

# REPUBLIC OF KENYA



MINISTRY OF AGRICULTURE  
MINISTRY OF PUBLIC HEALTH AND SANITATION

## APPLIED BASIC AGRI-NUTRITION RESOURCE TOOLKIT FOR TRAINERS



**USAID**  
FROM THE AMERICAN PEOPLE

May 2013

This Resource Toolkit for Trainers was produced under the USAID-funded Kenya Horticulture Competitiveness Project (KHCP).

**CHART NUMBER 1**

**WHAT IS APPLIED NUTRITION?**



**SELECT**



**PREPARE**



**COOK**



**HEALTH**

## CHART NUMBER 1

### WHAT IS APPLIED NUTRITION?

*Trainers Notes: Ask the participants what they think Applied Nutrition is.*

It is what you **'select'** to eat, how you **'prepare'** the food and how you **'cook'** the food

#### **SELECT:**

Select a variety of foods from each of the food groups: Starches (carbohydrates), fruits & vegetables, proteins, water, fats & oils

- **Starches (Carbohydrates)** – Select a variety of carbohydrates throughout the day including roots, tubers, grains, legumes and pulses. Make starchy foods the basis of most meals.
- **Proteins** - Select a variety of protein from both animal and plant sources. Each week select proteins from sources such as beans and lentils, fish, chicken, beef, goat, rabbit, eggs
- **Fruits & Vegetables** – by selecting a variety of fruit and vegetables, that include at least 5 different colours, you will be eating necessary vitamins and minerals to maintain a healthy body
- **Fats & Oils** – these are necessary for the body function but should be used in small quantities
- **Water**– consume at least 8 glasses of water daily
- **Salt & Sugar**- Reduce your intake of salt and sugar

#### **PREPARE:**

- Wash your hands- Attend to personal hygiene before preparing food
- Use only well washed utensils and cooking vessels
- Wash fruit and vegetables in clean safe water very well to remove all dirt that may cause diarrhoea or gastric upset (vomiting)
- Only remove the skin off the fruit and vegetables if necessary or inedible
- Wash, chop leafy greens just before cooking as this will retain most nutrients
- If you need to chop leafy green vegetables, make sure you do not chop the vegetable too finely as this will also reduce the nutrient retention when cooking
- Pre-Soak legumes and pulses to release nutrients and save on fuel since soaked legumes and pulses take shorter time to cook.

#### **COOK:**

- Animal products- Ensure well-cooked to avoid food borne infections (i.e. diarrhoea)
- Avoid over cooking vegetables as this will increase the loss of nutrients
- Only cook vegetables just before meal times to retain as many nutrients as possible. The longer cooked vegetables sit in the water the more nutrients are lost
- Use alternative food cooking methods to make meals interesting and ensure diets contains sufficient nutrients. Cover food that require long periods of cooking to retain nutrients and save energy

## CHART NUMBER 2

### BENEFITS OF HEALTHY EATING



## CHART NUMBER 2

### BENEFITS OF HEALTHY EATING

By eating the right quantities and variety of foods this will improve the health of your body and mind

#### **Improved Studies:**

- Children grow and develop in a healthy way
- Health of your children will result in better performance in their studies.

