

**PREVENTATIVE
MEDICINE
FOR THE
KNUCKLEDRAGGER**

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Welcome to the Remnant A-Team



THE REMNANT
A TEAM

- 1. No Bellyaching w/out solutions.**
- 2. LTPR**
- 3. BLUF / "So What?"**
- 4. No Pontificating (Hold off "What If's")**
- 5. ΑΠΟ ΕΞΟ ΤΙΠΟΤΑ**

PREVMED

- Preventive medicine (PM) procedures minimize disease/non-battle injuries (DNBI) during war and contingency operations.
- PM measures should be integrated into all missions and training exercises.

“Ground Hog Day”

PREVENTIVE MEDICINE CHECKLIST

- Immunizations
- Health Threat Briefing
 - Endemic Diseases
 - Water and Food Consumption
 - Field Sanitation
 - Personal Protective Measures
 - Personal Hygiene
 - Environment Exposure Hazards/Ecological Changes Caused by Disaster
 - Plants/Animals
 - Disruption of Public Utilities and Public Health Services
- Infectious Diseases of Concern and Changes of Pre-existent Disease Levels
 - Acute Diarrheal Disease
 - Sexually Transmitted Diseases
 - Insect/Arthropod Transmitted Diseases
 - Others
- Injuries
 - Recreational/Sports
 - Motor Vehicle Accidents
 - Training
- Pets/Mascots Policy
- DNBI and Environmental Surveillance Program
- Communications Requirements
- Linkage to Line Organizations
- Special Instructions
 - DNA Collection
 - HIV Screening
 - TB Screening
 - Deployment Health Assessments

Daily Priorities of Work

- Monitoring the acquisition and treatment of potable water.
- Monitoring the acquisition, handling and preparation of food.
- Monitoring and implementing vector (insect and rodent) control programs.
- Monitoring the construction and maintenance of personal hygiene (washing) facilities and solid and liquid waste disposal systems.

The Key Four

PREVENTIVE MEDICINE CHECKLIST

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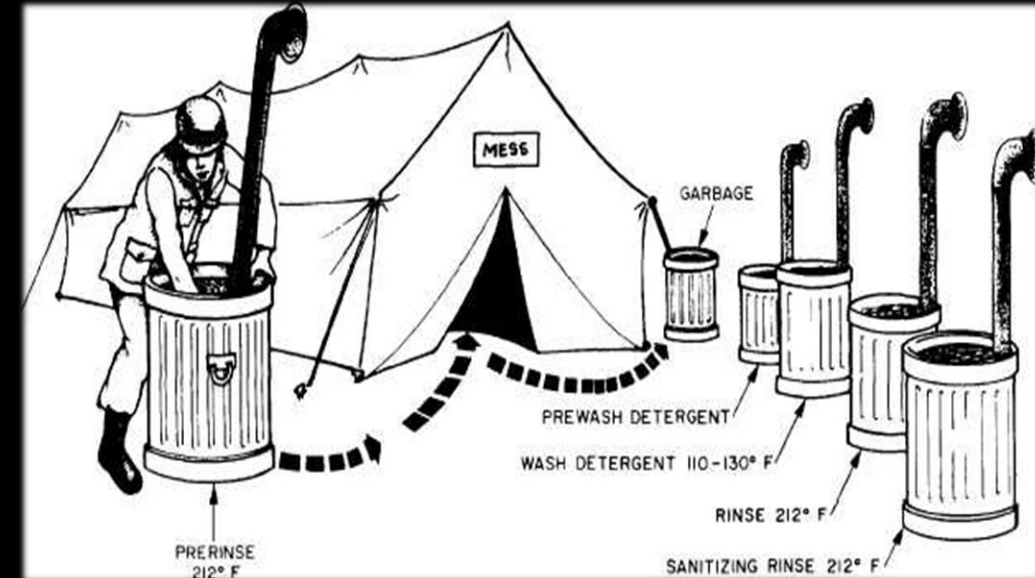
Field Sanitation

- Factors that create a high risk for food-borne diseases: poor food inspection and sanitation, poor personal hygiene habits, inadequate refrigeration, and lack of eradication programs for food-borne diseases such as hepatitis A and brucellosis.



