and people. These microorganisms are carried on hands, wiping cloths, utensils, and cutting boards. These microorganisms can easily be transferred to food and cause diseases. Insects such as flies land on soil contaminated with feces then carry fecal microorganisms to their next stopping point, often food. Therefore keeping clean in the food handling, preparation, storage and transportation environments is very important.



# Click to Play



- Wash hands before handling food and often while preparing food
- Hand washing area and educational poster at the entrance to the camp dining room.
- Protect food and kitchen areas from insects, pests and animals.
- Open screens allow insects and pests to enter food preparation areas.
- Always wash hands after using the toilet.
- All toilet areas should have hand washing facilities nearby.
- Train workers regarding safe food practices.
- Wash and sanitize all food preparation surfaces and equipment.



## 2. Separate Raw and Cooked Foods

Raw food, especially meat, poultry and seafood and their juices, can contain dangerous microorganisms which may be transferred onto other foods during food preparation and storage.

## 3. Cook Foods Thoroughly

Proper cooking kills almost all dangerous microorganisms. Cooking food to a temperature of 70°C can help insure it is safe to eat. Foods that require special attention include minced meats, rolled roasts, large joints of meat and whole poultry.

- Cook food thoroughly, especially meat, poultry, eggs and seafood
- Bring foods like soups and stews to boiling to make sure that they have reached 70°C
- For meat and poultry, make sure that juices are clear, not pink. Ideally use a thermometer
- Reheat cooked food thoroughly



Use separate equipment such as knives and cutting boards for handling raw foods



Correct use of separate knives and cutting boards for raw foods.

Separate raw meat, poultry and seafood from other foods



Inadequate storage space – combination of raw and cooked foods



Store food in containers to avoid contact between raw and prepared foods



Properly stored grains in covered containers



Refrigerate promptly all cooked and perishable food (preferably below 5°C)



Frozen foods left in high temperatures – unsafe temperatures during transport



Do not leave cooked food at room temperature for more than 2 hours.