#### **Improved productivity:**

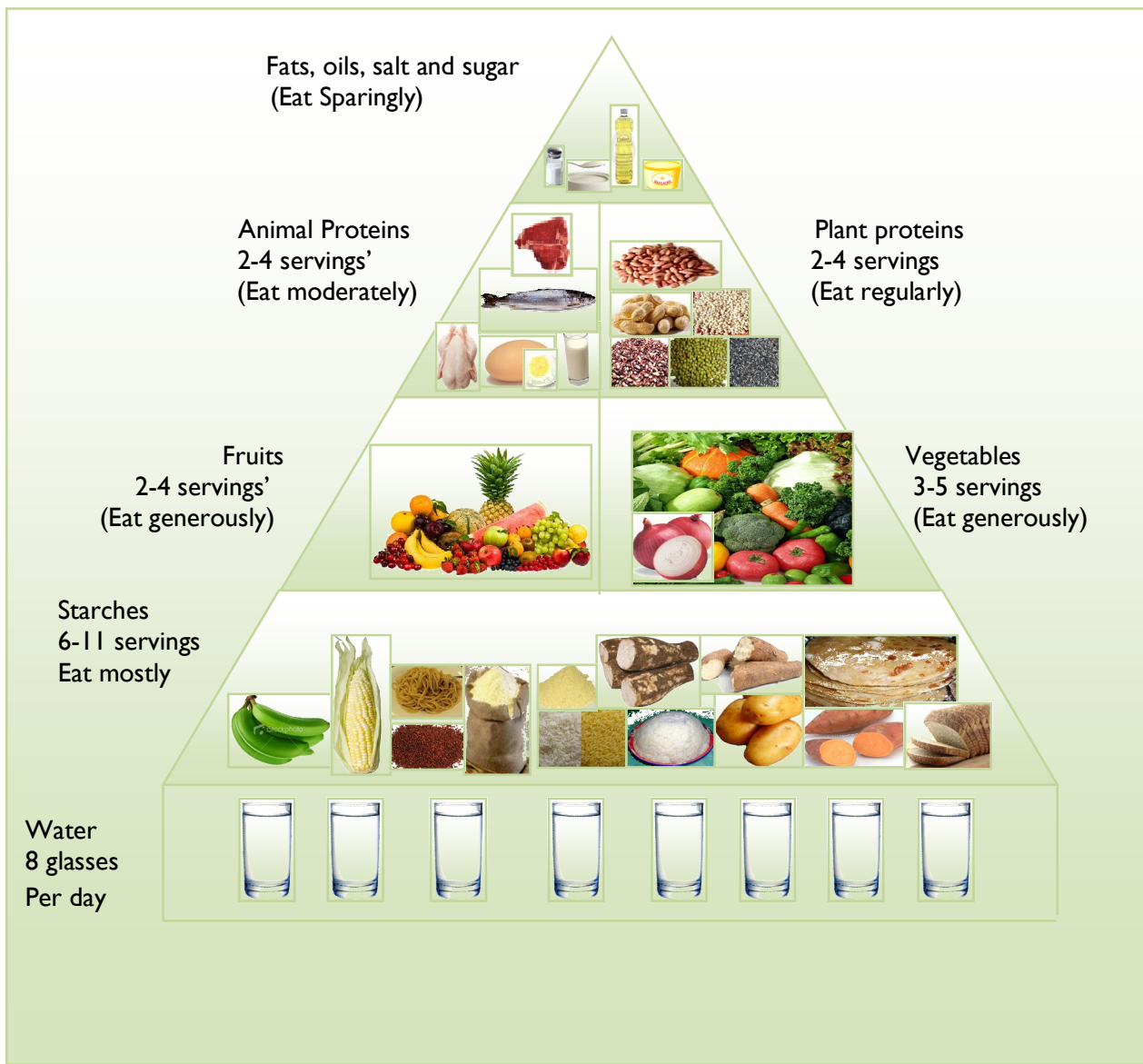
- Which will enable you to physically work harder, make positive decisions, which will lead to making more money.

#### **Healthy Family:**

- The possibility of family members becoming ill is reduced when eating a balanced diet, this results in less money being spent on medical costs
- This results in more money to buy healthy foods for the family

### CHART NUMBER 3

## THE HEALTHY EATING PYRAMID



## CHART NUMBER 3

### THE HEALTHY EATING PYRAMID

#### **WATER**

- Drink at least 8 glasses of clean safe water daily

#### **STARCHES<sup>6</sup> – 11 servings each day**

- Starches (carbohydrates) provide the body with energy, vitamins and minerals
- Keeps the body warm and working well

#### **VEGETABLES<sup>3</sup> – 5 servings and FRUIT 2-4 servings each day**

- They are low in fat and rich in fibre
- High in vitamins and minerals which strengthen the body's immune system

#### **ANIMAL AND PLANT PROTEINS 2 – 4 servings each day**


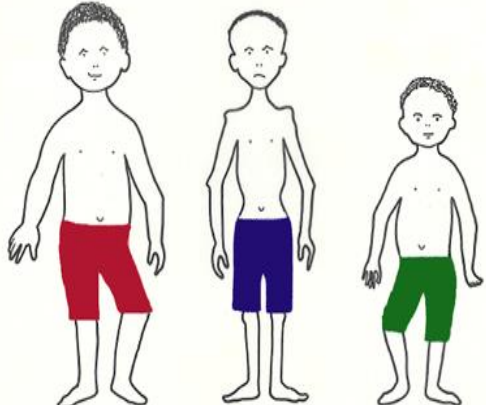


- Helps in building and repairing body tissue including muscles
- Provides vitamins and minerals for function of body systems
- Milk, yoghurt and cheese- 2-3 servings each day. They provide proteins, vitamins and minerals

