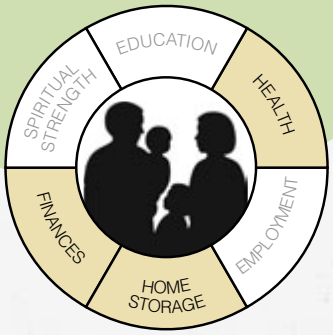
Basic Physical Health with Limited Resources

The Beginning of Self-Reliance



Basic Physical Health with Limited Resources

The Beginning of Self-Reliance

Published by
The Church of Jesus Christ of Latter-day Saints
Salt Lake City, Utah

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Printed in the United States of America

English approval: 2/10

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Introduction

Personal responsibility for one's own physical health is the beginning of self-reliance. True self-reliance comes as individuals achieve a balance of physical and emotional health, education, employment, financial management, building a reserve, and spiritual strength. This guide will help members of the Church and others worldwide to help themselves maintain reasonably good physical health even when resources are very limited.

Limited resources may be a result of:

- Poverty.
- Lack of education.
- Insufficient community services.
- Unemployment.
- Abuse.
- The ravages of war.
- Natural disasters.

Although very useful, this guide is not comprehensive. Additional information and resources are required to achieve optimal physical health.

How to Use This Guide

This guide can be used in several ways:

- Individuals can download and print a copy for personal use (http://health.lds.org), for example, with emergency preparedness supplies.
- Church and community leaders can use it to teach life-saving concepts.
- Relief Society and quorum leaders as well as humanitarian missionaries may find it useful in their service to those with limited resources.
- Church leaders can use it as a source to strengthen Church health fairs.

This guide is organized into five basic chapters. Each chapter consists of five to seven topics related to the theme of the chapter. Each topic in turn presents two to seven supporting concepts. Many topics include supplementary material to help in applying the concepts. Most people should study the first chapter on disease prevention even if they don't read the other chapters. The other chapters expand upon some of the ideas introduced in the first and can be studied in any order. Material in one chapter may occasionally refer to material in another.

Description of Measurements Used

For practical purposes, a teaspoon is the same whether it is a metric, U.S., or Canadian measure. The Imperial teaspoon is only about 20 percent larger than the others and for most purposes in this guide can be used interchangeably with the others. The same can be said for the metric, U.S., Canadian, and Imperial tablespoon.

The following definitions are used throughout this guide:

- A teaspoon (tsp.) is 5 milliliters (mL) or about ⅓ tablespoon or ⅙ fluid ounce (fl. oz.).
- A tablespoon (Tbsp.) is 15 milliliters (mL) or about ½ fluid ounce (fl. oz.).
- A cup is 250 milliliters (mL) or about 8 fluid ounces (fl. oz.).
- A liter (1,000 mL) is about 1 quart (32 fl. oz.).

CHAPTER 1

Disease Prevention

Improving Physical Health

The Lord wants us to be strong and healthy.

The Lord placed us on earth so that we might have joy (see 2 Nephi 2:25). He knows that we can best find joy if we are strong and healthy. He expects us to use wisdom and do all we can to stay healthy. President Brigham Young taught:

"Then let us seek to extend the present life to the uttermost, by observing every law of health, and by properly balancing labor, study, rest, and recreation, and thus prepare for a better life" (*Discourses of Brigham Young,* sel. John A. Widtsoe [1941], 186).

By revelation, the Lord gave us the law of health known as the Word of Wisdom. He promised us that we can have good health if we follow his laws. He said:

"And all saints who remember to keep and do these sayings, walking in obedience to the commandments, shall receive health in their navel and marrow to their bones" (D&C 89:18).

You can learn to prevent many health problems in your family.

People are usually happy and productive when they are in good health. However, many people of the world suffer unnecessarily from illnesses that could have been prevented or could be easily corrected.

One way to prevent disease is to be careful about what we eat and drink. Common diseases of the stomach and intestines are caused by eating food or drinking water that is not clean.

Unclean food and water can cause diarrhea and fever, but they can also cause more serious problems as well.

Many diseases and health problems can be prevented very easily. Scientists have developed immunizations that will prevent many diseases.

Other serious health problems can be caused by not eating enough food or by not eating the right kinds of food. See chapter 3 for information on preventing these diseases.

You can learn how to solve many of your family's health problems.

Besides learning how to prevent disease, you need to know how to solve health problems and care for those who are sick. Some health problems can be easily treated in the home by family members, and others require the care of a doctor or other health professional. It is important for you to be able to recognize health problems and get the best possible care for yourself and your family.

Some Diseases and Health Problems Caused by Unclean Food or Water

Cholera	Hepatitis
Diarrhea	Leptospira
Dysentery	Parasitic worms
Giardia	Typhoid fever

Some Diseases That Can Be Prevented through Immunization

Diphtheria	Rubella
Hepatitis A & B	Tetanus
Measles	Tuberculosis
Mumps	Whooping cough
Polio	

Some Diseases and Health Problems Caused by Poor Nutrition

Beriberi	Slowed physical growth
Kwashiorkor	Lack of strength
Marasmus	Lack of energy
Pellagra	Night blindness
Scurvy	
Slowed mental growth	

Basic Physical Health with Limited Resources contains information that will help you learn how to solve health problems. As you study this guide, you will learn ways to improve your health. You can also teach your children these ways to improve. Then the whole family can be healthier.

One of the most important things you can do to improve the health of your family is to begin to keep a family health record. The family health record should contain information about the health of your family members and the things you have done or plan to do to improve their health.

Additional Resources

1. *The Latter-day Saint Woman: Basic Manual for Women, Part A,* lesson 24, "Disease Prevention."
2. *Duties and Blessings of the Priesthood: Basic Manual for Priesthood Holders, Part B,* lesson 24, "Maintaining Good Physical Health."

What a Family Health Record Should Contain

1. Immunizations received by family members, along with the dates.
2. Illnesses and health problems that family members have had and the treatments they were given.
3. A list of allergies each family member has to foods and medicines.
4. Names and addresses of doctors, clinics, or health workers who can provide help.

Home Water Purification

Germs and parasite eggs can cause disease when they enter the body.

Doctors and scientists have studied for many years to learn what makes people sick. They have found that many people get sick because the water they drink contains germs and parasite eggs. These things are very tiny. We can't see them unless we look through a microscope.

Germs and parasite eggs can enter our bodies through our mouths. Then they multiply and make us sick.

Many people get sick and do not know that germs and parasite eggs have made them sick. It is not normal to have a little diarrhea or fever. These things are caused by germs and parasites.

Germs can be found in the following places:

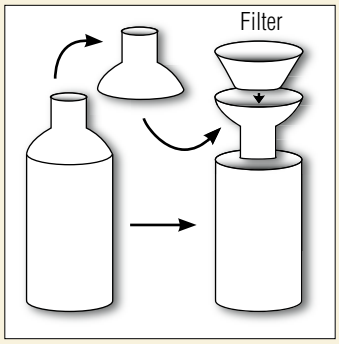
- In human and animal waste
- On the bodies of flies and cockroaches
- In impure water
- In impure food
- On dirty hands and clothing
- On dirty glasses, plates, and cooking utensils
- On the surfaces where food is prepared

They are also in anything that these wastes have touched, including water.

Filtering can make water clear, but it will not kill germs and parasite eggs.

One way to make water clear and better tasting is to pour it through a water filter. However, filtering water will not destroy germs or parasite eggs. After water has been filtered, it still should be purified by using chlorine bleach or by boiling.

Water can be filtered by pouring it through a piece of tightly woven cloth or, preferably, a paper filter such as those available from grocery stores for preparing hot drinks. One suggestion is to cut off the top of a two-liter soft drink bottle where it begins to curve in near the top, invert the top to use as a funnel, insert the filter into it, and pour the cloudy water through the filter into a clean container.



Another option is to make a filter for your family similar to the one described in the supplementary material at the end of this section. These water filters usually work well for a time, but then they become clogged. If you make a water filter for your family, you may need to change the sand, charcoal, and gravel every two or three months. *Remember that filtering water may make it clear, but it still must be purified to kill the germs and parasite eggs.*

If you purify the water in your home, your family will not get sick so often.

Water is purified by killing the germs and parasite eggs in it. Some cities and towns try to purify the water for everyone in the community. But most places in the world still have impure water. In fact, the water available to 70 out of every 100 people in the world is impure. Even when cities try to purify the water, the water can become impure in the water pipes or as it is brought into the home. So it is a good idea to purify water in your home. If you do this, your family will not get sick so often.

Once you have purified some water, you should make sure that no more germs or parasite eggs get in it before you use it. Keep it in a clean container covered with a lid. Use the purified water when preparing meals for your family. Use it when you make fruit drinks. You cannot kill the germs by adding chlorine bleach to the fruit drink after it is made. Use purified water to make ice. If the local supplier of ice does not use purified water, the ice will be impure and should not be used. Broths and drinks that are boiled are purified by the boiling. But it is still best to begin with purified water for cooking and drinking.

There are two easy ways to purify water in your home.

It is always best to filter cloudy water before trying to purify it.

1. *Boiling.* Water can be purified by boiling it. To do this, bring it to a rolling boil, and let it continue to boil for two minutes (at sea level) to five minutes (above 3,000 meters). In many places in the world, the fuel for boiling water—such as wood, gas, or kerosene—is much more expensive than the chlorine bleach to purify the same amount of water. However, if you have enough fuel or cannot get chlorine bleach, boiling may be the best way for you to purify water.

2. *Adding bleach.* Water can also be purified safely, quickly, and cheaply by adding fresh (less than four months old) liquid, unscented chlorine bleach to it. If used properly, chlorine bleach can kill germs and most parasite eggs.

To purify a liter of water using chlorine bleach, follow these steps:

- Get a clean, large container and label it “Drinking Water.”
- Fill it with one liter of water. Add four drops of fresh, liquid chlorine bleach. Bleach used for this purpose should contain 4 to 6 percent sodium hypochlorite and no added scent. Sometimes you can only get bleach with 1 percent sodium hypochlorite. Then you must add 20 drops of bleach to a liter of water.
- Cover the container with a clean lid or cloth. Let the water stand for 30 minutes.
- Taste the water and notice the faint chlorine taste. If there is no chlorine taste, add two more drops of bleach and wait 15 minutes. If there is still no chlorine taste, get new bleach and try again with fresh water. If the chlorine taste is too strong, pour the water back and forth from one clean container to another several times. This will improve the flavor.

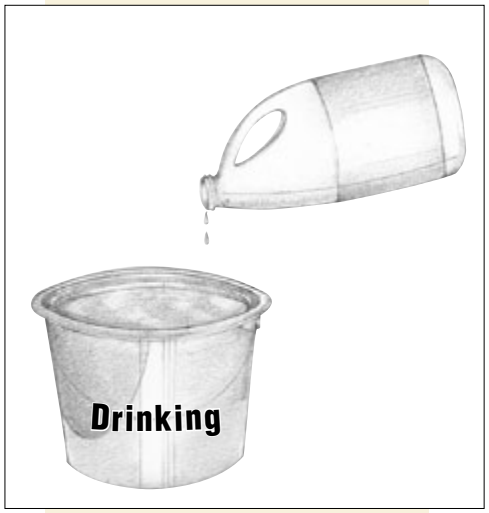
Some people are afraid that chlorine will hurt their bodies. In the amounts used to purify water, it is completely safe. Major cities throughout the world use chlorine to purify water.

Getting started

To begin purifying water at home, do the following:

1. Purify some water by boiling it or using chlorine bleach.
2. Store the water in a covered container where family members can use it for all drinking and food preparation.

Note: you may be able to purchase special filters that contain disinfectants to purify as well as filter water.



Purified Drinking Water

1 liter water + 4 drops
fresh chlorine bleach (4–6%)

Supplementary Material: Building a Home Water Filter

Filtering water with homemade filters will not remove germs or parasite eggs. But it will make the water clear before you purify it. Filtering also makes the water taste better. Algae and other particles are removed by passing the water through fine sand. Flavors and colors are removed by passing the water through crushed charcoal. Eventually the fine sand will get clogged, and the charcoal will not filter well. Both will need to be replaced.

Usually a filter like the one shown in the diagram will work well for two months. It will filter 40 liters of water a day. When the water starts flowing too slowly, replace the top layer of fine sand. If the water still has an odor, color, or taste after it has been filtered, replace the charcoal.

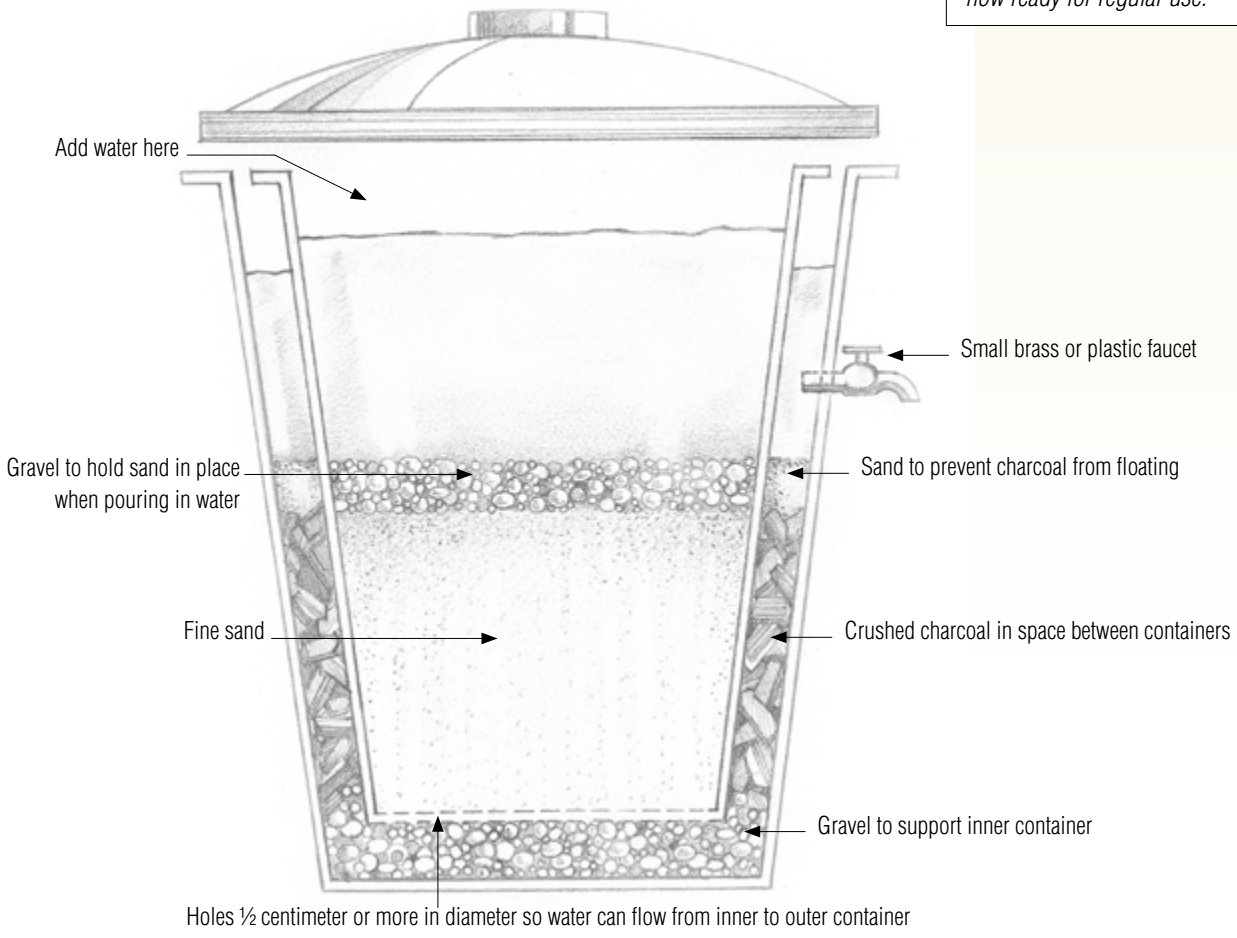
This simple filter is made of two clean plastic containers such as buckets or trash cans. One should be smaller so that it will fit inside the larger container with at least 2½ centimeters of space around the outer edge.

To build a water filter, follow these steps:

1. Study the picture of the filter.
2. Punch or drill holes in the bottom of the smaller container. They should be at least ½ centimeter in diameter so that the water can flow freely from the inner to the outer container.
3. You may want to use a faucet or spigot to draw off the purified water. If you do, drill or punch a hole in the side of the outer container. The hole should be a little above where the sand and charcoal will be. Install the faucet with rubber or plastic washers or plastic gasket cement.
4. Place gravel in the bottom of the large container. Put in enough so that the top of the inner container will be even with the top of the larger container.
5. Put the smaller container on the gravel. Fill it about half full with fine sand. Cover the sand with about five centimeters of gravel to hold the sand in place when you pour water into the filter.
6. Fill the lower portion of the space between the containers with crushed charcoal. Cover it with about five centimeters of sand to keep charcoal particles from floating to the surface.

Using the Water Filter

Clean the filter before you use it. Pour water into the smaller container and draw it off with the faucet until the water comes out clear. Then run eight liters of water that has two teaspoons of chlorine bleach in it through the filter. Then run eight liters of water without chlorine bleach through the filter. The filter is now ready for regular use.



Food Preparation

Wash and sanitize your hands before you prepare food for yourself or others.

Throughout the day, germs get on your hands, and you can easily spread them to food. By washing your hands, you can get rid of many of the germs. So before you prepare food, wash your hands for 20–24 seconds with plenty of soap. If your hands are very dirty, you may want to scrub under your fingernails and in the folds of your skin with a brush. If there is sickness in the home or to be extra cautious, also rinse your hands in a sanitizing solution and then with purified water.

You can make a sanitizing solution by adding one teaspoon of chlorine bleach with 4 to 6 percent sodium hypochlorite to one liter of water. (If the sodium hypochlorite in the bleach is only 1 percent, five teaspoons are needed for each liter.) Note that the amount of chlorine bleach in the sanitizing solution is much more than the amount used to purify water for drinking. Be sure to clearly label the sanitizing solution so it will not be confused with drinking water. You should be able to smell the chlorine in the solution. If the odor becomes weak after a few days, add more bleach.

Avoid preparing food if you have a skin disease or infected sores on your hands.

Germs can move from skin infections or infected sores to food. If you do not cook the food well enough, the germs make a poison in the food. If someone eats the food, within a few hours he may become very ill with nausea, cramps, vomiting, and diarrhea.

This same kind of germ is also found in the secretions of the nose. You should avoid touching your nose when you prepare food.

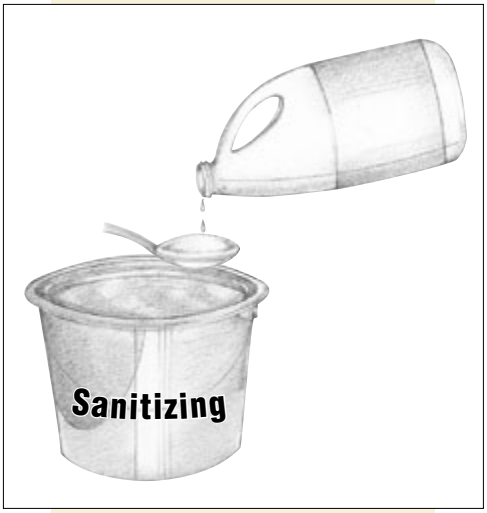
Sanitize fruits, vegetables, and other foods that you bring into your home.

People who produce and sell fruits, vegetables, and other foods may handle and sell the food in unsanitary ways. When you bring these foods home, they spread germs to everything they touch. You must take care of these foods in special ways. You can kill the germs by washing the food and soaking it for 60 seconds or more in a sanitizing solution made the same way as the sanitizing solution used for rinsing your hands.

When you bring food home, handle it carefully. Wash fruits and vegetables with smooth skins in soap and water to remove dirt and juices. Then soak them in a sanitizing solution. As you use the sanitizing solution many times, you will notice that you can no longer smell the chlorine. Then you should throw away the old solution and mix new water and chlorine.

Even if you are going to cook or peel fruits and vegetables, first wash them with soap and water and then soak them in a sanitizing solution. If you do not do this, the germs on these vegetables will spread to other things in the kitchen.

Some smooth-skinned fruits and vegetables can be cleaned well enough with a sanitizing solution to eat them raw. However, vegetables such as broccoli and cauliflower, or fruits such as strawberries and



Sanitizing Solution

1 liter water + 1 teaspoon fresh chlorine bleach (4–6%)

other berries, have tiny air spaces on them that usually trap dirt and germs. You cannot get these vegetables and fruits sanitary enough to eat them raw. They must be cooked.

You cannot make meat sanitary by putting it in a sanitizing solution. Meat, especially pork, must be well cooked to kill the germs in it. Raw chicken especially can spread dangerous germs to everything it touches. When raw meat or poultry touches something in the kitchen, you must wash that thing with the sanitizing solution. *Avoid eating raw meat of any kind.*

Eggshells can easily spread germs to things that they touch. Wash and sanitize eggs before storing them. You can store washed eggs longer if you put a thin layer of cooking oil on them. Never eat eggs raw.

Protect food you have prepared from getting germs on it again.

