

Human Environmental Sciences Extension

Safe Food Preparation: It's in Your Hands

Preparing safe, wholesome, nutritious, and appetizing food is an important job. As a person who is involved in the preparation of foods, you contribute greatly to the success of the establishment where you work, whether it's a sub shop, caterer, gourmet restaurant, fast-food operation, hospital, nursing home, or camp. The things you do (or don't do) can affect the safety of foods that are served to your customers, clients, or patients.

This booklet will bring to your attention the need for good personal hygiene and will show you why safe food preparation is in your hands.

Bacteria

Bacteria are all around us and carry out a number of functions vital for life. Many are beneficial and are responsible for the fermented dairy and meat products we enjoy. Some bacteria cause food to spoil, but only a small percentage are harmful to us. Because bacteria are invisible to the naked eye, their existence and activities are often overlooked or ignored until problems occur.

Unlike plants and animals that are composed of many cells, bacteria are single cells. Each bacterium is self-sufficient and lives independently. Bacteria come in a variety of shapes and must be magnified 1,000 times to be seen. About 400 million bacteria clumped together would be approximately the size of a grain of sugar.

Bacteria grow in a unique way; they increase in numbers, not in size. Under ideal conditions, cell numbers can double every half hour; one becomes two, two become four, four become eight, and so on. Therefore, if you start with one bacterial cell, after 12 hours there would be as many as 33,000,000. The rate at which bacteria grow is different for each type of organism and is affected by many factors.

Bacteria get from place to place by hitchhiking and people are one of the principal carriers. Bacteria are transferred to foods from hands, dirty aprons, utensils, food contact surfaces, and

equipment. They get into food where they can cause spoilage and sometimes illness. After investigating foodborne disease outbreaks, regulatory authorities found that poor personal hygiene of people working with food was responsible for 16 percent of the illnesses.

You may be asking yourself, "How can this happen?" Think about where you've been and what you've touched in the last few hours. You've cleaned up a spill, laced a shoe, talked on the telephone, emptied the garbage, brushed your hair, handled a dish, prepared food, and done many more things.

Did you wash your hands after you performed each of these jobs? If you didn't, you should have!

Some bacteria live in the folds and wrinkles of our skin, in our nose and throat, on our hair, and under our fingernails. Other bacteria are picked up from things we touch.

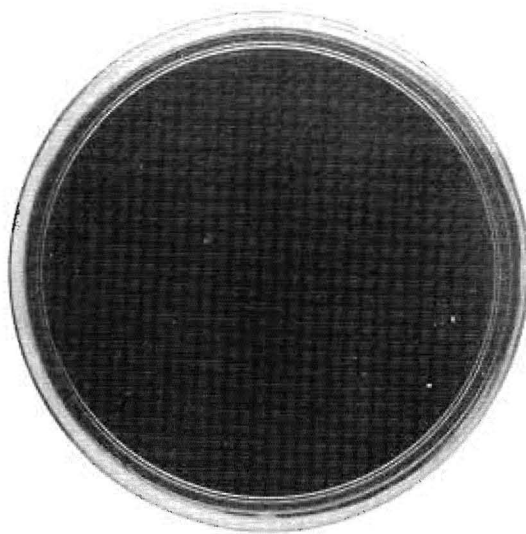
Some of these bacteria cause food poisoning when they get into foods, grow at warm temperatures (between 45°F and 140°F), and are eaten. Symptoms like headache, nausea, vomiting, cramps, and diarrhea occur after eating foods in which harmful bacteria have grown. These bacteria usually do not change the appearance, smell, or nature of the food, and only laboratory testing can determine whether they are present.

Practice Good Personal Hygiene

You can take a few steps to prevent these harmful bacteria from getting into foods by practicing good personal hygiene.

- Bathe or shower *every day* before going to work.
- Put on a clean uniform every day or as often as yours gets dirty.
- Wash your hands frequently—but always after:
 - using the bathroom,
 - eating or drinking,
 - smoking or chewing tobacco,
 - handling dirty plates or garbage,
 - working with raw foods,
 - touching other parts of your body like your nose, mouth, hair, and skin,
 - handling dirty utensils, objects or equipment, or before
 - returning to your work area.

The following pictures show how people help bacteria hitchhike from place to place, and how poor personal hygiene contributes to the contamination of food.



In the laboratory, bacteria grow on gelatin-like food (agar) in covered, sterile, plastic plates (petri dishes).



The bacteria grow rapidly by keeping them at a warm temperature (98.6°F). Twenty-four to 48 hours later, small colonies or clumps of bacteria approximately the size of a pinhead or larger can be seen in the agar.