#### **FATS, OILS, SALT AND SUGAR**

- They are necessary but should be eaten in moderation.
- Provide mostly energy
- Large amounts of these foods will cause a nutritional imbalance in the body
- These foods can cause health issues such as Diabetes type 2, obesity, hypertension(blood pressure) and some cancers

## CHART 4

### THE EFFECTS OF POOR NUTRITION

	<p><b>Wasting</b> - from not eating enough food containing essential nutrients for the body to develop. Extreme losses of fat and bone density to the body.</p> <p>Causes organ failure, bone breakage and heart failure</p>												
 <table border="0" data-bbox="143 1243 638 1310"> <tr> <td>Wasted</td> <td>No</td> <td>Yes</td> <td>No</td> </tr> <tr> <td>Stunted</td> <td>No</td> <td>No</td> <td>Yes</td> </tr> <tr> <td>Underweight</td> <td>No</td> <td>Yes</td> <td>Yes</td> </tr> </table>	Wasted	No	Yes	No	Stunted	No	No	Yes	Underweight	No	Yes	Yes	<p><b>Stunted growth</b> - from babies not being fed exclusive breast milk for the first 6 months of life and from not receiving adequate nutrients for growth and development after 6 months</p> <p>Both children here are age 7 years</p>
Wasted	No	Yes	No										
Stunted	No	No	Yes										
Underweight	No	Yes	Yes										
	<p><b>Frequent sickness</b> -from not eating adequate foods containing a variety of vitamins and minerals</p>												
	<p><b>Rickets</b> - from not receiving adequate, calcium, vitamin D and other important nutrients for the body to develop.</p> <p>Causes abnormal forming of bones while children are growing</p>												







## CHART NUMBER 4

### THE EFFECTS OF POOR NUTRITION

- **WASTING** – from not eating enough food containing essential nutrients for the body to develop.
  - Extreme losses of fat and bone density to the body. Causes organ failure, bone breakage and heart failure.
  
- **Stunted growth** - from babies not being fed exclusive breastmilk for the first 6 months of life and from not receiving adequate nutrients for growth and development after 6 months.
  - Both children here are age **7 years**.
  
- **Frequent sickness** - from not eating adequate foods containing a variety of vitamins and minerals
  
- **Rickets** - from not receiving adequate, calcium, vitamin D and other important nutrients for the body to develop.
  - Causes abnormal forming of bones while children are growing.

## CHART 5

### THE EFFECTS OF POOR NUTRITION

 <p>Vitamin A deficiency complicated by measles (Rubella)</p>	<p><b>Blindness</b> - from not receiving adequate Vitamin A</p>
	<p><b>Obesity</b> - from taking too much high fat processed foods and carbohydrates, coupled with lack of physical activity.</p> <p>Increases risk for Diabetes Type 2, heart disease, high blood pressure and some cancers</p>
	<p><b>Skin infections</b> - from not receiving enough of the Vitamin B group</p> <p>Causes the body not to be able to repair damaged skin due to infections or cuts</p>
	<p><b>Heart disease</b> - from having too much cholesterol from fatty foods and carbohydrates or from a genetic problem with the heart.</p> <p>Causes heart attack and stroke</p>

**CHART NUMBER 5****THE EFFECTS OF POOR NUTRITION**

- **Blindness** - from not receiving adequate Vitamin A
- **Obesity** - from taking too much high fat processed foods and carbohydrates, coupled with lack of physical activity.
  - Increases risk for Diabetes Type 2, heart disease, high blood pressure and some cancers.
- **Skin infections** - from not receiving enough of the Vitamin B group
  - Causes the body not to be able to repair damaged skin due to infections or cuts.
- **HEART DISEASE** – from having too much cholesterol from fatty foods and carbohydrates or from a genetic problem with the heart.
  - Causes heart attack and stroke.

