

FACTFILE: GCE NUTRITION & FOOD SCIENCE

WATER AND OTHER FLUIDS



Water and other fluids

Learning outcomes

- Demonstrate knowledge and understanding of the sources and functions of water and other fluids in the diet.
- Consider the nutritional benefits derived from consuming fluids other than water.
- Discuss factors that impact on hydration.
- Demonstrate knowledge and understanding of the effects of dehydration and water intoxication.

Course content

The body can exist for weeks without food but can only survive a matter of days without water. The nature of body processes means water is continuously being lost and therefore must regularly be replenished if important key functions are to take place. Nearly all of the major systems in the body depend on water.

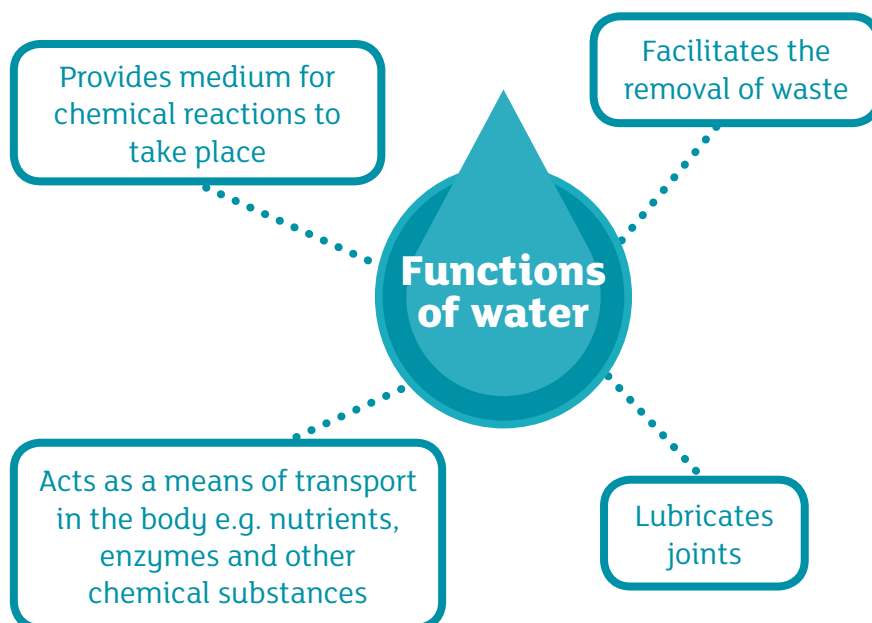


Figure 1: Functions of water

Sources of water

When drinks are chosen it is important to be aware that although they all provide water and some also contain essential vitamins and minerals, they may also provide energy (calories). These calories contribute to daily calorie intake in the same way as those from foods eaten. It is also important to look after the teeth, and consuming sugary drinks too often can cause dental caries. It is also important to be aware that some drinks are acidic (e.g. fruit juice and carbonated drinks) and this may cause dental erosion (damage to tooth enamel) if they are consumed frequently. For children, the use of a straw lessens the contact with teeth. [British Nutrition Foundation – Healthy hydration guide](#)

Some other sources of fluid in the diet

The below sources come with a varying degree of nutritional benefits.

Soups	Fruit juices and smoothies
Tea and coffee	Fruit and vegetables
Soft drinks	Stews and casseroles
Milk and yoghurt	Jelly



Factors that impact on hydration

Activity levels

When fluid levels fall due to excessive sweating there is an increase in sodium concentrations, which triggers the sensation of thirst. Endurance athletes, in particular, should consume fluids regularly before, during and after exercise. Dehydration is also cumulative over a period of days, which means it is possible to become dehydrated with even a moderate exercise routine if enough fluid isn't taken to replace what is lost on a daily basis. [Dehydration – Risk Factors](#)

Poor appetite or feeling unwell

More chronic diseases, for example, untreated diabetes, can leave a person dehydrated or any illness that results in a fever makes an individual more susceptible to dehydration.

Age

The sensation of thirst can diminish with age. Older people may also be affected by dementia, depression, or medication which affects their desire to eat or consume fluids. Also young children may not recognise being thirsty and if this is combined with being very active, they could be a vulnerable group for dehydration due to their higher body water content, along with their higher metabolic rates and increased body surface area to body mass index.

People working or exercising outside in hot humid weather

When it's hot and humid, the risk of dehydration and heat stroke increases. That's because when the air is humid, sweat can't evaporate and cool the body as quickly as it normally does, and this can lead to an increased body temperature and the need for more fluids.

People living at high altitudes

Living, working and exercising at high altitudes (generally defined as above 8,200 feet, or about 2,500 metres) can cause a number of health problems. One is dehydration, which commonly occurs when the body tries to adjust to high elevations through increased urination and more rapid breathing — the faster a person breathes to maintain adequate oxygen levels in the blood, the more water vapour is exhaled. [Dehydration – Risk Factors](#)



Effects of dehydration

Dehydration can be mild, moderate or severe, depending on how much of the body weight is lost through fluids:
[NHS – Dehydration Symptoms](#)

Mild	Moderate	Severe
<ul style="list-style-type: none"> dizziness or light-headedness headache tiredness dry mouth, lips and eyes passing small amounts of urine infrequently 	<ul style="list-style-type: none"> Heat exhaustion Kidney stones Muscle weakness constipation 	<ul style="list-style-type: none"> feeling unusually tired or confused dizziness when standing up that doesn't go away after a few seconds not passing urine for eight hours a weak pulse a rapid pulse fits (seizures) a low level of consciousness



Water intoxication

It can be dangerous to drink too much water as water intoxication can lead to hyponatremia
[British Nutrition Foundation – Liquids](#)

There are two types of over hydration, increased water intake and retaining water:

- increased water intake – or drinking more water than the kidneys can get rid of in the urine can cause too much water to collect in the body. This can occur both deliberately or accidentally. Some medications can increase thirst, for example, undiagnosed diabetes may lead to excessive thirst. Some mental illnesses, for example, schizophrenia, may result in compulsive drinking.
- when the body is unable to get rid of excess water, it is said to be retaining water, for example, liver disease or kidney problems. It can be dangerous because it throws off the balance between water and sodium in the blood.

Symptoms of over hydration may not be recognized in the early stages but can include:

- nausea and vomiting
- headache
- changes in mental state (confusion or disorientation)

If left untreated, over hydration can lead to dangerously low levels of sodium in the blood (hyponatremia), resulting in more severe symptoms, such as:

- muscle weakness, spasms or cramps
- seizures
- unconsciousness
- coma

[Healthline – Overhydration](#)



Revision Questions

- 1** Research the percentage water content of the following fruits and vegetables:

carrots

grapes

lettuce

oranges

peas

boiled potatoes

tomatoes

bananas

- 2** Summarise the nutritional benefits of including the following fluids in the diet:

Fluid	Nutritional benefit
Pure water	
Milk and yoghurt	
Fruit juices and smoothies	
Stews and casseroles	

- 3** Fluid intakes can be marginal in certain vulnerable groups. Discuss four population groups who could be at risk of dehydration.

- 4** Outline the reasons why water intoxication could occur and state the possible effects of this condition.

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