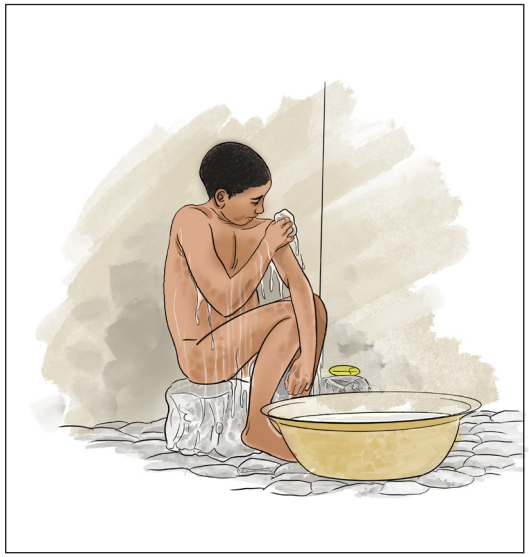
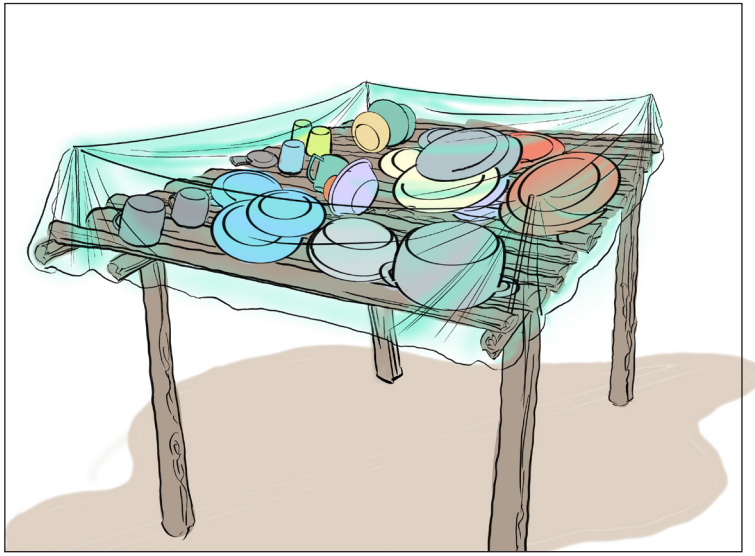
COUNSELLING CARDS ON FIVE KEYS TO SAFER FOOD FOR MALAWI





UNITY AND FREEDOM

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DEUTSCHE ZUSAMMENARBEIT

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PREFACE

Food contamination remains a major health concern, causing sickness and loss of life, particularly in places where resources are limited. This problem hits hard in communities like ours, where warm climates allow germs to thrive, and children are often the most affected.

To tackle this, the World Health Organization (WHO) created the Five Keys to Safer Food, which teach important actions like keeping clean, separating raw and cooked food, cooking food thoroughly, storing food safely, and using safe water and ingredients. While these ideas are powerful, putting them into practice in our villages and communities can be difficult due to lack of resources or specific cultural habits.

These counseling cards have been created to make food safety simple, practical, and effective for trainers in Malawi. They take the WHO guidelines and tailor them to fit our realities, like suggesting ways to safely store food without refrigeration. Each card uses questions to help learners think deeply and understand why the actions are important, making it easier for them to remember and use these practices in their daily lives.

Together, we can work toward healthier families and safer food for all.

COUNSELLING CARDS OBJECTIVES AND USES

The Objectives

- Equip facilitators with participatory and discussion skills for effective communication and engagement.
- Provide an understanding of the causes, impacts, and prevention of foodborne diseases.
- Guide the practical implementation of the WHO's Five Keys to Safer Food for safe food handling.

How to use these Counseling Cards

These Counseling Cards serve as a tool to foster discussion between facilitators and learners. Facilitators should encourage interactive and collaborative dialogues rather than simply instructing. This approach will enhance understanding and foster a supportive learning environment.

Instructions for Facilitators

- Use only images relevant to the current topic of discussion.
- Position the flip chart so that all participants can clearly view the images.
- Prompt the audience by asking what they observe in the images. Encourage them to connect these images with their own experiences.
- Ensure full participation throughout the discussion.

Guiding Tips

- Behind each image, key points are provided for reference. Avoid reading these aloud; instead, integrate them naturally into the conversation.
- Conclude discussions by asking learners to summarize what they have learnt and discuss how they can apply it.

SCOPE OF THE COUNSELLING CARDS

These cards provide simplified, practical, and culturally relevant guidance to promote the WHO's Five Keys to Safer Food in resource-limited settings.

Structure of Counselling Cards

These Counselling Cards on safe food handling practices based on the five keys to safer food has been divided into 7 sections. Each lesson introduces key concepts for facilitators to share with learners.

Lessons Outline

Lesson 1: Participatory and discussion skills

Lesson 2: Understanding foodborne diseases

Lesson 3: Key 1- Keep clean

Lesson 4: Key 2 - Separate raw and cooked

Lesson 5: Key 3 - Cook thoroughly

Lesson 6: Key 4 - Store food safely

Lesson 7: Key 5 - Use safe water and raw materials

Learning Outcomes

By the end of these lessons, learners will be able to:

a. Demonstrate participatory and discussion skills to foster open, impactful communication.

b. Recognize the causes, impacts, and prevention methods of foodborne illnesses.

c. Implement safe food handling practices by maintaining cleanliness, preventing cross-contamination, cooking thoroughly, storing food safely, and using safe water and raw materials.

1. PARTICIPATORY AND DISCUSSION SKILLS

Ask questions

Listen attentively

Identify the problem

Discuss the problem

Provide relevant points or solutions

Build consensus

Plan a follow-up meeting to assess if the problem has been resolved

PARTICIPATORY AND DISCUSSION SKILLS

1

This section provides a framework for leading effective discussions.

Lesson objective

Equip facilitators with essential discussion skills to effectively guide learners in safe food handling practices based on the five keys to safer food.

Lesson outcome

By the end of the lesson, learners will be able to confidently lead open, supportive discussions with learners, employing active listening, collaborative problem-solving, and empowerment techniques to guide safe food handling based on the five keys to safer food.

Discussion process steps

1. Begin by welcoming learners and making introductions.
2. Identify any challenges or questions learners may have, encouraging open communication.
3. Allow learners to share their thoughts uninterrupted, practicing active listening.
4. Help learners articulate the core issues they face.
5. Facilitate a collaborative discussion on possible solutions.
6. Share available strategies, allowing learners to choose which they feel are applicable.
7. Reinforce learners' chosen strategies by having them verbalize their choices.
8. Schedule follow-up visits to assess progress on any agreed actions.

Note to facilitation

Encourage facilitators to practice discussion skills by using various case studies, allowing them to gain confidence in guiding learners.

2. UNDERSTANDING FOODBORNE DISEASE

UNDERSTANDING FOODBORNE DISEASE 2

2.1 WHAT ARE FOODBORNE DISEASES?

Foodborne diseases are a global issue because:

- They affect people daily, causing sickness worldwide.
- They stem from dangerous microorganisms and toxic chemicals.
- They are preventable with proper food handling.

Discussion questions

1. What experiences have you had with foodborne illnesses?
2. Why do you think food safety is important in your community?
3. Name any two causes of foodborne diseases.

Answers to discussion questions

1. Learners should share their personal experiences with foodborne illnesses, such as symptoms, causes, or recovery processes.
2. Learners should provide their opinions on why food safety is important in their community, such as preventing illness, protecting vulnerable groups, and ensuring economic stability.
3. Two causes of foodborne diseases are harmful microorganisms (e.g., bacteria, viruses, and parasites) and toxic chemicals (e.g., pesticides and heavy metals).

Understand food borne diseases to properly handle food and significantly reduce the risk of foodborne illnesses.

2.2 IMPACT OF FOODBORNE DISEASE

2.2 IMPACT OF FOODBORNE DISEASE

Foodborne diseases impact communities by:

- Straining healthcare systems.
- Severely affecting vulnerable groups like infants, young children, the elderly and the sick.
- Creating a vicious cycle of diarrhea and malnutrition.
- Hurting national economies and hindering international trade.

Discussion questions

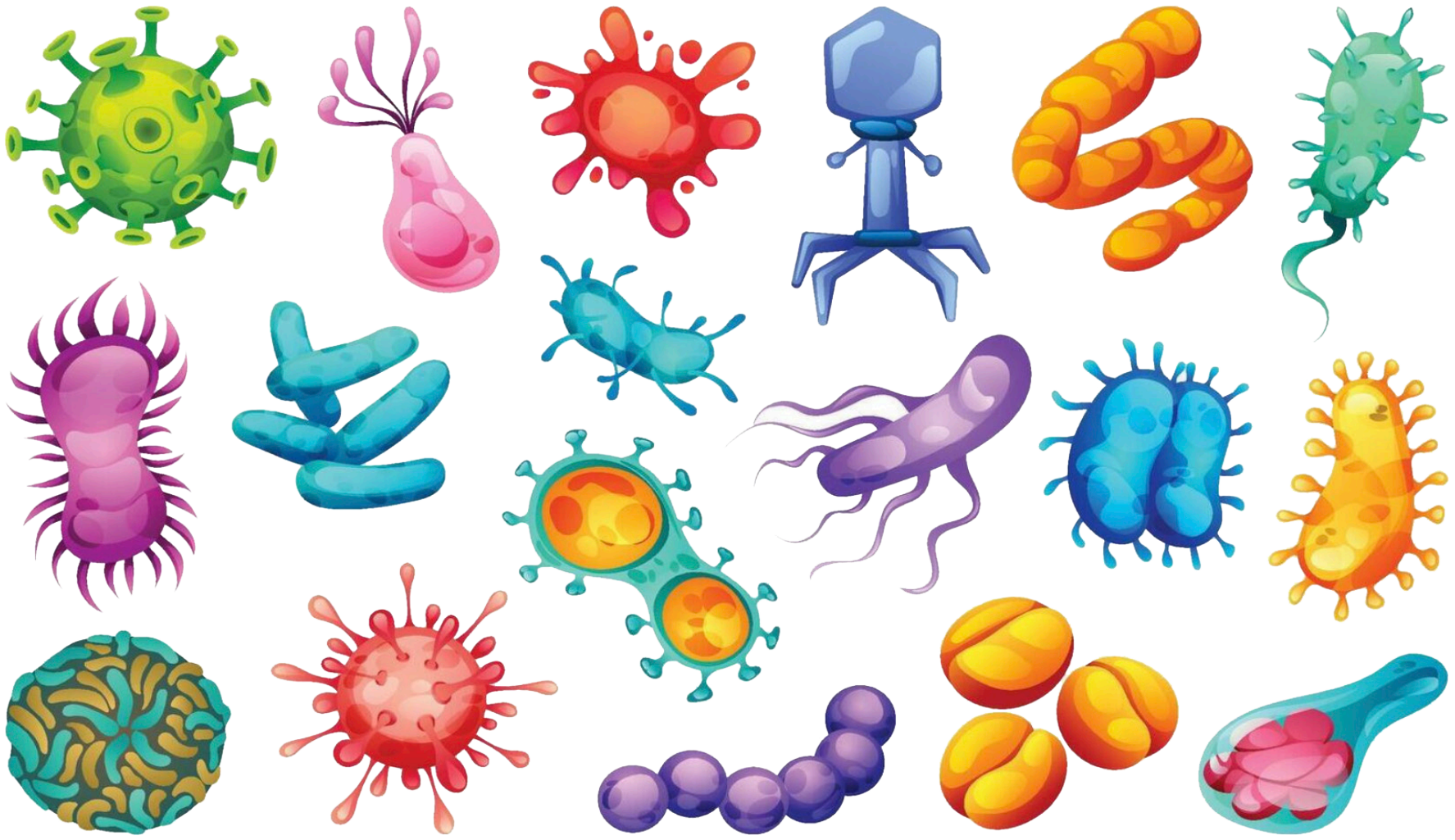
1. How do foodborne diseases impact your local healthcare system?
2. In what ways can communities support those affected by foodborne illnesses?
3. Who are the most vulnerable groups affected by foodborne diseases?
4. How can foodborne diseases affect the economy of a country?

Answers to discussion questions

1. Learners should share their opinions on how foodborne diseases strain local healthcare systems by increasing patient loads, treatment costs, and resource demand.
2. Learners should share their opinions on how communities can support affected individuals, such as by providing education, access to healthcare, and assistance with safe food practices.
3. The most vulnerable groups affected by foodborne diseases are infants, young children, the elderly, and people with compromised immune systems.
4. Foodborne diseases hinder a country's economy by disrupting international trade, straining healthcare systems, reducing workforce productivity, and increasing costs related to public health interventions

Recognize the impact of foodborne diseases to understand the importance of food safety.

2.3 MICROORGANISMS: THE GOOD, THE BAD AND THE DANGEROUS



2.3 MICROORGANISMS: THE GOOD, THE BAD AND THE DANGEROUS

Microorganisms are tiny living. Organisms that include:

- **Good Microorganisms:** Helpful in making food (e.g., cheese, yogurt) and medicine (e.g., penicillin).
- **Bad Microorganisms:** Spoilage types that do not typically cause illness but make food unappetizing.
- **Dangerous Microorganisms:** Pathogens that can cause serious illness or death. Common examples include:
    - **Bacteria:** *Salmonella, E. coli*
    - **Parasites:** *Giardia, Trichinella*
    - **Viruses:** *Hepatitis A, Norovirus*

Discuss questions

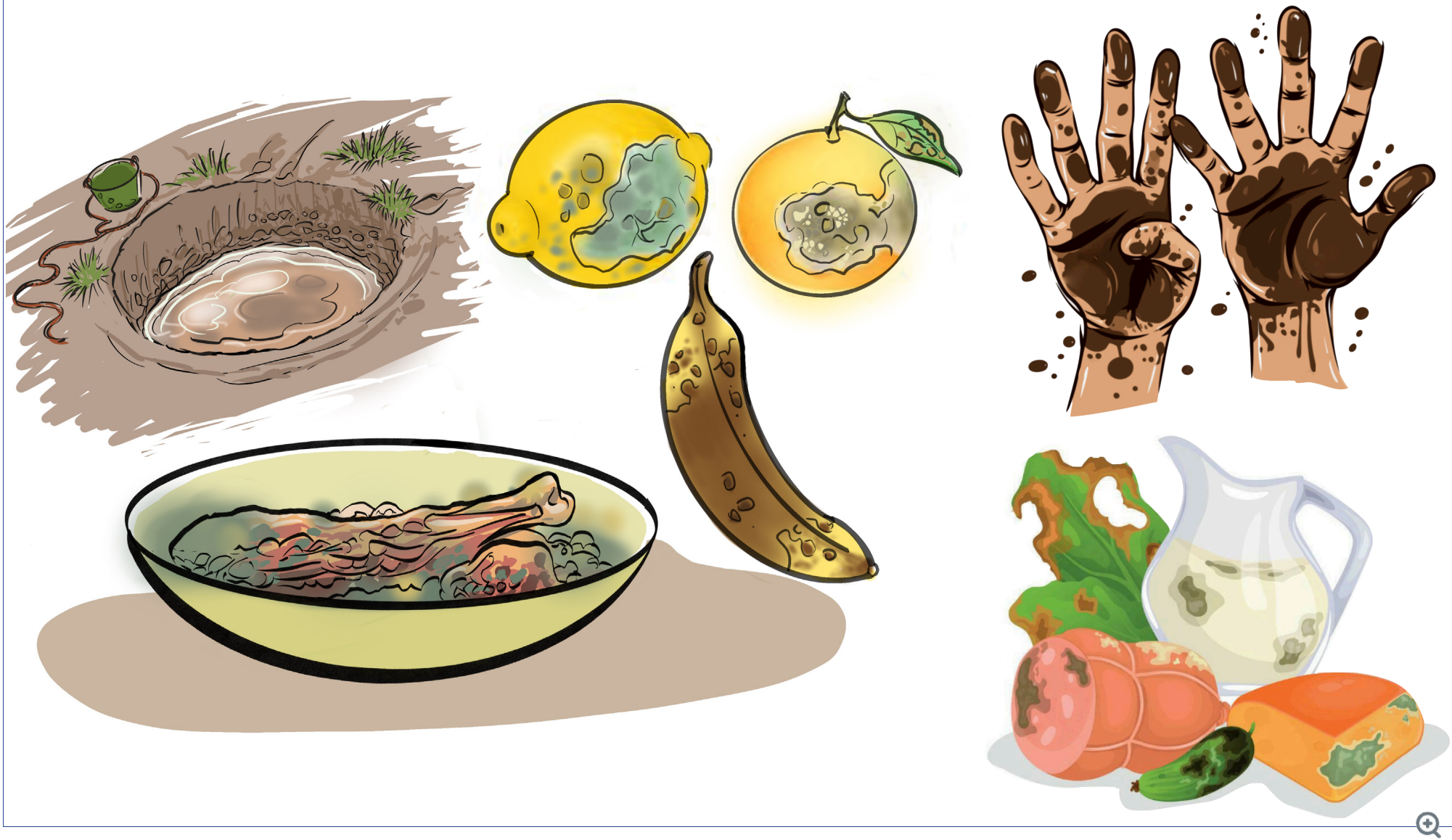
1. What are your thoughts on the role of microorganisms in food production?
2. What are two examples of beneficial microorganisms?
3. Name three dangerous microorganisms that can cause foodborne diseases.

