Food and Agriculture Organization of the United Nations

YUNGA LEARNING AND ACTION SERIES

NUTRITION UNITED NATIONS CHALLENGE BADGE

Nutrition Challenge Badge

YOUTH & UNITED NATIONS GLOBAL ALLIANCE

CBD :: FAO :: WAGGGS :: WHO :: WOSM

This booklet is intended as a guide for teachers and youth leaders. These individuals are responsible for the development of programmes and activities that are suitable for their group and should provide the required supervision to ensure all participants are safe and sound.

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World Health Organization

This document has been developed with the support of WHO. The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the World Health Organization.

Sida

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs, Education and Research EAER
Federal Office for Agriculture FOAG

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ZERO HUNGER CHALLENGE

This product is in support of the UN Zero Hunger Challenge: www.un.org/en/zerohunger

UNITED NATIONS DECADE OF ACTION ON NUTRITION 2016-2025

This badge is inspired by the Second International Conference on Nutrition (ICN2), co-hosted by FAO and WHO in 2014 and supports the United Nations Decade on Action on Nutrition.

UNESCO Global Action Programme on Education for Sustainable Development

This product contributes to the Global Action Programme on Education for Sustainable Development of UNESCO.

GOALS

The YUNGA Challenge Badges are developed to support the achievement of the Sustainable Development Goals (SDGs). This challenge badge supports achievement of SDGs 2,3 and 12.

This Challenge Badge is part of FAO's strategic objective 2, in making agriculture, forestry and fisheries more productive and sustainable.

YOUTH AND UNITED NATIONS GLOBAL ALLIANCE (YUNGA)

Nutrition Challenge Badge

Developed in collaboration with

Convention on Biological Diversity

Food and Agriculture Organization of the United Nations

World Health Organization

SCOUTS

The World Association of Girl Guides and Girl Scouts (WAGGGS) and the World Organization of the Scout Movement (WOSM) endorse this educational badge framework for use by Guides and Scouts around the world, adapting it as necessary to their local needs and requirements.

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS | 2017

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INTRODUCTION

> **Food** is fundamental to **health** and life and thus is considered a basic **human right**

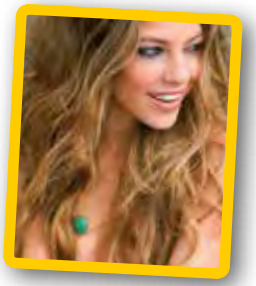
Food brings people together, providing a basis for sharing and enjoyment. Humans have always prepared special foods and dishes to mark celebrations and important events, from weddings to births, to the crowning of a new king or queen. However, food has a much more important role in our lives than just being the key to a celebration. Every human, animal and plant on Earth needs food to live, grow and reproduce. In fact, food is so fundamental to health and life that it is considered a basic human right. Each and every one of us should always be able to get the food we need to be healthy.

Eating the right kinds of foods, in the right amounts, is vital for our health. In this Challenge Badge, you will learn what nutrients, vitamins and minerals different foods can give you. You will also learn how to follow a healthy diet and develop good eating habits. You will learn about the importance of food safety, and steps you can take to buy and store food safely. The booklet also explains the impacts your food choices have on the wider world, and how you can shop and cook in a more environmentally friendly way. Finally, the Badge gives ideas about how you can take action to make sure you and those around you can lead healthy and environmentally responsible lives.

Take this booklet and EXPLORE, LEARN and DISCOVER – and while you're having fun, maybe you can even come up with some clever ways to spread the word about good nutrition. We hope you will feel inspired to take action and do what you can to have a healthy and nutritious diet.

THE ACTIVITIES OF THE YOUTH AND UNITED NATIONS GLOBAL ALLIANCE ARE SUPPORTED BY THE FOLLOWING AMBASSADORS:

Carl Lewis



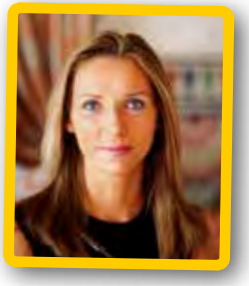
Debi Nova

Lea Salonga

Nadeah

Percance

Noa (Achinoam Nini)



Valentina Vezzali

YUNGA AMBASSADORS

BE SAFE AND SOUND!

DEAR LEADER OR TEACHER,

The Challenge Badges are designed to support you in undertaking educational activities. However, as you will be implementing these activities in different contexts and environments, it is up to you to ensure that the activities you choose are appropriate and safe. This document contains a number of suggested activities to help your group learn about good nutrition; however, do not feel restricted to this content – why not see what other things you can come up with in your groups?

Practical activities such as those in the second half of this booklet are a fantastic way to learn about foods that lead to good nutrition and a balanced diet. Nevertheless, it is important to take some precautions to ensure nobody gets hurt. Please plan carefully and make sure you have enough support to keep participants safe, especially when using sharp cooking utensils or heat. On the right are some suggested precautions to consider, but a full assessment needs to be carried out before you start the activities. You can also involve the young people you are working with, and see if they can come up with other safety issues that they should consider.

SOME GENERAL PRECAUTIONS TO CONSIDER INCLUDE:

LOOK AFTER YOURSELF

- Wash your hands before and after every activity.
- Don't taste things that you find unless you are certain they are not poisonous.
- Be particularly careful when you are using ovens, gas burners or fire. Make sure there is an adult present at all times. Avoid using coal and kerosene as fuel as they give off dangerous chemicals which are bad for both you and the environment.
- Be careful when using sharp objects such as knives, scissors and other cooking utensils. Young children should be supervised by an adult at all times.
- Be careful also when using electrical appliances. Make sure your hands, the surface you are working on and the appliance are dry before turning it on.
- Be careful to handle, prepare, store and cook food correctly and do not eat food that has gone past the use-by date.
- Don't drink or cook using water from natural sources unless you are sure it is safe.
- In some activities, you have the option of uploading pictures or videos to the Internet on Web sites such as YouTube. Always make sure that everyone in the pictures or videos, and/or their parents, has given their permission before you post anything online.

LOOK AFTER THE NATURAL WORLD

- Recycle or reuse the materials used in the activities as much as possible.
- Minimize your environmental footprint: try to shop locally, buy food that is in season and compost left-over food and fruit and vegetable peelings, etc.
- Do not leave litter in outside environments – take any rubbish home and dispose of it properly.
- It is better to leave nature as you found it. Never pick protected species. Before collecting plants or picking flowers, get permission. Only take what you really need and make sure you leave at least one-third of anything you find in the wild.

SUSTAINABLE DEVELOPMENT GOALS

The Youth and United Nations Global Alliance (YUNGA) actively supports the achievement of the Sustainable Development Goals (SDGs) through the development of initiatives, activities and resources such as the United Nations Challenge Badges and by promoting and encouraging young people to be active citizens in their communities. Additional Challenge Badges are being developed to further support the SDGs.

This Nutrition Challenge Badge specifically supports goals numbers 2 (Zero hunger), 3 (Good health and well-being) and 12 (Responsible consumption and production patterns).

END HUNGER, ACHIEVE FOOD SECURITY AND IMPROVED NUTRITION AND PROMOTE SUSTAINABLE AGRICULTURE

GOOD HEALTH AND WELL-BEING

ENSURE SUSTAINABLE CONSUMPTION AND PRODUCTION PATTERNS

The SDGs succeeded the Millennium Development Goals in 2015 and are a set of targets that governments, civil society organizations, United Nations agencies and other entities are working towards achieving by 2030 to ensure a more sustainable future for all.

SUSTAINABLE DEVELOPMENT GOALS

Find out more about the Sustainable Development Goals at:
www.fao.org/yunga/global-citizens/sdgs/en
and
https://sustainabledevelopment.un.org/topics/sustainabledevelopmentgoals

THERE ARE 17 SDGS:

1 – NO POVERTY
End poverty in all its forms everywhere

2 – ZERO HUNGER
End hunger, achieve food security and improved nutrition and promote sustainable agriculture

3 – GOOD HEALTH AND WELL-BEING
Ensure healthy lives and promote well-being for all at all ages

4 – QUALITY EDUCATION
Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

5 – GENDER EQUALITY
Achieve gender equality and empower all women and girls

6 – CLEAN WATER AND SANITATION
Ensure availability and sustainable management of water and sanitation for all

7 – AFFORDABLE AND CLEAN ENERGY
Ensure access to affordable, reliable, sustainable and modern energy for all

8 – DECENT WORK AND ECONOMIC GROWTH
Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

9 – INDUSTRY, INNOVATION AND INFRASTRUCTURE
Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

10 – REDUCED INEQUALITIES
Reduce inequality within and among countries

11 – SUSTAINABLE CITIES AND COMMUNITIES
Make cities and human settlements inclusive, safe, resilient and sustainable

12 – RESPONSIBLE CONSUMPTION AND PRODUCTION
Ensure sustainable consumption and production patterns

13 – CLIMATE ACTION
Take urgent action to combat climate change and its impacts

14 – LIFE BELOW WATER
Conserve and sustainably use the oceans, seas and marine resources for sustainable development

15 – LIFE ON LAND
Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

16 – PEACE, JUSTICE AND STRONG INSTITUTIONS
Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

17 – PARTNERSHIPS FOR GOALS
Strengthen the means of implementation and revitalize global partnership for sustainable development

GOAL 2: ZERO HUNGER

What's the goal here?

To end hunger, achieve food security and improved nutrition and promote sustainable agriculture.

Why?

Extreme hunger and malnutrition remain a barrier to sustainable development and create a trap that is very difficult for people to escape from. Hunger and malnutrition mean less productive individuals, who are more prone to disease and therefore often unable to earn more and improve their livelihoods. There are nearly 800 million people who suffer from hunger worldwide, the majority in developing countries.

In 2015

5.9 million children

die before the age of 5

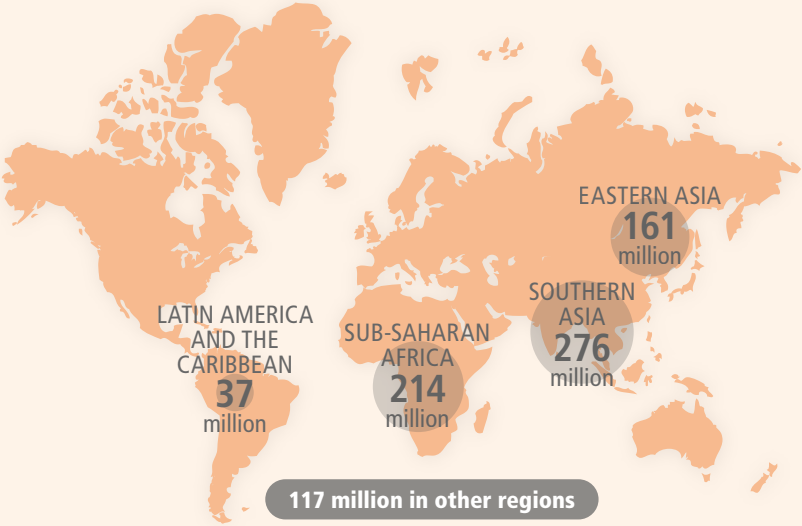
50% attributable to undernourishment

(*Source*: UNICEF, 2015)

Some of the targets of Goal 2

- By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round.
- By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons.
- By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment.

Most of the world's undernourished people are still found in Southern Asia, followed by sub-Saharan Africa, Eastern Asia and Latin America and the Caribbean.



GOAL 3: GOOD HEALTH AND WELL-BEING

What's the goal here?

To ensure healthy lives and promote well-being for all people at all ages.

Why?

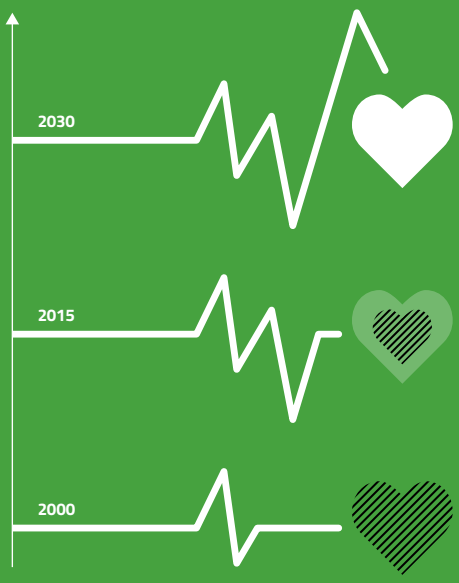
Ensuring healthy lives and promoting well-being for all people is essential to sustainable development. Significant strides have been made in increasing life expectancy and reducing some of the common killers associated with child and maternal mortality. Major progress has been made on increasing access to clean water and sanitation, reducing malaria, tuberculosis, polio and the spread of HIV/AIDS. However, many more efforts are needed to fully eradicate a wide range of diseases and address many different challenging health issues.

Some of the targets of Goal 3

- By 2030, reduce the global maternal mortality ratio to less than 70 per 100 000 live births.
- By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1 000 live births and under-5 mortality to at least as low as 25 per 1 000 live births.
- By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases.
- By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being.

THE WORLD IN 2030

Mothers are healthier than ever. Preventable causes of infant mortality are eradicated.



Fewer than 70
maternal deaths
per 100,000 live births

216
maternal deaths
per 100,000 live births

341
maternal deaths
per 100,000 live births

GOAL **3**

GOOD HEALTH AND WELL-BEING

#GLOBAL GOALS
Sustainable Development Goals

GOAL 12: RESPONSIBLE CONSUMPTION AND PRODUCTION

What's the goal here?

To ensure sustainable consumption and production patterns.

Why?

More people globally are expected to join the middle class over the next two decades. This is good for individual prosperity but it will increase demand for already constrained natural resources. If we don't act to change our consumption and production patterns, we will cause irreversible damage to our environment.