Flies and other insects spread many germs to food. Keep flies away from food while it is being served. You can keep some flies away by keeping the kitchen clean, but some flies will still come in because they smell the food. You can keep all kinds of germs off food by covering it during storage, while it is cooking, and while serving it. Do not let flies touch the food during the meal.

Once foods are well cooked, they will be free from germs as long as they remain hot (above 55 degrees Celsius). But after you serve food to family members, any leftover food becomes a problem. It may come in contact with germs from the air, drifting dust, flies, and utensils. As the food cools, these germs will grow and multiply.

Leftover food should be covered and kept under refrigeration (below 4 degrees Celsius). Most leftover foods, especially those made with milk, meat, and eggs, can cause sickness if they are not kept in refrigerators. Put food scraps into a covered garbage container, and take them outside as soon as possible. Clean up spilled food to keep flies and other insects out of the kitchen.

Immunizations

You can prevent many communicable diseases by getting immunizations.

A communicable disease is a disease that a person can get from another person or from an animal. Some of these diseases can be prevented by immunization, for example, tetanus, whooping cough (pertussis), diphtheria, measles, mumps, rubella, cholera, polio, and tuberculosis.

Diseases can hurt people in many ways. Polio can paralyze someone for life; meningitis can hurt a person's brain; rubella can cause birth defects when women get it during pregnancy; high fevers can hurt the brain, liver, heart, and other organs. You do not have to be hurt in these ways if you get immunizations.

People's bodies can fight off some diseases. Some people's bodies can fight off disease better than other people's. A person can fight off disease better when he is healthy. Sometimes when a person gets a sickness and then gets better, he will never get it again. This is called immunity. This happens with such sicknesses as rubella, chicken pox, and mumps. An immunization can help a person's body become immune to a disease before he gets sick. It makes a change in his body so that he will not get that disease.

Disease can keep a child's body and mind from developing properly. So it is good to prevent disease whenever you can. One reason disease hurts children is that when they get sick, their bodies need more food. But they may not get the food they need because they do not feel like eating. When young children do not eat enough of the right kinds of food, they do not grow as strong and tall as they should. Their minds do not develop properly, and their ability to think and act may be limited for the rest of their lives. Also, when they are sick, they may get diarrhea.

You should make sure that all members of your family get the necessary immunizations.

Parents must do everything they can to keep their families healthy. Immunizations are one of the most important ways to do this. In some areas government agencies try to get everyone immunized. In these areas you may be able to get immunizations at health clinics or in the schools. But parents should still learn which immunizations their families should have and make sure they get all of them.

It is helpful for each family to keep a schedule of the immunizations they should receive and a record of the ones they have received.

Parents should make sure that all of their children are completely immunized. You may be able to get immunizations only at certain times of the year. The vaccines and the health workers may not be available all the time. Sometimes floods or strikes can keep the vaccines from getting to the people. Vaccines may suddenly be hard to get. Parents must make sure that their children get the immunizations when they are available. If necessary, a parent or a group of parents should make a trip to a city health center or regional hospital with their children for immunizations.

When everyone gets immunizations, there are no more epidemics (many people infected at the same time). Each person can help his community by getting immunized. Smallpox is a good example of a disease that no longer hurts people because of immunizations. Once, epidemics of smallpox hurt or killed families and whole communities. Now, no one has had smallpox anywhere in the world for many years. Because many people have gotten smallpox immunizations, they cannot give the disease to other people.

If many people get immunizations, they will protect themselves and their communities from disease. They will also encourage the health clinics to keep providing immunizations. This is a good thing for the community.

Supplementary Material: Standard Immunizations

Immunizations for Infants

Because different countries have different resources, it is impossible to give an ideal immunization schedule that is practical in all countries. However, where it is possible, the World Health Organization recommends the following immunization schedule:

BCG tuberculosis vaccine

HPB hepatitis B vaccine

OPV poliomyelitis vaccine

DPT diphtheria, pertussis, tetanus vaccine

HiB *Haemophilus influenzae* type B vaccine

PNC pneumococcal conjugate vaccine

RTV rotavirus (Rotarix or Rota Teq) vaccine

Measles rubeola vaccine

Vaccine	*Age*
BCG*, HPB, OPV†	Birth
DPT, HiB, HPB, OPV, PNC, RTV	6 weeks
DPT, HiB, HPB, OPV, PNC, RTV	10 weeks
DPT, HiB, HPB, OPV, PNC, RTV‡	14 weeks
Measles§	6 months
Measles	9–15 months
Measles	4 or more weeks after previous dose

* BCG is given if tuberculosis is active in the population or the baby is at high risk, unless HIV+ or HIV** symptoms are present.

† OPV is recommended at birth only if polio is in the population.

‡ RTV third dose is needed only if Rota Teg vaccine was used previously.

§ Measles vaccination is needed at 6 months only if the HIV** incidence is high in the population.

** HIV = human immunodeficiency virus, which causes AIDS.

Immunizations for Adolescent Girls and Women of Child-Bearing Age Who Have Not Previously Been Immunized

The following schedule is recommended for tetanus vaccine usually combined with adult diphtheria vaccine (Td) and rubella immunizations:

Vaccine	*Timing*
Td (and rubella, if not pregnant)	When identified as not immunized
Td	4 weeks later
Td	6–12 months later or during subsequent pregnancy
Td	1–3 years later or during subsequent pregnancy
Td	1–5 years later or during subsequent pregnancy

Information about booster immunizations for children and immunizations for adults can be obtained from local public health organizations.

Source: http://www.who.int/immunization/policy/immunization_tables/en/index.html

New Immunizations Recommended for Preadolescent Girls

The World Health Organization now also recommends that girls between 9 and 13 years of age be vaccinated with three doses of HPV (Human Papillomavirus Vaccine) to prevent cervical precancers and cancers. There should be 1–2 months between the first two doses and 4–5 months between the second two.

Disease and Human Waste

Diseases are spread by contact with human waste.

Diseases can be spread when people come in contact with human waste, both fecal material and urine. These wastes are made up of food and nutrients that are not completely digested. Germs can live in human and animal waste and grow very quickly in warm, moist conditions. Human waste may also contain parasitic worms and their eggs.

Many diseases and parasites are spread by human waste. They are very common in areas of the world where sanitation is poor.

When a person has severe diarrhea, he often has diseases spread by human waste.

You can come in contact with human waste in many ways. It can get on your hands when you go to the bathroom. It can get on your feet when you walk barefoot in human waste or on ground that has human waste in it.

If you touch pets, rodents, and insects that have been in contact with human waste, the germs can get on you. The germs can be on pets such as dogs, cats, and birds; rodents such as rats and mice; and insects such as cockroaches, flies, and fleas.

Sometimes water that you drink or wash in may have human waste in it. This water can come from shallow wells, unsanitary water systems, streams, rivers, streets, ditches, or even piped water that has not been properly sanitized. Food may have germs on it because it has been handled by people who have human waste on their hands or because it has been touched by insects and rodents.

You should be very careful not to come in contact with human waste. This will help to keep you and your family from getting sick.

Avoid contact with human waste when you use the toilet.

When you use the toilet, use toilet paper or a sanitary wash cloth. If you use sanitary washcloths, you will not need to buy expensive toilet paper. Each family member will need at least three to five of them each day. After family members use them, they should put them in a closed container full of soapy water. Then the washcloths should be washed and rinsed in a sanitizing solution.

Wash your hands for 20–24 seconds with soap immediately after using the toilet or latrine, changing a diaper, or touching animals.

Make sure that you have a sanitary toilet or latrine and that all family members use it. Scrub the toilet or latrine at least once a week with soap and water, and then rinse it with chlorine bleach.

If you have elderly or sick people in your home, you may need to get a bedpan or chamber pot for them. Empty the contents of the pan or pot often into the toilet or latrine, and sanitize the pan or pot afterward.

Diseases Spread by Human Waste

Cholera	Giardia
Dysentery	Hookworm
Hepatitis	Pinworm
Measles	Roundworm
Polio	Tapeworm
Typhoid fever	Trichina worm
Amoeba	

Sanitizing Solution

1 liter water + 1 teaspoon fresh chlorine bleach (4–6%)

Do not touch human waste with your feet.

Put diapers on infants and young children until they are old enough to use the toilet or latrine.

Wear shoes that fully cover and protect your feet. Wear sandals only if mud and contaminated soil do not touch your feet.

Train your children to stay out of rivers, ditches, and rain water in the road.

Cover toilets and latrines or put screens over them. If you use trench latrines, cover the wastes with soil immediately.

Do not drink water or eat food that may have human waste in it or on it.

Build latrines away from wells and areas that drain into water.

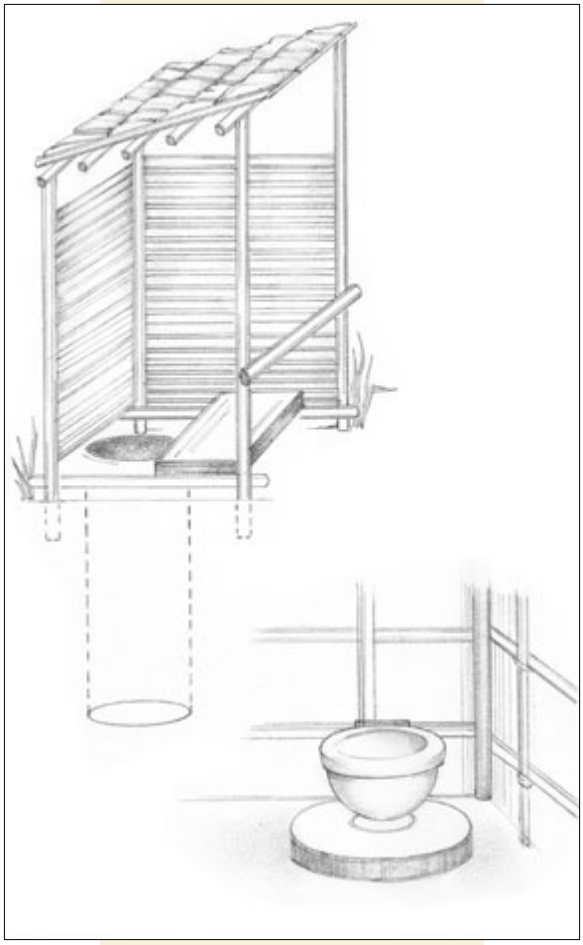
Purify all drinking water in the home with chlorine bleach.

Avoid eating food sold on the streets or in restaurants that may not take care to keep food clean.

Sanitize food that flies and cockroaches have touched before you eat it by rinsing it in a sanitizing solution or recooking it.

Dispose of human waste properly.

You must have a sanitary way to dispose of human waste at your home. If you do not have a sanitary system now, you should get one as soon as possible. A trench latrine is the simplest system to build, but you should try to get a better system as soon as you can. A pit latrine is better than a trench latrine. Water-sealed latrines and flush toilets with septic tanks or sewer systems are much better. You should work to get at least a water-sealed latrine.



Purified Drinking Water

1 liter water + 4 drops
fresh chlorine bleach (4–6%)

Disease and Human Body Fluids

The body fluids of infected persons can spread germs, causing disease to others.

Some germs grow in the nose, throat, or lungs, where the body produces mucus to help get rid of them. A healthy person who gets droplets of infected mucus into eyes, nose, or mouth can become ill.

Other germs are spread in blood or grow in the flesh around a wound, where the body may produce pus. A healthy person who gets infected blood, pus, or other fluids on a simple scratch can also get the infection.

Still other diseases are caused by germs carried in the fluids exchanged during sexual relations. A healthy person who contacts these fluids during sexual relations with an infected person may also become infected.

To remain healthy, be very careful to avoid contact with the body fluids of an infected person.

Cover your nose and mouth when sneezing or coughing to decrease the spread of disease-carrying droplets.

When you cough or sneeze, small droplets carrying germs are sprayed into the air. They may cause illness when breathed in by others. They may fall onto nearby food or other surfaces, and people who eat the food may become ill. Those who touch the sprayed surfaces and then touch food, drink, mouth, nose, or eyes may also become ill.

Cover your nose and mouth with a tissue or your sleeve or arm when sneezing or coughing to decrease the spread of disease-carrying droplets. Then discard the tissue in a sanitary waste disposal and wash your hands and arm. If you cover your sneeze or cough with your hand, immediately wash your hands thoroughly (scrubbing front, back, and between fingers for 20-30 seconds) with soap and water to lessen the chance of spreading infected droplets by touching anything else, such as doorknobs, other people's hands, and food.

To improve your chances of remaining healthy, thoroughly wash your hands frequently; before touching your mouth, nose, or eyes; and always before eating.

Some Diseases Carried in Mucus Droplets

Colds	Strep throat
Influenza (flu)	Tuberculosis
Pneumonia	

Avoid touching blood, pus, or other fluids coming from the wounds of another person.

Wounds that result in a break in the skin can become infected. The body sends white cells to fight the infection, and these cells often form pus. Because pus may contain germs, it can cause infection in another person who touches it. Blood and other fluids oozing from a wound may also carry germs, either from an infection in the wound or from germs elsewhere in the body, such as human immunodeficiency virus (HIV, which causes AIDS) or hepatitis. Thus, even if a person's wound is fresh and not clearly infected, you should avoid getting fluids from it on your skin. Small breaks or damaged areas may allow germs to enter.

Wearing disposable plastic or rubber gloves (if available) is the safest way to handle blood and other fluids from wounds. These should be carefully destroyed after using. If they must be used again, first clean and then soak them for 20 minutes in sanitizing solution. If blood or fluids from wounds of another person accidentally get on your skin, do your best to flush it clean with water and then wash thoroughly with soap and water.

Some Diseases Carried in Wound Fluids

Hepatitis	Staphylococcus
HIV AIDS	Streptococcus

Sanitizing Solution

1 liter water + 1 teaspoon fresh chlorine bleach (4–6%)

Avoid fluids exchanged during sexual relations with an infected person.

Some infections (for example, bacteria, viruses, yeasts, and parasites) thrive in the genital area and are readily passed on to uninfected partners during sexual relations. Since these fluids ultimately come from blood, they may also spread other diseases carried in the blood, such as human immunodeficiency virus (HIV), which causes acquired immunodeficiency syndrome (HIV AIDS).

The best way to keep from getting these diseases is to avoid contact with these fluids from an infected person. If someone knows he or she is infected with the germs carried in fluids exchanged in sexual relations, he or she should avoid behaviors that would put these fluids in contact with another person.

Some Diseases Carried in Fluids Exchanged during Sexual Relations

"Buboes"	Human Papillomavirus (HPV)
Chlamydia	Syphilis
Gonorrhea	Trichomonas or "Trich"
Herpes	
HIV AIDS	

Infected persons should seek local medical advice about which medicines are effective, available, and affordable.

Treatment for Parasitic Worms

Many children and some adults have parasitic worms.

Some scientists checked a group of one-year-old children to see if they had parasitic worms. One out of ten children had worms in their intestines. When the children were two years old, the scientists checked them again. At that time, nine out of ten children had worms in their intestines. Between the ages of one and two years, the children began to walk and to feed themselves. During that year the children got parasitic worms because they touched, ate, and drank impure things around them.

When children have worms, the worms use the food that the children eat. Then the children do not grow as they should. Parasitic worms can also cause diarrhea. This makes children lose more food. Parasitic worms are one of the main reasons that children grow too slowly.

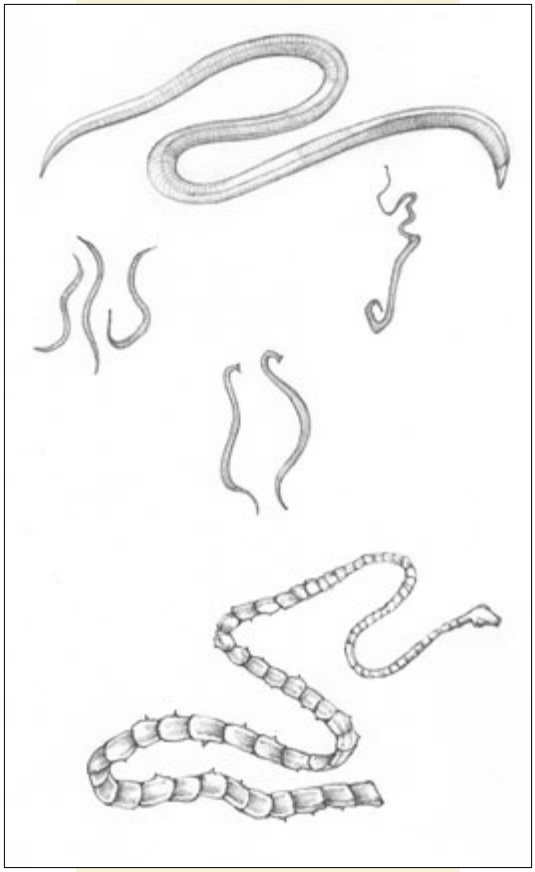
Many adults also have parasitic worms. They get them from impure food, water, and things they touch.

Adults and children can get many worms in a short time when the things around them are not clean. The worms can make them sick, tired, and weak.

You can keep the worms from getting in your body.

Worms usually come from human or animal waste. Anything that has touched human or animal waste can spread worms. The following are ways that worms can get inside people:

1. The soil becomes contaminated with parasitic worms when human and animal wastes are left uncovered. Some parasitic worms can burrow into feet. Do not walk barefoot on unclean soil. Wear closed shoes, slippers, or sandals to protect your feet from worms. Teach your children to always wear shoes or sandals and not to play in unclean soil. When feet are dirty, wash them with soap as soon as possible. Rinse them with a sanitizing solution made by mixing one teaspoon of 4 to 6 percent sodium hypochlorite bleach in one liter of water. Rubbing alcohol is also a good rinse.
2. Hands and fingernails are places where worm eggs and tiny worms can stay. When you eat with dirty hands, touch your mouth, or bite a fingernail, the worms can get in your body. Wash your hands often and keep your fingernails short and clean. Do not eat until you have washed your hands with soap and purified drinking water. When your hands are really dirty, wash them well with soap and then rinse them in a sanitizing solution.
3. Water with very small amounts of human and animal waste in it can look clean, but it can give worms to the person who drinks it. You can get worms from wells, river water, open ditches, flood water in streets, and sewage. You must purify all water before you drink it or use it in preparing food.
4. Since parasitic worms and worm eggs are too small to be seen without a microscope, they can get in food when you prepare it to eat. Cook food very well to kill worm eggs. Flies carry small amounts of feces to food, utensils, and dishes.



Sanitizing Solution

1 liter water + 1 teaspoon
fresh chlorine bleach (4–6%)

Purified Drinking Water

1 liter water + 4 drops
fresh chlorine bleach (4–6%)

They can transfer worm eggs to food that has been cooked well. Then you must heat the food all the way through again.

Food that is prepared and sold at small stands on the street often gets germs or worm eggs on it through dirty hands and fingernails, flies, not being kept clean, and not being cooked enough. Be careful when buying and eating such food. Unless the food comes directly from a boiling pot or from a hot fire or stove, it may have germs on it.

5. Dirty or inadequate bathrooms, comfort rooms, and latrines are places where many people get worms. Keep these places clean, and sanitize them often. Avoid touching the floor or ground or other surfaces in public restrooms. Wash your hands after each time you use the toilet.

You can take medicine to get rid of the worms in your body.

Different kinds of parasitic worms can get into people's bodies. These include roundworms, threadworms, whipworms, hookworms, and tapeworms. You can take medicines for these different kinds of worms. Some medicines work for several types of worms. Others are for only one kind of worm. You must learn which medicine to take and be aware of any possible side effects.

Family members can easily give worms to each other. So all family members should get the worm treatments at the same time.

When you take the medicine for parasitic worms, the worms will go away quickly and easily. You may find that you are healthier immediately. If you keep your body and surroundings clean, the worms may not come back. In warm, humid climates, however, it is very difficult to keep worms from coming back. If you live in these climates, you should regularly take a medicine that treats all common kinds of worms. You should be especially careful to give this medicine to children. When you do this every three months, the worms will be very small and usually not visible in the feces. The longest time between treatments should be six months. If large worms are in the feces immediately after a treatment, you should take the medicine more often but no sooner than every three months. If you do these things, you will not have many problems with parasitic worms.

Supplementary Material: Medications for Parasitic Worms

There are many different medicines for the treatment of worms. One common medicine that is safe and effective against several kinds of worms is mebendazole. Mebendazole is used for *Ascaris* (roundworm), *Angiostrongylus, Capillaria, Enterobius* (pinworm or threadworm), filariasis, gnathostomiasis, and hookworm.

Some worms cannot be treated by mebendazole, and the medicine may not be available where you live. By visiting local health clinics or pharmacies, you should be able to learn what medicines are available in your area, how much they cost, and what kinds of worms they are used for.

Warning: Before you take any medicine for tapeworms or protozoa such as amoeba or giardia, you must consider whether you have any roundworms in your body. If you do, you must get rid of them before you take it. Some of these medicines can make the roundworms

come out of your mouth and nose. This can make small children choke. To keep this from happening, assume that most children have roundworms in their bodies. Give them the roundworm treatment first. You do not need to do this if you or your child has been taking roundworm medicine regularly.

