

Micronutrients

Micronutrients are vitamins and minerals. They are required in very small amounts in the diet. The units to measure how much we need each day are either **micrograms** or **milligrams**. The microgram is the very smallest amount.

1 milligram (mg) = 1000 micrograms (mcg)

Vitamins:

The body requires only small amounts of each vitamin, but as it cannot make most of them itself, they must be supplied by food.

Vitamins are needed to maintain health and growth. A diet lacking in one or more vitamins will result in specific deficiency diseases. Many of these occur in poorer countries.

The ones we need to know in particular are:

- ❖ A
- ❖ B
- ❖ C
- ❖ D
- ❖ E
- ❖ K



Vitamins can also be grouped according to the substances in which they dissolve. There are 2 groups:

- ❖ **Fat soluble vitamins** = vitamins A, D, E & K
- ❖ **Water soluble vitamins** = vitamins B & C

Fat Soluble Vitamins

Vitamins A, D, E and K are fat soluble vitamins which can be stored in the body for months and even years.

For each vitamin you need to know and recall the following information:-

- ❖ Function
- ❖ Sources
- ❖ Effects of excess
- ❖ Effects of deficiency
- ❖ DRV's - amount required each day to remain healthy

Fat Soluble Vitamins

<u>Vitamin</u>	<u>Functions</u>	<u>Sources</u>	<u>Effects of Deficiency</u>	<u>Effects of Excess</u>	<u>Reminder Picture/Image</u>
A					
D					
E					
K					

Water Soluble Vitamins

The B group of vitamins and vitamin C are water soluble and cannot be stored in the body. They must therefore be eaten regularly.

For each vitamin you need to know and recall the following information:-

- ❖ Function
- ❖ Sources
- ❖ Effects of excess
- ❖ Effects of deficiency
- ❖ DRV's - amount required each day to remain healthy

<u>Vitamin</u>	<u>Functions</u>	<u>Sources</u>	<u>Effects of Deficiency</u>	<u>Effects of Excess</u>	<u>Reminder Picture/Image</u>
B1 Thiamin					
B2 Riboflavin					

<u>Vitamin</u>	<u>Functions</u>	<u>Sources</u>	<u>Effects of Deficiency</u>	<u>Effects of Excess</u>	<u>Reminder Picture/Image</u>
Folic Acid					
B12					
C					

How Preparation and Cooking Affects the Nutritional Properties of Food

The preparation and cooking of food can affect its nutritional value.

Water soluble vitamins in the vitamin B group and Vitamin C are affected by food preparation and cooking as they are very unstable.

They dissolve in water, can be destroyed by contact with sunlight, air and heat and are affected by enzymes.



Tips for Reducing the Loss of Water Soluble Vitamins when Preparing and Cooking Food

1. Buy fruit and vegetables in good condition

Bruised or damaged fruit and vegetables release enzymes which destroy vitamins

2. Choose ripe fruit and vegetables

Just ripened fruit and vegetables contain the most vitamins. Unripe or over-ripe fruit and vegetables may have a lower vitamin content

3. Store in cool, dark place

Most fruit and vegetables should be stored in the fridge as the cool temperature slows down enzyme activity. Sunlight destroys some vitamins

4. Use shortly after buying

Ripening will continue after buying so use fruit and vegetables quickly. Pre-packed bags of salad are packed under **modified** conditions to preserve them but will deteriorate quickly after opening

5. Minimise preparation

Ripping and tearing reduces cell damage, whereas chopping, cutting or slicing destroys the cell walls allowing enzymes to be released that will destroy vitamins

6. Blanch vegetables

Blanching is immersing prepared fruits and vegetables into boiling water for a few minutes and then cooling rapidly to reduce enzyme activity and help retain vitamins

7. Avoid soaking in water

Soaking fruits and vegetables containing water soluble vitamins considerably reduces the vitamin content as the vitamins leach into the water

8. Eat fruits and vegetables raw

It has been suggested that 75% of the vitamin C content found in green vegetables is lost during cooking so try to eat raw fruits and vegetables wherever possible

9. Cook and eat fruit and vegetables in their skins

The highest concentration of vitamins is found just under the skin so leave skins on wherever possible

10. Use a small amount of water when cooking fruit and vegetables

The smallest amount of water should be used to cook fruit and vegetables to prevent vitamins being lost into the cooking liquid. Microwaving and steaming are good methods as they use little water

11. Place vegetables in boiling water and cook quickly

Put prepared fruits and vegetables into boiling water immediately after preparation to destroy the enzymes rather than heating the water up from cold as the enzymes can attack the vitamins before the water is hot enough to kill them.

Cook fruits and vegetables for the minimum amount of time to reduce vitamin loss

12. Use the cooking water

As water soluble vitamins leach into water use the cooking liquid to make gravies, soups and sauces so vitamins are eaten

13. Serve immediately

Cooked vegetables should not be kept warm for long periods as this increases the vitamin loss. Reheating will reduce the vitamin content even more.



Antioxidant Functions of Vitamins A, C and E

What are Antioxidants?

All bodily functions and lifestyle habits produce substances called **free radicals** that can attack cells. When free radicals are found in large amounts in the body the healthy cells are weakened and are more vulnerable to heart diseases and certain types of cancer. Antioxidants help to protect healthy cells from the damage caused by free radicals

Vitamin A, C and E are all antioxidants

'**ACE**' is a good way to remember the antioxidant vitamins which protect the body

Where are the Antioxidants Found?

Found in food rich in vitamins A, C and E particularly fruits, vegetables, nuts and wholegrains and smaller amounts in meat, chicken and fish

Questions:

Explain with reasons and examples how you would minimise the loss of vitamins from food as you prepare, cook and serve. (10 marks)

2. State why pregnant women, young women and elderly people might need vitamin supplements. Give reasons for your answer (6 marks)

3. Discuss why it is advisable to seek medical advice before taking or giving vitamin supplements. Give reasons for your answers. (3 marks)

Minerals

Just like **vitamins**, minerals help your body grow, develop, and stay healthy. The body uses minerals to perform many different functions — from building strong bones to transmitting nerve impulses. Some minerals are even used to make hormones or maintain a normal heartbeat.

Minerals are found in **foods** such as meat, cereals (including cereal products such as bread), fish, milk and dairy **foods**, vegetables, fruit (especially dried fruit) and nuts. Essential **minerals** include calcium and iron.

Minerals

<u>Minerals</u>	<u>Functions</u>	<u>Sources</u>	<u>Effects of Deficiency</u>	<u>Effects of Excess</u>	<u>Reminder Picture/Image</u>
Iron					
Calcium					
Iodine					
Sodium Chloride					

3. Describe the harmful effects of eating too much salt.

4. Discuss the role of minerals in the diets of children.