

The ABC of Iodine

A discovery guide for students
and teachers



EUthyroid2

Iodine feedback tool

Take 5 minutes to fill out the Iodine feedback tool individually

Why is iodine important?

Iodine is an essential mineral that plays a key role in the body for a healthy life. You only need it in tiny amounts every day. It helps your thyroid gland, which controls how fast your body uses energy. It's crucial for growth and staying energised. Without enough iodine, your body might not work as it should, so it's important to make sure you get enough. The intake of iodine is important at all stages of life, but especially for children and women who plan to have a child.

You need iodine before you are born and very early in life to ensure you can grow and learn well. In the months after birth, your mother's breast milk or formula can provide the iodine you need. After that, you need to find it in your diet from different iodine-rich foods.



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An **essential mineral** is when a mineral is needed but your body cannot produce it, you have to get it from your diet

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Why is iodine important?

Iodine is needed before you are born, very early in life, throughout your childhood, and when you are planning to have a baby.

You need iodine:

Before birth



During childhood



As an adult

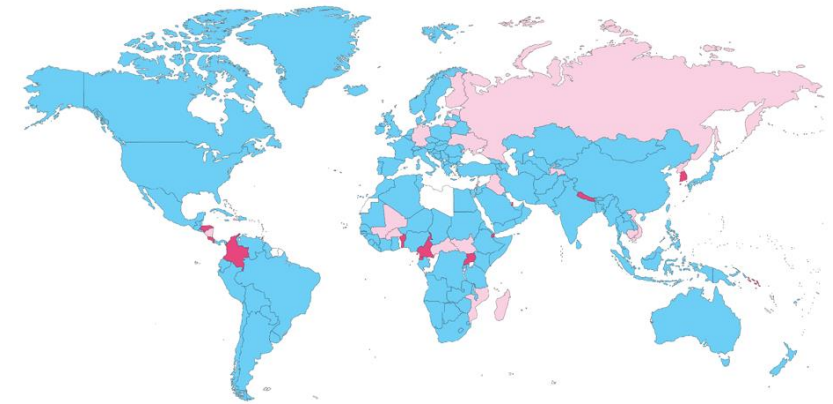


Does everyone in the world have access to iodine in their diet?

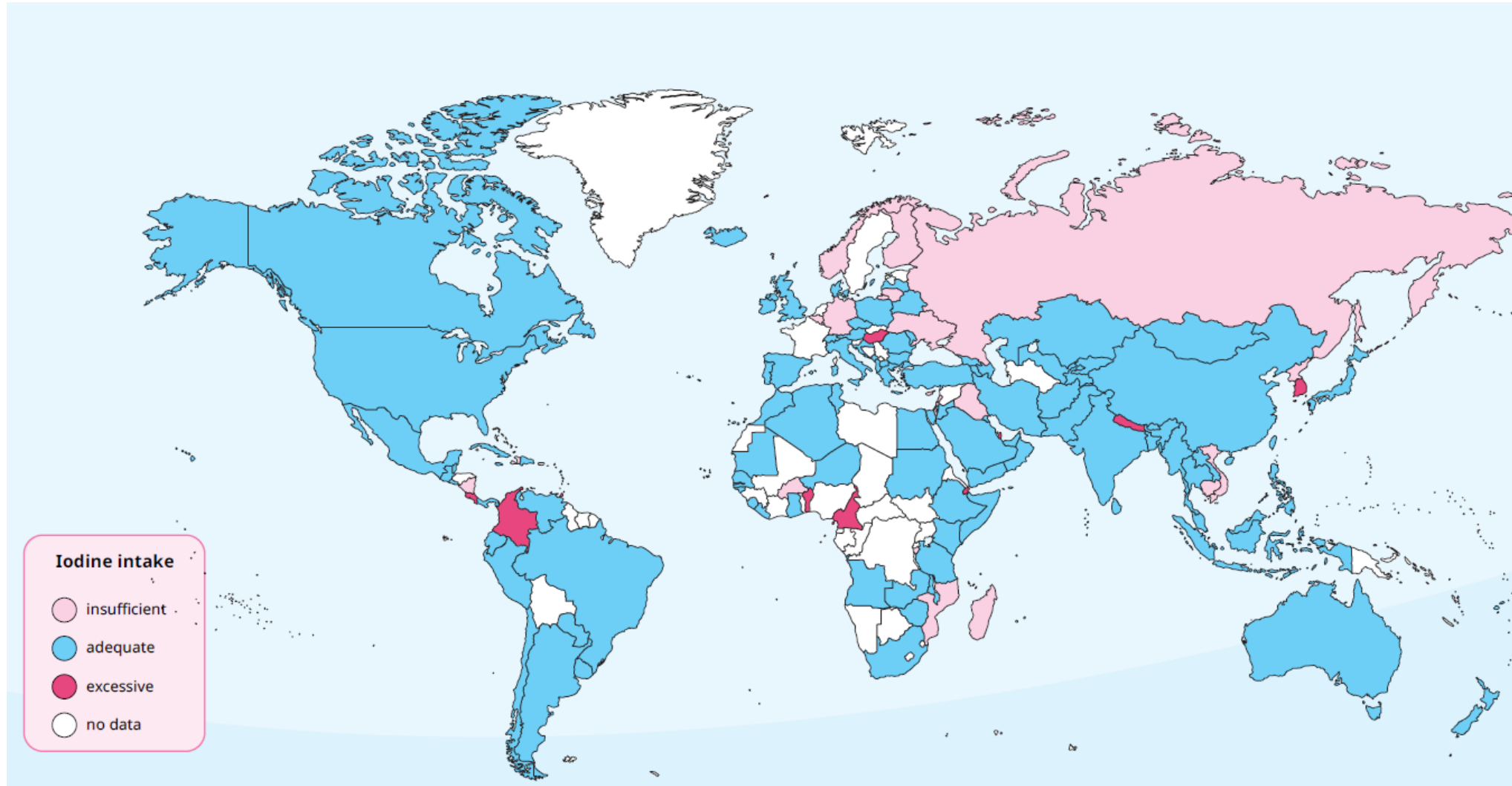
Most normal diets in many countries lack sufficient iodine.