The following information has been taken from *Where There Is No Doctor* by David Werner. A subsequent edition of the book is available in bookstores in many countries and may also be obtained in different languages from http://hesperian.org or the following address:

The Hesperian Foundation

1919 Addison Street, Suite 304

Berkeley, California 94704 USA

There are many types of worms and other tiny parasites that live in people's intestines and cause diseases. The larger ones are sometimes seen in the feces:

1. Roundworm *(Ascaris)*
2. Threadworm *(Enterobius)*
3. Whipworm *(Trichuris)*
4. Hookworm
5. Tapeworm

The only worms commonly seen in the stools are roundworms, threadworms, and tapeworms. Hookworms and whipworms may be in the gut in large numbers without ever being seen in the stools.

Roundworm (Ascaris)

Size: 20–30 centimeters long.

Color: pink or white.

How they are spread: Feces to mouth. Through lack of cleanliness, the roundworm eggs pass from one person's stools to another person's mouth.

Effect on health: Once the eggs are swallowed, young worms hatch and enter the bloodstream; this may cause general itching. The worms then travel to the lungs, sometimes causing a dry cough or, at worst, pneumonia with coughing of blood. The young worms are coughed up and swallowed, and then they reach the intestines, where they grow to full size.

Many roundworms in the intestines may cause discomfort, indigestion, and weakness. Children with many roundworms often have very large, swollen bellies. Rarely, roundworms may cause asthma, fits (seizures), or a dangerous blockage in the gut. When the child has a fever, the worms sometimes come out in the stools or crawl out through the mouth or nose. Occasionally they crawl into the airway and cause gagging.

Prevention: Use latrines, wash hands before eating or handling food, and protect food from flies.

Threadworm or Pinworm (Enterobius)

Size: 1 centimeter long; very thin and threadlike.

Color: white.

How they are spread: These worms lay thousands of eggs just outside the anus. This causes itching, especially at night. When a child scratches, the eggs stick under his nails and are carried to food and other objects. In this way they reach his own mouth or the mouths of others, causing new infections of threadworms.

Effect on health: Itching may disturb the child's sleep.

Treatment and prevention: A child who has threadworms should wear tight diapers or pants while sleeping to prevent scratching.

Wash the child's hands and buttocks when he wakes up and after he has a bowel movement. Always wash his hands before he eats. Cut his fingernails very short. Change his clothing and give him baths often.

Cleanliness is the best prevention for threadworms. Even if medicine is used to get rid of the worms, they will be picked up again if the child is not kept clean.

Whipworm (Trichuris)

Size: 3–5 centimeters long.

Color: pink or gray.

How they are spread: These worms, like roundworms, are passed from the feces of one person to the mouth of another person. They may cause diarrhea. In children they occasionally cause part of the intestines to come out of the anus.

Prevention: The same as roundworm.

Hookworm

Size: 1 centimeter long.

Color: red. Hookworms cannot usually be seen in the feces. A stool analysis is needed to prove that they are there.

How they are spread:

1. The baby hookworms enter a person's bare feet. This can cause itching.
2. In a few days they reach the lungs through the bloodstream. They may cause a dry cough (rarely with blood).
3. The person coughs up the young worms and swallows them.
4. A few days later the person may have diarrhea or a stomachache.
5. The hookworms attach themselves to the walls of the gut. Many worms can cause weakness and severe anemia.
6. The hookworm eggs leave the body in the person's stools. The eggs hatch on moist soil and the cycle begins again.

Hookworm infection can be one of the most damaging diseases of childhood. Any child who is anemic or very pale, who eats dirt or does not wear shoes may have hookworms. If possible, his stools should be analyzed.

Tapeworm

Size: In the intestines, tapeworms grow several meters long. But the small, flat, white pieces (segments) found in the feces are usually about one centimeter long. Occasionally a segment may crawl out by itself and be found in the underclothing.

How they are spread: People get tapeworms from eating pork (pig meat), beef (cow meat), or other meat that is not well cooked.

Effect on health: Tapeworms in the intestines sometimes cause mild stomachaches but few other symptoms.

The greatest danger exists when tapeworm cysts (small sacs containing baby worms) get into a person's brain. This can happen when the eggs pass from the stools to the mouth. For this reason, anyone with tapeworms must follow the guidelines of cleanliness carefully—and get treatment as soon as possible.

Prevention: Be careful that all meat is well cooked, especially pork. Make sure that there are no raw parts in the center of roasted meat.

CHAPTER 2

Cleanliness and Sanitation

Keeping Your Body Clean

You can be more healthy if you always keep your body clean.

The Lord has given us the opportunity to come to this earth and obtain a physical body. If we take care of this special gift from our Father in Heaven, we can enjoy good health and happiness.

"The healthy man, who takes care of his physical being, has strength and vitality; his temple is a fit place for his spirit to reside. . . . It is necessary, therefore, to care for our physical bodies, and to observe the laws of physical health and happiness" (David O. McKay, "The 'Whole' Man," *Improvement Era,* Apr. 1952, 221).

The information in this chapter will help you understand ways to keep from getting germs that will make you sick. If you learn and do these things, you will be more healthy.

Wash and rinse your hands to get rid of germs.

Diseases are caused by tiny living organisms called germs. These germs get into people's bodies through their mouths, noses, eyes, ears, and broken skin. People get germs by touching, eating, or drinking things that have germs on them.

You can get rid of many germs on your hands by washing your hands with soap and water. Rinsing your hands in a sanitizing solution and then in purified drinking water will help to kill even more germs.

During a normal day, a person touches many things that have germs on them. That is why it is especially important for you to wash and rinse your hands in certain situations: before eating, preparing food, or feeding or caring for a baby; and after caring for someone who is sick, handling garbage, handling dirty clothes, or using the toilet.

Bathe at least twice a week to keep your body clean and free from germs.

If you can, try to bathe daily. If this is not possible, bathe at least twice a week. Skin diseases are caused by bacteria, fungi, mites, lice, and fleas. By bathing regularly, you can lower your chances of getting skin diseases.

If you have piped water and do not already have a shower, you may be able to build one. If water is hard to get, you can use a basin of water to wash your body. When you bathe, shower, or wash your body, use an antiseptic or disinfectant soap.

Sanitizing Solution

1 liter water + 1 teaspoon
fresh chlorine bleach (4–6%)

Purified Drinking Water

1 liter water + 4 drops
fresh chlorine bleach (4–6%)

Shampoo your hair at least once a week.

If you shampoo your hair regularly, you will have a healthy scalp and keep your hair free from germs. You can wash your hair with a regular shampoo or hand soap.

If your hair gets lice in it, you should use a special disinfectant shampoo that contains a special chemical: for example, pyrethrin, permethrin, lindane, or malathion. When you wash hair with this special shampoo, do not let the shampoo get into your eyes. Leave the lather on the hair for 15 minutes; then rinse the hair well with clean water. Remove lice eggs by rinsing the hair with warm vinegar and wrapping it in a vinegar-soaked towel for 30 minutes. Then comb the hair thoroughly with a fine-tooth comb.

Wear shoes and keep your feet clean.

There are many germs and parasites in the places where people walk. You can avoid getting many germs and some parasites by wearing shoes or sandals. You can also get rid of germs by rinsing your feet in a sanitizing solution. This is particularly important if you have walked in a place where there are human or animal wastes.

Sleep in clean bedding.

Germs, fungi, mites, and other things that cause disease are frequently found in unclean bedding.

You should wash and sanitize bedding each week. Other items such as pillows, sleeping mats, cots, or mattresses should occasionally be taken outside and aired in direct sunlight. If possible, they should be hung or suspended off the ground.

It is good for each child in the family to sleep in a separate bed if possible. When more than one person sleeps in the same bed, it is especially important for the bedding to be washed and sanitized each week and for each person to bathe at least twice a week.

Each family member should use a separate set of basic toilet articles.

When a person washes, bathes, brushes his teeth, or combs his hair, the germs from his body may be left on washcloths, towels, toothbrushes, or combs. If other members of the family use these articles, they may get the germs.

You should try to have a separate set of basic toilet articles for each member of your family. If possible, provide a separate place for each family member to keep these personal articles so they do not come in contact with someone else's.

Caring for Your Teeth

If you take good care of your teeth, they will stay strong and healthy throughout your life.

It is very important to begin taking care of a child's teeth when the teeth first come in. If the baby teeth are not cared for, children may lose them before they should from decay or accidents. Then their permanent teeth may grow in crooked. Also, if children do not learn to care for their baby teeth, they probably will not care for their permanent teeth and may lose them. Adults need all of their permanent

teeth so that they can eat many kinds of food. Without good teeth, they may have a more difficult time staying healthy.

Parents or older children have the responsibility to teach young children how to brush and floss their teeth. Then children will develop the habit of taking care of their teeth throughout their lives. Children's first permanent teeth come in at age six, and they must know how to keep these teeth healthy. If they learn how to keep their teeth healthy, they will have healthier bodies and feel better about the way they look.

Also, if you teach your children to take good care of their teeth, they will not have so many expensive visits to the dentist. If teenagers and young adults take care of their teeth, they will look more attractive. If adults care for their teeth, they will not have the pain of toothaches and they will be able to eat many kinds of food. You need to keep every tooth as long as possible. People of every age must take good care of their teeth.

You should keep your teeth clean to prevent tooth decay and gum disease.

You should learn to keep your teeth clean. The best time to clean your teeth is immediately after meals. Food particles left on the teeth for a long time will cause tooth decay and gum diseases. Brushing and flossing are the best ways to keep your teeth clean.

If you do not clean your teeth after meals, a film forms on your teeth. The film feels fuzzy and causes your breath to smell bad. This film coating is called plaque. Plaque is made up of the bacteria in the mouth, plus the acid they make from sugar in food. Removing the film each day is easy, but if the film is allowed to remain on the teeth day after day, it hardens. Once the plaque has hardened, it must be removed by a person who has been trained and has the proper tools.

Family members should brush their teeth properly after each meal.

Start now to teach your children how to care for their teeth, especially by brushing after each meal. You may need to encourage and remind them until they do this. The children will be grateful when they are older, and you will not spend so much money on visits to the dentist. You should also start now to take care of the teeth you have. Then you will not have so many problems in the future.

Adults and children should use a soft toothbrush. A hard toothbrush can hurt the gums or the covering of the teeth. Let your brushes dry between uses, and use the brushes only for your teeth. You should get new ones when the old ones wear out.

If you cannot buy toothbrushes, you can make them at home. See the supplementary material for instructions on making your own toothbrush.

To brush your teeth well, clean the fronts and backs of your teeth, the biting surfaces, and also the places between your teeth. Focus on each tooth, cleaning the back as well as the front. Brush each area at least six times, taking three to four minutes in all.

Use a toothpaste or tooth cleaning powder when you brush your teeth.

You should brush with a toothpaste or tooth cleaning powder. If you buy toothpaste, try to buy a brand that contains fluoride. Fluoride will help prevent tooth decay. You only need to use a small amount of toothpaste to clean your teeth.

If you cannot buy toothpaste, you can mix together equal parts of baking soda (sodium bicarbonate) and salt. You can use this powder with purified water to brush your teeth. If you do not have baking soda, just use plain salt. You should rinse your mouth well with purified water after brushing.

You can clean plaque off your teeth by using dental floss regularly.

To help remove plaque from your teeth, you should use dental floss. It is simple to use, and you should use it every day. If you use it, you will keep more of your teeth.

Dental floss is a thin fiber made to clean between the teeth. Sometimes the fiber or thread is covered with wax to make it slip easily between teeth that are close together. You can buy dental floss where you buy toothpaste. You can also use a medium weight thread that you have pulled through a piece of wax.

Dental floss must be strong so it will not break. This means that you must floss carefully so you do not cut your gums.

To floss your teeth, cut off 25–40 centimeters of floss. Hold the piece between your thumbs and index fingers about 7 centimeters from each end. Put the floss between the teeth and slowly slide the strand down between the teeth, against the gums. Be careful not to cut the gums with quick movements. Work carefully between all the teeth. The movement of the floss will remove food and plaque. Use a clean section of the piece of floss for each tooth. Your gums may bleed the first few times you do this. This is normal, and after a few days the gums will not bleed. Regular flossing makes the gums stronger.

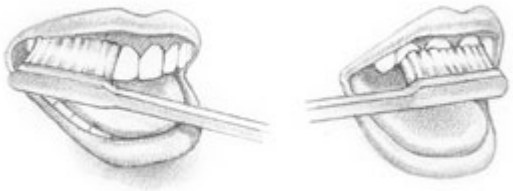
Flossing can prevent pain and decay, and you should do it every day. If your gums are still bleeding after two weeks of flossing, you may need to see a dental health worker.

Supplementary Material: Brushing Teeth

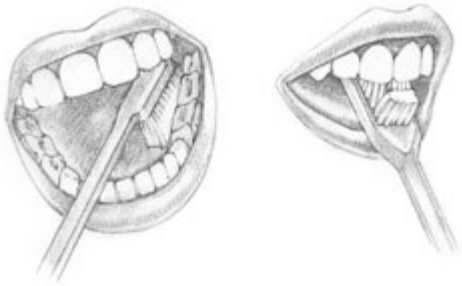
Effective Method for Brushing Teeth

For the outside surfaces of all teeth, place the brush where the teeth and gums meet. Hold it at a 45-degree angle.

Brush with short, careful strokes back and forth along the area between the teeth and the gums.



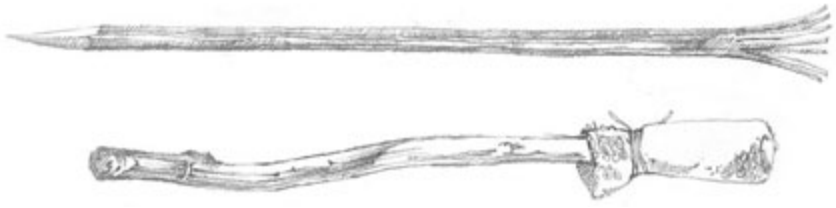
Use the same method on the inside surfaces of the teeth.



Brush back and forth on the biting surfaces of the teeth.

Making a Homemade Toothbrush

Take a twig from a tree and sharpen one end to use in cleaning between your teeth. Chew on the other end and use the fibers as a brush. Or tie a small piece of rough towel around the end of the stick to use as a brush.



Sanitation in the Kitchen

Germs on dishes can make family members sick.

When people get germs inside their bodies, they can become sick. When germs are on dishes, they can get into your body when you eat food from these dishes. Germs can get on dishes in many ways. Flies and other insects can bring germs to clean or dirty dishes, and dishes can be washed in water that has germs in it. When one person in the family gets sick, he can give other family members his germs if the dishes are not properly sanitized. Remember that when children in the family get sick often, they will grow too slowly.

Wash and sanitize dishes after cooking or eating.

To sanitize means to kill all the germs or parasite eggs on an object. You can sanitize your dishes by washing them in hot, soapy water. The soap helps get the food off the dishes. The heat and the soap kill the germs that make you sick. After washing the dishes, rinse them in hot water. Place them in a draining rack to dry. Because the dishes are hot, they will dry quickly.

If fuel is expensive, you can heat the water for washing dishes by putting a pan of water over the cooking coals after the meal is cooked and leaving it there until after the meal.

You cannot sanitize dishes by washing them in cold water with soap. If you cannot use hot water, you can sanitize dishes in another way. First wash your dishes in cold water with soap and rinse them in cold water. Then rinse them again in a sanitizing solution made by adding one teaspoon of 4 to 6 percent sodium hypochlorite bleach to one liter of water. Note that the amount of chlorine bleach in the sanitizing solution is much more than what is used to purify water for drinking. Be sure to clearly label the sanitizing solution so it will not be confused with drinking water.

You can use the rinse water with chlorine in it over and over during the day as long as the same strong smell of chlorine comes from the water. If you carefully wash and rinse the dishes in cold water before putting them in the sanitizing solution, the solution may last all day. Notice the strong smell of bleach and compare it to the smell of purified drinking water. Also notice the feel of your hands after rinsing them in the sanitizing solution.

Make sure the dishes do not get germs on them again after they have been sanitized.

Many people wipe their dishes dry with a towel. Many germs can be hidden in towels and will get on the dishes during wiping. You should let the dishes dry on a clean drain rack after they have been sanitized. Cover the dishes with a clean, dry cloth while they are drying so dirt and insects will not get on them.

After sanitized dishes are dry, put them in cupboards or containers that keep dirt, flies, cockroaches, and other insects away. Closed cupboards are the best place. Regularly wash the cupboards with soap, rinse them, and sanitize them with sanitizing solution. Make sure the doors of the cupboards fit tightly. If you have separate boxes for dishes, knives, forks, and spoons, your cooking area will be organized and easier to keep sanitary. You may want to store sanitized utensils in clean tin cans or plastic containers with lids.

Sanitizing Solution

1 liter water + 1 teaspoon
fresh chlorine bleach (4–6%)

If you cannot keep dishes sanitary, you must sanitize them just before using them by rinsing them in sanitizing solution.

Sanitized dishes and dishes with germs on them may look exactly the same. However, a microscope would show no germs on the sanitized dishes.

Keep the cooking area in your home clean.

You can get sick from germs that are in many places in the kitchen. These germs get on the food when it is prepared and served. You must sanitize cutting boards, utensils, food containers, and places where you prepare food. You can do this by rinsing these things with the sanitizing solution.

Sometimes cutting boards, wooden bowls, and tables have many deep scratches or cracks on them. The chlorine bleach cannot kill the germs in the deep scratches. Because of this, you should occasionally use sandpaper to remove the scratches. Then the wooden items will be easier to sanitize. If you cannot do this, you can put a plastic sheet or an oilcloth on the surface and sanitize it.

If you do not have a flat surface for preparing food, use flat plates (glazed or metal). Sanitize them after you use them, and store them away from dust and flies.

It is also important to keep the floor of your eating area clean. Sweep it after each meal, and clean the floor of the entire cooking area at least once a day. If the floor is a hard surface, scrub it with soap and water frequently. If the floor is made of dirt, put a layer of smooth gravel or cobblestone on it to reduce dust, if possible. You can also oil and pack a dirt floor to reduce dust.

Dust the walls and ceiling occasionally and wash them if possible.

It is difficult to keep your cooking area clean if the smoke from the cooking fire is not vented away from the area. If you have smoke in your cooking area, you should find a way to vent it.

Store pure drinking water and leftover food away from insects and dust.

You should always have a source of pure water in your cooking area. Contaminated water spreads many diseases. Keep the pure water in a closed container so dust and insects will not get in it. Label it "Drinking Water." Make pure water by adding four drops of chlorine bleach containing 4 to 6 percent sodium hypochlorite to each liter of clear or filtered water. After 30 minutes, the water is safe to drink.

Store any leftover food in containers that seal tightly. If possible, put the containers in a refrigerator or on shelves protected by a screen door. Leftover food will store longer and stay safer at low temperatures. Cook all leftover food well before serving it again.

Keep garbage in a sealed container.

Keep garbage in a container that seals tightly until you dispose of it properly. This will help to keep flies, rats, and mice away. You can use a simple pail with a lid that fits tightly or a closed plastic bag. Dispose of the garbage as far away from the house as possible.

Purified Drinking Water

1 liter water + 4 drops
fresh chlorine bleach (4–6%)

Sanitation in the Home

Keep all animals out of areas where family members live, prepare food, eat, bathe, and play.

Many people have animals in and around their homes. Animals can spread diseases to people. They also carry lice, ticks, and fleas, which can spread diseases to people. Animals can bring dirt and hair into the home as well as animal and human wastes that are not properly disposed of.

If you keep all animals out of the home, your family will not get so many diseases. You can keep animals out by doing the following things:

- Place low gates across doorways.
- Build fences around cooking areas and homes.
- Build pens for animals away from the home.
- Keep small animals and fowls in cages.
- Feed animals away from the living area.
- Teach children and other family members to keep animals out of the home.

If you keep pet animals in the house, be very careful to not let them spread disease.

If you keep pets in the house, do the following things so that they will not spread disease:

- Housebreak the pets (train them to use a litter box or to go outside).
- Bathe pets often.
- Clean and sanitize the floors often, especially if you have young children.
- Do not let animals climb on surfaces where food is prepared.
- Do not let pets eat from family dishes.

In some countries it is possible to give animals vaccinations or worm medications to keep them from spreading diseases. Animals that are very sick may need to be disposed of.

Organize the sleeping area in your home so that family members do not spread disease to one another.

Diseases are spread from person to person in crowded sleeping areas. If children have separate places to sleep, they will not spread diseases to one another during the night. If you cannot afford to have separate beds for each child, you could use hammocks that can be folded, small sleeping platforms that can be stacked, or sleeping mats that can be rolled up.

Keep bedding, hammocks, sleeping platforms, and sleeping mats free from insects and germs by putting them in the bright sunlight. Wash washable fabrics with soap and water, and rinse them in a sanitizing solution made by mixing one teaspoon of 4 to 6 percent sodium hypochlorite bleach in one liter of water. You can wash woolen fabric in cold water and hang it in the sunlight.

Sanitizing Solution

1 liter water + 1 teaspoon fresh chlorine bleach (4–6%)

Clean and sanitize the toilet area and bathing area to protect family members from disease.

If the toilet area in a home is unsanitary, family members can get many diseases. This is because many germs and parasites live in human waste. Sometimes the toilet area is so unsanitary and unpleasant to use that family members do not use it. You must have a clean and pleasant toilet area to keep your family healthy.

You should have toilet paper or sanitary cloths in the toilet area. You should also have a place to wash hands in the toilet area. You can choose whether you want to have towels for drying hands in this area. If you do, make sure they are very clean. Each family member should have a personal towel and a place to hang it to dry.

