FOOD SAFETY AND STANDARDS AUTHORITY OF INDIA

*Inspiring Trust, Assuring Safe & Nutritious Food*

Ministry of Health and Family Welfare, Government of India

Eat Right India
सही भोजन. बेहतर जीवन.

# THE 'EAT RIGHT' HANDBOOK

NATIONAL HEALTH MISSION
राष्ट्रीय स्वास्थ्य मिशन

NHSRC

FIT INDIA

बेटी बचाओ बेटी पढ़ाओ

प्रधानमंत्री जन आरोग्य योजना
आयुष्मान भारत
PM-JAY

POSHAN Abhiyaan
PM's Overarching Scheme for Holistic Nourishment
सही पोषण - देश रोशन

Anemia Mukt Bharat

स्वच्छ भारत
एक कदम स्वच्छता की ओर

Voluntary Health Association of India

# Preface

The 'Eat Right' toolkit has been developed to provide key messages on nutrition and food safety to the population at large with a focus on preventive healthcare. The toolkit has been designed to be part of the training material for the frontline health workers (such as ASHA, Anganwadi workers, Multipurpose workers), Mid-level health providers, etc. It is expected to be disseminated through Health and Wellness Centres under the Ayushman Bharat, and other government programmes such as Poshan Abhiyaan etc. Content in this toolkit would complement the content of the main programmes with focus on food safety, food adulteration, food fortification, reducing the consumption of high fat, sugar and salt foods and elimination of trans fats from our diets.

The need for such a toolkit is critical in the backdrop of rising incidence of food borne and non-communicable diseases like obesity, diabetes, hypertension, cancer, etc. especially in the vulnerable section of the population. The toolkit will be included in the training of the Frontline health workers to deliver food safety and nutrition messages effectively to the beneficiaries. Each topic in the 'Eat Right' toolkit has approximately 25 minutes of theory and 25 minutes of practical activities. The activities are backed by content specific tools to engage, excite and enable beneficiaries to improve their health and wellbeing.

This toolkit has been co-developed by domain experts of Foods Safety Standards Authority of India (FSSAI), National Health Systems Resource Centre (NHSRC), and the Voluntary Health Association of India (VHAI). I am sure that the toolkit will go a long way in making India a healthier nation.

**Pawan Agarwal**
Chief Executive Officer
Food Safety and Standards Authority of India

# Table of Contents


Background 01

How to Use the Toolkit 04

1 Nutrition During First 1,000 Days 05

2 Balanced Diet 14

3 Food Fortification 21

4 Limiting the Consumption of Foods High in Fat, Sugar and Salt 27

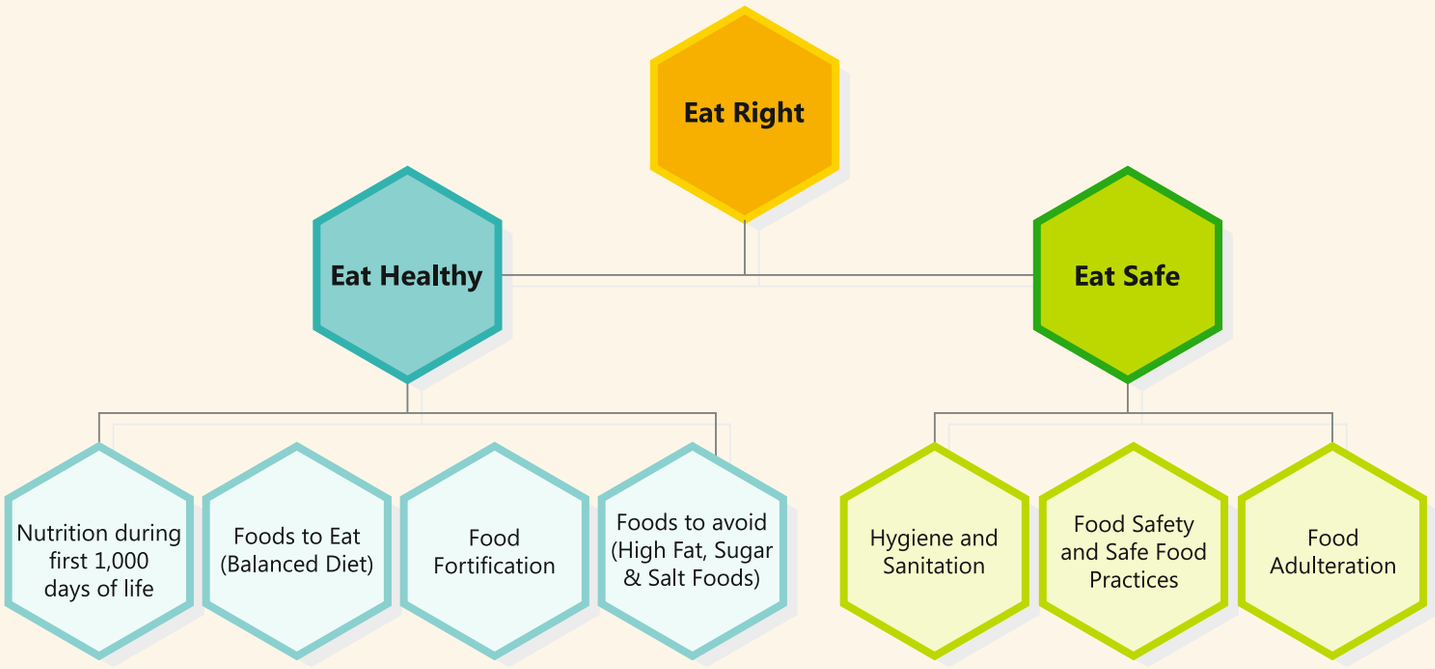
5 Hygiene and Sanitation 34

6 Food Safety and Safe Food Practices 43

7 Food Adulteration 53

# Background

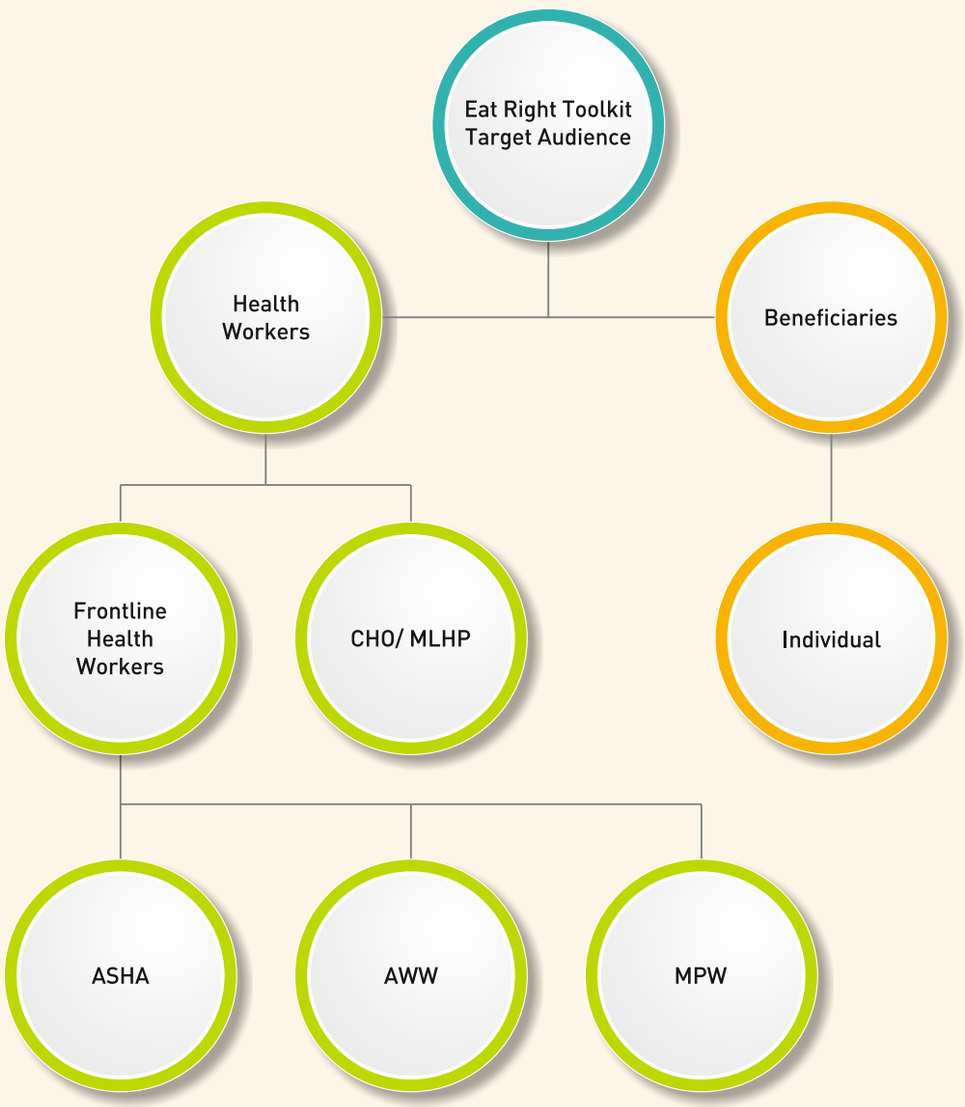
Eating right is an integral part of preventive health care. The Eat Right Toolkit serves as a supplementary and engagement resource to be mainstreamed in the national nutrition and public health programmes. The toolkit has been designed to complement the existing training material for the frontline health workers. "The Eat Right Toolkit" is built on two broad components - "Eat Healthy" and "Eat Safe", delivering clear and simple messages on eating healthy including building healthy food choices – foods to eat (balanced diet, fortified foods, nutrition during the first 1,000 days) and foods to avoid (high fat, sugar and salt foods). It also includes crucial components on eating safe which deals with maintaining hygiene (personal and environmental), food safety and safe food practices, and food adulteration.



## Target Audience and Implementation

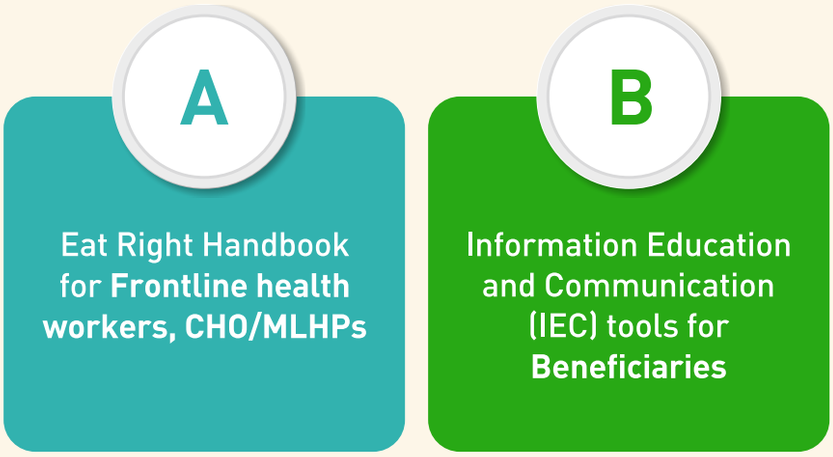
The Eat Right Toolkit through its engaging components, aims to target frontline health workers, Community Health Officers (CHO)/ Mid-level Health Providers (MLHPs) as well as beneficiaries. It will be implemented by frontline workers of the health department, CHOs/ MLHPs at the Sub-Health Centre-Health and Wellness Centre (SHC-HWC), functionaries of the ICDS department and other government programmes including Poshan Abhiyaan, etc.

The frontline health workers and CHOs/ MLHPs will be trained by trainers to deliver the messages of the toolkit in an interesting and effective way. Each topic in the 'Eat Right' toolkit is divided into approximately 30 minutes of theory and 30 minutes of activities. The activities are backed by content specific activity tools to engage, and enable beneficiaries to improve their health and wellbeing.




**AWW:** Anganwadi Workers, **MPW:** Multi-purpose Workers
**CHO:** Community Health Officers ; **MLHP:** Mid-level Health Providers

## Components of Eat Right Toolkit




### A Eat Right Handbook for **Frontline health workers, CHO/MLHPs**

**The Eat Right Handbook:** It provides nutritionally rich and credible content on nutrition during first 1,000 days of life, balanced diet, food fortification, reducing the consumption of high fat, sugar and salt foods. It also includes ways to maintain hygiene, proper waste disposal, following safe food practices and combating food adulteration. The activities at the end of each chapter are helpful in reinforcing the messages.

### B Information Education and Communication (IEC) tools for **Beneficiaries**

**Information Education and Communication (IEC) tools:** IEC tools, namely, posters with nutrition information and key messages on hygiene, safe food practices, food adulteration key ring, fortification logo (+F) puzzle, 3-D food pyramid, etc. in the toolkit will help in dissemination of the messages in a more interesting and engaging manner.

## Objectives

- To enable frontline health workers and CHO/ MLHP understand the basic concept of eating right through balanced diet, food safety and their components.
- To provide supplementary material that complements the current training modules.
- To provide easy to use Information Education and Communication material that would enable the frontline health workers and CHO/ MLHPs deliver the key messages to the community in an engaging manner.

# How to use the 'Eat Right' toolkit?

## Who is the toolkit for?

The 'Eat Right' toolkit has been developed as an interactive tool for frontline health workers and Community Health Officers (CHOs)/ Mid-level Health Providers (MLHPs) to provide a holistic learning on 'Eating Right'. It can also be useful to a range of partners providing health services at the grass root level.

## What does this toolkit contain?

The 'Eat Right' toolkit box consists of:

1. Eat Right Handbook
2. Posters
3. Activity Tools
    a. 3-D Food Pyramid
    b. Food Fortification pocket flyer
    c. +F logo puzzle
    d. Hygiene activity card on surrounding hygiene
    e. Hygiene activity card on personal hygiene
    f. Food Adulteration key ring
4. CD containing Videos

## How to use this toolkit?

1. The health worker will go through each chapter in the 'Eat Right' handbook, in the given sequence and explain it to the beneficiaries.
2. At the end of each chapter there are short activities, designed to impart education on the respective chapter. It also explains how each of the given posters and activity tools can be used to form interesting activities for the participants. These activities have to be performed with the beneficiaries/participants using the activity tools provided with each chapter (poster/activity card/pocket flyer etc.).

**Posters:** The posters will be displayed at the Health & Wellness Centres and/or in group/community meetings. The health workers will further explain the messages provided in the posters to the participants.

**Activity Tools:** The activity tools provided in this toolkit are designed to engage participants and disseminate key messages on health and wellbeing to them in an interesting manner. The health workers will follow the instructions given against each activity and engage the participants in these activities.

**CD:** The toolkit also contains a CD consisting of interesting videos which will be played at Health & Wellness Centres or at other appropriate places. Through these, the health workers will disseminate key messages on Eating Right to the participants.