Food service at Aurora Camp

Safe food transport in ice chest – monitor temperatures



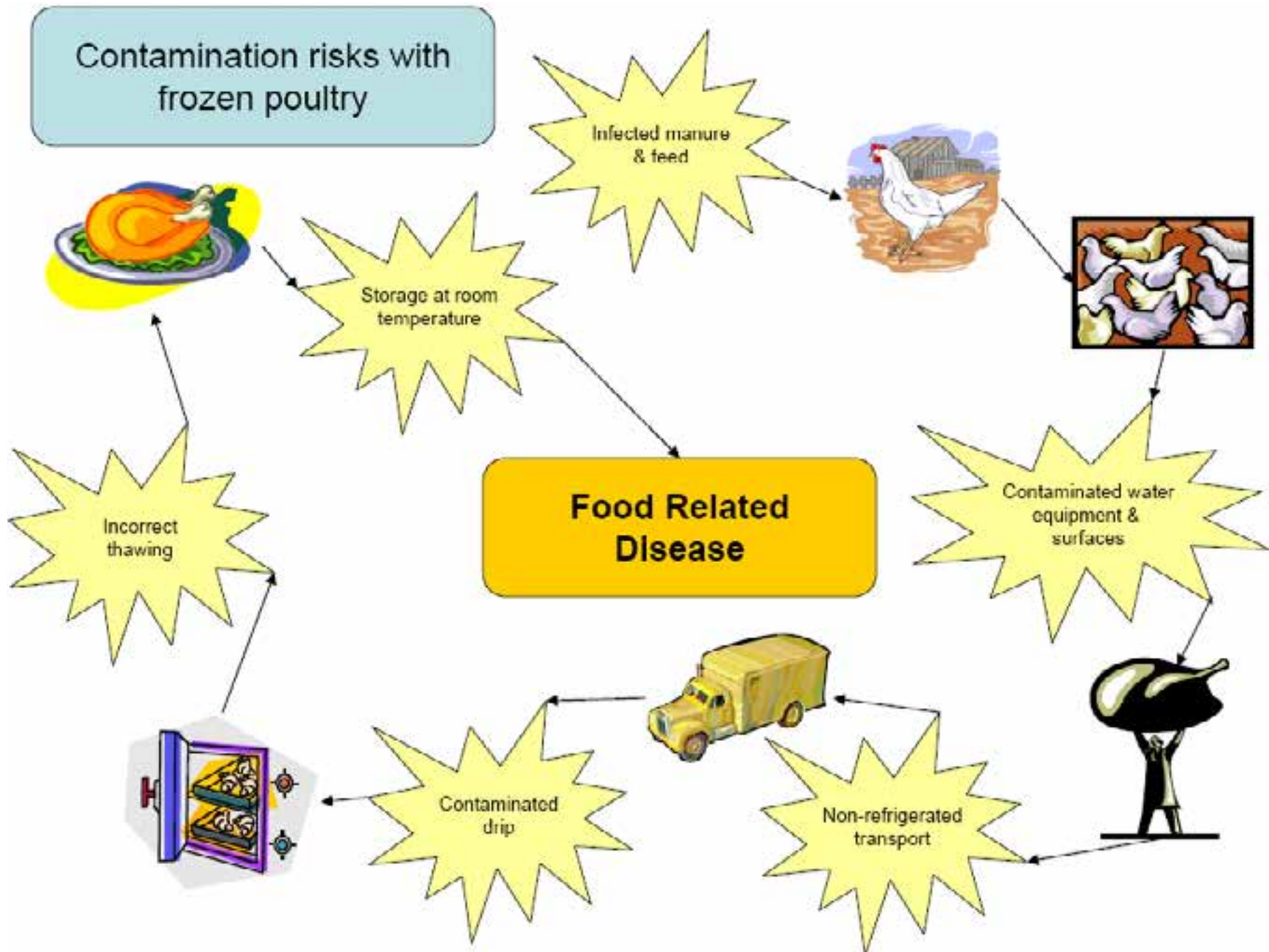
## 4. Keep Food at Safe Temperatures

Microorganisms can multiply very quickly if food is stored at room temperature. Holding foods at temperatures below 5°C or above 60°C will slow down or stop the growth of microorganisms. Some dangerous microorganisms still grow below 5°C.

Proper temperatures must be maintained during food transport which often takes long periods of time in remote environments.

Many foodborne microbes are naturally present in the intestinal tracts of healthy animals that are commercially raised for food. During commercial production and processing, meat and poultry can become contaminated by contact with even small amounts of intestinal contents. The diagram below shows potential contamination risks in the food processing and preparation of poultry products.





## Use Safe Water and Raw Materials

Food and water can be adversely affected either separately or in combination since water is essential for food preparation. Food and water can be impacted by a variety of hazards that can make people sick either immediately or in a slower and more chronic fashion. Some of the major categories of food and water hazards include:

- Microbial pathogens - microorganisms that occur naturally in animals, humans, or the environment and can cause both short and long-term medical illnesses;
- Zoonotic diseases - diseases that can be transmitted from animals to humans through food or water.
- Parasites - intestinal worms or other organisms transmitted through contaminated water or food.
- Adulterants - physical contaminants in food or water can pose an ingestion hazard; e.g., glass, metal, plastic, hair, etc..
- Mycotoxins – naturally occurring substances that are present on plants or in animal products. Mycotoxins can increase the risk of cancer in humans.
- Antibiotic drug residues - Residues can occur in animal products. Some residues may potentially contribute to the growing resistance of microorganisms to antibiotics.