Wash the floors, doors, and walls of the toilet area with soap and water, and rinse them with a sanitizing solution. Do this at least weekly and more often if necessary.

The bathing area is usually where family members take baths, wash their faces and hands, comb their hair, and brush their teeth. Keep this area organized and sanitized so that family members do not spread disease to one another. Each person should have an assigned space for a comb, towel, hairbrush, and toothbrush where the air can dry them quickly. Wash and sanitize these things often, as well as the places they are stored.

The floor, doors, and walls of the bathing area should also be washed with soap and water and rinsed with sanitizing solution at least once a week.

Sanitizing Solution

1 liter water + 1 teaspoon fresh chlorine bleach (4–6%)

Washing and Sanitizing Laundry

You can prevent the spread of disease by washing and sanitizing cloth items.

You can help to prevent the spread of disease by washing and sanitizing the cloth items in your home. Underclothes, diapers, and cloths used for toilet paper can spread many diseases if they are not clean and sanitary. Dishcloths and dishtowels used where you prepare food contain germs that will grow and spread if you do not wash and sanitize the cloths regularly. Clothing and bedding can spread germs that cause skin infections and many contagious diseases. This is especially true if they have been used by a person who is sick. Towels and washcloths used in the bathing area of the home can also spread diseases.

When you wash cloth items with soap and water, you remove dirt and other material where germs can grow. But you kill germs only if you sanitize the items. To sanitize cloth items, wash them in hot water and rinse them in a sanitizing solution. Or rinse them in clean water and dry them in direct sunlight.

Sort out items that need to be presoaked or washed separately.

You should always presoak some cloth items before you wash them. These items include underclothing, diapers, cloths used for toilet paper, and any other item that has become very dirty. Soak such items in soapy water for about one hour, and then wring them out before washing.

Sanitizing Solution

1 liter water + 1 teaspoon fresh chlorine bleach (4–6%)

Wash cloth items in hot, soapy water.

Make sure that tubs, basins, or washing machines are clean before using them for laundry. If you need to sanitize many cloth items because family members are sick, you can use a kettle to boil the items.

Use clear, clean water for the laundry. You may need to filter the water to make it clear. The water does not need to be purified. If possible, the water should be hot to get the cloth items clean and kill the germs.

You must use enough soap to remove the dirt from the cloth. If you use enough soap, you will still have soapsuds in the water when you are through washing. If there are no suds left, you did not use enough soap.

Begin your washing with items that are light colored and not very dirty. You must agitate the cloth items to get all of the dirt out. You can do this by rubbing the cloth together with your hands, by rubbing the cloth on a washboard, by beating the clothes with sticks or on rocks, or by using a washing machine. If you have a washing machine, you do not have to touch the dirty clothes when you are washing them. If you do not have much water, you can use the same soapy water to wash several items.

Rinse the laundry carefully.

Rinse the items several times with clean water to remove the soap and the dirt. You may want to have two tubs of water and rinse the cloth first in one and then in the other. Wring out the cloth between the rinses.

After the regular rinse, you should rinse some items in a sanitizing solution to kill germs. Wring the sanitizing solution out of the cloth, and dry the cloth as quickly as possible on a clean clothesline or drying rack.

The following items must be sanitized: underclothes, towels, washcloths, dishcloths, sheets, pillowcases, hammocks, sanitary cloths used instead of toilet paper, and clothes and other cloth items used by a sick person. The bleach in sanitizing solution may lighten dark colored items.

Dry your laundry in bright sunlight.

Dry the items in bright sunlight, if possible, to kill germs and parasites. If possible, hang clothes to dry on a rope or wire. Sanitized clothing dried on bushes or the ground can get germs on it. If it is raining, you can dry the clothing under a waterproof cover such as a thatched roof or the edge of the house. Be especially careful to dry dark cloth in bright sunlight if you did not rinse it in a sanitizing solution.

Try to find ways to make washing laundry an easier job.

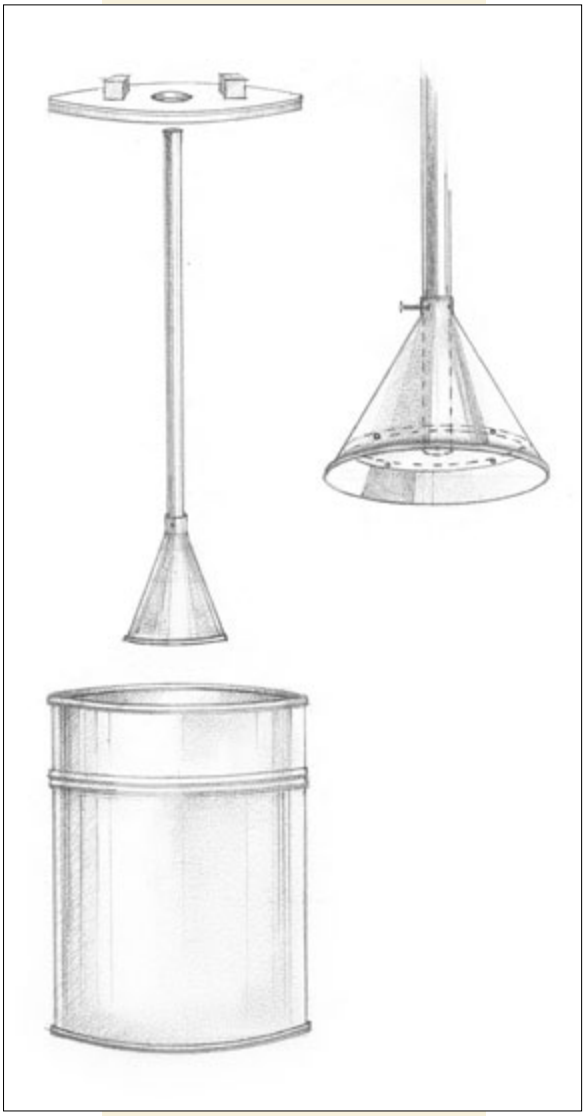
If you do all the things recommended in this chapter, you will probably have to spend more time washing cloth items than you did before. The following suggestions can help you make washing an easier job:

1. Pipe water into your home or take your laundry to a supply of water. Dry the laundry before you carry it home so that it is not so heavy.
2. Use less water by rinsing clothes first in one large tub of water and then in another.
3. Washing wears out cloth items, so you should buy cloth that will last a long time. Especially be sure that children's clothing will last a long time. You will have to do more work if you buy items that need special care, such as double knit, rayon, and delicate fabrics. Natural fibers like cotton, flax, and wool will usually last a long time. Some man-made fabrics will also last a long time. You should buy the items that work best for you.
4. Make a washing machine. Then you will be able to wash small items such as dishcloths, washcloths, and towels more easily. You will also be able to wash underclothes, diapers, and sanitary cloths without touching them.

Supplementary Material: Making a Hand-Powered Washing Machine

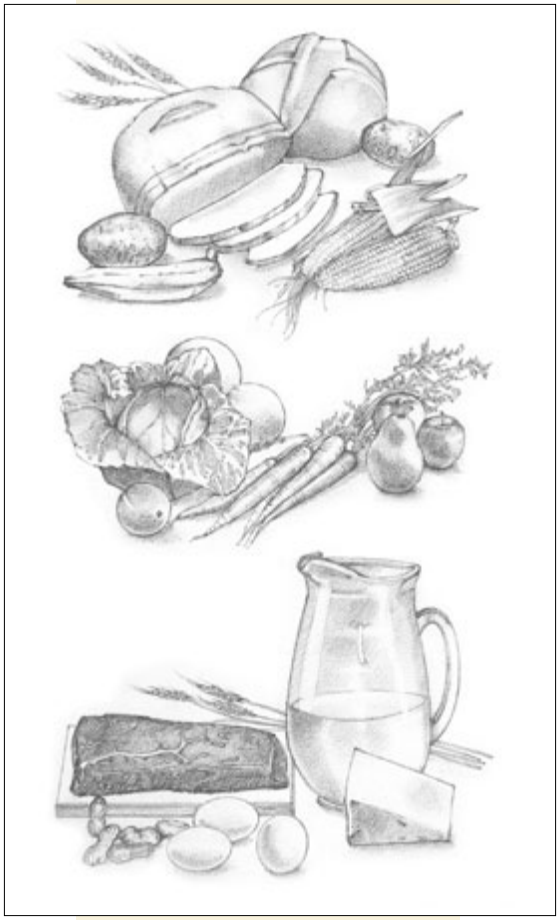
You can make a washing machine from a toilet plunger with a rubber suction cup, and a tall pail with a cover. The pail should be about twice as big around as the cup on the plunger. Make a small hole in the cover of the pail to put the handle of the toilet plunger through. Fill the pail with soapy water and cloth items. Put the cover on it with the plunger inserted through the cover. Raise the plunger above the water in the pail and lower it with quick up-and-down strokes. The plunger should come above the level of the water on the up stroke but should not hit the bottom of the pail on the down stroke. Wait a few seconds between strokes.

If you do not have a plunger or a pail, you can make a washing machine with available local materials.



CHAPTER 3

Nutrition



The Need for Good Nutrition

Good nutrition will help you to be healthy and strong.

Good nutrition means eating enough of the right kinds of food so the food can be used by our bodies.

A healthy person is alert, active, and usually happy. A healthy child grows at a normal rate and is interested in learning new things. To be a healthy person, you need to have proper nutrition. The foods that you eat can help you to grow and to be strong and healthy.

Our Heavenly Father loves us very much. Because He wants us to enjoy good health on earth, He has given us guidelines about the foods and other things that we take into our bodies. These guidelines are found in the Doctrine and Covenants, section 89, called the Word of Wisdom. In the Word of Wisdom, we are told to eat certain kinds of foods that contribute to good health.

Your body can become weak if you do not eat enough food or do not eat the right kinds of food. This is called malnutrition. Malnutrition may cause some very serious diseases and even death. It also causes other problems. Your body loses its ability to replace skin and hair and to keep strong eyes, teeth, blood, bones, and muscles.

Also when you have poor nutrition, you do not have enough energy to do what you need to do. A child may be too tired to play, and students may not be able to study and learn as well as they should. Adults may not be able to work the entire day.

In the Doctrine and Covenants, the Lord said:

"Yea, all things which come of the earth, in the season thereof, are made for the benefit and the use of man, both to please the eye and to gladden the heart;

"Yea, for food and for raiment, for taste and for smell, to strengthen the body and to enliven the soul" (D&C 59:18–19).

The information in this chapter will help you understand what kinds of food you and your family should eat to keep strong and healthy.

Every person needs energy foods, growth foods, and protection foods.

You can improve the health of your family members by helping them eat the right kinds of food. Every member of your family needs food from three different groups.

1. *Energy foods.* Foods in the energy food group give energy to your body. Most of these foods are high in starch. They include rice, corn, wheat, millet, cassava, taro, and potatoes. Other foods that provide energy for your body are cooking oil, seeds containing oil, lard, fat, and tallow, as well as sugar, molasses, and honey.

2. *Growth foods.* Foods in the growth food group give your body protein. Your body uses protein to grow and to repair body tissues. Foods in this group include various kinds of dried beans and seeds; meats such as beef, pork, poultry, and fish; milk and milk products such as cheese and yogurt; and eggs.

3. *Protection foods.* Foods in the protection food group are high in vitamins and minerals. Most fruits and vegetables are in this group. This group has three parts: foods high in vitamin A, foods high in vitamin C, and the other fruits and vegetables.

Foods high in vitamin A include all dark green, leafy vegetables, such as spinach, sweet potato tops, and chard, and all yellow or orange fruits and vegetables, such as mangoes, carrots, and orange squash.

Foods high in vitamin C include many fruits such as oranges, pomelos, strawberries, papayas, watermelons, and tomatoes.

The other fruits and vegetables in this group give our bodies important vitamins and minerals. However, they are not high in either vitamin A or vitamin C. They include bananas, okra, eggplant, green beans, and avocados.

You should eat some energy food, some growth food, and some protection food at each major meal during the day.

You should try to serve all three types of food in each major meal during the day. Doing this will make these meals complete. Some of the necessary food can also be served between major meals.

Every day you should eat at least one food that has a lot of vitamin A and one that has a lot of vitamin C. These foods can be eaten as snacks. If you do not eat energy foods, you will get very tired, and your brain will not work as well as it should. If you do not eat growth foods, your mind and body will not have the protein they need to develop and work properly. You will get sick very easily. If you do not eat protection foods, you may get many serious diseases.

The amount of food people need depends on how old they are, how big they are, how much they work each day, how healthy they are, and other things. For example, a child generally needs less food than an adult needs. A large man will need more energy food than a small man does to do the same work. However, everyone needs to have some food from all three groups every day.

Supplementary Material: Three Basic Food Groups

Common Energy Foods

Starchy Foods

Grains

corn
millet
quinoa
rice
wheat

Root vegetables

cassavas
potatoes
sweet potatoes
taro
yams

Fats and Oils

butter
lard
margarine
tallow
vegetable oil

Sweets

candied fruits
candies
honey
jams and jellies
molasses
sugar

Common Growth Foods

Dried Beans and Seeds

beans
mung beans
soybeans
lentils
peas
tarhui

Meats

beef
pork
poultry
rabbit
veal
fish or shrimp

Milk or Milk Products

cheese
ice cream
milk
milk custard
yogurt

Eggs and Egg Products

Common Protection Foods

Foods High in Vitamin A

Dark green, leafy vegetables

amaranth leaves
beet greens
chard
kale
mustard greens
spinach
sweet potato leaves
watercress

Orange fruits and vegetables

cantaloupes
carrots
mangoes
orange squash
orange yams
papayas
pumpkins
yellow sweet potato tubers

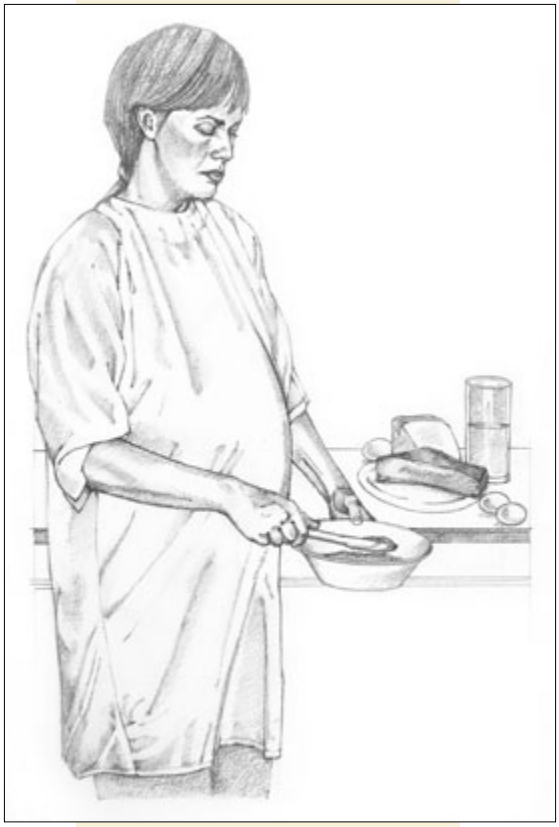
Foods High in Vitamin C

grapefruit
guayabano
guava
kalamansi
mangoes
oranges
papayas
pomelos
strawberries
tomatoes
watermelons

Other Fruits and Vegetables

avocados
bananas
bitter melons
cabbage
cucumbers
eggplant
green beans
green peas
jackfruit
lettuce
okra
pineapples
white squash
white sweet potatoes
white yams

Nutrition for Women



A woman needs very good nutrition before and during pregnancy.

Good nutrition is very important for women of childbearing age. The health of a pregnant woman is greatly affected by what she eats before and during the pregnancy. A growing unborn baby lives on the nutrients from the food the mother eats. So the mother's diet is also very important to the health of the child she is carrying.

Before pregnancy and after becoming pregnant, a woman needs to eat more foods that contain iron, calcium, protein, vitamin A, and folic acid.

Foods that contain iron are very important for women before pregnancy and especially after becoming pregnant. Iron is found in many of the growth foods. Foods high in iron include liver, red meats, eggs, beans, and enriched cereal products. Iron is also found in dark green vegetables.

Foods containing a lot of calcium are also important for women before and during pregnancy. Calcium is found in milk, cheese, yogurt, ice cream, dark green vegetables, dried beans, soybeans, curd, and some seeds and nuts. Different countries have different sources of calcium. In parts of Latin America where tortillas are eaten, the lime used in soaking the corn provides calcium. In other countries, bone marrow or soft bones provide calcium. Small fish that are cooked until their bones are soft and eaten whole also provide calcium.

Growth foods that contain protein (see pages 29–30) are important to help prepare the body of a woman to have a baby. They are also important to help a baby grow in the womb. Some good growth foods are fish, poultry, meat, eggs, milk, yogurt, cheese, beans, and nuts.

Protection foods (see pages 29–30) are important for the mother and for the baby growing in the womb. Those containing vitamin A and folic acid are especially needed. Good sources of vitamin A are orange and green vegetables. Good foods for folic acid are beans and legumes, citrus fruits, whole grains, dark green leafy vegetables, poultry, pork, shellfish, and liver.

A mother who is breastfeeding a baby needs even more good food than when she was pregnant and also plenty of clean water.

The best food that can be given to a newborn baby is milk from its mother. When drinking mother's milk, the baby gets the nutrients needed from food the mother eats. If the mother eats well during pregnancy and while she is breastfeeding, her child usually needs no other food for the first six months.

While a mother is breastfeeding, she should eat even more growth foods (see pages 29–30) than when she was pregnant. She should especially eat foods that contain a lot of calcium. She also needs a lot of clean water so she can provide enough milk for her baby. Drinking plenty of clean water will help her continue to make milk.

Supplementary Material: Iron and Calcium Sources

Common Iron Sources

Enriched Foods

enriched cereals
enriched cornmeal
enriched flour
enriched pasta
enriched rice

Beans

baked beans
black beans
kidney beans
navy beans
pinto beans
soybeans

Meats

beef
chicken
duck
lamb
liver
mollusks
pork
poultry giblets
seafood
turkey

Lentils

Tofu

Green, Leafy Vegetables

amaranth leaves
collard greens
kale
mustard greens
spinach
turnip greens

Other Vegetables

asparagus
broccoli
brussels sprouts
parsley
swiss chard

Common Calcium Sources

Milk Products

cottage cheese
cream
hard cheeses
ice cream
milk (fresh, dried, or even evaporated)
yogurt

Dark Green Vegetables

amaranth
broccoli
mint leaves
spinach

Dried Corn Treated by Soaking in Lime Water

corn tortillas
hominy
masa

Dried Beans and Nuts

almonds
filberts or hazelnuts
garbanzo beans
many dried beans
soybeans and soy flour
tofu (if made with calcium)

Seeds or Grains

chia
finger or ragi millet
teff

Small Bones of Fish Cooked until Soft

anchovies
canned salmon
sardines

Flour Made from Small Dried Fish

Dark Molasses

Nutrition for Babies

A baby should be breast-fed from the day it is born.

The early breast milk contains colostrum, which is very important and will protect the baby from infections in the intestines and other illnesses. For this reason, the mother should begin breast-feeding the baby from the day it is born if at all possible.

For the first few days, the amount of milk the mother produces may not seem to be enough for the baby. The baby may nurse very little, but that may be all it needs. For these first few days, the mother should feed the baby for about five minutes on each breast at each feeding. In the next week or two, she can gradually increase the feeding to 10 or 15 minutes on each side. As she continues to nurse her baby, her supply of milk will usually increase to meet the needs of the baby. Eventually, milk from one breast may be enough for a feeding. The other breast may be used for the next feeding. Frequent breast-feeding during the first few weeks is the best way to develop a good milk supply. By the time babies are four to six weeks old, they can usually be fed every three or four hours during the day.

A baby that is getting enough milk will be satisfied after feeding and will be gaining weight. A well-nourished baby should double in weight in about five months. It should triple its birth weight in one year.

A baby can begin eating other foods at about six months. But breast milk should still be the baby's main food until at least age one. The mother should breast-feed the baby first and then offer other foods. Then she will have enough milk. When the baby is about one year old and begins to eat more and more of the other foods, it will need less breast milk. But it is good to continue breast-feeding until the baby is two or older.

A baby should begin eating other foods at about six months.

At about six months or a bit earlier, a baby should begin eating foods other than breast milk. As you begin to give other foods to your child, you should remember three things:

1. Give the baby only one new food at a time and not more than one or two new foods in a week.
2. Mash or puree the food so it will be easy to eat and the baby will not choke on a piece of food.
3. Be very careful to wash your hands and prepare the food with sanitized utensils so germs do not get on the food.

The first food should be a very thin rice gruel. Other starchy gruels or pureed vegetables, fruits, or lean meats should be added next. Very ripe fruits such as bananas, avocados, papayas, and mangoes are easy to puree. Vegetables and lean meats should be cooked before they are pureed. The juice from the strained food, or water that has been purified, can be used to thin the puree and make it easy for the baby to swallow. If the food is tart, a small amount of sugar may be added.

To puree food, do the following:

- Wash hands with soap and water; also consider rinsing in sanitizing solution and purified water.