Answers to discuss questions

1. Learners should share their opinions on how microorganisms contribute to food production, such as in fermentation, and their importance in food safety.
2. Two examples of beneficial microorganisms are yeast (used in bread and beer production) and bacteria like *Lactobacillus* (used in yogurt and probiotic foods).
3. Three dangerous microorganisms that can cause foodborne diseases are bacteria (e.g., *Salmonella, E. coli*), parasites (e.g., *Giardia*), and viruses (e.g., *Norovirus*).

Understand the different types of microorganisms to make safer food choices.

2.4 SOURCES AND MOVEMENT OF MICROORGANISMS



2.4 SOURCES AND MOVEMENT OF MICROORGANISMS

Microorganisms are found everywhere, often via:

- Hands transferring germs from surfaces to food.
- Contaminated food and water.
- Infected food handlers passing viruses like Hepatitis A and Norovirus.

Discussion questions

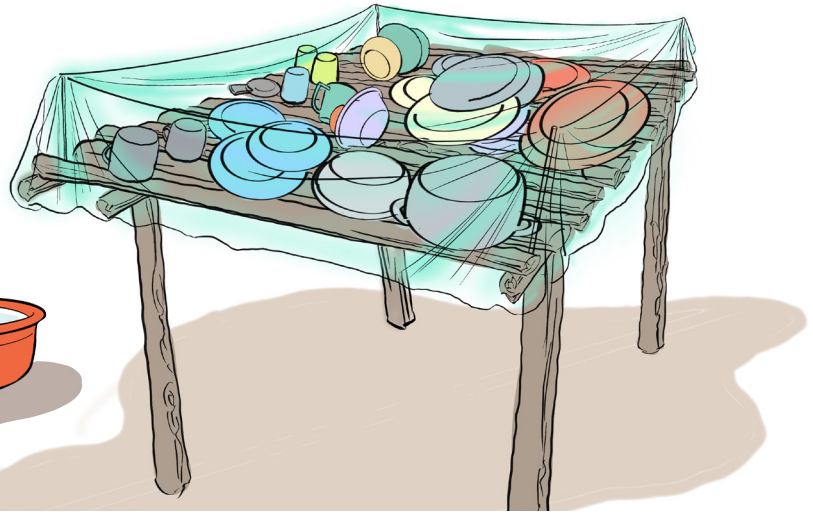
1. How do microorganisms typically spread from one surface to another?
2. Can you name three places where harmful microorganisms might be found?

Answers to discussion questions

1. Microorganisms spread when hands transfer germs from contaminated surfaces to food, other surfaces, or directly to people.
2. Harmful microorganisms can be found in feces, soil, water, animals (pets and farm animals), pests (rats and insects), and on people (skin and mouth).

Practice safe food handling and hygiene to reduce the risk of foodborne diseases.

FIVE KEYS TO SAFER FOOD



FIVE KEYS TO SAFER FOOD

Stop microorganisms from making you and other people sick by following the Five Keys to Safer Food:

1. Keep clean;
2. Separate raw and cooked;
3. Cook thoroughly;
4. Keep food at safe temperatures; and
5. Use safe water and raw materials.

It is very important to follow the Five Keys to Safer Food because proper food handling is key to foodborne disease prevention.

These messages are core information and should be presented to all audiences.

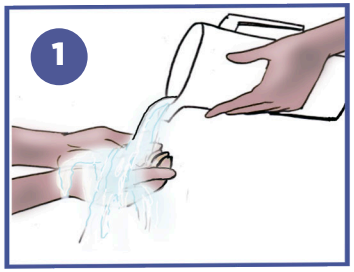
In some countries, it may be necessary to address the use of safe water and raw materials before presenting the Five Keys to Safer Food.

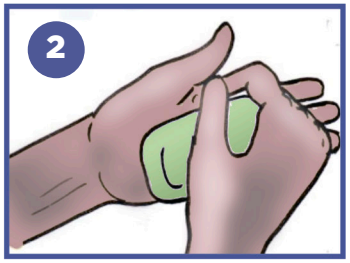
KEY 1: KEEP CLEAN

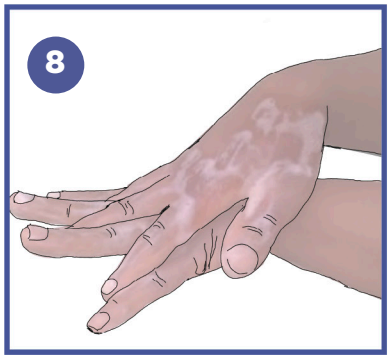
Rationale : While most microorganisms do not cause disease, dangerous microorganisms are widely found in soil, water, animals and people. These microorganisms are carried on hands, wiping cloths and utensils, especially cutting boards, and the slightest contact can transfer them to food and cause foodborne diseases.

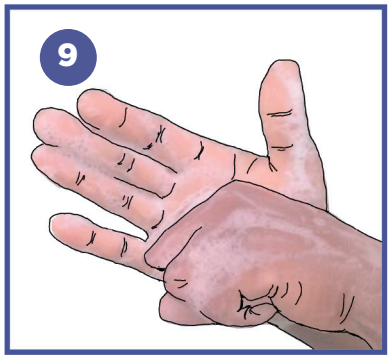
Recommendations (What?)	Actionable steps to schieve recommendations (How?)
Wash hands under the following circumstances 1. Handling or Consuming Food ▪ Before handling food and often during food preparation ▪ Before eating ▪ Before breast feeding and expressing breast milk 2. After Contact with Bodily Fluids or Waste ▪ After going to the toilet ▪ After changing a baby's nappy (diaper) ▪ After blowing your nose ▪ After changing sanitory pads ▪ After sneezing and coughing 3. After Handling Potentially Contaminated Items ▪ After handling raw meat or poultry (these items naturally carry pathogens) ▪ After handling rubbish and manure ▪ After handling chemicals (including those used to clean) 4. After Interacting with Animals ▪ After playing with pet animals or slaughtering animals including poultry 5. After Touching Different parts of the body eg nose, mouth and hair	Wet hands with running water, apply soap, rub hands together for at least 20 seconds (paying special attention to fingernails, thumbs, wrists, and in between fingers), then rinse thoroughly with running water. Dry hands with a stelile towel or air dry. Towels should not be shared.

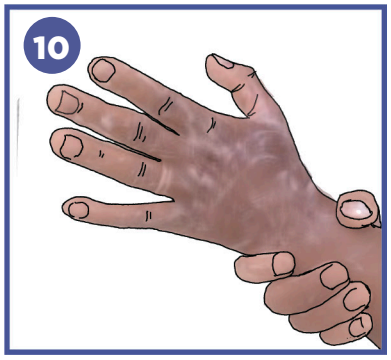
Procedure for washing hands

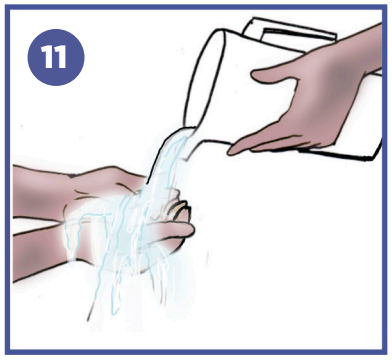












KEY 1: KEEP CLEAN

Discussion questions

1. How do harmful microorganisms transfer from hands to food?
2. Why is using running water more effective than static water for cleaning hands?
3. What alternatives exist for handwashing if there is no tap water available?
4. How can soap or substitutes, like coal ash, help in maintaining hand hygiene?
5. In what ways can washing hands before breastfeeding impact infant health?
6. Why is it significant to wash hands after using the toilet?
7. What precautions should be taken when handling raw meat or poultry regarding hand hygiene?
8. How can proper handwashing techniques be promoted in households and communities?
9. What role does handwashing play in preventing the transmission of infectious diseases?
10. What are the most commonly overlooked situations where handwashing is needed?

Answers to discussion questions

1. Harmful microorganisms transfer from unclean hands to food when food is touched without proper handwashing.
2. Running water is more effective as it uses pressure to wash away dirt and microorganisms, while static water in basins can encourage recontamination.
3. Alternatives to tap water include tip-taps, buckets with spouts, or other setups that allow water to flow over the hands during washing.
4. Soap or substitutes like coal ash help by removing fats, dirt, and microorganisms from the hands, making them clean and hygienic.
5. Washing hands before breastfeeding removes microorganisms from a mother's hands, preventing foodborne diseases when touching the breast during feeding.
6. Washing hands after using the toilet removes microorganisms that could be transferred from the toilet to food or surfaces.
7. Wash hands thoroughly with soap and running water after handling raw meat or poultry to prevent the spread of harmful microorganisms.
8. Promote proper handwashing techniques by educating community members on its benefits, providing demonstrations, and making handwashing facilities accessible.
9. Handwashing reduces the presence of microorganisms that cause foodborne and infectious diseases, preventing their spread.
10. Commonly overlooked situations include handwashing after changing baby nappies, sneezing, coughing, handling sanitary pads, touching pets, or handling poultry.

A MAINTAIN GENERAL BODY HYGIENE WHEN HANDLING FOOD

A. MAINTAIN GENERAL BODY HYGIENE WHEN HANDLING FOOD

Recommendations (what?)	Actionable steps to achieve recommendations (how?)
Take daily showers and wear clean clothes	Food handlers should shower daily, wear clean, laundered uniforms, and maintain short, clean fingernails.

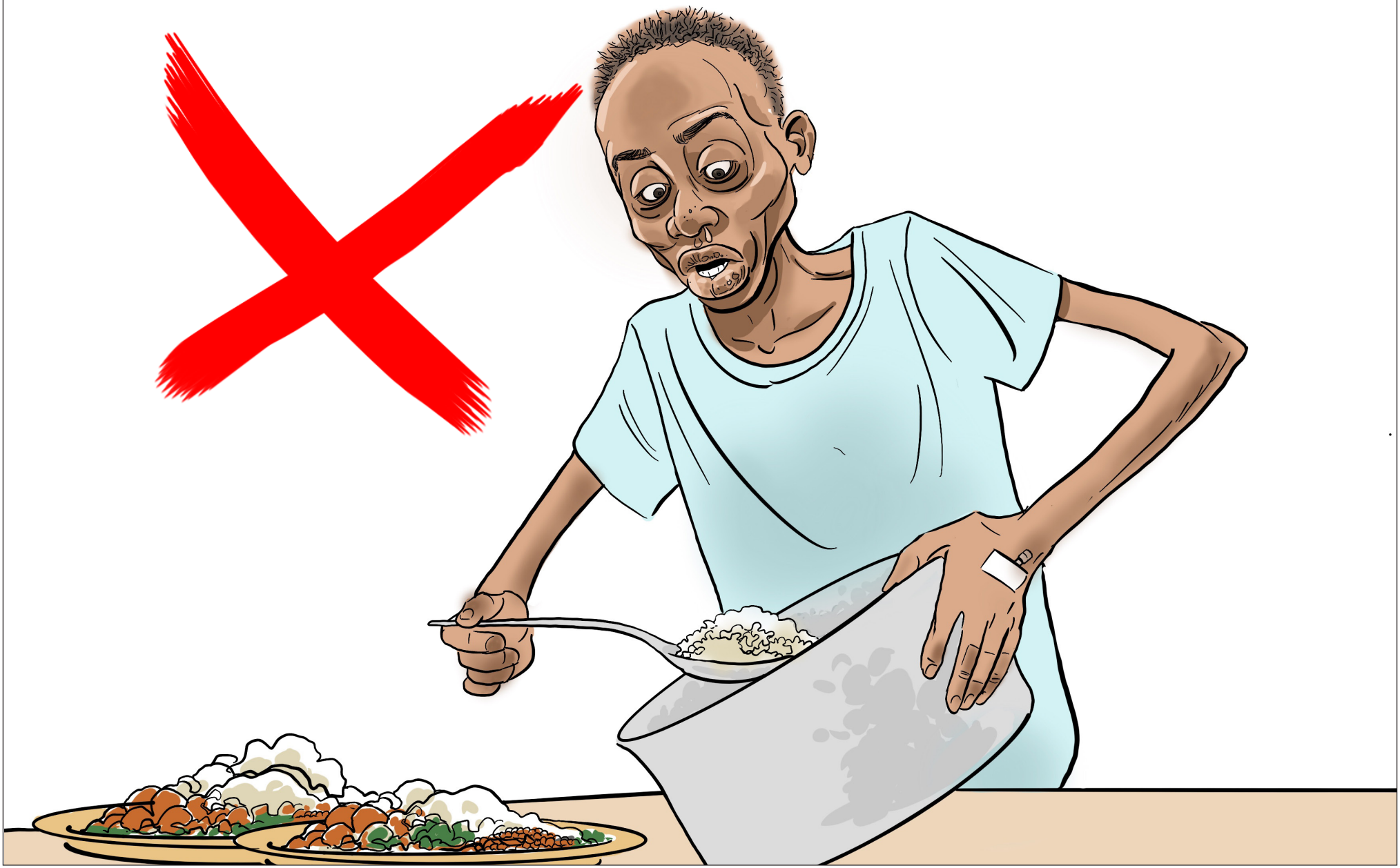
Discussion questions

- How does regular bathing minimize the risk of foodborne illness?
- What are the potential risks of food handlers not maintaining short, clean fingernails?
- What challenges might food handlers face in maintaining personal hygiene?

Answers to discussion questions

- Regular bathing reduces the number of microorganisms on the body, lowering the risk of transferring them to food during preparation.
- Long nails can trap dirt and microorganisms, which may be transferred into food during preparation, increasing the risk of contamination.
- Challenges include lack of access to resources such as soap, clean water, and clothes, as well as limited training or awareness of personal hygiene practices.

Avoid handling food when sick



Recommendations (what?)	Actionable steps to achieve recommendations (how?)
Avoid handling food when sick, especially with symptoms like fever, diarrhea, or vomiting	Avoid work until symptom-free for at least 48 hours.
Cover skin cuts or wounds with a clean, waterproof bandage and wear gloves	Clean any cuts with antiseptic and cover them with a waterproof bandage. Use disposable gloves on hands with cuts, and replace gloves as needed.

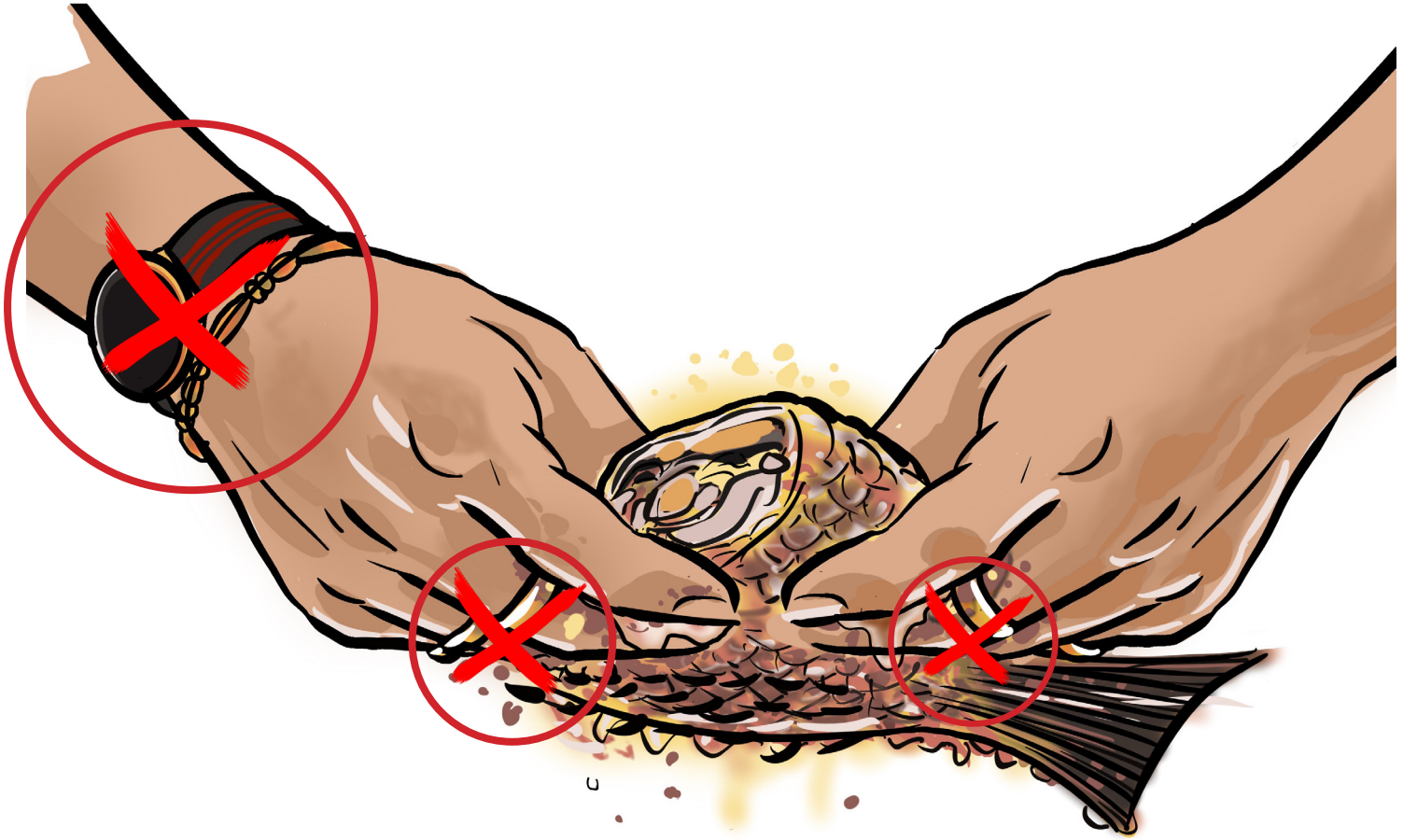
Discussion questions

1. Why is it important to avoid handling food when experiencing symptoms like fever or vomiting?
2. What risks are associated with open cuts or wounds while handling food?
3. Why is it recommended to be symptom-free for at least 48 hours before handling food?

