



Healthy Harvest Session Guide for Lead Farmers and Paravets

The thrust of the sessions on the healthy harvest is to promote learning by doing culture among farmers as these will have a lot of demonstrations as well as participatory and highly engaging sessions. The lead farmers need to include energisers in between sessions to keep other farmers engaged in sessions.

This should be followed by a strong emphasis on practising the key behaviour i.e. consumption of diverse and nutritious foods from a healthy plate at each meal each day.

Lead famers are encouraged to lead by example as role models and be ahead of the other members in adopting the learnt concepts.

Nutrition officers with support from Ministry of health and Child Care (MOHCC) and Ministry Of Agriculture Mechanisation and Irrigation development MAMID will do review meetings with lead and para-vets farmers once every month to discuss progress

During sessions:-

- **Listen to what people have to say**
- **Create a free environment where people are free to say what they have to say**
- **Use a gender lens in analysis and discussions**
- **Seek to develop jointly a way forward**

Session number	Topic	Tick box if topic is done
1.	<p>Principles of Nutrition-Food groups and nutrients</p> <p>Key Message: Eat foods from different groups not the same kinds of food at each meal to achieve a varied diet</p> <p>Activity 1</p> <p>-Introduce the topic and the key message for the session</p> <p>-Explain that you are going to talk about food groups and function of food in our bodies</p> <p>-Ask the participants what food is and why we need to eat and facilitate the discussion.</p>	<input type="checkbox"/>

Notes

-Explain that food contains nutrients which are important substances for the body. There are many different nutrients and each has functions in the body.

These nutrients provide:

- Energy and warmth
- Materials for the body to grow and repair itself and
- Protection from diseases

Activity 2

-Ask the participants what dietary diversity is, its importance and facilitate the discussion.

-Explain to participants that in order for us to choose the most nutritious kinds of food to eat we can divide food into different groups. Mention the food groups-the staple group, legumes group, fruit and vegetables group, fats and oils and animal products group

-Do a food group game to identify the foods that are commonly eaten and not eaten. After performing the food game ask the participants if the foods have been placed under the correct food group.*(Discuss)*

-Ask participants what they have learnt about their own eating habits and the extent to which their diets are varied.

-Show the participants the DIETARY DIVERSITY VISUAL AID

-Discuss the different food groups and ask the participants to identify some of the foods in the different food groups. Which kinds of food shown on the picture are available in their community? Are they bought, grown or collected from the wild?

-Explain that although most foods are mixtures of nutrients, many of them contain a lot of one nutrient and less of the other nutrients. Foods are often grouped according to the nutrient that they contain in abundance. Ask participants to identify the nutrients that they get from each food group and discuss.

-Show participants the FOOD GROUPS AND FUNCTIONS VISUAL AID

Notes for lead farmer

What is dietary diversity?

- Dietary diversity is defined as the number of individual food items or food groups consumed over a given period of time

- At the household level, dietary diversity is usually considered as a measure of access to food, (e.g., of households' capacity to access costly food groups), while at individual level it reflects dietary quality, mainly micronutrient adequacy of the diet. It is recommended that an individual consume 4 food groups in each meal.

Why is dietary diversity important?

- No one single food or food group contains all of the nutrients that the human body requires for optimal function and good health. The human body requires nutrients that come from a variety of foods.
- To achieve good dietary diversity, it is important to regularly eat a variety of foods and to consume foods from all food groups.

Food game

- Give each participant two or more small pieces of blank paper and ask them draw or write the name of a locally available ingredient which they often eat.
- Explain that they should not write down foods that include many ingredients e.g. beef stew but they can write ingredients of stew such as beef, onions and tomatoes on separate pieces of paper
- Collect all the pieces of paper and mix them up together in a basket. Meanwhile write the names of the food groups on flipcharts (one food group per flip chart)
- Lay the flipchart on the floor and ask each participant to take a small piece of paper from the basket. Ask participants to come up one by one and place their pieces of paper onto the food group flipchart to which they belong. Ask the rest of the group to say whether the papers have been correctly placed.

Food groups and their nutritional benefits

- **Energy giving foods – Cereals, roots and tubers, fats and oils:** Cereals, roots and tubers provide carbohydrates. Unrefined staples are a good source of fiber, protein, vitamins and minerals. Fats and oils are a good source of energy. However fats and oils should be consumed in moderation
- **Protective foods-Fruits and vegetables:** Excellent sources of vitamins and minerals which help protect the body from diseases. They are also rich in fiber.
- **Body building foods-animal product:** Excellent source of protein for building and repairing the body. Also a good source of fats, oils, vitamins and minerals.

- **Body building foods-legumes:** They are good sources of protein for building and repairing the body. This group also contains vitamins, minerals and fiber

Please note

- *Salt and sugar are just added to the food to taste*
- *A lot of junk/fast food that is processed and sold in the supermarkets is high in oils, salt and sugar as well as other chemicals that cause serious health problems e.g. the fizzy sugary drinks that make people full but do not have any nutrients.*

Activity 3

-Explain that you are about to discuss how to come up with balanced meals to achieve a varied diet

-Draw a circle on a flip chart to represent a plate. Explain that you want volunteers from the group to choose ingredients from the food group flip charts to make different healthy plates for different meals of the day i.e. breakfast, lunch, dinner

-Discuss how balanced and nutritious the different meals are. The group members can suggest ways of varying their diets

-Ask participants who makes a decision on what is consumed by the family, who carries out the activities and factors that should be considered in planning healthy family meals as the meals are developed

Notes

Planning balanced meals and diets

- A balanced meal consist of foods from all the food groups and therefore when planning meals, at least each food group should be represented
- A diet consists of everything and individual eats and drinks, including meals, snacks and drink
- If households each balanced meals, there is high likelihood that the diet in terms of all foods eaten over a given course of time also becomes balanced.