Sanitizing Solution

1 liter water + 1 teaspoon fresh chlorine bleach (4–6%)

- Sanitize fruits or cooked vegetables to be pureed, and rinse them in purified water.
- Sanitize utensils, and rinse in purified water.
- Peel the fruits and vegetables or finely mince fresh, well-cooked meat.
- Mash the food with a fork.
- Use a spoon to force the food through a strainer into a clean bowl.
- Throw away the pulp left in the strainer.
- If needed, thin the pureed food with juice from the food or with water that has been purified.

Foods for the baby do not need to be cooked separately from those for the rest of the family. Vegetables, roots, pasta, or rice can be taken out of a pot of food for the whole family and pureed for the baby. Foods that have been salted or highly seasoned should not be given to the baby. (See the supplementary material at the end of this section for recipes for baby food.)

Fruit juices give the baby vitamin C. You can easily prepare juices from such fruits as oranges, kalamansi, pomelos, papayas, or watermelons by squeezing or mashing these fruits. Then strain the juice with a strainer or a sterile piece of cloth to remove small pieces of fruit. Add an equal amount of purified drinking water to the juice to dilute it. Add only enough sugar to make the juice taste good to the baby.

Some foods should not be given to small babies. Avoid giving babies salt or other seasonings or egg white during the first year. Avoid honey until they are one or two years old. Do not give children nuts, popcorn, or other hard pieces of food until they are more than two years old.

A baby that is born prematurely or to a poorly nourished mother needs special feeding.

Premature babies or babies born to poorly nourished mothers are called “at-risk” babies because it is very easy for them to get sick or even die unless they are properly cared for. At-risk babies require special feeding and care.

Breast-feeding from the first day of life is especially important for an at-risk baby. The colostrum that a baby receives from the mother’s breasts is greatly needed. If an at-risk baby cannot be breast-fed, it should be under the care of a specially trained medical person.

Breast-feeding should continue for at least the first year and longer if possible. If the baby is gaining weight at a steady rate, there is no need to add other foods until the baby is about six months old. An at-risk baby needs good nutrition but cannot take in large amounts of food. It is better to improve the mother’s diet than to try to add foods too fast to the baby’s diet.

When food is added, it should be given to the baby in very small amounts. Only one new kind of food should be added each week. When preparing foods for an at-risk baby, be very careful not to spread germs. You should wash and sanitize your hands and the utensils before preparing the food. The food should be fresh, fruit should be sanitized, and cooked foods should be boiled.

Purified Drinking Water

1 liter water + 4 drops
fresh chlorine bleach (4–6%)

Follow the general pattern for adding foods to the baby's diet as you would for a healthy baby. Begin by adding cereal or fruit. Avoid wheat products at first, since they may cause allergies and intestinal problems.

If breast milk is not available because the mother is missing or very ill, the baby should receive special formula.

While breast milk is clearly best for babies, if it is not available, the next best option is commercial, iron-fortified baby formula prepared as directed. If commercial formula is not available or costs too much, then animal milk can be prepared as a formula in an emergency.

A mother must wash and sanitize her hands before she makes the formula and be very careful to use utensils and containers that are clean and have been sanitized. Only purified drinking water should be used to prepare formulas. Never add more water than directed to dilute the formula to make it last longer. If it is diluted, the baby will not get enough of the nutrients needed.

If an animal milk must be used, choose one from the following table to create the formula. Mix the amount shown of that milk with the amount of purified drinking water shown on the row below it and three teaspoons (or one tablespoon) of sugar.

Purified Drinking Water

1 liter water + 4 drops
fresh chlorine bleach (4%–6%)

Animal Milk	*Cow or Goat (Evaporated)*	*Cow or Goat (Whole)*	*Sheep or Buffalo*
Milk	100 mL	200 mL	140 mL
Purified water	240 mL	140 mL	200 mL
Sugar	3 teaspoons	3 teaspoons	3 teaspoons

Honey, molasses, or corn syrup sweetener should not be used in the formula. To use donkey or mare milk, thoroughly mix one teaspoon (5 mL) of vegetable oil with each 340 milliliters of milk, but do not add water or sugar.

The milk must also be sterile. Boil the formula, and let it cool at room temperature in a sterile container protected from dust and flies.

Supplementary Material: Recipes for Baby Food

The water from unsalted cooked vegetables or broth from cooked meat is nutritious and safe. You can use it to make foods. Make gruel from boiled rice in the following way:

Food	*Amount of Boiled Rice*	*Amount of Water*	*Boiling Time*	*Yield*
Thin gruel	½ tablespoon	½ cup	10 minutes	5 tablespoons
Thick gruel	4 tablespoons	1 cup	10 minutes	12 tablespoons
Soft rice	1 cup	1 cup	5 minutes	1½ cup

You can make other gruels from corn or oats as well as from starchy roots such as cassava, potato, and yam. Wheat does not make a good gruel for babies under the age of one year, since it causes allergies.

Egg Yolk–Rice Gruel

½ cup unsalted meat or chicken broth

2 tablespoons of boiled rice

1 egg yolk, beaten

1 tablespoon of milk or evaporated milk

Add broth to rice and mash with the back of a spoon. Bring to a boil. Combine egg yolk and milk. Add to the rice-broth mixture. Lower heat, and cook three minutes. Let cool. Give to babies seven to eight months or older.

Mixed Vegetable and Bean Puree

¼ cup of water from unsalted cooked vegetables (or purified water)

¼ cup of boiled beans, mashed

¼ cup of tender greens

1 tablespoon of milk or evaporated milk

Add water to greens, and boil for five minutes. Add beans and heat to boiling. Remove from fire, mash well, and pass through a sieve. Add milk, and cook two minutes, stirring constantly. Let cool. Give to babies seven to eight months or older.

Fish or Shrimp Powder or Flour

Toast small fish such as fresh anchovies and small shrimp over a low fire until they are crisp (20 to 30 minutes depending on the size of the fish). Powder them, and pass them through a fine sieve. You can keep the powder for a week and use it in gruel and pureed vegetables as a growth food. Give to babies six months or older.

Starchy Root Cooked with Coconut Milk

Add cooked sweet potato, yam, cassava, or potato to an equal amount of thick coconut milk. Mash into a gruel. Cook it over medium heat for three minutes, stirring constantly. Let cool. Give to babies six months or older.

Peanut-Banana Mash

Blend a ripe banana with ¼ cup of smooth peanut butter. Give to babies six months or older. If you do not have peanut butter, toast ¼ cup of shelled peanuts (without molds) until golden brown. Remove skins, and pound or grind finely. Be sure there are no small pieces of peanut that may cause the baby to choke.

Stretching the Food Budget

If you shop wisely, you can save money.

When you buy food, you pay for much more than the value of the food itself. Here are some things you pay for:

- The cost of the food itself.
- The cost of the fuel you use to prepare the food.
- The cost of your travel to buy the food.

Sometimes you can reduce the cost of food by buying a lot of food at once rather than small amounts. It is usually best to do this during the harvest season, when the food is at its lowest price.

If you buy large amounts of food, you must store the food well so that it will not spoil. You must think about what foods will store well without spoiling for a week, two weeks, or a month. Grains, seeds, sugar, cooking oil, dried fish, and whole squash may be good for storage.

Buying food in the less expensive markets can also help you save money. Sometimes you can buy things for a lower price by going to a large marketplace in the central city. However, you must also remember the cost of transportation. You need to learn where you can shop to get the lowest price for good food.

Another way to pay less for food is to learn to get the best value for the least money. For example, there are many different kinds of growth foods (see pages 29–30), but they do not all cost the same. You can plan your meals to use more of the less expensive foods.

You can save money by avoiding foods that do not help the body grow or stay healthy. In many parts of the world, people drink a lot of soda pop and eat puffed rice, puffed pasta, fried chips, and candies. These kinds of foods do not provide good nutrition. Also, they waste money that should be used on food to make a complete and balanced diet. For example, candy and soda pop provide only energy, and they usually cost much more than the value of sugar. The amount of money spent on one soda pop could provide something much more nutritious.

You can save money and keep the nutrients in food by the way you cook.

The cost of the fuel needed to cook food can raise the cost of the food. But many foods must be cooked well to kill germs. You may spread germs if you try to save fuel by just warming the food instead of cooking it fully. However, there are ways to use less fuel and still have sanitary food.

One way is to cook vegetables in a container above a steaming pot of rice or beans during the last few minutes of cooking the rice or beans. The vegetables do not need to be mixed with the cooking food, just exposed to the steam above the food being cooked in the pot. The vegetables should be in a container that is the same size as the pot so heat will not be lost around the sides. The water in the pot should be just barely boiling so heat is not wasted.

Another good idea is to soak grains and seeds in water before cooking them. This will shorten the cooking time. Rice needs to be soaked for about an hour, but beans should be soaked for at least 12 hours before cooking.

The instructions for soaking rice are as follows:

- Measure the rice and wash it once.
- For every three cups of rice, use four to five cups of water.
- Soak the rice in the water for one hour. Drain off the water into a cooking pot.
- Bring the drained water to a boil.
- Cook the rice in the boiling water as usual.

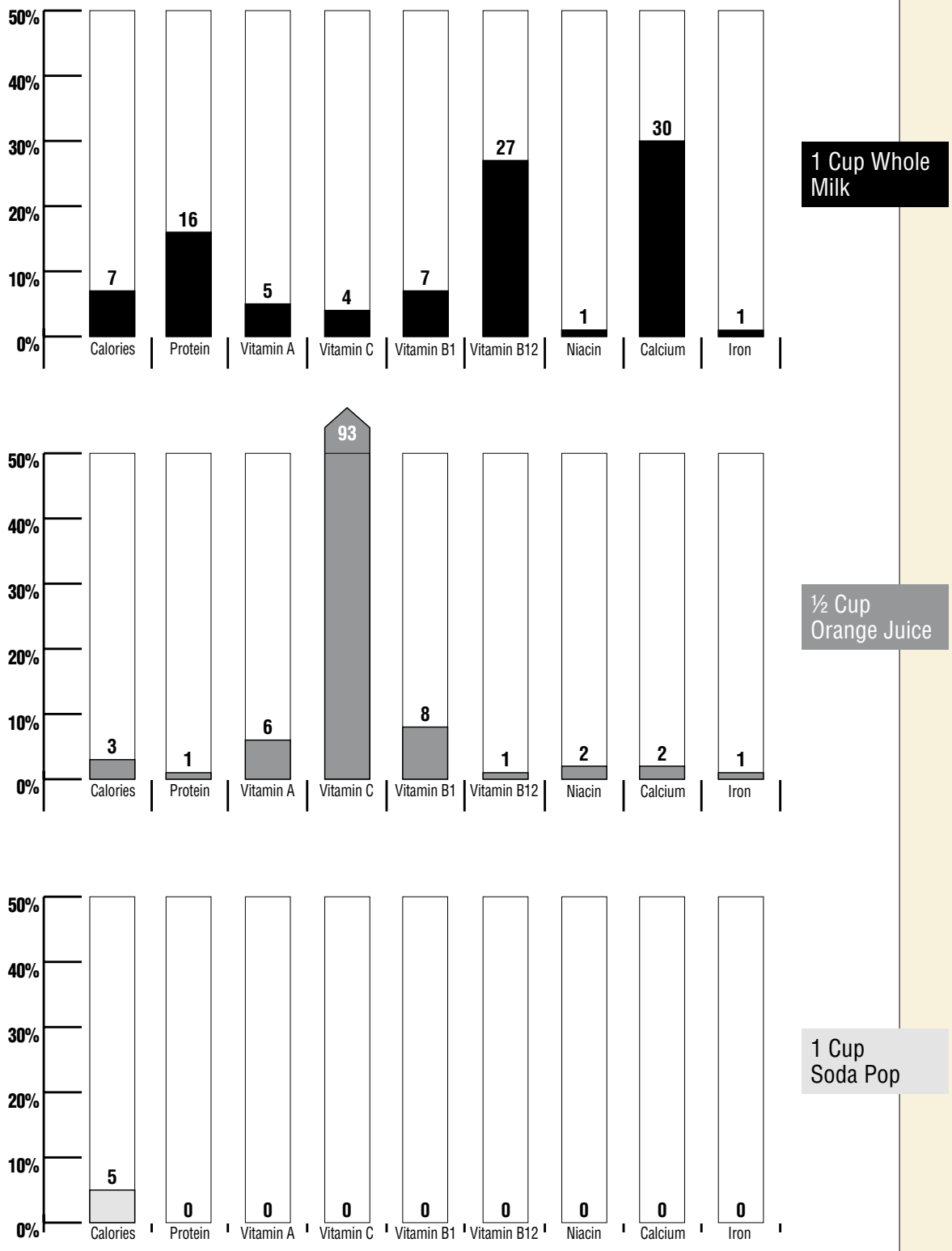
The rice will be cooked in less time and with less fuel.

Some of the nutrients in food are destroyed or lost when food is cooked or washed. Here are some things you can do to reduce the loss of nutrients in food:

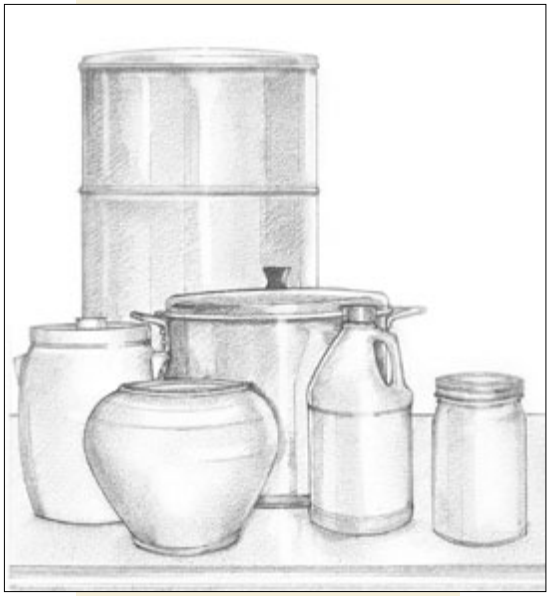
- Wash enriched grains only once before cooking. Cook them for a short time in very little water.
- Do not cut or slice vegetables until just before cooking.
- Steam vegetables rather than boiling them, or boil them in small amounts of water.

Supplementary Material:
The Nutrition in Soda Pop Compared to Milk and Juice

Based on 50 Percent of Recommended Daily Allowance



Food Storage



You should store food that will provide good nutrition for your family.

We have been counseled to store food so that we will be able to provide good nutrition for ourselves at all times. Many fruits and vegetables are available only at certain times of the year. You can buy them during the harvest season when prices are low and store them. You will be able to eat the food you store during times when fresh foods are not available.

Having a supply of food can also be of great importance to you in times of emergencies such as fires, floods, earthquakes, famines, typhoons, or other times when food is difficult to get. If you were ever unable to earn money to buy food for your family because of illness or unemployment, it would be very helpful to have some food stored.

If you decide to store food, you should make sure that it will provide good nutrition for you and your family.

Store food from each of the three basic food groups: some energy foods, some growth foods, and some protection foods (see pages 29–30).

The body must have energy foods constantly. It is very important for your family to store a supply of some energy foods.

It is also important to store growth foods. When people eat growth foods regularly, their bodies can grow and repair themselves. Growth foods are most important for infants, children, pregnant or nursing women, and people recovering from an illness.

Most fruits and vegetables are good protection foods. Some are very important because they have a lot of vitamin A or vitamin C.

Remember to store foods that your family members are used to eating and like to eat. In an emergency, if they have to eat food that they do not like or are not used to, they could get sick.

Store the amount of food that will be right for your family.

The amount of food you store depends on many things, including the size of your family, the cost of food, the climate, and local laws for food storage. Many people are able to store only enough for one or two weeks. Others are able to store enough food to last from one harvest season to the next or even for a full year. You should determine for yourself how much your family should store.

You should be wise as you store food and water. Do not go to extremes; it is not prudent, for example, to go into debt to establish your food storage all at once. With careful planning, you can, over time, establish a home storage supply.

Three-month supply. Build a small supply of food that is part of your normal, daily diet. One way to do this is to buy a few extra items each week to build a one-week supply of food. These items should be rotated regularly to avoid spoilage. If money is scarce and you cannot afford to purchase extra food, you can take a handful of the uncooked food you prepare daily and store it in a glass jar. You will soon have a reserve of your most basic food, whether it is rice, beans, wheat, or cornmeal. Then you can gradually increase your supply until it is sufficient for three months.

Longer-term supply. For longer-term needs, and where permitted, gradually build a supply of food that will last a long time and that you can use to stay alive, such as wheat, white rice, and beans. These items can last 30 years or more when properly packaged and stored in a cool, dry place. A portion of these items may be rotated in your three-month supply.

Stored foods do not last indefinitely. You should rotate them by eating older stored foods first and replacing them with freshly preserved foods. This rotation plan is a continuing process. One way to assure proper rotation of foods is by marking the date on packages of food as they are purchased or stored. Put recently purchased or preserved food on the shelf behind foods that you purchased or preserved earlier. As you prepare meals, this will make it easier for you to use the older foods first.

Choose the best method for you to preserve the types of food you eat.

There are many different ways to preserve and store food. They include the following:

- Storing under the ground level
- Smoking or curing
- Drying fruit, vegetables, and meat
- Canning or bottling
- Salting or brining
- Fermenting or pickling
- Cold storage or freezing
- Dry food storage in PETE containers or glass bottles

When selecting a method of preserving food, consider expense, need for special equipment, and dependability of the method. Consider whether it is a new method in your area or one that has been used successfully by many people for a long time.

Once foods are preserved, they must be stored in a way that will keep them clean and safe to eat.

Regardless of the method you use to preserve foods, you should always follow these requirements:

1. Keep foods cool. Store them in a dark or shady place, away from sunlight.
2. Protect foods from moisture. Dried foods will spoil if they get wet before they are used. Food preserved by other methods may spoil from excess moisture.
3. Protect foods in packages or containers. The best containers prevent dust from reaching the food and make it difficult or even impossible for insects and animals to eat the food.

(See the supplementary material at the end of this chapter for additional information on preserving and storing food.)

Store some purified water in case of emergencies.

Natural disasters such as earthquakes, typhoons, or floods often cause water supplies that are normally clean to become dirty and full of germs. It is a good idea to have a small supply of purified water stored in case of such emergencies. Each family member needs about four liters of purified water every day.

Before you store water, if it is not clear you may want to pass it through a filter. You should purify it by adding four drops of strong chlorine bleach (4 to 6 percent sodium hypochlorite) to each liter.

Store your purified water in a plastic or glass container. Clean the container very well with soap, and rinse it with sanitizing solution. If you use glass bottles, put them in larger containers or pad them to keep them from breaking in case of an earthquake.

Check the containers every month to see if a lid is beginning to rust or if a plastic bottle is beginning to split and leak.

Another way to provide pure water in case of emergencies is to store a bottle of bleach that could be used to purify water.

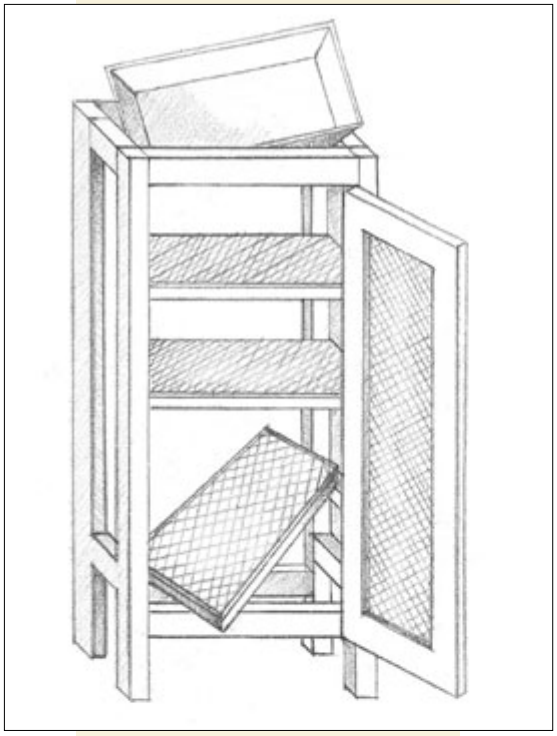
Purified Drinking Water

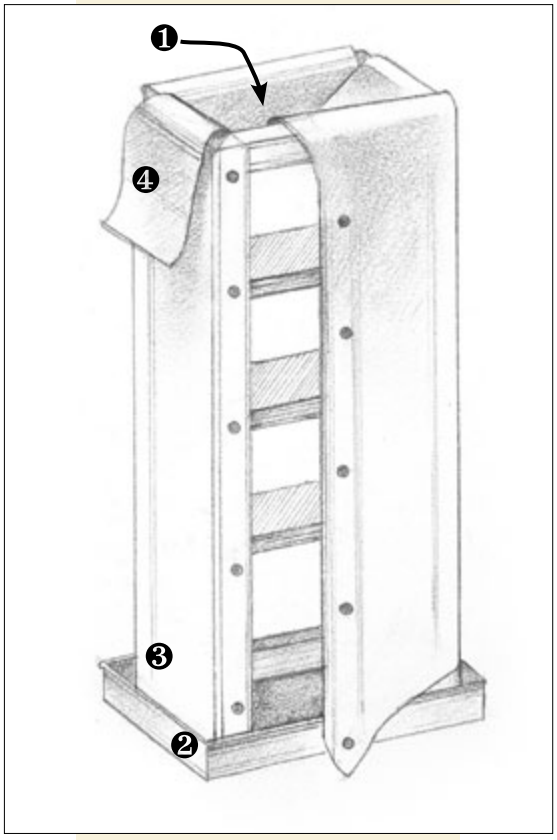
1 liter water + 4 drops
fresh chlorine bleach (4–6%)

Sanitizing Solution

1 liter water + 1 teaspoon
fresh chlorine bleach (4–6%)

Supplementary Material: Food Storage





Making a Food Cooler

An evaporative cooler will keep meats, fruits, vegetables, milk, and butter cool. It costs very little to build and nothing to operate. The following directions will provide a general outline of how to make it. Use local knowledge and materials to make the refrigerator useful for your area. Please note, however, that it will not cool effectively in a humid environment and in such circumstances may encourage the growth of mold, germs, and mosquitoes in the containers of water.