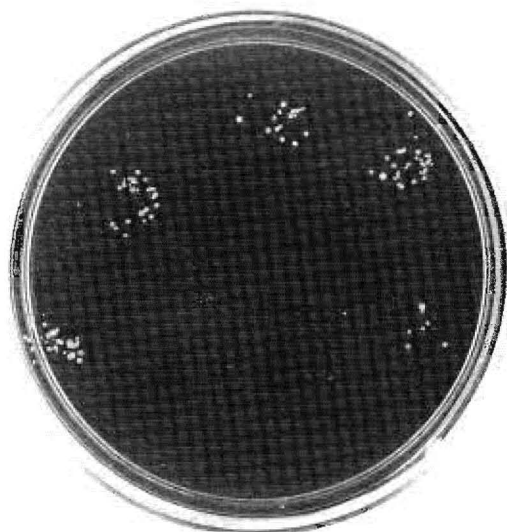
Food Contaminants

HANDS

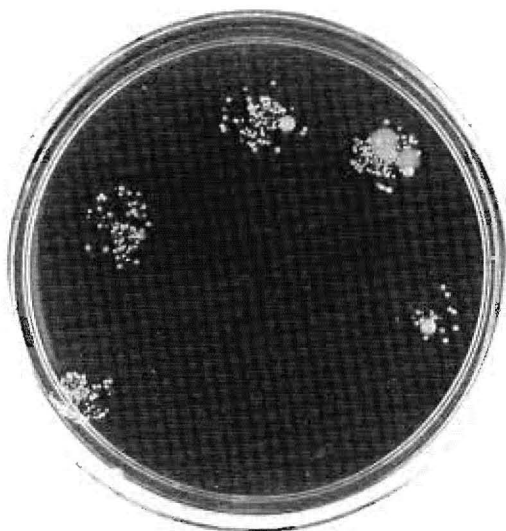
Let's see how hand washing affects the number of bacteria present.



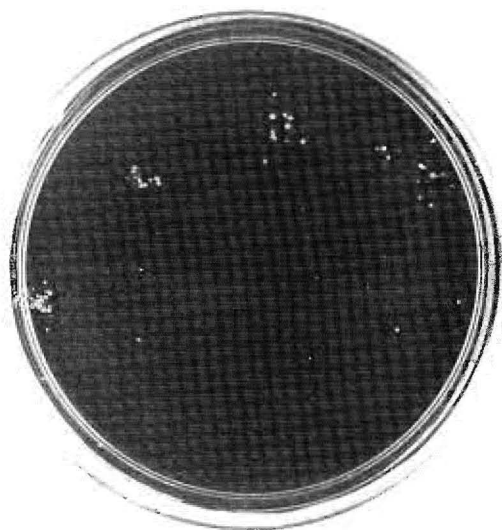
An unwashed hand that looks clean is touched to the agar.



After washing hands for 15 seconds with hot water and soap, bacteria are reduced in number.



The plate is incubated at 98.6°F for 24 hours. The heavy growth of white colonies indicates that this hand was not very clean, and that millions of bacteria were present.



Washing the hands with soap and water for another 15 seconds reduces the bacteria even more.

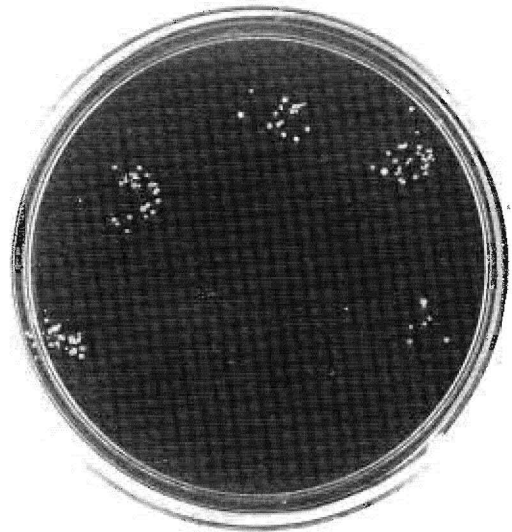
Food Contaminants

HANDS

Let's see how hand washing affects the number of bacteria present.



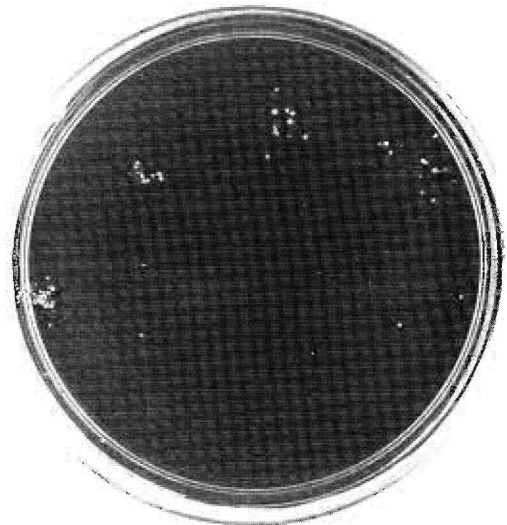
An unwashed hand that looks clean is touched to the agar.