Answers to discussion questions

1. A person experiencing symptoms like fever or vomiting may be a host for harmful microorganisms, which can contaminate food during preparation and increase the risk of foodborne diseases.
2. Open cuts or wounds can harbor microorganisms that may transfer to food, posing a significant risk of contamination and foodborne diseases.
3. Being symptom-free for at least 48 hours ensures a reduced risk of transmitting foodborne pathogens, as this allows time for the individual to recover and no longer be infectious.

Remove personal items, such as jewelry and watches, before food handling



Recommendations (what?)	Actionable steps to achieve recommendations (how?)
Remove personal items, such as jewelry and watches, before food handling	Remove jewelry and watches etc, before food handling

Discussion questions

1. How can wearing jewelry or watches during food handling contribute to contamination?
2. How do different cultures perceive the practice of removing jewelry before food handling?

Answers to discussion questions

1. Jewelry and watches can harbor dirt and harmful microorganisms, creating a risk of contamination. Additionally, they obstruct proper hand washing, reducing overall hygiene during food handling.
2. Cultural beliefs and traditions may influence the perception of removing jewelry before food handling, with some individuals feeling uncomfortable or resistant due to symbolic or religious reasons.

B CLEAN PLATES, UTENSILS AND SURFACES

CLEAN PLATES, UTENSILS AND SURFACES

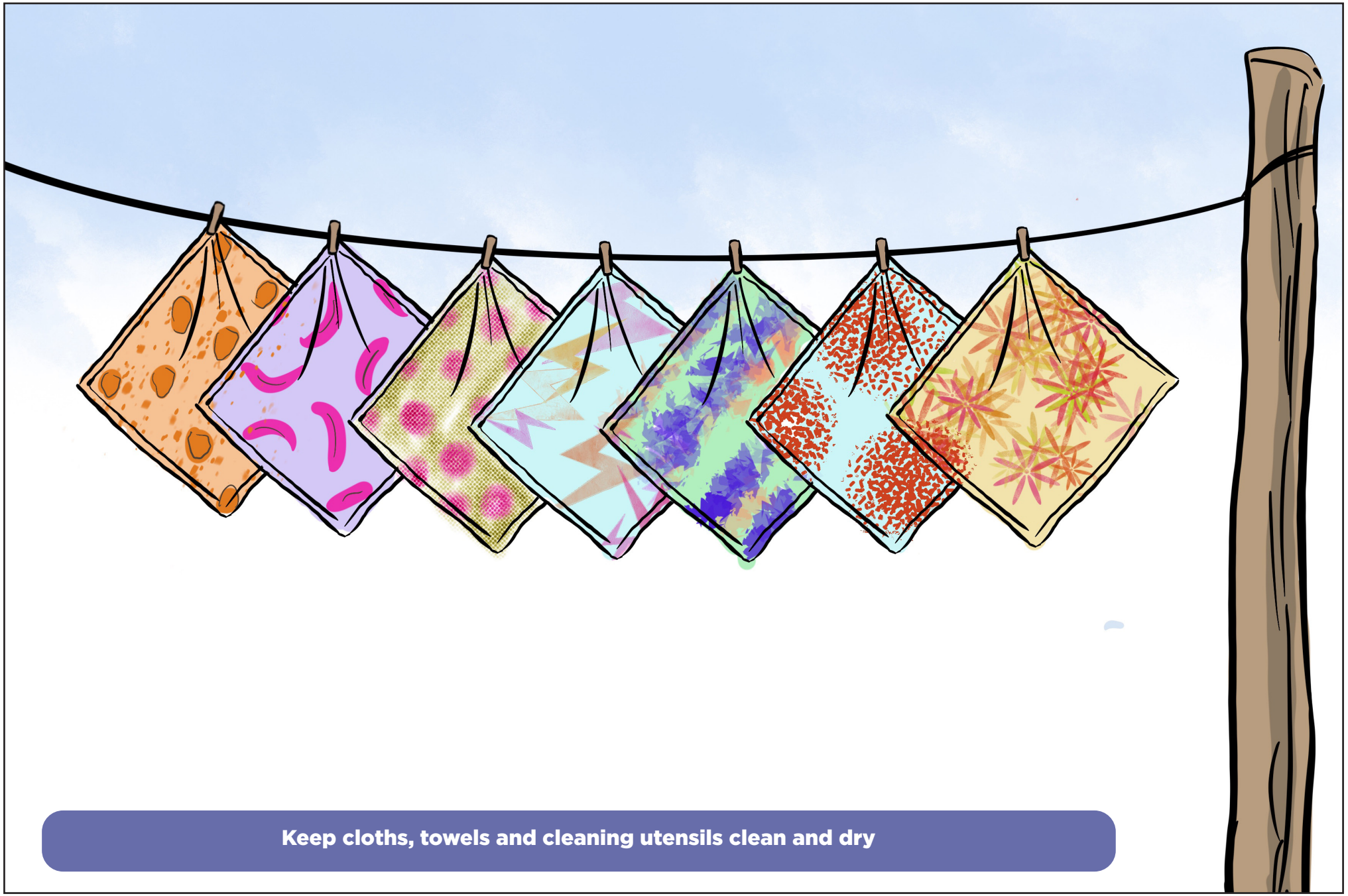
Recommendations (what?)	Actionable steps to achieve recommendations (how?)
Clean and sanitize plates, utensils, and cutting boards regularly during food preparation.	Wash utensils with hot water and detergent. Pay attention to items that touch raw food. Sanitize any utentils after contact with raw meat, seafood, or poultry.
Properly clean and sanitize all dishes and utensils after meals.	Scrape excess food into a rubbish bin, wash with hot water and detergent, rinse in hot water, sanitize with boiling water or bleach solution, and air-dry or wipe with a clean, dry cloth.

Discussion questions

1. What is the difference between cleaning and sanitizing?
2. Why is air-drying utensils recommended over using towels?
3. What are the risks of using utensils that have not been sanitized after contact with raw food?
4. What are the proper steps to wash utensils effectively using hot water and detergent?
5. Why is it important to scrape excess food into a rubbish bin before washing dishes?

Answers to discussion questions

1. Cleaning removes visible dirt, grease, and food particles using hot water and detergent, while sanitizing eliminates invisible germs and bacteria, typically using boiling water or a bleach solution (5 ml bleach in 750 ml water).
2. Air-drying prevents recontamination that can occur if towels are dirty or have been used on unsanitized utensils.
3. Unsanitized utensils can transfer harmful microorganisms from raw foods to cooked foods, increasing the risk of foodborne illnesses.
4. Proper steps include scraping excess food into a rubbish bin, washing utensils with hot water and detergent to remove grease and debris, rinsing thoroughly in hot water, sanitizing with boiling water or a bleach solution, and air-drying.
5. Scraping off excess food prevents sink clogs, reduces detergent usage, and ensures utensils are cleaned more effectively.



Keep cloths, towels and cleaning utensils clean and dry

Recommendations (what?)	Actionable steps to achieve recommendations (how?)
Keep cloths, towels, and cleaning utensils clean and dry.	Change cloths daily. Avoid sponges, use separate cloths for different tasks, and ensure cleaning utensils are dried after use.

Discussion questions

1. Why is it beneficial to avoid using sponges in the kitchen?
2. What potential health risks can arise from using dirty or damp cloths during food preparation?
3. How often should cleaning cloths be changed, and what factors influence this frequency?

Answers for discussion questions

1. Sponges retain moisture, creating an environment conducive to the growth and multiplication of microorganisms. These microorganisms can easily contaminate utensils and surfaces during cleaning, increasing food safety risks.
2. Dirty or damp cloths harbor microorganisms that can transfer to food or surfaces, significantly raising the risk of foodborne illnesses.
3. Cleaning cloths should be changed daily or immediately if they are visibly dirty, fall to the ground, or are used to clean utensils that have come into contact with raw food.

use bleach solution to sanitize utensils and surfaces.

Recommendations (what?)	Actionable steps to achieve recommendations (how?)
Use or make own homemade bleach solution to sanitize utensils and surfaces.	Mix 5 ml of household bleach in 750 ml of water and use it for sanitizing utensils, surfaces, and cloths. Let the solution sit for at least 30 seconds before rinsing. Alternatively, boil water and sanitize the items by submerging them for at least 1 minute. **Notes:** • Use only plain, unscented bleach without additives for sanitizing. • Always prepare the bleach solution fresh before use, as its effectiveness decreases over time. • Ensure proper ventilation while using bleach to avoid inhaling fumes..

Discussion questions

1. How can freshly prepared bleach solutions enhance the sanitizing process?
2. What are the steps involved in preparing a homemade bleach solution for sanitizing utensils and surfaces?
3. Why is it important to use only plain, unscented bleach without additives for sanitizing purposes?
4. Why is it necessary to let the bleach solution sit for at least 30 seconds before rinsing?
5. What alternative method can be used for sanitizing items if bleach is not available?

Answers for discussion questions

1. Freshly prepared bleach solutions are more effective as bleach loses its potency over time, reducing its ability to kill microorganisms.
2. To prepare a homemade bleach solution, mix 5 ml of household bleach with 750 ml of clean water, ensuring thorough mixing before use.
3. Scented or additive-laden bleach should be avoided as the chemicals can transfer to food-contact surfaces, posing a risk of contamination.
4. Allowing the bleach solution to sit for at least 30 seconds provides sufficient contact time to kill microorganisms effectively.
5. If bleach is unavailable, items can be sanitized by boiling them in water for at least 1 minute to achieve similar disinfecting effects..

Dry washed utensils

Recommendations (what?)	Actionable steps to achieve recommendations (how?)
Dry washed utensil and plates outdoors in direct sunlight whenever possible. If drying outdoors is not feasible (e.g., due to weather conditions), use indoor drying in a clean, ventilated space.	Outdoor Sun Drying (Preferred Method) • Place a clean drying rack or mat in a sunny, dust-free area outside. • Position plates so they're tilted to allow water to drain off, encouraging airflow and faster drying. • Use a light cover (such as a mesh or cloth) to protect plates from dust and insects. Indoor Drying (Alternative) • Choose a well-ventilated indoor space, ideally near a window for indirect sunlight or airflow. • Arrange plates on a drying rack with space between them to allow air circulation and prevent moisture retention. • Avoid enclosed, damp areas to reduce the risk of bacteria and mold.

Discussion questions

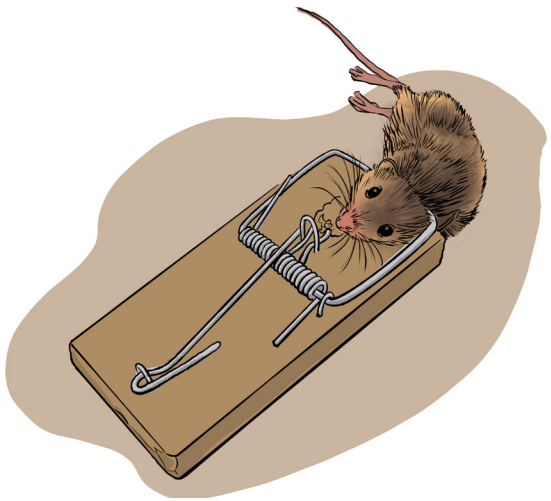
1. How does sunlight act as a natural disinfectant?
2. How should plates be positioned on a drying rack to ensure optimal drainage and airflow?
3. What precautions should be taken to protect plates from dust and insects while drying outdoors?
4. When outdoor drying is not possible, what are the key factors to consider for indoor drying?

Answers to discussion questions

1. Sunlight provides UV rays that kill residual bacteria, promoting sanitation. It also speeds up drying by reducing moisture, which inhibits bacterial growth.
2. Plates should be tilted on the drying rack to allow water to drain off completely, ensuring proper airflow and faster drying.
3. Use a light cover, such as a mesh or cloth, to protect plates from dust and insects while drying outdoors.
4. For indoor drying, choose a well-ventilated space near a window for airflow or indirect sunlight. Arrange plates with space between them on a drying rack to promote air . circulation and prevent moisture retention. Avoid enclosed or damp areas to reduce the risk of bacteria and mold growth.

C

PROTECT FOOD PREPARATION AREAS FROM PESTS AND ANIMALS



PROTECT FOOD PREPARATION AREAS FROM PESTS AND ANIMALS

Recommendations (What?)	Actionable steps to achieve recommendations (How?)
Protect food preparation areas from pests	• Keep food covered or in closed containers. • Use clean food nets to cover food and prevent insects from landing on it. Altenatively designated cloth can be used. • Keep rubbish bins covered and properly dispose rubbish regularly. Where bins are not available use deep pits located away from kitchen. • Repair cracks or holes in walls to maintain kitchen areas. • Use baits or insecticides carefully to avoid food contamination. • Keep domestic animals away from food preparation areas. • Proper housing to keep them away from food preparation area .
Maintain pest-free food environments	• Regularly clean and sanitize kitchen surfaces and utensils, especially where it is difficult to be completely pest-free. • Adjust pest control measures based on the common pests in the specific area. • Use food nets to protect food from flying insects and pests.

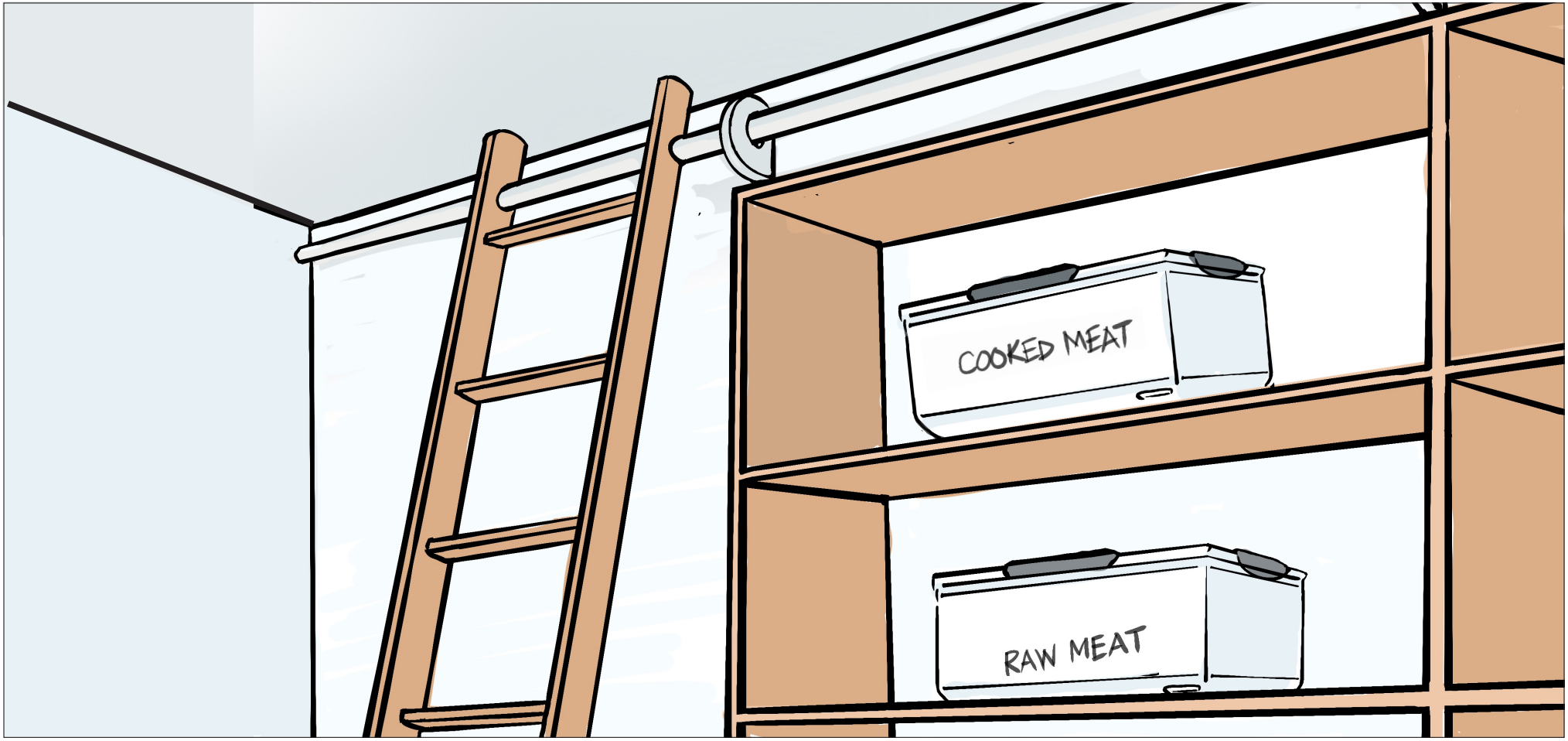
Discussion questions

1. How can pests in food areas lead to contamination?
2. What effective methods exist to prevent pests from accessing food areas?
3. Why is it crucial to keep food covered or in closed containers during food preparation?
4. What alternatives exist for food nets?
5. What best practices should be followed for managing rubbish bins to minimize pest attraction?
6. What precautions should be taken when using baits or insecticides to avoid contaminating food?
7. How often should kitchen surfaces and utensils be cleaned and sanitized to maintain a pest-free environment?