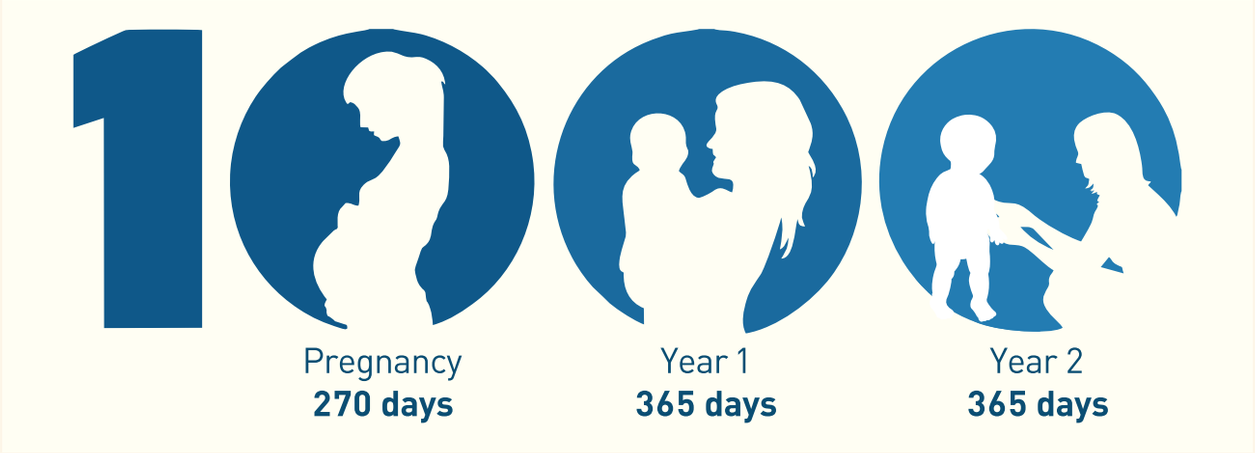
**Eat Right Toolkit...a step towards healthy India!**

# 1 Nutrition During the First 1,000 Days

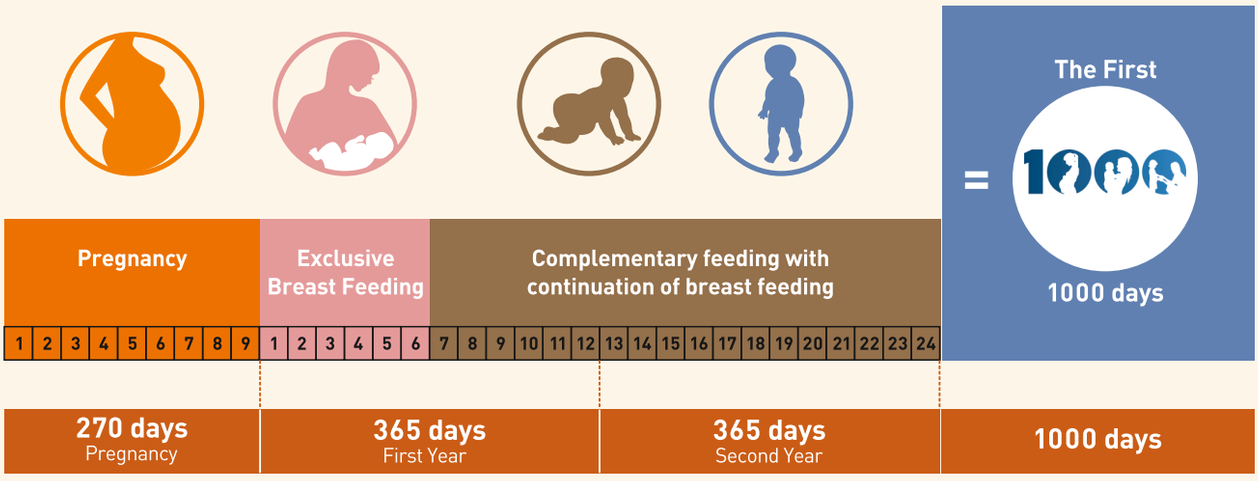
| Session Description | |
|---|---|
| Session Duration | • Theory: 25 minutes<br>• Practical: 25 minutes |
| Session Outline | • The three stages of the first 1,000 days of life<br>• The importance of nutrition in first 1,000 days of a child's life i.e. from conception to 2 years |
| Role of Trainers | • To explain the concept of first 1,000 days of life to the health workers<br>• To effectively teach the use of training tools under this session to the health workers |
| Role and Responsibility of Health Workers | • To explain the nutritional requirements of the pregnant woman and child up to 2 years of age and the foods they should eat during this period<br>• To use the given tools to explain the importance of good nutrition during pregnancy and up to two years of the child's life |
| Outcome | • The participants would understand the importance of nutrition during the first 1,000 days of life<br>• The participants would know what nutrients and food the pregnant woman and the child requires during first 1,000 days of life |

# 1. Nutrition During the First 1,000 Days

The "First 1000 days" begin from the day a woman conceives and continues till the child turns two years of age. It is known as a sum of 270 days of pregnancy (9 months) when the child grows in mother's womb, 365 days of the 1st year of infant's life and 365 days of the 2nd year of child's life.




The first 1,000 days is a unique period of opportunity when the foundation of child's optimum growth and development across the life span is established. This critical period of growth and development is largely affected by maternal and child nutrition. It is a period of great opportunity to provide adequate nutrition for the child without which the child becomes vulnerable to various birth defects and health problems. Inadequate nutrition before and during pregnancy may lead to low birth weight, stunting*, wasting**, poor mental development, greater chances of diseases, problems in child such as overweight/obesity, diabetes, high blood pressure, heart diseases in later life and even death of the child. Therefore, it becomes critical to provide appropriate nutrition during the first 1,000 days of life. Let us now understand the entire 1,000 days in three stages with the focus on nutrition.




* Stunting : Low height for their age
** Wasting : Low weight for their length/height

1. **STAGE 1: Period between conception to birth of the child** (when child grows in the mother's womb) i.e., first 270 days: This period is the foundation for the child's health. It is the period of the most rapid brain growth. The health of the woman before and during pregnancy is directly related to the growth and development of the foetus/baby in the womb. Therefore, diet during this period is very important for the wellbeing of the developing foetus as well as for the woman. Proper care before pregnancy prepares caregivers/parents to ensure birth of a healthy child.

## Nutrition tips for the woman during pregnancy

A pregnant woman should consume a balanced and nutritious diet. The diet should contain a mix of cereals, pulses, vegetables including green leafy vegetables, milk, eggs, meat and fish. If possible, the pregnant woman should be encouraged to add oils, jaggery and fruits to the diet. Meat and nuts are especially good for anaemic women. No foods should be forbidden during pregnancy.

- Eat cereals such as rice, wheat, ragi, bajra, jowar in the form of chapati, halwa, idli, dosa, upma, poha, etc. Avoid white bread, biscuits and other foods made with refined flour (Maida).
- Eat seasonal and locally available fruits and vegetables liberally.
- Include green leafy vegetables (spinach, fenugreek leaves, etc), starchy vegetables (sweet potato, yam, colocasia, etc) and other vegetables (beetroot, brinjal, lady finger, cauliflower, cabbage, beans, carrot, etc.) in the diet.
- Consume well cooked eggs, cooked meat like poultry, fish, etc. ; milk and milk products like curd, paneer, etc. moderately.
- Consume pulses like moong, masoor, tur, rajma, etc. on a daily basis.
- Use vegetable sources of fat like mustard oil, soyabean oil, sunflower oil, groundnut oil, etc. in cooking.
- Drink daily plenty of fluids.
- Consume fortified foods like wheat, rice, oil, milk and salt.


## Important nutrients required during pregnancy

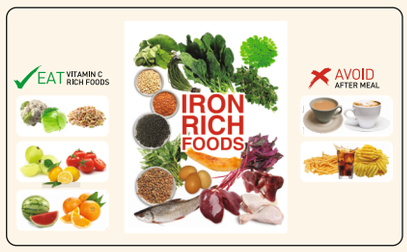
**Iodine** for foetal/baby's brain development

**Major Source:** Iodized salt or double fortified salt (iodized salt with iron)

**Folic acid** to prevent birth defects

**Major Source:** Milk and milk products, egg yolk, meat, green leafy vegetables (mustard leaves, fenugreek leaves, spinach, etc.), peanuts, beans, etc.

**Iron** to help in foetal brain development




**Major Source:** Fish, meat, chicken, dark green leafy vegetables (spinach, radish leaves, fenugreek leaves,mustard leaves, turnip leaves etc.), jaggery, dry dates, raisins, sesame seeds,ragi, pumpkin, pulses (daals), legumes (rajmah, lobia, black chickpeas), fresh peas etc.

Also include foods containing Vitamin C like cauliflower, cabbage, tomato, watermelon, guava, orange, lemon, gooseberry (amla), sweet lime (mosambi), etc. and animal foods- meat, poultry, fish, liver, egg, etc., fermented and sprouted foods (grains and pulses), etc. as these increase the absorption of iron.

**Vitamin B12** to prevent birth defects

**Major Source:** Milk, curd, liver, meat, fish, etc.

**Vitamin D** for bone development

**Major Source:** Sunlight, egg yolk, fish, milk and milk products, etc.

2. **STAGE 2: Period from birth of the child to 1 year i.e 365 days:** The time from birth to 1 year of a child's age is the second phase of the first 1,000 days of life. For a better understanding of these 365 days, it can be further split into 2 stages.

   **a. Stage 2a: Birth to 6 months:** During this period, the child should be exclusively breastfed. Exclusive breastfeeding means feeding the child ONLY breast milk for the first 6 months (180 days). Breast milk provides all nutrients and contains sufficient water to meet the requirements of the child up to six months of age; the infants who are exclusively breastfed do not require anything else. The first thick yellowish milk from the breast is called colostrum. It provides protection against infection and is the child's first immunization against illness and disease. Exclusive breastfeeding protects the child from respiratory infections, diarrhoeal diseases, becoming overweight/obese and developing diabetes, high blood pressure and heart diseases later in life. Mothers should continue breastfeeding even during diarrhoea or any other illnesses to help the child to get optimal nutrition and recover from the illness faster. Infants who are exclusively breastfed in the first six months of life with frequent, on demand feedings do not need water or any other liquids (such as herbal water, ghutti, honey, glucose water, tea, fruit drinks, etc.) even in hot climates. Also, avoid giving water, animal milk, powdered milk or foods before six months of child's age as it may introduce germs, infections and reduces the amount of breast milk consumed leading to malnutrition. Using bottles and teats (a plastic nipple used on top of the bottle) for feeding the child are harmful as they are likely to carry infections. Breast feeding mothers should eat extra and drink plenty of fluids to provide adequate milk for the child during this time.

### Nutritional requirement of an infant (0-6 months)

- Early initiation of breastfeeding immediately after birth or definitely within 1 hour of birth.
- Exclusive breastfeeding till the completion of 6 months of age of the child.

   **b. Stage 2b: Six months to 12 months:** This period is marked by increased nutritional need of an infant due to increased activity (moving hands, legs, crawling, etc.), growth and development. Therefore, introduction of complementary food alongwith continued breastfeeding is recommended. The mother's milk alone cannot fulfill the nutritional requirements for infants beyond 6 months of age.

### Nutritional requirement for infants (6-12 months)

- Initiation of complementary feeding on completion of six months of age
- Continued breastfeeding

**What is complementary feeding?**

Complementary feeding is giving an infant other food like semi-solid and soft foods and liquids along with breast milk on completion of six months of age. This is because breast milk alone is not sufficient to meet the growing needs of the child as 6 months to 24 months is a period of rapid growth and development in the young child and thus the child demands extra nutrition. These foods should complement breastfeeding rather than replace it. Complementary feeding should start after completion of 6 months and continue to 24 months of age, even though breastfeeding may continue beyond two years. The nutrient needs of full-term, normal birth weight infants can be met by human milk alone for the first 6 months only.

3. **STAGE 3: Period between 12 months to 24 months of child's age:** This period of first 1,000 days of life stretches from 12 months to 24 months of the child's age. In this stage, complementary foods have already been introduced in addition to continued breastfeeding. However, the consistency and quantity of the complementary feed changes between 12 months to 24 months of the child's life.

### Feeding of sick and malnourished child

Sick and malnourished children also require timely initiation of complementary feeding. These children need small frequent meals and more fluids, including breastmilk and other liquids to recover more quickly during illness. Children who are breastfeeding, need to be breastfed more often and for longer time.

After an illness, children should be given more food at frequent intervals at least 2 weeks to help recover from the weight lost during illness.

## Requirements of complementary foods

1. **Timely:** Introduced at completion of six months when requirement for energy and nutrients exceeds that provided by breastmilk alone.

2. **Adequate:** Should provide sufficient nutrients to meet the growing needs of the child-energy, protein, vitamins and minerals from different food groups like cereals such as wheat, wheat flour, millets like bajra, ragi, jowar, etc. and pulses and legumes such as channa daal, besan, moong daal etc; vegetables (including green leafy vegetables and other coloured vegetables) and fruits; milk and milk products like milk, curd, cottage cheese, etc., animal products/ non-vegetarian foods (meat, liver, fish, poultry, eggs (well-cooked), etc.); and ghee/butter/cooking oil and sugar/jaggery and nuts. Roasted, crushed and powdered/mashed ground nuts can be added to the food (only if the child is not allergic.


3. **Properly Fed:** Active feeding method to encourage the child to eat more without forced feeding. Children have small stomach therefore should be fed more frequently. Feed children from a separate cup/katori/plate at recommended frequency (Table 1.1).

4. **Safe:** Food should be hygienically prepared and stored. Mothers/caregivers should wash their hands with soap and water before preparing food and feeding the child. Also wash the child's hands.

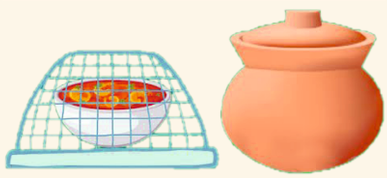
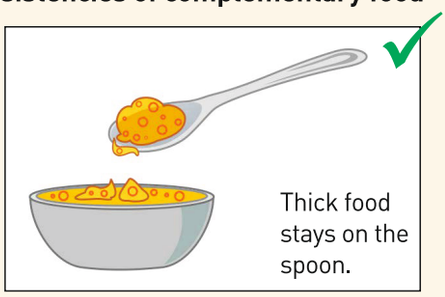
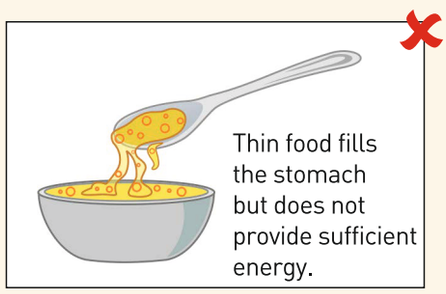


**Table 1.1: Five important things to remember about complementary feeding**

| Consistency | Quantity | Frequency | Density | Variety |
|---|---|---|---|---|
| • Depends on age of the child and readiness to chew and swallow.<br>• Initially include soft and mashed foods.<br>• Move gradually to foods with appropriate thick consistency.<br>• Give Daal (& not Daal ka Paani)<br>• Feed prepared should not be too thin and too thick. Test: stays on a spoon when the spoon is tilted (see figure given below) | • Increase with the age of the child.<br>• Encourage for better intake but not force child to eat more.<br>• At one-year, child should receive half the mother's nutrition. | • Increase with the age of the child.<br>• Number of feeds will increase gradually with increase in age of the child. | • Add a spoon of some edible oils or fats/ ghee/butter; sugar/ jaggery (gur) to each feed, to make the feed rich in energy. | • Add fruits and vegetables- The rule is that the greener it is, or the more red and yellow is the feed, the more is the protective quality.<br>• Meat, egg (well-cooked), poultry, fish, etc. are liked by children and are also very nutritive and protective. |

**Different consistencies of complementary food**

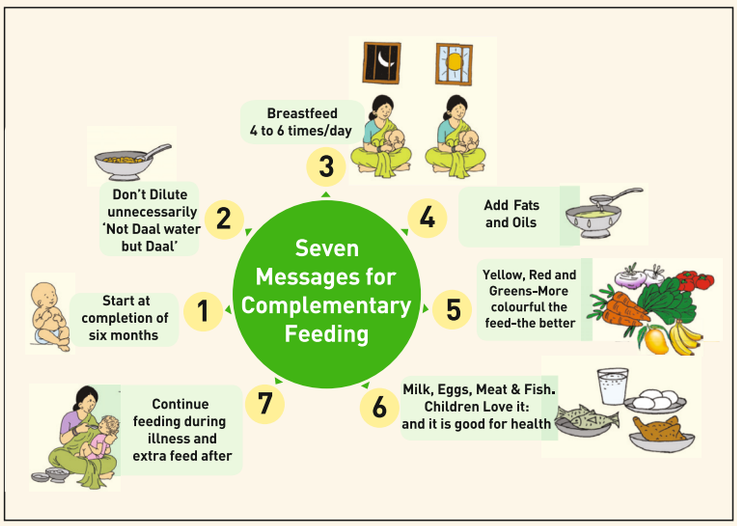



## Important messages for mothers and caregivers on complementary feeding

- Combination of pulses (daals) and legumes with cereals and millets should be given. Example: daal with rice or cracked wheat porridge (dalia) with daal, chappati/roti soaked in daal, bajra khichri with daal, etc. Feed should be prepared from locally available pulses and cereals/millets.
- Oil/ghee/butter, sugar/jaggery (gur), roasted crushed and powdered/ mashed groundnut (if the child is not allergic) etc. can be added to the feed for making it rich, tasty and easy to swallow. Do not add spices to the food of the child.
- Locally available, fresh and seasonal fruits and vegetables should be given to the child. Washed, cooked and mashed fruits and vegetables can be added to the feed.