Iodine status is monitored by governments by checking iodine content in urine during national or regional surveys.

Because of a global campaign to add iodine to household salt, much of the world's population has access to the tiny amounts of iodine they need. However, in some countries, including the United Kingdom and the Republic of Cyprus, people do not have access to iodised salt.



Find your country to see iodine status



What is the history of iodine deficiency?

Iodine deficiency has a long history. In 326 BCE, Alexander the Great saw swollen necks in residents of the northern area of present-day Pakistan. This was goitre, a swelling of the thyroid gland in the neck due to iodine deficiency.

Switzerland was the first country in the world to iodise salt (add iodine to salt) as a way of tackling the problem of iodine deficiency, and has been doing so for more than a hundred years. Before that, there were high rates of severe and permanent mental impairment, especially in regions with low iodine levels in soil and plants.



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Iodine deficiency or micronutrient deficiency is when your body doesn't get enough of something it needs, such as important vitamins and minerals, like iodine.

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Mental impairment involves difficulties in cognitive functions such as learning, understanding, remembering, or problem-solving, which might affect an individual's ability to grasp information or interact with the world in typical ways.

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What is the history of iodine deficiency?

About 30 years ago, international leaders, the salt industry and people all over the world came together in a campaign to iodise salt, called Universal Salt Iodisation. Thanks to this campaign, we no longer see the signs of severe iodine deficiency in most parts of the world.

However, we still see moderate and mild deficiencies, mostly due to lack of attention to use of iodised salt and eating iodine-rich foods.



Iodine: Fueling growth and energy

You need iodine to produce thyroid hormones, which are necessary for growth and metabolism. The thyroid gland is in front of your neck, below the Adam's apple. If it cannot produce the right amount of thyroid hormones, this may lead to negative health effects. Also, if the thyroid gland does not get enough iodine, it may lead to thyroid diseases (too little or too much of the thyroid hormone is produced). Since the thyroid hormones are important for metabolism, iodine deficiency may lead to problems regulating body temperature, fatigue, tiredness, and weight changes.



Fact

The thyroid gland is a small butterfly-shaped gland in the front of your neck, below the Adam's apple.



Iodine in pregnancy: growth and brain development of the baby

It's important to have good iodine nutrition before becoming pregnant.

Iodine is crucial during pregnancy because it supports the production of thyroid hormones. These hormones are essential for the healthy development of the baby's brain and nervous system.

Thus, iodine is important for the development of cognitive abilities, learning, and overall health as the baby grows.



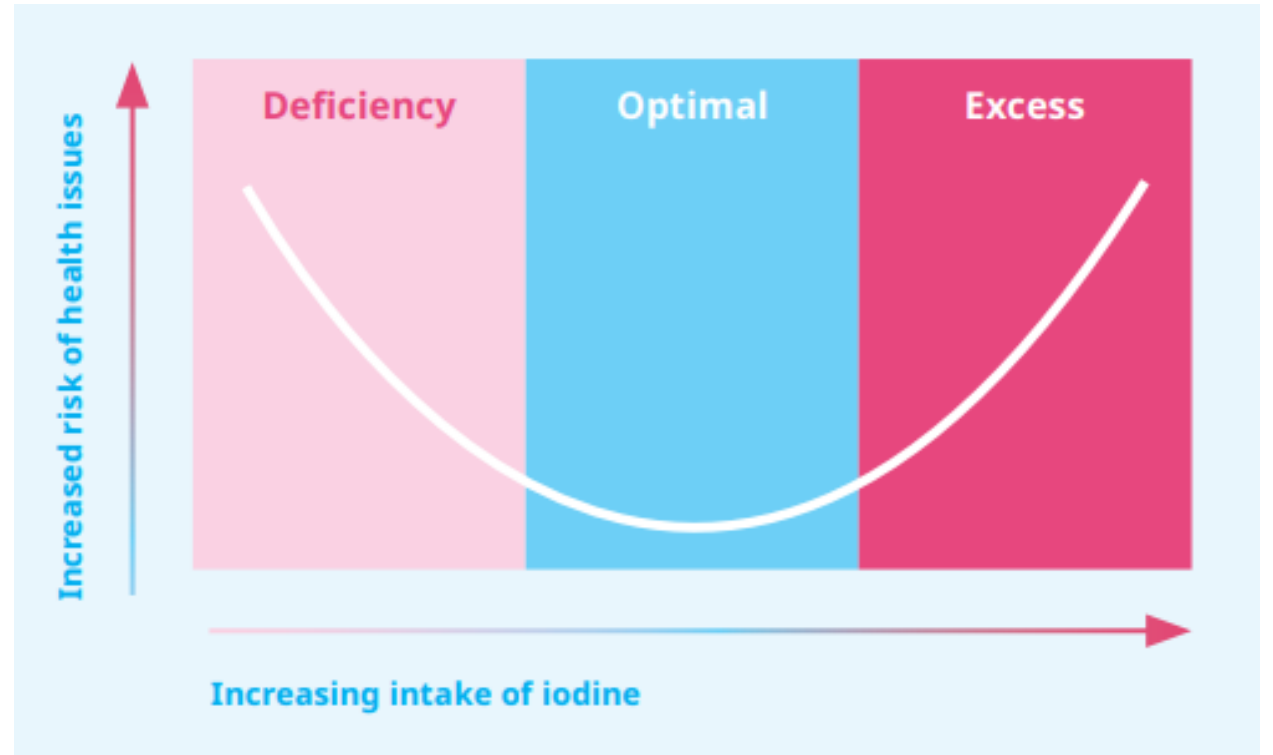
Why should we care about iodine deficiency today?