Answers to discussion questions

1. Pests transfer harmful microorganisms to food, causing contamination and increasing the risk of foodborne diseases.
2. Prevent pests by covering food with clean nets or designated cloths, keeping rubbish bins covered and emptying them regularly. If bins are unavailable, use deep pits located away from the kitchen. Seal cracks or holes in walls, use insecticides or baits cautiously, and ensure domestic animals are kept away from food preparation areas.
3. Keeping food covered or in closed containers prevents contact with pathogens and pests that could cause contamination.
4. Alternatives to food nets include clean, designated cloths to cover food effectively.
5. Rubbish bins should always be covered, emptied regularly, and kept clean. In the absence of bins, deep pits far from kitchen areas can be used for waste disposal.
6. Baits and insecticides must be used carefully, ensuring they are kept away from food preparation and storage areas to avoid contamination.
7. Kitchen surfaces and utensils should be cleaned and sanitized regularly, especially in areas prone to pest presence, to maintain hygiene and a pest-free environment.

KEY 2: SEPARATE RAW AND COOKED



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

KEY 2: SEPARATE RAW AND COOKED

Recommendations (what?)	Actionable steps to achieve recommendations (How?)
Separate raw and cooked foods	• While shopping or sourcing, keep raw meat, poultry and seafood separate from other foods. • Store food in containers with lids to avoid contact between raw and prepared foods. If resources are limited, designate specific areas or surfaces (e.g. separate corners or simple mats) for handling raw and cooked foods. • Use available materials (e.g. reusable cloths or separate plates) to keep raw and prepared foods separate.

Discussion questions

1. Why is washing poultry and meats in a kitchen sink considered forbidden?
2. Why is it important to keep raw foods, especially meats, separate from other foods during all stages of food handling?
3. What are some practical ways to separate raw and cooked foods in resource-limited settings?
4. What challenges might arise in enforcing the separation of raw and cooked foods in your homes?

Answers to discussion questions

1. Washing poultry and meats in a kitchen sink can spread dangerous microorganisms from raw meat to other surfaces or foods, increasing the risk of cross-contamination.
2. Keeping raw foods separate from other foods prevents cross-contamination, reducing the risk of transferring harmful microorganisms to cooked or ready-to-eat foods.
3. In resource-limited settings, designate specific areas or simple surfaces like separate mats or trays for handling raw and cooked foods to ensure separation.
4. Challenges include the lack of adequate utensils, workspace, or storage options to effectively separate raw and cooked foods.

Recommendations (what?)	Actionable steps to achieve recommendations (how?)
Prevent cross-contamination	• Use separate equipment and utensils such as knives and cutting boards for handling raw foods • If access to multiple utensils is limited, wash knives, plates, and surfaces with clean water and soap between handling raw and cooked foods. • If containers are scarce, use basic alternatives such as plastic bags or natural covers like banana leaves to keep raw and cooked foods separate. • In the refrigerator, store raw meat, seafood and poultry below cooked or ready to eat foods to avoid cross-contamination. Similarly, food placed outside refrigerator should also be separated (raw and cooked). • Avoid pouring liquids used for marinating raw meat over cooked food.

Discussion questions:

1. What are the potential consequences of cross-contamination in food handling?
2. How can separating utensils and surfaces help prevent the spread of harmful microorganisms?
3. How can washing knives, plates, and surfaces with clean water and soap help prevent cross-contamination when access to multiple utensils is limited?
4. What alternative methods can be used to keep raw and cooked foods separate when containers are scarce?

Answers to discussion questions:

1. It can lead to foodborne illnesses.
2. It prevents the transfer of microorganisms from raw foods to cooked foods.
3. Washing utensils removes and kills microorganisms from the utensils preventing cross-contamination.
4. If containers are scarce, use basic alternatives such as plastic bags or natural covers like banana leaves to keep raw and cooked foods separate.

Additional Guidelines and Considerations

1. **Full food preparation process:** Emphasize that food separation must happen at all stages, from shopping to cooking and marinating, to reduce cross-contamination risks effectively.
2. **Marinating caution:** Remind that liquids used for marinating raw meat should never be poured over the cooked meat, as this reintroduces pathogens to the final dish.
3. **Avoid hot food in plastic bags:** Avoid placing hot food in plastic bags as the heat can cause chemicals to leach from the plastic into the food, posing health risks.

Additional discussion questions:

1. Why is it necessary to practice food separation not only during cooking but also during other stages, like shopping and marinating?
2. How does the improper use of plastic containers with hot food pose a health risk?
3. Why should hot foods not be stored in plastic bags?

Answer to additional discussion questions

1. Practicing food separation at all stages, including shopping and marinating, prevents cross-contamination between raw and cooked foods or allergens, reducing the risk of foodborne illnesses.
2. Plastic containers can release toxic chemicals, such as BPA or phthalates, when exposed to high heat, contaminating the food and posing health risks.
3. Hot foods should not be stored in plastic bags because the heat can cause the plastic to melt or leach harmful chemicals into the food, compromising its safety.

KEY 3: COOK THOROUGHLY

Rationale: Proper cooking can kill almost all dangerous microorganisms. Studies have shown that cooking food to a temperature of 70 °C can help ensure it is safe for consumption. Foods that require special attention include minced meats, rolled roasts, large joints of meat and whole poultry.

KEY 3: COOK THOROUGHLY

Recommendations (what?)	Actionable steps to achieve recommendations (How?)
Cook food thoroughly especially meat, poultry, eggs and seafood	■ Use a thermometer where available, placing it in the center of the thickest part of the meat. ■ If a thermometer is unavailable: • For poultry, ensure that the juices are clear and no longer pink. • For eggs and seafood, ensure they are cooked until piping hot throughout. • For liquids like soups and stews, bring them to a boil and continue boiling for at least 1 minute. • For larger pieces of meat, ensure that they are evenly browned, especially at the thickest part. You can cut a small piece from the center to check if it is properly cooked.

Discussion questions

1. Why is it essential to cook meat, poultry, eggs, and seafood to at least 70°C?
2. What signs indicate that poultry and large cuts of meat are safely cooked without a thermometer?
3. Why is it important to bring liquids like soups and stews to a boil and maintain that temperature for at least one minute?

Answers to discussion questions

1. Cooking at 70°C ensures the destruction of most harmful microorganisms, such as bacteria, viruses, and parasites, that can cause foodborne illnesses.
2. Without a thermometer, poultry is safely cooked when the juices run clear and there are no pink areas. For large cuts of meat, ensure they are evenly browned, particularly at the thickest part, and cut a small piece from the center to confirm thorough cooking.
3. Bringing soups and stews to a boil and maintaining the temperature for at least one minute eliminates pathogens and ensures the food is safe to consume.

Ensure safe microwave cooking

Recommendations (What?)	Actionable steps to achieve recommendations (How?)
Ensure safe microwave cooking	■ Ensure microwave-cooked food is evenly heated and piping hot throughout. ■ Avoid using plastic containers not labeled as microwave-safe.

Discussion questions

1. Why should certain plastic containers be avoided in microwave cooking?

Answers to discussion questions

1. Certain plastic containers can release harmful chemicals, such as BPA or phthalates, when heated. Additionally, some plastics may interfere with even heat distribution, creating cold spots in the food where harmful microorganisms could survive.

Check the cooking temperature

Recommendations (What?)	Actionable steps to achieve recommendations (How?)
Check the cooking temperature	■ Properly use a thermometer by placing it in the center of the thickest part of the food, ensuring it does not touch bone or container sides. ■ If a thermometer is unavailable: • For poultry, juices should run clear, and the meat should not be pink. • For liquid-based foods, boiling for 1 minute ensures sufficient heat throughout. • For seafood and eggs, they should be cooked until piping hot, with no translucent parts remaining.

Discussion questions

1. What is the correct method for using a thermometer to check the cooking temperature of food?
2. Why is it important to avoid touching bone or the sides of containers when using a thermometer?

Answers to discussion questions

1. Insert the thermometer into the center of the thickest part of the food, ensuring it does not touch bone, fat, or the sides of the container, to get an accurate temperature reading.
2. Touching bone or container sides can give inaccurate readings because these areas may not reflect the actual temperature of the food's interior.

Reheat cooked food thoroughly

Recommendations (What?)	Actionable steps to achieve recommendations (How?)
Reheat cooked food thoroughly	■ When there is no thermometer, rely on visual cues to ensure food is piping hot throughout. ■ Reheat liquids by bringing them to a boil again. For solid foods like meat, ensure even heating by stirring or cutting into the food to check if it is hot throughout.

Discussion Questions

1. Why is thorough reheating essential for food safety, especially after storage?
2. What are effective visual cues to determine that reheated food is safe to consume?

Answers to discussion questions

1. Thorough reheating is essential to destroy dangerous microorganisms that may have multiplied during storage, ensuring the food is safe to eat.
2. Effective visual cues include bringing liquids to a rolling boil and ensuring solid foods, like meat, are evenly heated by stirring or cutting into them to ensure they are hot throughout.

KEY 4: STORE FOOD SAFELY

Rationale: Microorganisms can multiply quickly if food is stored at room temperature or retains too much moisture. Preservation techniques focus on reducing water activity, alongside controlling temperature, to slow or stop the growth of harmful microorganisms. Reducing water activity through methods such as dehydration, salting, and fermentation is essential in preventing bacterial growth and food spoilage

A REFRIGERATION

REFRIGERATION

Recommendations (What?)	Actionable steps to achieve recommendations (How?)
Refrigerate promptly all cooked and perishable foods at temperatures < 5°C.	Store perishable foods in the refrigerator as soon as possible after purchase or cooking. Use a refrigerator thermometer to confirm that the temperature stays below 5°C.
Limit storage time, even in a refrigerator. Cooked food should be consumed or preserved within 3 days.	Label containers with the date of storage and set reminders to consume, preserve or dispose of cooked food within 3 days.

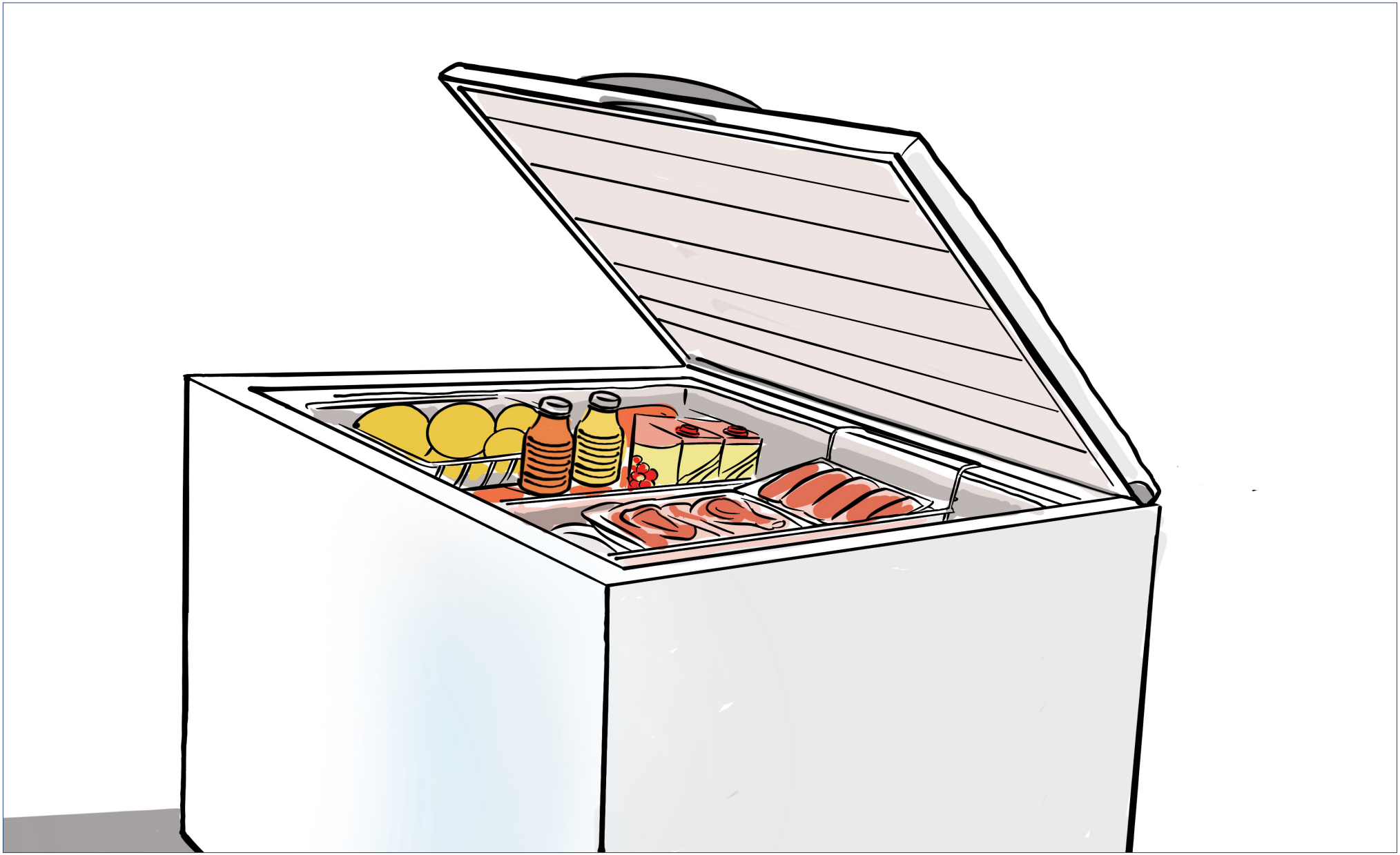
Discussion questions

1. Why is it necessary to keep refrigeration temperatures below 5°C?

Answers to discussion questions

1. Refrigeration temperatures below 5°C slow bacterial growth, preserving food safety and extending its shelf life.

B THAWING



THAWING

Recommendations (What?)	Actionable steps to achieve recommendations (How?)
Do not thaw frozen food at room temperature. Always thaw food in the refrigerator or another cool places.	Plan ahead to allow enough time for food to thaw in a refrigerator. Alternatively, use a cold-water bath or microwave to speed up the process while keeping the temperature safe. Food thawed in a microwave oven should be cooked promptly

Discussion questions

1. Why is it unsafe to thaw frozen food at room temperature?
2. How can planning ahead help ensure that food is thawed properly and safely in the refrigerator?
3. How does using a microwave to thaw food compare to other methods in terms of safety and efficiency?

Answers to discussion questions

1. Thawing at room temperature creates an environment where bacteria can grow rapidly, increasing the risk of foodborne illnesses.
2. Planning ahead allows sufficient time for food to thaw safely in the refrigerator at a consistent, safe temperature, preventing bacterial growth.
3. A microwave speeds up thawing, making it more efficient than refrigeration, but food must be cooked immediately after thawing to prevent bacterial growth in warm spots created

Obtain fresh food daily

Recommendations (What?)	Actionable steps to achieve recommendations (How?)
Obtain fresh food daily and prepare only what is needed.	Purchase fresh food in small quantities, plan meals carefully and prepare portions that match immediate consumption needs. Avoid leftovers when refrigeration is not available.