- Pesticide residues – contaminants which may impact both surface and groundwater sources. High levels of pesticide residues may also enter into the local food chain, particularly in a developing country setting.
- Chemicals - industrial and environmental contaminants including those produced during preparation of the food product;
- Additives - direct and indirect substances added during food processing; in many developing countries non-approved dyes/colorants are utilized;
- Heavy metals - may be present in both food and water sources. Metals enter the food chain through soil or water. Water may be impacted by naturally occurring or man-made sources

## Use safe water or treat it to make it safe

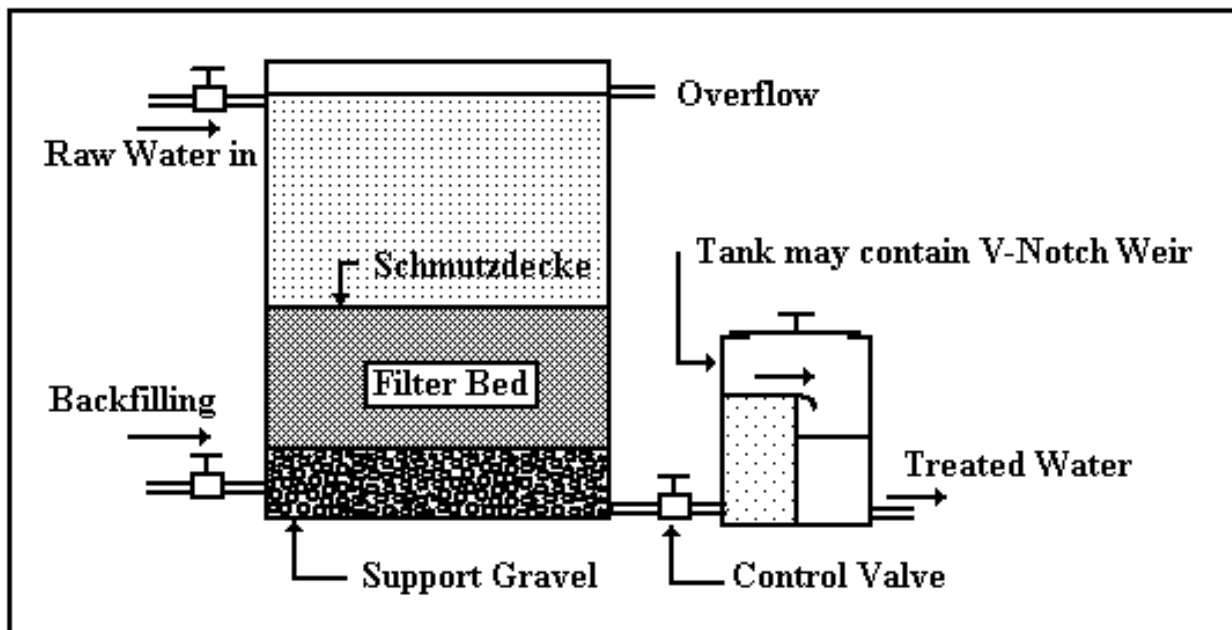
### Treatment Options

Aside from chlorination, there is another well established non-chemical treatment option that is available for communities, i.e., construction of a simple sand filter. Slow sand filtration (SSF) has existed as a water treatment option for over one hundred years. SSF has been widely employed in treating community water supplies in developing countries against water-borne disease and numerous WHO publications are available.

Slow sand filtration relies on both physical and biological activity in controlling plant pathogens. In a slow sand filter, water passes through the sand from top to bottom. The larger suspended particles are left behind in the top layers of sand. Organic sediment particles are eaten by microscopic organisms including bacteria and protozoans which 'stick' in the layers of slime that form around the sand particle (known as the *schmutzdecke*'s). Provided that the grain size is around 0.1mm in diameter, a sand filter can remove all fecal coliforms (bacteria that originate from feces) and virtually all viruses. Some of the key operating factors include (i) the particle size distribution of the sand, (ii) the ratio of surface area of the filter to depth and (iii) the flow rate of water through the filter.