Activity 4

Practical – Planning for Cooking demonstration on balanced meals

-Briefly discuss food preparation hygiene tips

	<p>-Explain that you are going to prepare ONE of the planned balanced meals for the family using locally available food in the next session</p> <p>-Kindly ask participants to identify the ingredients required to prepare the balanced meal for the family.</p> <p>-Kindly ask the participants to bring the ingredients, cooking pots and utensils in the next session</p> <p>Wrap up</p> <p>-Ask the participants what they learned in the session and if they can recall the important messages given in the session.</p> <p>-Sing songs and slogans on dietary diversification based on messages given in the session</p>	
2	<p>Dietary diversification</p> <p>Key Message: Eat foods from different groups not the same kinds of food at each meal at adequate frequency each day</p> <p>Activity 1</p> <p>-Introduce the session and explain that you are going to talk about how much of the food from the different food groups should be eaten.</p> <p>- Find out the number of meals consumed per day by each age group-children 0-6months and 0-59months,adults- males and women of child bearing age in the community</p> <p>-Draw a circle on the flip chart and explain it represents a plate. Ask for volunteers from the group to show how much of staples, legumes, meat and vegetables they usually eat in a meal.</p> <p>-Discuss with participants whether their meal frequency and proportions are appropriate for the person’s age, sex and daily activity. Discuss why children need different amounts of food from adults and why women of child bearing age need a particularly good diet.</p> <p>Refer to notes and explain the different nutritional requirements for different age groups</p> <p>-Show participants VISUAL AID ON HOW MUCH FOOD WE SHOULD EAT IN A MEAL and discuss what they can see</p> <p>Notes</p> <p>How much food should be eaten-going beyond diversity with nutrition and meal adequacy in the life cycle?</p>	

- Adults should eat 3 balanced meals each day but those who do a lot of physical work need more energy from staple food and men have higher energy needs than women and should eat slightly more energy giving foods than women
- Women of child-bearing age (15-49 years) need more iron than other people in the family.
- Pregnant women need an extra meal per day to provide extra energy and nutrition for the mother and the growing baby.
- Breastfeeding mothers need 2 extra meals per day to provide extra energy and nutrition for the mother and the growing baby.
- Children 0-6 months should be given breast milk only and breastfeeding should be continued up to 2 years and beyond
- Children 6-59 months should eat more frequently than adults as they have small stomachs and they are growing rapidly. Children from the age of six months to five years should have three meals plus two nutritious snacks per day

The first 1,000 days is the period from pregnancy through 2 years of age. These 1,000 days offer a unique window of opportunity to shape healthier and more prosperous futures. Proper nutrition during this 1,000 day window can have a profound impact on a child's ability to grow, learn and rise out of poverty. It can also shape a society's long-term health, stability and prosperity.

- The elderly should eat 5-6 small meals each day. This is because they require less energy and they are less active.
- Sick people need to eat more frequently as they may be experiencing loss of appetite, symptoms reduce intake of food e.g. oral sores and absorption of nutrients e.g. stomach ulcerations
- Families or carers can help people suffering from diarrhea and vomiting by giving them oral rehydration solution, giving them soft foods such as soups, vegetable or fruit mashes or porridge.

How much food we should eat in a meal

In a balanced plate, the following portion sizes are recommended

-Energy giving foods: **the size of your fist**

-Protective foods: **the size of your fist**

-Body building foods-animal source: **the size of your palm**

	<p>-Body building foods-Legumes: the size of your fist</p> <p>-The amount of fat or oil per main meal-the tip of your finger</p> <p>Proportions in a healthy plate</p> <ul style="list-style-type: none"> • For a highly physically active person such as a farmer, half of your meal should be staple foods, if you are less active reduce this amount • A quarter of everyone’s meal should be legumes or animal products and the rest should be vegetables <p>Practical –Cooking demonstration on balanced meals(Recipe no1)</p> <p>-Prepare ONE recipe for balanced meals for the family that were planned in previous session and record comments from your group members</p> <p>-Show participants how to make a healthy plate. Also ensure that the healthy plate comprises of the recommended proportions of foods in a main meal</p> <p>-Also urge participants of your group to go and try different healthy plates for the family and share their experiences in the next session.</p> <p>Wrap up</p> <p>-Ask participants what they have learned from the session</p> <p>-Do a news bulletin to summarize messages discussed in the session</p> <p>-Ask participants to bring materials for tippy tap for next session</p> <p>-Invite Village health worker to participate in next session</p> <p>-Also tell participants with children to bring their children and their child health cards in next session</p>	
3.	<p>Malnutrition, its causes and consequences</p> <p>Key message: Eat foods from different groups not the same kinds of food at each meal and at adequate frequency each day in order to reduce cases of malnutrition in your community</p> <p>Activity 1</p> <p>-Explain that you are going to talk about malnutrition</p>	□

-Ask participants what malnutrition means. Discuss their responses and explain that malnutrition can mean undernutrition or over nutrition.

-Brainstorm on the possible causes of malnutrition in the community

-Show participants THE MALNUTRITION INFECTION CYCLE VISUAL AID

-Find out from them who they think are most at risk of malnutrition in their household? Discuss why children below 5 years, pregnant and lactating women, those that are ill and the elderly are most at risk and how this happens.

-Briefly discuss how supporting women prevents malnutrition

Notes

What is malnutrition?

Undernutrition is, in general terms, an outcome of insufficient quantity and quality of food

Over nutrition results from too much nutrient intake relative to nutrient requirements. This is becoming common in Zimbabwe

Causes of malnutrition

Undernutrition is caused by many different factors that often interact with one another.