## CHART NUMBER 6

### Hand-washing technique with soap and water



1  
Wet hands with water



2  
Apply enough soap to cover all hand surfaces



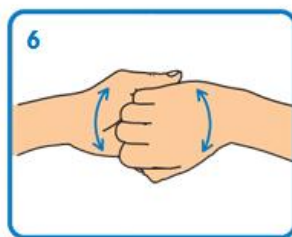
3  
Rub hands palm to palm



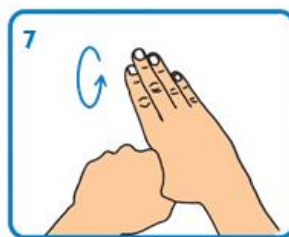
4  
Rub back of each hand with palm of other hand with fingers interlaced



5  
Rub palm to palm with fingers interlaced



6  
Rub with back of fingers to opposing palms with fingers interlocked



7  
Rub each thumb clasped in opposite hand using a rotational movement



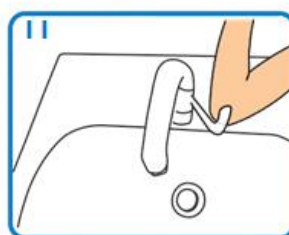
8  
Rub tips of fingers in opposite palm in a circular motion



9  
Rub each wrist with opposite hand



10  
Rinse hands with water



11  
Use elbow to turn off tap



12  
Dry thoroughly with a single-use towel

Adapted from World Health Organization Guidelines on Hand Hygiene in Health Care

## CHART NUMBER 6

### Basic Hygiene Guidelines (see hand-washing technique chart)

- Wash hands after visiting the toilet, blowing your nose, brushing hair or touching your body.
- Wash hands between food preparation tasks.
- Wash hands when coming from the farm.
- Wash hands after handling animals.
- Wash raw foods thoroughly – fruits & vegetables contain harmful dirt, fertilizers, pesticides
- Avoid unnecessary human contact and over handling of food. Use spoons or other utensils.
- Prepare raw and cooked food separately; use separate chopping boards and utensils where possible. This prevents Cross Contamination – transferring micro-organisms from contaminated food to uncontaminated food, (by hands, utensils, storage)
- Wash cooking equipment's with soap and clean water before and after use and when preparing different foods using the same equipment.
- Never eat while preparing food
- Minimize time food is at unsafe temperatures during preparation.

## CHART NUMBER 7

### The Best Methods for Cooking Food to Retain Nutrients



**STEAMING UTENSILS**



**STEAMING**



**SAUTEING**





**BOILING**

**CHART NUMBER 7****The best methods for cooking food to retain nutrients**

- **Steaming** is a quick method of cookery. Steaming retains the color, flavor and nutritional value of food. It is a fat-free method of cookery, it is also healthier.  
*Trainer notes – demonstrate how to steam vegetables using the colander with a leafy green vegetable sitting in it over the sufuria and a lid placed on top.*
- **Sautéing** - is a quick method of cooking that requires only a very small amount of oil, fat or even water. Vegetables only require partial cooking before being consumed. Nutritional value of vegetables remains particularly high. No nutrients are being lost in discarded liquid.
- **Boiling** - Root vegetables are placed into cold water and then brought to the boil. The vegetables cook more evenly. Rice and flour for Ugali are placed into water that is already boiling. This sets the starch and stops the food sticking together or lumping.
- **Blanching**-Green and leafy vegetables are placed in boiling water. This reduces the loss of color and nutrition.

**CHART NUMBER 8****Tools to use when Measurement Serving amounts**

Cup 	2 Servings 250 grams
Tub 	2 Servings 250 grams



## **CHART NUMBER 8**

**These guides are used to help measure out the serving sizes of each of the food groups**

- One cup measure = 2 servings
- One tub measure = 2 servings

*Ask the participants which measurement they would use in their homes*

### CHART NUMBER 9

## Serving Size Recommendations – Cereals, Grains, Tubers & Roots

Each day eat 1.5 – 2.5 cups (3-5 servings) of cooked or 3-5 cups of cereals grains

Cup



Tub



250 grams- Equivalent to 2 servings



## CHART NUMBER 9

### Serving Size Recommendations – Cereals, Grains, Tubers & Roots

**Select a variety of these products to eat each day to provide your body with energy. Try to eat wholemeal grains when possible for fiber to keep your body regular.**