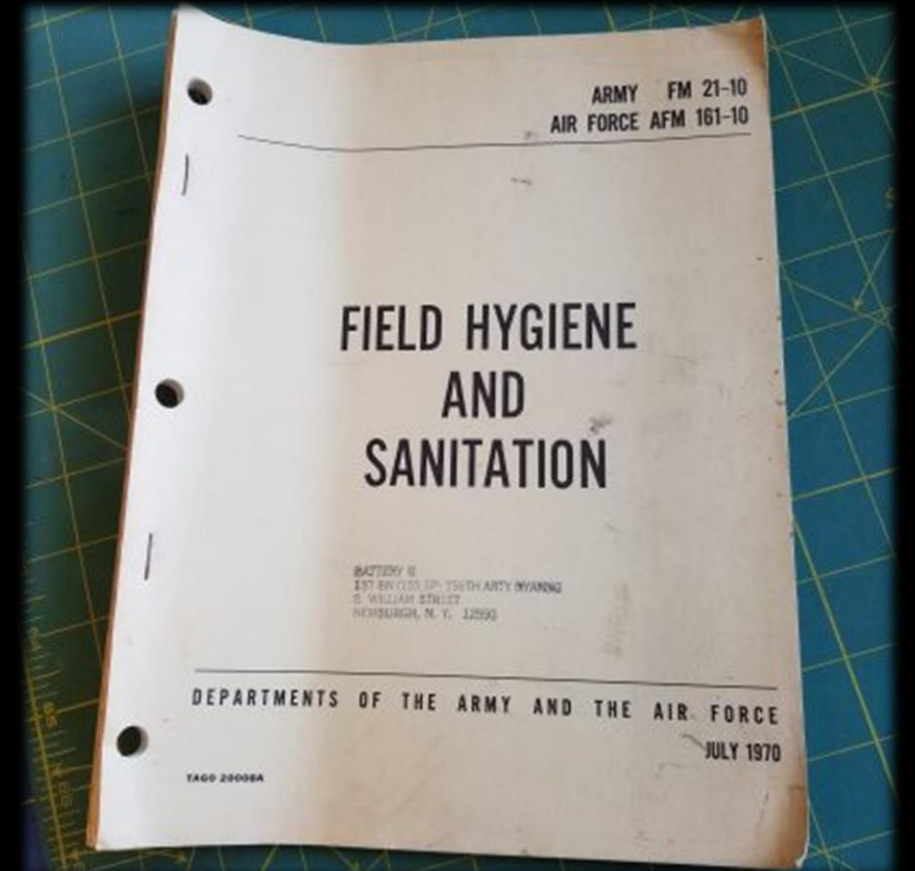
Field Sanitation

- Food transportation, storage, preparation and service have direct bearing upon the success or failure of a mission.
- Dining Facility sanitation is a chronic operational problem.
- The prospect of disease outbreaks, particularly dysentery and food poisoning, is always present and must be recognized as a constant threat to unit health.



Field Sanitation

- **Potentially Hazardous Foods (PHFs):** Any food that contains milk, milk products, eggs, meat, poultry, fish, shellfish, or other ingredients in a form capable of supporting rapid growth of infectious or toxic microorganisms.
- PHFs are typically high in protein and have a water content greater than 85% and a pH greater than 4.5.





Field Sanitation

Factors that most often cause food-borne disease outbreaks:

1. Failure to keep PHF cold (below 40°F internal temp.).
2. Failure to keep PHF hot (above 145°F internal temp).
3. Preparing foods a day or more before being served.
4. Allowing sick employees who practice poor personal hygiene to handle food.

Field Sanitation

Food contamination can be classified into three categories:

- 1. Biological - contamination by pathogenic microorganisms (protozoa, bacteria, fungus, virus) or unacceptable levels of spoilage. This category is the major threat to personnel.
- 2. Chemical - contamination with chemical warfare agents, industrial chemicals, and/or other adulterating chemicals (zinc, copper, cadmium, pesticides, etc.).
- 3. Physical - contamination by arthropods, debris, radioactive particles, etc



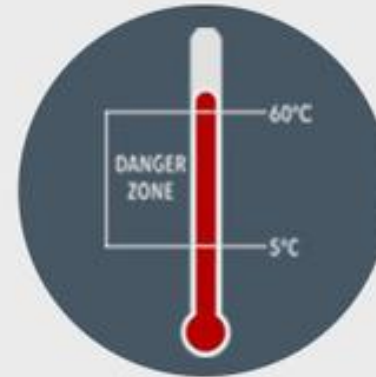
KEEP CLEAN



**SEPARATE RAW
AND COOKED**



**COOK
THOROUGHLY**






**KEEP FOOD AT
SAFE TEMPERATURE**



**USE SAFE WATER
AND RAW MATERIALS**

Field Sanitation

- Bacteria that multiply at temperatures between 60°F and 125°F cause most food-borne illness.
- Maintain the internal temperature of cooked foods that will be served hot at 145°F or above.
- Maintain the internal temperatures of foods that will be served cold at 40°F or below to control any bacteria that may be present in the food.

Cook Foods to Safe Temperatures		
145°F	160°F	165°F
<p>Pork</p> <ul style="list-style-type: none">• Ham• Roasts• Chops 	<p>Ground Meat</p> <ul style="list-style-type: none">• Pork• Red meat 	<p>Chicken and Other Poultry</p> <ul style="list-style-type: none">• Ground• Whole• Pieces 
<p>Red Meat</p> <ul style="list-style-type: none">• Steaks• Roasts 	<p>Egg Dishes</p> 	<p>Leftovers</p> 
<p>Seafood</p> <ul style="list-style-type: none">• Fish• Shellfish 	<p> COLORADO STATE UNIVERSITY EXTENSION</p>	

Field Sanitation:

- Thorough reheating to an internal temperature of 165°F or above will kill bacteria that may have grown during storage.
- However, foods that have been improperly stored or otherwise mishandled cannot be made safe by reheating.

THE COMPLETE LIST OF LONGEST LASTING SURVIVAL FOODS

GRAINS

Dry pasta Flour
Soft and hard grains White rice
Hardtack Ramen noodles
Rolled oats Canned spaghetti

PROTEIN

Canned meat
Dried meat
Freeze-dried meat
Dried lentils and legumes
Canned beans
Powdered eggs
Pemmican
Dried beans
Nut butters

FRUITS & VEGGIES

Freeze-dried veggies
Dehydrated veggies
Canned veggies
Potato flakes
Dried corn
Dehydrated fruits
Freeze-dried fruits
Fruit leather
Canned fruit

KITCHEN STAPLES & ESSENTIALS

Tea Ghee
Instant coffee Vinegar
Powdered milk Olive oil
Alcohol Coconut oil
Corn starch Baking soda

SWEET ADDITIONS

Raw honey
Dry jello mix
Cocoa powder
Pure vanilla extract
Maple syrup
Sugar
Corn syrup
Hard candy

SALTY ADDITIONS

Stock / Bouillon
Soy sauce
Salt
Dried herbs
Dried spices

Field Sanitation:

- Ensure everything that touches food during preparation and serving is clean to avoid introducing illness-causing bacteria.





Field Sanitation:

Order of preference for food acquisition:

- 1. US Military rations brought with unit or previously cached.
- 2. Local food procured from sources approved by supporting Veterinary and Environmental Science Officers.
- 3. Local food procured from unapproved sources.