Roughly 1/3 of food produced for human consumption gets lost or wasted 1.3 billion tons per year

(*Source*: UNCTAD)

Some of the targets of Goal 12

- By 2030, achieve the sustainable management and efficient use of natural resources.
- By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses.
- By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.

Sustainable Development GOALS

Why don't you explore with your group which 'targets' you could contribute towards achieving in your local community?

Find out more about the Sustainable Development Goals at:
www.fao.org/yunga/global-citizens/sdgs/en/
and **https://sustainabledevelopment.un.org/topics/**

If you have access to a smartphone, you could then create and record your actions using the SDGs in action app:
https://sdgsinaction.com

THE CHALLENGE BADGE SERIES

Developed in collaboration with United Nations agencies, civil society and other organizations, the United Nations Challenge Badges are intended to raise awareness, educate and motivate young people to change their behaviour and be active agents of change in their local communities. The Challenge Badge series can be used by teachers in school classes and by youth leaders and especially Guide and Scout groups.

To see existing badges go to www.fao.org/yunga. To receive updates on new releases and other YUNGA news, register for the free YUNGA newsletter by emailing yunga@fao.org.

YUNGA has or is currently developing badges on the following topics:

AGRICULTURE: How can we grow food in a sustainable way?

BIODIVERSITY: Let's make sure no more of the world's glorious animals and plants disappear!

CLIMATE CHANGE: Join the fight against climate change!

ENERGY: The world needs a healthy environment as well as electricity – how can we have both?

FORESTS: Forests provide homes for millions of plant and animal species, help regulate the atmosphere and provide us with essential resources. How can we ensure they have a sustainable future?

GENDER: How can we create an equal and fair world for girls and boys, women and men?

GOVERNANCE: Discover how decision-making can affect your rights and equality among people around the world.

HUNGER: Having enough to eat is a basic human right. What can we do to help the 1 billion people who still go hungry every day?

NUTRITION: What is a healthy diet and how can we make food choices that are environmentally friendly?

THE OCEAN: The ocean is mesmerizing and amazing. It helps regulate temperatures on Earth, provides us with resources and much, much more.

SOILS: Without good soil, nothing grows. How can we take care of the ground under our feet?

WATER: Water is life. What can we do to safeguard this precious resource?

CREATING BEHAVIOUR CHANGE

We work with young people because we want to support them in leading fulfilling lives, help them prepare for their future, and for them to believe that they can make a difference in the world. The best way to make this difference is by encouraging young people to embrace long-term behaviour change. Many current social and environmental problems are caused by unhealthy or unsustainable human behaviour. Most people need to adapt their behaviour, and not just for the duration of a project, such as working on this badge, but for life. Young people know more about these issues than ever before, but many still behave in a detrimental way. It is clear that simply raising awareness is not enough to change behaviour; it requires different values, attitudes and skills.

So what can you do?

There are some proven ways of promoting behaviour change so, to increase the long-term impact of this Challenge Badge, try to do the following:

FOCUS ON SPECIFIC, ACHIEVABLE BEHAVIOURAL CHANGE
Prioritize activities that target very clear and specific behaviour change (e.g. "walk or cycle whenever you can rather than taking the car" rather than "reduce your climate impact").

ENCOURAGE ACTION PLANNING AND EMPOWERMENT
Put young people in charge: let them choose their own activities and plan how to carry them out.

CHALLENGE CURRENT BEHAVIOUR AND TACKLE BARRIERS TO ACTION Encourage participants to scrutinize their current behaviour and think about how it could be changed. Everyone has excuses for why they don't behave in a particular way: lack of time, lack of money, not knowing what to do... the list goes on. Encourage young people to voice these excuses and then find ways around them.

PRACTISE ACTION SKILLS You'd like to take public transport more often? Collect and practise reading timetables, plot out routes on a map, take a walk to the bus stop, find out what the fare is, do a trial journey. You'd like to eat more healthily? Try lots of healthy foods to see which you like, experiment with recipes, learn how to read food labels, create meal planners, visit the shops or local markets to find healthy food choices. Keep practising until it becomes a habit.

SPEND TIME OUTDOORS No one is going to look after something they don't care about. Time spent in natural environments – whether that is the local park or a pristine wilderness – encourages an emotional connection with the natural world that is proven to lead to more pro-environmental behaviour. Using public spaces, even those in a city centre, and getting involved with communities are excellent ways of building ownership and a sense of responsibility for the environment and other individuals around us.

GET FAMILIES AND COMMUNITIES INVOLVED Why change the behaviour of just one young person when you could change the behaviour of their entire family, or even the whole community? Spread your message more widely, encourage young people to "pester" their family or friends to join in and showcase what you have been doing for the local community. For an even bigger impact, get political and lobby your local or national government.

MAKE A PUBLIC COMMITMENT People are far more likely to do something if they agree to do it in front of witnesses or in a written statement – why not take advantage of this?

MONITOR CHANGE AND CELEBRATE SUCCESS Behaviour change is hard work! Revisit tasks regularly to monitor achievement and reward continued success in an appropriate way.

LEAD BY EXAMPLE The young people you work with look up to you. They respect you, care about what you think and want to make you proud. If you want them to embrace the behaviour you are advocating, then you must lead by example and make those changes yourself.

TIPS ON UNDERTAKING THE BADGE WITH YOUR GROUP

In addition to the suggestions above encouraging behavioural change, the following ideas are intended to help you develop a programme to undertake the Challenge Badge with your group.

STEP 1 INVESTIGATE

Encourage your group to learn about the importance of nutrition and of having a healthy, balanced diet. You may find the background information is useful for this. Start by raising participants' awareness about how eating well keeps us healthy and why making good food choices are vital for everyday activities and our physical and mental development. Make sure they understand which foods supply which nutrients, and what service those nutrients provide us in living healthy, happy lives. Explain also how being undernourished or malnourished can damage our bodies. You can then introduce the concept of sustainable diets and why it is important that our food choices have minimal environmental impacts.

Finally, discuss with the group how our individual choices and actions can help make a positive difference to our health and the environment.

STEP 2 SELECT

Apart from the compulsory activities, which ensure that participants understand basic concepts and issues related to nutrition, participants are encouraged to select the activities that best match their needs, interests and culture. As far as possible, let the participants choose which activities they want to do. Some activities can be done individually, others in small groups. If you have another activity that is especially appropriate for your group or area, you may also include it as an additional option. You can also ask the young people if they can think of any activities they would like to do on this topic.

STEP 3 ACT

Allow enough time for the group to carry out the activities. Support and guide them through the process but make sure they carry out their tasks as independently as possible. Many activities can be conducted in several different ways. Encourage participants to think and act creatively when undertaking their activities.

STEP 4 DISCUSS

Have participants present the results of their Challenge Badge activities to the rest of the group. Do you notice any changes in their attitudes and behaviour? Discuss the experience and reflect on how they can continue to apply it in their lives.

STEP 5 CELEBRATE

Organize a celebration for those who successfully complete the badge curriculum. Invite families, friends, teachers, journalists and community leaders to participate in the celebration. Encourage your group to present the results of their project to the community in a creative way. Award them with certificates and Challenge Badges (see resources and additional information on p. 205).

STEP 6 SHARE WITH YUNGA!

Send us your stories, photos, drawings, ideas and suggestions:
yunga@fao.org

Find out more about YUNGA and treating a YUNGA Tribe at:
www.fao.org/yunga

BADGE STRUCTURE AND CURRICULUM

The Nutrition Challenge Badge is designed to help children and young people explore basic concepts of good nutrition, healthy and environmentally friendly eating habits and lifestyles. This booklet will help you develop an appropriate, enjoyable and engaging educational programme for your class or group.

This booklet includes basic **background information** on what we need to be healthy and well-nourished, and how important it is to practise healthy eating habits and lifestyles. The badge looks at the many factors that affect health, growth and prevention of disease and examines the connections between what people eat, their everyday practices and their health. It aims to help young people improve their skills in making good food choices, planning and preparing healthful meals, protecting the quality and safety of the foods they eat and in establishing personal habits and lifestyles that are good for their health and good for the environment. It also suggests and encourages actions you can take to raise awareness in the community about the importance of healthy diets and lifestyles.

The **second part** of the booklet contains the **badge curriculum**, a range of activities and ideas to stimulate learning and motivate children and young people to engage in nutrition issues and healthy diets.

Additional resources, useful Web sites and a glossary explaining key terms (that are highlighted in the text like **this**) are provided at the end of the booklet.

Badge structure

For ease of use and to ensure that all the main topics are addressed, both the background information (p. 32) and the related activities (p. 166) are divided into five main sections:

A. **HEALTHY LIFESTYLES**: explores the many factors and personal choices and practices that affect health and well-being.

B. **HEALTHY EATING CHOICES**: explains how important it is to eat the right variety and the right amounts of foods (not too little, not too much) to prevent malnutrition as well as other **non-communicable** diseases and conditions.

C. **FOOD SAFETY**: examines how to make sure that the foods we eat are fresh, nutritious, clean and free from harmful substances.

D. **EAT GREEN – TIME FOR SUSTAINABLE DIETS**: explains how our choices in eating, cooking and storing food affect the planet.

E. **TAKE ACTION**: suggests activities to motivate and help your class or group to practise healthy eating habits and to raise awareness in the community of the importance of healthy diets and lifestyles.

Requirements: To earn the Badge, participants must complete one of the two compulsory activities presented at the beginning of each section, plus (at least) one additional activity from each section, chosen individually or as a group (see graphic on p. 24). Participants can also complete additional activities considered appropriate by the teacher or leader.

Section A: HEALTHLY LIFESTYLES

1 compulsory activity (A.1 or A.2) & at least 1 optional activity (A.3 - A.14)

+

Section B: HEALTHY EATING CHOICES

1 compulsory activity (B.1 or B.2) & at least 1 optional activity (B.3 - B.21)

+

Section C: FOOD SAFETY

1 compulsory activity (C.1 or C.2) & at least 1 optional activity (C.3 - C.10)

+

Section D: EAT GREEN – TIME FOR SUSTAINABLE DIETS

1 compulsory activity (D.1 or D.2) & at least 1 optional activity (D.3 - D.20)

+

Section E: TAKE ACTION

1 compulsory activity (E.1 or E.2) & at least 1 optional activity (E.3 - E.17)

=

Nutrition Challenge Badge COMPLETED!

Age ranges and appropriate activities

To help you and your group select the most appropriate activities, a coding system is provided to indicate the age group(s) for which each activity is most suitable. Next to each activity, a code (for example 'Levels 1 and 2') indicates that the activity should be suitable for participants aged five to ten years old and eleven to fifteen years old.

However, please note that this coding is only indicative. You may find that an activity listed at one level is suitable for another age group in your particular circumstances. As teachers and youth leaders you should use your judgement and experience to develop an appropriate curriculum for your group or class. This could incorporate additional activities not listed in this booklet but that allow you to achieve all the educational requirements.

LEVEL

1 **Five to Ten years old**

2 **Eleven to Fifteen years old**

3 **Sixteen plus years old**

REMEMBER!

The key objectives of the Challenge Badge are to educate, inspire and stimulate interest in learning about nutrition and encouraging healthy eating habits. It also aims to motivate individuals to change their behaviour and create local and international action. However, most of all, the activities should be **FUN**! Participants should enjoy the process of earning the Badge and learning about nutrition.

SAMPLE BADGE CURRICULA

The sample curricula for the different age groups below provide examples of how the Badge could be earned and are intended to help you in developing your own programme.

LEVEL

1 Five to Ten years old

2 Eleven to Fifteen years old

3 Sixteen plus years old

Each activity has a specific learning aim, but in addition to this, children will have the opportunity to learn more general skills including:

* TEAMWORK
* IMAGINATION AND CREATIVITY
* OBSERVATION SKILLS
* CULTURAL AND ENVIRONMENTAL AWARENESS
* NUMERACY AND LITERACY SKILLS

SECTION	ACTIVITY	LEARNING OBJECTIVE
A Healthy lifestyles	A.1: Health Fête (p. 167)	To engage the local community to learn the basics about healthy lifestyles in a fun way.
	A.5: Keeping Clean (p. 168)	To understand the importance of hygiene in daily life.
B Healthy eating choices	B.2: Keep a Food Diary (p. 173)	To become more aware of eating habits and areas for improvement.
	B.3: Favourite Foods (p. 175)	To make the connection between nutrition and what we eat on a regular basis.
C Food safety	C.1: Inspect Your Kitchen (p. 183)	To learn more about food safety and how it can be improved at home.
	C.4: Charades (p. 184)	To have fun and engage in teamwork while learning about food safety and nutrition.
D Eat green – time for sustainable diets	D.1: Meal Mania (p. 187)	To gain practical experience in planning and preparing a sustainable meal.
	D.9: Make a Recipe Book (p. 190)	To learn more about cooking and seasonal produce in a creative way.
E Take action	E.1: Create a Nutrients Corner (p. 197)	To raise awareness and learn about the nutrients that we get from our food.
	E.4: Organize a Storytelling Event (p. 198)	To learn creatively about food and nutrition and their importance around the world.