Make a wooden frame, approximately 140 centimeters high by 30 centimeters wide by 35 centimeters deep. Cover it with screen wire or hardware cloth, preferably the kind that will not rust. If you cannot get such wire, you can use woven grasses or branches. The top of the frame should be covered with wire, but the bottom may be solid. Make a door for one side and mount it on hinges or leather thongs. Fasten it with a wooden button or latch.

You can make adjustable shelves out of light wooden frames covered with poultry wire mesh or woven grass or other plant material. Put these shelves on side braces.

Paint the woodwork and the shelves. If this is not possible, oil the wooden parts with linseed oil, coconut oil, or cooking oil, and let them dry for a few days before using.

Make a cover of flannel, burlap, or other heavy, coarse, water-absorbent cloth to fit the frame. Put the smooth side of the fabric on the outside. Button the cover around the top of the frame and down the side on which the door opens. Use buggy hooks and eyes or large-headed tacks and eyelets, or simply lace cord through worked eyelets.

Place a pan 10 centimeters deep or a shallow bucket on top of the frame (❶). Put the frame in a larger container of water (❷). Both containers should be painted. The bottom of the cover (❸) should extend down into the lower pan. Sew four doubled strips of cloth (❹), 20 to 25 centimeters wide, to the upper part of the cover. These strips form wicks that dip over into the upper pan.

The operation of this refrigerator is simple. Keep it in a shady place where the wind can blow over it. Keep the upper pan filled with water. The water is drawn through the wicks, and it saturates the cover. Cooling starts more quickly when the cover is dampened by dipping it in water or throwing water on it. The greater the evaporation, the lower the temperature inside the refrigerator.

Regularly clean the refrigerator and put it in the sun. It is a good idea to have two covers so that a fresh one can be used each week while the soiled one is washed and put in the sun to be dried and sanitized.

Ways to Preserve and Store Foods

Storing under the ground level. This method is good for some root vegetables and certain fruits and green, leafy vegetables. Fruits and vegetables should not be stored together. If green, leafy vegetables are stored, there must be good drainage and not too much rain. They can be stored only if in a cool, dry place, such as a cellar. Some examples of vegetables and fruits that can be stored are carrots,

potatoes, dry beans, cabbage, celery, grapes, onions, oranges, pears, peas, pumpkins, squashes, and turnips.

Smoking or curing. A type of drying using smoke increases the storage life of food. Curing involves a combination of curing agents and smoking to preserve the food. Commonly used for preserving meats and fish, these methods greatly alter the flavor of the original product. Smoked or cured foods keep only for a few months. You must be very careful to use the right amount of curing agents, such as nitrates and nitrites. Please consult local authorities for smoking and curing recommendations for your area.

Drying fruits, vegetables, and meats. Foods such as fruits, vegetables, and meats can be stored by drying them first in the sun. The basic requirements for food drying are heat (from sunlight), circulating air, and protection from dust, dirt, and animals. The food should be cut into fairly thin sections and placed on a screen of thin cloth that allows the air to circulate. The food should be dried until there is no apparent moisture when the food is bent.

Canning or bottling. Heat-processed foods that are sealed in a closed container, such as a glass bottle, can be stored for a year or more. However, appropriate containers, equipment, and fuel are necessary for this process and may be expensive. Low-acid foods, such as vegetables and meats, may cause severe illness and death if they are improperly processed. Canning must be done in a steam or water bath and cannot be done in the oven. Please consult your local authorities for the best canning practices for your area.

Salting or brining. Salt may be used in the drying process to increase storage time of some foods, such as fish. Salt and water brines may be used to prevent the growth of spoilage organisms in some foods. Excess salt may be washed away before the salted food is used.

Fermenting or pickling. Fermented or pickled products include pickles, sauerkraut, fermented soybean curd, and pickled eggs and olives. These methods make it possible to store vegetables for several months.

Cold storage or freezing. Refrigeration and freezing are useful ways to preserve many foods. However, these methods usually take a great deal of space and fuel consumption unless the food can be stored outside in very cold climates.

Dry food storage in PETE containers or glass bottles. To keep dry foods from spoiling, you must protect them from moisture, pests, or other contamination. In addition, foods will be better quality and more nutritious if they are protected from heat and light.

Selecting Storage Containers

A good container may be made of glass, metal, rigid plastic, wood, or clay, depending on storage conditions. It should retain moisture and natural food odors while keeping out additional moisture, rodents, insects, microbes, dust, air, and light. Where moisture is a problem, avoid wooden or paper containers.

Rodents and insects can penetrate wood, cardboard, and thin plastic. In the right storage area, polypropylene and polyethylene bags and containers are safe, but not all plastic materials can be used to store food. Buckets that have been used for food products may be used again, but after many years the plastic may decompose, crack, and emit odors, making the containers unsuitable for storage. Use metal containers only in a dry storage area, and protect glass containers from breaking. Containers must be airtight and capable of being tightly sealed.

In summary, the principles for how to store foods are:

- Store foods so as to avoid the effects of air, light, heat, moisture, insects, and rodents.
- Choose storage areas according to the types of food you store. Remember that cool, constant temperatures and low humidity are preferable.
- Store food in durable containers that best suit the conditions in your storage area. Any container that will keep out air, heat, moisture, and pests is suitable.
- Control insect contamination by keeping the storage area clean and by treating insect-infested foods.

Storing Bulk Dry Foods

The following recommendations apply to dry foods such as grains, beans and other legumes, dehydrated fruits and vegetables, and non-fat powdered milk. Before storage, the foods need to be clean, dried to a moisture level of about 10 percent or less, and low in oil content. You will want to choose whole grains and legumes of excellent quality for storing. Because the grain must be dry, you can either dry it in the sun or in an oven.

If you use an oven, heat the oven on low heat for 10 minutes and turn the oven off. Place the grain or beans on a toasting pan or tray, and put them inside the slightly warm oven for 10 minutes.

To test the dryness of your grain or beans after drying, place one grain or bean on a hard surface and smash it with a rock. If the grain or bean fractures or breaks into pieces, then it is dry enough. If it is still bendable and does not fracture into pieces, then it needs to be dried more before storing.

Plastic bottles such as used soda pop or juice bottles that have only held food items are often used to store dry foods. Glass bottles with metal gasket lids can also be used.

PETE Bottles for Longer-Term Storage

Bottles made of PETE (polyethylene terephthalate) plastic can be used with oxygen absorbers to store products such as wheat, corn, and dry beans. PETE bottles can also be used without oxygen absorbers, using the alcohol method to reduce the amount of oxygen in the PETE bottle. PETE bottles are identified on the container with the letters PETE or PET.

PETE bottles can also be used for shorter-term storage (up to five years) of other shelf-stable dry foods such as white rice.

Packaging in PETE Bottles

1. Use PETE bottles that have screw-on lids with plastic or rubber lid seals. You can verify that the lid seal will not leak by placing a sealed empty bottle under water and pressing on it. If you see bubbles escape from the bottle, it will leak.
2. Clean used bottles with dish soap and rinse them thoroughly to remove any residue. Drain out the water and allow the bottles to dry completely before you use them for packaging food products.
3. Place an oxygen absorber in each bottle. The absorbers can be used with containers of up to one-gallon capacity (four liters).
4. Fill bottles with wheat, corn, or dry beans.
5. Wipe top sealing edge of each bottle clean with a dry cloth, and screw lid on tightly.
6. Store the products in a cool, dry location, away from light.
7. Protect the stored products from rodents.
8. Use a new oxygen absorber each time you refill a bottle for storage.

The alcohol method. If you do not use an oxygen absorber, then you can follow these simple instructions to reduce the amount of oxygen in your PETE bottles:

1. Fill the bottle to about three fingers from the top with a grain or legume, such as beans, peas, lentils, wheat, beans, popcorn, soybeans, oats, chickpeas, bulgur wheat, or hominy. As you fill the bottle, make sure to tap the sides so that all the contents settle and there is no additional trapped air.
2. Make a funnel with aluminum foil and place it inside the PETE bottle. You can use your fingers to make a hole in the grain to make room for the funnel.
3. Place a small piece of cotton with a tiny amount of rubbing alcohol on it inside the aluminum foil funnel in the PETE bottle.
4. Ignite the small piece of cotton and immediately cap the bottle. The fire will consume the oxygen inside the bottle.
5. Tape around the lid at least three times to seal the bottle.

Other methods for storing grain and beans in PETE bottles include using garlic cloves, bay leaves, or oil.

The garlic method. Fill the PETE bottle up to the height of three fingers of grain or beans, and then add three garlic cloves with the skin intact. The cloves should have the entire shell without cracks and should be small enough to fit through the opening of the PETE bottle. Then fill the PETE bottle to the next height of three fingers, and add three garlic cloves with skin intact. Repeat this process until you fill the PETE container to the neck. You should feel that the bottle is airtight and is hard like a rock. Then place the lid on the PETE bottle, and tape securely to seal the lid. You should not use more than nine cloves per PETE bottle. Shelf-life is one to two years.

The bay leaf method. Start by placing three bay leaves or laurel leaves at the bottom of the PETE bottle. Then fill the PETE bottle to the height of three fingers, settle the grain or beans, and place another three bay leaves or laurel leaves on top of the grain or beans. Repeat the process of adding a layer of grain or beans, settling the contents, and adding three more bay leaves or laurel leaves until you reach the neck of the bottle. The PETE bottle will be hard like a rock if you have done it correctly. If it is not hard, then you need to start over. When you have finished filling the PETE bottle, place one last bay leaf or laurel leaf on top of the grain or beans, and place the lid on the PETE bottle to secure it. Then seal it with tape.

The oil method. This process should be used with one pound of grain or beans at a time. After drying the beans or grain, mix them with one tablespoon (15 mL) of vegetable oil. Keep the beans or grain in plastic bags. The plastic bags can then be stored in durable containers such as plastic bottles or cans. This will help to reduce insects or rodents.

CHAPTER 4

Family Food Production

Planning for a Garden

You can grow a successful garden.

Some people have grown gardens for many years and are very good at it. However, others who do not have as much experience often think that growing a garden is too difficult. Do not let fear keep you from growing a garden. Almost everyone who tries to grow a garden for the first time makes a few mistakes. But by making mistakes we learn how to do things better the next time. Your garden will be a success if you and your family are committed to spending the time and doing the work that will be needed. If you are willing to make the effort, you can have a successful garden.

The information in this chapter applies to gardens in most parts of the world. But you should also use the resources in your community. Local people and organizations can tell you specific things that make gardening successful in your area.

Plan to grow foods that meet the particular needs of your family.

You must decide what kind of garden will be right for you. You will want to consider such things as the size of your family, the amount of land available to you, the cost of seeds, the amount of time you have to work in your garden, and how much experience you have. Every family has different needs, so you should make sure that the garden you grow is right for your family.

It is very important to choose foods to grow that will improve nutrition for your family. We all need food from three different groups (see pages 29–30).

You will need different amounts of land to grow foods in each of these groups. Energy foods need a lot of space. Growth or protein foods need medium amounts of space, and protection foods need little space. To grow enough food from all three food groups to completely feed a family of six requires half a hectare of good land (about one acre). This is true if the climate is tropical and two crops are harvested each year.

If you have enough land, you can grow a garden that will provide the majority of the food your family needs. If you have only a small amount of space, you may want to grow foods from the protection group. In a small area, you can grow some dark green, leafy vegetables that contain good amounts of vitamin A. Tomatoes and peppers contain good amounts of vitamin C and can be grown in small planters, pots, or plastic bags.

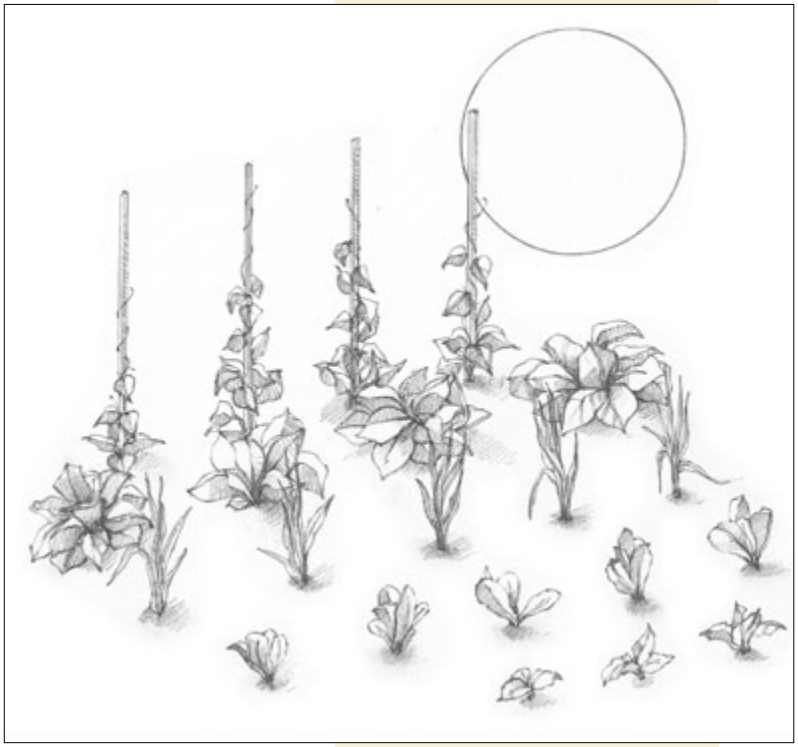
When you are deciding what foods to plant, be sure to think about the foods your family likes. It is important to grow foods that will provide good nutrition for your family. But it does not matter how nutritious the food is if your family will not eat it.

People often make the mistake of trying to grow a garden that is too large and has too many different kinds of food in it. Unless you have a lot of experience in growing gardens, it is usually better to start out small. Begin with only three or four kinds of crops. Choose those that will provide good nutrition and that the family likes. Choose crops that grow well in your area and do not require a great deal of work. Get information from local universities, ministries, bureaus, and neighbors.

Choose the best possible place and design for your garden.

Even if you have no plot of ground for a garden, the supplementary material following this section tells how you can still grow vegetables in containers. Otherwise, when you are choosing a place for your garden, consider the following things:

Soil. Choose a place where the soil is loose and does not have many rocks. The soil must be free from tree roots, grasses, and weeds. Soil that grows a lot of weeds will usually also grow good vegetables if the weeds are removed first.



Slope. Try to find a place where the ground has very little slope. The ground should be flat enough that the plants and fertilizer will not wash away. However, it should have some slope so that the water will drain and not stand around the plants. In some areas, the ground may slope so much that you will have to build terraces to hold the plants and fertilizer.

Water. Choose a place for your garden that is close to a source of water. You must have water to use in your garden. Even if you plan to use rainfall for water, you will need some water to use while planting and transplanting, after weeding, and during dry periods.

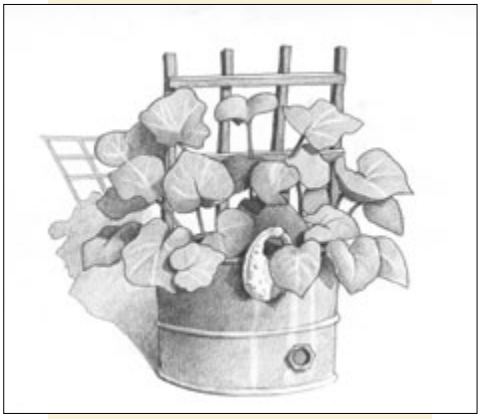
Sun. Find a place for your garden where the plants will get lots of sun. Energy and growth foods need full sun to be able to grow well. Protection foods need sun too, although some will grow when they are partly shaded.

After you have chosen the place for your garden, you should decide where to plant the different crops in the garden. To do this, make a drawing of your garden before you plant it.

Plan to plant the different crops in your garden so that they will get enough sun. Fruit trees, vines on poles, or tall vegetables should not be planted where they will keep the sun from getting to other plants. Smaller vegetables should be planted in rows that run from north to south to help them get the most sun.

It is a good idea to keep the drawing of your garden in a place where you can find it next year. Some plants leave the soil with more nutrients than were in it before. Other crops, such as corn, take nutrients out of the soil very quickly. You will need to grow these plants in different places in your garden each year. Having a drawing of the garden will help you do this.

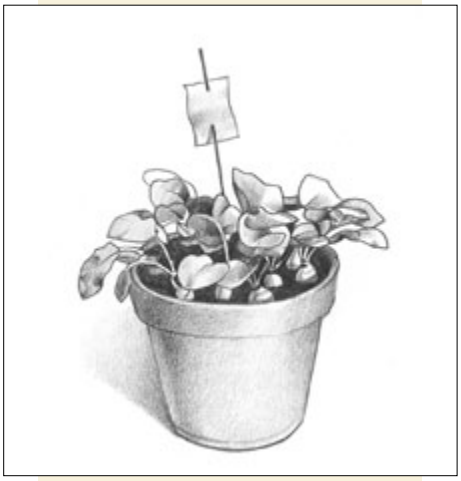
Supplementary Material: Container or Patio Gardening



You do not need a plot of ground to grow fresh vegetables. Many vegetables do well in containers, especially bush or dwarf varieties. Vegetables that take up little space, such as carrots, radishes, and lettuce, or crops that bear fruit over a long period of time, such as tomatoes or peppers, are perfect for container vegetable gardens. All they need is a sunny place to grow (six hours of direct sunlight each day), soil, water, and some fertilizer.

For example, tomato, cucumber, and parsley or chives might all be together in a large (0.6–0.8 m or 24–30") summer salad container. They all have the same water and sun requirements. By late summer they may not look very pretty, but they'll keep producing into the fall.

Containers and Pots for Vegetable Gardens

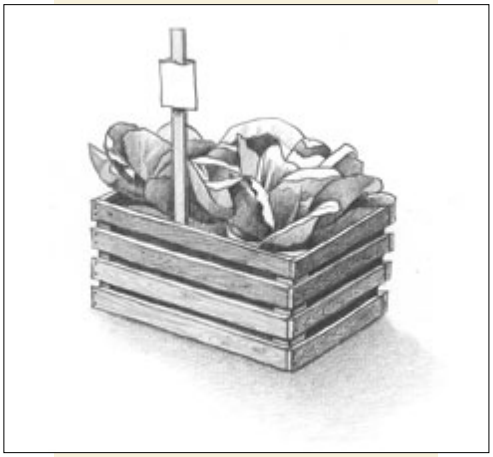


Containers can be almost anything: flower pots, buckets, baskets, wooden boxes, wash tubs, plastic bags, etc. However, they should have holes at the base or in the bottom for excess water to drain out. If they are a dark color, they may need to be painted a light color so they won't absorb heat and damage plant roots. For larger vegetables like tomatoes and eggplants, you should use a five-gallon (20-liter) container. Containers half that size require more attention and water.

Soil and Fertilizer

Soil can be used in the container, but synthetic mixes are better. Peat-based mixes (peat moss plus vermiculite) are relatively sterile and have the right acidity; they also allow plants to get enough air and water. You can mix one part compost to two parts planting mix to improve fertility. Use a slow-release or complete organic fertilizer to keep vegetables fed for the whole growing season.

Watering

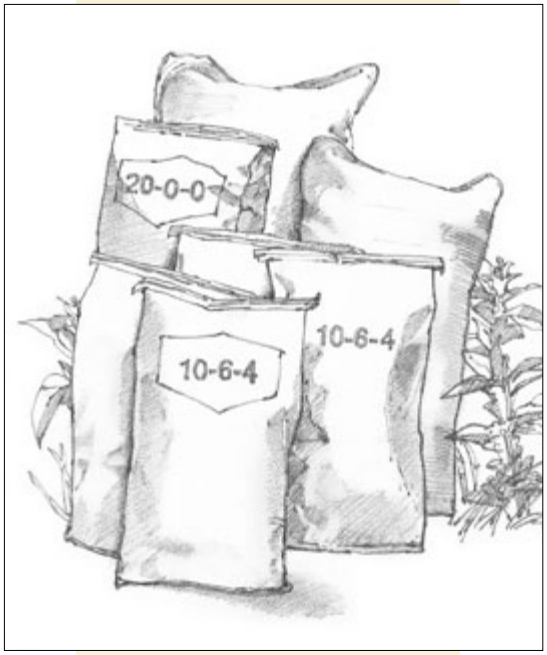


Plants in containers always need more water than plants in the ground. And as they grow, they need even more water. Don't wait until the plants begin to wilt to give them water. Check them daily.

Seed and Fertilizer Availability

Seed and fertilizer are available at local garden supply stores. More information about growing food is available at LDS.org and other Internet sites.

Fertilizer and Compost



Fertilizer adds nutrients that plants need to grow well.