- **Immediate causes:** Poor diet and disease are immediate causes of malnutrition which occur at individual or household level. Family members can have a poor diet due to caregivers not knowing how to, not giving children enough variety in their diet or not feeding enough to meet needs of their growth and development. Disease can cause undernutrition because sick people may have poor appetite, illness makes the body lose nutrients, illness reduces body ability to absorb nutrients and illness makes the body use up nutrients more quickly.
- **Underlying causes (household and community level):** The underlying causes occur at household and community level and include family shortages, inadequate care and feeding practices, poor living conditions and poor health services. Gender inequality at household level is also a key underlying cause of malnutrition. Gender inequality refers to unequal treatment or perceptions of individuals based on their gender. It arises from differences in socially constructed gender roles. Gender inequality can thus be both a cause as well as an effect of hunger and malnutrition. High levels of gender inequality is associated with high levels of malnutrition.

Let participants discuss this in light of what they generally see in their community of residence.

- **Basic causes (sub-national, national and international level):** The basic causes of malnutrition can occur at community and national level and can include climate change, poverty, unequal distribution of resources such as land, low status and education of women etc.

Who is at risk of malnutrition? (See notes on how much food should be eaten)

- Children below 5 years-They tend to be more affected by undernutrition than adults because they need many nutrients in order to grow and develop properly. In addition they have small stomachs so they cannot take in large amounts of food at one time
- Pregnant and lactating women-they have higher nutritional requirements to cater for their own health and the growing baby's health
- The chronically ill-when one is ill their immune system is impaired and this can have a serious impact on a person's food intake and absorption of nutrients.

How supporting women prevents malnutrition

- **Women play a key role in family nutrition since they get pregnant and breastfeed and are responsible for childcare, food production, food purchases and food preparation.**
- **Women need to be included in decision making about what food can be grown or bought and how the family can be fed**

An activity profile exercise to give a visual picture of the workload of women and men can be done:

What are the tasks that men and women do at home? (unpaid care work / unpaid productive work / paid work)

TASK	MALE	FEMALE
Cooking		
Washing clothes		
Fetching water		
Fetching firewood		
Cleaning the house		
Taking care of children		
Taking care of the sick		
Attending village meetings		
Herding cattle and goats		
Preparing land for agriculture		
Gardening		
Weeding the fields		

Harvesting		
Going to the market to sell		

- ***Moral of the exercise:*** If women have a heavy workload and are not given adequate support from men and other family members the nutrition of the whole family can be negatively affected

Activity 2

-Ask the members of your group how they can tell if someone in their family is malnourished i.e. the symptoms of over and undernutrition including the micronutrient deficiencies of public health significance in Zimbabwe?

-Show participants VISUAL AID ON DIFFERENT FORMS OF MALNUTRITION and FORMS OF MICRONUTRIENT DEFICIENCIES

- **NB:** Explain to the participants that the major challenge is stunting however with the La Nina effect there could be an increase in cases of wasted children.

- Ask participants if they have observed any cases of over nutrition or undernutrition in their community?

-Ask the participants why people in their community could be malnourished and what the consequences are?

-Encourage participants to take their children to the nearest clinic for growth monitoring. - ***Ask Village health worker to check the children's vaccination cards and to take MUAC measurements***

Notes

Indicators of undernutrition

- Wasting (thinness in the form of Marasmus and or edema in the form of kwashiorkor or both) which happens in the short term
- Stunting (shortness) which happens in the long term
- Deficiencies in vitamins and mineral (in the form of Vitamin A in the form of night blindness, Iron in the form of pale hands and pale tongue because of Anemia and Zinc which are the common micronutrient deficiencies in Zimbabwe).

Indicators of over nutrition

- Overweight and obesity (too fat)

Consequences of undernutrition

Short term

- Both wasting and stunting significantly increase the risk of mortality in children
- Undernutrition increases the susceptibility to, and severity of, infections in childhood

Long-term

- Functional losses in mental development, ability to learn in childhood, and work productivity in adulthood
- Low birthweight infants are also at increased risk of dying in infancy and are more likely to face lifelong cognitive and physical deficits as they remain short into adulthood which predispose them to chronic health problems such as diabetes and cardiovascular disease
- Stunted children are at increased risk of becoming shorter adults; for women, being stunted increases the chances of having a low birthweight baby
- Stunted children also perform less well at school and have lower incomes in adulthood
- Vitamin A deficiency can lead to visual impairment and blindness
- Iron deficiency can lead to tiredness which leads to reduced endurance and work capacity resulting from impaired energetic efficiency and lower voluntary activity levels
- Poor pregnancy outcomes
- Zinc deficiencies lead to poor growth, loss of appetite and an impaired immune system

Consequences of over nutrition

- It can lead to heart disease, diabetes and high blood pressure.

Activity 3

-Brainstorm on how agriculture can help address the challenge of malnutrition?

Notes

Why Agriculture matters?

	<ul style="list-style-type: none"> • AGRICULTURE is important to HUMAN NUTRITION as it contributes to food that is consumed and it's a source of livelihood as it generates income that can in turn be used to buy other foods not produced. For this reason trainings sessions on HEALTHY HARVEST have been developed so as to ensure that Agriculture impact positively on Nutrition and contribute to reduction in malnutrition. • Crop and livestock systems that produce a variety of foods for all year round access helps to improve the consumption of diversified foods at the HH level. <p>Practical-Establishment of tippy taps, practicing ten steps of handwashing at the five critical times</p> <p>-Explain that it is important to establish hygiene enabling facilities within your homesteads and exercise personal hygiene to prevent disease and malnutrition</p> <p>-Conduct a practical demonstration on establishment of two rubbish pits, tippy tap and practice the ten steps of hand washing. Show participants poster on TEN STEPS FOR HANDWASHING</p> <p>-Discuss the five critical times of handwashing. (a) after defecation (b) after cleaning a child's diaper/nappy (c) before cooking (d) before eating (e) before feeding a child. - Show participants VISUAL AID ON HAND WASHING</p> <p>-Sing song/slogan on handwashing</p> <p>-Discuss the roles and decisions of men and women on handwashing and analyze them</p> <p>Wrap up</p> <p>-Ask participants what they have learnt</p> <p>-Encourage participants to establish tippy taps and rubbish pits in their homesteads and share experiences in next session</p> <p>-Assign participants to bring materials for salt test and clay pot fridge practical for next session</p>	
4	<p>Harvesting, handling and storage of food</p> <p>Key message: Practice safe harvesting, handling and storage of food to maintain nutritional value of diverse foods</p> <p>Activity 1</p> <p>-Introduce the session that you are going to talk about safe ways to harvest and store food to maintain its nutritional value</p> <p>-Show group members VISUAL AID ON STAGES OF FOOD PRODUCTION WHERE FOOD CAN BE CONTAMINATED OR LOSE NUTRIENTS and ask them to identify different points when nutrient loss and contamination can occur</p>	