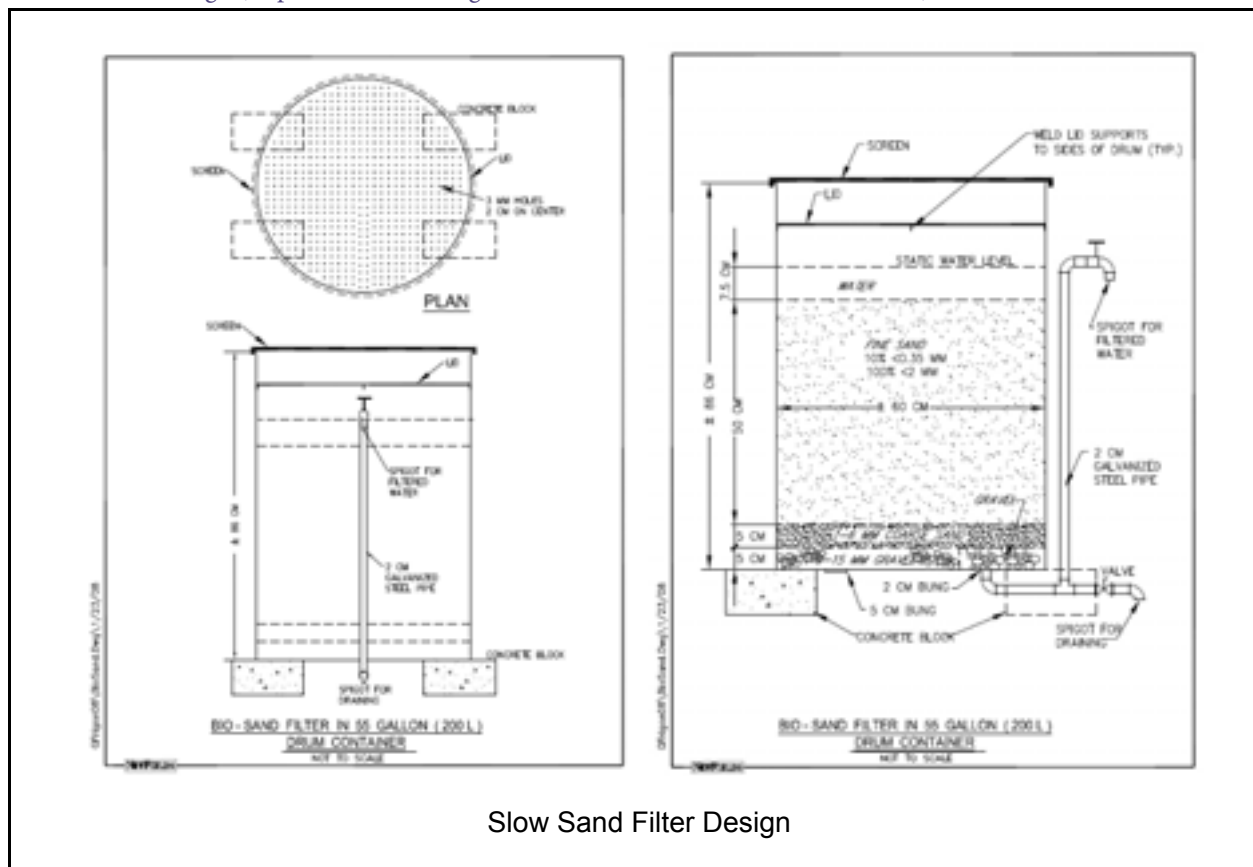


Source: Oasis Design (<http://www.oasisdesign.net/water/treatment/slovsandfilter.htm>)

A schematic of a simple sand filter using basic materials is shown below> This design was prepared by NewFields water engineers to be easily constructed using simple , inexpensive materials.

**In addition to using safe water in the food preparation area:**

- Select fresh and wholesome foods
- Choose foods processed for safety such as pasteurized milk
- Wash fruits and vegetables, especially if eaten raw
- Do not use food beyond its expiration date



Slow Sand Filter Design