While the signs of severe iodine deficiency are fading, moderate and mild iodine deficiency still exist. As it is no longer an obvious, visible issue, many people do not know about the importance of having enough iodine in their diets.

Iodine deficiency can impact the health of all population groups, and it is the largest preventable cause of mental impairment.

Getting the proper amount of iodine is important for good health

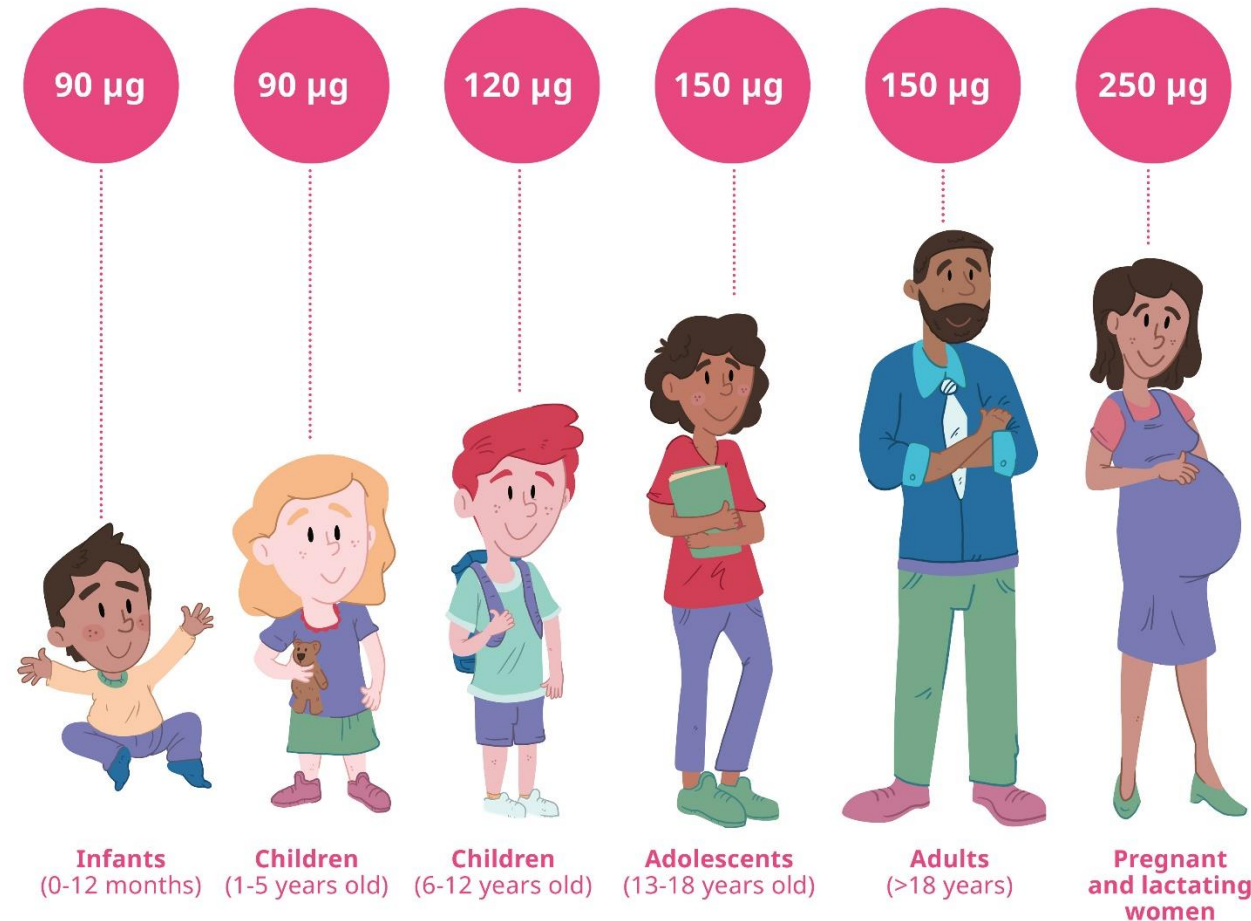
One might think that if a little iodine is good for human health, then consuming more iodine is even better. But like many nutrients, you can have too much of it. Ensuring an adequate but not excessive iodine intake is essential for health.