Plants, like people, need specific foods or nutrients to grow well. The soil in many parts of the world does not have all of the nutrients that plants need. To have a garden with strong, healthy plants that do not get diseases, you must add the missing nutrients to the soil. This is called fertilizing the soil.

Garden plants need three nutrients: nitrogen, phosphorus, and potassium. Plants use these nutrients quickly and need to have more of them put into the soil. You can add fertilizer that contains these nutrients to your soil. This is especially important to do in a tropical country with frequent heavy rains, since the rains wash the nutrients out of the soil. In these areas, gardens may need to be fertilized every three or four weeks.

Soil is different from one place to another. Some soil may have a lot of all three nutrients. Other soil may need more nitrogen, more phosphorus, or more potassium to grow healthy plants. Sometimes you can take a sample of your soil to a university or an agricultural agency to be analyzed. Then you can find out which nutrients your soil needs.

You can choose a fertilizer that has the nutrients your crops need.

Different fertilizers have different amounts of the three nutrients. You must know how to read the labels on the fertilizers so you will know which fertilizers to get for your garden. The amounts of the nutrients are usually listed in this order: nitrogen, phosphorus, and potassium. The numbers on the label show what percentage of the fertilizer is made up of each nutrient.

A container of fertilizer with the numbers 14-14-14 on the label contains 14 percent nitrogen, 14 percent phosphorus, and 14 percent potassium. This fertilizer would be good for fertilizing corn, sweet potatoes, and rice.

Another example is a fertilizer with the numbers 45-0-0 on the label. This type of fertilizer contains 45 percent nitrogen and no phosphorus or potassium. In most countries this type of fertilizer would be good for fertilizing leafy, dark green plants such as spinach, kale, and kangkong.

In addition to nutrients for plants, fertilizer also contains filler. Filler is sawdust, sand, or some other inexpensive material. The plants use the nutrients and not the filler. For this reason, you should be careful to buy the fertilizer with the most nutrients, not the most filler.

A sack of fertilizer labeled 10-10-10 contains a total of 30 percent nutrients; the other 70 percent is filler. A sack labeled 5-5-5 contains a total of 15 percent nutrients and 85 percent filler. The second sack has half the nutrients of the first sack and should cost only half as much. You should look for the fertilizer that has the most nutrients and the least filler.

Fertilizer may seem expensive, but it is worth the money it costs. It can make the seeds you plant produce much more food. The value of the extra food is usually much more than the cost of the fertilizer. It is usually less expensive to buy large amounts of fertilizer, such as bags of 50 or 100 pounds. Two or three families may want to buy a bag together and divide it.

You can improve the soil in your garden by adding composted mulch.

Another way to improve the soil in your garden is by adding mulch. Mulch can be made very simply. You pile natural waste between layers of soil and layers of a chemical fertilizer and allow it to decompose. This is called composting.

To make mulch in a compost pile, follow these steps:

1. Build a container one meter square and one meter high out of boards or blocks to contain the compost. Or choose an area one meter square for a compost pile. Or dig a hole one meter square and one meter deep for a compost pile in the ground.
2. In the area you have chosen, make a layer 10 centimeters high of old plants, kitchen garbage, and manure. For the plant material, you can use such things as mature plants, rice hulls, seed husks, and leaves. Do not use tree limbs, boards, bones from kitchen garbage, or other material such as grease or fat that will not decompose quickly. Do not put human feces or dog feces in the compost or use them in any way near the garden.
3. Cover the first pile with 5 centimeters of soil.
4. Spread 200 grams of ammonium sulfate (21-0-0) or 100 grams of urea (45-0-0) on top of the soil.
5. Repeat these three layers about five more times.
6. Cover the top with 5 centimeters of soil. If you have made your compost pile above ground without a container, cover the sides of the pile with 10 centimeters of soil so that no waste shows.
7. After two months, thoroughly mix the compost and cover it with 10 centimeters of new soil.

The compost will be ready to use as mulch in four months from the time it was started. Mulch can be made in less time if the pile is covered with plastic and the compost is turned once a week.

Mulch has many valuable uses in the garden. You can put it on the soil around plants to keep weeds from growing and to keep water in the soil. It can also be mixed with soil before the garden is planted.

Mulch does the following things:

- Keeps water in the soil.
- Helps the soil to drain well.
- Keeps nutrients and fertilizer in the soil.
- Helps the plant roots to get oxygen.
- Helps good bacteria to grow in the soil.

Making mulch by composting will also help you keep the area around your home free of trash. Sometimes leaves and garden trash contain weed seeds and insect eggs. Composting can destroy these seeds and eggs.

Seeds and Transplants

Make sure that you get good seeds for your garden.

Buying good seeds and plants is the best way to have a good garden without spending a lot of money. Sometimes it may seem easier to use seeds from past years or to get seeds from friends and neighbors. However, such seeds may not grow well. You will have better harvests if you get new, high quality seeds each year.

Good seeds have a high germination rate. This means that almost all of the seeds planted will grow.

You can tell which seeds are good by the way they are packaged for sale. Watch for these things:

- The package should state that the seeds are certified by the seller. This means that there are no weed seeds in the package and that all of the plants will be good.
- The package should state the germination rate. This should usually be over 90 percent.
- The package will include a date showing that the seeds have been packaged for this year.
- There will be instructions for planting on the package.

Start some kinds of seeds in a seedbed rather than planting them in the garden.

Some plants may die or be easily damaged if they are planted as seeds in the garden. You can protect these plants by planting the seeds in a special seedbed. Let them grow into young plants before transplanting them to the garden. Some plants that grow well when started in seedbeds include tomatoes, peppers, eggplants, cucumbers, squashes, and onions. You can make a seedbed in one corner of your garden, in a planter box, or even in a flowerpot. You can border the seedbed with adobe or rocks and cover it with clear plastic to protect the young plants. You should prepare special soil for the seedbed. Mix one part sand, one part good garden soil, and one part compost.

Start some kinds of plants from cuttings taken from mature plants.

Some plants cannot be started from seeds. To grow sweet potatoes or kangkong, you must put cuttings from the vine in water or in a seed bed. The water should cover a joint where a leaf emerges from the vine. When roots begin to grow on the vine, you can plant the cuttings in the garden.

To grow cassava and cane, you must have the cuttings from the woody stem of a mature plant. Let these cuttings dry for about three weeks in the shade, and then plant them directly in the garden.

Taro and potatoes can be started by planting pieces of the taro or potatoes directly in the garden.

Preparing the Soil and Planting the Garden

Prepare the soil carefully before planting.

Before you plant, clean up your garden site and the area around it. Remove any tree roots, rocks, cans, bottles, boards, or other trash. You can kill grasses and weeds with herbicides, but these are expensive and must be used exactly as the directions say. Most families will need to pull out weeds and grasses by hand.

Your soil must be loose and easy to work with. Then water will drain through it well and not stand around the crops' roots. If the soil sticks together too tightly, you should add plant or animal material such as leaves, rice hulls, cottonseed hulls, or compost. Mix these things well with the soil. Then make the area as level as possible, and break up the soil so that it is fine enough for planting.

Plant your seeds at the right distance under the soil and away from each other.

Every kind of seed must be planted at a different depth and distance from other seeds. Most good seeds will have planting instructions on the package. However, a general rule is to plant seeds at a depth that is three to four times the width of the seed. Small seeds such as carrot, lettuce, and tomato seeds are planted about 6 millimeters deep. Larger seeds such as mung bean seeds are planted about 10 millimeters deep. Very large seeds such as dried beans and peas are planted about 2 to 4 centimeters deep.

It is also important to plant the seeds far enough apart so that they will have room to grow. In general, most plants must be more than 10 centimeters apart in rows that are about 20 centimeters from each other. Carrots, lettuce, and onions are this kind of plant. Some larger plants such as tomato, eggplant, and cabbage must be planted 30 centimeters apart in rows that are about 100 centimeters from each other. Plants that are too close together will shade each other and take too many nutrients out of the soil.

Carefully transplant plants from seedbeds.

When you transplant plants from seedbeds, you must be careful not to damage the roots. First dig holes large enough for the roots in the soil that you have prepared. Dig the plants from the seedbed one at a time. Try to keep a ball of soil around the roots of the plant as you remove it. Plant it immediately in the hole that has been prepared. Set the plant a little deeper in the soil than it was in the seedbed. Then water it with about one-fourth liter of water.

Maintaining the Garden

Keep your garden free of insects, snails, and slugs.

To have a good crop, you must control pests in your garden. In most tropical countries, there are many insects that reduce the crop or destroy the garden. Slugs and snails must also be kept out of the garden.

You can do the following things to keep pests out of your garden:

1. Get rid of places in and around the garden where pests can live. Insects can live in weeds around the garden. Trash, weeds, or dead leaves from garden plants are food for snails and slugs. Remove these things.
2. You may wish to spray your garden regularly with an insecticide. Most insecticides are in liquid form. Dilute the insecticide by carefully following the instructions on the bottle. Spray it with a hand sprayer onto the plants in the garden. Follow instructions carefully.
3. If there are plants around the garden, spray them at the same time you spray your garden. If you do not, the insects will move from these plants back into your garden.
4. Do not use insecticides around children, and keep all insecticide containers out of the reach of children. Throw away empty containers (but not in streams, lakes, or ponds), and do not use them for other things.
5. Do not immediately pick and use vegetables that have been sprayed or dusted with an insecticide. Carefully follow the instructions on the container for waiting a certain time before picking the crops.
6. Insecticides will not kill slugs and snails. You may be able to control them by picking them off plants by hand. You may also use bait that you leave on the ground for the slugs and snails to eat. Talk to local specialists to find out which bait is best for your area. You will need to put out more bait after a certain length of time. This bait is dangerous to humans and animals.
7. Some tropical soils contain pests called nematodes or wireworms. These pests attack the roots of crops and either reduce yield or destroy the crops. Talk to local specialists to find out if nematodes are a problem and how you should treat them.

Keep your garden free of weeds.

You must do all you can to keep weeds out of your garden. Weeds use nutrients and water that the crops need. They steal fertilizer and keep sun from getting on the vegetables. Remove weeds from your garden as soon as they start to grow. You can do this by hand or with a simple tool. However you do it, keep weeds out of your garden at all times. You may need to weed each week. You should also remove the weeds from around the garden to keep them from dropping seeds into the garden area.

Make sure your garden gets enough water.

Plants need water to grow. When they do not receive rain regularly, they begin to wilt in the hottest part of the day. This means that they grow slower and produce less. They are weaker, so insects and bacteria can hurt them more easily. If you see your plants start to wilt, water them very well. The water should reach below the plant roots. You can make a sprinkling can by punching holes in the bottom of a clean can. If necessary, carry water from a nearby river or pond. Use compost or mulch to help the soil hold water.

Fertilize your garden regularly.

The amount of fertilizer you should put on your garden depends on the kinds of plants, the type of soil, and the climate. In general, however, you should use about 150 grams of fertilizer for each meter of a row.

Do not place fertilizer next to seeds when planting. Put it beside the row after the plants come up (usually two or three weeks after planting). The fertilizer should not touch the plants. It should be at least 5 centimeters from the plant but not more than 10 centimeters away. Work dry fertilizer into the soil with a sharpened stick or hoe. If you do not, the rain may wash the fertilizer away.

You can also use liquid fertilizer. To do this, dissolve 3 tablespoons of fertilizer in 4 liters of water. This will fertilize 30 centimeters of a row or the stems of three large plants such as corn, sweet potato, or tomato. Liquid fertilizer should also be used with plants in seedbeds about two weeks after planting.

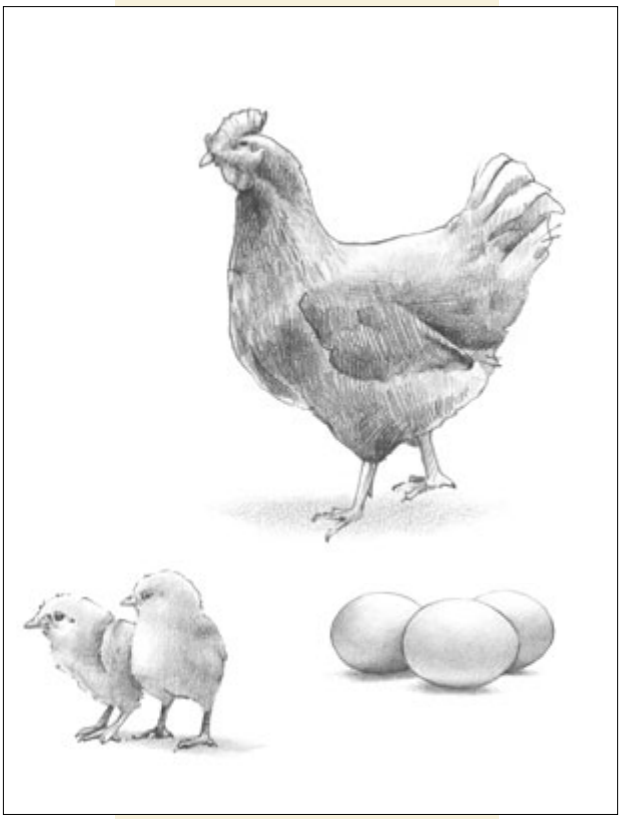
In most tropical countries, you should put fertilizer on your garden every three weeks until the plant flowers.

Harvest food regularly.

The plants in the garden will be ready to pick at different times. Someone with experience can help you know when to pick your crops. Generally, plants like lettuce need to grow about 30 days, plants like tomatoes need three months, plants like sweet potatoes need five months, and plants like taro and cassava may need a year to produce their starchy roots.

You should regularly harvest crops such as cucumbers, beans, and summer squash so they will produce more.

When you pick crops and remove old plants, you will have room to plant more crops.



Small-Animal Production

Small-animal production can provide a family with a good protein source and some income.

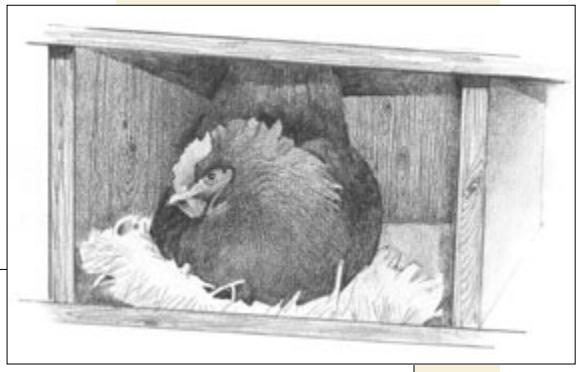
Animals best suited to small-scale production include chickens, rabbits, guinea pigs, and goats for the following reasons:

- Small-animal production is less likely to upset the food production balance that may be used for meeting other basic family needs.
- Small animals cost less individually for families whose focus is not on producing food to sell.

- The short time to get small animals into production reduces the risk of loss and the time needed to receive benefits.
- The minimal feed requirements for small animals fit well into the limited resources of families.
- Small animals individually yield smaller quantities of animal products. The yields of eggs, milk, or meat more closely match the daily needs of a family and do not require refrigeration.
- Children and adults with special needs can be involved in the management and care of small animals.

Because chickens can live and are eaten in nearly every country and culture in the world, some basic principles of home production of chickens are given below.

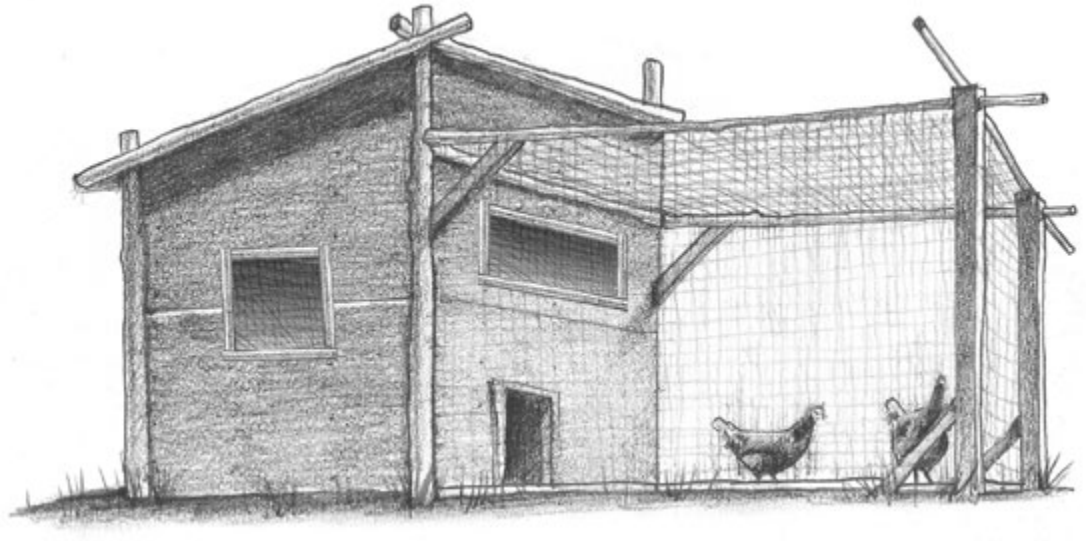
Chickens can be raised at home all over the world.



Chickens are a good source of eggs and meat. They are the most simple food animal to raise at home. After hatching, healthy baby chicks will begin laying eggs at 20 weeks. Chickens in good health will lay eggs three days out of four for 18 months. They are easy to care for and have four basic needs: clean feed, clean water, a clean coop, and a safe roaming area.

Clean Feed

Chickens will eat many things, including plants, seeds, insects, and scraps from the home, such as meat, fruits, and vegetables. They do best when they have a good source of grains, such as corn, on a constant basis. Almost all areas of the world have agricultural supply businesses that sell chicken feed that has high grain content and is usually supplemented with critical nutrients (proteins, minerals, and vitamins). Chickens also need grit (small crushed rocks) to help them grind and digest food. Chickens that have a roaming area can usually find the grit they need.



Clean Water

Chickens need a constant source of clean water that is easily available. Their water source should never be allowed to dry up. Hens that are laying eggs need a constant supply of water.

A Clean Coop

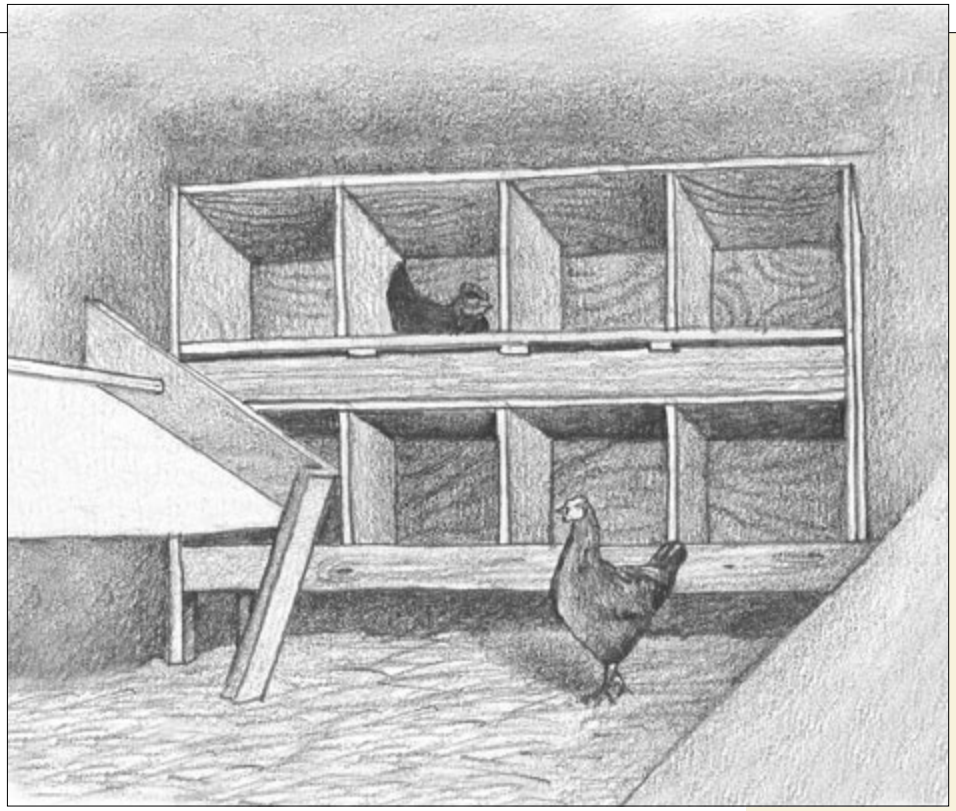
Chickens need a safe and relatively clean place to lay eggs and roost (rest and sleep). The coop needs to be secure so animals can't get in to kill the birds or disturb their food and water. A small shedlike structure can provide protection from bad weather, a supply of fresh air, ventilation, and easy access for you to work in while feeding and watering the chickens and collecting their eggs. There needs to be at least two to three square feet (0.2 to 0.3 square meters) for each bird in the coop.

Inside the coop the chickens need nesting boxes with straw or other similar material where they can rest and lay their eggs on a soft, clean surface. Chickens also require roosts where they can sit and sleep. There should be at least one nesting box for every two hens, and there should be two linear feet (0.6 meters) of roost for each bird in the coop.

Safe Roaming Area

Chickens need room to get out of the coop for fresh air and sunshine and to scratch for food in the soil. The roaming area can be made by attaching a wire run to the coop so the birds can get out of the house but not have free range. Chickens need at least three to four square feet (0.3 to 0.4 square meters) of space for each bird in the run.