- Cereals/millets and pulses that are soaked, sprouted, dry roasted and powdered for cooking can be given to the child as they are easily digested.
- Animal products/non-vegetarian foods (meat, liver, fish, poultry, eggs (well-cooked), etc.), wherever culturally acceptable, can be started as early and given as often possible to the child.
- Plan for one to two healthy snacks in between the main meals. Snacks are like small meals which are given in between main meals. These must NOT be a replacement of meals. Mashed fruits like banana, papaya, mango, cheeku and other soft fruits; boiled and mashed potatoes, mashed vegetables, well-cooked eggs, curd, panjeeri, laddoo, halwa, upma, idli, poha with crushed/mashed groundnuts (do not add groundnuts if child is allergic), etc. are some of the examples of food items to be given as snack to the child.
- Introduce only one food at a time, variety can be increased by adding new foods one by one.
- Show interest, smile or play games to encourage children to eat enough food.
- Continue complementary feeding during illness and increase the amount during the recovery period.
- Feed the child in a separate cup / katori / plate as it will help mother / caregivers to understand the quantity of food eaten by the child.
- If the child dislikes a particular food, remove it from the diet for some time and give again at a later stage.




- Complementary foods should be prepared hygienically. Mothers / caregivers must wash their hands before preparing and before feeding the child. The child's hands should be washed also. Clean utensils should be used to prepare the feed of the child.
- Girls and boys have the same nutrition requirement to grow and develop. So they both should be given the same amount and similar kind of food.

### Informing mothers and caregivers what should be avoided in complementary feeding

It is also important to explain mothers/caregivers to avoid:

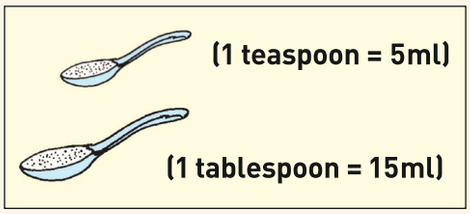

- Ready-made or processed food available in the market such as toffees, sweets, chips, chocolates, biscuits, namkeens; drinks such as tea, coffee, cola drinks, cold drinks, fruit juices, sharbats, etc.
- Showing personal dislikes for any food item otherwise child will not learn to eat all types of foods.
- Food which can pose choking hazard such as whole nuts, grapes, raw carrot pieces, etc. initially. These should be given only at a later stage when the chewing and swallowing ability has been fully developed.

## Some useful household measurements for preparing feeds for the child

The child should be fed according to age, however the quantity may be difficult for a family to measure correctly. The size of cup/katori, serving spoon/karchi, teaspoon and tablespoon can vary in size and shape. Thus, it is important to explain the mother and caregiver about the quantity by showing common household utensils that are used in the family for serving food.

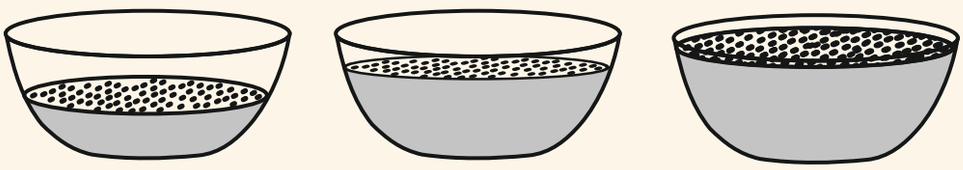
## Household measurements of commonly used household utensils

- 1 full cup/katori*= 250 ml (the volume may vary)
- 1 serving spoon/karchi= 100 ml (the volume can vary)
- 1 teaspoon- 5 ml
- 1 tablespoon- 15 ml




With the child's bowl, it can be easy to demonstrate how much is 1/2 (half), 3/4th, and a full cup/ katori as shown in the figure given below.

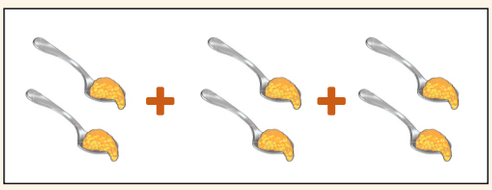
## Common household measurement of a cup/katori



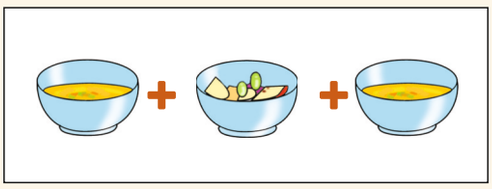
1/2 (half) cup/katori | 3/ 4th cup/katori | 1 full cup/katori* (250ml)

## Complementary feeding- quantity and frequency for the child

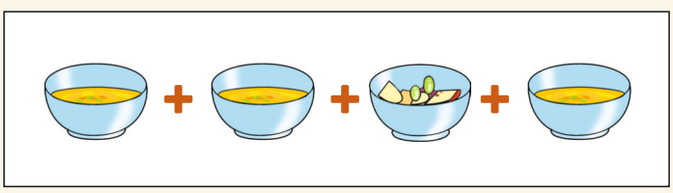
- Breastfeed as often as the child wants, especially if the child is unwell.



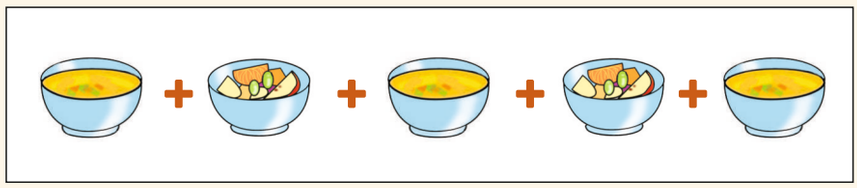
- **At 6 months:** On completion of 6 months, start feeding 2-3 tablespoons at each meal of soft, well-mashed foods, 2-3 times each day.



- **From 6 months upto 9 months:** 2-3 tablespoons to be gradually increased to half (1/2) cup/katori at each meal of mashed food, 2-3 times each day and 1-2 snacks.



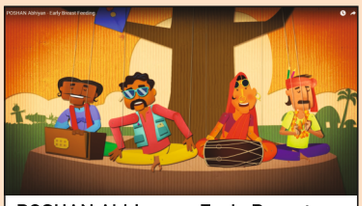
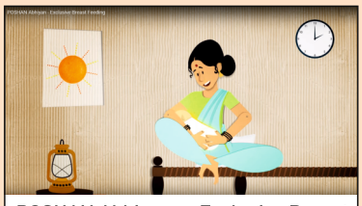
- **From 9 months upto 12 months:** Atleast half (1/2) cup/katori at each meal of finely chopped or mashed food and foods that the baby can pick up with her/his fingers, 3-4 times each day and 1-2 snacks.



- **From 12 months upto 2 years:** Introduce family foods, chopped or mashed, give ¾ to 1 full cup/katori at each meal, 3-4 times each day and 1-2 snacks.

For 2 years and older children, give a variety of family foods to the child, at least 1 full cup/katori (250ml) at each meal, 3-4 meals each day with 1-2 nutritious snacks between meals.

## Activity 1.1: Videos on importance of diet diversity in pregnancy, early initiation of breastfeeding, exclusive breastfeeding and complementary food.

| Tools: Videos | Instructions for use |
|---|---|
|  POSHAN Abhiyaan - Diet Diversity for Pregnant Mother<br>  POSHAN Abhiyaan - Early Breast Feeding<br>  POSHAN Abhiyaan - Exclusive Breast Feeding<br>  POSHAN Abhiyaan - Complementary Feeding | **Objective of the activity:** To help understand the importance of diet diversity for pregnant woman, early initiation of breastfeeding, exclusive breastfeeding and timely introduction and importance of complementary food.<br>**Instructions for health workers:** State will upload the videos provided in CD in the 'Eat Right' toolkit and provide link of the four videos related to this activity to the health workers. These videos can also be played at the HWCs and Anganwadi centres.<br>**Steps for implementation:**<br>• The health workers will explain the importance of diet diversity for a pregnant woman, importance of early initiation of breastfeeding, importance of exclusive breastfeeding and timely introduction and importance of complementary food through video/audio-visual material<br>• The health workers will solve the queries related to diet for a pregnant woman and queries related to breastfeeding and complementary feeding with the mothers/ caregivers |

# 2 Balanced Diet

| Session Description | |
|---|---|
| Session Duration | • Theory: 25 minutes<br>• Practical: 25 minutes |
| Session Outline | • Balanced diet<br>• Food groups<br>• Food pyramid<br>• Tips to achieve a balanced diet |
| Role of Trainers | • To explain the concept of balanced diet and food groups to the health workers<br>• To effectively teach the use of given tools to the health workers |
| Role and Responsibility of Health Workers | • To enable the participants to modify their dietary habits and choose a balanced diet for healthy living<br>• To use the given tools to explain and help the participants understand the basic concept of a balanced diet |
| Outcome | • The participants would understand the need for a balanced diet and its basic concept<br>• The participants would be able to choose and consume foods based on eating a balanced diet |

# 2. Balanced Diet

We need the right kind of food in adequate amounts for proper growth, development and functioning of our body. This can be achieved by consuming a balanced diet. A balanced diet is a wholesome diet which provides essential nutrients (carbohydrates, fats, proteins, vitamins, minerals, and water) from all food groups in the proper amounts to maintain good health. In addition, a balanced diet also provides dietary fibre.

The quantity of food needed to meet body requirements varies according to the age, gender, body composition, physical activity and physiological status (pregnancy/lactation etc.). For example, those who engage in heavy work activities require to eat more, as compared to those who do not do much activity. Similarly, a pregnant woman needs more calories as compared to a non-pregnant woman.

We know that no single food can meet all the nutrient requirements. Even milk, which is often considered as a wholesome food, is deficient in some nutrients (like iron and vitamin C). Therefore, to achieve a balanced diet, a combination of different foods should be included in the diet. Based on the major nutrients present in foods, and their functions, different foods have been grouped under four major food groups. These are described below:

**Table 2.1: Food groups**

| Foods Groups | Examples* |
|---|---|
| 1. **Cereals and millets:** They are rich in carbohydrates: **Pulses and Legumes:** They are rich in proteins.<br>**Carbohydrates give us energy and fibre/ roughage.**<br>**Proteins are important for building and repairing the body tissues and muscles.**<br>a. **Cereals:** Wheat, wheat flour (atta/maida), rice, rice flakes (chiwra), maize/corn, barley, oats (jai), suji, vermicelli (sevian), puffed rice, etc.<br>b. **Millets:** Jowar (sorghum), ragi (finger millet), kodo, sama, bajra (pearl millet), samva, etc.<br>c. **Pulses (dals) and legumes:** Bengal gram (channa dal), bengal gram flour (besan), green gram (moong dal), black gram (urad dal), arhar dal (tur dal), chickpea (white/black/green chana), sprouted pulses, legumes like rajma, lobia, soyabean and its products, etc. | **Cereals and millets**<br>  <br>**Pulses and legumes**<br>  |

| Foods Groups | Examples* |
|---|---|
| **2. Vegetables and Fruits:** This group provides vitamins and minerals.<br>**Our body needs vitamins and minerals** for normal functions of the body and help fight infections.<br>Example includes:<br>a. **Vegetables**<br>i. **Green leafy vegetables** – Spinach (palak), mustard leaves (sarson), fenugreek leaves (methi), bathua, coriander leaves (dhania), mint (pudina), etc;<br>ii. **Other vegetables** - Carrots, onion, brinjal, lady finger, cucumber, cauliflower, tomato, capsicum, cabbage etc.;<br>iii. **Starchy roots and tubers**** - Potatoes, sweet potatoes, yam, colocasia and other root vegetables;<br>b. **Fruits** - Mango, guava, papaya, orange, sweet lime, watermelon, lemon, grapes, amla, etc. | **Vegetables and Fruits**<br>  <br>  |
| **3. Milk and animal products:** This group include foods which provide good quality protein.<br>**Proteins are important for building and repairing the body tissues and muscles.**<br>Example includes:<br>a. **Milk and milk products** - Milk, curd, cheese, cottage cheese (paneer), etc.<br>b. **Animal products** - Meat, egg, fish, chicken, liver, etc. | **Milk and animal products**<br>  |
| **4. Fats/oils, sugar and nuts: This group includes foods which are high in energy.**<br>Example includes:<br>a. **Oils and Fats** - Butter, ghee, vegetable cooking oils like groundnut oil, mustard oil, coconut oil, etc.;<br>b. **Sugars** - Sugar, jaggery, honey;<br>c. **Nuts** - Peanuts, almonds, cashew nuts, pistachios, walnuts, etc. | **Fats/oils, sugar and nuts**<br>  |

* These examples will change according to local crops and diets in different areas.
**Starchy roots and tubers like potatoes, sweet potatoes (shakarkandi), yam (jimikand), colocasia (arbi) and other root vegetables; as well as fruits like banana are rich in starch which provide energy.

Eating a variety of foods from each food group and including foods from all food groups (as mentioned in the table) is called Dietary Diversity. It means that foods from all the basic four food groups, should be eaten in proper quantities. Let us now understand how much food from each of these food groups should be included in our diet to achieve a balanced diet. We can understand this better through the 'Food Pyramid'.

## Food pyramid

The Food Pyramid is a guide to be used by the healthy population for the amount and types of foods to be included in the daily diet in order to stay healthy. It is a pictorial representation of different food groups and the quantity in which they should be consumed. It helps in planning a balanced diet. It is made in the shape of a triangle (pyramid) and is broadly divided into four separate levels based on the nutrients provided by each food group.

- The base of the pyramid is made up of foods that should be the bulk of a healthy diet. It represents cereals, millets, pulses, legumes and, which should be consumed adequately.
- The second level represents fresh, seasonal, locally available fruits and vegetables, which should be consumed liberally.
- The third level shows non-vegetarian foods/animal products, milk and milk products and oils which should be consumed in moderation.
- The tip of the pyramid has all processed, refined foods, which have high fat, salt and sugar content like sweets, fried foods, bakery items, etc. which should be consumed sparingly.
- The food pyramid also guides us to avoid drinking alcohol and consuming tobacco and encourages individuals to exercise regularly and to be physically active.