After washing hands for 15 seconds with hot water and soap, bacteria are reduced in number.



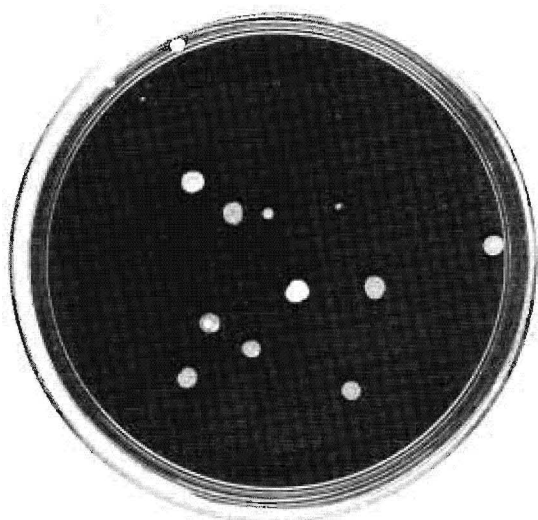
The plate is incubated at 98.6°F for 24 hours. The heavy growth of white colonies indicates that this hand was not very clean, and that millions of bacteria were present.



Washing the hands with soap and water for another 15 seconds reduces the bacteria even more.

After washing, the hands are not sterile because bacteria are hidden in the folds of the skin, but proper hand washing will significantly reduce the numbers of bacteria present.

Fingernails should be kept neatly trimmed and clean. Dirt harbors bacteria and gets under long or ragged nails.



This picture shows the bacteria present in fingernail scrapings.

The main purpose of proper hand washing is to protect public health by preventing the transfer of disease-producing bacteria to foods. Although hand washing is a simple and easy task, you'd be surprised how many people avoid washing their hands or do it improperly. In several studies, it was estimated that nearly 60 percent of the people did not wash their hands after using the toilet. Disease-producing bacteria associated with human wastes can easily be transmitted to food if hands are not thoroughly and properly washed.

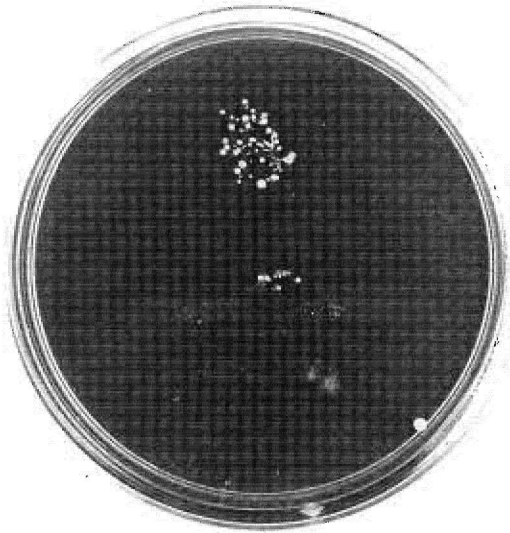
Sanitarians recommend the following hand-washing procedure for people working with food.

- Allow enough time to wash hands properly.
- Wet hands thoroughly in warm water (105°F).
- Apply a self-foaming soap, detergent, or disinfectant soap to the hands and lather all areas.
- Wash hands by rubbing one against the other using friction for 15-60 seconds. Particular attention should be given to the areas between the fingers and around the nails.
- Rinse off the cleaner and the soil under warm running water.
- Dry hands thoroughly with a clean, single-service towel or a hot-air dryer.

In some food service establishments, after hand washing, hands are dipped into or sprayed with a sanitizing solution. Sanitizing hand creams can also be used. This further reduces the numbers of bacteria present. Sanitizers commonly used for the hands can be chlorine (50-100 ppm), iodophors (25 ppm), or quaternary ammonium compounds (QUATS) (200 ppm). These compounds should be checked frequently and changed when they lose their strength.

LIPS AND NOSE

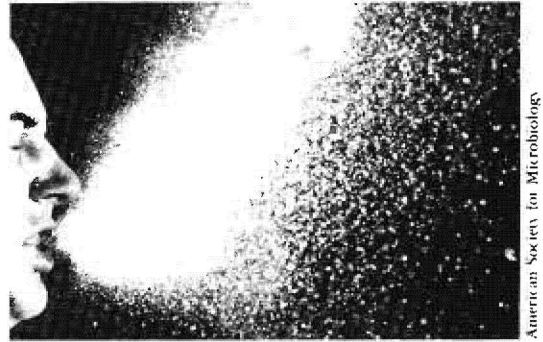
The lips and nose, in addition to hands, play an important role in harboring bacteria.