- Rice
- Arrowroot
- Cassava
- Wheat
- Potato
- Millet
- Sorghum
- Sweet potato
- Maize

## CHART NUMBER 10

### Serving Size Recommendations– Vegetables & Fruit

Each day eat 1.5 – 2.5 cups of cooked or 3-5 cups/handfuls of raw chopped vegetables

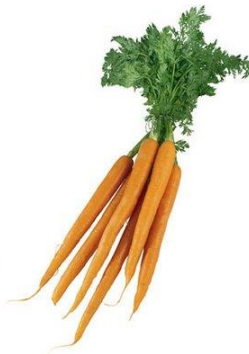
Cup



Tub



250 grams- Equivalent to 2 servings



**CHART NUMBER 10****Serving Size Recommendations – Vegetables & Fruit****Vegetables are rich in vitamins and minerals to help maintain a healthy body**

- Select at least 5 different colours of vegetables each day to receive a variety of vitamins and minerals
- Children from 6 months to 8 months of age should have mashed vegetables.
- Children from 9 months to 23 months of age should have finely chopped or mashed vegetables.
- Children from 24 months to 3 years should have chopped vegetable

**CHART NUMBER 11**

**Fruits**

**Each day eat 1-2 cups (2-4 servings) of chopped or whole fruit**

**Cup**



**Tub**



250 grams- Equivalent to 2 servings



## **CHART NUMBER 11**

### **Fruits**

**Each day eat 1-2 cups/handfuls of chopped or whole fruit**

- Fruits are rich in essential vitamins and minerals to help maintain a healthy body
- Select at least 2 varieties of fresh fruit daily
- Eat fruit with the skin where possible. The skin contains nutrients and fibre to improve digestion.
- Wash the fruit well before eating to avoid contamination

## CHART NUMBER 12

### Raw Foods

# Eat raw foods often

1 serving/portion is equivalent to ½ cup fruit or cooked vegetables and 1 cup raw vegetables.





## CHART NUMBER 12

### Raw Foods

#### **EAT RAW FOODS OFTEN**

*1 serving/portion is equivalent to ½ cup fruit or cooked vegetables and 1 cup raw vegetables.*

***Raw fruits and vegetables contain high levels of nutrients that have not been destroyed by heat. The health benefits of eating raw foods are:***

- Increased energy
- Clear Skin
- Reduced risk of illness and disease

Foods that can be eaten may include:

- All fruits
- Tomato
- Salad lettuce
- Carrot
- Capsicum
- Onion
- Cabbage
- Cucumber
- Carrots

**CHART NUMBER 13**

**Each day eat 80g-120g (1/3-1/2) cup servings of animal protein or 1-2 cups of plant protein (2-4 servings)**

















**Cup**



**Tub**



250 grams- Equivalent to 2 servings

Animal Protein	Plant Protein
	
	
	
	
	
	
	
	

## CHART NUMBER 13

**Each day eat 80g-120g (1/3-1/2) cup servings of animal protein or 1-2 cups of plant protein (2-4 servings)**

PROTEIN CAN COME FROM 2 SOURCES – ANIMALS OR PLANTS

ANIMAL PROTEIN CAN INCLUDE THE FOLLOWING:

- Fish
- Chicken
- Beef
- Mutton
- Goat
- Pork
- Rabbit
- Eggs
- Insects
- Offal (e.g matumbo, intestines, heart, lungs, liver, kidney, tongue)

When cooking animal protein, avoid deep-frying as this will reduce the amount of nutrients. Use small amounts of oil and cook well, for tougher meats add to liquid and boil gently until tender.

## PLANT PROTEIN

ENSURE THAT BEANS ARE SOAKED FOR SEVERAL HOURS BEFORE COOKING - THIS WILL HELP TO RELEASE NUTRIENTS AND SHORTEN THE COOKING TIME

PLANT PROTEINS INCLUDE:

- red beans
- green grams
- cow peas
- soya beans
- peanuts
- cashews
- pigeon peas
- black bean

**CHART NUMBER 14**

**Serving Size Recommendations – Dairy Products**

**Each day take 2 cups of dairy**



**YOGURT**



## **CHART NUMBER 14**

### **Serving Size Recommendations – Dairy Products**

**Dairy foods are rich in calcium, which helps in bone and teeth development and strengthening. Calcium will aid in the prevention of Osteoporosis (breaking bones) in old age.**