## The picture below shows the food pyramid and foods placed at each level.


**1 Eat Sparingly**
Sugary, refined and processed foods
**Contains foods high in fat, sugar and salt**

**2 Eat Moderately**
Meat, fish, poultry, eggs, milk and milk products
**This groups provides proteins**

**3 Eat Moderately**
Fats and Oils: Vegetable oil, butter, ghee, nuts, etc.
**This group includes foods that are high in energy**

**4 Eat Liberally**
Fruits: Orange, mango, papaya, amla, lemon, etc.
Green leafy vegetables: Spinach, fenugreek leaves, mustard leaves, etc.
Other vegetables: Carrots, onion, brinjal, cucumber, cauliflower, tomato, capsicum, cabbage etc.
**This group provides vitamins and minerals.**

**5 Consume Adequately**
Cereals: Rice, wheat, maize, ragi, etc.
Pulses and legumes: Dals, besan, chickpea (white/black/green chana), sprouted pulses, legumes like rajma, lobia, soyabean and its products, etc.
**This group provide carbohydrates and proteins.**

Source: Adapted from Dietary Guidelines for Indians, National Institute of Nutrition, 2011

## Tips to achieve a balanced diet

- Consume a variety of fresh, colourful, seasonal and locally available fruits and vegetables (including green leafy vegetables).
- Eat whole grains, cereals and pulses (with outer covering) and their products. They are high in fibre or roughage as compared to refined cereals (maida) and pulses (without outer covering). Fibre/roughage helps in slowing down the absorption of sugar and fats into the blood.
- Eat whole fruits as they are rich in natural fibre (roughage).
- Limit the consumption of refined grains, including foods made with Maida (mathri, bhatura, naan, kulcha, etc.)
- Try to include foods from each of the four basic food groups in your diet.
- Choose vegetable oils like mustard oil, groundnut oil, soybean oil, etc. for cooking/frying. It is always better to use different oils in rotation.
- Ensure moderate use of edible oils and animal foods.
- Limit the use of butter/ghee and avoid Vanaspati.
- Use of re-heated fats and oils should be avoided.
- Drink plenty of water daily. Beverages like water, buttermilk, lassi, coconut water, lemon water /nimbu paani, aam paana, kokum, sattu, etc. should be consumed instead of cold/cola drinks and fruit juices.

## Important Tips

- Wash fruits and vegetables properly before cutting and peeling, to preserve their nutrients.
- After cutting fruits and vegetables, eat or cook them immediately to avoid nutrient losses.
- Fruits are best eaten raw.
- Do not repeatedly wash rice and dals.
- Do not discard the water used for soaking pulses and rice. This water may be used during cooking food.
- When cooking, cover the food to preserve their nutrients.
- Choose cooking methods such as boiling, steaming, roasting rather than frying.
- Do not overcook the food to prevent loss of nutrients.
- Do not skip your meals.

## Activity 2.1: 3-D food pyramid on identifying the foods according to their food groups

| Tool : 3-D 'Food Pyramid' | Instructions for use |
|---|---|
|  | **Objective of the activity:**<br>• To enable participants to understand food groups and the concept of a balanced diet.<br>**Instructions for health workers:**<br>• Health workers (ASHA/Anganwadi worker, Multi-Purpose Workers-Female (ANM)/Male), CHO/MLHP) will demonstrate the food pyramid using the food pyramid standee collateral at HWCs, Anganwadi centres, central place, during home visits and village meetings.<br>• Ask the participants to identify foods in each level of the food pyramid.<br>• Ask the participants how much (large portions, medium portions, small portion sizes) of these foods should be consumed. |

## Activity 2.2: Poster on food groups and their functions

| Tool : Poster 'Go, Grow, Glow Foods' | Instructions for use |
|---|---|
|  | **Objective of the activity:**<br>• To make the participants understand the role of each food group.<br>**Instructions for health workers:**<br>• The poster can be displayed in the Health and Wellness Centres, Anganwadi centres, schools, etc. or carried by the health workers during home visits and village meetings.<br>• Health workers (ASHA, Anganwadi worker, Multi-Purpose Workers-Female (ANM)/Male, CHO/MLHP) will explain the participants regarding role of each food group from the poster. |

# 3 Food Fortification

FORTIFIED
SAMPOORNA POSHAN
SWASTH JEEVAN

| Session Description | |
|---|---|
| Session Duration | • Theory: 25 minutes<br>• Practical: 25 minutes |
| Session Outline | • Fortified foods<br>• Need and benefits of fortified foods<br>• Five fortified food staples<br>• Identification of +F logo for fortified foods<br>• Storage and usage of fortified foods |
| Role of Trainers | • To explain the concept of food fortification<br>• To effectively teach the use of training tools under this session to the health workers |
| Role and Responsibility of Health Workers | • To use the given tools to teach participants about the need and benefits of fortified foods.<br>• To teach participants to look for the +F logo and identify fortified foods.<br>• To encourage the participants to consume fortified foods. |
| Outcome | • The participants will know about the need and benefits of fortified foods.<br>• They will also be able to identify the +F logo and fortified food items. |

# 3. Food Fortification

FORTIFIED
SAMPOORNA POSHAN
SWASTH JEEVAN

Food fortification is the addition of key vitamins and minerals (micronutrients) such as iron, iodine, zinc, vitamin A & vitamin D to certain staple foods such as wheat flour, rice, salt, milk and oil to improve their nutritional content.

## Need for fortified foods

Micronutrients such as vitamins and minerals are required for the normal functioning of the human body. We usually get them through our daily diet. However, we may not get all the nutrients in the required quantity through our daily diet. This could be due to unhealthy eating habits or unavailability of foods rich in micronutrients. This may result in different kinds of deficiency diseases. For example, if we do not get enough iron through our diet, it may lead to anaemia. Lack of Vitamin D will lead to weakened bones. Folic acid deficiency in pregnant women may lead to abnormalities in the baby. Lack of iodine in the diet may result in physical and mental retardation.

There are several ways to fulfil this need. One such method is dietary diversification, which means eating a variety of foods, from all food groups. Another simple method is to eat fortified staple foods, to which vitamins and minerals are added in standarised quantities. Let us understand the benefits of eating fortified foods.

## Benefits of fortified foods

- Fortified foods provide essential vitamins and minerals that may be missing in the diet.
- Fortified foods are safe to eat and do not pose any health risk. The amount of vitamins and minerals added is very small and standardised. So, the chance of an overdose or harmful effect is unlikely.
- Fortified foods look, taste, smell and feel the same as non-fortified foods.
- Fortified foods do not require any change in food habits and dietary patterns.
- Fortified foods are cooked and stored in the same manner as non-fortified foods.

## Fortified food staples

Five staple foods are fortified in India and are available in the market. These include wheat flour, rice, double fortified salt (iodised salt with added iron), milk and oil. Let us learn about these in detail.

Fortified with Iron, Folic Acid, Vitamin B12

Fortified with Iron, Folic Acid, Vitamin B12

Double Fortified with Iron and Iodine

Fortified with Vitamin A & Vitamin D

Fortified with Vitamin A & Vitamin D

## Fortified wheat flour

Wheat flour is predominantly fortified with Iron, Folic Acid and Vitamin B12. In addition, other micronutrients* can also be added either alone or in combination. Fortification of wheat flour is a simple and cheap way to fight anaemia and other micronutrient deficiencies.


### Health benefits of fortified wheat flour are:

- Reduces iron deficiency. Iron helps children develop physically and mentally. It also improves the health of pregnant women and their infants.
- Provides folic acid and vitamin B12.
- Adequate folic acid is required during pregnancy to prevent birth defects.
- Adequate intake of Vitamin B12 is required for mental growth and development of children.

## Fortified rice

Fortifying rice helps to improve its nutritional content by adding vitamins and minerals, many of which are lost during the milling and polishing process to produce white rice. Rice is fortified with iron, folic acid and vitamin B12. In addition, rice may also be fortified with other micronutrients*.


### Health benefits of fortified rice are:

- Reduces iron deficiency. Iron helps children develop physically and mentally. It also improves the health of pregnant women and their infants.
- Provides folic acid and vitamin B12.
- Adequate folic acid is required during pregnancy to prevent birth defects.
- Adequate intake of Vitamin B12 is required for mental growth and development of children.

## Double fortified salt

Salt is already fortified with iodine in India. Iodised salt is now further fortified with iron to make Double Fortified Salt (DFS). DFS provides necessary amounts of iodine and iron in our diet.


### Health benefits of fortifying salt with iodine and iron are:

- DFS provides iodine that is required for thyroid function, brain development and growth.
- Iodine is especially important for pregnant women for the proper mental and physical development of their children.
- DFS provides iron that is required to produce blood. It is especially important for the health of pregnant women, adolescent girls and children.

**Such as Zinc, Vitamin A, Vitamin B1, Vitamin B2, Vitamin B3, Vitamin B6*

## Fortified edible oil


Edible oils are fortified with Vitamin A and D. Oils such as groundnut oil, mustard oil, sunflower oil, soybean oil, palmolein oil are fortified.

**Health benefits of fortified edible oil:**

- It contains Vitamin A, which prevents night blindness.
- It contains Vitamin D, which is essential for strong bones.

## Fortified milk


Milk is a good source of calcium, protein and some vitamins. Fortification of milk with Vitamin A and D helps to add vitamins lost in processing.

**Health benefits of fortified milk:**

- It contains Vitamin A, which prevents night blindness.
- It contains Vitamin D, which is essential for strong bones.

FORTIFIED
SAMPOORNA POSHAN
SWASTH JEEVAN

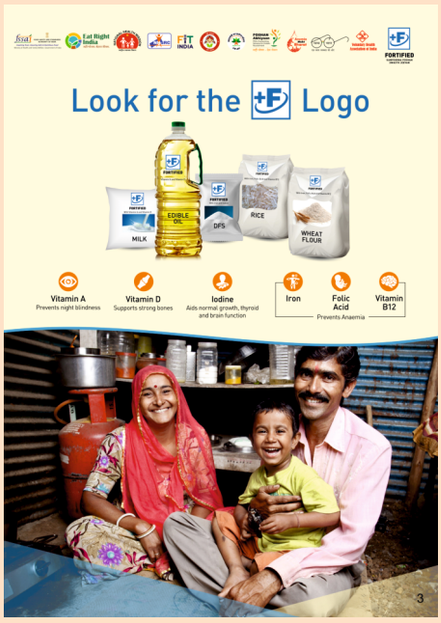
### Identification of fortified food products

Fortified Foods can be identified by the blue +F logo on the packet. This logo has been released by FSSAI, Government of India. The micronutrients added are mentioned below the logo.

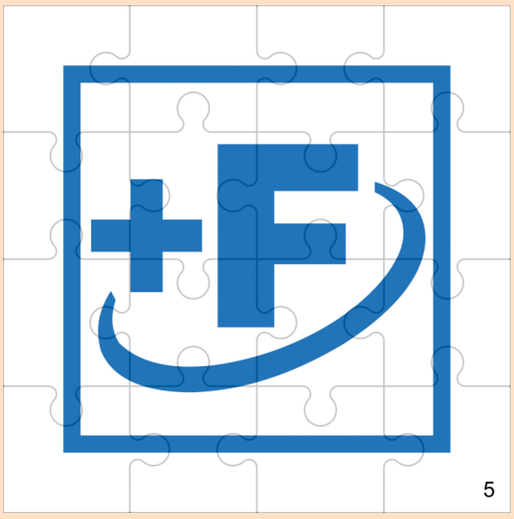
## Storage and usage of fortified foods

- While buying food, keep in mind to buy fortified rice, wheat flour, oil, milk and salt. Fortified foods are available at your local ration shops and Kendriya bhandaar.
- Check for the +F logo on the food packet.
- Fortification does not change the look, feel, smell or taste of the food. Therefore, fortified foods should be used in the same way as non-fortified foods.
- Fortified foods, like all other foods, need clean and hygienic storage. They should be stored in closed airtight containers, away from moisture and sunlight. The instructions for storage on the packet should be followed for each of these five fortified foods.

## Activity 3.1: Poster on fortified foods

| Tool: Poster 'Look for the +F Logo' | Instructions for use |
|---|---|
|  | **Objective of the activity:**<br>• To generate awareness about the available fortified foods and +F logo<br>**Instructions for health workers:**<br>• The poster can be displayed in the Health and Wellness Centre, Anganwadi centres, schools, Kendriya bhandaars, etc. or carried by the health workers during home visits and village meetings<br>• The health workers ASHA, Anganwadi workers, Multi-purpose workers-Female (ANM)/Male, CHO/MLHP) will explain the benefits of fortified foods to the participants |

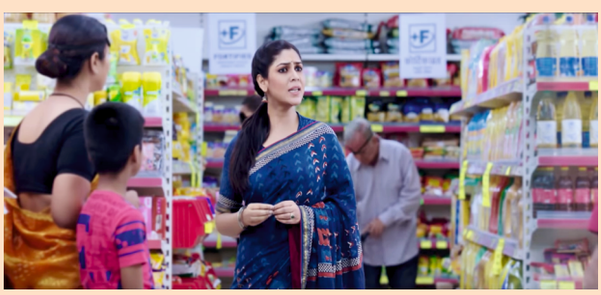
## Activity 3.2: Puzzle on +F Logo

| Tool: Puzzle '+F (Fortification) Logo' | Instructions for use |
|---|---|
|  | **Objective of the activity:**<br>• To familiarize the participants with +F logo<br>**Instructions for health workers:**<br>• Understand the design of the +F logo and assist participants to form the right design<br>• Inform participants to look for the +F logo on Edible oil, wheat flour, DFS, rice and milk packets<br>• Scatter the puzzle pieces<br>• Invite participants to complete the puzzle<br>• Assist participants to put together the puzzle to form the '+F' logo |

## Activity 3.3: Pocket flyer on benefits of fortified foods

| Tool: Pocket flyer 'Fortified Foods' | Instructions for use |
|---|---|
|  | **Objective of the activity:**<br>• To generate awareness about the benefits of each fortified commodity<br>**Instructions for health workers:**<br>• The health workers ASHA, Anganwadi workers, Multi-purpose workers-Female (ANM)/Male, CHO/MLHP) will carry the folded flyer during home visits and display the folded flyer<br>• Read out the material and explain the benefits as below:<br>  • Vitamin A - Helps against night blindness<br>  • Vitamin D - Supports strong bones<br>  • Vitamin B12 - Important for maintaining normal functioning of nervous system and blood formation<br>  • Folate & Folic Acid - Important for foetal development and blood formation<br>  • Iron - Fights anemia<br>  • Iodine - Required for normal growth, thyroid and brain function<br>  • Zinc - Supports a healthy immune system<br>  • Vitamin B1 - Required for normal nerve and heart function<br>  • Vitamin B2, Vitamin B3, Vitamin B6 - Necessary to release energy from food |

## Activity 3.4: Video on food fortification

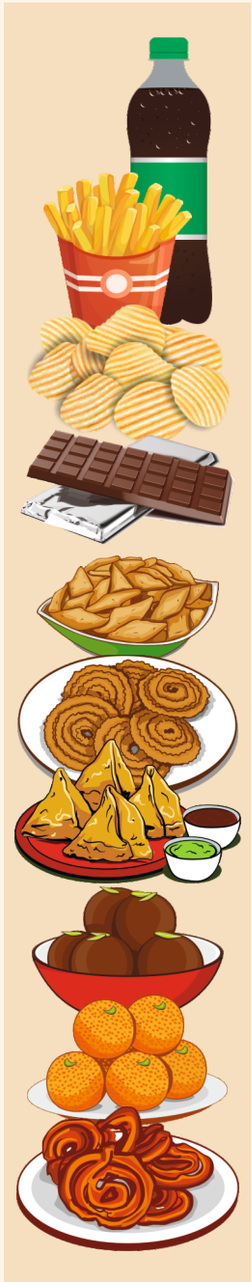
| Tool: Video '+F Dekha Kya' | Instructions for use |
|---|---|
|  | **Objective of the activity:**<br>• To help understand the importance of food fortification<br>**Instructions for health workers:**<br>• State will upload all the videos provided in CD in the 'Eat Right' toolkit and provide link of the video related to this activity to the health workers. These videos can also be played at the HWCs and Anganwadi centres<br>**Steps for implementation:**<br>• The health workers will explain the importance of food fortification through video.<br>• The health workers will solve the queries related to food fortification |

# 4 Limiting the Consumption of Foods High in Fat, Sugar and Salt

| Session Description | |
|---|---|
| Session Duration | Theory: 25 minutes<br>Practical: 25 minutes |
| Session Outline | • Understanding foods high in fat, sugar and salt<br>• Limiting fat consumption in the diet<br>• Elimination of trans fat<br>• Sugar reduction<br>• Salt reduction |
| Role of Trainers | • To explain the concept of high fat, sugar and salt (HFSS) foods<br>• To effectively teach the use of training tools under this session to the health workers |
| Role and Responsibility of Health Workers | • To help participants identify foods high in fat, sugar and salt<br>• To use content specific tools to talk about limiting fat, sugar and salt foods<br>• To help participant during home visit with ways to restrict fat, sugar and salt in food preparations, and also provide suggestions to include healthier food options |
| Outcome | • The participants will be able to understand the harmful effects of consuming foods high in fat, sugar and salt<br>• The participants will be able to understand the need to limit the consumption of foods high in fat, sugar and salt<br>• The participants will be able to choose and consume healthier food options |

# 4. Limiting the Consumption of Foods High in Fat, Sugar and Salt

*High fat, sugar and salt (HFSS) foods are foods (any food or drink, packaged or non-packaged) that are high in fats, sugar and salt, along with high in energy (calories). They are usually low in proteins, vitamins, minerals and dietary fibre and have adverse health effects if consumed regularly.*



The Indian population is going through changes in lifestyle, pattern of food choices and consumption. The homemade meals are being replaced by ready to eat processed/packaged foods (chips, samosa, biscuits, cake. jalebi, outside food from dhabas/restaurants etc.). As a result, there is an increased demand for these processed foods in the market. The changing lifestyle is not only limited to the urban areas, but also spreading in rural areas. Lifestyle changes include urbanization, changing family composition (from joint families to nuclear families), long working hours, - poor or no physical activity hectic lifestyles, etc. Simultaneously, changes in taste, increased variety of foods available in the market, attractive packaging and advertisement are leading the higher acceptability and consumption of processed foods.