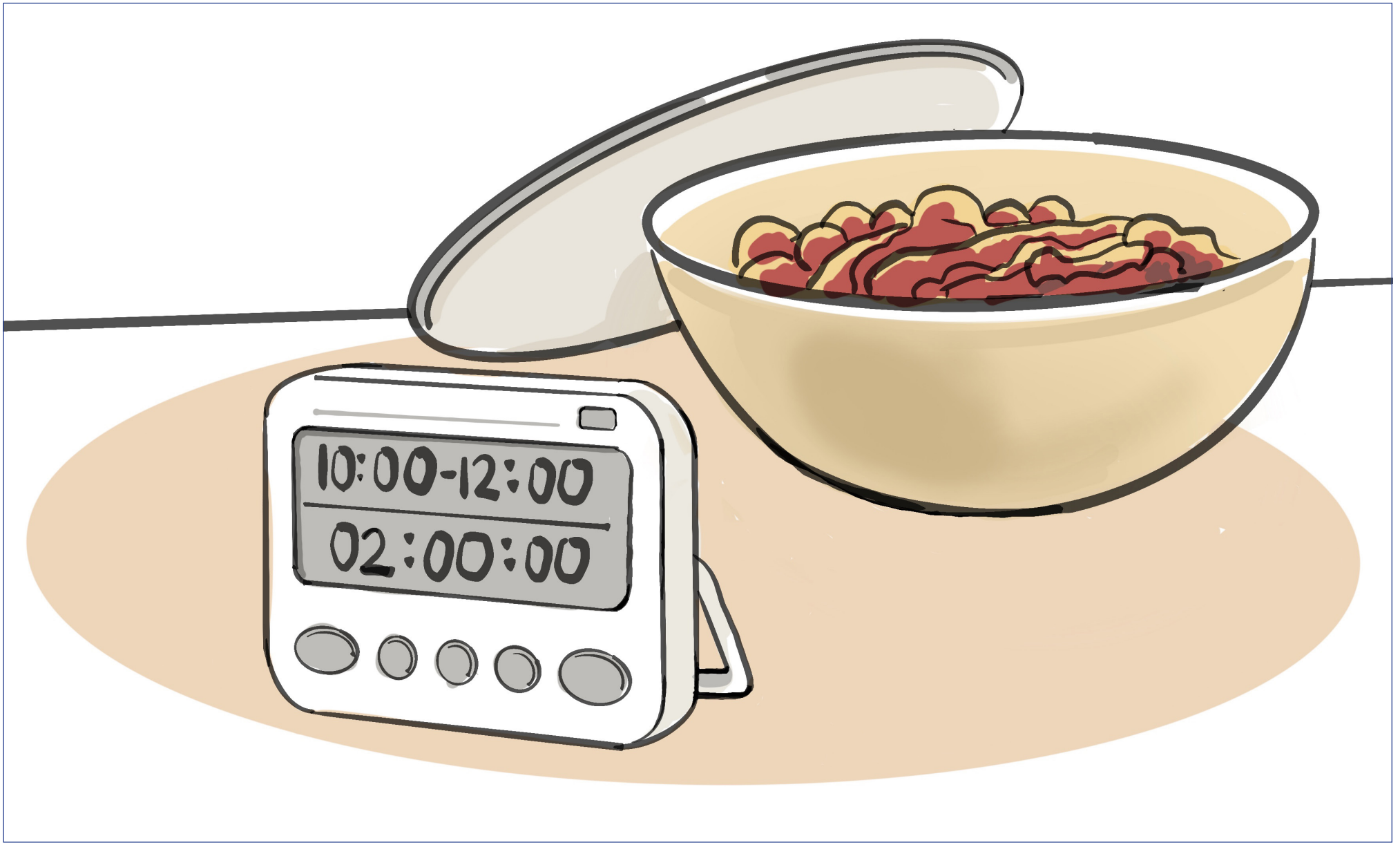
Discussion questions

1. What strategies can be employed for effective meal planning to ensure only necessary amounts are cooked?
2. What potential risks arise from keeping leftovers when refrigeration is not available?

Answers to discussion questions

1. By planning meals carefully and cooking portions that match immediate consumption needs.
2. Food can easily be contaminated by dangerous microorganisms that cause foodborne illnesses during the process

C STORAGE OF COOKED FOOD



STORAGE OF COOKED FOOD

Recommendations (What?)	Actionable steps to achieve recommendations (How?)
Do not leave cooked food exposed for long periods of time (consume within 2 hours at room temperature).	Set timers to track how long food is exposed. Cover food when it is left out and refrigerate leftovers promptly.

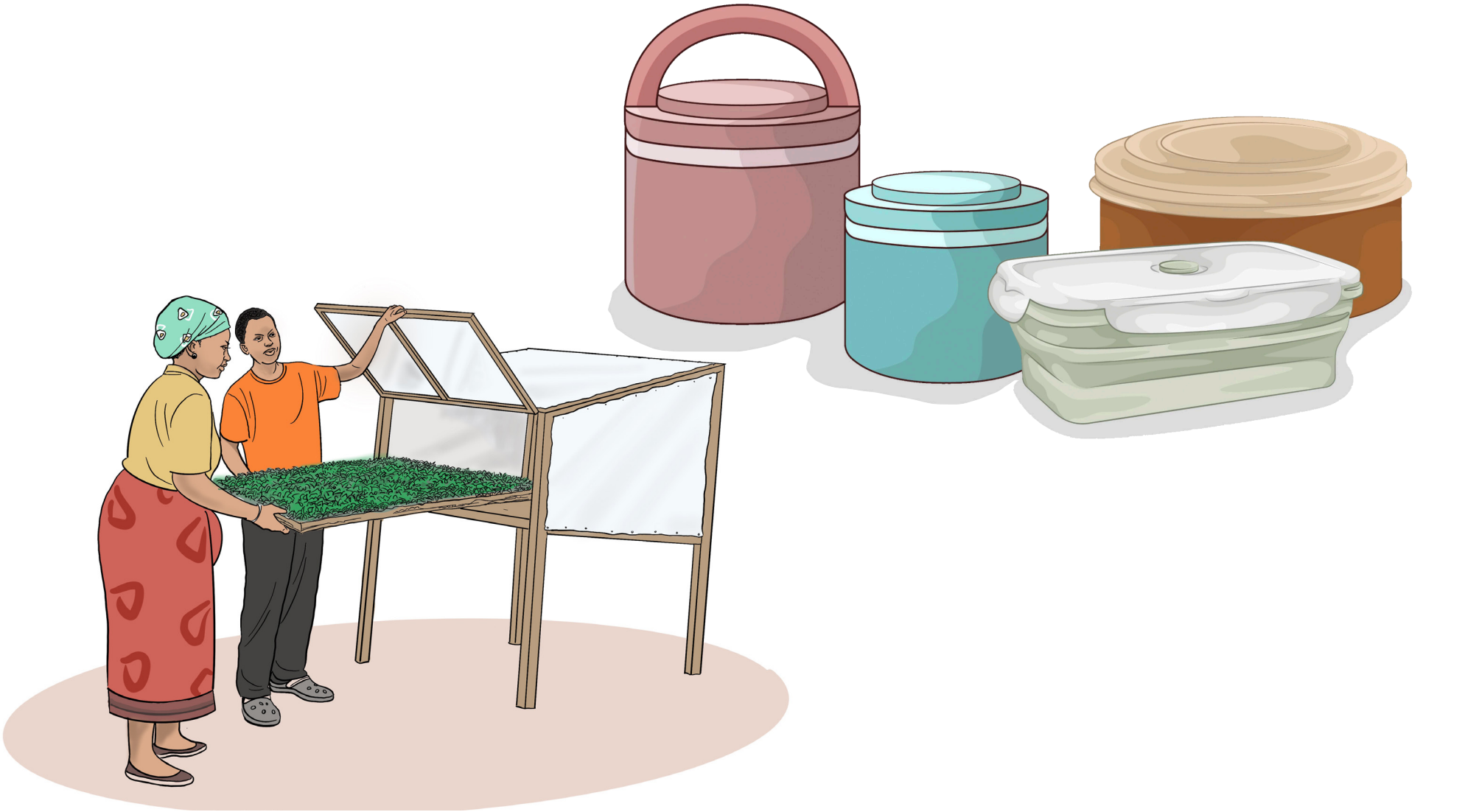
Discussion questions

1. Why is it important not to leave cooked food exposed for long periods, specifically beyond 2 hours at room temperature?
2. What are the benefits of covering food when it is left out, and what types of covers are most effective?
3. What steps should be taken to refrigerate leftovers promptly after food has been served?

Answers to discussion questions

1. Cooked food left at room temperature for more than 2 hours allows microorganisms to multiply rapidly, increasing the risk of foodborne illnesses.
2. Covering food protects it from airborne microorganisms, pests, and contaminants. Effective covers include food nets, clean cloths, or lids that create a barrier while allowing airflow if necessary.
3. Leftovers should be covered immediately after serving, allowed to cool slightly if hot, and placed in airtight containers before refrigerating promptly to maintain safety and quality.

D STORAGE AT ROOM TEMPERATURE



STORAGE AT ROOM TEMPERATURE

Recommendations (What?)	Actionable steps to achieve recommendations (How?)
Dehydrate/dry foods such as vegetables, fruits and meats to reduce moisture.	Use solar dryers, electric dehydrators or simply dry food in the sun on raised ground. Ensure that food is dried thoroughly and stored in airtight containers to prevent moisture reabsorption.

Discussion questions

1. How does removing water from food through dehydration or salting help prevent bacterial growth?
2. What methods can be employed for drying foods, and what are the advantages of each?
3. What role do airtight containers play in preventing moisture reabsorption in dried foods?

Answers to discussion questions

1. Dehydration or salting removes water, lowering the water activity in food, which inhibits the growth of bacteria, molds, and yeast, thereby extending shelf life.
2. Food can be dried using solar dryers, electric dehydrators, or sun-drying on raised surfaces. Solar dryers are cost-effective and hygienic, electric dehydrators provide consistent results regardless of weather, and sun-drying is a low-cost option suitable for regions with strong sunlight.
3. Airtight containers create a moisture-proof barrier, preventing dried foods from reabsorbing moisture, which helps maintain their safety, texture, and shelf life.

E SALTING

SALTING

Recommendations (What?)	Actionable steps to achieve recommendations (How?)
Salt meat, fish and vegetables to sequester moisture and inhibit microbial growth.	Rub salt evenly on the surface of the food or submerge the in brine. Store treated food in a cool, dry places to increase effectiveness. **Note:** This method is not recommended for individuals with high blood pressure for whom excessive sodium intake may pose a health risk.

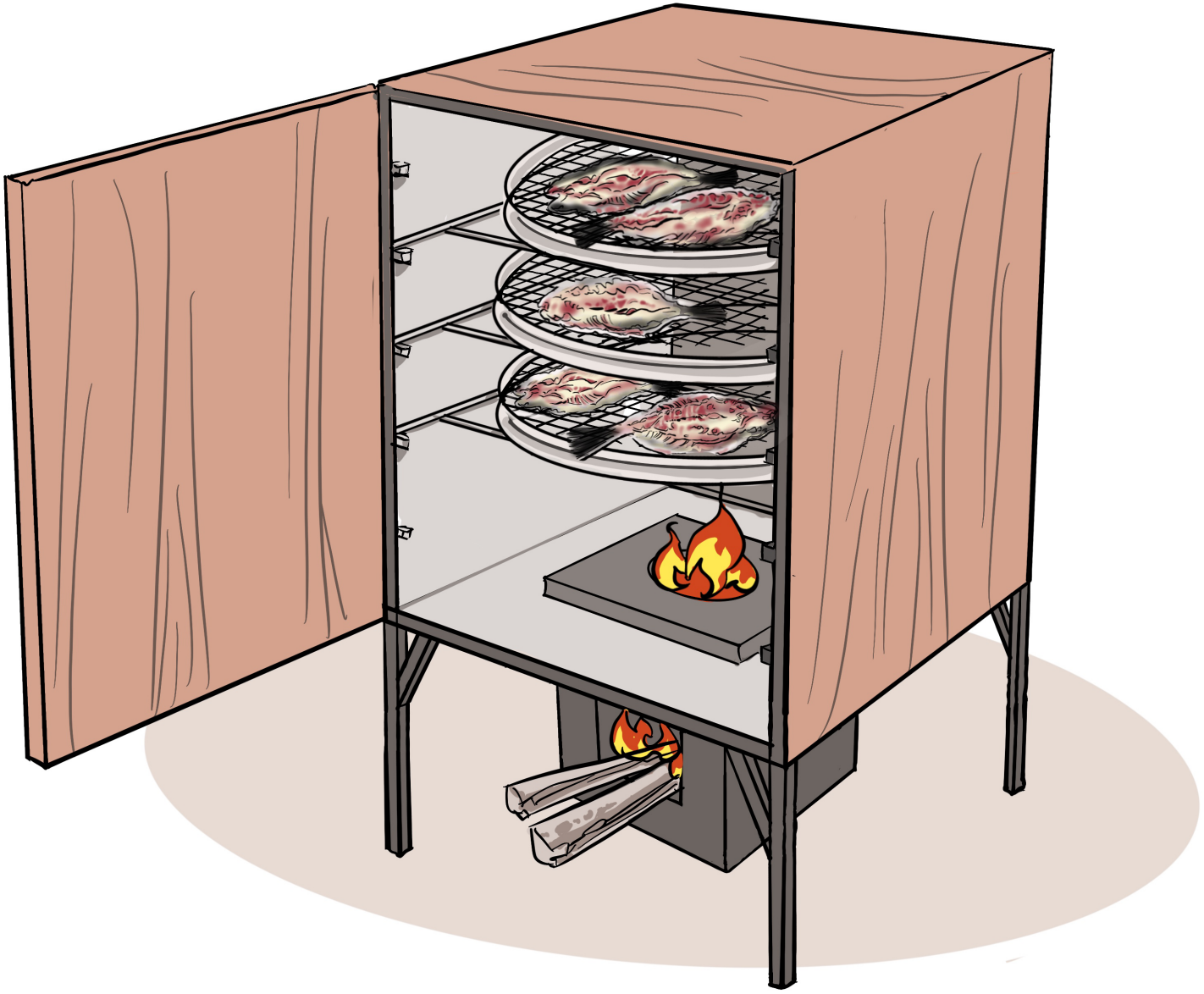
Discussion questions

1. How does salting foods prevent bacterial growth?
2. What techniques can be used to apply salt effectively to the surface of food items?
3. Why is it essential to store salted foods in cool, dry places for maximum effectiveness?

Answers to discussion questions

1. Salting creates a hypertonic environment that draws out moisture from food and bacteria, inhibiting bacterial growth and preserving the food.
2. Salt can be applied effectively by evenly rubbing it onto the surface of the food or submerging the food in a brine solution to ensure complete coverage.
3. Cool, dry storage conditions slow microbial activity and prevent reabsorption of moisture, ensuring the effectiveness of the salting process and extending shelf life.

F SMOKING



SMOKING

Recommendations (What?)	Actionable steps to achieve recommendations (How?)
Smoke meats and fish to preserve them.	Smoke food at low temperatures using wood chips or charcoal in a smoker. Ensure the food is cured or brined beforehand. Store in a cool, dry place after smoking.

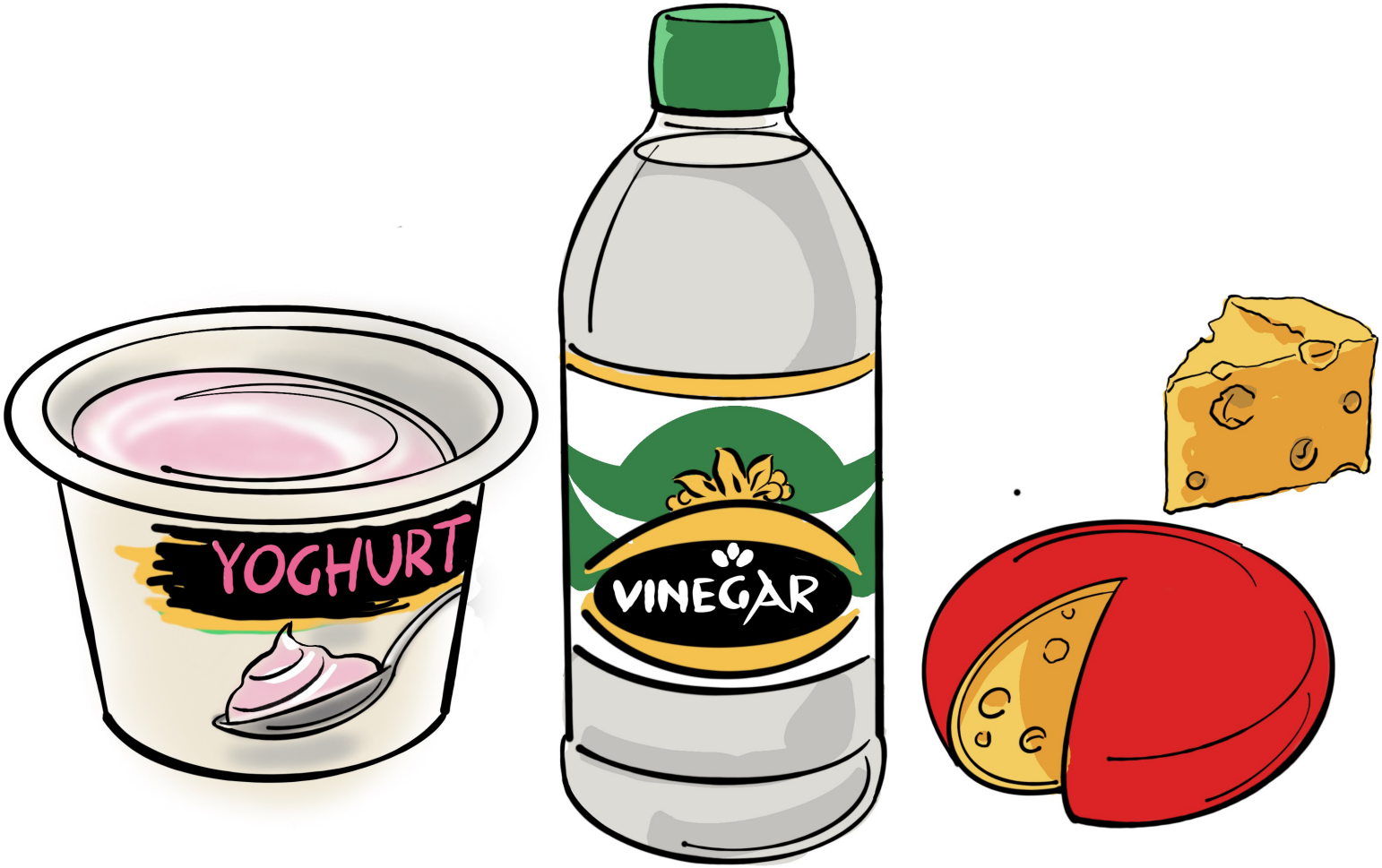
Discussion questions

1. How does smoking help reduce microorganisms in food, and why is it essential to cure or brine before smoking?
2. What specific steps should be followed to ensure that meats and fish are smoked properly?