-Explain that you are going to develop some harvesting, handling and storage tips

Notes

Potential causes of nutrient loss and food contamination during food production

Process	Nutrient loss and food contamination can be caused by
Crop and livestock production	<p>-Poor agricultural practices leading to low yields and low nutrient crops or livestock</p> <p>-Inappropriate use of agricultural chemicals and veterinary drugs and poor hygiene leading to contamination</p>
Harvesting handling and storage	<p>-Not harvesting crops at maturity</p> <p>-Damage to produce caused by poor handling</p> <p>-Poor hygiene ,exposure to moisture, pest and diseases leading to contamination</p>
Processing, value addition, packaging, transport and marketing	<p>-Damage to produce caused by poor handling</p> <p>-Improper processing and storage before consumption leading to nutrient loss and increased contamination</p> <p>-Unnecessary additives(salt, sugar, monosodium glutamate(MSG) colourants, preservatives, flavourants) can lead to health problems</p>
Food preparation and feeding practices	<p>-poor choice of meals</p> <p>-Poor hygiene in food preparation and during feeding/eating</p> <p>-Lack of protection from contamination and spoilage</p> <p>-Overcooking and other poor cooking methods</p>

Activity 2

-Divide participants into four groups. Ask each group to prepare a five minute presentation on harvesting and handling of one of the following:

Group 1- roots and tubers, plus fruits and vegetables

Group 2-cereals

Group 3-legumes

Group 4-animal products

-Give each group five minutes to present their work and discuss points which they raise ,adding any additional points from other participants and any information which may have been missed

Notes

General harvesting, handling and storage tips

- Wear clean clothes and wash hands and tools before harvesting
- Choose the coolest time of day during a period of dry weather
- Avoid eating food which has been recently sprayed with chemicals. If you spray or apply chemicals to your crops make sure you follow the instructions on the container to allow enough time between spraying and harvesting
- Avoid damaging dry produce or allowing it to come into contact with water

Roots and tuber crops

- Roots and tuber crops should be harvested when they reach the desired size
- Roots and tuber crops can be dried and made into chips which can be milled for flour
- Sweet potatoes and yams can be kept in pits for a few weeks or can be dried and made into chips

Fruits and vegetables

- For the best flavor and most nutrients leave the fruit to ripen on the plant
- Fruit should be cut from the stem of the plant leaving a small stalk

- Fruits should be handled carefully to avoid damaging the skin
- Sort fruit carefully before storage. Do not store ripe fruit including tomatoes with unripe fruit

Harvesting cereals

- Cereals should be stored in clean dry containers and kept in cool, dark, dry well ventilated place, protected from rats, mice and insects
- Maize should be harvested when the cobs are dry with hard and glassy kernels. The cobs must not be left to dry in the field.
- Millet should be harvested when the seeds are dry
- Cereals should be dried on a clean cement floor or dried in a crib
- Before storage the grain should be tested for moisture content
- Dried cereals must be threshed and winnowed
- Cereals must be stored as unprocessed. Once milled into flour they will have a shorter shelf life

Legumes

- Cowpeas and groundnuts should be harvested when the pods are yellow and dry and the skins of kernels are easily detached
- Groundnut plants should be dug up and the excess soil removed. They should then be hung on drying frames for 3-4 weeks. Once completely cured the groundnuts should be shelled then carefully sorted to remove any moldy or shriveled nuts
- Roundnuts may be harvested fresh or dried in their shells. They are mature when brown patches appear on the pods
- Dried legumes must be threshed, winnowed and cleaned
- Legumes must be stored as unprocessed in insect free airtight containers

Animal products

- Strict hygiene is very important when handling animal products

- Meat and milk should be consumed as soon as possible or refrigerated or processed for storage
- All unprocessed meat must be stored in a refrigerator or freezer
- Animals should be slaughtered in a clean, dry, dust free area with a source of clean water and a cool, dry fly proof hanging area
- Animals should be killed as quickly as possible and humanely as possible then hung to bleed. The carcass should be skinned or plucked.
- The intestines and internal organs must be removed and examined for any deformities, parasites, unusual colouration, marks or swellings
- Any carcass which has unhealthy organs must be discarded. The carcass must be washed before butchering
- Clean protective clothing must be worn and hands and all implements must be thoroughly washed
- Milk should be collected in sterilized containers and stored in clean, glass containers in refrigerator or freezer
- Eggs should be collected each day, wiped with damp cloth(not soaked in water) and stored in a cool dark place

Activity 3

-Ask participants if they know what aflatoxins are? Where can they be found? Discuss dangers of aflatoxins

Notes

- All grain especially groundnuts can be contaminated with aflatoxin through poor production, harvesting, processing and storage
- Aflatoxin is a poisonous chemical produced by a mold. If people eat produce contaminated by this toxin they can suffer irreversible damage to the liver
- Aflatoxin can also damage the gut, reducing absorption of nutrients. This may be one of the causes of malnutrition, including stunting and underweight.
- Cooking or processing grains does not remove aflatoxins
- Livestock must not be fed moldy grain as they can become sick and their meat, milk or eggs may be contaminated

Activity 4

- Ask participants which kinds of insects attack stored grain.
- Ask participants which traditional and nontraditional methods are used to protect grains from insects
- Discuss some traditional methods of storing grain
- Talk about ways to improve granary designs
- Discuss the dangers to people's health of using pesticides in grain storage