Recommended intake

– also for pregnancy and breastfeeding

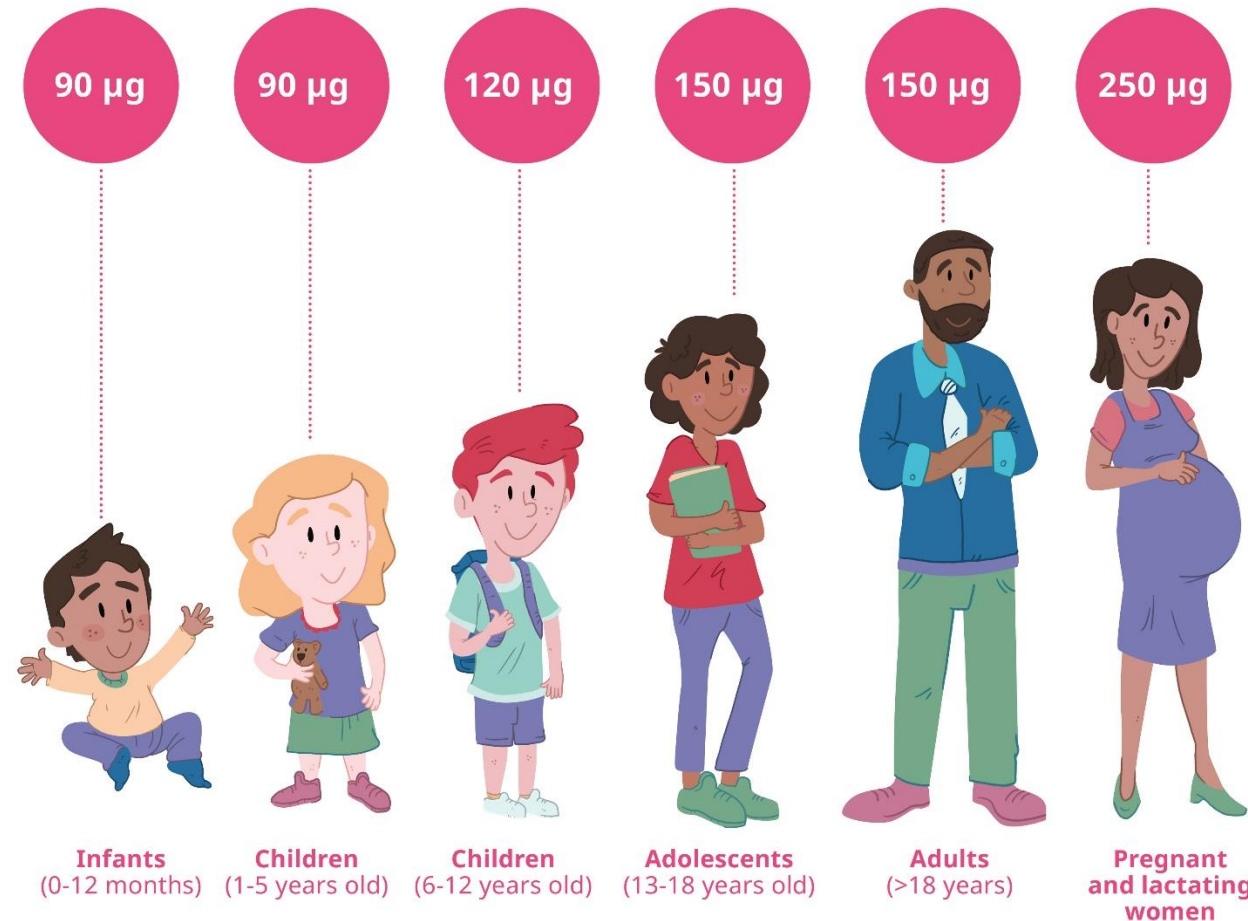
Recommendation (micrograms per day)



The World Health Organisation (WHO) recommends the following iodine intake per day (2007). These recommendations are based on the average daily intake of iodine necessary to maintain thyroid hormones and overall well-being for different age groups and life stages.

Recommended intake

Recommendation (micrograms per day)

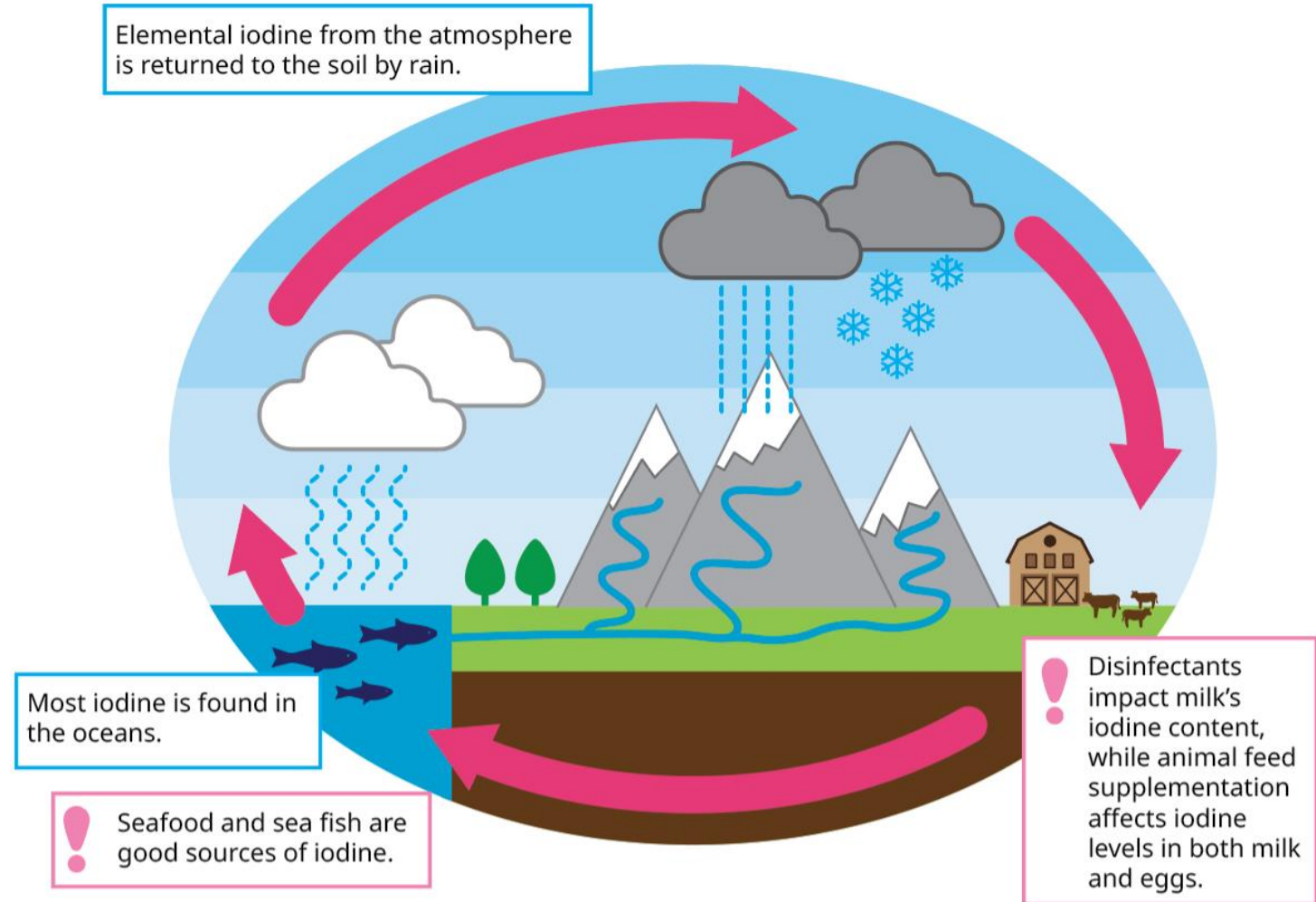


Fact

A µg (microgram) is such a small amount that it's hard to illustrate. The amount of iodine you need a day is so small that you will need less than a teaspoon of iodine your entire lifetime.