LEVEL

1 Five to Ten years old

2 **Eleven to Fifteen years old**

3 Sixteen plus years old

As in Level 1, each activity in Level 2 has a specific learning aim, but also fosters additional, more general skills including:

* TEAMWORK AND INDEPENDENT STUDY SKILLS
* IMAGINATION AND CREATIVITY
* OBSERVATION SKILLS
* CULTURAL AND ENVIRONMENTAL AWARENESS
* RESEARCH SKILLS
* PRESENTATION AND PUBLIC SPEAKING SKILLS

SECTION	ACTIVITY	LEARNING OBJECTIVE
A Healthy lifestyles	**A.1: Health Fête** (p. 167)	To engage the local community to learn the basics about healthy lifestyles in a fun way.
	A.9: Healthy Camping Trip (p. 170)	To learn about the different aspects of healthy lifestyles in a fun way.
B Healthy eating choices	**B.1: Pot Luck** (p. 173)	To gain hands-on experience of preparing nutritious meals.
	B.12: Malnutrition Investigation (p. 178)	To learn about the key causes and effects of malnutrition.
C Food safety	**C.1: Inspect Your Kitchen** (p. 183)	To learn more about food safety and how it can be improved at home.
	C.3: Shopping Spree (p. 184)	To learn how to spot food safety issues in shops and markets.
D Eat green – time for sustainable diets	**D.2: Watch Out for Waste** (p. 187)	To find ways to reduce waste and spread the word on the importance of doing so.
	D.6: Sustainable Shopping (p. 189)	To improve sustainable practices at home.
E Take action	**E.2: Healthy and Balanced Diet Campaign** (p. 197)	To raise awareness and motivate activism for healthy lifestyles and sustainable living among family and friends.
	E.11: Volunteer with a Community Organization (p. 201)	To learn more while helping others.

LEVEL

1 Five to Ten years old

2 Eleven to Fifteen years old

3 **Sixteen plus years old**

General skills a Level 3 curriculum seeks to develop include:

* TEAMWORK AND INDEPENDENT STUDY
* IMAGINATION AND CREATIVITY
* OBSERVATION SKILLS
* CULTURAL AND ENVIRONMENTAL AWARENESS
* TECHNICAL SKILLS AND THE ABILITY TO RESEARCH COMPLEX ISSUES
* PRESENTATION AND PUBLIC SPEAKING SKILLS
* THE ABILITY TO PRESENT AN ARGUMENT AND DEBATE

SECTION	ACTIVITY	LEARNING OBJECTIVE
A Healthy lifestyles	**A.2: Game On!** (p. 167)	To become more aware of and increase physical activity in daily life.
	A.12: Germy Truths (p. 171)	To learn how germs and diseases spread, and what we can do to protect ourselves.
B Healthy eating choices	**B.2: Keep a Food Diary** (p. 173)	To become more aware of eating habits and areas for improvement.
	B.14: Diet Debate (p. 179)	To examine body image issues in the world today and discuss the role of the media in influencing eating behaviour.
C Food safety	**C.1: Inspect your Kitchen** (p. 183)	To learn more about food safety and how it can be improved at home.
	C.5: Quick Guide to Easy Cooking (p. 184)	To learn first-hand about how foods are preserved in different ways.
D Eat green – time for sustainable diets	**D.2: Watch Out for Waste** (p. 187)	To find ways to reduce waste and spread the word on the importance of doing so.
	D.17: From the Field to My Plate (p. 194)	To understand the different stages that go into food production before we eat it.
E Take action	**E.2: Healthy and Balanced Diet Campaign** (p. 197)	To raise awareness and motivate activism for healthy lifestyles and sustainable living among family and friends.
	E.9: Educate Your Community (p. 200)	To work with peers to raise awareness of the importance of healthy diets and lifestyles.

BACKGROUND INFORMATION

The following section provides an overview of key issues relating to nutrition. It aims to help teachers and youth leaders prepare their sessions and group activities without having to search for the information.

Naturally, not all the materials will be required or appropriate for all age groups and activities. Leaders and teachers should therefore select the topics and level of detail most appropriate for their group.

For example, you may wish to skip the more complicated issues with younger groups, but will probably wish to conduct further research with older groups, who could also read the background information for themselves.

A HEALTHY LIFESTYLES

Being fit and active
Enough sleep
Mental health
Good sanitation and hygiene levels
Safe water
Access to medical care
Knowledge and care
A balanced diet

B HEALTHY EATING CHOICES

A balanced diet
Nutrients
Creating a balanced diet
What are calories?
Malnutrition
Reading food labels
The healthy eating checklist

C FOOD SAFETY

What makes us sick
Some good micro-organisms
Five keys to safer food

D EAT GREEN – TIME FOR SUSTAINABLE DIETS

How do our eating habits impact the environment?
Social and economic impacts
It is time for a sustainable diet
Buying and acquiring food sustainably
Saving and storing
Cooking for a healthy you and a healthy planet
Sustainable reuse and disposal solutions
Dishes: putting knowledge into practice
Sustainable choices checklist

E TAKE ACTION

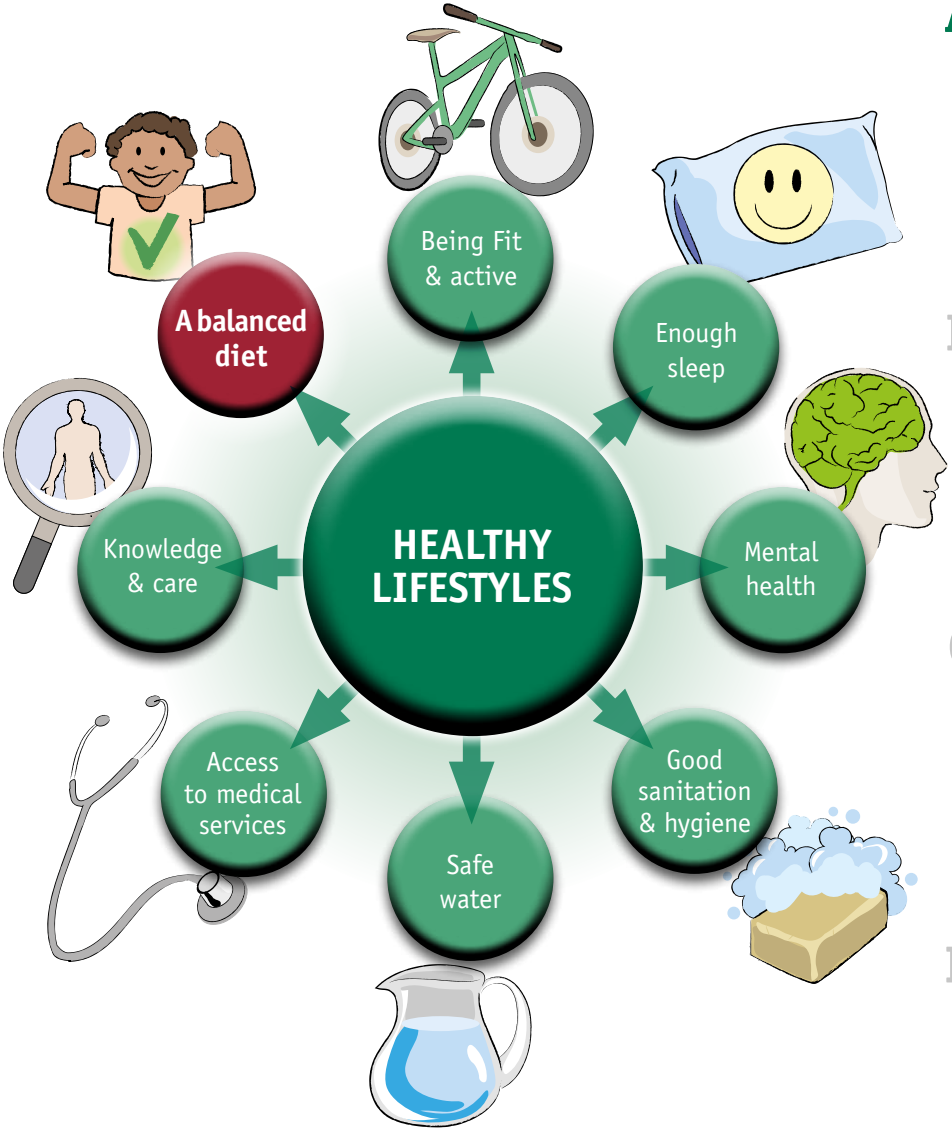
Actions of governments and international organizations
YOUR actions

HEALTHY LIFESTYLES

The World Health Organization (WHO) defines health as 'a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity'.

This Challenge Badge focuses on nutrition, looking at how the food that we eat affects our physical well-being. Of course, our health and well-being are not only dependent on what we eat but also on many other factors, including the environment we live in, social factors (e.g. education), emotional and mental health, and the physical aspects of health.

Although some factors are not under our control, many of them are. So, before we start looking at nutrition, let's start by considering some of the main factors leading to a healthy lifestyle.


HEALTHY LIFESTYLES
A balanced diet
Being Fit & active
Enough sleep
Mental health
Good sanitation & hygiene
Safe water
Access to medical services
Knowledge & care

BEING FIT AND ACTIVE

Move more. These two words pretty much sum it up. Physical activity is great for our health. It not only helps in controlling weight, but also helps improve heart, lung and muscle functions. It contributes to healthy bones, muscles and joints, increases flexibility and aids movement, helps to relieve the pain of arthritis, and it is associated with fewer hospitalizations and doctor visits!

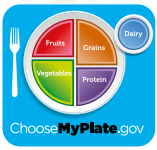
Physical activity can also help to improve self-esteem and mental well-being, reduce stress and anxiety, as well as improve sleep, concentration and academic performance. But don't worry, you don't need to run a marathon to be active and fit! Your physical fitness can be greatly improved just by sitting less and moving more every day. Try to include simple activities in your daily life that keep you active – look at the graphic (p. 37) for some inspiration! In addition, think about how much time you spend each day sitting, watching television, being on the computer or playing computer games. Should you be reducing your time doing these things? What else can you do?

BE A FIT KID

10 tips for being active every day

Fit kids are physically active and play for at least 1 hour every day. Look for ways to make physical activity a part of your day. Do activities that build your muscles, get your heart pumping, and make you feel good about yourself.

MyPlate Kids' Place



1 tie up your laces and walk

Go for a walk around your neighborhood or walk to your friend's house instead of taking the bus or asking for a ride. Forget the elevator and take the stairs every chance you get! Remember to be safe by using sidewalks and crosswalks.

2 turn up the music

Shake, rattle, and roll to your favorite songs. Turn on some hip hop, country, salsa, or pop music and move your body. Dancing is a great way to get some physical activity.

3 ride a bike

Grab your helmet and safety gear and go for a bike ride. Ride your bike to school or grab your friends and enjoy a ride in the neighborhood.

4 join a team

Show your team spirit and join a sport at your school or community center. There are tons of fun teams such as basketball, baseball, gymnastics, dancing, soccer, swimming, and tennis. Choose an activity that you like and have fun!

5 go out and play

Ditch the TV and go outside with friends, family, and even your pets! Walk your dog. Make a snowman. Fly a kite. Have a Hula-Hoop contest. Play basketball with friends. Try jumping rope. Or simply play a game of tag.

6 dive right in!

Go to your local indoor or outdoor pool and swim. Swim laps, play water games with friends, or have diving contests for fun.

7 get paid to be fit

Earn extra cash by mowing lawns, washing cars, shoveling snow, or walking dogs for your family or for your neighbors. Listen to music while you work to keep you going.

8 try skating or skateboarding

Grab your friends and go to a local park or indoor skating rink! It's easy to learn and a great way to be active while still having fun! Remember to wear your helmet and safety pads.

9 plant a garden

Plant and grow flowers, fruits, and vegetables with your family, or even with your friends! Creating a garden is tough work and a good way to keep fit. Be sure to check on your plants and water them every day!

10 stuck inside?

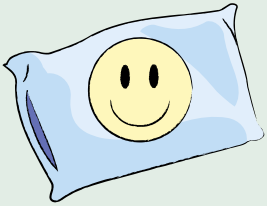
Play a game of hide-and-seek or plan a scavenger hunt in your house with friends and family. Another great way to stay active indoors is by doing crunches and jumping jacks-see how many you can complete!

WHAT IS ENOUGH?

The World Health Organization (WHO) recommends children and youth aged 5–17 do **at least 60 minutes of moderate- to vigorous-intensity physical activity daily**. And, it indicates that most of this activity should be **aerobic**. High-intensity activities should also be added, including those that strengthen muscle and bone, at least three times per week.

(*Source:* **www.who.int/dietphysicalactivity/factsheet_young_people/en/index.html**)

ENOUGH SLEEP



Don't you just love to sleep? Getting the right amount of sleep is extremely important for our bodies. It is particularly important for children and young people, as sleeping is the time when the body rests, grows and develops. Children under ten years old need to sleep for at least ten hours each night, while those older than ten years should sleep between eight and ten hours each night (*Source*: UK National Health Service, 2013). There are also a number of 'tips' for getting a good night sleep, for example avoiding large heavy meals, bright screens and other stimulants just before going to bed can help. A balanced healthy diet and plenty of exercise are also beneficial.

MENTAL HEALTH

As well as being physically healthy, it is also very important to look after your mind. An important part of keeping your mind healthy is spending time with friends and family, playing games and being social. Participate in school and community activities as much as possible. There are many things you can do to keep you thinking clearly and positively – read more about it here: **www.youngminds.org.uk/for_children_young_people/better_mental_health** and **www.who.int/maternal_child_adolescent/topics/adolescence/en**

GOOD SANITATION AND HYGIENE LEVELS

Keeping our bodies and the spaces we live in as clean as possible can help protect us from getting sick. While most **microbes** are not harmful, some are very harmful, causing diseases that spread easily from person to person. We can start by making sure that where we live, work or go to school is clean, tidy and safe. Keeping our hands clean is especially important through regular hand washing. In addition, it is important to wash your face as lack of face hygiene is linked with trachoma, a preventable eye infection that can lead to blindness.

More to explore:

www.cdc.gov/bam/index.html

SAFE WATER

Access to safe water is very important for good health and to protect us and the people around us from the harmful **germs** that cause disease. Bathing, washing, drinking or preparing food with dirty or **contaminated** water can cause diarrhoea, cholera, typhoid, dysentery and worm infections. In addition, improper storage of water creates breeding grounds for mosquitoes that can transmit malaria, dengue and zika. Drinking water polluted with chemicals and **pesticides** can also lead to a number of serious illnesses and could have longer term implications, including some cancers. On the whole, it is no exaggeration to state that clean water, and safe disposal of waste and rubbish, is crucial for staying healthy and preventing disease and for our quality of life in general. While our communities are responsible for providing us with this, we also have a responsibility to keep the water sources near us clean and safe.