Processed foods are easy to prepare, durable, have longer shelf- life, convenient to carry and easily available throughout the year. However, if we will look at other way around, they adversely affect our health. They are high in energy, particularly fats, sugar and salt and low in proteins, vitamins, minerals and dietary fibre. Over consumption of these foods can lead to overweight/obesity[1], resulting in diet related non-communicable diseases, such as high blood pressure (hypertension), diabetes and certain types of cancers. Therefore, consumption of these foods should be avoided or consumed in restricted amounts.

A large number of processed foods are high in fat especially foods containing vanaspati[2], which have high levels of trans fat. Trans fats are bad fats present in our diet. They have been linked with overweight/obesity, heart diseases, high blood pressure, diabetes and some types of cancers. Trans fats are also found in foods which are cooked in re-used oil, not only at commercial outlets but even at household levels.

Excessive consumption of potato chips, cold drinks, pakora, samosa, bhatura, sweets (imarti, ladoo, jalebi, gulab jamun, etc.), pickle, mathri, bhujia, fried savoury mixture (fried namkeen), kachori, papad, vanaspati, cakes, biscuits, fans etc. can increase the fat, sugar and salt intake.

Now that we have learnt and understood about the harmful effects of excessive consumption of foods high in fat, sugar and salt, let us understand how we can avoid them and make healthy food choices by following simple steps.

1 Overweight/Obesity: Excess body fat

2. Vanaspati: Partially hydrogenated vegetable oil (source of trans fat) is commonly used in India as substitute of butter.

## Reduction in fat intake

Excess fat intake is a risk factor for obesity and non-communicable diseases like diabetes, heart disease and cancer. Therefore, both children and adults need to be cautioned to restrict the intake of high fat foods (butter, ghee, red meats (lamb, mutton, pork, beef, etc.) and their products).

### Ways to limit the total fat/oil intake

- Use fats and oils in moderation, that means not more than 3-4 teaspoons/per person/day (1 teaspoon equals to 5 ml). If consuming more than this, gradually reduce the use of oil in daily cooking.
- Measure cooking oil with a teaspoon rather than pouring freely in the cooking vessel from the bottle.
- Monitor the consumption of oil at home - buy and use minimum required quantity every month.
- Avoid use of vanaspati in cooking/frying, instead use vegetable oils (mustard oil/groundnut oil/sunflower oil/soybean oil etc.).
- Change the type of cooking oil every three months or use different oils for different recipes.
- Limit the consumption of fried (chips, poori, pakora, etc.), baked or processed foods (biscuits, chips, cake, fan, rusk, etc.)
- Fat also comes from animal products like meat and poultry, butter, sweets and snack foods. Consume these in limited amounts. If you are a non-vegetarian, prefer eating lean meats like chicken or fish over red meat (lamb, beef, mutton, pork).

### Eliminate trans fat

As we discussed above, trans fats are bad fats, which should not be consumed as part of our diet. These fats are present in large quantities in vanaspati and its products. In prepared foods, trans fats are found in bakery products (biscuit, fan, rusk, cake etc.), fried foods (poori, pakora, bhatura, bhujiya, fried savoury mixtures (namkeens) etc.) and re-heated oils. For example, the local road-side food vendor selling kachoris, samosas, chole bhaturae, etc. reuses the oil for frying.

### Ways to avoid trans fat

- Avoid using "vanaspati" for any kind of cooking.
- When deep frying the foods (poori/pakora etc.), do not heat the oil for a very long time. Prefer not to leave the food in the oil for a very long time.
- Do not reheat the oil or re-use the same oil for frying. The oil which has once been used for frying can be used for the preparation of vegetables, curries, dals, etc.
- Use smaller vessels (kadhai, etc.) at home for deep frying. This will allow you to do frying using a lesser amount of oil/fat.
- Limit the consumption of baked/processed foods like biscuit/fan, cake, chips, fried savoury mixtures (namkeens, etc.).

## Sugar reduction

Sugar is the major source of calories in the diet. High intake of sugar increases the risk of becoming overweight/obese, developing diabetes and other diet related non-communicable diseases.

### Ways to reduce sugar consumption

- Gradually reduce the use of sugar in your daily diet (in beverages like tea, coffee, lassi, lemon water/shikanji,etc.).
- Limit the consumption of foods and drinks containing high amount of sugar (e.g. cold/cola drinks, sweets like laddoo, jalebi, imarti, gulab jamun, sweet snacks, etc.)
- Sweets (jalebi, imarti, gulab jamun, ladoo, balushahi etc.), biscuits, cakes, etc. are high in sugar, fat and may contain trans fats. They are usually prepared with refined wheat flour (maida), therefore such foods should be consumed in restricted amounts.
- Wherever possible, use naturally sweet ingredients (dates/ fruits/ honey/ jaggery) rather than sugar, in restricted amounts.
- Prevent children from over indulging in chocolates and toffees. Over consumption of these, may put children at risk of developing obesity and diet related non-communicable diseases (diabetes, heart diseases) in later life. Therefore, healthy habits should be formed from an early age. Further, children should be cautioned to avoid buying sweets under the influence of attractive advertisements that target children.
- Instead of drinking juice, eat fresh fruits. It provides fibre, which gives a feeling of fullness and fewer calories. Fibre helps in slowing down the absorption of sugar and fats into the blood.

## Salt reduction

Salt is the main source of sodium in our diet. High sodium is a risk factor for hypertension (high blood pressure), which can further lead to heart problems. An average Indian consumes double the amount of salt as recommended (5g/day equivalent to 1 teaspoon). Processed foods or foods from street vending sites/ restaurant/dhaba, often contain higher amount of salt. Limiting the use of salt in cooking can lead to reduction in the overall sodium intake and prevention of hypertension and cardiovascular diseases.

### Ways to reduce salt consumption

- Gradually reduce the salt usage while cooking.
- Add salt at the end of the cooking.
- Monitor the consumption of salt at home - buy and use minimum required quantity every month. For eg. if a packet lasts first 6 weeks try using it over 8 weeks.
- Avoid adding salt to rice, dough for making chapatti or batter for idli, dosa, etc.
- Avoid sprinkling salt on salads, cut fruits and curd.
- Avoid addition of extra salt at the time of eating.
- Use traditional ingredients like spices, dried or fresh herbs, garlic, ginger, citrus ingredients (e.g. lemon juice, dried lemon powder, tamarind pulp/powder, etc.) instead of salt.
- Limit consumption of foods high in salt such as papads, pickles, chutney, ketchups, sauces, salted biscuitsand chips, etc.
- Adequately consume seasonal fruits (papaya, guava, banana, mango, jamun, orange, amla) and vegetables (brinjal, beans, bittergourd, pumpkin, cauliflower, cabbage, carrot) including green leafy vegetables.
- Drink plenty of water every day. It helps in removing waste products (toxins) and excess salt (sodium) from the body.

## Activity 4.1: Poster on reducing the consumption of high fat, sugar and salt foods

| Tool: Poster 'Tel, Cheeni aur Namak Thoda Kam' | Instructions for use |
|---|---|
|  | **Objective of the activity:**<br>To make participants understand and adopt simple and practical ways to limit the consumption of fat/oil, sugar and salt in the daily diet.<br>**Instructions for health workers:**<br>• The poster can be displayed in the Health and Wellness Centres, Anganwadi Centres, Schools, etc. or carried by the health workers during home visits and village meetings.<br>• Health workers (ASHA/Anganwadi workers, multipurpose workers - female (ANM)/male, CHO/MLHP) will explain the participants about the importance and ways of limiting the consumption of fat/oil, sugar and salt in the daily diet. |



## Activity 4.2: Poster on replacing unhealthy foods with healthier options

| Tool: Poster 'Eat Right..Choose a Healthy Life' | Instructions for use |
|---|---|
|  | **Objective of the activity:**<br>To make the participants identify locally available healthier options for foods high in fat, sugar and salt.<br>**Instructions for health workers:**<br>• The poster can be displayed in the Health and Wellness Centres, Anganwadi Centres, Schools, etc. or carried by the health workers during home visits and village meetings.<br>• Health workers (ASHA/Anganwadi workers, multipurpose workers-female (ANM)/ male, CHO/MLHP) will explain the participants regarding the regional foods high in fat, sugar and salt and their healthier alternatives from the poster. |

## Activity 4.3: Video on reducing the consumption of foods high in fat, sugar and salt

| Tool: Video 'Aaj Se Thoda Kam' | Instructions for use |
|---|---|
|  | **Objective of the activity:**<br>To generate awareness on high fat, sugar and salt foods, their adverse health effects and ways to reduce their consumption.<br>**Instructions for health workers:**<br>State will upload the short video provided in the CD in the 'Eat Right' toolkit and provide link of the video related to this activity to the health workers. The video can also be played at the HWCs and Anganwadi Centers.<br>**Steps for Implementations:**<br>After playing this video, the health worker will solve the queries related to adverse health effects and ways to reduce consumption of foods high in fat, sugar and salt. |

## Activity 4.4: Video on elimination of trans fat

| Tool: Video 'Heart Attack Rewind' | Instructions for use |
|---|---|
|  | **Objective of the activity:**<br>To generate awareness on trans fat, their adverse health effects and ways to reduce their consumption.<br>**Instructions for health workers:**<br>State will upload the short video provided in the CD in the 'Eat Right' toolkit and provide link of the video related to this activity to the health workers. The video can also be played at the HWCs and Anganwadi Centers.<br>**Steps for Implementations:**<br>After playing this video, the health worker will solve the queries related to adverse health effects and ways to eliminate trans fat. |

# 5 Hygiene and Sanitation

| Session Description | |
|---|---|
| Session Duration | Theory: 20 minutes<br>Practical: 20 minutes |
| Session Outline | • Importance and methods of maintaining personal hygiene<br>• Simple ways to maintain hygiene and sanitation<br>• Waste disposal techniques<br>• Compost of food waste |
| Role of Trainers | • To explain the concept of hygiene and sanitation<br>• To effectively teach the use of training tools to the health workers |
| Role and Responsibility of Frontline Workers | • To make the participants understand the importance of maintaining hygiene and sanitation<br>• To use the given tools to make the participants follow good personal hygiene practices<br>• To help participants identify effective ways of waste disposal and maintaining hygienic surroundings |
| Outcome | • The participants will be able to understand messages on hygiene and sanitation<br>• The participants will be able to understand and follow the best practices to maintain personal hygiene<br>• The participants will be able to understand and follow the best practices to maintain hygiene in their surroundings |

# 5. Hygiene and Sanitation

Hygiene refers to conditions and practices that help in maintaining health and preventing the spread of diseases. Hygiene practices are the actions that are performed to ensure the cleanliness of our body, and our surroundings (homes, schools, communities and other people) for safeguarding the health from illnesses. Good hygiene prevents infectious diseases such as diarrhoea, cholera, typhoid, jaundice, etc. Let us start with simple tips on how to maintain hygiene.

## Personal hygiene

Personal hygiene is one of the most effective ways to protect ourselves from illness. It is less likely that germs will get inside the body if people maintain good personal hygiene. Personal hygiene includes habits like bathing, hands washing and brushing teeth, etc. which keep germs away from the body.

## Healthy personal hygiene habits

In order to minimize the risk of infection and enhance overall health, some basic personal hygiene habits should be followed. These include the following,

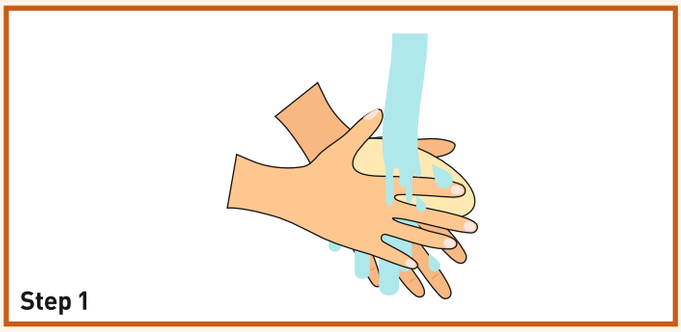
- **Defaecation and urination:** To prevent diarrhoea and other infectious diseases, use proper toilets for defecation and urination. Faecal and urine waste of infants and young children should be disposed off in a latrine or toilet or in a pit and then covered with a layer of soil. In communities where toilet or latrine facility is not available, they should make efforts to build such facilities. They can also apply for grants to build toilets from Swachh Bharat Scheme of the Government. Under this scheme, there are provisions of construction of household toilets as well as community toilets.
- **Wash your hands:** Washing hands prevents illnesses and spread of infections. Germs from unwashed hands can get into food and drinks while we prepare or consume food. Germs can also be transferred to other objects like door handles, tabletops, utensils or toys, and transmitted to other person's hands. Removing germs through hand washing therefore helps in preventing diarrhoea and respiratory, eye and skin infections.

**When should you wash hands**

- After using the toilet
- Before, during, and after preparing food
- Before and after eating food
- Before and after caring for someone who is sick
- Before and after treating a cut or wound
- After cleaning up a child who has used the toilet
- After blowing your nose, coughing, or sneezing
- After touching and handling animals, animal feed, or animal waste
- After touching garbage
- When your hands are dirty

Please remember, washing hands with Ash or Mud is not recommended as, they can be contaminated. Wash hands with soap and clean water.

## Steps involved in hand washing

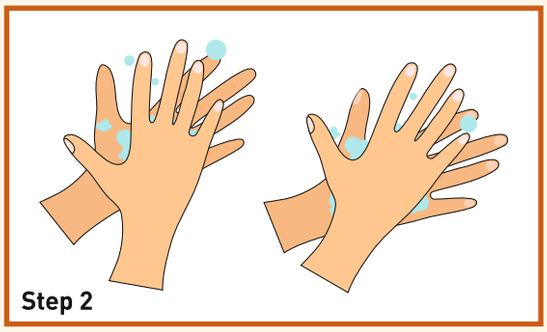


**Step 1**

Remove rings, bangles, wrist watch or any other ornament or bands from both hands.

Roll the sleeves of garment up to elbow level. Wet hands and forearm up to elbow with clean water.