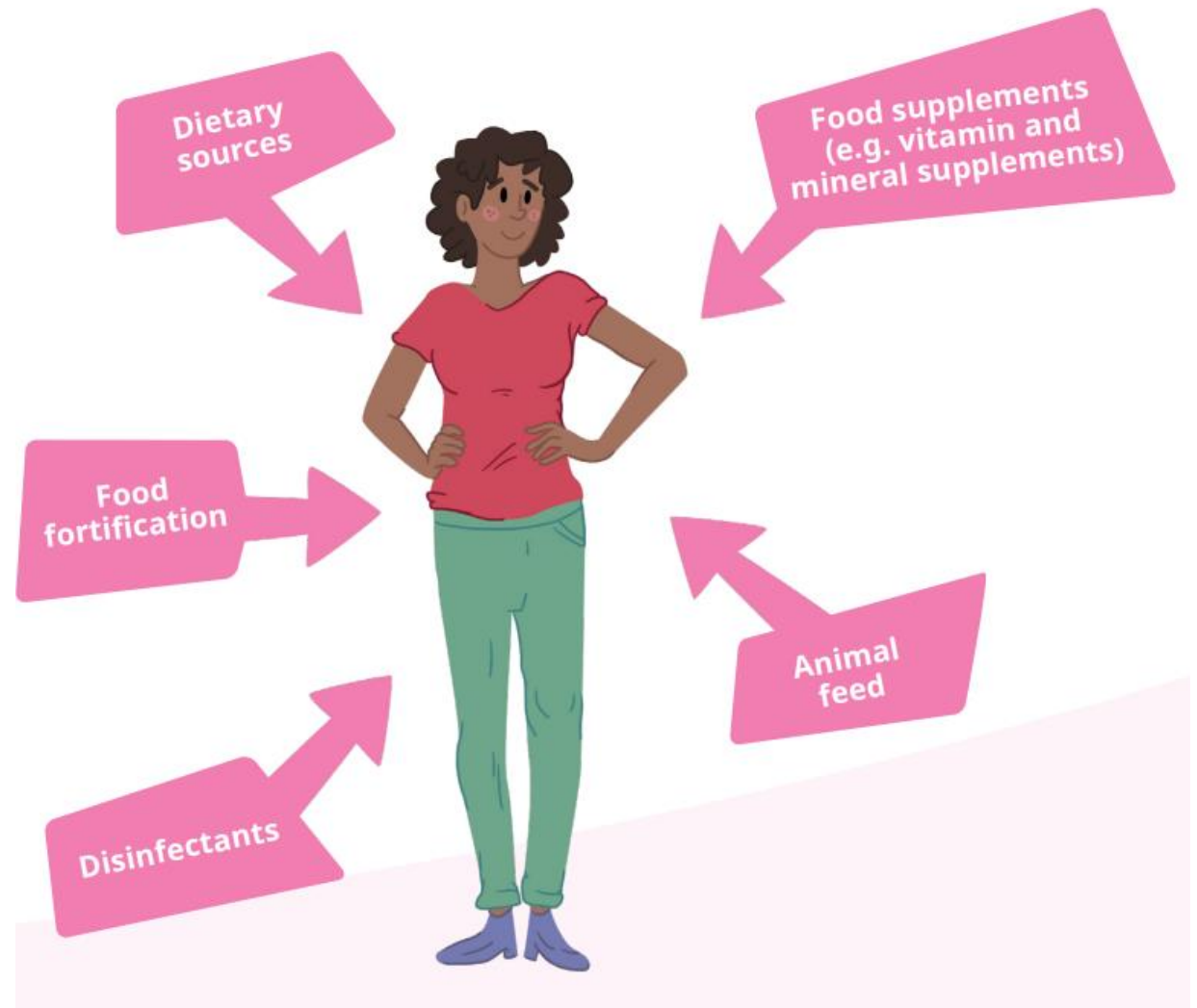
The iodine cycle

Iodine's journey starts in the ocean, where fish, shellfish and seaweed absorb it from sea water. From the ocean, iodine evaporates into the air in tiny droplets. These droplets fall on land when it rains, and the soil absorbs the iodine.