ACCESS TO MEDICAL CARE

Going to the doctor may not be your favourite way to pass the time, but good medical care is necessary for people to improve and maintain good health. This includes access to **immunization**, which is a way to keep people safe from disease. Good medical care also means that diseases are detected early, people receive effective treatment and the disease is prevented from spreading throughout the community. With better prevention, we can improve people's health, and also relieve the economic burden of disease on families and communities. Additionally, health care providers can help by educating the community about disease and providing information and counselling for improving and maintaining good health as well as preventing disease from spreading.

DID YOU KNOW?

Diarrhoeal disease and respiratory tract infections are the two biggest killers of children in developing countries. The simple act of washing hands with soap and clean water can significantly help to prevent the spread of **germs** and cut the risk of these and other diseases. Wash your hands often throughout the day. Use soap and clean water, rubbing well outside the stream of water for at least 20 seconds, then rinse under clean running water and dry with a clean cloth, paper towel or a hand-dryer.

Always wash your hands:

1 
- After using the toilet

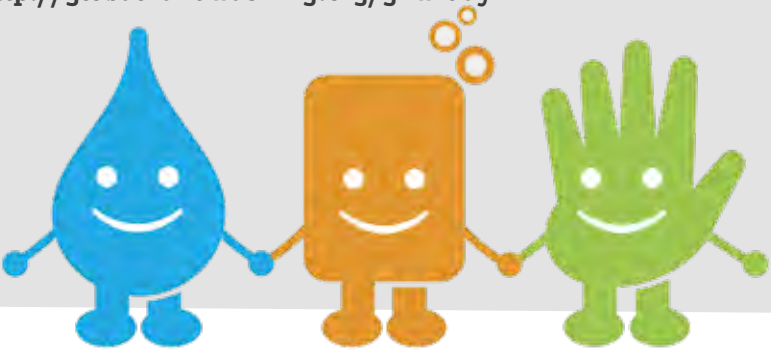
2 
- Before eating

3 
- Before and after handling food

4 
- Before touching or feeding a baby

5 
- After changing a baby's diaper (nappy)

These are the key times to wash your hands, but can you think of any other times when it would be a good to wash your hands?
Learn more: Global Handwashing Day:
http://globalhandwashing.org/ghw-day



KNOWLEDGE AND CARE

Making sure we are in good health, however, is not just up to the people around us!
We have to take personal responsibility to ensure that we lead healthy lifestyles. This involves informing ourselves about different health issues, and trying at all times to lead a balanced lifestyle to keep our physical and mental health in good working order. If we feel ill or notice something strange or different about our bodies or the way we feel, it is important that we consult a doctor to check that everything is OK.

A BALANCED DIET

Finally, this is what this Challenge Badge is all about: choosing a healthy diet and eating well will help keep us healthy and active, which improves our quality of life. However, we need good knowledge and understanding of what a healthy diet is. Not understanding the body's nutritional needs, and not knowing which available foods can meet these needs, can lead to poor diets, poor nutrition and poor health. This happens even in families with sufficient incomes and food, good **sanitation** and health services. On the flip side, it is possible to eat a healthy and **balanced diet** even on a limited budget. We will learn more about this in Section B. What is also important is that what we buy and cook is safe to eat, and we learn more about this in Section C. Finally, in Section D we learn how we can make sustainable and environmentally friendly choices.

ON KI MA, aged 15, HONG KONG

HEALTHY EATING CHOICES

Adequate food is fundamental to health and life and it is considered a basic human right.

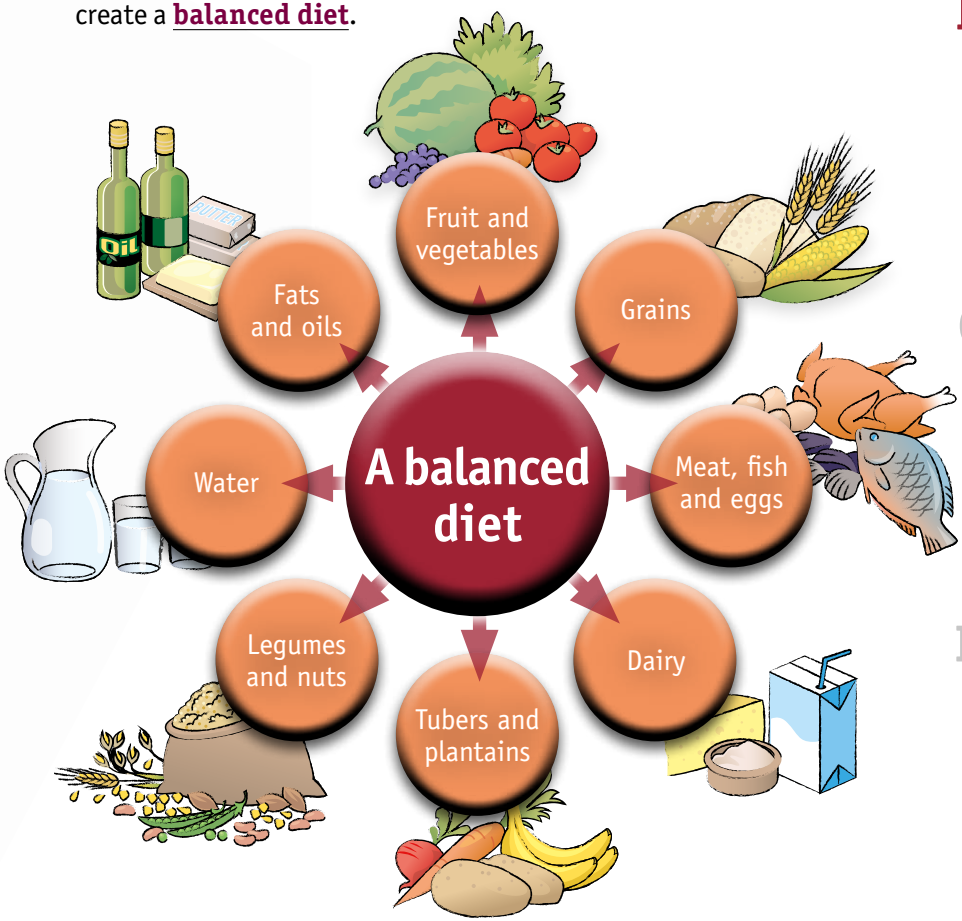
This means that the international community has agreed that each and every human being *should always* be able to get the food they need to be healthy and well-nourished.

So let us investigate how to make the right food choices.

A BALANCED DIET

A **balanced diet** is fundamental to get the right amounts of **nutrients** to support our body's growth and the proper functioning of major systems, such as the **immune**, **circulatory**, **nervous** and **musculoskeletal systems**. It is only by eating a variety of **nutritious** foods that we can grow, survive and prevent **malnutrition** or getting other diseases.

Ideally, we should have a balanced meal every time we eat. However, we know that food choices are often made for other reasons, such as how easily available the food is, how much it costs, if you like how it looks and tastes; as well as traditional, religious and cultural beliefs. But eating the right balance and variety of food can also be achieved by what we choose to eat over a given time period. For example, a food or **nutrient** that may be lacking or in excess in one meal can be made up for or balanced in the next meal or snack. Similarly, eating more food (**calories**) than we need one day, or less than we need, can be balanced by how much or how little we eat the following day. Let us now explore the main food groups and how they can be used to create a **balanced diet**.



Fruit and vegetables

Among other things, fruit and vegetables will give your body the essential **vitamins**, **minerals**, **fibre** and natural sugars. Eating adequate amounts of fruit and vegetables may help to reduce the risk of certain chronic diseases and may help protect against certain types of cancers. Most fruit and vegetables are also low in **calories** and fat. Fruit and vegetables can be bought fresh, canned, or dried; can be eaten raw or cooked, and may be whole, cut-up or mashed. One glass of pure fruit or vegetable juice also counts as a portion, but even unsweetened fruit juice is sugary so it is better to eat whole fruit and vegetables that also contain other **nutrients** too. The fruit and vegetables group also includes root vegetables such as carrots, parsnips, turnips, radishes and beets. How many other fruit and vegetables can you think of?

EATING TIPS:

* Eat as many fruit and vegetables as possible every day; in fact, at each meal we should try to fill at least one-third of our plate with them. A joint WHO/FAO Expert Committee recommends **a minimum of 400 g (equal to five portions or five cups) of fruit and vegetables per day**. That might sound like a lot, but you would be surprised what counts as a portion! Some examples of a single portion are:
  * One medium-sized fresh fruit, such as an apple, pear or banana.
  * Two or more small fruits, such as two plums or kiwi fruit, three apricots or seven strawberries.
  * One cup of spinach, lettuce or another leafy green.
  * Three tablespoons of cooked vegetables.
  * One glass of pure vegetable juice.

- Try to choose a variety of red, orange or dark green vegetables and fruits; they usually contain more **nutrients** than those with lighter colours.
- For best nutritional content, flavour and price, purchase fresh fruit and vegetables in season and when possible choose items that are ripe and whole.
- Buy only what can be eaten or preserved in the next few days; fruit and vegetables lose **nutrients** and flavour when they wilt or spoil.
- Wash fresh fruit and vegetables with safe water to ensure they are clean from dirt, **pesticides** or **herbicides**.
- When fresh fruits are not available or too expensive, substitute with frozen; they can be just as **nutritious**, keep well and reduce the amount of preparation time.
- Canned vegetables can also be good, but may contain higher amounts of salt, sugars and **preservatives**. Choose vegetables canned in water without added salt or sugar.
- For canned fruit, check how much sugar has been added; it's healthier to select fruit in juice instead of sugary syrup.
- Choose whole fruit over fruit juices and fruit drinks (whole fruit contains more **fibre**). Fruit drinks may contain added sugars and only a small amount of fruit juice.
- When purchasing root vegetables, look for ones that are firm, heavy and smooth skinned. If their leaves are attached, they should be crisp and bright green in colour.
- The skins of root vegetables hold many of their **nutrients**. It is fine to eat the skin of very young, fresh roots like beets and turnips, but older, larger, thick-skinned root vegetables require peeling.

- Most roots vegetables can be eaten raw or cooked (but make sure they are well washed to reduce biological or chemical exposure; they are also safer peeled if eaten raw).
- Root vegetables tend to lose what little moisture they have quickly, so they are best stored without their green foliage in a perforated plastic bag in the refrigerator.

There are also many simple steps you can take to preserve the **nutrients** *in the preparation of fruit and vegetables:*

- Prepare and cut vegetables right before they are cooked or eaten; do not leave them exposed to air or sitting in water.
- Cook vegetables with as little water as possible (so that you don't lose the **nutrients** in the water; you can even use the water to make a soup). Alternatively, steam, microwave or stir-fry vegetables in a little oil for a few minutes instead of boiling them and draining the water (which causes a lot of the **vitamins** to be lost).
- Eat foods rich in **vitamin** C (e.g. dark green leafy vegetables such as spinach and broccoli, citrus fruits, berries and tomatoes), fresh and raw or with the smallest amount of cooking. Water-soluble **vitamins**, like **vitamin** C, are fragile and easily destroyed by heat, air and water. Avoid soaking them in water for a long period of time.
- Serve and eat **vitamin** A-rich plant foods with a little bit of fat to help improve the **absorption** of **vitamin** A. For example, eat pumpkin and carrots with a small amount of oil.
- Prepare and eat iron-rich plant foods together with **vitamin** C-rich foods to help **absorption**. For example, eat leafy green vegetables and salads with the juice of a lemon.

DID YOU KNOW?

In the 1600s and 1700s, sailors who travelled the seas for months lacked access to fresh fruit and vegetables, often resulting in a **vitamin** C **deficiency**. Many sailors developed a disease called scurvy, which affected their bones, gums and teeth and sometimes even led to death from internal bleeding and heart failure. Once the cause behind their illness was discovered, ships started to carry supplies of limes and other foods rich in vitamin C.

DID YOU KNOW?

In many countries, especially developed countries, many people do not eat enough fruit and vegetables. In fact in the last ten years there has been a decline in the number of fruit and vegetables we eat. However, not eating enough fruit and vegetable plays a role in cancer, heart disease, high blood pressure, strokes and diabetes. So, try to eat as many fruit and vegetables as you can!

WHAT'S THE DIFFERENCE BETWEEN A FRUIT AND A VEGETABLE?

Everybody knows that strawberries are fruits and carrots are vegetables. But what about tomatoes? This everyday favourite is often caught in the middle of the fruit/vegetable argument! Scientifically speaking, fruits are the parts of flowering plants that contain the seeds.

Therefore, tomatoes are fruits, as are cucumbers, aubergines, peppers and pumpkins (among others). Vegetables are all the other parts of the plants, such as the leaves (e.g. spinach and lettuce), roots (e.g. parsnips and carrots), stems (e.g. celery) and the flower buds (e.g. cauliflower and broccoli).

However, from a 'popular' and culinary point of view, vegetables are less sweet – or more savoury – and served as part of the main dish. Fruits are sweeter and tart and are most often served as a dessert or snack.

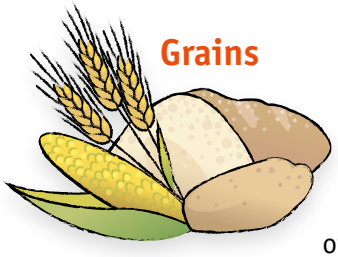
Fruit and vegetable storage

Many fruit and vegetables continue to ripen even after they have been picked, so they can either be placed in the fridge or left on the counter in a fruit basket to ripen. They should be kept off the ground and out of the sun. In general, once cut or peeled, most fruit and vegetables are safest if kept in the fridge. On the whole, fruit and vegetables lose their **nutrients** and spoil easily, so, they need to be handled carefully to protect their freshness and quality. Spoiled fruit and vegetables should be separated and promptly removed from boxes, shelves, baskets or containers where they are stored or displayed. They should be fresh and not soft or limp, and should not have spots or other signs of damage, spoilage or insects.