Answers to discussion questions

1. Smoking introduces antimicrobial compounds from the smoke, while the heat and reduced moisture levels inhibit bacterial growth. Curing or brining before smoking adds salt, creating a hypertonic environment that further prevents bacterial activity and enhances preservation.
2. To smoke meats and fish properly, cure or brine the food beforehand to ensure safety and flavor. Smoke at low, consistent temperatures using wood chips or charcoal in a smoker. Monitor the process to achieve proper drying and store the smoked food in a cool, dry place to maintain its quality.

G FERMENTATION



FERMENTATION

Recommendations (What?)	Actionable steps to achieve recommendations (How?)
Ferment foods like vegetables (e.g., pickles or kimchi) and dairy (e.g., yogurt).	Use appropriate starter cultures or naturally occurring microbes. Follow tested recipes to ensure the right balance of ingredients and storage conditions for fermentation.

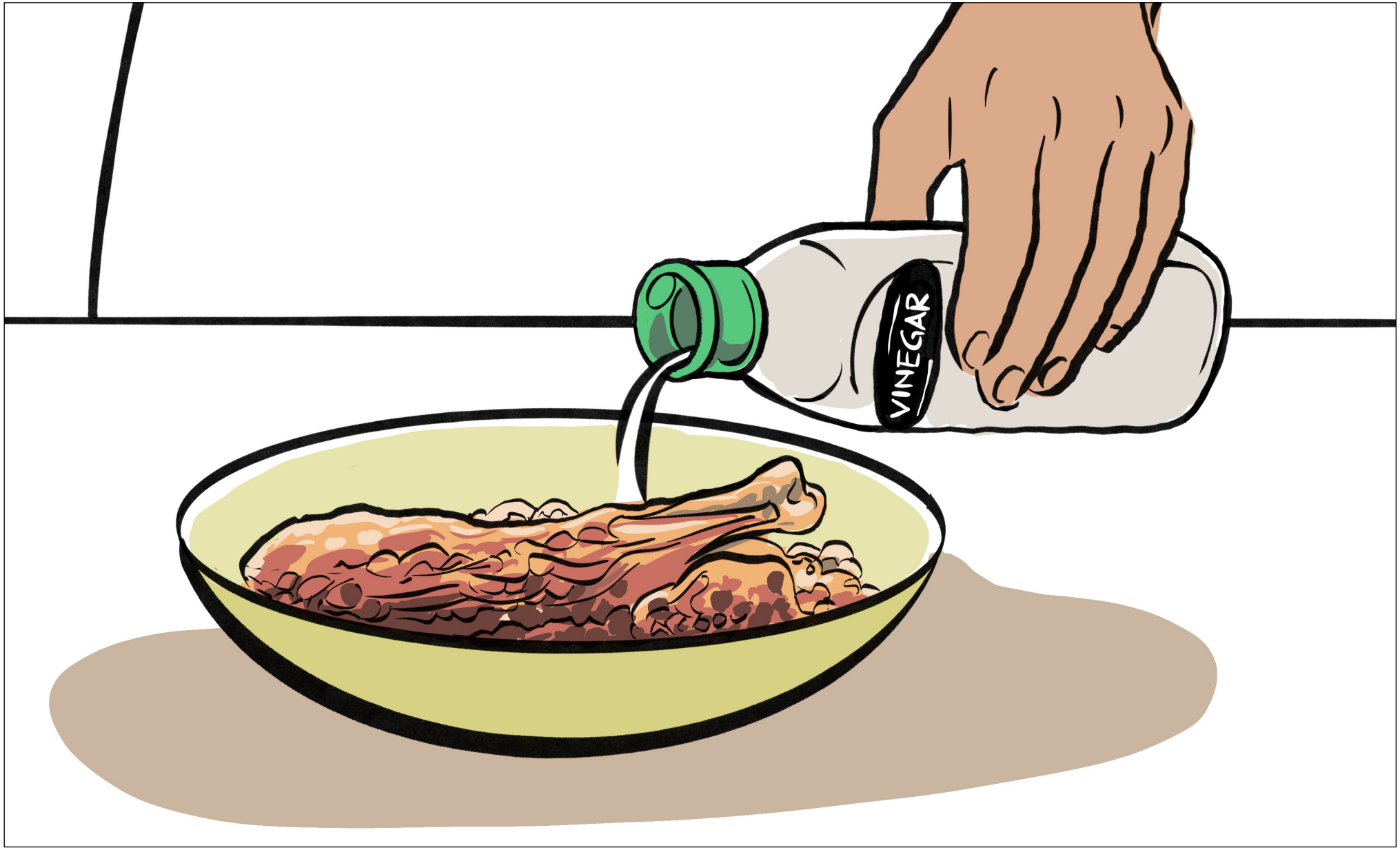
Discussion questions

1. Why is it important to follow tested recipes when fermenting foods?
2. What challenges might arise during the fermentation process, and how can they be effectively managed?

Answers to discussion questions

1. Following tested recipes ensures the correct balance of ingredients, pH levels, and storage conditions, reducing the risk of spoilage and ensuring safe and consistent fermentation outcomes.
2. Challenges such as inadequate utensils, lack of proper starter cultures, or unsuitable fermentation environments can arise. These can be managed by using clean, food-grade utensils, sourcing reliable starter cultures, and maintaining the right temperature and hygiene during fermentation.

H MARINATE



MARINATE

Recommendations (What?)	Actionable steps to achieve recommendations (How?)
Marinate food in acidic solutions e.g., vinegar.	Prepare acidic marinades with vinegar or citrus juice and submerge the food for sufficient time. Keep the food covered and, when possible, refrigerated during marinating.

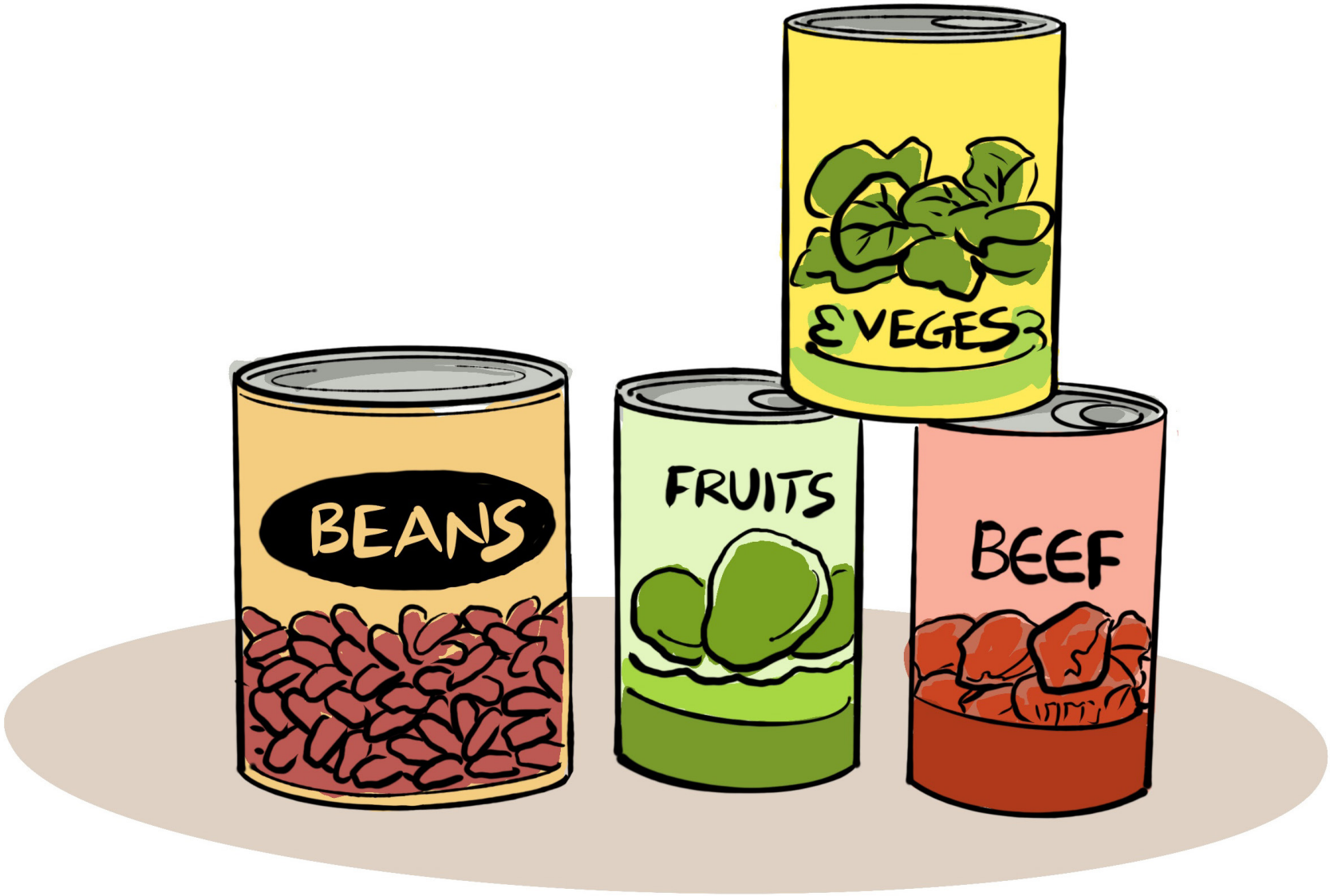
Discussion questions

1. Why is it beneficial to marinate foods in acidic solutions, and how does it aid in preservation?

Answers to discussion questions

1. Acidic marinades preserve food by creating an environment that inhibits bacterial growth. Additionally, they enhance the taste and flavor of food, improving its overall quality.

I CANNING



CANNING

Recommendations (What?)	Actionable steps to achieve recommendations (How?)
Can food in jars	Sterilize jars for canning by placing them in boiling water. Ensure a tight seal after processing. Store sealed foods according to their type (refrigerated or shelf-stable).

Discussion questions

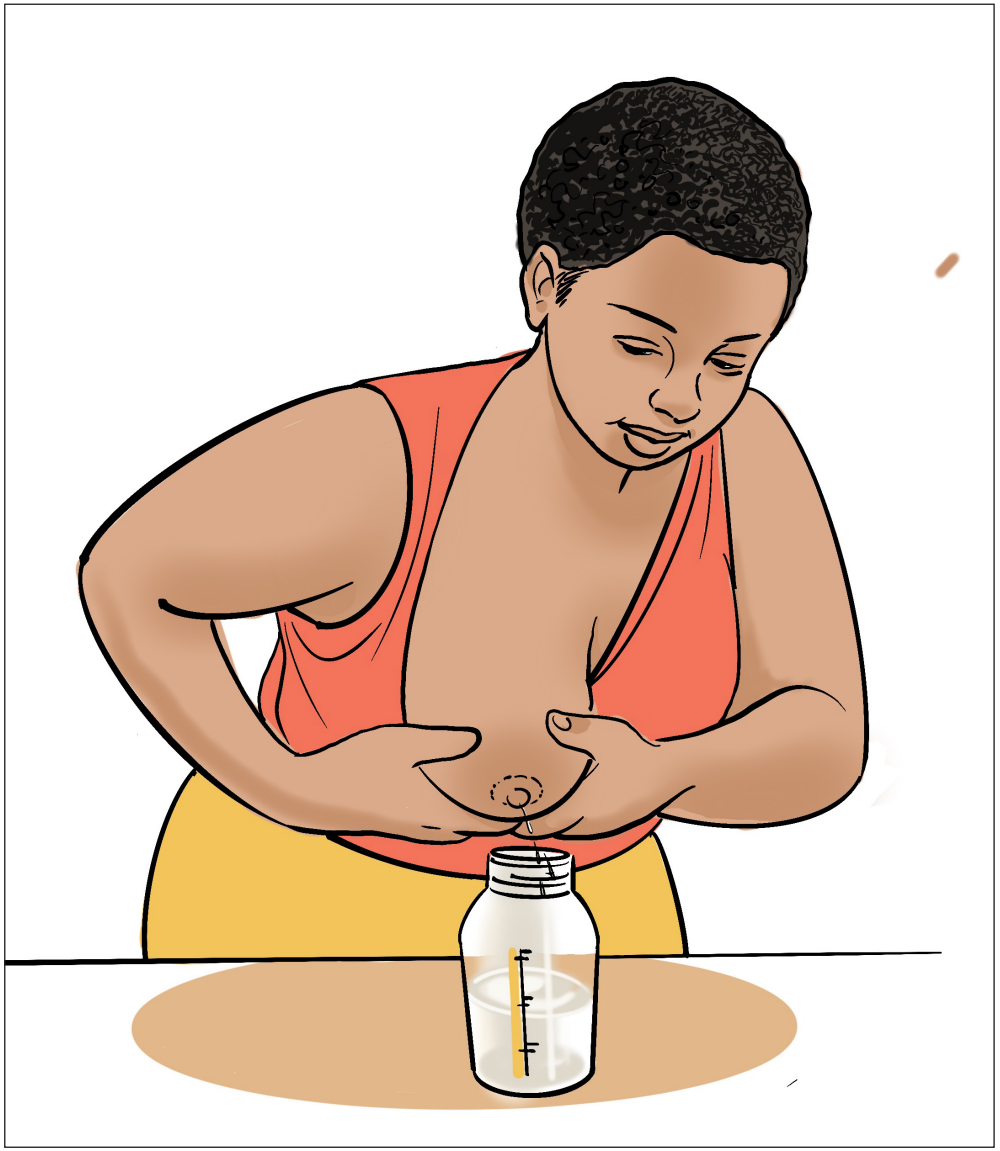
1. What are the critical steps in canning that prevent bacterial growth and spoilage?
2. How does boiling jars in hot water contribute to food safety during the canning process?
3. What potential risks arise from improper sealing or storage of canned foods?

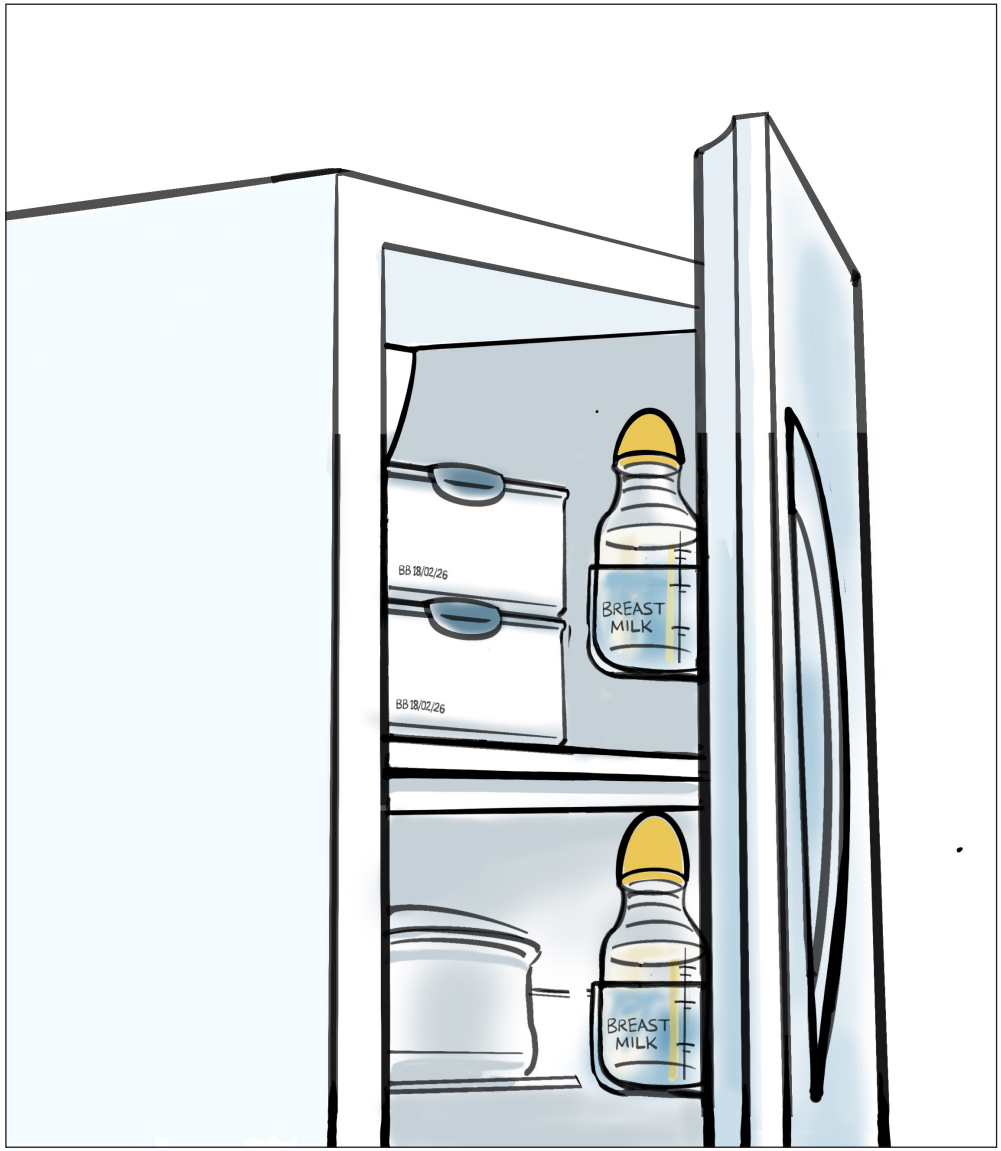
Answers to discussion questions

1. Critical steps in canning include sterilizing jars by boiling them in hot water before use, ensuring a tight seal after processing, and storing the sealed foods in appropriate conditions based on their type (refrigerated or shelf-stable).
2. Boiling jars in hot water sterilizes them by killing harmful microorganisms, creating a safe environment for the preserved food.
3. Improper sealing or storage allows air and moisture to enter the jars, creating favorable conditions for microbial growth, which can lead to spoilage and foodborne illnesses..