The iodine cycle

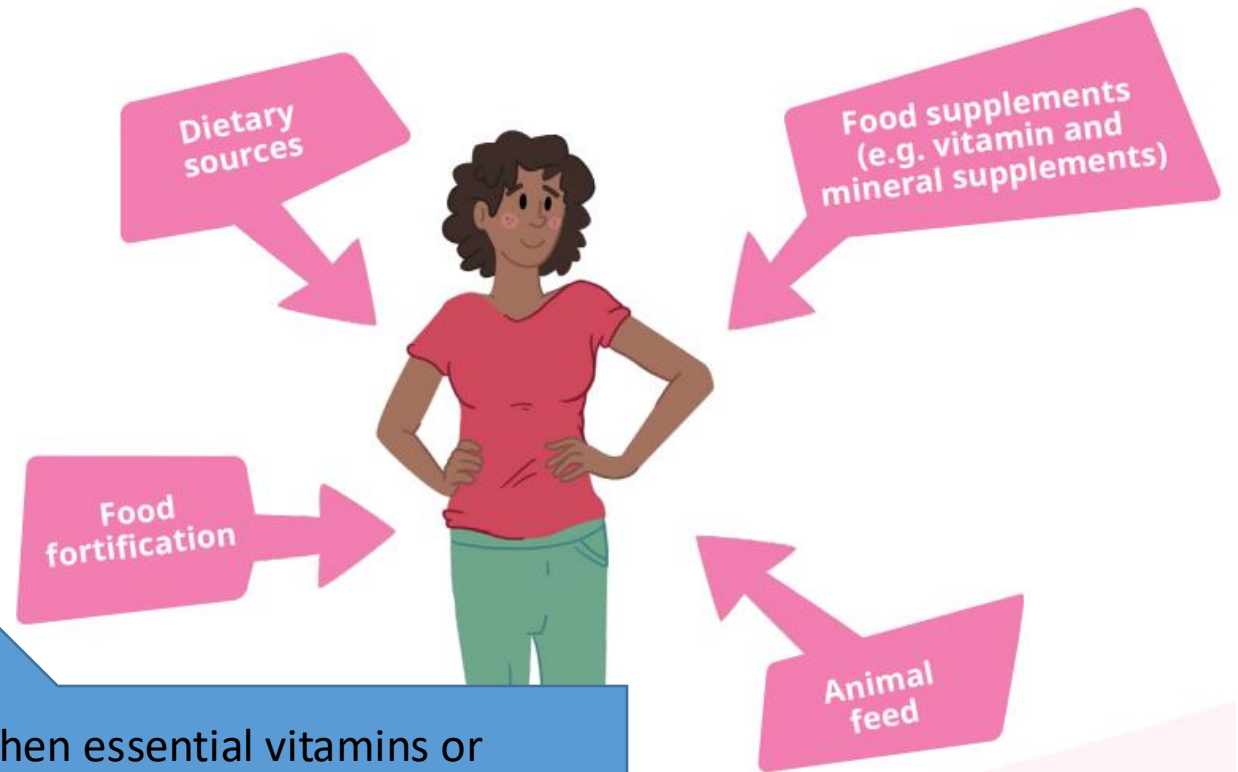
Furthermore, national regulations on iodine content in animal feed, food fortification, and salt iodisation programmes influence the level of iodine in foods. In some countries, iodine is also used as a disinfectant during milking and so milk and dairy products are also a good source of iodine in your diet. Hence, iodine enters the food chain in various ways.



The iodine cycle

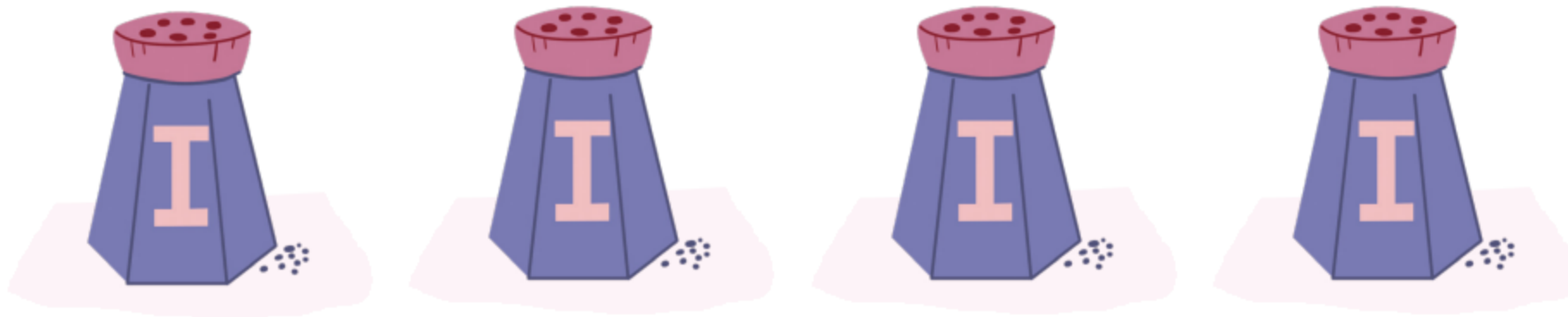
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Fortification is when essential vitamins or minerals, like iodine, are added to certain foods such as salt, bread, cereals, or milk. The aim is to increase the amount of certain nutrients in particular foods and make sure that people get enough of the important vitamins and minerals.



How can countries ensure that people are getting enough iodine in their diets?

Countries may have different ways of ensuring that their population consumes enough iodine. Many countries have salt iodisation programmes, but they may differ in terms of how much iodine is added to salt (this depends on how much iodine people in a particular country need). In some countries, it is mandatory to use iodised salt (salt with added iodine) to produce bread and ready-made foods, whereas in others, it is voluntary.



How can countries ensure that people are getting enough iodine in their diets?