Apply soap properly on wet hands and forearm up to elbow to create good lather (foam).

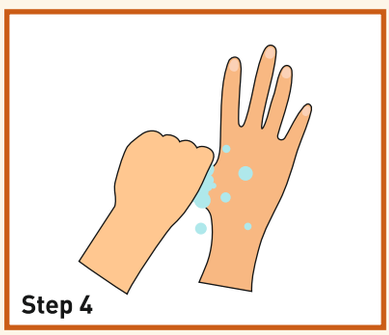


**Step 2**

Scrub your palms of both hands from the front and back and clean the area between your fingers.

**Step 3**

Scrub your knuckles of both hands.



**Step 4**

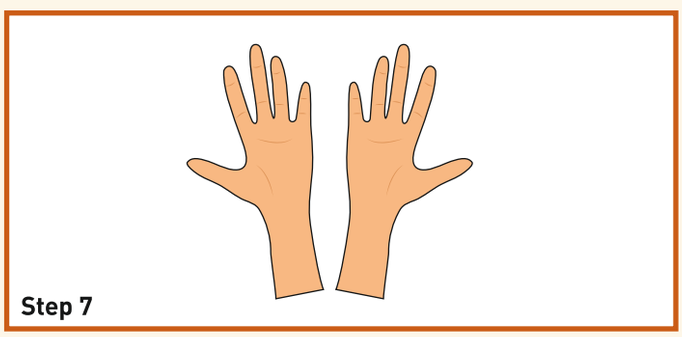
Scrub your thumb of both hands.

**Step 5**

Scrub your nails of both hands by rubbing against your palms.

**Step 6**

Scrub both the wrists, by moving down slowly scrubbing both the forearms.



**Step 7**

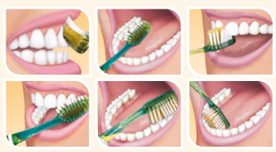
Wash your hands and forearms thoroughly with clean water.

Air-dry with hands up, elbows facing the ground.

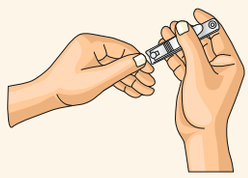
Do not use towel or any cloth to dry the hands and not touch the ground or dirty objects after washing hands.

- **Bathe regularly:** Take bath every day using soap and wash your hair at regular intervals.

- **Brush your teeth:** Brush your teeth at least twice a day (i.e. in the morning and at bed time) with a toothbrush or a chewstick (miswak, neem stick). Germs present in the mouth can cause tooth decay and gum disease. Brushing minimizes the accumulation of germs in mouth.



- **Trim your nails:** The finger and toe nails should be kept short and should be trimmed/cut regularly. Longer fingernails can accumulate more dirt and germs, which can cause infections and food poisoning. Nails should be cleaned thoroughly with soap and water while washing hands.

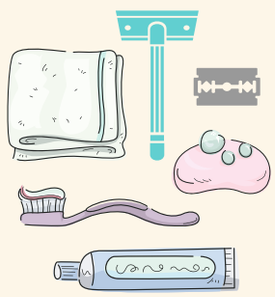


- **Wash your clothes after wearing them:** Wash your clothes regularly and keep them clean.

- **Change your undergarments every day:** It is important to use clean and dry undergarments daily, to avoid infections.

- **Don't share your personal items with other people:** Avoid sharing your personal items like razors, towels, handkerchief, comb, toothbrush, etc. with other people as it increases the likelihood of spreading infections. If you do share towels or clothing, be sure to wash them both before and after lending them to others.

- **Change sanitary pads or menstrual cloth regularly:** Menstruating women should use sanitary pads (or clean cloth which is regularly washed and dried in direct sunlight, if use of sanitary pad is not possible). Change the sanitary pads/cloth every 4-8 hours and discard the used pads by wrapping it in a piece of paper and throw it in a closed dustbin. If reusing the cloth, then wash the cloth with detergent and dry it in the sun.

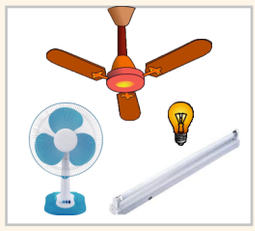


## Environmental/Surrounding hygiene

Environmental/Surrounding hygiene is controlling the environmental factors that may cause infections and diseases. It includes waste management, safe drinking water, garbage disposal and pest control. Environmental hygiene is important for the health and wellbeing of an the individual, family and the community.

### Tips to maintain hygiene in the surrounding

#### Inside the house



- Do not leave open containers/buckets with water inside or near your house, as these places serve as the environment for breeding mosquitoes causing malaria, dengue and chikungunya.
- Clean the ceiling, walls and appliances like fan, bulb, tube lights etc. to remove spider webs and dust.

- Sweep or mop the floors regularly.
- Clean the spilled food from the floor, table, bed, chair, etc. immediately.
- Check the drainage system to avoid water logging in bathroom, kitchen and other areas.
- Repair the pipes and taps for any leakage.

- Place dustbin in the kitchen and at other appropriate places. Make sure to empty the dustbins after use.
- Use insecticides and insect repellants to prevent insects. Make sure to keep them away from children and animals.

#### Outside the house

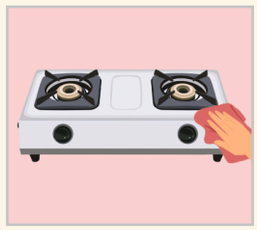
- Check the drains to avoid water logging outside the house.
- Always sweep water that collects around your house and also make sure that the gutters (drainage) close to your house are regularly cleaned so as to avoid breeding of mosquitoes and saving yourself from malaria, dengue, and chikungunya.

- Spray kerosene oil in the water collected outside the house to prevent breeding of mosquitoes.
- Clean the overhead tank, at least twice a year. Contaminated water may cause food poisoning/diarrhoea.
- Throw away the garbage only in the dustbins. Do not throw them inside the home, or outside the home on the streets.
- Always make sure that the bushes close to your house are well cleared.

- Keep your pet animals like cows, buffaloes, dogs, goats, etc. clean.
- Keep the animal sheds clean, dispose their waste properly in a closed dustbin and make sure to throw the waste away from human contact in a pit, and cover it with mud.
- Keep the roads, gulli, mohalla free from dung and garbage.

### Keep your kitchen clean

- Keep your utensils, knives and cooking area clean.
- Use clean cloth to wipe kitchen surfaces and utensils.
- Clean the stove before and after cooking.
- Ensure that the drains are kept clean and covered with a wire mesh/lid so that solid kitchen waste does not get swept into the drains and clog them.
- Clean kitchen shelves/ storage cupboards at least once every two weeks.
- Make sure that the kitchen walls, ceilings, and fittings (bulb/tubelight) are cleaned regularly.
- Empty dustbins and dispose the garbage daily.
- If you use a gas cylinder, make sure it is kept in a well-ventilated place and clean its rubber tube to avoid contamination of food.
- It is also important to keep the gas stove/chulha clean.
- Do not allow animals in the kitchen, especially near the cooking area.
- Clean the cleaning cloths thoroughly with detergent and dry them in sun.
- Keep separate cleaning cloths for drying utensils and cleaning kitchen surfaces.



### Keep your utensils clean

- Wash and scrub the utensils with clean water and detergent.
- Properly rinse the utensils in clean water.
- Dry the utensils by keeping them in an inverted position.
- Store cleaned dishes away from the dirty dishes to avoid contamination.

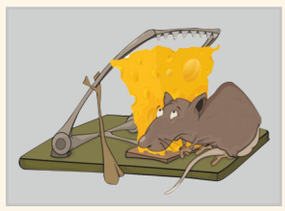
### Pest control

Pests are harmful because they can contaminate food, utensils, cooking area, surfaces, hand towels, kitchen cloth, etc. with harmful germs, or poison food by their dead bodies or body parts such as excreta, hair, skin, feathers, larvae, etc.


### Rules to prevent pests in the kitchen

- Keep kitchen and food storage area ventilated, dry and clean.
- Clean the kitchen surfaces after cooking/having food.
- Dispose off garbage daily. Separate liquid and dry food waste.
- Clean damp places regularly. Fix leaking taps/pipes and do not let water accumulate anywhere.
- Check food items for the presence of insects, (damaged/powdered grains etc.) before purchase/storage. Check bags/sacks for insect eggs and body parts.
- Clean and dry the storage containers before storing grains.
- Keep sacks of grain / flour away from the walls, in a ventilated and well-lit place.
- Use turmeric, neem leaves etc. to safeguard the food grains from pests.

- If using pesticides tablets, tie them properly in cloth before putting them in the grain containers. Make sure to remove them before using the grains.
- Keep all food items covered.
- Discard infested food. Dispose the food waste in covered dustbins only.
- Place rat/pest traps placed at holes, drains and other places from where pests are likely to enter.



- Seal cracks in and around the house (with cement/plaster or glue). These are easy places for pests to hide.
- Where possible, fix wire mesh screens on windows, doors and ventilators to reduce entry of pests.
- Use mosquito/insecticide sprays (cover food items carefully before spraying). Make sure to keep them away from children and animals.

- Use chalk coated with insecticidal powder (used mostly for ants and cockroaches). Apply it carefully, away from food items and food storage, preparation and serving surfaces.
- Apply pesticide to cracks, underside of cupboards, behind the sink/washing area and other such non-visible spots that could shelter pests.
- Do not keep dirty/used utensils overnight. Make sure no leftover food is stuck on the utensils as it attracts pests.

## Waste disposal

Many things constitute our daily household waste. These include wet waste (vegetable and fruit peels, food leftovers etc.) and dry waste (empty plastic bottles, plasticware, containers, jars). Managing and disposing waste appropriately is important and useful. Here are some tips on garbage disposal and making good use of waste.

## Rules for waste disposal

- Be sure to discard waste promptly and only in covered dustbins.
- Drain liquid waste separately and put solid waste in the dustbin.
- Cover the garbage container with close fitting lids.
- Never allow garbage to remain near cooking area as it attracts insects and pests, thereby contaminating food.
- Clean the floor below the dustbins with detergent. Mop the area (if possible with a disinfectant) and let it dry before replacing the dustbins.
- Clean garbage bins regularly with water and detergent and dry them in sun, before the next use.
- Do not allow any garbage to spill around the dustbin.
- If garbage has to be kept overnight before disposal, it should be kept covered (away from the kitchen) in a cool, covered place.
- Avoid throwing food waste in the drain.
- Food waste can be converted to compost and used as manure for kitchen gardens or potted plants.

**Segregate waste and recycle**

- Separate dry and wet waste and put it in the separate dust bins.

**Wet waste (green)**

- Vegetable/fruit peels and pieces
- Leftover food

**Dry waste (blue)**

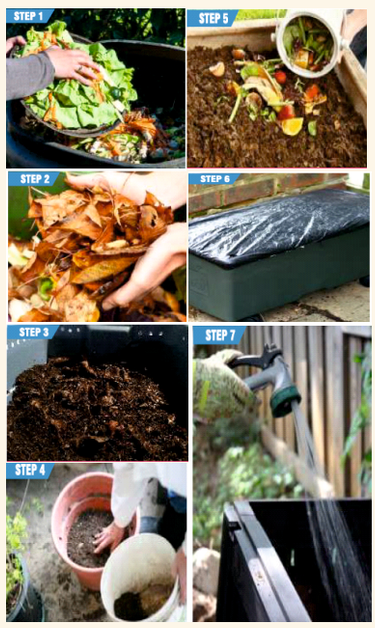
- Paper (cartons, newspaper, paper)
- Glassware (bottles)
- Plastics (containers, jars)
- Metals (cans, bins)

Recycle: Paper, glass and plastics if possible. After segregation, deposit these at a recycling plant or have it picked up from your house if service for recycling material is available around your house.

**Compost**

We learnt above on how to segregate waste. We can use the organic waste to make compost. Compost is made up of organic matter (like kitchen waste, leaves, sawdust, straw etc.) that has been decomposed over a period of time, in a process called composting. This process recycles various organic materials, which are otherwise regarded as waste products. Compost is rich in nutrients and improves the quality of the soil. It can serve as manure for kitchen garden or potted plants. Let us now learn how to make compost in 7 simple steps:

1. Collect the wet waste (vegetable peels, fruit peels, small amount of waste cooked food) in a container.
2. Collect dry organic matter (dried leaves, saw dust) in a small container.
3. Take large earthen pot or bucket and make 4-5 holes around the container at different levels to let air inside.
4. Line the bottom with a layer of soil.
5. Now start adding food waste in layers alternating kitchen waste (vegetable and fruit peels) and straw, sawdust, dried leaves.
6. Cover this container with a plastic sheet or a plank of wood to help retain the moisture and heat.
7. Every few days, give the pile a quick turn to provide aeration. If you think the pile is too dry, sprinkle some water so that it is moist. The compost gets ready in approximately one month.



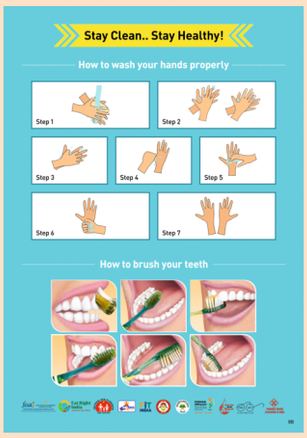

**Things to remember**

1. The container in which compost is being made should not be placed in the kitchen/ near the cooking area. It should be placed outside the house or balcony.
2. Do not compost meat, meat wastes (bones, fat, fish, fish wastes), dairy products (cheese, butter, curd), grease or oils of any kind. They breakdown slowly, attract rodents, insects and scavenging animals and produce unpleasant odour.

## Activity 5.1: Activity card on waste segregation and disposal

| Tool: Activity card 'Clean India.. Healthy India' | Instructions for use |
|---|---|
|  <br>  | **Objective of the activity:**<br>• To generate awareness on proper waste segregation and disposal of waste.<br>**Instructions for health workers:**<br>• The surrounding hygiene activity card can be displayed in the Health and Wellness Centres, Anganwadi Centres, Schools, etc. or carried by the health workers during home visits and village meetings.<br>• Health workers (ASHA/Anganwadi workers, multipurpose workers - female (ANM)/male, CHO/MLHP) will explain the participants about the waste segregation and disposal techniques.<br>• From the front side of the surrounding hygiene activity card, health worker will explain the participants about waste disposal depending on the type of waste.<br>• From the back side of the surrounding activity card the health worker will show the waste options carefully. Then the health worker will ask the participants to tell in which of the two dustbins (wet waste dustbin or dry waste dustbin) should each of the listed waste go. The participants will be asked the reason for choosing the answer. The health worker will check the correct option from the answers given at the bottom corner and correct the participant if the answer given by them is incorrect. |

## Activity 5.2: Activity card on personal hygiene

| Tool: Activity card 'Stay Clean.. Stay Healthy!' | Instructions for use |
|---|---|
|  <br>  | **Objective of the activity:**<br>• To generate awareness on personal hygiene.<br>**Instructions for health workers:**<br>• The personal hygiene activity card can be displayed in the Health and Wellness Centres, Anganwadi Centres, Schools, etc. or carried by the health workers during home visits and village meetings.<br>• Health workers (ASHA/Anganwadi workers, multipurpose workers - female (ANM)/male, CHO MLHP) will explain the participants about the importance of maintaining personal hygiene. |

# 6 Food Safety and Safe Food Practices

| Session Description | |
|---|---|
| Session Duration | Theory: 20 minutes<br>Practical: 20 minutes |
| Session Outline | • Importance of food safety<br>• Simple ways to maintain food safety |
| Role of Trainers | • To explain the concept of food safety and safe food practices<br>• To effectively teach the use of training tools to the health workers |
| Role and Responsibility of Health Workers | • To use given tools to talk about the importance of food safety<br>• To help participants identify effective ways of ensuring food safety<br>• To ensure that community members follow the key rules for food safety<br>• To help counsel women during home visit on food safety. |
| Outcome | • The participants will be able to understand the importance food safety.<br>• Resources created through the tool kit will help in effective dissemination and reinforcement of clear and easy to understand messages to the participant. |

# 6. Food Safety and Safe Food Practices

Food borne illnesses are major public health concern and can also be fatal. Food safety is an important part of preventing food borne illnesses. It involves proper handling, preparation, storage and consumption of food. Food can become contaminated at any point during harvesting or slaughtering process, storage, distribution, transportation and preparation. Lack of adequate food hygiene can lead to food borne diseases.