Notes

- Insects and other pest can damage stored grain reducing its shelf life, exposing it to contamination and reducing its nutrient value
- Chemicals to protect stored grain are available from farmer supply shops. However some chemicals can be harmful to people's health so it is important to ensure that you use the right product and carefully follow instructions for use.
- Some traditional grain storage methods which do not require the use of bought chemicals:
 - surround grain storage containers with wood ash to repel pests
 - cover grain in a very thin layer of vegetable oil to preserve it
 - place dried lavender leaves in storage containers
 - line storage containers with crushed Mexican marigold plants or sprinkle Mexican marigold powder between layers of stored grain
 - line storage containers with a 3-5 cm layer of leafy zumbani branches
 - take smoking branches into the grain store and allow the smoke to fill the room to kill
 - if pests have been seen in the granary, spread the grain out on a raised platform in full sunlight for a few hours and the weevils will run away

Practical-Salt test and clay pot fridge

- Demonstrate the salt test for grain moisture

	<p>-Demonstrate the clay pot fridge.</p> <p>-Ask group members to practice the salt test and use the clay pot fridge at their homesteads and share experiences in the next session</p> <p>Wrap up</p> <p>-Ask participants what they have learnt</p> <p>-Sing song on key messages learnt</p> <p>-Tell participants that you are going to construct solar drier in next session. Assign participants to bring materials for solar drier</p>	
5	<p>Harvesting, preservation and processing of food</p> <p>Key message: Practice safe harvesting, preservation of food to ensure all year round access to diverse nutritious foods</p> <p>Activity 1</p> <p>-Explain that you are going to talk about food processing and preservation</p> <p>-Ask participants why we process food. Discuss the advantages of processing food</p> <p>-Ask group members to describe the processing methods which they know</p> <p>Notes</p> <ul style="list-style-type: none"> • Food processing is the changing or transformation of raw ingredients into food or changing food into other forms or types of food for marketing or preservation and storage <p>Advantages</p> <ul style="list-style-type: none"> • Surplus crop can be preserved • Nutritious food is available for consumption or sale throughout the year • Shelf life of food is increased for storage, transport and marketing • Range of products that can be sold or eaten is increased • Weight and bulk of food is reducing, making it easier to store and transport • Nutritional value of food may be increased • Digestibility of food is improved 	O

Processing methods

- Drying, salting, smoking, fermentation etc.

Activity 2

-Ask participants which produce they dry and which methods they recommend

- Discuss tips to improve drying methods of crops and meat. Explain what blanching means

-Talk about solar drier to the participants and explain its advantages

-Talk about blanching

Notes

- Food which is dried properly tends to have a higher concentration of nutrients than fresh food
- Dried products can be added directly to cooking or reconstituted by soaking in water before cooking
- They can also be made into powders used for fortifying food to make it more nutritious
- Drying makes products easier to store, package and transport and preserves food by removing the water that helps germs to grow
- Produce that is commonly dried includes bananas, mango, pawpaw, guava, okra, tomato, onion, pepper, pumpkin and squash, sweet potato, cassava and all green vegetables
- Roots and tuber crops, meat, fish and insects, mushrooms, pumpkin seeds, beans and grains can all be dried

Drying tips

- Drying is best done during the dry season
- Crops must be placed in a drier within 48 hours of harvesting
- Sort produce into groups of similar ripeness
- Wash in cool, clean water and remove any blemished or damaged sections
- Peel, cut, slice or shred the produce into pieces of similar size so that they take the same amount of time to dry
- Green vegetables should be blanched before you dry them to keep their colour and flavor and improve the shelf life

- Avoid sun drying .Drying in the shade reduce loss of nutrients
- Dip fruits slices such as mangoes ,guava or banana in lemon juice before drying
- Dry produce as quickly as possible-preferably in one day
- Place the produce on trays or racks in a warm place with moving air'
- Use a raised frame protected with gauze to keep out dust and insects
- Store the dried produce in clean, dry, dark airtight containers in well ventilated places to avoid mold
- Dried bananas, sweet potatoes, cassava and pumpkins can also be made into flour for storage

Blanching

- Blanching involves immersing the vegetables in hot water for a very short time
- This quickly kills any germs and preserves the colour and flavor of the vegetable before drying
- It shortens the drying time and the time taken to soften the dried produce before cooking
- Blanching can be done by steaming or by dipping the leaves in salted boiling water for a few minutes .NB-blanching cannot be used for okra, onions, garlic or chilies

Drying meat

- Drying should be done in the dry season in a clean place which has warm dry air circulating through it and which is protected from insects and animals
- All equipment must be very clean and the person preparing the meat must follow strict hygiene rules
- Only use freshly slaughtered meat
- Remove the bones ,fat, nerves ,tendons, blood vessels and dirty spots or blemishes
- Cut the meat into long thin strips of equal size (20-30cm long)
- Dip the strips in a 14% salt water solution(810g salt to 5 liters water) for five minutes
- Hang the strips so that they do not touch each other and air can circulate around them

	<ul style="list-style-type: none"> • Enclose the drying frames in insect-proof screens • The meat will take 4-5 days to dry. Drying must be gradual so that the outer meat surfaces do not become too dry while the inside is still wet • Store the dried meat in clean, dry paper, plastic or foil coverings. It can be stored for up to 6 months <p>Practical</p> <ul style="list-style-type: none"> • Demonstrate how to construct the solar drier • Dry some vegetables or fruits in the solar drier • Encourage participants to construct and use solar drier at their homesteads <p>Wrap up</p> <p>-Ask participants what they have learnt</p> <p>-Sing a song on drying produce using a solar drier</p> <p>-Encourage participants to construct and use solar drier at the homesteads</p> <p>-Planning for next session-Assign participants to bring clay soil for construction Fuel efficient stoves</p>	
6	<p>Nutrition in the lifecycle</p> <p>Key Message: Pregnant and lactating women, children 6-59 months and women of child bearing age consume iron rich foods including Vitamin A rich and biofortified foods each day</p> <p>Activity 1</p> <ul style="list-style-type: none"> • Have a recap with participants on reasons why children, women of childbearing age, pregnant and breastfeeding women need a diversified diet. • Highlight the point that if a woman is not getting a healthy diet when she becomes pregnant her baby may suffer from undernutrition. For this reason women of child bearing age should have a nutritious balanced diet • Show the group members VISUAL AID GOOD NUTRITION IS PASSED THROUGH GENERATIONS to remind them how malnutrition can be passed between the generations 	