AFGHAN STREET FOOD NANGARHAR PROVINCE AFGHANISTAN



Field Sanitation:

- Special Operations Forces will probably have to procure food from unapproved sources during real world contingencies, presenting a serious medical threat to the team and the mission.
- **Use the following guidelines:**
- Avoid local street vendors. Their personal hygiene habits tend to be poor, which results in contaminated food (i.e., fecal-oral contamination).

Field Sanitation:

- Consider all ice contaminated. It is often made from non-potable water and freezing will not kill disease-causing organisms. Anything with ice in it or on it should be considered contaminated (i.e., alcohol in the drink does not make the ice in it safe).
- Semi-perishable rations (canned and dried products) are relatively safe and should be chosen over fresh food. Protect canned and dried foods from extreme heating and freezing. Do not use swollen or leaking cans.
- Do not procure moldy grain or grain contaminated with insect larvae.
- Raw fruit and vegetables may be grown in areas where “nightsoil” (human fecal matter) is used as fertilizer or where gastrointestinal or parasitic diseases are prevalent.



Field Sanitation:

- Wash raw fresh fruits and vegetables in potable water and disinfect with one of the methods described below:
 - a. Dip in boiling water for 15 seconds. Place small amounts of produce in net bags, completely submerge items for 15 seconds, remove and allow cooling. Not recommended for leafy vegetables.
 - b. **Disinfect with chlorine. Immerse for at least 15 minutes in a 100 ppm solution of chlorine or 30 minutes in a 50 ppm solution. Rinse the produce thoroughly with potable water before cooking or eating. Break apart “head” produce such as lettuce, cabbage or celery before disinfection**



Field Sanitation:

Bleach: (Clorox)

4.84 oz in 32 gallons = 50 ppm

9.68 oz in 32 gallons = 100 ppm

1 tablespoon per gallon = 200 ppm

70% Calcium Hypochlorite:

0.32 oz in 32 gallons = 50 ppm

0.64 oz in 32 gallons = 100 ppm



Field Sanitation:

A close-up photograph of a woven basket filled with several brown eggs. The basket is made of light-colored, woven material, and the eggs are a warm, brownish-orange color. The lighting is soft, highlighting the texture of the basket and the smooth surface of the eggs.

- Always cook eggs to prevent salmonellosis. Blood and meat spots are acceptable, but cracked and rotten eggs are not acceptable and should be discarded
- Boil unpasteurized dairy products for at least 15 seconds to prevent tuberculosis, brucellosis, Q fever, etc.
- Avoid cheese, butter and ice cream made from unpasteurized milk, which can carry these diseases.
- Cook all seafood to prevent hepatitis, tapeworms, flukes, cholera, etc.

Field Sanitation

CURING



- is similar to pickling, and uses salt, acid, and/or nitrites.
- It is used for meat and fish.
- Simple, modern curing methods often reduce the amount of salt and nitrites, which may require that you refrigerate or freeze the final product.
- Some curing methods also employ a secondary process such as fermenting, smoking, or sealing.



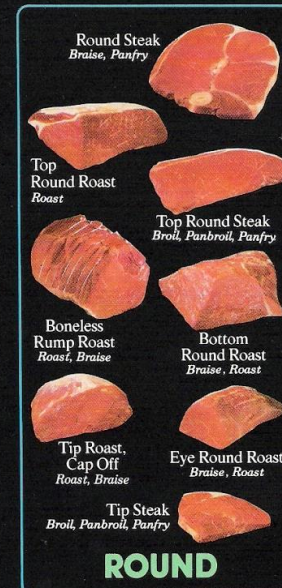
Do not take shellfish!

Field Sanitation:

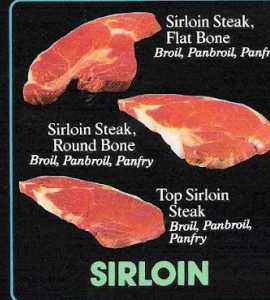
- Avoid shellfish - cooking does not degrade some toxins (red tide).
- Certain saltwater fish have heat stable toxins that are not destroyed during cooking. Do not eat any species that the native population does not eat.
- Avoid large predatory reef fish, like barracuda, grouper, snapper, jack, mackerel, and triggerfish, which may accumulate toxins (ciguatera).

Field Sanitation:

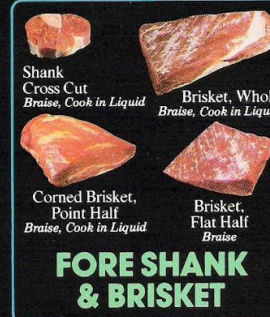
- Eat carcass or muscle meat rather than visceral meat (liver, heart, kidney, etc.). Muscle flesh is less likely to be contaminated.
- Fresh meat from healthy animals is safe if cooked thoroughly.



ROUND



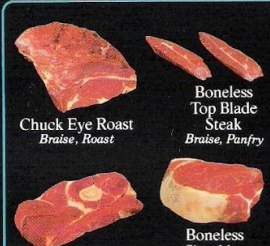
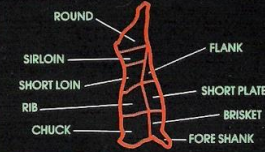
SIRLOIN