Growing fruit and vegetables

Fruit and vegetables can become **contaminated** with dangerous **micro-organisms** during production. Remember to follow the WHO Five Keys to Growing Safer Fruit and Vegetables (WHO, 2012) to ensure your fruit and vegetables are safe for consumption. You can learn more about this in the food safety section (p. 82–97).

KAVYA NAGALAKUNTA, aged 15, UNITED ARAB EMIRATES



Grains

The grains group contains all foods made from wheat, rice, oats, maize, barley or other cereal grains. Bread, pasta, oatmeal, breakfast cereals and tortillas are examples of grain products. These foods are also known as 'staple' foods because they provide us with the **nutrient** that is our most basic source of energy: carbohydrates. Some less common grains, though still very important nutritionally and for **biodiversity**, include: amaranth, buckwheat, bulgur, farro/emmer, kamut, millet, rye, quinoa and spelt. To find out more about these grains take a look here:
http://wholegrainscouncil.org/whole-grains-101/whole-grains-a-to-z

EATING TIPS:

- Try to make sure at least half the grains you eat are whole, **unrefined grains**. Whole grains, which contain the entire grain kernel, are better for you than refined grains. Examples of whole grain foods are whole wheat bread, whole grain cereals and crackers, oatmeal, bulgur and brown rice.
- When grains are refined, many of the **nutrients** that are naturally present get removed. Examples of refined grains include white bread, white rice, enriched pasta, flour tortillas and most noodles. Sometimes, the **nutrients** that get lost during processing are added back to refined grains. Such foods are said to be '**fortified**' or 'enriched'. If you buy refined grain products, make sure that the word '**fortified**' is included in the label. However, on the whole, go for whole grains!

DID YOU KNOW?

Have you heard of quinoa? It's pronounced keen-wa, and it is a highly **nutritious** cereal that is rich in protein and **micronutrients**. To highlight its importance, the UN and FAO proclaimed 2013 as the International Year of Quinoa (**www.fao.org/quinoa-2013/en**). Quinoa's production costs are low and it grows easily in different climates and difficult conditions so, according to FAO, it can play an important role in fighting hunger, **malnutrition** and poverty. Small, **organic** family farmers in the Andes are the major quinoa producers, and its production has helped increase their incomes. You can also read more about quinoa at:
www.fao.org/news/story/en/item/170254/icode

Tubers and plantains

Potatoes, sweet potatoes, yams, yautia, taro, cassava and malanga are examples of tubers. Tuber crops are a staple food and a main source of **calories** for an estimated 700 million people in Africa, Asia, Europe and Latin America. Tubers form an important part of our diet because they are a rich source of carbohydrates, as well as containing other **vitamins** and **minerals**. Plantains are also another important starchy staple food in Africa, Central America, the Caribbean and coastal areas of South America. Plantains are related to bananas, but are less sweet and are typically eaten cooked.

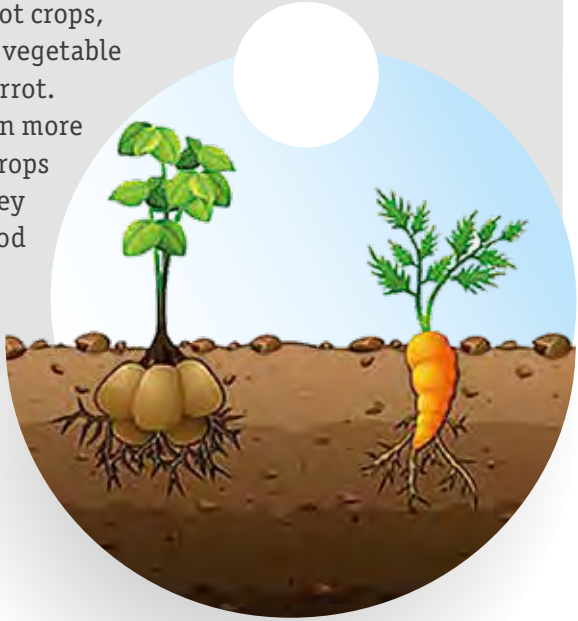
EATING TIPS:

- When purchasing, look for tubers that are firm, heavy and smooth skinned. Avoid those with shriveled skin and avoid greened potatoes.
- Tubers, with the exception of jicama, are mostly eaten cooked.
- Tubers can be cooked in a variety of ways. Boiling, roasting, steaming or baking – cook them any way you like!
- Tubers are best stored in a dark, cool, well ventilated place and not in the refrigerator.
- When buying plaintains look for firm, mature, deep green, well-formed items that feel heavy in hand. Do not buy overripe, damaged or split fruits, as they do not store well. Store them open at room temperature and eat them in 4–5 days.
- Plaintains can be cooked in similar ways to tubers and can even be cooked with their skins on the barbecue.

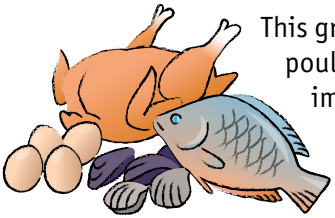
DID YOU KNOW?

Tubers differ from root crops in many ways. Tubers are swollen or enlarged underground stems capable of storing energy for the parent plant and producing new plants should the parent plant die. Roots, on the other hand, can take **nutrients** from the ground, but cannot store energy or reproduce.

With tubers, a single plant can produce several tubers, such as a potato plant. Root crops, instead, form one vegetable per stem, like a carrot. Tubers also contain more starch than root crops and this is why they are in different food groups.



Meat, fish and eggs



This group includes all foods made from meat, poultry, seafood and eggs. These foods are important because they contain proteins made up of **amino acids** that are responsible for strength, building tissue and repairing your body.

EATING TIPS:

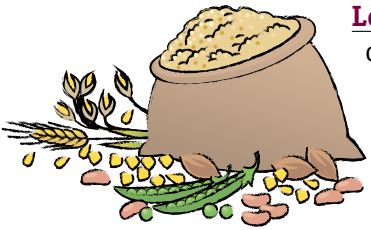
When choosing animal protein products
(e.g. all types of meat, poultry, fish and eggs):

- Eating even small amounts of meat, poultry, eggs and fish on a regular basis can help meet the need for protein and are rich in certain **minerals**.
- Eat a variety of fish and seafood, especially fatty fish such as salmon, mackerel, herring, trout, sardines and anchovies, which are rich in **omega-3 fatty acids** that help reduce the risk of heart disease and have other health benefits.
- Include a variety of red and white meats and poultry.
- Choose lean or low-fat meat and poultry, which can still provide protein and other **nutrients**, while reducing the amount of fat and **calories** you eat. For example, chicken or turkey breasts are considered lean meats, as well as goat meat, pork tenderloin or lean beef steak.
- We need to be careful about how much salt we eat during the day, as processed meats such as ham, sausages or cured meats tend to be high in salt (and other chemicals). Check the product labels to look out for added salts.

More to explore:

www.choosemyplate.gov/food-groups/protein-foods.html

Legumes and nuts



Legumes (e.g. pulses like beans, peas or lentils), nuts, seeds and soybean and tofu products are also important sources of proteins. These plant-derived proteins are usually a cheap source of protein, are low in fat, high in **fibre** and contain other useful nutrients. As we will also learn in Section D, plant proteins are also more environmentally friendly. However, not all foods (especially from plants) contain all the **amino acids** we need, so we need to ensure we eat a balanced diet so we can stay healthy (learn more on p. 70).

EATING TIPS:

- Choose unsalted nuts and seeds.
- Buy beans, peas and lentils – canned or dried.
- Use a number of different types of food items listed above to create a complement of **amino acids** (legume soups or a nut/legume loaf are just some examples – can you think of others?).

More to explore:

www.choosemyplate.gov/food-groups/protein-foods.html

2016 INTERNATIONAL YEAR OF PULSES

Pulse crops such as lentils, beans, peas and chickpeas are a critical part of our food basket. Pulses are a vital source of plant-based proteins and **amino acids** for people around the globe and should be eaten as part of a healthy diet. The UN has declared 2016 the International Year of Pulses (IYP). The IYP 2016 aimed to heighten public awareness of the nutritional benefits of pulses, as part of sustainable food production aimed towards food security and nutrition. Visit the International Year of Pulses Web site to find great news and events, resources, recipes and more: **www.fao.org/pulses-2016/en** and download kits and lessons at: **http://iyp2016.org/resources/national-committee-kits**

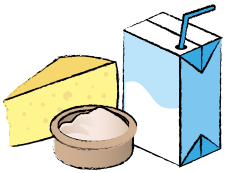
Pulses for a healthy diet

Pulses are rich in **complex carbohydrates**, **micronutrients**, **protein** and **B-vitamins**. Therefore, pulses are a **vital part of a healthy diet**.

Pulses are easy to prepare, and they can also serve as a meat alternative.

(*Source*: FAO, 2016)

Dairy products



All milk products and many foods made from milk are considered part of this food group. For example, cheese, cream, yoghurt and ice-cream are popular dairy products. Although most dairy products come from cow's milk; goat, sheep, buffalo and yak milk are also used to produce cheese, butter and other products. Foods made from milk that retain their calcium content are part of the dairy group, and so is calcium-**fortified** soymilk (find out more about calcium on p. 74). As well as containing high levels of calcium, dairy products are also a source of protein and fat.

EATING TIPS:

- Look for lower-fat varieties, as dairy products can have a high fat content.
- Check for sugar content in yoghurts and milk-based drinks.

DID YOU KNOW?

Many people cannot eat dairy products because they are lactose-intolerant. Lactose is a sugar present in milk, which some people are unable to digest. If you are sensitive to lactose, you may be able to tolerate smaller portions (e.g. 120 ml of milk). Lactose-free and lower-lactose products are also available. These include lactose-reduced or lactose-free milk, yoghurt and cheese, and calcium-**fortified** soymilk.

Fats and oils

Fats and oils are an important part of a **balanced diet** as they are needed to perform many important functions in the body:

* Fats provide energy.
* Fats build healthy cells – in fact every cell membrane in our body is made of them. Without a healthy cell membrane, the rest of the cell couldn't function.
* Fats are important for the development of the brain and the central **nervous system**.
* Fats help the body **absorb vitamins**. **Vitamins** A, D, E and K are fat-soluble **vitamins**, meaning that the fat in foods helps the intestines **absorb** these **vitamins** into the body.
* Fats help the body produce hormones and build body tissues.
* Fats keep us warm: the layer of fat just beneath the skin (called subcutaneous fat) acts as the body's own insulation against the cold.
* Fats form a protective cushion for your organs. Many of the vital organs, especially the kidneys, heart and intestines are cushioned by fat that helps protect them from injury and holds them in place.

However, although you need some fat in your diet, it must not be too much. Most importantly, the fats you eat should be the right kind of fat (see the eating tips on the right). Eating too much fatty food may make you gain more weight than you need to be healthy. Fats contain more than twice as many **calories** as proteins or carbohydrates so we need to limit the number of fats we eat. Unfortunately, foods high in fats are heavily promoted and marketed to children through the media by certain food companies.

EATING TIPS:

Fats are found naturally in foods from both plants and animals. Almost all foods contain some fat, even if only in very small amounts. Not all fats are the same, and the type of fat we eat is even more important for our health than the total amount of fat in our diet.

* **Most of the fat in our diet should come from unsaturated fats**, especially from olives and seeds (e.g. sunflower, sesame and pumpkin seeds), nuts (e.g. almonds, hazelnuts, pecans, walnuts) and fatty fish that provide omega-3 fatty acids (salmon, trout, mackerel, herring, sardines, tuna, anchovies). When cooking, choose oils such as canola oil, olive oil, safflower oil, sesame oil or sunflower oil, which are high in unsaturated fat.
* **Limit the amount of saturated fatty acids** that come from animal products such as pork, beef, cheese, butter, lard, cream, ice-cream and other whole-milk dairy products. You can also reduce the level of saturated fatty acids by switching to lean or white meat (chicken, fish, etc.) and choosing reduced-fat/low-fat dairy products.
* **Artificial trans fats (also known as 'partially hydrogenated oil') should be avoided or consumed as little as possible.** **Trans fats** are human manufactured and involved the process of pumping hydrogen **molecules** into vegetable oils using a metal catalyst. This changes the chemical structure of the oil, turning it from a liquid into a solid. Examples of foods containing artificial **trans fats** include some margarines and **processed foods** such as ready-made pies, cakes and cake mixes, biscuits, pizza, potato chips, fritters, doughnuts and other so-called 'fast foods' (all of which should be avoided). **Trans fats** are also produced in the stomachs of ruminant animals (cows, goats, etc.) and are found in meat and dairy products. Choose lean cuts of meat and low-fat dairy products to limit your **consumption** of these **trans fats**.
* You can also reduce your fat intake by changing the way you cook; for example, remove the fatty part of meat; use vegetable oil (not animal oil); and boil, steam or bake rather than fry.

See: **www.who.int/mediacentre/factsheets/fs394/en**

Water

Though water is not a food and not really even a **nutrient**, it is life-giving and essential for our good health. Our bodies can last weeks without food but only days without water. Therefore, we need to drink more water each day than we need to eat or drink any other **nutrient**. Water carries **nutrients** throughout the body, provides lubricants for the eyes and cushions the joints, helps flush out waste, helps maintain a steady body temperature (through sweating) and regulates many of the body's processes. As our bodies do not store extra water, we need to replace water through the foods and liquids that we eat and drink each day.