Diarrhoeal diseases are the most common illnesses resulting from the consumption of contaminated food. Unsafe food creates a vicious cycle of disease and malnutrition, particularly affecting infants, young children, elderly and the sick. Food borne diseases are also a huge financial burden to the family, therefore it is important to safeguard ourselves from them. Most instances of food poisoning can be avoided by following simple guidelines. From the time the food is purchased to the minute it is consumed, the safety of the food should be ensured. In this section we will learn how to handle food safely, thus making it safe to eat and preventing it from spoiling. What we learn here is applicable to a wide range of environments like purchase/procurement and proper storage of food.

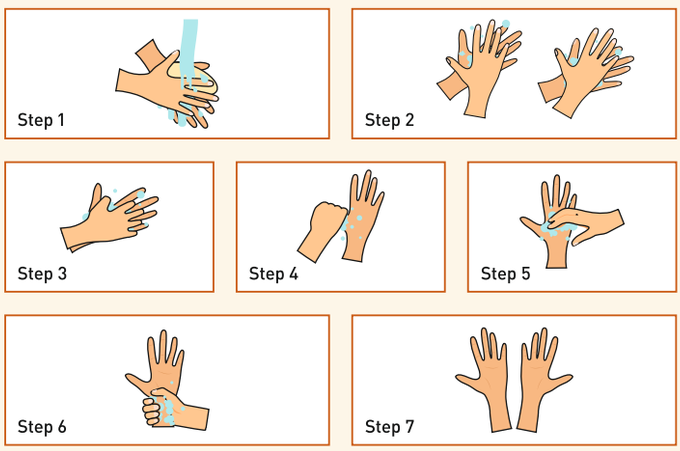
We have learnt how to maintain hygiene in the previous chapter. Here we will focus on ways to maintain food safety. Hygiene and food safety are interrelated, therefore, we will also revise some portions of maintaining hygiene in this section.

**There are FIVE steps to safer food**

**1. Keep clean**

As we have discussed previously, hands should be washed thoroughly, otherwise germs from dirty hands can contaminate the food.

- Wash your hands with soap and clean water thoroughly before handling food and often during food preparation.
- Wash your hands after going to the toilet.
- Wash and clean all surfaces and equipments used for food preparation
- Protect kitchen areas and food from insects, pests and other animals.




**2. Separate raw and cooked foods**

- Separate raw meat, poultry and fishes / seafood from other food items.
- Use separate equipment and utensils such as knives for handling raw foods.
- Store food in closed containers to avoid contact between raw and prepared foods.

**3. Cook thoroughly**

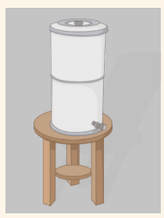
- Cook food thoroughly, especially meat, poultry, eggs and seafood
- Boil foods like dals, curries, soups, etc. For meat and poultry, make sure that juices are clear, not pink.
- If consuming leftover food, reheat the cooked food thoroughly.

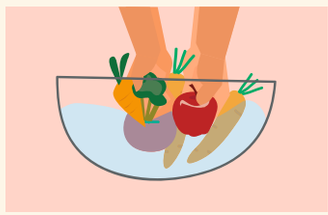
**4. Keep food at safe temperatures**

- Do not leave cooked food at room temperature for more than 2 hours
- If using a refrigerator, refrigerate all cooked and perishable foods
- Keep cooked food hot prior to serving
- Do not store food too long after cooking (even in the refrigerator)

**5. Use clean water and fresh wholesome foods**

- Use clean water. Treat the unclean water to make it safe by either boiling it or by putting chlorine tablets.
- Use ladles with long handle in your house - to fetch water from the water container or use a container with a tap.
- The water containers should be kept in a clean and dry place, preferably on a higher platform.
- Select fresh and wholesome foods
- Wash fruits and vegetables properly before cooking or consumption (if eaten raw)
- If using packaged foods, do not use food beyond its expiry date



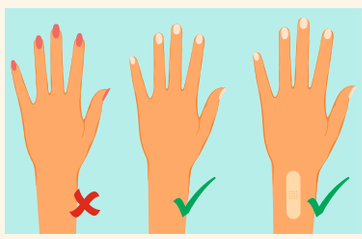


## Dos and DON'Ts while handling food

Apart from the points mentioned above, let us learn some more 'DOs and DON'Ts' for safe handling of food

**DOs**

- Keep nails short and clean and avoid nail polish if you are cooking. Dirt from nails or harmful dyes from nail polish might contaminate the food.
- Whenever you handle any kind of food, ensure that any cuts, wounds or scratches on your hands, are covered or bandaged properly, to prevent contaminating the food.
- Make sure your hair is neatly combed and tied and your head is covered with a scarf/dupatta/pallu while cooking. There should be no stray hair because they might fall into the food while cooking. Do not comb hair in the kitchen.
- Properly tuck your pallus, dupattas, or any loose flowing clothes while working in the kitchen.
- Make sure you wear clean and preferably cotton clothes while cooking.



**DON'Ts**

- Do not sneeze or cough on to the food while preparing it, or at least cover your mouth and then wash your hands immediately after sneezing and/or coughing, to avoid spreading infection.
- Do not wipe hands on your clothes or hair while cooking. Use a clean cloth to wipe hands and wash this cloth regularly. Dry with a clean and dry towel/cloth.
- Try to avoid handling of food if you have jaundice, diarrhoea, vomiting, fever, sore throat, skin rashes, cough, cold, itching or discharge from ears, eyes, or nose, or any kind of infection, otherwise your infection can spread to those who eat the food.
- Do not smoke or eat paan, gutka, betel nuts, etc. while preparing food. Our saliva contains lots of germs, which can spoil the food.
- Do not scratch your head or dig your nose while handling food, as body secretions and dirt can spoil the food.
- Do not taste food to check if it is contaminated. Even a small amount of spoiled food can cause health problems. When in doubt, throw it out.

**Food safety while purchasing food:** Safe eating begins with choosing what foods you buy. So, let us start with purchasing food from the market.

**When buying packaged foods, check for these marks**

## LOOK FOR THESE LOGOS

FSSAI MARK ON ALL PACKAGED FOODS AND BEVERAGES

ISI MARK FOR FOODS SUCH AS MILK AND SKIMMED MILK POWDER

AGMARK FOR ALL AGRICULTURAL PRODUCTS SUCH AS VEGETABLE OIL, PULSES, CEREALS, SPICES, HONEY, FRUITS AND VEGETABLES

FORTIFIED SAMPOORNA POSHAN SWASTH JEEVAN

फोर्टिफाइड सम्पूर्ण पोषण स्वस्थ जीवन

LOGO FOR FORTIFIED FOOD

GREEN COLOUR FILLED CIRCLE INSIDE THE SQUARE WITH GREEN OUTLINE FOR VEGETARIAN FOOD

BROWN COLOUR FILLED CIRCLE INSIDE THE SQUARE WITH BROWN OUTLINE FOR NON-VEGETARIAN FOOD, INCLUDING EGG

**When buying raw foods**

| Food Commodities | DO Buy/Use | DON'T Buy/Use |
|---|---|---|
| **Fruits and Vegetables** | ✓ Buy fresh, seasonal and locally available fruits and vegetables at the right stage of maturity<br>✓ Green leafy vegetables that are crisp and fresh. The darker the colour, the better.<br>✓ Fruits that are firm to touch, unblemished, fresh and clean.<br>✓ Roots and Tubers that are firm to touch. | × Buy overripe, blemished/ darkened, bruised or insect infested vegetables & fruits<br>× Green leafy vegetables with damaged/cut or yellow leaves or unpleasant odour and colour.<br>× Fruits that are pulpy and overripe<br>× Roots and tubers that are soft, pulpy, green and sprouted. |
| **Milk and Milk Products** | ✓ Pasteurised/properly boiled milk<br>✓ Packaged and sealed milk<br>✓ Fresh paneer/cottage cheese<br>✓ Prefer preparing curd at home, if purchasing packaged curd check the date of manufacture and 'best before' date | × Milk that is discoloured, stringy, sour in taste or curdled<br>× Paneer/cottage cheese that is slimy to touch or has creamy yellowish colour<br>× If buying packaged product, do not buy if it is not sealed properly or puffed<br>× Unpasteurized/unboiled milk |
| **Fats, Oils, Oilseeds and Nuts** | ✓ Preferably packaged fats, oils and ghee and oilseeds and nuts<br>✓ Fortified fats and oils | × If 'expiry date' or 'best before date' has passed/lapsed<br>× Oils sold loose, especially mustard oil |
| **Pulses and Cereals** | ✓ Preferably packaged and sealed grains<br>✓ If possible use fortified wheat flour and rice<br>✓ Even sized and clean grains | × Those with strong smell<br>× Insect infested/ mouldy groundnut<br>× Grains with clumps, cottony growth, unpleasant odour, dirt, stones, insect infestation |
| **Eggs** | ✓ Eggs with shells that are clean and intact | × Eggs with shells that are dirty and discoloured, cracked or broken |
| **Meat, poultry** | ✓ Meat/poultry with Pink Flesh<br>✓ Lean meat with less cartilage and bone<br>✓ If buying packaged meat / poultry, buy/use before the 'Best before' date. | × Meat/poultry with Tough, fibrous flesh, discolouration, strong smell and slim appearance<br>× Fish with dull, sunken eyes<br>× Grey or green gills<br>× Foul odour |
| **Fish** | ✓ Fish with gills that are intact, bright and pink in colour<br>✓ Clear eyes and fish that bounces back when pressed with finger | × Fish with Flabby flesh that separates from bones<br>× Very few scales |

**Note:** *If food is spoiled or looks doubtful, it is best to throw it away immediately and wash the container properly. Never taste such doubtful food to check if it is spoiled. Eating even a small amount of spoiled food can cause harm.*

**Safe storage of food**

Storing foods safely before and after food preparation is very important in combating food borne illness. Raw and cooked foods should not be stored together, as this can cause cross contamination, i.e. bacteria from raw foods can get transferred to the cooked foods, spoiling them and further causing food borne illness.

**Shelf life:** The shelf life of a particular food refers to the length of time that food will last without getting spoilt. All food has a limited shelf life. This varies depending on the food type, how it is packaged and how carefully it is stored. If the food items are stored properly, it can stay safe from the growth of food poisoning bacteria; and can also reduce food wastage and will help in saving money.

**Cereals and pulses**

- Store cereals and pulses in clean storage containers or canisters, preferably placed above the ground level.
- Keep a clean, dry tablespoon/scoop in every container.
- If possible, containers should be airtight.
- The place of storage should be dry and free from moisture.
- All grains and pulses can be safely stored with dry whole turmeric, whole crystal salt, dried neem leaves or bay leaves. This will prevent them from infestations by insects and pests.
- Dry roast semolina (suji) and broken wheat (dalia) before storing. Allow it to cool down and then store in dry, airtight bottles/containers to retain flavour for a longer period.

**Vegetables**

- Pick and clean the green leafy vegetables before storing.
- Store green leafy vegetables in a clean cloth (do not use newspaper) as this would allow them to breathe.
- Do not wash onions, garlic, and potatoes, before storing. Store them in open baskets to permit air circulation.
- All other vegetables such as carrot, radish, beetroot, cauliflower, tomatoes, brinjal, capsicum, lady finger, etc. should be washed, air dried and then stored in cloth bags or jute sacks, in a cool but dry place.

**Fruits**

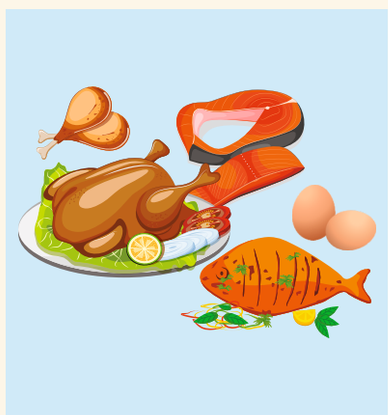
- Wash fruits with clean water and air-dry before storing.
- You may store fruits like apples, pears, and oranges in a cool, dry place for a few days.
- Store banana by hanging them in a loop. Do not refrigerate bananas, as the peel will turn black
- Store all other fruits in a cool and dry place (if possible in refrigerator).
- Prefer consuming fruits within 1-2 days of purchase.

**Milk and milk products**

- If taking fresh, unpasteurized milk, boil it over medium-high heat. Once the milk is boiled, cover the milk with mesh lid and allow to cool to room temperature and refrigerate. If refrigeration is not possible, cover the vessel and keep it in a cool place. Re-boil the milk before consumption. Prefer getting milk in small quantities so that minimal amount requires storage.
- When purchasing packaged milk in pouches, wash the pouches of milk under running water before storing.
- If using milk powder (especially for infants), store milk powder at room temperature in an airtight container
- Keep butter, cream, paneer in a cool, dry place (if possible, in a refrigerator).

**Meat, fish, poultry and eggs**

- Store eggs separately in a dry basket (preferably in a refrigerator).
- Prefer purchasing meat and poultry just before food preparation to avoid spoilage.
- Store raw meat and poultry in covered utensils to avoid contamination into other foods.
- Wrap the cooked meat tightly while storing.
- Keep raw and cooked meat separately.



**Fats and oils**

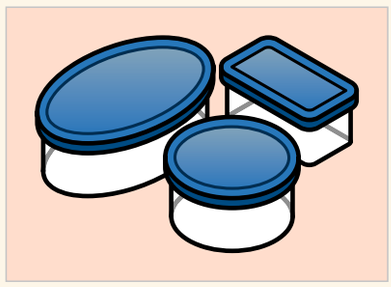
- Fats and oils include edible cooking oil and fat (ghee/butter/ vegetable oils)
- Store fats/oils in opaque jars/containers with well-fitting lids in a cool, dark place.
- Avoid storage places near gas/stoves or exposed to sunlight.

**Spices and condiments**

- Clean, dry and sort spices before storing.
- Store the spices in clean, dry utensils (masaldani) and keep them covered.
- Store in a dry place.

**Keep your storage containers clean**

- Wash containers with soap and clean water before refilling.
- Sun dry the washed containers thoroughly before storing food in them.
- Discard any containers that are cracked or broken.



**Tips for safe food storage**

- Keep foods dry and away from moisture.
- Avoid storing food in plastic containers. If required, use only food grade plastic containers.
- Always keep vegetarian and non-vegetarian food items separately.
- All food storage areas should be clean and ventilated.
- The cleaning materials, pesticides, etc. must be stored away from food to prevent any accidental mixing, which might have serious consequences.

**Safe storage of cooked foods**

Food items have a limited shelf life. The shelf life of each food depends on its type of food and its storage condition. Food poisoning is caused by bacteria from foods that have been incorrectly stored, prepared, handled or cooked. Food contaminated with food-poisoning bacteria may look, smell and taste normal. If food is not stored properly, the bacteria in it can multiply to dangerous levels.

**Using leftovers**

In order to avoid food wastage, the leftover foods can be used as such or in preparation of other foods. However, some precautions need to be maintained when storing and using the leftover foods.

- Use leftovers as soon as possible.
- When reheating leftover food, make sure it is heated at high temperature (70$^{\circ}$C) for two minutes, so that it is steaming hot throughout.

**Food safety while cooking food**

It is important to follow some rules for cooking food properly to minimize nutrient loss and food contamination.