Another option is to let the chickens have free range outside of the coop during the day without being restricted by a run. Birds quickly learn to go inside the coop in the evening for protection, but the coop must be secured nightly or animals will get inside and kill the birds.



How to care for baby chicks during the first 60 days.

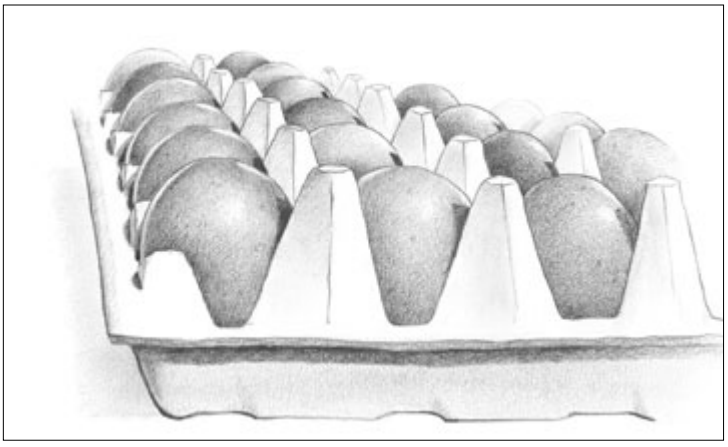
Baby chicks have special needs but grow fast. With a little attention they can provide the beginnings of an ongoing supply of the high quality growth foods meat and eggs (see pages 29–30).

When caring for baby chicks, consider the following:

- A young chick brooder (housing) can be as simple as a sturdy cardboard box or a small animal cage.
- The flooring (bedding) can be wood shavings, straw, or grass.
- The temperature needs to be controlled between 90 and 100 degrees Fahrenheit (32–38 degrees Celsius) for the first week and then should be decreased 5 degrees Fahrenheit (3 degrees Celsius) per week until normal room temperature is reached. A 100-watt bulb or heat lamp in the center of the brooder allows chicks to gather in a comfort zone. If the chicks crowd under the lamp, the brooder is too cold. If they have moved away and are panting, they are too hot.
- Food and water needs are met simply by chick starter feed from the local agricultural store and a small chick waterer.
- Outside time can be provided by creating a safe area near the home where the chicks can explore and scratch. Make sure you can catch them when it's time to come in.
- Vaccination will help prevent the chicks from getting sick. Chicks should be vaccinated for Newcastle disease at 6–8 days of age and against fowl pox at 8–12 weeks.

Hens need 14 hours of light per day to lay eggs each day.

When daylight hours are short, use a 25-watt lightbulb in the coop to maintain laying. Don't leave the light on all night or use a bulb that is too bright, or birds will start to peck each other. If you choose not to use a bulb to maintain light, the chickens will be fine, but they will not lay eggs every day and they may begin to molt. Molting is a time when chickens lose their old feathers and start to grow new ones. They will stop laying eggs during this time.



CHAPTER 5

Basic Family Medical Care

Meeting Personal Health-Care Needs

Make sure that you and your family get the best possible health care.

If you have good health, you have many advantages. You can work hard and support yourself, you can study and learn, and you can enjoy life more fully. All people, even those with handicaps or health problems, need to protect the health they have.

In the Book of Mormon, we read how the members of the Church in the time of Helaman cared for their health needs:

"And there were some who died with fevers . . . but not so much so with fevers, because of the excellent qualities of the many plants and roots which God had prepared to remove the cause of diseases" (Alma 46:40).

Today we are fortunate to have well-trained doctors and other health workers who can treat difficult health problems. But remember, you have the main responsibility for your good health. The information in this chapter will help you understand when and how to get help from a professional and will also explain some simple things you can do in your own home.

To make good decisions about where to get health care, you need to learn all you can about health care in your area.

If you have a choice such as between two clinics or two dentists, you must decide where to get the best care. You can decide which clinic is cleanest or which has the fastest service. You can decide which dentist will give your family the best care.

You should keep health records at home.

You can resolve some of your health problems at home. Home records are important tools to help you care for your family members at home.

The family health record can remind you that family members need immunizations or parasite treatments at certain times of the year. If you keep a record of medicines prescribed at the clinic, you can remember what drug to buy for a problem that returns. You can know what syrup to buy for coughs or what ointment to buy for skin rashes. You can save money by not making so many trips to the clinic or doctor.

You can treat some emergencies at home if you have a first-aid box.

Minor emergencies happen around the home, many times to children. Burns, cuts, wounds, and childhood diseases are common in all parts of the world. If you can treat these emergencies quickly and correctly, you can prevent serious infections and scars. You can often treat these emergencies at home if you have a first-aid box.

A very simple first-aid box might have the following items in it:

- A roll of good quality toilet paper in its original wrapper (for drying wounds or cuts that have been cleaned)
- A bar or bottle of disinfectant soap (for cleaning cuts and scrapes)
- A liter of purified water (boiled or chlorinated)
- A small bottle of alcohol (for disinfecting around cuts and for sterilizing scissors, needles, and thermometers)
- A small bottle of antiseptic (for use on wounds)
- Pieces of clean cloth that are carefully wrapped so they will stay clean
- A bottle of paracetamol or acetaminophen (Tylenol, for example) for reducing pain and fever
- A thermometer with instructions
- A jar of sterile petroleum jelly (Vaseline, for example)
- A packet of dry ingredients for oral rehydration solution (see page 62)
- Adhesive tape
- Scissors or a knife
- Tweezers

All of these things should be stored in a container with a tight lid. If the container is plastic, you should clean it with a sanitizing solution. You must store the first-aid box carefully so that the supplies will be clean when they are needed. Do not let dust and insects contaminate the things inside the box. Store the box where adults can reach it quickly but where children cannot reach it.

It is a good idea to keep a written list of all the supplies in the box. Then you will know when to get new supplies. Keep the list on the outside of the box so you can see it easily.

Treating Fever, Diarrhea, and Dehydration

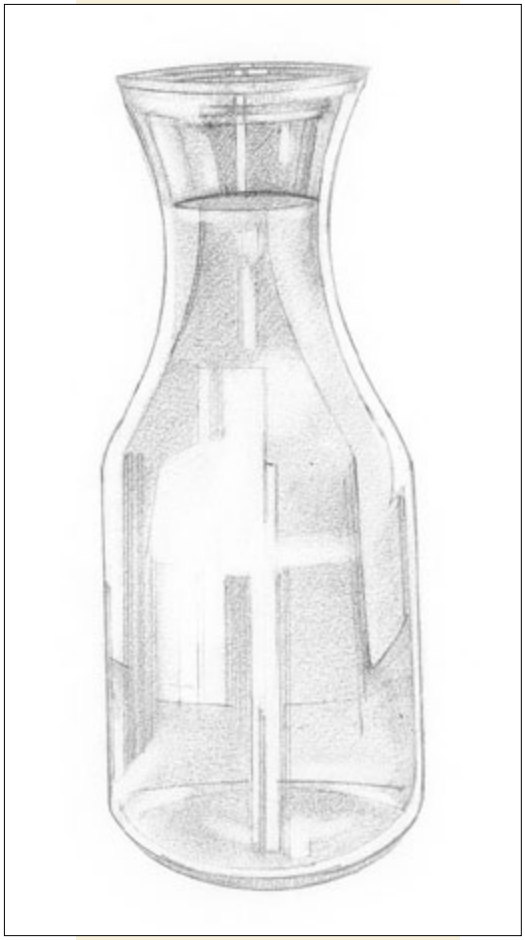
Try to lower the temperature of someone who has a fever.

When the temperature of a person's body is too hot, we say the person has a fever. Most fevers are caused by the body trying to fight germs that have infected the person. Some infections, such as colds, may give people mild fevers for a short time. Infections with flu, malaria, and pneumonia often cause high fevers. The fever from some infections, such as tuberculosis, may last for many days.

In areas where malaria is common, a person with a fever should quickly see a health worker and receive treatment if malaria is the likely cause. In areas without malaria, a person with a high fever or one that lasts more than a few days should also seek help from a health

worker. A health worker should be consulted as soon as possible if any of the following symptoms accompany a fever: cough with fast breathing, a stiff neck, excessive sleepiness, extreme restlessness, severe pain, or convulsions.

People with fevers lose extra water, and this can be made worse if diarrhea is also present. It is important for people with fevers to drink extra liquids to prevent dehydration and to help fight both the fever and the infection. Children with fevers should wear loose, light clothing. Bathing or spraying with lukewarm or cool (but *not* cold) water also can help a person with a fever feel better. Taking simple medications such as paracetamol (acetaminophen) can help reduce the fever temporarily.



Give a person liquids to stop diarrhea.

When you eat or drink, your intestine prepares water, salts, and nutrients to be carried by the blood to all parts of the body. When you have diarrhea, your intestine does not work properly. It lets too much water pass through the intestine and out of the body. This can cause a serious condition called dehydration. The intestine also lets food pass through so quickly that the body cannot use it. This results in poor nutrition.

Dehydration and poor nutrition from diarrhea often cause death, especially among small children. In tropical areas, an average of 100 out of every 1,000 babies die before the age of one year. Over 90 of these deaths are caused by dehydration and poor nutrition that begin with diarrhea and fever.

It is important for you to understand how to treat diarrhea and fever. In some places in the world, people treat diarrhea in ways that make it worse. They keep water and liquids away from people who have diarrhea. They think that if a person has no water, the diarrhea will end. But when people have diarrhea, they need a lot of liquid or they may become dehydrated and die.

When members of your family have mild diarrhea, you should give them lots of liquids to drink. As soon as they are able to eat, you should give them soft foods that are easy to digest, such as soup, porridge, cooked bananas, or mashed potatoes. If you are nursing an infant who gets diarrhea, do not stop breast-feeding the child. Breast-feeding helps prevent diarrhea and dehydration.

Use oral rehydration solution to treat dehydration.

If people have very bad diarrhea or have had diarrhea for several days in a row, they can become dehydrated. This is especially true for small children. Symptoms of severe diarrhea and dehydration include:

- Frequent bowel movements that the person cannot control.
- Watery stools.
- Little urine or dark yellow urine.
- More than normal thirst.
- Dry mouth and tongue.
- Fast, weak pulse.
- Sunken or dry eyes.
- Skin that does not spring back immediately when pinched.

If members of your family have diarrhea and have two or more of these symptoms, you should give them oral rehydration solution. You can buy oral rehydration solution in a pharmacy or clinic. It may come in a powdered form that you can mix with purified water, or it may be a liquid.

You can also make a simple oral rehydration solution by mixing the following ingredients:

- 1 liter purified water
- 20 grams sugar (2 tablespoons or 6 teaspoons)
- 3.5 grams (½ teaspoon) salt

Give people with severe diarrhea small sips of the solution every five minutes, even if they vomit, until they begin to urinate normally. The drink can be given with fruit juice as a flavoring. People with diarrhea may also drink green coconut water, thin vegetable soup, or the water in which rice or barley has been cooked.

Treating Wounds and Cuts

The skin protects the body from infection.

The skin on our bodies protects us in the same way that the skin on a banana protects the fruit inside. If we take good care of our skin, it will help us to stay healthy. The skin works well unless it is broken by insect or animal bites, puncture wounds, cuts, or scrapes. When the skin is broken, it can let in germs and infections that can make us sick or cause damage to our bodies.

Learn the five basic steps for treating wounds and cuts.

Some wounds and cuts are minor, and some are very serious. For major wounds that bleed a lot or are very deep, the person may need to see a doctor. However, you can treat most minor wounds at home without medical help.

You can treat minor wounds and give initial treatment for major wounds by learning the following five basic steps:

1. *Stop the bleeding.* Put any clean cloth (towel, handkerchief, gauze, etc.) over the wound. Press down on the cloth for at least three minutes.
2. *Wash the wound.* This is the most important thing you can do to prevent infection and to help the wound heal quickly. First wash your hands well with soap and water and rinse them in a sanitizing solution or purified water. Then wash the wound with disinfectant soap and purified water.
3. *Clean out dirt particles.* If there are flaps of skin, lift them gently with sterile tweezers. Squirt, spray, or pour purified water on the wound to clean it completely. Do not put alcohol, tincture of iodine, or Merthiolate directly on a wound. These things hurt the flesh and slow the healing process.
4. *Close the skin.* A fresh wound less than 12 hours old will heal faster if the edges of the skin are held together. If the wound or cut is severe, a health worker may need to sew the edges closed to allow for better healing. However, you can close many wounds with a butterfly bandage made of adhesive tape.

Purified Drinking Water

1 liter water + 4 drops
fresh chlorine bleach (4–6%)

Sanitizing Solution

1 liter water + 1 teaspoon
fresh chlorine bleach (4–6%)

5. *Dress and cover the wound.* Antiseptic or antibiotic ointment can be put on the wound when it is clean and closed. Cover the wound gently with a clean covering such as gauze, toilet paper, or a sterilized cloth bandage.

Get medical help to treat wounds that are infected.

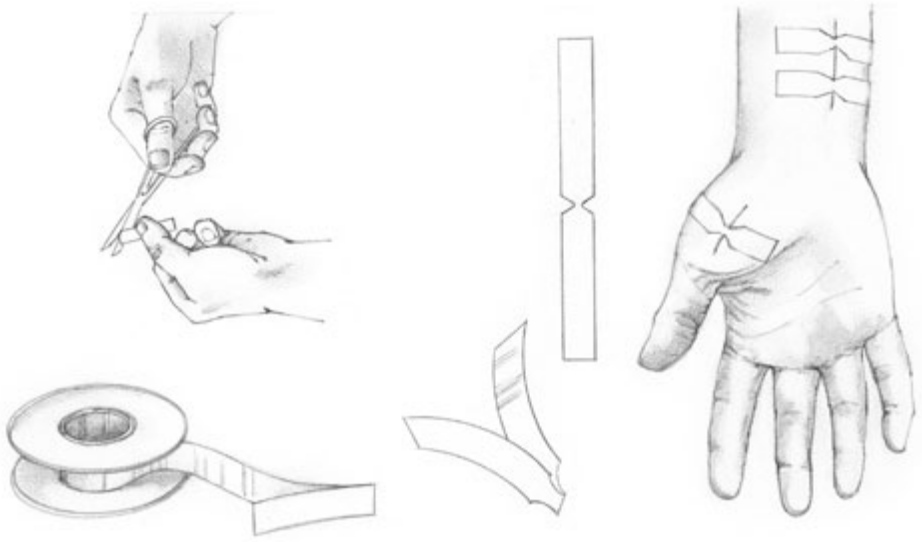
Sometimes wounds can become infected. If they do, they need to be treated by a doctor or a health worker. Any of the following signs may mean that wounds are infected:

- The wound is painful, and the skin is red and hot to the touch.
- There is swelling and pus.
- The wound smells bad.

If anyone in your family has a cut or wound that appears to be infected, you should get help from a doctor or someone who has medical training.

Supplementary Material: How to Make and Use a Butterfly Bandage

1. Unroll some tape and fold it so that the nonsticky sides are touching.
2. Trim the corners from the folded end of the tape as shown.
3. Close the wound and place the bandage on the wound as shown to keep it closed.



General Skin Care

You should be able to recognize different skin problems and diseases.

Skin provides protection from sun, rain, insects, and disease. You must take care of your skin to keep your body healthy and avoid disease.

The following conditions are signs of skin disease:

- Swelling or inflammation
- Pain or a burning sensation
- Itching or stinging

- Rashes or dry, scaly patches
- Areas that feel hot to the touch
- Areas that blister, crust, or ooze
- Infected sores with pus
- Sores that heal slowly

Learn the three basic home treatments for mild skin diseases.

There are three simple treatments that you can use in your home to treat mild skin problems:

1. *Hot compresses.* For swelling, inflammation, pain, skin that feels hot to the touch, or pus, apply hot compresses. You can make hot compresses in the following way: Boil water and allow it to cool just enough so that it is still hot but you can hold your hand in it. Fold a clean cloth so it is slightly larger than the area you want to treat. Moisten it in the hot water. Put the cloth over the affected skin. Cover the cloth with a sheet of thin plastic or cellophane. Wrap the cloth and the plastic with a towel. Keep the affected part raised above the body if possible. Put the cloth in hot water again whenever it becomes cool.
2. *Cold compresses.* For itching, stinging, blistering, crusting, or oozing of clear fluid, apply cold compresses. You can make cold compresses in the following way: Soak cloths in cool water and white vinegar (two tablespoons of vinegar in one liter of boiled or chlorinated water). Apply cloths to the affected area several times a day. After several days, when the affected area feels better and has formed new skin, mix talc and water (one part talc to one part purified water). Spread the mixture lightly over the skin. When the new skin begins to thicken or to flake, rub on a little vegetable oil or baby oil.
3. *Protection from sunlight.* When any signs of skin disease appear on parts of the body that are normally exposed to the sun, protect the affected area from sunlight.

See a health worker for serious skin infections.

Serious skin infections should be treated by a health worker. You should see a health worker whenever the following things happen:

- A skin disease gets worse with home treatment rather than healing.
- The lymph nodes behind the ears, under the chin, in the armpits, or in the groin become swollen.
- A red line on or under the skin appears near the infected area and follows the blood vein in the direction of the heart.
- The affected area begins to smell bad.

Treating Burns

You should know how to recognize first-degree, second-degree, and third-degree burns.

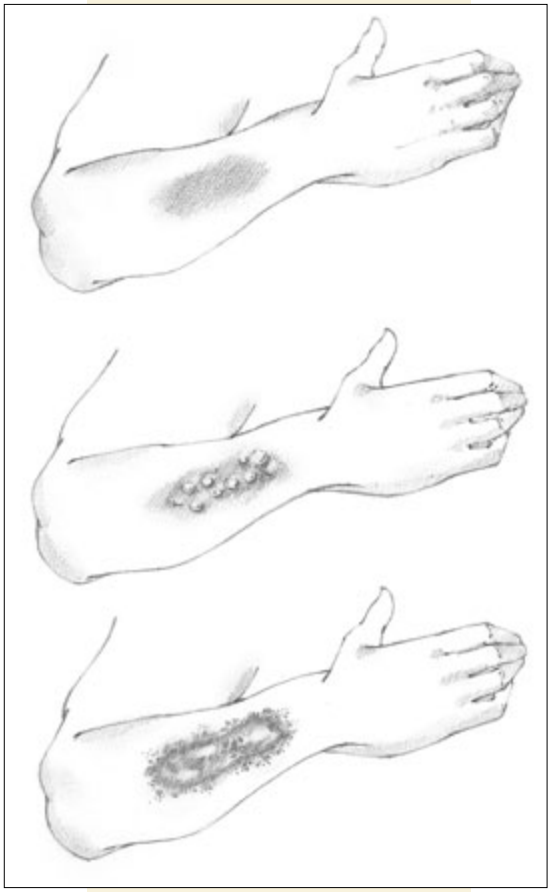
Heat and flame can cause very painful wounds. Around the home and workplace, people can be burned by open fires, hot grease, cooking pans, explosions of flammable liquids, hot irons, and over-exposure to the sun. Some burns are merely painful, while others are very dangerous.

First-degree burns are minor burns that do not form blisters. They are red and slightly swollen.

Second-degree burns are more serious. They form blisters that swell and fill with fluid but do not expose raw flesh.

Third-degree burns are often very painful because they destroy the skin and expose raw or burned flesh. But where nerves are destroyed, there may be no pain.

It is important that you be able to tell the difference between these kinds of burns. Then you can give the correct treatment.



Learn how to treat different kinds of burns.

First-degree burns are minor and can be safely treated at home. To treat them, relieve the pain by soaking the burned part in cold, purified water immediately. The person can take a pain reliever containing paracetamol or acetaminophen (Tylenol, for example) to relieve the pain. No other treatment is necessary. Ointments and creams do not need to be applied.

Second-degree burns are more serious. There will be blisters on the skin. If they are not broken, do not break them. Protect the blisters from breaking and treat as a first-degree burn. If the blisters are broken, keep the burn area clean. Wash your hands in soap and purified water, and then gently wash the burn with soap and purified water. Then cover the burn with a sterile bandage or a piece of sterile gauze.

If the burn is small or if you do not have a way to cover it, leave it open. Wash the open burn area twice daily with soap and purified water. Never put grease, fat, hides of animals, coffee grounds, or feces on a burn. These things are used in some parts of the world, but they do not help burns. They cause germs to spread in the body. If the burn develops pus, a bad smell, or swelling, take the victim to a health clinic or trained health worker.

Third-degree burns that have destroyed the skin should not be treated at home, because the danger of infection is very great. Persons with third-degree burns should be treated by a trained health worker. Also, people who are burned over a large part of their body should be treated by a health professional. Until treatment can be received, loosely wrap the burned area with a very clean cloth or towel.

Learn how to treat a person who is in shock.

It is possible for people to go into shock anytime they experience one of the following conditions: a serious wound or burn, a great deal of pain, a lot of fear, the loss of blood, a severe illness, or an accident. The symptoms of shock include a weak, rapid pulse; pale, damp, or cold skin; confusion, weakness, or unconsciousness.

You should treat people in shock in the following way:

- Have them lie down with their feet higher than their head.
- Cover them with a blanket if they feel cold.
- If they are conscious, let them drink lukewarm liquids, especially oral rehydration solution.

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