Health specialists advise us to drink about two litres of water a day (that's eight glasses each day) and much more when the climate is hot. How close are you to this? You also need to make sure the water you drink (or wash your food and cook with) is safe, as water can carry diseases. If you are worried, treating the water before you use it by boiling or filtering it is a good way to make sure all the **bacteria** and other **pathogens** that might be present are killed. Once treated it is important to safely store water in a clean container with a lid so it does not become **re-contaminated**. You also need to ensure the water is free from **contaminants** such as heavy metals and chemicals. Talk to local advisors or water authorities to find out if your water is safe. Check the WHO Guidelines for drinking-water quality to find out more about specific contaminants and other issues on safe water: **www.who.int/water_sanitation_health/publications/dwq_guidelines/en**

DID YOU KNOW?

Our bodies are made up of between 50 and 75 percent water! Water forms the basis of blood, carrying important **nutrients** around the body and allowing us to function healthily.

Reducing your sugar and salt consumption

Sugar provides energy. However, the sugar we eat should come from foods where it is found naturally, such as fruits, vegetables or dairy products. It is important that we limit the amount of sugar we eat each day – excess sugar that we don't use is converted and stored as body fat. Less than ten percent of total energy intake (i.e. the total number of **calories** that we get from food and drink each day) should come from free sugars, which is equivalent to 50 g (or around 12 level teaspoons) for a person of healthy body weight **consuming** approximately 2000 **calories** per day. However, for additional health benefits, ideally less than five percent of total energy intake should come from free sugars. Free sugars are all sugars added to foods or drinks by the manufacturer, cook or consumer, as well as sugars naturally present in honey, syrups, fruit juices and fruit juice concentrates. See more details at:
www.who.int/elena/titles/guidance_summaries/sugars_intake/en

Reducing salt (sodium) intake significantly reduces the risks of high blood pressure and risk of cardiovascular disease, stroke and coronary heart disease. It is recommended that adults eat less than 5 grams of salt per day. To avoid eating too much salt carefully examine the salt content of different foods. Processed foods such as processed meats, snack foods and fast foods often have high level of salt. It's best to use raw whole ingredients when you can, so that you can avoid added salt and sugar. For more information see:
www.who.int/nutrition/publications/guidelines/sodium_intake/en

DID YOU KNOW?

Salty food can be really delicious, and sodium is an essential **mineral**. However, having too much sodium in your body can have negative effects (e.g. high blood pressure – a major risk factor for heart disease, strokes and kidney disease). WHO recommends **consuming** less than 5 g of salt per day, and only to **consume** iodized salt (so you also get iodine from the salt). Remember that many **processed foods** already contain salt, so make sure you check out the packaging for the details and generally avoid using salt in food preparation when you can.

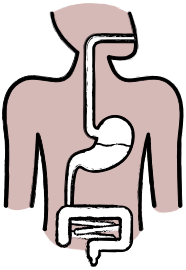
EATING TIPS:

- Control your **consumption** of sugar, sugary foods and beverages. Many soft drinks contain high amounts of sugar – take a look at how much sugar some popular drink brands contain: **www.sugarstacks.com/beverages.htm**
- Eat only a limited amount of sugary foods such as pastries, cookies and other sweets. These may give you a quick energy buzz, but they don't give you many other **nutrients**, and often have a high sugar and fat content.
- Many **processed foods** contain added or hidden sugars and salts even if the food itself isn't sweet (e.g. tomato ketchup, hamburgers and peanut butter often contain a lot of sugar) therefore it is very important to check food labels carefully to see exactly what the ingredients are.
- Eat whole fruit rather than drinking fruit juices that often have added sugar.
- Limiting the amount of sugar you eat will also keep your teeth healthier and help prevent cavities.

DID YOU KNOW?

Sugar can come from sugar cane or the root of the sugar-beet plant. Maple syrup (from maple trees) and honey are also almost completely sugar; they contain very small amounts of other substances, which makes them look and taste different.

How do we get food into our bodies?



It sounds like an easy question – we just eat the food – but how the body absorbs nutrients into our body is quite fascinating. Let us take the journey together. The first step in the journey is that we chew the food in our mouths and **enzymes** in our saliva help to start to breakdown the food, which then travels to our stomach.

Stomach acid as well as additional **enzymes** like protease (that breaks down protein), lipase (that breaks down lipids or fats) and amylase (that breaks down carbohydrates) continue to break down the food. Some nutrients take longer to digest than others, but an 'ordinary' meal containing a little bit of everything – carbohydrates, proteins and fats – leaves the stomach in about two to four hours.

The next stop, our small intestine (which is approximately 10 feet long), is the site where virtually all nutrient absorption takes place, including proteins, carbohydrates, fats and water, as well as vitamins and minerals.

What is left then goes into the large intestine, which has the role of converting the remaining food into faeces, absorbing essential vitamins produced by the gut **bacteria** and absorbing water out of the remaining waste. The journey is then complete.

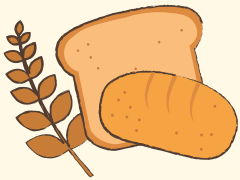
NUTRIENTS

As we have seen in the previous section we need to eat the correct proportions of different food groups to get the right amounts of **nutrients**. You will have noticed many of these nutrients are found in more than one food group. So let us now review these **nutrients**, why we need them and how they relate to the main food groups that we have just discussed. Before we begin it's worth noting that there are two types of nutrients. **Macronutrients** are the structural and energy-giving nutrients, which include carbohydrates, fats and proteins. **Micronutrients** are the vitamins, **minerals**, trace elements, phytochemicals and antioxidants that the body needs only in small amounts but are essential for proper functioning and good health.

DID YOU KNOW?

Here is an interesting fact: did you know that there are such things as antinutrients? These are natural substances that can inhibit the absorption of others. For example, phytic acid (common in the hulls of nuts, seeds and grains) and oxalic acid (present in spinach) have a strong binding affinity to **minerals** such as calcium, magnesium, iron, copper and zinc and prevent their absorption in the human body. Glucosinolates, which are found in plants such as mustard, cabbage and horseradish (which also give them their pungent taste) prevent the uptake of iodine. It is therefore important to eat food in certain combinations to ensure that all the **nutrients** we need are absorbed into our body.

CARBOHYDRATES



Carbohydrates can be found in many different foods; however, grains represent the food group richest in carbohydrates.

- Carbohydrates are the most important source of energy for the body, providing energy to every cell: your body breaks down carbohydrates into glucose (sugar), which is used for energy. Some extra glucose is stored in your liver and muscles for when it might be needed later on. However, if you eat more carbohydrates than your body uses for energy, the body converts carbohydrates into fat for more long-term storage, since the liver and muscles can only store a small amount of glucose.
- We need energy from carbohydrates for physical activity, growth and the overall maintenance and renewal of body tissues.
- We also need this energy for basic functions such as breathing, circulating blood and oxygen, and digesting and **metabolizing** food.
- Carbohydrates help our muscles work and are necessary for our brains to function.

Three kinds of carbohydrates

Carbohydrates generally come from plants, and exist in three forms: **starch**, **fibre** and **sugar**.

Starchy carbohydrates: Starch is a tasteless white substance, and an important source of energy in our diet. Starch is a polysaccharide (chain of joined single sugars) that is produced by most green plants as an energy store. It is the most common carbohydrate in human diets and is contained

in large amounts in staple foods such as potatoes, wheat, maize (corn), rice and cassava.

Fibrous carbohydrates: **Fibre** is derived from long interlinked chains that make structures like fruit skin, stems, etc. **Fibre** is an important part of a healthy diet even though our bodies cannot **absorb** it. It passes through the gut and helps the body get rid of its waste products, 'cleaning out' the digestive track. Fruit and vegetables such as leafy greens, asparagus, artichokes, eggplant, raspberries and broccoli are all good sources of fibrous carbohydrates. **Legumes**, such as dried beans, peas and lentils, are also a good source of fibre, as is bran, which is present in many **unrefined grain** products (e.g. brown rice).

Sugary carbohydrates: There are quite a few different forms of sugar. Fructose, sucrose, glucose, lactose and maltose are different types of sugar **molecules**. Sugar is either found naturally in our food and drinks, or it is added – for example, in soda, cakes, biscuits and pastries. These so-called 'free' sugars also include sugars naturally present in honey, syrups, fruit juices and fruit juice concentrates. As a rule, WHO recommends to reduce the intake of sugars at all stages of life and the limited sugars we do eat should be those found naturally in food such as fruits. The longer chain of sugars, such as starch mentioned above, are actually bitter in taste, but they are healthier for our bodies, especially when still found in their natural state in whole, raw foods. We should therefore mainly get our energy from these food types.

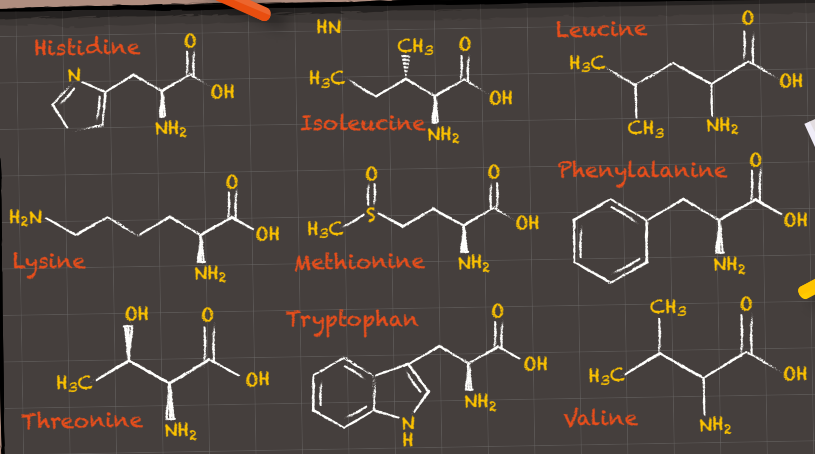
PROTEIN

Protein is a key **nutrient** for us, because:

- Every cell in the human body is made of protein.
- Protein works in the body to build and repair body tissues such as muscles, bones and organs, blood, skin and hair.
- Protein is therefore particularly important for growth and healthy development during childhood, **adolescence** and pregnancy.
- Protein helps make our blood clot to help stop bleeding, keeps our **immune system** strong to fight disease and is needed to produce hormones.
- Protein is also a major component of the body's transportation system, carrying oxygen and **nutrients** to each of the body's cells.

There are 22 different types of **amino acids** that our body uses to make proteins, which are long chains of different combinations of **amino acids**. Our bodies can produce about 13 of these, but there are nine **amino acids** that our body cannot make itself. These are called essential amino acids (see p. 70) and we need to get these by eating certain protein-rich foods. If we don't eat foods containing these essential amino acids, our bodies will begin to break down existing protein, such as muscle tissue. Therefore, it is particularly important that we include these essential amino acids regularly in our diet.

Different foods contain different **amino acids**, so it is important to eat a varied diet each day. Meat protein contains all **amino acids**, including the essential ones. Nuts, grains, **legumes**, fruits, and vegetables are incomplete protein sources, i.e. they do not contain all the **amino acids**. Therefore, vegetarians should mix and match food carefully to get a complete protein combination (see box on p. 71). However, in general, it is good to vary your diet and mix meat, dairy, grains and **legumes** together to give you the right combination of **amino acids** and reduce **consumption** of other **nutrients** such as fats. For example, eating whole oat granola and yoghurt together is a healthy option to get the right mix of **amino acids**.



Essential amino acids	Some foods you can find them in
Histidine	Meat, beans, parmesan, soy protein, seeds, seaweed and sesame
Isoleucine	Almonds, cashews, chicken, chickpeas, eggs, white fish, lentils, most seeds and soy protein
Leucine	Meat, poultry, fish, dairy products, beans, peanuts and soy protein
Lysine	Meat, eggs, poultry, soy, beans, peas and cheese
Methionine	Meat, fish, dairy products, beans, spinach, zucchini, nuts and seeds
Phenylalanine	Meat, milk, eggs, walnuts, peanuts, chickpeas and soy protein
Threonine	Meat, eggs, soy, spinach, turnip, mushrooms, kale and beans
Tryptophan	Chocolate, oats, dried dates, milk, yoghurt, cottage cheese, red meat, eggs, fish, poultry, sesame, chickpeas, seeds, bananas and peanuts
Valine	Meat, dairy products, grains, mushrooms, peanuts and soy protein

VEGETARIANS

Generally speaking, vegetarians do not eat meat, fish or poultry, but there are many different types of vegetarian diets. These include:

- Lacto-vegetarian diets that exclude meat, fish, poultry and eggs, as well as foods that contain them. Dairy products, such as milk, cheese, yoghurt and butter, are included.
- Lacto-ovo vegetarian diets that exclude meat, fish and poultry, but allow dairy products and eggs.
- Ovo-vegetarian diets that exclude meat, poultry, seafood and dairy products, but allow eggs.
- Vegan diets that exclude meat, poultry, fish, eggs and dairy products – and foods that contain these products.

Based on which vegetarian diet you follow, you must make sure you eat plenty of the right foods to **consume** all the **nutrients** that your body needs. For example, to get iron and protein, which is most commonly found in meat, vegetarians should eat more dried beans, whole grains and leafy green vegetables. For those who don't drink milk, they could get their calcium from soymilk or tofu. Vegetarians also need to be extra careful in selecting different food products to get the rights amounts of the different essential **amino acids**. This can be achieved by eating a variety of seeds, nuts and **legumes** (especially beans, lentils and peas) to give you the right mix. Seeds, such as sesame, pumpkin or sunflower, are healthy options, while nuts like almonds or cashews have less fat than other nuts, while being rich in proteins.

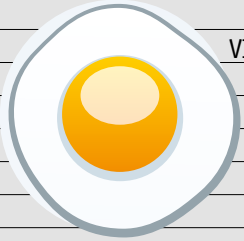
It's all about mixing and matching!

DID YOU KNOW?