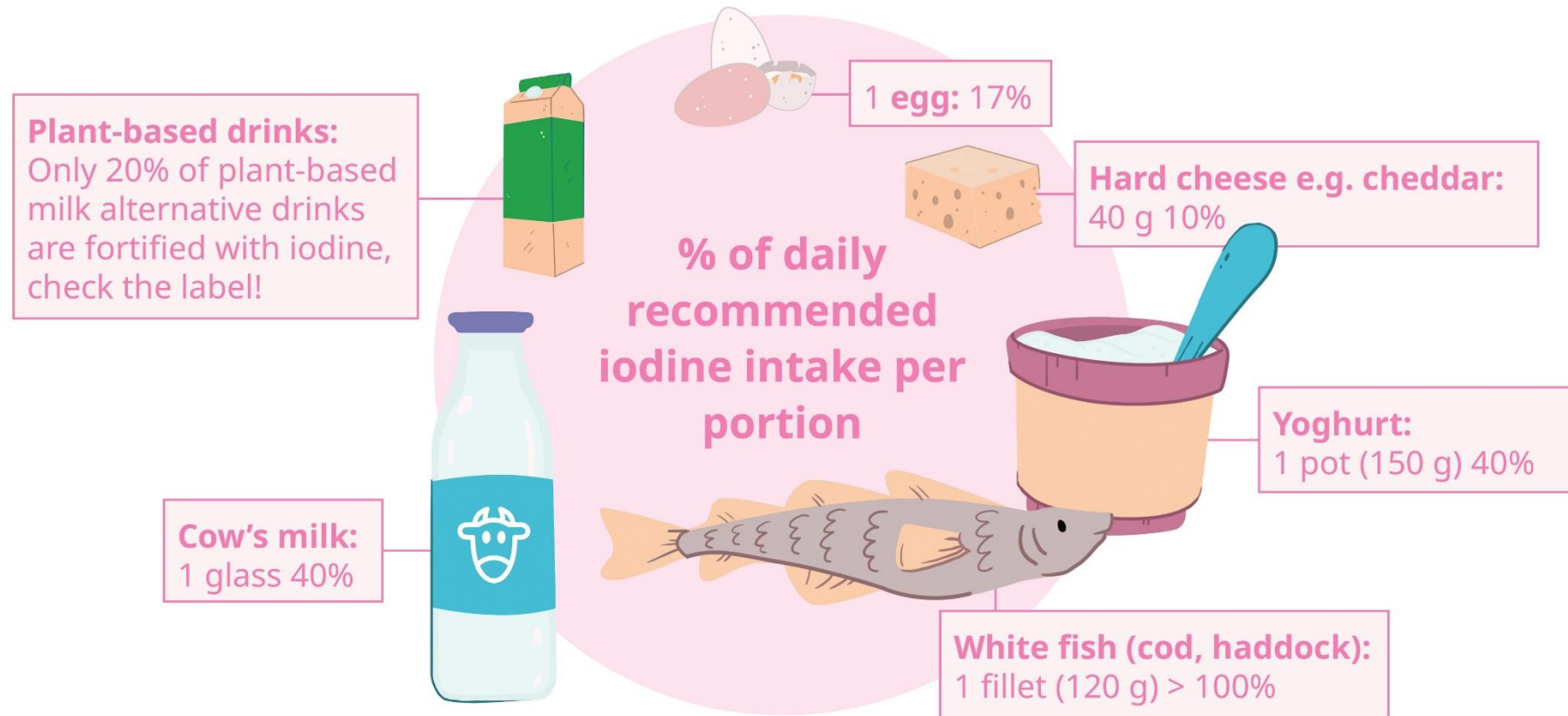
There are also other ways iodine is introduced into the food chain, including fortification of animal feed and the use of biocides in food production. These affect how much iodine ends up in foods such as milk and eggs because of what the animals eat or how the foods are produced.

Legislation regarding iodised salt, food culture and geographical conditions may create significant differences in iodine intake between countries – even those that are geographically close to each other.



Iodine sources

Portion sizes to get the recommended amounts of iodine through diet



Isn't salt bad for us?

WHO supports salt iodisation as the best strategy to ensure that people get enough iodine. But WHO is also concerned about how much salt people eat because it can cause other health problems, such as high blood pressure, heart disease, and stroke. What people really need to do is eat less salt, but make sure it's iodised.



Designing iodine-rich meals: A group exercise


In a small group or two and two together, come up with a meal for lunch rich in iodine.

You can also choose to compose the three main meals for a pregnant/ non-pregnant women, a vegetarian, or a vegan, ensuring their iodine needs are met.

Present your work to the others and discuss it with your classmates.




Things to remember




Having enough iodine before and during pregnancy protects the baby's brain development.




Be sure to include different iodine-rich foods in your diet.



Iodine is important for your health throughout your life.

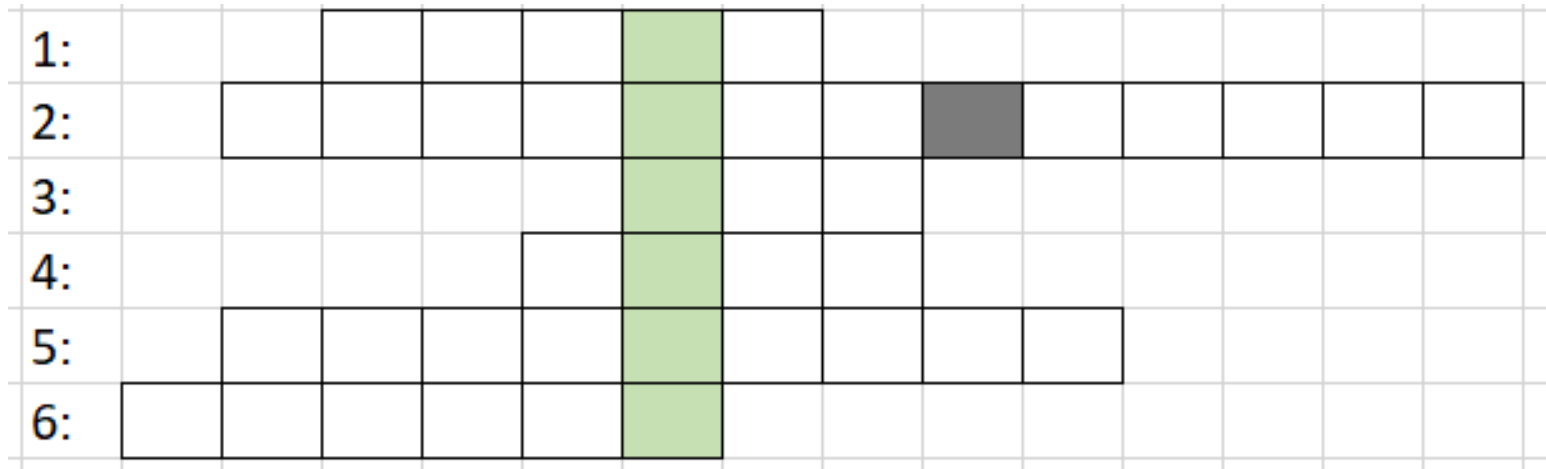


If you use plant-based drinks like soy or oat products to substitute cow's milk, check if it contains iodine and if not, make sure you are getting your iodine from other sources.