- Use clean water for washing and preparing food.
- Wash fruits and vegetables properly before peeling and cutting to avoid nutrient loss.
- Remove spoiled portion of fruits and vegetables if any.
- Do not soak cut vegetables in water, as all the vitamins and minerals will be lost.
- Do not wash food grains repeatedly before cooking.
- Wash pulses with clean water and then soak them in water for 30 minutes (half an hour) before cooking. Do not discard the water used for cooking.
- After handling raw meat and fish, wash hands with soap and clean water.
- Cook food/food items in covered vessels to prevent loss of nutrients.
- For maximum health benefits, it is preferable to cook vegetables in minimum amount of water required.
- Do not throw away the water in which rice has been boiled.
- Do not overcook or undercook the food. Overcooking causes loss of nutrients, while undercooking of food may lead to indigestion.
- We learnt about iodized and double fortified salt in the previous chapter. Use only iodized salt. Where available use double fortified salt (which contains both iron and iodine)

**Food safety while serving food**

It is important to serve food properly in a clean, healthy and safe manner. Let us learn some tips to ensure how to serve foods safely.

- Keep cooked food covered before serving.
- Make sure the utensils are clean and dry before use.
- Never place cooked food on an unwashed plate that previously contained raw meat or fish.
- Do not use plastic utensils or newspaper to serve food.
- Do not use aluminium or copper/ metals for serving sour (acidic) food.
- **Packaging for heated foods:** Inappropriate food packaging material can have negative health effects in the long term. The contact between food and unsuitable packaging material can cause cancer, brain disorder and other disorders. Therefore, it is important to store food in non-toxic packaging material".
  - Do not pack the food items (Chapatti/parantha, etc.) in the newspaper.
  - Do not pack lunch for school/office in low grade plastic lunch boxes. Use food grade plastic lunch boxes or use steel lunch boxes.
  - Do not serve hot beverages (tea/coffee/soup) in plastic or thermocol cups. It is best to use glass, steel containers or earthen containers (kulhad).

## Activity 6.1 : Poster on safe food practices

| Tool: Poster 'How to Prevent Growth of Germs?' | Instructions for use |
|---|---|
|  | **Objective of the activity:**<br>To generate awareness on safe food practices.<br>**Instructions for health worker:**<br>• The poster can be displayed in the Health and Wellness Centres, Anganwadi Centres, Schools, etc. or carried by the health workers during home visits and village meetings.<br>• Health workers (ASHA/Anganwadi workers, multipurpose workers-female (ANM)/male, CHO/MLHP) will demonstrate the participants safe food practices from the poster. |



## Activity 6.2 : Poster on safe serving and packaging material

| Tool: Poster 'Eat safe.. Serve Safe!' | Instructions for use |
|---|---|
|  | **Objective of the activity:**<br>To generate awareness on safe food serving and packaging material.<br>**Instructions for health worker:**<br>• The poster can be displayed in the Health and Wellness Centres, Anganwadi Centres, Schools, etc. or carried by the health workers during home visits and village meetings.<br>• Health workers (ASHA/Anganwadi workers, multipurpose workers-female (ANM)/male, CHO/MLHP) will explain the importance of packaging and serving foods in safe serving and packaging materials giving examples from the posters.<br>• The health worker will then randomly say out the names of some serving packaging materials and will ask the participants to classify them as safe/unsafe. |

# 7 Food Adulteration

| Session Description | |
|---|---|
| Session Duration | • Theory: 30 minutes<br>• Practical: 30 minutes |
| Session Outline | • Introduction to food adulteration<br>• Types of food adulterants<br>• Common food adulterants and simple ways to detect food adulteration at home |
| Role of Trainers | • To teach the participants about food adulteration and simple ways to detect food adulteration at home.<br>• To effectively teach the use of training tools to the health workers. |
| Role and Responsibility of Health Workers | • To explain the importance of identifying food adulteration.<br>• To help the participants, learn effective ways to detect food adulteration.<br>• To effectively use the given tool during home visits. |
| Outcome | • The participants will be able to understand common adulterants in food items.<br>• The participants will be able to detect common adulterants in food items at home. |

# 7. Food Adulteration

We need the right kind and quality of food for proper growth, development and functioning of our body. However, sometimes the food we get is adulterated with external, poor quality materials, which lowers down the overall quality of the food and can be a risk to our health. Food adulteration is a deliberate act of degrading the quality of the food. The quality of the food is degraded further by addition of an inferior substance and/or the removal of a vital element from the food.

Food Adulteration is done intentionally to reduce the quality of the foods and increase profits. The Food Safety and Standards Authority of India (FSSAI) is the nodal body (under the Ministry of Health and Family Welfare, Government of India) to check Food Adulteration. There are standards set for food items, mandated to be enforced throughout India. As per the standards, food should be safe, wholesome and free from adulteration for proper maintenance of human health.

## Types of adulterants

There are three major types of adulterants. Let us understand them with the given examples

| Type of adulterants | Substances Added |
|---|---|
| Intentional adulterants | Sand, marble chips, stones, mud, talc, chalk powder, water, mineral oil, harmful colours, water, poor quality seeds, saw dust, brick powder. |
| Incidental adulterants | Pesticide residues, droppings of animals (mouse, squirrel, cat, etc.), larvae in foods , antibiotic residues in milk, meat, etc. |
| Metallic contaminants | Mercury in fish, lead and arsenic from water and other wastes from chemical industries. |

## Harmful effects of using adulterated food

Adulteration of food is intended to cheat the consumer, causes risk to their health and further causes the monetary loss. Let's know more about adulteration and its harmful effects.

### Health effects

Adulterated food can cause a number of health risks, depending on the type of adulterants used. The health effects can range from disorders like diarrhoea, dysentery, constipation, liver disorders, to serious health problems like heart disease, food poisoning, lathyrism[1] etc. The effects may be temporary or permanent. Pregnant women consuming adulterated food can have harmful effects on their body as well as on the growing baby.

### Lack of nutritional value

Foods made using poor quality or adulterated ingredients not only brings down the overall quality of food but also reduces its nutritional content. For example, adding water to milk or removing cream from milk reduces its nutritional value. It can also have a change in taste, especially if kept for a long time. Thus, adulteration makes the consumer compromise with the taste as well as their health.

1. Lathyrism: A brain disorder, caused by consuming seeds of kesari dal. It can cause a form of paralysis in boys and men 5 to 45 years old. The disease starts with stiffness of the knee joints and legs with pain around the knee and ankle joints, as well as in the back thighs.

## Monetary loss

Eating adulterated food can cause monetary loss to the consumer through a number of ways. As adulteration alters the composition of the food item, the consumer has to spend more money per unit (kilogram/ gram/litre etc.) of the actual food product bought*. Further, the health risks caused by eating adulterated food, also require money for treatment and medicines.

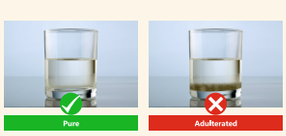
*** The following example clarifies the point. For example, you buy one kg of rice for Rs. 34/kg. If this rice is mixed with 100 grams of some foreign matter (stones, dust, pebble, seeds, damaged grains, insects, animal hair and excreta) which is not consumable (i.e. 100 grams in 1 kg of rice). You will have to clean this rice before cooking and remove this 100 grams of foreign matter. Thus, you have paid Rs. 34/- only for 900 grams of rice.**

We have seen how adulteration can affect our health, let us now learn some common adulterants in food and how we can easily detect them at home. Some food adulterants can be easily detected by a careful visual inspection (Table 7.1), while others can be identified by simple tests at home, using water or other easily available material at home (Table 7.2).

**Table 7.1. Identifying food adulterants through visual inspection.**

| S. No. | Food Article | Adulterant | How to identify |
|---|---|---|---|
| 1. | Mustard Seeds   | Argemone Seeds | Take small quantity of mustard seeds in a plate. Mustard seeds have smooth surface and when pressed inside it is yellow in colour. Argemone seeds, have a rough surface and when pressed, it is white in colour from inside. |
| 2. | Arhar Dal   | Khesari Dal | Khesari Dal has edged type appearance showing a slant on one side and square in appearance in contrast to other dals. |
| 3. | Atta, Maida, Suji (Rawa)   | Sand, soil, insects, web, lumps, rodent hair and excreta | Visually examine the food article for presence of sand, soil, insects, web, lumps, animal hair and excreta. |
| 4. | Food Grains (Wheat, rice, maize, jowar, bajra, channa, barley etc.)   | Extraneous matter (dust, pebble, stone, straw, weed, seeds damaged grain, insects' animal hair and excreta) | These may be examined visually.Take small quantity of food grain in a plate and visually examine it for impurities |

**Table 7.2. Food articles, adulterants and how to identify them at home through simple tests.**

| S. No. | Food Article | Adulterant | Common test for detection of adulterant |
|---|---|---|---|
| 1. | Milk   | Detergent | Shake 5-10 ml of the milk sample with an equal amount of water. If milk is adulterated with detergent, it forms a dense lather. Pure milk will form a very thin foam layer due to vigorous shaking. |
| |   | Starch | Boil 2-3 ml of milk sample with 5 ml of water. Cool and add 2-3 drops of tincture of iodine. Formation of blue colour indicates the presence of starch. |
| 2. | Sugar   | Chalk powder | Dissolve 2 teaspoons (10 grams) of sugar samples in a glass of water and allow it to settle. Chalk will settle down at the bottom. |
| 4. | Tea leaves   | Iron fillings | By moving a magnet through the sample, iron fillings can be separated. |
| 5. | Asafoetida (Hing)   | Soap stone/ other earthy material | Shake little amount of sample asafoetida with water. If asafoetida is adulterated, the soap stone or other earthy matter will settle down at the bottom. Pure asafoetida will not leave any soap stone or other earthy matter at the bottom. |

## Reporting Food Adulteration

In case a raw food item/commodity is suspected to be adulterated, the person may share the grievances/ complaints through any of the following modes for necessary action.

- Register the complaint/grievance at the Food Safety Connect App/portal (available at: https://foodlicensing.fssai.gov.in/cmsweb/)
- Write to FSSAI at enforcement1@fssai.gov.in OR compliance@fssai.gov.in
- Call on the FSSAI toll free number 1800112100
- Message or WhatsApp at 9868686868
- Contact the Designated officer/ Authorized officer (list and contact details for each state, available at : https://fssai.gov.in/cms/designated-officer.php ; https://fssai.gov.in/cms/authorised-officer.php)

| S. No. | Food Article | Adulterant | Common test for detection of adulterant |
|---|---|---|---|
| 6. | Turmeric whole   | Artificial colours (including lead chromate) | Take small amount of turmeric and put it in a glass of water. Turmeric adulterated with artificial colour, appears to be bright in colour and leaves colour immediately in water. |
| 7. | Red chilli powder   | Artificial colours | Sprinkle chilli powder on the surface of water taken in a glass. The artificial colour will immediately start going down in colour streaks. |
| 8. | Common salt   | White powdered | Stir a spoonful of sample of salt in a glass of water. The presence of chalk will make solution white and other insoluble impurities will settle |
| 9. | Green vegetables (bitter gourd, green chilli, ladies finger, shelled peas and others)   | Artificial green colour (Malachite Green) | Take a piece of cotton soaked in water or vegetable oil (conduct the test separately)<br>Rub a small part of the outer surface of the green vegetable/chilli, with the cotton. If the cotton turns green the vegetable is adulterated with artificial green colour. |

**Tips to avoid consuming adulterated food**

- While buying spices, salt, tea leaves etc. prefer to buy packaged food items bearing FSSAI licence number.

FOR ALL PACKAGED FOODS AND BEVERAGES

- Prefer to take food items with quality marks like:
  - ✓ ISI mark for foods such as milk and skimmed milk powder.
  - ✓ AGMARK for all agricultural products such as vegetable oil, pulses, cereals, spices and honey, wheat, atta, besan, etc.

FOR PACKAGED DRINKING WATER AND CERTAIN PROCESSED FOODS

- If buying open food items, check the appearance and texture of the food [spices (turmeric, chilli powder, salt), sugar, pulses, wheat grain, wheat flour (atta) etc.]. Do not buy if you have any doubt.

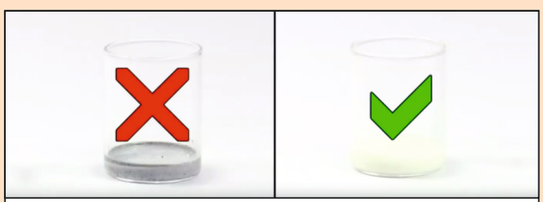
FOR ALL AGRICULTURAL PRODUCTS

- Before preparing the food, check for the quality of any food ingredient (you have recently bought), using simple tests mentioned above. The consumer can also get any food item analysed by the Food Analyst as per the Food Safety and Standards Act, 2006 in order to check for adulteration.

## Activity 7.1: Key ring on how to check food adulteration

| Tool: Key Ring 'Food Adulteration' | Instructions for use |
|---|---|
|  | **Objective of the activity:**<br>• To enable the participants perform simple tests at home to identify food adulteration.<br>**Instructions for health workers:**<br>• Health worker will demonstrate simple tests for checking food adulteration in milk, spices, vegetables etc. at the anganwadi centre/ community centre.<br>• Health workers (ASHA/Anganwadi workers, multipurpose workers-female (ANM)/male, CHO/MLHP) will show each card from the key ring one by one and read out the instructions written at the back side of the card. The health worker will also demonstrate simple tests for checking food adulteration in milk, spices, vegetables etc. at the anganwadi centre/ community centre. |

## Activity 7.2: Videos on checking food adulteration

| Tool: Videos 'Food Adulteration' | Instructions for use |
|---|---|
|  <br>Testing Milk adulteration with Starch<br>  <br>Testing Turmeric Powder adulteration with Artificial Color<br>  <br>Testing Honey adulteration with Sugar | **Objective of the activity**<br>• To enable participants perform simple tests at home to identify food adulteration<br>**Instructions for health workers**<br>• State will upload the short videos provided in the CD in the 'Eat Right' toolkit and provide link of the videos related to this activity to health workers. The video can also be played at the HWCs and Anganwadi Centres.<br>**Steps for implementation**<br>• After playing these videos, the health workers will solve the queries related to food adulteration. |

# List of Contributors

**Ms Madhavi Das**
Joint Secretary
Executive Director
Food Safety and Standards Authority of India

**Ms Inoshi Sharma - IRS**
Director
Food Safety and Standards Authority of India

**Ms Kriti Chugh**
Assistant Director,
Food Safety and Standards Authority of India

**Dr Swati Bhardwaj**
Nutrition Consultant,
Vital Strategies &
Food Safety and Standards Authority of India

**Dr Meenu Singh**
Nutrition Consultant,
Vital Strategies &
Food Safety and Standards Authority of India

**Ms Rijuta Pandav**
Deputy Lead,
Food Fortification Resource Centre

**Ms Rohini Saran**
Deputy Lead,
Food Fortification Resource Centre

**Dr Rajani R Ved**
Executive Director,
National Health Systems Resource Centre (NHSRC)

**Ms Ima Chopra**
Consultant
Community Processes/
Comprehensive Primary Health Care
National Health Systems Resource Centre (NHSRC)

**Dr Nancepreet Kaur**
Senior Programme Officer
Voluntary Health Association of India

**Dr Priyanka Bhat**
Assistant Programme Manager
Voluntary Health Association of India

FOOD SAFETY AND STANDARDS
AUTHORITY OF INDIA

*Inspiring Trust, Assuring Safe & Nutritious Food*

Ministry of Health and Family Welfare, Government of India

FDA Bhavan, Kotla Road, New Delhi-110 002

Tele: +91-11-2322 0995 | Telefax: +91-11-2322 0996

E-mail: iec@fssai.gov.in | www.fssai.gov.in, www.eatrightindia.gov.in

Design & Printed by: adworthmedia.org