The humble egg is one of the best sources of protein. Eggs also contain many **vitamins** (such as **vitamin** A and D) and **minerals** (such as calcium). A medium-sized egg has around 6 grams of protein and is complete with all 22 **amino acids** in an easily digestible form. For example, an omelette or, even better, a boiled or poached egg can be part of a great meal.

ONE LARGE EGG (50GR) PROVIDES THE DAILY REQUIREMENTS OF

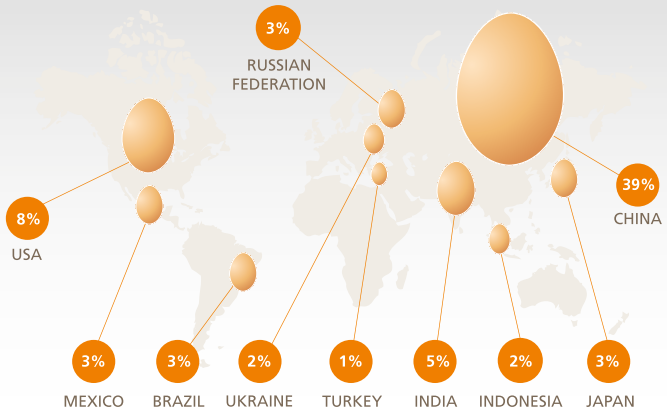
27%	SELENIUM	FOLATE	9%
25%	VITAMIN B12	VITAMIN A (RAE)	8%
23%	CHOLINE	IRON	6%
15%	RIBOFLAVIN	ENERGY	4%
13%	PROTEIN	VITAMIN B6	4%
11%	PHOSPHORUS	ZINC	4%
9%	VITAMIN D	VITAMIN E	2%



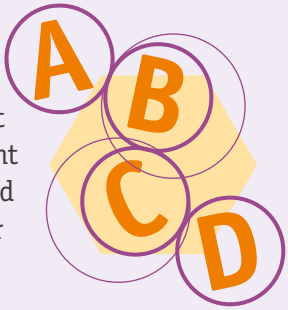
BASED ON APPROXIMATE AVERAGES FOR ADULT MALE/FEMALE FROM 5 DATABASES (AUSTRALIA, CANADA, CHINA, EU, USA)

TOP 10 EGG PRODUCERS (2013)

These countries produce 70% of the world production



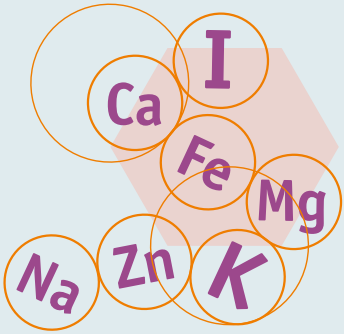
VITAMINS



Vitamins are **organic** compounds that cannot be synthesized by the human body in sufficient quantities, but they are provided by plants and animals that we eat. Vitamins are essential for body functioning, helping to prevent severe illness and support longer, healthier lives.
Fruits, vegetables, beans and grains are rich in **vitamins**. There are many different kinds of **vitamins**, and each one has a very specific function. Let us take a look at some of the main ones:

- **Vitamin A** is important for healthy skin, bone formation, a strong **immune system**, reproduction, growth and good eyesight. In fact, **vitamin** A **deficiency** as a child can lead to permanent blindness. The best sources of **vitamin** A are orange and yellow fruit and vegetables, green leafy vegetables, milk, eggs, liver and other organs.
- There are **eight B-vitamins**, which work together to process energy, regulate body functions, and build and repair tissues. Foods rich in B-**vitamins** include all meats (particularly liver), fish, eggs, nuts, seeds, **legumes**, milk and dairy products and green leafy vegetables.
- **Vitamin C** is important for the health of tissues and acts as the 'cement' to hold cells and tissues together. It also reduces the risk of disease. It cannot be stored by the body, so foods with **vitamin** C should be eaten very often. Foods rich in **vitamin** C are fruits, especially citrus fruits, and most vegetables, including potatoes with their skin.
- **Vitamin D** works with calcium and other **minerals** for the health of our bones, **immune system**, brain, **nervous system**, skin, muscles and reproductive organs. Its best source is the body's own production through exposure to sunlight, which gives it its nickname: 'the sunshine **vitamin**'. Do be careful when soaking up the sun though; the sun's ultraviolet rays can be harmful, and it is a good idea to use sunscreen or other protection!

MINERALS



Minerals are naturally occurring **inorganic** chemicals ('**inorganic**' means they are neither plants nor animals – remember **vitamins** are **organic**).

Here are their key functions:

* **Minerals** regulate many body processes, such as the heartbeat, nerve responses and reactions, blood clotting, fluid regulation and energy **metabolism**.
* **Minerals** form part of the structure of bones, teeth, nails, muscles and red blood cells.
* **Minerals** cannot be broken down or changed by our bodies, and are not destroyed by heat or air.

Different **minerals** are found in different foods, so we should eat a wide variety of **nutritious** foods to get the minerals we need for good health. At least 15 **minerals** are currently known to be essential for human nutrition. Here are a few:

* **Calcium** is essential for the formation of strong bones and teeth and for nerve and muscle functions. Children in particular are often told to drink their milk so their growing bones and teeth get the calcium they need to be strong. Apart from dairy products (e.g. milk, cheese and yoghurt), calcium may also be found in some small bony fish and leafy green vegetables. Calcium-**fortified** foods and drinks, such as cereals, orange juice, or rice or almond beverages, also provide calcium, but do not necessarily provide the other **nutrients** found in dairy products (e.g. proteins, fats and B-**vitamins**).

- **Iodine** is essential for normal growth, development and functioning of the brain and body. Iodine **deficiency** can cause delayed mental development and stunted physical and mental growth. Iodine is above all found in iodized salt, but also in some types of seafood and seaweed.
- **Iron** carries oxygen through the body and is important for proper growth and development and resistance to infections. It is especially important for women during pregnancy and childbirth, and for infants and children. Lack of iron can lead to delays in physical growth and reduced fertility. Iron is found in red meats, liver, fish, poultry, eggs, lentils, beans and dark leafy green vegetables like spinach.
- **Magnesium** is an important component in bone structure formation and is essential for energy transfer around the body. Magnesium is found in fruits, vegetables and nuts.
- **Potassium** helps trigger your heartbeat and helps regulate the body's blood pressure. Potassium is found in fruit and vegetables.
- **Zinc** helps keep cells strong, assists the **immune system** and is critical for normal growth and development. It is important for the proper functioning of the central **nervous system** and the brain, especially during infancy, childhood and pregnancy. Zinc is found in fish and shellfish, red meats, liver and **legumes**.
- **Sodium** helps regulate the body's fluid volume, helps maintain blood pressure and supports muscle and nerve functioning. Sodium is found in salt.

Food groups and nutrients summary

Wow! We realize that was a lot of information – to help you take it all in here is a table (on the right) that indicates which food groups are significant sources of the listed nutrients. Note, however, these food groups do not exclusively supply these nutrients, and there will also be differences in amounts between food items and even varieties.

Other food groups may also contain small amounts of nutrients. That is why a balanced and varied diet is so important. It is not only important to eat the right amounts of the different food groups but also a good mix of different food items within each group (variety is the spice of life after all).

WAI YING, VANESSA YU, aged 15, HONG KONG

	Fruit	Root veg	Dark, leafy green veg	Grains	Legumes (beans, lentils, etc.)	Nuts and seeds	Meat	Fish	Dairy products	Eggs	Fats and oils
Starchy carbohydrates		✓		✓	✓	✓					
Fibrous carbohydrates	✓	✓	✓	✓	✓						
Sugary carbohydrates	✓								✓		
All essential amino acids							✓	✓	✓	✓	
Other amino acids				✓	✓	✓					
Unsaturated fatty acids						✓		✓			✓
Vitamin A	✓	✓	✓				✓		✓	✓	
B vitamins			✓		✓	✓	✓	✓	✓	✓	
Vitamin C	✓	✓	✓								
Vitamin D								✓	✓	✓	
Calcium			✓					✓	✓		
Iodine								✓		✓	
Iron			✓	✓	✓		✓	✓		✓	
Magnesium	✓	✓			✓	✓					
Potassium	✓	✓			✓	✓					
Zinc					✓	✓	✓	✓			

CREATING A BALANCED DIET

What proportions?

Now you've learned about all the food groups and nutrients, let us see in a bit more detail how much we should eat of each food type. Many countries have food guides showing how much commonly **consumed** foods within each food group should make up of the typical meal (e.g. food pyramids, palms, plates, etc.). It is generally recommended that you eat at least five portions of fruit and vegetables each day. Starchy carbohydrates could make up about half of your energy intake each day – with these being whole grains where possible. We also need protein-rich foods – either from animal products (meat, fish and dairy) or from plants (**legumes**, nuts and seeds).

Less than 30 percent of your energy intake should be fats, and less than 10 percent from free sugars. Keeping salt intake to less than 5 g per day helps reduce the risk of heart disease and stroke in later life. Remember that a balanced diet is not just about getting the correct proportions of the different food types but also having variety within these food types. For example, there are many types of vegetables that are in season at different times of the year, and it's fun to try them and cook them in different ways.

More to explore:

- FAO's Eating Well for Good Health lessons on nutrition and healthy diets. In particular, Lesson 7 - Making good food choices and healthy meals:
  www.fao.org/docrep/017/i3261e/i3261e.pdf
- WHO Healthy Diet factsheet
  www.who.int/mediacentre/factsheets/fs394/en
- The Five Keys to a Healthy Diet
  www.who.int/nutrition/topics/5keys_healthydiet/en

How much?

So we know the proportions but how much should we eat? Well, this depends on your age, whether you're a boy or a girl, and how active you are physically!

Whatever your age, it is important that you get the most out of the food that you are eating. This means ensuring that the food you choose to eat contains the highest levels of **nutrients** possible. For example, eating fresh, whole foods will contain many essential **nutrients** that would be lost when processed or stored. It is also important to remember that many **processed foods** often contain high levels of fats, sugar and salt and contain many additives such as **preservatives** made from chemicals. You can also maintain high **nutrient** levels through your cooking methods – for example, steaming vegetables rather than boiling or frying them. Find out more about this on p. 108.

More to explore:

- WHO Healthy Diet Fact Sheet: **www.who.int/mediacentre/factsheets/fs394/en**
- 5 A Day: **www.nhs.uk/LiveWell/5ADAY/Pages/5ADAYhome.aspx**
- 100 snack ideas: **www.100daysofrealfood.com/2012/07/31/85-snacks-for-kids-and-adults**
- Choose My Plate: **www.choosemyplate.gov**
- FAO Eating Well for Good Health: **www.fao.org/docrep/017/i3261e/i3261e00.htm**
- Food Groups: **www.cdc.gov/nutrition/everyone/basics/foodgroups.html**
- All about nutrition: **www.superkidsnutrition.com**
- Tips for vegetarians: **www.choosemyplate.gov/healthy-eating-tips/tips-for-vegetarian.html**

CHILDREN AGED 2–10 YEARS OLD

- Growing children have high energy and **nutrient** needs, but they have small stomachs and cannot eat large portions of food at a time.
- Girls and boys need the same amounts of food at this age and have the same **nutrient** needs.
- They need to eat at least three good meals a day with two to three healthy snacks in between.
- Going to school on an empty stomach makes it hard to concentrate and learn. Every day should start with a **nutritious** meal before going to school!
- It's very important to include a variety of foods in their diets in order to grow and be healthy.

ADOLESCENT BOYS AND GIRLS (11–20 YEARS OLD)

- **Adolescence** is a period of very rapid growth and high demands for **nutrients** and energy as the body matures into adulthood. In this period, your skeleton builds its strong foundation of calcium stores, which is especially important for girls.
- So this is a time to establish good food choices, eating habits and regular meal patterns to practise throughout later life. Diets that do not meet all nutritional needs should be avoided.
- It is important to choose foods rich in **micronutrients** (**vitamins** and **minerals**).
- **Adolescent** girls need to eat well for their own immediate development – and because this provides a basis to support their own children, if they become mothers later on in life. In particular, they need to eat foods rich in iron to meet their very high iron needs due to rapid growth and blood loss through their monthly periods.
- **Adolescent** boys mature differently from girls and are likely to need more **calories** and high- protein foods.

WHAT ARE CALORIES?

So now we know all about the **nutrients** that we get from food, but what about the energy that we need to think, do activities and grow? The energy we get from food is measured in **calories**. Broadly speaking, **calories** are the energy that fuels our bodies (a bit like petrol fuels an engine!). The calories in our food are used for:

* **Growth:** **calories** provide our cells and muscles with the energy they need to grow.
* **Vital body processes:** e.g. heartbeat, breathing, **metabolizing**, digesting, thinking, blood circulation, growing. The amount of energy needed for these processes is called 'Basal Metabolic Rate' (BMR).
* **Physical activity:** e.g. walking, swimming, playing, working, dancing, cycling, etc.

DID YOU KNOW?

The scientific definition of a **calorie** is: the energy needed to raise the temperature of 1 g of water by 1 °C.

The body gets the energy, or **calories**, it needs from food through a process called **metabolism**. Different food types provide different amounts of energy. For example, a gram of carbohydrates provides 4 **calories**, a gram of protein provides 4 **calories** and a gram of fat provides 9 calories. If you know the amount of carbohydrates, fats and proteins in the food you eat at a meal, you can calculate the number of **calories** (or energy!) you are taking into your body. A rough average of what people should eat each day is 2 000 **calories**. However, the amount really required by a particular person depends on factors such as height, weight, gender, age and the level of physical activity.