J

RECOMMENDATIONS FOR SAFE BREAST MILK STORAGE





RECOMMENDATIONS FOR SAFE BREAST MILK STORAGE

Recommendations (What?)	Actionable steps to achieve recommendations (How?)
Keep expressed breastmilk in the refrigerator for up to 4 days, in a freezer for up to 6 months.	• Choose a suitable container made of glass or plastic that can be kept covered to be used for expressing breast milk. • Clean it by washing in hot soapy water and rinsing in hot clear water. • If storing several containers, each container should be labeled with the date. Use the oldest milk first. • Frozen breast milk may be thawed slowly in a refrigerator and used within 24 hours. • It can be defrosted by standing in a jug of warm water and used within one hour, as it is warm.
Store expressed breast milk in clean, airtight containers at room temperature for up to 4 hours	• Select an appropriate glass or plastic container with a lid for expressing breast milk. • Clean it by washing in hot soapy water and rinsing in hot clear water

Discussion questions

1. Why is it important to label breast milk containers with the storage date?
2. What are the safety considerations when storing breast milk at room temperature?

Answers to discussion questions

1. Labeling breast milk containers with the storage date ensures the proper use of the “first in, first out” method, where the oldest stored milk is used first, reducing waste and ensuring freshness.
2. Breast milk should be stored in clean, airtight containers and can be kept at room temperature (25°C or below) for up to 4 hours. Beyond this period, the risk of bacterial growth increases, compromising its safety.

Keep cooked food hot

Recommendations (What?)	Actionable steps to achieve recommendations (How?)
Keep cooked food piping hot (> 60°C) if storing for immediate consumption.	• Use a food thermometer to ensure hot food stays above 60°C. Cover food and keep it in an insulated container if it needs to stay hot for an extended period of time.

Trainer Considerations and Suggestions

1. **Local storage practices:** Discuss safe storage practices and their effectiveness in preventing foodborne illnesses, considering local variations.
2. **Safe refrigeration times:** Provide clear guidelines on refrigeration times for local foods to ensure they are stored safely.
3. **Handling fresh food without refrigeration:** Emphasize the importance of acquiring and consuming fresh food promptly when refrigeration isn't available.
4. **Safe thawing techniques for large meats:** Discuss the importance of thawing large meat products safely, ideally in the refrigerator or in cold water.
5. **Understanding safe temperature zones:** Explain the "danger zone" (5°C to 60°C) where bacteria can multiply rapidly, and ways to keep food outside this range.
6. **Cooling and storing leftovers:** Share practical tips for cooling food quickly and safely storing leftovers, emphasizing the importance of not reheating more than once..

KEY 5: USE SAFE WATER AND RAW MATERIALS

Rationale: Raw materials, including water and ice, may be contaminated with dangerous microorganisms and chemicals. Toxic chemicals may be formed in damaged and mouldy foods. Care in selection of raw materials and simple measures such as washing and peeling may reduce risk.

KEY 5: USE SAFE WATER AND RAW MATERIALS

Recommendations (What?)	Actionable steps to achieve recommendations (How?)
Always use safe running water for washing fruits and vegetables, making food, making drinks, and cleaning cooking utensils.	■ Safe water includes treated water (through boiling, chlorination, or filtration). ■ To disinfect water: • Bring it to a rolling boil; • Add 3-5 drops of chlorine per liter; • Use an appropriate filter to remove pathogens. ■ Ensure storage tanks are protected from contamination, especially by animals or insects (like mosquitoes).

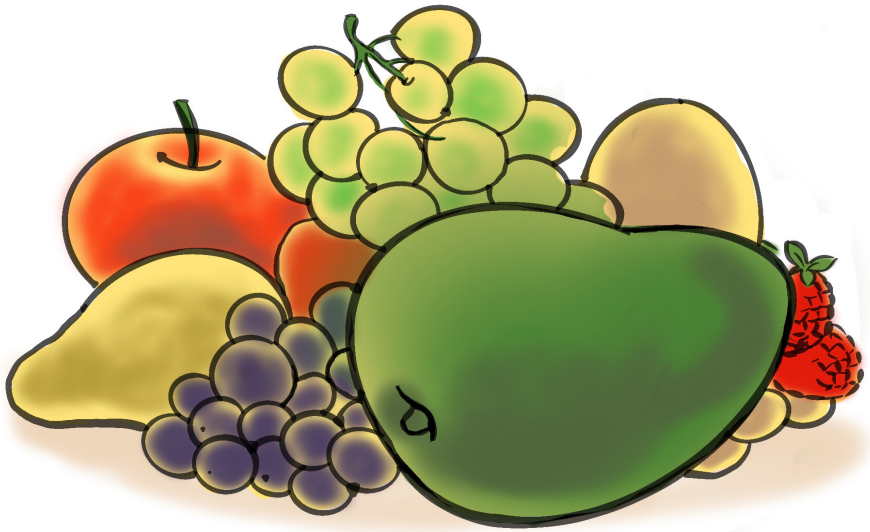
Discussion questions

1. How do untreated water sources contribute to foodborne illnesses?
2. What methods can be used to treat water to ensure it is safe for food preparation and cleaning?
3. What is the recommended amount of chlorine to add per liter of water for disinfection, and why is this important?

Answers to discussion questions

1. Untreated water sources often contain harmful microorganisms, such as bacteria, viruses, and parasites, which can contaminate food during preparation and lead to foodborne illnesses.
2. Water can be treated by bringing it to a rolling boil, adding 3-5 drops of chlorine per liter, or using an appropriate filter to remove pathogens. Additionally, storage tanks should be secured against contamination from animals, insects, or debris.
3. Adding 3-5 drops of chlorine per liter disinfects the water by killing microorganisms, ensuring it is safe for food preparation and cleaning.

Select fresh and wholesome raw materials



Recommendations (What?)	Actionable steps to achieve recommendations (How?)
Select Fresh and Wholesome Raw Materials	• Choose fresh, undamaged, and wholesome foods. • Discard damaged or bruised areas from fruits and vegetables. • Avoid items displaying signs of spoilage, mold, or damage (detailed guidelines on the prevention and control of mold and mycotoxin contamination in agricultural products are provided below).

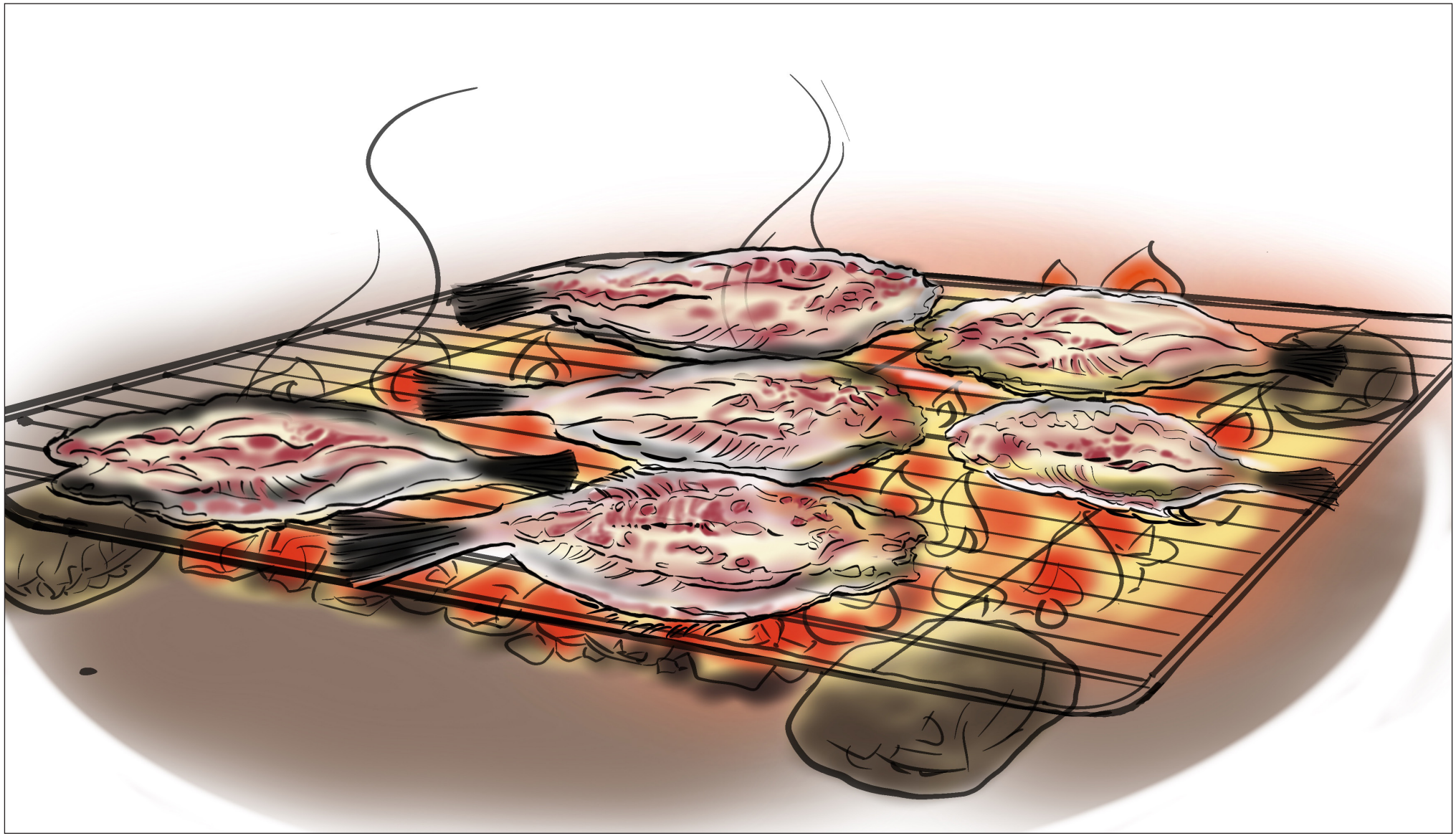
Discussion questions

1. Why is it crucial to avoid damaged or moldy raw materials in food preparation?
2. How can the selection of wholesome ingredients reduce the risk of foodborne diseases?
3. What characteristics should be considered when selecting fresh and wholesome raw materials?
4. How can damaged or bruised areas on fruits and vegetables affect their overall quality and safety?
5. What specific signs indicate that food items are spoiled or contaminated?
6. Why is it important to discard items showing signs of mold?

Answers to discussion questions

1. The presence of mold on food indicates the potential presence of harmful microorganisms and toxins, which pose health risks.
2. Selecting wholesome ingredients reduces the risk of microorganisms and toxins entering food, thereby minimizing foodborne diseases.
3. Fresh, undamaged, and wholesome foods should be chosen to ensure quality and safety.
4. Damaged or bruised areas on fruits and vegetables serve as entry points for disease-causing microorganisms, compromising their safety and shelf life.
5. Signs of spoilage or contamination include the growth of mold, off-flavors, discoloration, and unpleasant odors.
6. Discarding moldy items prevents the proliferation of mold and associated toxins, ensuring food safety.

A PROCESSING OF HIGH-RISK FOODS



PROCESSING OF HIGH-RISK FOODS

Recommendations (What?)	Actionable steps to achieve recommendations (How?)
High-Risk Foods must be processed before consumption for Safety. This recommendation specifically applies to high-risk foods (meats, dairy), not to low-risk foods like fruits and vegetables, which can be consumed fresh if washed with safe water.	• Opt for processed high-risk foods, such as pasteurized milk and irradiated meats, that have undergone treatments to ensure safety. • When consuming unprocessed or raw high-risk foods (e.g., meat, poultry, dairy), ensure they are thoroughly cooked or properly treated to eliminate harmful microorganisms.

Discussion questions

1. How does processing high-risk foods like dairy and meats make them safer for consumption?
2. What precautions should be taken when consuming raw or unprocessed high-risk foods?
3. What cooking methods are most effective in eliminating harmful microorganisms in high-risk foods?

Answers to discussion questions

1. Processing, such as pasteurization for dairy and proper handling for meats, eliminates harmful microorganisms that can cause foodborne illnesses.
2. Ensure raw or unprocessed high-risk foods are thoroughly cooked, treated (e.g., pasteurized or cured), or handled under hygienic conditions to eliminate or reduce harmful microorganisms.
3. Boiling, steaming, and using advanced methods like irradiation are highly effective in killing harmful microorganisms in high-risk foods.

B WASHING OF VEGETABLES AND FRUITS

WASHING OF VEGETABLES AND FRUITS

Recommendations (What?)	Actionable steps to achieve recommendations (How?)
Wash Fruits and Vegetables Thoroughly	• Wash all fruits and vegetables under clean, safe water before consumption. • Particularly focus on raw items (e.g., salads), as they pose a higher risk when consumed without cooking.

Discussion questions

1. Why is washing fresh produce under clean water important even if it appears clean?
2. How can the handling of fruits and vegetables after washing affect their safety?

Answers to discussion questions

1. Washing fresh produce under clean water is important because harmful microorganisms, dirt, and pesticide residues may not be visible to the naked eye.
2. Improper handling after washing, such as placing produce on contaminated surfaces or using dirty utensils, can lead to recontamination of the already cleaned food.

C EXPIRY DATES

EXPIRY DATES

Recommendations (What?)	Actionable steps to achieve recommendations (How?)
Avoid Using Expired Foods	• Always check expiration dates on food packages and discard anything past the date. • Avoid dented, swollen, or rusted cans, as these may indicate compromised safety.

Discussion questions

1. How does consuming expired food increase the risk of foodborne illness?
2. Why should damaged cans be avoided when selecting canned foods?

Answers to discussion questions

1. Expired foods may harbor harmful microorganisms and toxins that increase the risk of foodborne illnesses, as they are likely to deteriorate in quality and safety over time.
2. Dented, swollen, or rusted cans should be avoided because they may indicate compromised seals or contamination, making the contents unsafe for consumption.

EFFECTIVE STRATEGIES FOR THE PREVENTION AND CONTROL OF MOLD AND MYCOTOXIN CONTAMINATION IN AGRICULTURAL PRODUCTS

A SUSTAIN PLANT'S VIGOR AND HEALTH

SUSTAIN PLANT'S VIGOR AND HEALTH

Recommendations (What?)	Actionable steps to achieve recommendations (How?)
Sustain plant's vigor and health	• Timely plant agro-ecologically adapted varieties. • Use sound seeds and plant disease-resistant/tolerant varieties. • Maintain soil fertility by applying organic or inorganic fertilizers, manure, and/or follow integrated approaches like crop rotation. • Maintain adequate soil moisture (irrigation or water conservation practices) during plant growth. • Ensure proper plant spacing to avoid overcrowding. • Use integrated pest management (biocontrol, minimal pesticide use). • Control pests, weeds, and diseases through regular monitoring and timely intervention. • Remove weeds and diseased plants promptly.

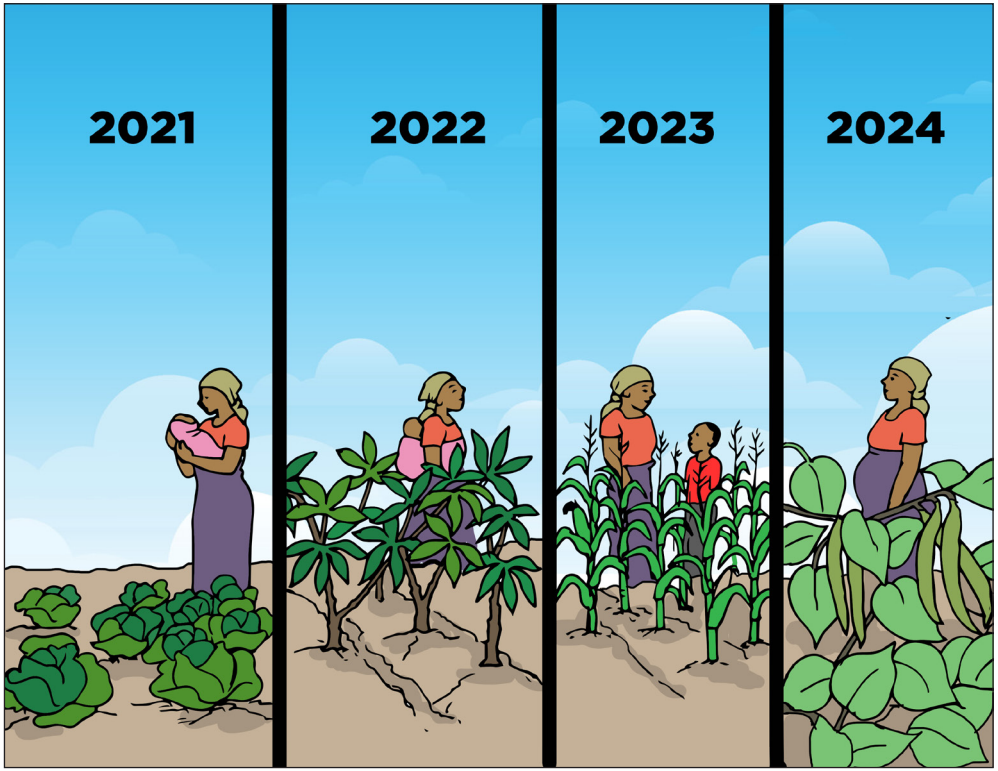
Discussion questions

1. How does maintaining plant health contribute to reducing mold and mycotoxin contamination?
2. Why is crop rotation effective in preventing soil-borne fungal infections?
3. Why is it important to plant agro-ecologically adapted varieties at the right time?
4. How can using disease-resistant or disease-tolerant plant varieties contribute to maintaining plant vigor?
5. How does maintaining adequate soil moisture impact the health and growth of plants?
6. What are the benefits of ensuring proper plant spacing?