- Ask the participants to identify cereals, legumes and animal foods that are naturally good sources of iron and vitamin A
- Ask participants to discuss their experiences on biofortified foods. What are biofortified foods? Have any of your group members produced, purchased or consumed bio fortified foods?
- Discuss the roles and decisions of men and women in consumption of iron and Vitamin A Rich foods including biofortified foods and analyze them

Notes

Food sources of iron and vitamin A

Vitamin A rich foods

- mango, pawpaw but not oranges
- carrots, pumpkin, butternut, orange fleshed sweet potatoes
- red peppers
- dark green leafy vegetables: pumpkin leaves, spinach, amaranth, covo, rape, tsunga
- animal products: liver, eggs, cow's milk, chicken, fish

Iron rich foods

- whole grain cereals, especially millet and sorghum
- legumes: cowpeas, groundnuts, roundnuts, sugar beans
- Dark green leafy vegetables: pumpkin leaves, spinach, amaranth, covo, rape and tsunga
- Animal products: beef, insects, liver and fish
- Seeds: pumpkin, sesame
- Bio fortification is the process by which the nutritional quality of food crops is improved through agronomic practices, conventional plant breeding, or modern biotechnology. Bio fortification differs from conventional fortification in that bio fortification aims to increase nutrient levels in crops during plant growth rather than through manual means during processing of the crops.

- Varieties with high concentration of the nutrients are cross bred with high yielding varieties to develop biofortified varieties.
- Biofortified crops-Vitamin A orange maize, Iron and Zinc rich sugar beans and the orange fleshed sweet potatoes

Activity 2

- Briefly talk about exclusive breastfeeding for children 0-6months.Explain that it is important to exclusively breastfeed children from birth to six months. Thereafter it is essential to breastfeed until baby is 24 months of age and beyond.
- Explain that you are now going to talk about complementary feeding
- Highlight that as the child grows, they have higher nutritional requirements. Hence in addition to breastmilk the baby should be introduced to complementary feeds at 6 months
- Ask participants the factors that they need to consider when planning for complementary feeds
- Show participants cards and discuss complementary feeding requirements for each age group-6 to 9 months, 9 to 12months, and 12 to 24 months. Emphasize on frequency, amount, texture and variety
- Dramatize on benefits of feeding children adequate variety of foods for each meal until they are full.
- Discuss the roles and decisions of men and women on complementary feeding – food variety and analyze them

Notes

- Timely introduction of solids, semi-solid and soft complementary foods. Mothers/carers timely introduce solid, semi-solid and soft complementary foods at 6 months
- Food Variety. Mothers/carers feed their children aged 6-59 months meals containing foods from four food groups each day
- Meal Frequency. Mothers/carers feed their babies ages 6 – 59 months adequate meals for age per each day.
- Amount

	<ul style="list-style-type: none"> • Hygiene • Active feeding <p>Activity 3</p> <ul style="list-style-type: none"> • Explain to participants that you now want to learn how to plan and prepare complementary foods and nutritious foods for pregnant and lactating women. • Refer to the dietary diversity card. Plan two four star complementary food recipes and two four star recipes suitable for pregnant or lactating women. NB do not forget to include foods that are high in iron and vitamin A including biofortified foods • Tell participants that they shall prepare some of the foods using the hot box. Assign participants to bring materials for hot box demonstration <p>Practical-fuel efficient stoves</p> <p>Key message: Use fuel efficient stoves (<i>tsotso</i> and <i>Jengetahuni</i> to prepare complementary and family meals)</p> <ul style="list-style-type: none"> • Discuss the two models and the benefits of using the fuel efficient stoves • Conduct the practical session for construction of Jengeta huni and tsotso stove • Discuss the requirements for construction Jengetahuni and organize separate sessions for construction in the group members kitchen • Also discuss with members how they can generate income from fuel efficient stoves as a livelihood <p>Wrap up</p> <p>-Ask participants what they have learnt</p> <p>-Sing song/slogan on key messages discussed including fuel efficient stoves</p>	
7	<p>Growing diverse nutritious foods</p> <p>Key message: Your family can consume diverse diets each day if you grow a variety of crops</p> <p>Practical- Show participants how to prepare and place food in hot box</p>	

Activity 1

- Introduce the topic and the key message for the session
- Ask participants where their food comes from?
- How much of the food they eat is produced on the family land/animals kept, how much is collected from natural areas such as forests and how much do they buy. **Do proportional piling**
- Discuss on what informs families to produce the crops and livestock they are producing. Are the production levels satisfactory?
- Discuss on the food groups that are **not** mostly produced by members of the group and why? Discuss any cultural or religious reasons which stop people from eating some livestock products. Are there any members of the family restricted from eating certain livestock products and why?