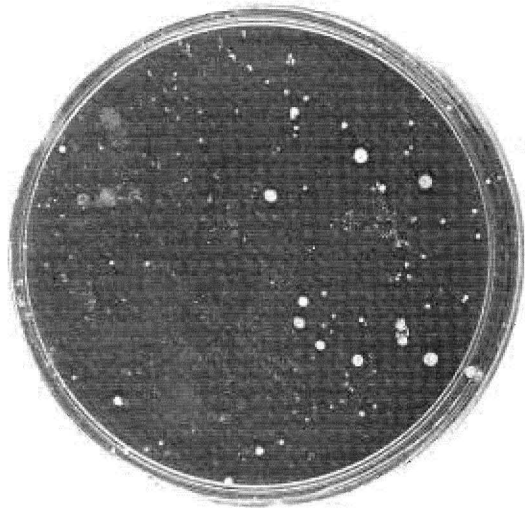
This plate shows what happens when the lips and nose are pressed against agar in a petri dish.

If someone smokes and then handles food, the tiny droplets of moisture from the mouth get transferred to the hands and find their way into the food. This is why smoking and chewing tobacco are not allowed in a food preparation area and why hands must be washed after smoking.

Bacteria also can find their way into food through coughs, sneezes, and vigorous nose blowing.



This picture shows that a single sneeze produces a mist of small droplets containing bacteria.

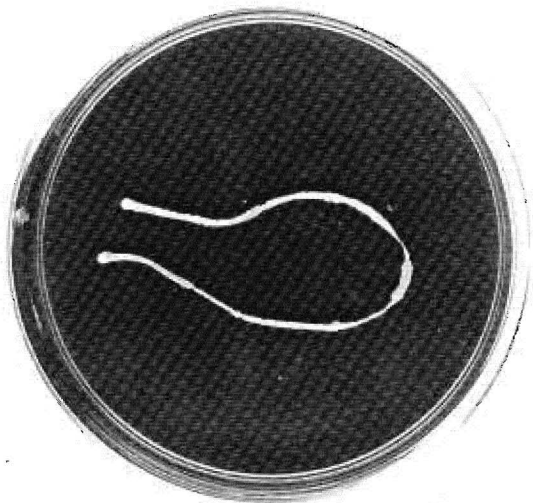


Each sneeze contains between 10,000 and 100,000 bacteria and they are moved through the air at more than 200 mph.

The mouth and nose should be covered when sneezing to prevent contamination of the foods being prepared. Always wash hands after coughing or sneezing.

HAIR

Hair is also a source of bacteria and has no place in food. It is unappetizing, unappealing, and adds bacteria to food.



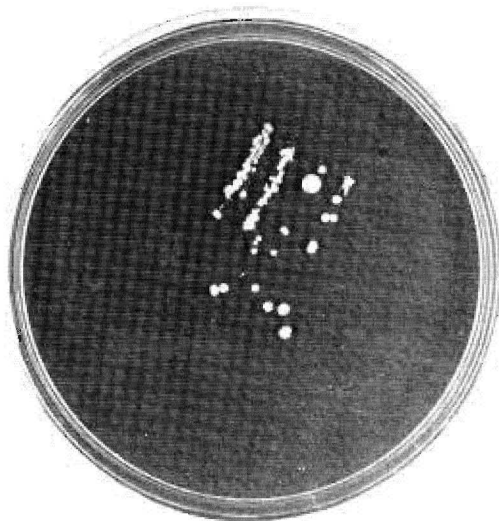
This picture shows the bacteria associated with human hair.

Since the average person loses 80 hairs a day, effective hair restraints must be worn to prevent hair from getting into food and to prevent food service personnel from brushing their hair and scratching their heads—which could result in harmful bacteria entering the food being prepared.

Washing the hair regularly and practicing good grooming techniques will help you look neat and clean, and will reduce the chances of bacteria entering food that is being prepared.

DIRTY UTENSILS

Improperly cleaned and sanitized utensils also contribute to the contamination of food.



This photo illustrates how an unclean fork adds millions of bacteria to food. Equipment and utensils must be washed thoroughly to remove soil, rinsed clean, and then sanitized.

Food safety and sanitation are a concern to everyone and it's up to each food industry worker to prevent foodborne disease.

The safeness of food depends on all people, but especially those who produce and process it, transport and distribute it, and prepare it.

Won't you do your part? Remember, **Safe Food Preparation: It's In Your Hands!**

Reprinted with permission of Cornell University-Cornell Cooperative Extension. Written by Robert B. Gravani, Assistant Professor, Department of Food Science, Cornell University.