Avoid having too little or too much iodine: balance is important.

Crossword



1. Iodine is important for the development of the baby's _____.
2. Thyroid hormones are produced in the _____ gland.
3. As an adolescent, you need 150 micrograms of iodine per _____.
4. _____ is a good marine source of iodine.
5. Women need a higher iodine intake per day during _____.
6. Iodine deficiency may lead to the enlargement of the thyroid, this is called _____.

Spot the errors

Adequate iodine intake is essential to prevent iron deficiency.

Having enough iodine in the diet is especially important during old age.

A global campaign 100 years ago to iodise salt helped reduce the incidence of deafness.

Apart from iodised salt, other important sources of iodine are chocolate and rice.

Module A exercises - answers

A1: Which functions do iodine influence and regulate in your body?

(You can mark multiple choices.)

- Blood circulation
- Metabolism
- Brain development, especially during pregnancy and early childhood
- Reproductive functions and fertility
- Respiratory function
- Growth and development, particularly during childhood and adolescence

Module A exercises - answers

A1: Which functions do iodine influence and regulate in your body?

(You can mark multiple choices.)

Blood circulation

Metabolism

Brain development, especially during pregnancy and early childhood

Reproductive functions and fertility

Respiratory function

Growth and development, particularly during childhood and adolescence



Module A exercises - answers

- **A2: Fill in the blanks**

- Insufficient iodine in the diet might lead to a condition known as _____, characterised by an enlarged _____.
- The u-shaped curve illustrates that you can get both too _____ and too _____ iodine.
- When there is too little iodine, it may result in _____ and impaired _____ development.

Module A exercises - answers

A3: Which foods are good iodine sources? (You can choose more than one answer)

- Eggs
- Bread
- Cereals
- Milk and dairy products
- Fish and seafood
- Fruits and vegetables
- Potatoes
- Vegetable oils
- Iodised salt

Module A exercises - answers

A3: Which foods are good iodine sources? (You can choose more than one answer)

- ✓ Eggs
- Bread
- Cereals
- ✓ Milk and dairy products
- ✓ Fish and seafood
- Fruits and vegetables
- Potatoes
- Vegetable oils
- ✓ Iodised salt

Module A exercises - answers

A4: How much iodine does WHO advise adolescents to consume per day?

- 100 μg
- 150 μg
- 200 μg
- 250 μg
- 350 μg
- 600 μg
- 1000 μg

Module A exercises - answers

A4: How much iodine does WHO advise adolescents to consume per day?

- 100 μg
- 150 μg
- 200 μg
- 250 μg
- 350 μg
- 600 μg
- 1000 μg

Module A exercises - answers

A5: How much iodine does WHO advise pregnant women to consume per day?

- 75 μg
- 100 μg
- 150 μg
- 175 μg
- 200 μg
- 250 μg
- 600 μg
- 1000 μg

Module A exercises - answers

A5: How much iodine does WHO advise pregnant women to consume per day?

- 75 μg
- 100 μg
- 150 μg
- 175 μg
- 200 μg
- 250 μg
- 600 μg
- 1000 μg

Module A exercises - answers

A6: Why is iodine vital during pregnancy? (You can choose more than one answer)

- It is important for the development of the baby's bones and teeth
- It is important for the development of the baby's brain and nervous system
- It ensures the baby's overall growth
- It is important for the development of the baby's organs and skin

Module A exercises - answers

A6: Why is iodine vital during pregnancy? (You can choose more than one answer)

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- ✓ It is important for the development of the baby's brain and nervous system
- ✓ It ensures the baby's overall growth
- It is important for the development of the baby's organs and skin

Module A exercises - answers

A7: How many or how much?

How many eggs should you eat a day to have enough iodine as an adolescent?

- 2 eggs
- 5 eggs
- 6 eggs
- 9 eggs

Module A exercises - answers

A7: How many or how much?

How many portions of white fish should you eat a day to have enough iodine as an adolescent?

- 1 portion
- 2 portions
- 3 portions
- 4 portions

Module A exercises - answers

A7: How many or how much?

How many glasses of cow's milk should you drink a day to have enough iodine as an adolescent?

- 1 glass of milk
- 2-3 glasses of milk
- 5 glasses of milk
- 10 glasses of milk

Group work in module B

Iodine awareness quest: crafting a community questionnaire

Assignment



Work with your classmates to create a questionnaire that asks family and friends or people in your community about iodine and how it affects their health.

How to make a questionnaire and how to do the study? See more on the ABC of iodine platform

Iodine detective: exploring family food records

Assignment



Work together with your group to create iodine food records, focusing on where they get iodine in their diets. Use the iodine feedback tool.

How to make a food record? See more on the ABC of iodine platform

Tracing iodine: mapping global fortification programmes

Assignment



You and your group will study and compare iodine fortification programmes in different countries, including your own.

Learn more on fortification programmes on the ABC of iodine platform

Iodine investigation: exploring local food sources

Assignment



Explore local stores and markets to uncover iodine-rich foods. Collaborate with your group to select stores, examine products, and document findings. Prepare a presentation for the class. Alternatively, conduct an online search.

Find guidelines for your investigation on the ABC of iodine platform

Group work in module C

Craft your iodine campaign poster!

Assignment



Design and create a campaign poster for an imagined national campaign for iodine awareness. This poster should educate others about what iodine is and why it is important for health.

A campaign aims to inform people about a topic and encourage them to act in a certain way. You will create a campaign for iodine awareness, targeting students of your age, explaining them why iodine is important for health and guide them to pay attention to their daily iodine intake.