#### ***Dairy includes:***

- Milk – cow, goat and camel
- Yoghurt
- Fermented milk

## CHART NUMBER 15

### Fats and Oils

**Reduce your intake of saturated fats and oils to one spoonful each day**



**Choose fats and oils that have fortification logo**



## CHART NUMBER 15

### Fats and Oils

# REDUCE YOUR INTAKE OF FAT

DO NOT EAT MORE THAN ONE SPOON FULL OF FAT EACH DAY

Too much fat and oil can lead to:

- Obesity
- Heart disease
- Diabetes type 2
- Some cancers
- Hypertension

WHEN SELECTING FATS AND OILS, TRY TO CHOOSE THOSE THAT HAVE BEEN FORTIFIED WITH NUTRIENTS

Fats and oils include:

- butter
- margarines
- cooking oils both vegetable and animal
- vegetable shortening

*Trainer notes: Use a dessert spoon and pour oil into it to demonstrate exactly how Much Fats and oils should be taken daily.*

**CHART NUMBER 16**

**Sugar and Salt**

**Reduce your intake of  
sugar**



**Reduce your intake of  
salt**





**CHART NUMBER 16****Sugar and Salt****HIGH LEVELS OF SUGAR CAN INCREASE RISK TO ILLNESSES SUCH AS:**

- Diabetes type 2
- Obesity
- Heart disease
- Dental caries
- Depression

Recommended daily intake of sugar ( includes sugar contained in foods and drinks) should be: For Women- 6 teaspoons daily, Men – 9 teaspoons daily, and Children – 3 teaspoons daily . Sugar intake should be no more than 10% of dietary energy.

**HIGH LEVELS OF SALT CAN INCREASE RISK TO ILLNESS SUCH AS:**

- High blood pressure
- Heart disease

The recommended daily intake for salt should not exceed 5g

*Trainers note: Measure exactly one teaspoon salt to show how much should be taken each day.*

Note: Maximum recommended includes all sugar in the foods & drinks-(6 teaspoon for women, 3 children, and 9 for men) i.e, cakes, biscuits, mandazis, juices, sugar in tea

**CHART NUMBER 17**

**Water**

**Drink at least 8 glasses of clean safe water each day which is the same as 2 liters**



## CHART NUMBER 17

### Water

Drink at least 8 glasses of clean Safewater each day which is the same as 2 liters water helps to:

- Break down the solid foods you eat
- Helps nutrients move through your digestive tract and into your bloodstream
- The nutrients move throughout your body to nourish muscles, tissues and organs
- Water helps with bowel movements and removing waste and toxins
- You can make your water safe by boiling or by treatment

## CHART NUMBER 18

### Breastfeeding

# BABIES SHOULD BE EXCLUSIVELY BREASTFED FOR THE FIRST 6 MONTHS

<p>0 – 6 months</p>  <p><i>Courtesy: Let's talk Breastfeeding, Kenya</i></p>	<p>Give only breast milk – no other foods or liquids</p>
<p>6 months –8 months</p> 	<p>Complementary foods are needed – thick liquid or well mashed foods Breastfeeding should still provide half or more of the daily food</p>
<p>9 months – 11 months</p> 	<p>One third of the child's food should be breast milk. Finely chopped or mashed foods.</p>
<p>12 months – 23 months</p> 	<p>Family food chopped or mashed if necessary plus breastfeeds</p>

**CHART NUMBER 18**

**Breastfeeding**

**Babies should be exclusively breastfed for the first 6 months**

- The baby receives 100% of its nutritional requirements from breast milk in the first 6 months
- Breastfeeding reduces the risk of illness, especially diarrhea and respiratory infections
- Stimulates growth
- Breastfeeding contributes to food security for the infant

## CHART NUMBER 19

# Value Addition through Processing and its Importance



## CHART NUMBER 19

### Value Addition and its Importance

- By adding high nutritious foods to your everyday meals will help add important vitamins and minerals to your diet

#### Some examples are:

- Amaranth flour
- Sweet potato flour
- Sorghum flour
- Moringa powder and leaves
- Cassava flour
- Pumpkin flour and seeds
- Banana flour



**When purchasing food products from the markets look for the Kenyan Food Fortification logo**