Notes

Characteristics of the Natural Regions (NR)

- NR I: High rainfall (over 1000mm per year), low temperatures and steep slopes
- NR II: Medium rainfall (750-1000 mm per year) from November to March or April. Temperatures are not too extreme and soils are generally good.
- NR III: Low rainfall (650-800 mm per year), with mid-season dry spells and high temperatures.
- NR IV: Low rainfall (450-650 mm per year) with severe dry spells during the rainy season and frequent seasonal droughts.
- NR V very low rainfall (less than 450 mm per year) and highly erratic

Notes

Growing diverse food crops and livestock production should be based on the agro-ecology of the area

Food group and crops	Natural region	Time of year to grow
Grain staples		
Maize, Provitamin A maize	NR1-3	Rainy season
Millet and sorghum	NR3-5 in sand soils	Rainy season
Wheat	NR1-3 in loam soils with irrigation	Cold season
Potatoes	NR1-2 in loam/clay soils	Best in cold season
Sweet potatoes	NR2-5 in clay soils	Rainy season
Yams	NR1-3 in clay soils	Rainy season
Cassava	NR1-5 in loam or sand soils	
Legumes and oil seeds		
Groundnuts, roundnuts, cowpeas, sugar beans including NUA 45	NR2-5 in sandy loam soils	Rainy season
Soybeans		
Vegetables		
Leafy vegetables-cabbage, tsunga, rape, covo, spinach, amaranth, nyeve	NR1-5 in sandy loam or clay soils	Rainy season
Tomatoes, onions, garlic, leeks, carrots	NR1-5 in sandy loam soils	Rainy season
Pumpkins, squash, cucumbers	NR1-5 in sandy loam or clay soils	Rainy season
Fruit		
Temperate fruit (apple, peach, plum, nectarine, pear)	NR1-3 in sandy loam soils	
Tropical fruit (banana, pawpaw, guava, mango, litchi, avocado)	NR2-5 in frost free areas	

Livestock		
Dairy cows, pigs	NR1-3	
Sheep	NR1-5	
Beef cattle, goats, game	NR2-5	
Small livestock(poultry, rabbits, guinea pigs, fish ,bees)	All areas	

Activity 2

- Explain that you are going to talk about micro gardens. Ask participants what micro gardens are and their advantages and disadvantages
- Discuss the steps involved in establishing different types of micro gardens, goal formation, why consumption from home gardens and even own livestock is important)
- Discuss the roles and decisions of men and women in home micro gardening

Activity 3

- Tell the group members that you are about to come up with a crop and livestock plan for the micro garden, and the field
- Divide participants into five small groups and allocate each a different food group. Ask each group to make a crop and livestock plan best adapted to the natural region that they live in to show what they could produce to supply their families with enough nutritious food.
- Bring participants together and ask each group to present their work. Discuss how realistic the plans are for the Natural Region
- What are the sources of seeds-discuss use of hybrid seeds, new hybrid seeds that are biofortified and retained seeds that are locally adapted to the areas and free from diseases e.g. aflatoxins in groundnuts
- Find out the preparedness

	<p>Practical-Cooking demonstration for 4 Star complementary recipes</p> <ul style="list-style-type: none"> • Prepare planned recipes from previous session • Encourage participants to prepare new recipes back at home. The participants can share experiences in next session <p>Practical-Fuel efficient stoves</p> <ul style="list-style-type: none"> • Check on the fuel efficient stoves. Continue with constructing fuel efficient stoves <p>Planning</p>	
8	<p>Review of progress by participants on the extent to which households are achieving what they planned to achieve (adoption of positive GAP, Post-harvest management and nutrition and health practices).</p> <p>-What changes are being observed and reported by participants?</p> <p>-What problems are being encountered and solutions to the problems?</p> <p>-Do an inventory of adopters of technologies-fes,solar drier, tippy tap, micro gardens etc.</p> <p>-Submission and reviewing of monthly report</p>	

9

Buying and collecting diverse nutritious foods

Key message: Your family can consume diverse diets each day if you buy and collect nutritious foods

Activity 1

- Introduce session and key message
- Ask participants to outline the type of foods that they buy
- Ask participants which of the food they usually spend most of the money on
- Discuss key factors to consider when choosing and buying food. Discuss which foods they should spend more money on for improved nutrition
- Do a role play to help participants make the best choices when they are buying food

Notes

Tips on buying food

- Choose food from the different food groups which contain many nutrients as well as fiber.
- Always buy fruit, vegetables and animal products which are fresh.
- Avoid vegetables or fruit which have had pesticides applied before harvesting and selling (within 1-2 weeks of application, depending on the chemical). When possible, try to choose organic food (which means no chemicals have been used in its production).
- Avoid meat, eggs or milk taken from animals which have recently been treated with medicines or vaccines. Ask the person selling the food if they know if this has happened.
- Only buy livestock products which have been kept cool and protected from flies.'
- Do not buy dried legumes or grains which look as if they are damaged by insects or contaminated by mold.
- Avoid any food that is past its expiration date, damaged, dirty, old, moldy, or smells bad.

- Avoid junk food, processed food or food containing many additives (such as flavorings, coloring, salt, sugar or monosodium glutamate - MSG).
- Avoid buying milk formula – it is better to breastfeed your baby.

Activity 2

- Introduce the session by saying that you are going to talk about the nutritional benefits of collecting wild harvested foods
- Ask participants to mention some of the wild harvested foods that they find in their community
- Discuss reasons for these foods not being eaten more often and note that they are very good sources of nutrients
- Ask whether there are any cultural or traditional restrictions in their community ownership, harvesting and selling wild harvested produce. Discuss what would happen if people collected too much of it

Practical-Micro gardening

- Discuss on preparation of micro garden nursery and do the practical
- Compost making discussion and practical

Wrap up

-Ask participants what they learnt

10

Good Agricultural Practices- Soil management. Practice principles which contribute to the production of safe, nutritious food and income while not damaging human health through contamination of food or the environment on which people and agriculture depend on.

Key message: Conserve soil and improve fertility to increase long term agricultural (crops and livestock) production and availability of nutritious food for consumption

Activity 1

-Introduce the topic and the key message for the session

-Discuss the practices that farmers are undertaking to conserve soil so that there is minimum disturbance, challenges and how to address the challenges?

-Discuss the practices that farmers are undertaking to improve soil fertility and challenges and how to address the challenges?

-Discuss ways in which soils get contaminated and how to control it?

-To what extent do inorganic fertilizers pose risks to human health?

-Visit one field and assess risk of contamination of the soil?