FORE SHANK & BRISKET

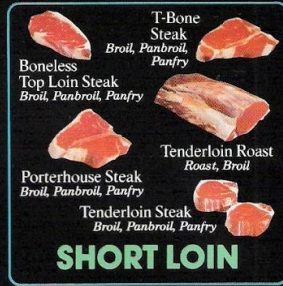
Beef

• RETAIL CUTS •
WHERE THEY COME FROM
HOW TO COOK THEM

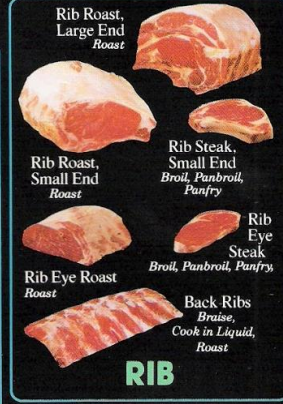


CHUCK

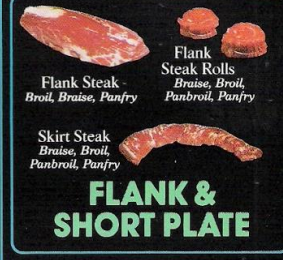
THIS CHART APPROVED BY
NATIONAL LIVE STOCK & MEAT BOARD



SHORT LOIN



RIB



FLANK & SHORT PLATE



OTHER CUTS

Field Sanitation:

- Perform an antemortem examination (before slaughtering), use correct field slaughter methods and perform a postmortem examination (after slaughtering).
- Color of meat should be red to slightly-red brown. Do not consume green or brown beef if possible. Avoid meat with off odors, such as sour or sweet, fruity smells.
- Cook meat until it is WELL DONE- do not eat rare, medium, or bloody meat.
- Sausages and meat products should be well cooked.

Field Sanitation:

- **Food Storage and Preservation**
 - a. Protect canned and dried foods from extreme heat and freezing.
 - b. Store and preserve perishables such as meat, poultry, fish, etc. by refrigerating at or below 40°F. Because refrigeration or potable ice is often not available, slaughter what you need, cook thoroughly and then consume immediately. Meat can be preserved by methods other than refrigeration if time and resources are available by smoking, curing, making jerky or pemmican, salting, and pickling. (See [Vet Medicine: Food Storage](#).)

Field Sanitation:

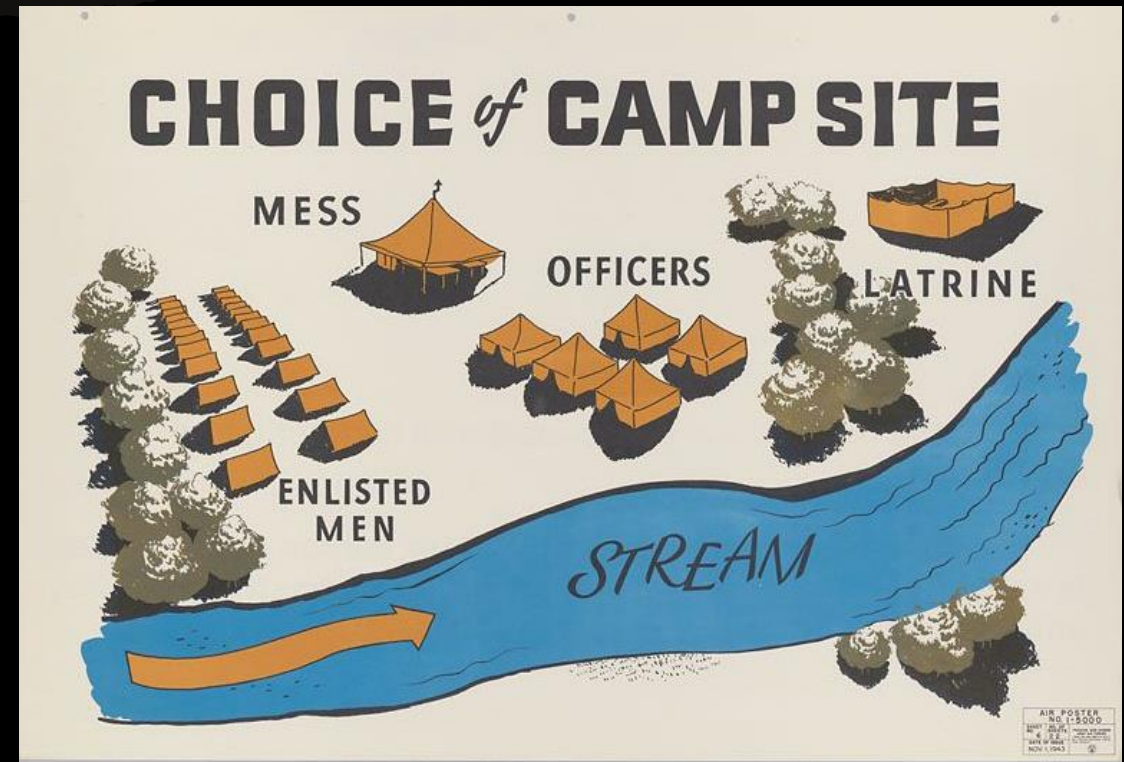
- c. Semi-perishable foods such as potatoes and onions should be stored in a dry place off the ground, allowing air to circulate around them, retarding decay and spoilage.
- d. Store staple products (flour, sugar etc.) in metal cans with tight-fitting lids.
- e. Do not store acidic foods or beverages such as tomatoes or citric juices in galvanized cans. This will prevent zinc poisoning.

Field Sanitation:

- **Preparing and Serving Food:**
 - a. Use pesticides according to the directions on the container. Limit residual sprays to crack and crevice treatment only. Protect all foods and food contact surfaces when applying pesticides.
 - b. Coordinate food preparation and consumption to eliminate unnecessary lapses of time.
 - c. Leftover food presents a problem. Plan meals to reduce the amount of leftovers. Discard items held at unsafe temperatures (45°F to 140°F) for 3 or more hours. Never save PHF foods such as creamed beef, casseroles or gravies.
 - d. Meat may contain disease-producing agents that cannot be detected by inspection. Follow cooking procedures strictly to ensure that heat penetrates to the center of the meat and that all the meat is cooked to at least 165°F. This applies to poultry, pork, beef and any stuffing or other foods containing these meats.