Answers to discussion questions

1. Healthy, vigorous plants are naturally more resistant to molds, pests, and diseases, reducing the risk of mold and mycotoxin contamination.
2. Crop rotation maintains soil fertility, supports plant growth, and interrupts pest and disease cycles by introducing different crops, breaking the life cycles of harmful pathogens.
3. Planting agro-ecologically adapted varieties at the right time allows crops to mature properly before adverse conditions, such as the end of the growing season, ensuring better yields.
4. Disease-resistant or disease-tolerant plant varieties are less likely to suffer from pest and disease attacks, helping maintain plant vigor and productivity.
5. Adequate soil moisture supports plant health by ensuring proper hydration, nutrient absorption, and overall growth.
6. Proper plant spacing reduces competition for moisture, nutrients, and sunlight, promotes air circulation, and lowers the risk of fungal infections and pest infestations.

B REDUCE TOXIGENIC FUNGAL POPULATION



REDUCE TOXIGENIC FUNGAL POPULATION

Recommendations (What?)	Actionable steps to achieve recommendations (How?)
Reduce toxigenic fungal population in growing plants and in storage	• Implement crop rotation and avoid monoculture. • Use biological controls or appropriate fungicides where necessary. • Remove and burn diseased plants to prevent spread. • Avoid produce coming into direct contact with the soil (use clean harvesting methods). • Ensure storage facilities and bags are cleaned and disinfected before use. • Apply fungicides in storage when required. • For fruits and vegetables, avoid bruising and keep stored items dry and clean to prevent mold growth.

Discussion questions

1. What measures can be taken to reduce fungal populations in growing and stored crops?
2. How does proper storage environment prevent mycotoxin contamination?
3. How does crop rotation help in reducing the toxigenic fungal population in growing plants?
4. How can the cleanliness of storage facilities and bags impact the presence of fungi in stored produce?
5. How can bruising in fruits and vegetables contribute to mold growth?

Answers to discussion questions

1. Fungal populations can be reduced by practicing crop rotation, using biocontrol methods, removing and burning diseased plants, avoiding direct contact between produce and soil, cleaning and disinfecting storage facilities and bags, applying fungicides when necessary, avoiding bruising, and keeping stored produce dry and clean to prevent mold growth.
2. A proper storage environment, such as maintaining low humidity and cool temperatures, inhibits mold growth and reduces the risk of mycotoxin contamination.
3. Crop rotation reduces toxigenic fungal populations by disrupting their life cycles, as rotating different crops prevents fungi from consistently accessing their specific host plants, thereby decreasing their ability to survive and reproduce..
4. Clean storage facilities and bags reduce the risk of fungal contamination by eliminating spores and residues from previous use, providing a hygienic environment for produce.
5. Bruising in fruits and vegetables creates entry points for fungi and other microorganisms, accelerating mold growth and spoilage.

C RAPIDLY REDUCE MOISTURE CONTENT OF CROPS AND AVOID REHYDRATION

RAPIDLY REDUCE MOISTURE CONTENT OF CROPS AND AVOID REHYDRATION

Recommendations (What?)	Actionable steps to achieve recommendations (How?)
Rapidly reduce moisture content of crops and avoid rehydration	• Harvest at the right time (when crops or fruits are mature but not overripe or damaged). • Dry crops (grains, fruits, and vegetables) rapidly and completely, as soon as possible after harvest. • Store produce under dry conditions (ensure good ventilation, prevent leaks, avoid contact with walls or floors). • Keep pests (rodents, insects) away from stored foods. • Do not store food with water, animals, or in damp conditions. • Use desiccants like calcium chloride (CaCl2) to maintain low moisture in storage.

Discussion questions

1. Why is rapid moisture reduction essential in preventing fungal contamination in stored foods?
2. How do desiccants, like calcium chloride, contribute to maintaining safe storage conditions for crops?
3. Why is it important to harvest crops at the right time, and how can rapid drying methods improve storage outcomes?
4. What storage practices are necessary to maintain low moisture levels and prevent spoilage in crops?
5. Why should food not be stored in damp conditions or with water?

Answers to discussion questions

1. Rapid moisture reduction prevents fungal contamination by removing the moisture necessary for mold growth and mycotoxin production.
2. Desiccants like calcium chloride absorb excess moisture in the storage environment, reducing humidity and microbial activity, which prevents mold growth and spoilage.
3. Harvesting at the right time prevents spoilage from immature crops or late rains, and rapid drying using solar dryers or sun-drying on clean mats ensures crops are properly preserved for storage.
4. Proper storage practices include maintaining dry conditions, ensuring good ventilation, avoiding leaks or contact with damp walls and floors, protecting crops from pests, and using desiccants to maintain low moisture levels.
5. Storing food in damp conditions or with water promotes rehydration, creating an environment for fungal growth and spoilage..

D

SAFEGUARD OUTER LAYERS, SKINS, AND PROTECTIVE STRUCTURES

SAFEGUARD OUTER LAYERS, SKINS, AND PROTECTIVE STRUCTURES

Recommendations (What?)	Actionable steps to achieve recommendations (How?)
Safeguard outer layers, skins, and protective structures	• Handle fruits, vegetables, and grains gently to avoid mechanical damage during harvesting, processing, or transport. • Prevent insect or rodent attacks by using proper packaging and pest control measures. • For fruits, ensure the skin is intact, and for grains, protect the seed coat or shell from damage. • Use appropriate tools during harvest and transport to prevent physical damage.

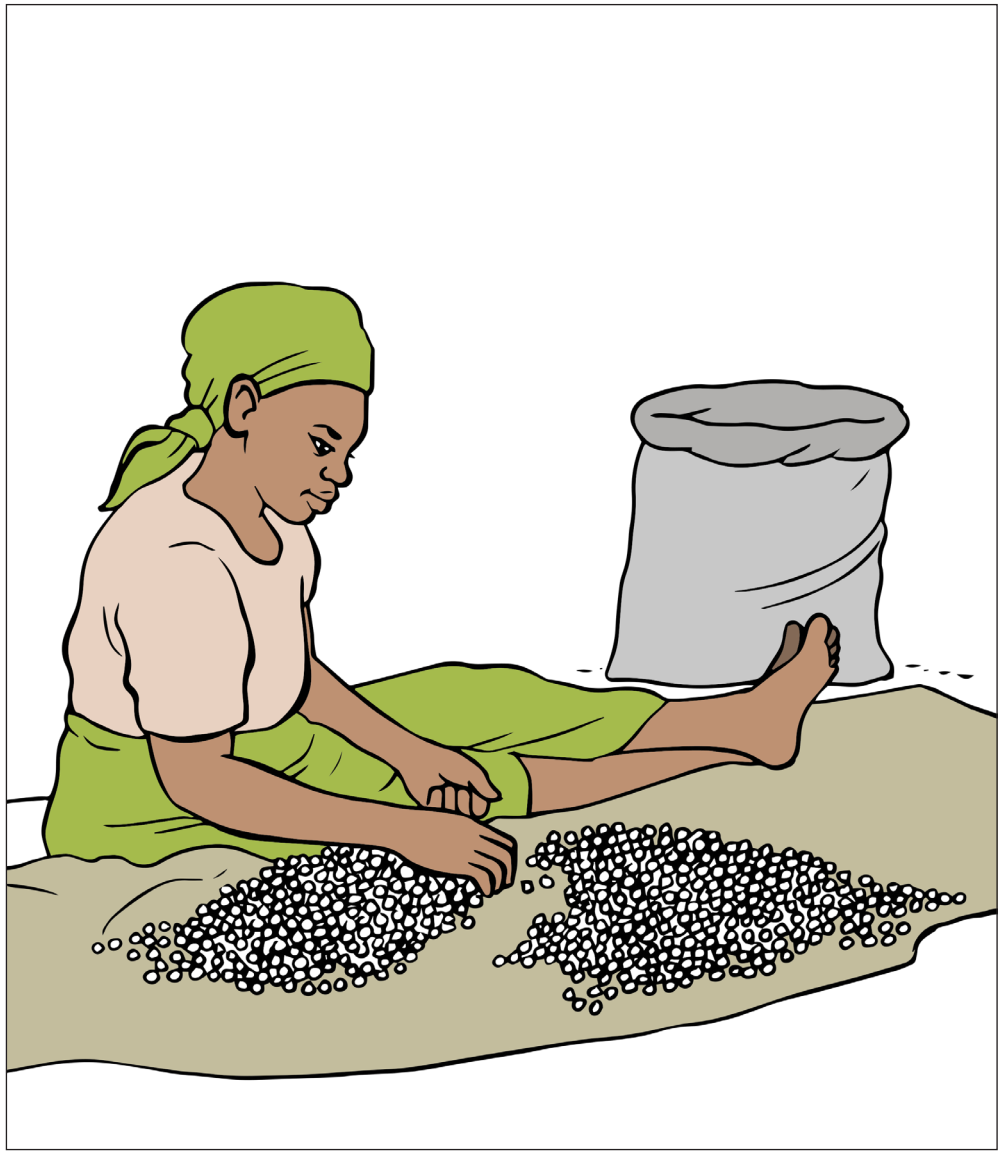
Discussion questions

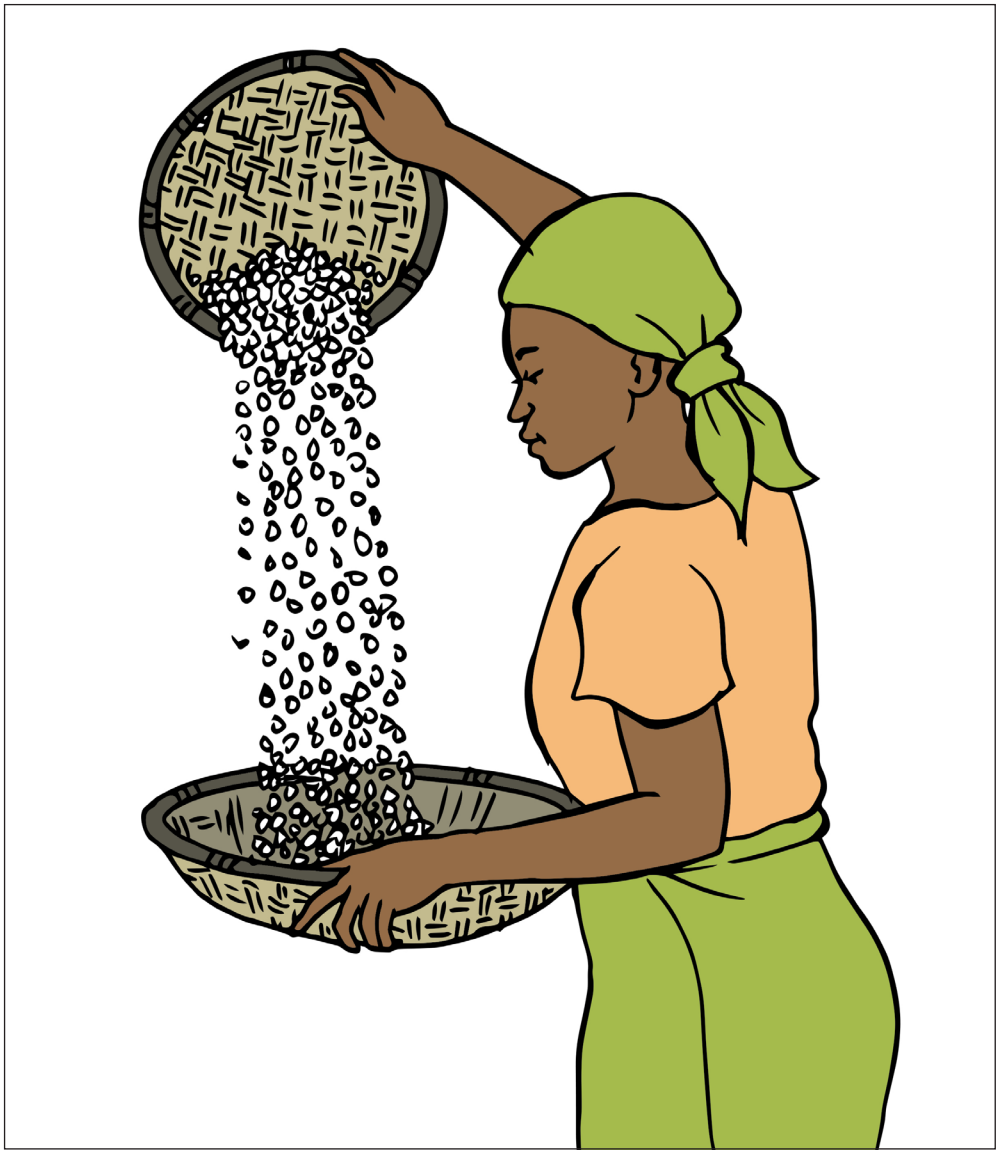
1. How do the outer layers of crops help prevent microbial contamination?
2. What steps can be taken to protect these outer layers during handling and storage?
3. In what ways can physical damage during transport impact the quality of fruits and vegetables?
4. What role does gentle handling play in maintaining the quality of grains during processing?

Answers to discussion questions

1. The outer layers of crops provide a natural defense against fungi and bacteria by acting as a physical barrier that prevents microbial contamination.
2. To protect the outer layers, handle fruits, vegetables, and grains gently during harvesting, processing, and transport to avoid mechanical damage. Use proper packaging and pest control measures to prevent insect or rodent attacks. For fruits, ensure the skin remains intact, and for grains, protect the seed coat or shell from damage. Use appropriate tools to minimize physical harm.
3. Physical damage during transport compromises the outer layer of fruits and vegetables, creating entry points for microorganisms, which can lead to contamination and spoilage.
4. Gentle handling during processing maintains the integrity of the outer layer of fruits, vegetables, and grains, preventing damage that can reduce quality and increase vulnerability to contamination.

E SAFEGUARD OUTER LAYERS, SKINS, AND PROTECTIVE STRUCTURES





SAFEGUARD OUTER LAYERS, SKINS, AND PROTECTIVE STRUCTURES

Recommendations (What?)	Actionable steps to achieve recommendations (How?)
Clean and remove mycotoxin high-risk components	• Sort and clean all produce to remove any diseased, moldy, or damaged components before storage. • Sort grains and fruits to discard immature, shriveled, or broken pieces. • Sieve and remove debris, dirt, and fine particles from produce partcularly grains. • For fruits and vegetables, remove any visibly damaged, overripe, or spoiled items before storage or sale. • Separate grains by density and discard lighter, moldy portions (e.g., floating grains).

Discussion questions

1. How does sorting and removing damaged produce reduce the overall mycotoxin load in stored foods?
2. What techniques can help identify high-risk components in crops for removal?
3. How can the presence of immature, shriveled, or broken pieces affect the overall quality and safety of stored produce?
4. In what ways can visibly damaged, overripe, or spoiled fruits and vegetables impact food safety and quality?
5. What potential risks do mycotoxins pose to consumers?

Answers to discussion questions

1. Sorting and removing damaged produce reduce the overall mycotoxin load in stored foods by eliminating components that are most likely to harbor molds and toxins.
2. High-risk components can be identified and removed using techniques such as sorting, winnowing, sieving, and flotation to separate damaged or contaminated produce.
3. The presence of immature, shriveled, or broken pieces increases the risk of molds, mycotoxins, and microorganisms, reducing the quality and safety of stored produce.
4. Visibly damaged, overripe, or spoiled fruits and vegetables can harbor microorganisms and molds, contaminating other stored produce and posing food safety risks.
5. Mycotoxins can cause a range of illnesses in consumers, including gastrointestinal issues, liver damage, and long-term health risks such as cancer.

Additional Trainer Considerations

1. **Understanding local water sources:** Trainers should address regional water treatment practices and stress the importance of using safe water sources in food preparation.

2. **Promoting selection of fresh ingredients:** Emphasize the importance of selecting fresh and wholesome raw materials, particularly in areas where food quality may vary.

3. **Handling high-risk foods:** Educate participants on safe handling and processing practices for high-risk foods, especially in regions without consistent access to processed options.

4. **Monitoring plant health and crop storage:** Trainers should familiarize themselves with local crop management practices and provide advice on fungal prevention in both plants and stored crops.

5. **Safe storage practices for crops:** Encourage the use of drying, salting, and proper storage techniques to prevent mold growth and mycotoxin production in regions where refrigeration is limited.