Notes

Conserve soil and improve fertility

- Practicing conservation agriculture
- Improve micronutrient levels in soils and plants, which will improve the composition of plant foods and enhance yields
- Analyze the type of soil and its depth for good growth of the roots
- Practice crop rotation and intercropping
- Select seeds that can adapt to the soil of the field
- Select improved seeds and resistant to the most frequent diseases according to the recommendations of AGRITEX-the risk of retained seed is that it may already be diseased e.g. groundnuts with aflatoxins
- Use crop residue for animal fodder, compost or mulch
- Use compost, manure, mulch and liquid fertilizers

□

	<p>Use clean soil</p> <ul style="list-style-type: none"> • Avoid the improper use of manure i.e. use organic manure before planting the crop. • Compost manure completely to kill pathogens, and incorporate it into soil at least two weeks prior to planting. • Keep domestic and wild animals out of fields to reduce the risk of faecal contamination and ensure that waste is well managed and used for agricultural purposes. • Advise use of improved latrines instead of open defecations and observing good personal hygiene. Faecal ingestion that damages the stomach walls reducing absorption of nutrients in young children. • Avoid pollution by chemicals e.g. heavy chemicals which end up accumulating in food • Prevent run-off or drift from animal operations from entering produce fields. <p>Practical</p> <ul style="list-style-type: none"> • Micro gardening: Garden layout/Design of beds and preparation discussion and practical. 	
11	<p>Good Agricultural Practices- Water for irrigating crops and livestock drinking Key message: use clean water for irrigation purposes to avoid physical and systemic contamination of produce</p> <p>Activities</p> <ul style="list-style-type: none"> -Introduce the topic and the key message for the session -What are the sources of water that we are using to irrigation purposes? -Discuss the extent to which the water is getting contaminated by chemicals, human faeces or animal waste? -What are the dangers and how can this be addressed? -If possible visit your water sources for irrigation and assess cleanliness? Can use of drip irrigation and settling ponds help? 	□

	<p>Notes</p> <p>Conserve water</p> <ul style="list-style-type: none"> • Mulching <p>Use clean water</p> <ul style="list-style-type: none"> • Keep livestock away from the active recharge area for well-water that will be used for irrigation. • Keep chemicals away from the active recharge area for well-water that will be used for irrigation. • Filter or use settling ponds to improve water quality. • Where feasible, use drip irrigation to reduce crop wetting and minimize risk. <p>Practical-Micro gardening</p> <p>Garden management-GAPs on fertility management</p>	
12	<p>Good Agricultural Practices: - Weeds, pests and diseases management</p> <p>Key message: Avoid harmful effects of chemicals used for managing weeds, pests and diseases as this can erode the gains from the consumption of diverse diets</p> <p>Activity 1</p> <p>-Introduce the topic and the key message for the session</p> <p>-Discuss the use of chemicals by famers for weed control, pest and disease management during crop and livestock production?</p> <p>-To what extend are farmers cautious in terms of observing and following the directions for use so that the chemicals are not hazardous to health?</p> <p>-To what extend are farmers practicing organic farming and use of biological control methods and their effectiveness?</p>	□

	<p>Notes</p> <p>Prevent the harmful effects of chemicals to humans</p> <ul style="list-style-type: none"> • Use of chemicals (pesticides, herbicides, fertilizers and veterinary drugs) is beneficial to agricultural production however these are a threat to human health in both acutely and chronically • Recognize the type of weeds, pests and diseases affecting your crop • Analyze if it is possible to apply a biological control instead of a chemical one • Consult AGRITEX to know what agro-chemicals are recommended to be used in accordance with your crop and the type of weeds and disease • Use potable water for making up chemical pest management sprays. • Follow the directions for use according to the recommendations by AGRITEX • Use protective clothing during application, take a shower after application and wash the protective clothing • People especially those at risk of malnutrition should not come near the area where agro-chemicals are applied • Respect waiting time for each application • Use sealed boxes if possible away from home to store the chemicals • Ensure good disposal of empty containers • Avoid consuming or selling crops recently sprayed with pesticides and animals feed with hormones. <p>Practical-Micro gardening</p> <p>Transplanting into the final seed bed</p>	
13	<p>Good Agricultural Practices: - Weeds, pests and diseases management of Bio fortified crops</p> <p>Key message: Avoid harmful effects of chemicals used for managing weeds, pests and diseases as this can erode the gains from the consumption of diverse diets</p>	

	<p>Practical Micro gardening</p> <p>Garden management- Watering, Weed, pest,disease management</p> <p>-Ask participants where they can get seed varieties for micro gardens</p> <p>-Have a discussion on how to plan for continuity</p> <p>Management of biofortified crops</p> <p>-Discuss about management of biofortified crops. Ask for testimonies from participants who grew biofortified crops in previous season. Is the seed available locally in agro dealer shops?</p> <p>-Discuss pest and disease management of biofortified crops</p> <p>-have a discussion on how participants are going to finance their agricultural activities</p> <p>-Help participants to come with realistic budget plans</p>	
14	<p>Review of progress by participants on the extent to which households are achieving what they planned to achieve (adoption of positive GAP, Post-harvest management and nutrition and health practices).</p> <p>-What changes are being observed and reported by participants?</p> <p>-What problems are being encountered and solutions to the problems?</p> <p>-Do an inventory of adopters of technologies-fes, solar drier, tippy tap, micro gardens etc.</p> <p>-Visits to successful households for observations and learning.-Have an exposure visit to a neighboring village for learning purposes</p>	□

Notes for Facilitators

- **Targeting for nutrition sessions should always include both men and women. Couples are encouraged because this has been proven to work. Women are already overburdened with household and reproductive tasks hence targeting women only in nutrition may not add value nor change unequal power relations between men and women.**
- **Gender analysis should be part of every situation analysis, analysing the need, priorities and roles of men and women.**
- **An eye for analysing practices, access to resources, services and control is critical for ultimately measuring change.**