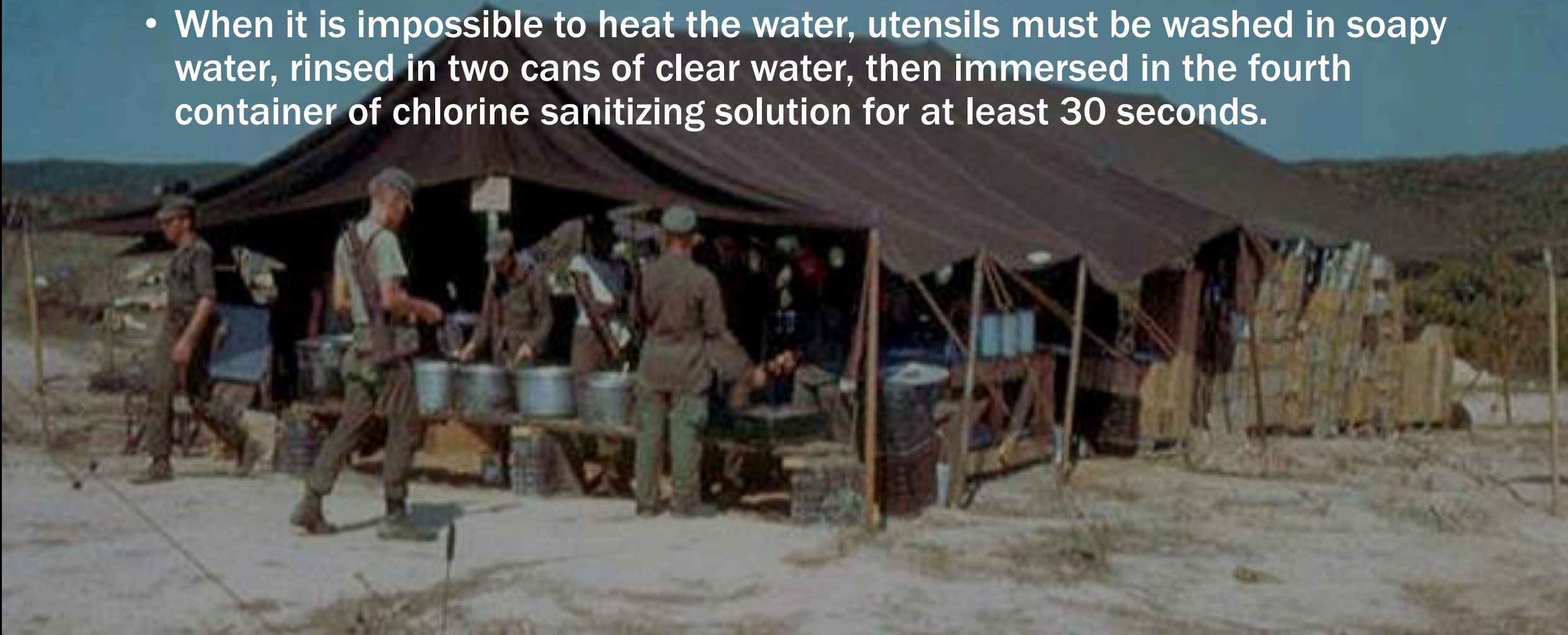
Field Sanitation:

- **5. Cleaning and Disinfecting:**
Cooking utensils and mess kits should be cleaned, disinfected, and properly stored after each use. They must be scraped free of food particles, washed in hot (120°F to 130°F) soapy water, rinsed in boiling water, sanitized for at least 10 seconds in another container of boiling water, and allowed to air dry. (see figure below). They must be stored in a clean, covered container that is protected from dust and vermin.



Field Sanitation:

- When it is impossible to heat the water, utensils must be washed in soapy water, rinsed in two cans of clear water, then immersed in the fourth container of chlorine sanitizing solution for at least 30 seconds.



Field Water Purification:

- **1. Treat and disinfect all sources of water other than US Military Installation or Quartermaster produced or approved water in the field.**
- **2. Minimize the possibility of water-borne illness by selecting proper sources.**



Field Water Purification:

3. Water consumed by personnel will come from four possible sources.

These sources are prioritized in the order in which they should be chosen for use:

- a. Fixed Facility (closed pipe system with treatment)
- b. Water Production Points (portable units, i.e., (ROWPU - Reverse Osmosis Water Purification Unit)
- c. Bottled water
- d. Emergency (raw water from the five natural sources below) from:
 1. Surface water (lakes, rivers, streams)
 2. Ground water (wells, springs)
 3. Rain water
 4. Ice
 5. Snow



Field Water Purification:



When selecting a water source for a Special Operations unit, consider certain factors:

- **Military Situation:** Does the site provide cover and concealment? Is the site accessible to soldiers? Can water be extracted with available equipment? Can the source be used without interference from the enemy? Is the water source accessible under all weather conditions? Is the site a safe distance from targets?
- **Quantity of Water:** Is there enough water in the source to sustain the troops for the desired time? Can enough water be acquired quickly?
- **Quality of the Water:** A detailed site survey is critical in selecting a quality water source.

Field Water Purification:

Water Treatment:

a. During deployments personnel will utilize the following prioritization and standards for water treatment of the four types of water sources:

(1) Fixed Facility - Chlorinate to a minimum of 2 ppm prior to consumption. If individual containers (2 quarts or less) are to be used for transport/storage of water, treat with iodine tabs (2 tabs/quart) or chlorinate to 2 ppm prior to consumption. If bulk containers (> 5 gallons) are to be used for storage/transportation of water, chlorinate to 2 ppm. This water source is preferable to over all others.



Field Water Purification:

(2) Water Production Points - Chlorinate to 2 ppm prior to consumption.

(3) Bottled Water - Carbonated bottled water needs no further treatment. If the containers are broken down and the water is placed in other containers (not the originals), treat the water with iodine (2 tabs/quart) or chlorine (2 ppm). This source is preferred when approved fixed facilities are not available.



Field Water Purification:

(4) Emergency Water - Select the least contaminated raw water source available. Filter water with a KATADYN or SWEETWATER filter system (both systems are GSA approved and can be purchased through your logistics channels) or through any system with a pore size of 0.2 microns or smaller. Treat water with iodine (2 tabs/quart) or chlorine (2 ppm) prior to consumption. Seawater must not be utilized for consumption.

b. Use the following guidelines for treating water:

NOTE: Adding 250 mg of vitamin C (ascorbic acid) per quart of water after the contact time has elapsed will improve the taste of chemically purified water.



Field Water Purification:

- (1) Individual Canteen (1 or 2 Quart)
 - (a) Iodine Tabs - NSN 6850-00-985-7166. Use 2 tabs per quart.
 - (b) Chlorine - Chlorination kit: NSN 6850-00-270-6225

1. Locate water source. Fill canteen with cleanest water available.
2. Prepare a solution by pouring the contents of one (1) ampule of calcium hypochlorite into 1/2 canteen cup of water. Thoroughly mix the solution.
3. Add 1 canteen capful (NBC WATER CAP) per quart.



Field Water Purification:

4. Shake the canteen to mix. Wait five (5) minutes (contact time). Loosen cap to allow water to seep around the threads of the neck and cap of the canteen. Re-tighten cap. Wait an additional twenty-five (25) minutes before using the water.

5. In cold weather, wait 40 minutes before using the water.

(c) Chlorine - Bleach:

1. Locate water source. Fill canteen with cleanest water available.

2. Use 2-3 drops of household bleach per quart .

3. Follow directions in 4 and 5 above.



Field Water Purification:

Boiling (least preferred):

1. Locate water source. Use cleanest water available.
2. Bring water to a rolling boil for 3-5 minutes. This will kill most organisms that are known to cause intestinal diseases.
3. In areas where *Giardia*, *Entamoeba histolytica* or viral hepatitis are known to be present, boil water for thirty (30) minutes to ensure destruction of the microorganisms.



Field Water Purification:

Boiling (least preferred):

4. In emergency situations, boil water for a minimum of 15-30 seconds.
5. High altitudes may require additional boiling.
6. Allow water to cool before dispensing or drinking.
7. Boiling provides no residual protection against recontamination and should only be used as a last resort. Water can become recontaminated if not protected properly after decontamination.

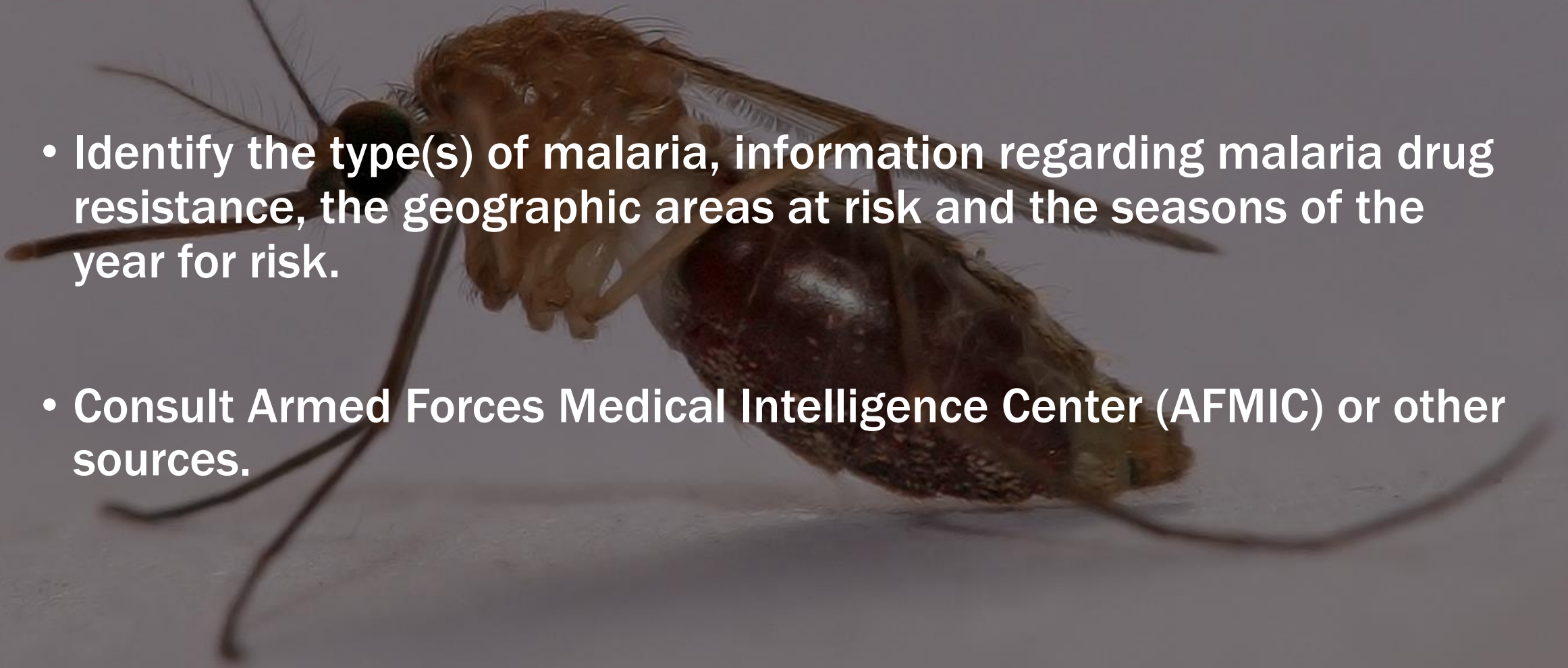


Field Water Purification:

- Other Chemical treatments:
 - 1. Povidone-iodine solution (Betadine solution, 10%, NOT THE SCRUB SOLUTION): 16 drops per liter gives 8 ppm iodine. Contact time is 20 minutes minimum or 90 minutes for cold, turbid water.
 - 2. Chlor-Floc tablets: 1 tablet per liter of water makes 8.4 ppm chlorine. Contact time is 15 minutes minimum or 60-90 minutes for cold, turbid water. These tablets have a flocculation material to clear turbid water. After treatment, the water must be strained before drinking, i.e., through a T-shirt.

Malaria Prevention and Control:

- Identify the type(s) of malaria, information regarding malaria drug resistance, the geographic areas at risk and the seasons of the year for risk.
- Consult Armed Forces Medical Intelligence Center (AFMIC) or other sources.



Malaria Prevention and Control:



- Design a prevention and control program to include the use of prophylactic drugs; personal protective measures like skin and clothing repellents, and Permethrin bed nets; and area mosquito control measures and education programs.
- Administer prophylactic drugs when indicated to those who are not allergic, comply with pre-deployment dosing requirements and advise patients of side effects such as photosensitivity with doxycycline.

Malaria Prevention and Control:



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- Administer prophylactic drugs when indicated to those who are not allergic, comply with pre-deployment dosing requirements and advise patients of side effects such as photosensitivity with doxycycline.

Malaria Prevention and Control:

Doxycycline

Adults: 100 mg daily.

Children: ≥ 8 years old: 2.2 mg/kg (maximum is adult dose) daily. Begin 1-2 days before travel, daily during travel, and for 4 weeks after leaving.



Malaria Prevention and Control:

- Provide alternative, effective drug prophylaxis for those unable to take the first line regimen.
- Ensure that all infected patients are protected from biting mosquitoes to prevent transmitting malaria to others.



Malaria Prevention and Control:

- Depending on the nature and extent of the operation, determine the need to conduct area mosquito control operations, to include control or elimination of breeding sites, use of larvicides and use of sprays.
- DIESEL / KEROSENE BARRIER



Malaria Prevention and Control:

- NOTE: Pests that require a blood meal are attracted to humans or animals by carbon dioxide emitted from the body.
- Identify and eliminate breeding sites for mosquitoes and other insects by improving drainage, disposing of refuse properly and applying appropriate chemicals.



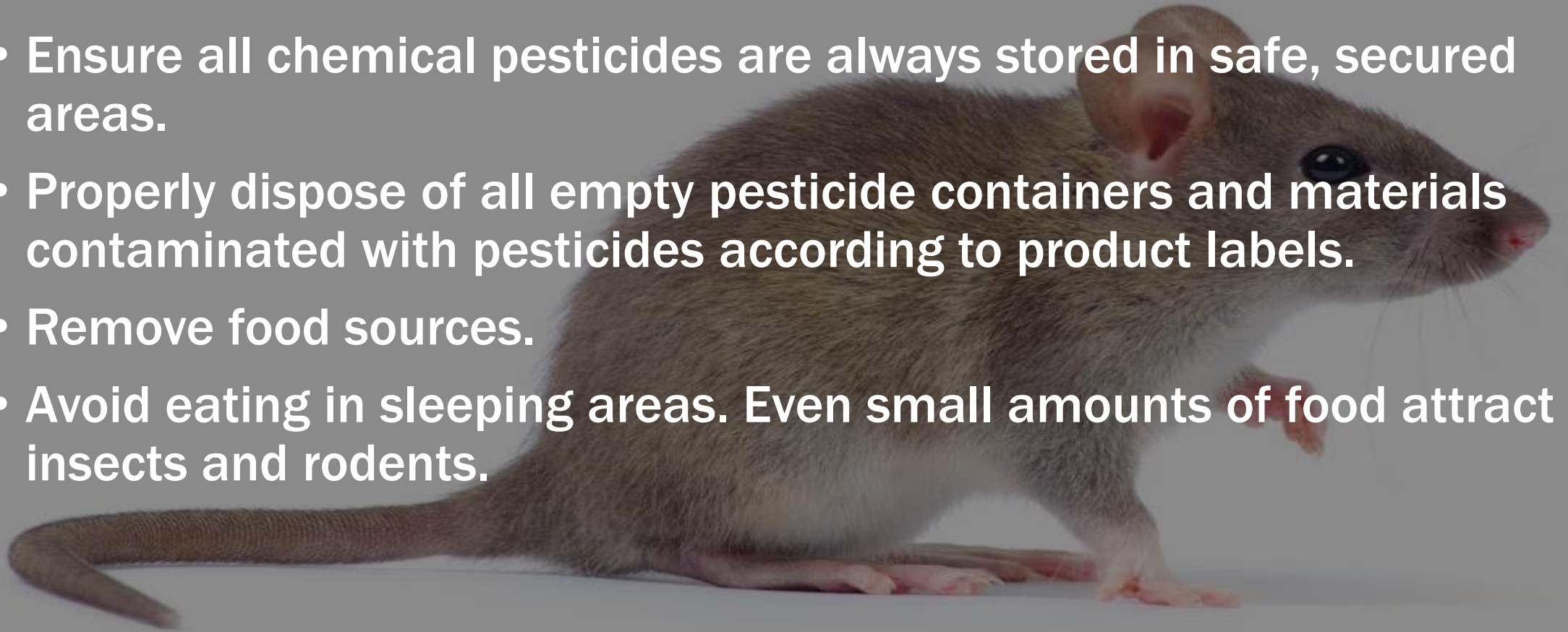
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Pest Control:

- Ensure all chemical pesticides are always stored in safe, secured areas.
- Properly dispose of all empty pesticide containers and materials contaminated with pesticides according to product labels.
- Remove food sources.
- Avoid eating in sleeping areas. Even small amounts of food attract insects and rodents.



Pest Control:

- Do not have pets near living areas.
- They harbor fleas, ticks and other insects and can attract mosquitoes and other pests.
- Use personal protective measures
- Use the DOD Arthropod Repellent System (DEET and Permethrin).

DISEASES CAUSED BY RATS

- ✓ Salmonella
- ✓ Typhoid
- ✓ Weil's disease
- ✓ Typhus
- ✓ Rat-bite fever
- ✓ Hantaviruses
- ✓ Rat Tapeworm
- ✓ Lymphocytic Chorio-meningitis



Mice & rats carry over 35 known diseases that can be passed to people such as:

- Hantavirus Pulmonary Syndrome
- Lassa Fever
- Lymphocytic Chorio-meningitis (LCM)
- Plague
- Salmonellosis
- Tularemia
- California Serogroup Viruses
- Omsk Hemorrhagic Fever
- Hemorrhagic Fever with Renal Syndrome
- Leptospirosis
- Omsk Hemorrhagic Fever
- Rat-Bite Fever
- South American Arenaviruses
- Babesiosis
- Colorado Tick Fever
- Cutaneous Leishmaniasis
- Human Granulocytic Anaplasmosis
- Murine Typhus
- Powassan Encephalitis a. Scrub Typhus
- Relapsing Fever
- Sylvatic Typhus
- Rickettsialpox
- Rocky Mountain Spotted Fever
- Western Equine Encephalitis
- Lyme Disease



Pest Control:

- Rats have gotten a bad reputation as the catalyst behind the Black Death, the infamous medieval pandemic that originated in China in 1334. It's been popularly thought that rats infected with a bacterium called *Yersinia pestis* transmitted plague to humans through a bite, a horrific process that culminated in the death of 60 percent of the European population as it spread across continents.



Pest Control:



Plague — most commonly transmitted to humans in the United States by infected ground squirrel fleas, *Oropsylla montana*, and globally by infected Oriental rat fleas, *Xenopsylla cheopis*. Also, may be transmitted by improperly handling an animal infected with plague bacteria.

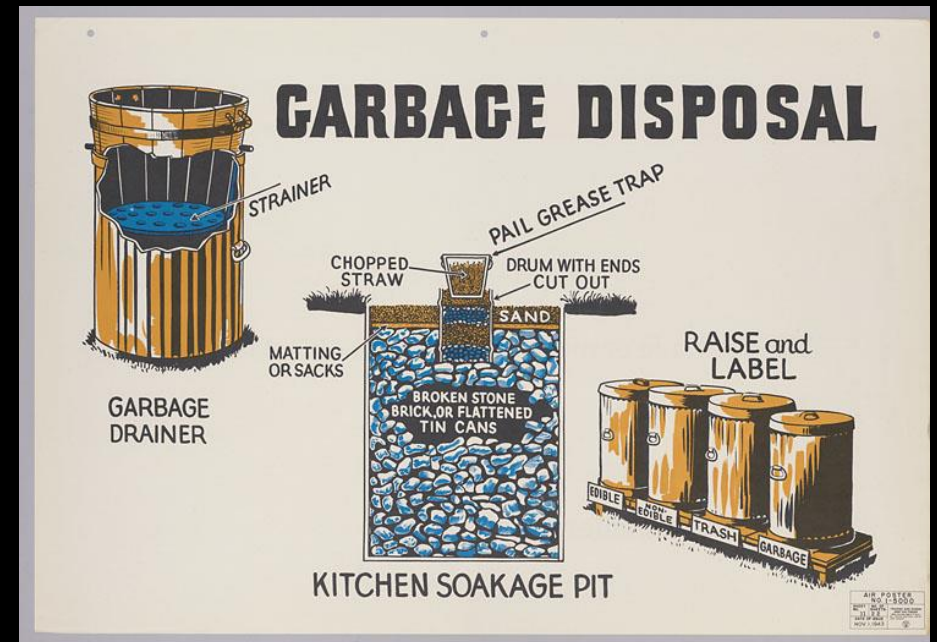
Flea-borne (murine) typhus — transmitted to people by infected cat fleas, *Ctenocephalides felis*, infected Oriental rat fleas, *Xenopsylla cheopis*, or their feces (poop; also called “flea dirt”). Most cases in the United States are reported from California, Texas, and Hawaii.

Cat scratch disease (CSD) — transmitted to humans most often after a scratch from a domestic or feral cat that has been infected by a *Ctenocephalides felis* flea, or through flea feces (poop; also called “flea dirt”) being inoculated through a cat scratch. CSD occurs wherever cats and fleas are found.

Fleaborne parasites, such as tapeworms can spread to people and animals if they accidentally swallow an infected flea. Small children are at a higher risk than adults, as they may spend more time close to the floor and carpeted areas where fleas are found. Most infected people will not show symptoms and will not know they are carrying tapeworms.

Waste Disposal:

- Proper waste disposal is necessary to prevent disease during real world contingencies and training exercises.
- Liquid and solid wastes produced under field conditions can amount to 100 pounds per person per day, especially when shower facilities are available.



Waste Disposal:

- Without proper waste disposal methods a camp or bivouac site will soon become an ideal breeding ground for flies, mosquitoes, rats, mice and other pests, which can spread diseases such as plague, dysentery, typhoid, dengue fever, and other vector-borne diseases.



Waste Disposal:

There are four different types of waste:

- 1. Human waste;
 - 2. Garbage (Food);
 - 3. Liquid;
 - 4. Rubbish
(Paper/Plastic/Cans/Glass)
-
- Select disposal methods compatible with location, military situation and regulations.



Waste Disposal:

Human Waste Disposal:

- Under field conditions, bury human waste when feasible.



Waste Disposal:

Devices most commonly used for various field situations are as follows:

- Cat Hole Latrine (for patrols)
- Straddle Trench Latrine
- Deep Pit Latrine
- Burn Out Latrine
- Pail Latrine



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