EATING TIPS:

- As a general rule, remember to balance the amount of **calories** you eat with the amount of energy you use doing exercise and other physical activity. Maintaining this energy balance is important for keeping a healthy body weight.
- Snack wisely. Foods eaten in addition to regular meals have an important place in a good diet. Snacks are important for people with high food energy and **nutrient** needs, and for people who may not be able to eat enough food at one time to meet their needs, such as small children or people who are ill. Snacks should consist of nourishing foods that supplement and complement a good diet. However, snacks should not take the place of foods eaten at meals. Good snacks include:
  - An apple, a pear or any serving of fruit.
  - Dried fruit and nuts – these should be eaten in moderation, too high quantities can be fattening.
  - A cup of yoghurt – check for the sugar and fat content. You can always add fresh fruit to plain yoghurt.
  - Raw vegetables, such as bell pepper, radishes, celery or carrots. These taste great on their own but if you prefer you can also have them with a healthy dip such as houmous (made with ground chickpeas and sesame seeds) or guacamole (made with avocado).
  - A small sandwich of whole grain bread with a filling of lean meat and lettuce, avocado and tomato slices, low fat cheese, or any other healthy combination.
- Avoid foods that are high in saturated fats and sugars, such as fried snacks, soft drinks, sugary breakfast cereals, etc.

Maintaining a healthy body size

Good health for most people depends on a body size that is neither too fat nor too thin. Extremes of either are signs of poor health and can put us at risk of disease. A healthy body weight depends on a person's age, sex and height. You can maintain a healthy body weight and get all the **nutrients** you need by choosing foods well, planning your meals and snacks carefully, paying attention to your **calorie** intake and doing regular physical activity.

Extra energy that is not used immediately by the body is stored as fat. This is very important for survival in times of hunger; when food is scarce the body uses its fat stores for energy. However, storing too much body fat can put us at risk of being overweight or **obese**.

DID YOU KNOW?

People have different attitudes and perceptions about body size. Some cultures see a plump body as a symbol of beauty, health and wealth, while others consider thin bodies the beauty ideal. These perceptions can lead to poor diets and eating habits because they are based on issues other than health and nutrition. How does your culture think about body size? What problems can this cause in especially young people? What can be done to prevent it?

EVALUATING BODY SIZE IN RELATION TO HEIGHT

The **body mass index (BMI)** is the most common method of evaluating body size.

BMI is calculated by dividing weight in kilograms by the square of your height in metres: BMI = Weight (kg)/[height (m)]^2

Example for an adult whose weight = 67 kg and height = 1.7 m
BMI = 67 / (1.7 x 1.7) = 23 (normal weight)

If you are using pounds and inches the formula would be:
weight (lb) / [height (in)]^2 x 703

Example: Weight = 150 lbs, Height = 5'5' (65')
Calculation: [150 ÷ (65)2] x 703 = 24.96

BMI result	Weight status	
Less than 18.5	Underweight	
18.5 to 24.9	Normal weight	
25 to 29.9	Overweight	
30 and over	Obese	

WHAT ABOUT MY BMI?

Note that BMI is just a rough measure that is useful at the population level, but for individuals the figure will change over time and more accurate measurements should also be taken. BMI is calculated differently for children and **adolescents**, because healthy weight ranges change with each month of age for each sex. In young people, healthy weight ranges also change as height increases. This is why BMI for children and teens is mapped on charts, allowing you to compare your relative position with other boys and girls of your age.

See the BMI chart for girls aged 5–19:
www.who.int/growthref/bmifa_girls_z_5_19_labels.pdf

See the BMI chart for boys aged 5–19:
www.who.int/growthref/bmifa_boys_z_5_19_labels.pdf

But please remember to always check with your doctor if you are worried about your BMI!

MALNUTRITION

We cannot take good nutrition for granted. Unfortunately, not everyone has access to the food or the knowledge they need to eat well or the needed healthy environment or appropriate health care. Nearly 30 percent of the world's population suffers from some form of malnutrition (*Source*: FAO). This means they are not getting enough food, not getting the right kind of food or they are getting too much food (obesity). This may temporarily or permanently damage the body's basic functions. A balanced and healthy diet is important at all ages of life but is particularly important during early childhood and for example during pregnancy, which can affect the health of the newborns.

DID YOU KNOW?

Many countries are now facing a double burden of malnutrition, which is the coexistence of undernutrition along with overweight, obesity or diet-related noncommunicable diseases (NCDs). The double burden can also be found within communities, households and even individuals who may be overweight or obese but also suffering from anaemia or micronutrient deficiencies, for example.

DID YOU KNOW?

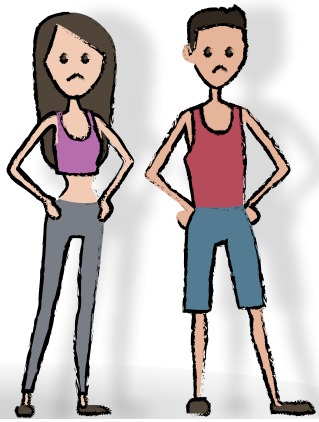
The foods you eat can benefit or damage the health of your unborn baby during pregnancy. Mothers with inadequate or unhealthy diets during pregnancy may be putting their children at increased risk of developing long-term health issues including obesity, cardiovascular disease and type 2 diabetes.

Malnutrition is often grouped into three types:

1. **Micronutrient malnutrition** is caused by not eating or not **absorbing** the right amounts of **vitamins** and **minerals** that the body needs to function well. Eating enough food to meet the body's need for energy (**calories**) does not guarantee meeting our needs for essential **micronutrients**. This type of **malnutrition** is sometimes called 'hidden hunger' because a person might look healthy even though their body is not receiving the essential **nutrients** that it needs.

2. **Undernutrition** is caused by not eating (either because there is no food or due to illness) or being unable to digest and **absorb** enough food (due to illness or infection) to meet the body's minimum needs for energy and **nutrients**. **Undernourished** people are considerably underweight and may suffer from wasting, stunting, severe acute **malnutrition**, anaemia and other **micronutrient deficiencies**.

   A person is considered underweight if their BMI is under 18.5. An **undernourished** person is likely to have less energy to be physically active than a person of average weight, and may find it harder to concentrate. Being **undernourished** also weakens the body's **immune system**, making **undernourished** people more vulnerable to getting ill. It can also affect blood pressure and cause the heart rate to drop. **Undernourished** people also often have more fragile bones and are more prone to infertility problems. Monthly periods often stop or become irregular if **adolescent** girls' and women's are too thin.



Some kinds of illnesses and diseases can prevent your body from **absorbing** the **nutrients** it needs (such as AIDS, diarrhoea, malaria or certain types of cancer), which can cause people to become underweight. Other illnesses, known as **eating disorders**, are caused by a mixture of physical and psychological factors, and can lead to extreme weight loss. **Anorexia** (which literally means 'having no appetite') and **bulimia** (self-induced vomiting after eating, often after binge eating) are the most common examples of **eating disorders**. Eating disorders are often a symptom of other problems – can you think of what kind of situations might cause people to be prone to **eating disorders**? What kind of cultural changes can help to solve these issues? Fortunately, with careful treatment, anorexia and bulimia patients can get better again. Find out more about **eating disorders** here: **www.nimh.nih.gov/health/topics/eating-disorders/index.shtml**

3. Overweight and obesity are caused by eating more food (**calories**) than the body needs (see p. 83). These **calories** are stored as body fat. We all need some body fat, but too much fat accumulation can lead to becoming overweight and **obese**. A person is considered overweight when he or she has a BMI of 25 or over, and **obese** when he or she has a BMI of over 30. While **obesity** is often caused by overeating, it may also be caused by simply eating the wrong kinds of foods. Knowledge about foods that are better for you will help keep you in good shape. People whose diets provide more food than they need may still be **deficient** in **vitamins** and **minerals**. Lack of exercise also contributes to **obesity**; exercise has many health benefits, including its ability to burn off the extra calories (see Section A for more information). **Obesity** may also contribute to people exercising less, making the problem worse. Obesity is a growing problem in the world; it leads to many health problems, including heart disease and diabetes.

Children and malnutrition

It is vital that small children in particular get **adequate** nutrition to grow up healthy and strong. Unfortunately, we still have a long way to go to making sure all children in the world get good nutrition. Currently, **malnutrition** causes 45 percent of all deaths of children younger than five years (*Source*: Black *et al.*, 2013). **Malnutrition** also affects children's ability to learn and perform well in school, as it is harder to concentrate if your body is not well-nourished.

DID YOU KNOW?

The World Health Organization (WHO), UNICEF and the World Bank have estimated that:

Stunting: for 2016, 155 million children under the age of five years (22.9 %) were stunted, meaning that they were too short for their age.

Wasting: for 2016, 52 million children under the age of five (7.7 %) suffered from wasting, meaning that they were too thin for their height.

Overweight: for 2016, 41 million children under the age of five (6 %) suffered from being overweight, meaning that they were too heavy for their height. Once considered to be a high-income country problem, overweight and **obesity** are now on the rise in low- and middle-income countries, particularly in urban settings.

Find out more at: **http://who.int/nutrition/publications/jointchildmalnutrition_2017_estimates/en/**

More to explore:

- FAO: Understanding Hunger and Malnutrition: **www.fao.org/resources/infographics/infographics-details/en/c/238873**
- FAO: The Spectrum of Malnutrition: **www.fao.org/worldfoodsummit/english/fsheets/malnutrition.pdf**
- FAO: The State of Food Insecurity in the World: **www.fao.org/publications/sofi/en**
- WHO: Global Database on Child Growth and Malnutrition: **www.who.int/nutgrowthdb/estimates/en/index.html**
- WHO: Obesity: **www.who.int/topics/obesity/en**
- WHO: Nutrition Landscape Information System **http://apps.who.int/nutrition/landscape/report.aspx**
- WHO: Global Targets 2025 **www.who.int/nutrition/global-target-2025/en**

HUNGER UNITED NATIONS CHALLENGE BADGE

Learn more about this topic through the **ENDING HUNGER CHALLENGE BADGE**

READING FOOD LABELS

Depending on the country in which you live, packaged foods normally have labels that describe the ingredients in the product. Reading these labels is important to understand the amounts of nutrients you are eating and ensuring that you are not eating too many calories, fat, sugar or salt. From the label you will also see what other chemicals, such a preservatives, are used. You may notice some processed foods have a lot of additional chemicals, sugars or fats and salt. This is why it is normally better to prepare the same food yourself with the raw/whole basic ingredients, avoiding these additional ingredients and preservatives.


ANIKE BIENE PADRIGO, aged 15, PHILIPPINES

Ingredients list

The ingredients list should normally contain the items in order of volume. So packages will contain a lot of the ingredients listed first, second or third, etc. The ingredients mentioned at the end of the list will be in smaller (even tiny) amounts.

However, be careful as even in small amounts some ingredients (such as salt and sugar) can be too much for your diet. The list will also include the additives and **preservatives** that have been added. In addition, you will find information with regard to allergens, i.e. if the food contains traces of foods to which some people are allergic (such as peanuts, milk, etc.). Learn more about food allergies at: **www.allergyuk.org**

Nutrition labels

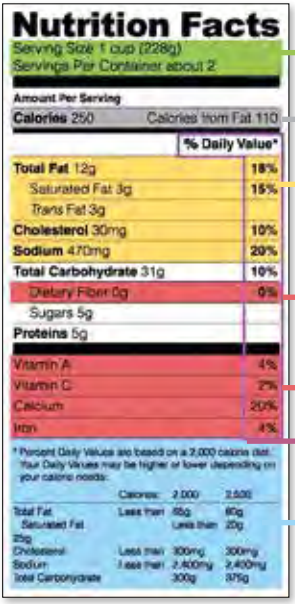
Nutrition labels are useful because they tell us:

1. **Serving size**: this tells you how many servings are in the package. This is the basis for the rest of the information on the label.

2. **Amount of calories**: these are calculated as a total per serving.

3. **Limit these nutrients**: this is what you have to pay attention to (the goal is to reduce the **consumption** of **nutrients** such as saturated fat, sugar and salt to below the daily values).

4. **Get enough of these nutrients**: eating these **nutrients** may improve your health and help to reduce the risk of illness and disease.



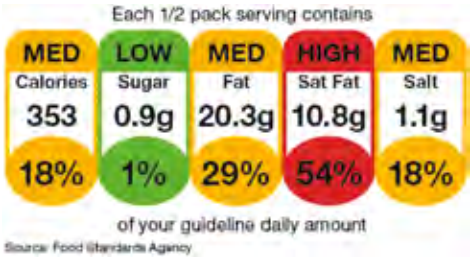
5. **Percent daily value**: tell you the daily value recommendations for key **nutrients**, but only for a 2 000-**calorie**-daily diet. You can use this to help calculate your overall meal plan for the day.

6. **Footnote with daily values**: this provides more information about the daily values.

Traffic light labelling and other front-of-pack labelling

In some countries, products now include 'traffic light labelling' or other front-of-pack labelling, a system that uses colours to indicate the relative levels of fat, saturated fat, sugar and salt in the product (green = low; amber = medium; red = high).

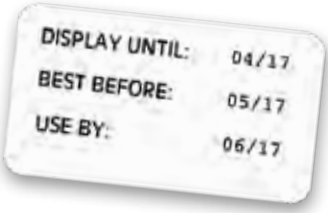
They also tell you the percent of daily reference intake of particular **nutrients** that the product contains. For example, a chocolate bar may contain 20 percent of your daily fat reference intake. Traffic light labels provide a quick and easy way to understand the nutritional content of your food.



Expiry dates

You will find the product's expiry date or 'shelf life' on the package. There can be three dates:

- The 'display until' date gives you the last date until which the shop can display the item.
- The 'best before' date is the recommended time that the product can be stored, during which the product remains of good quality.
- The 'use by' date is the recommended final date that the item can safely be **consumed**. After this date, it might be that the food goes bad, in which case it could be unhealthy to eat it.



Foods without food labels

As was already mentioned in previous sections, buying fresh produce that is not processed or packaged is often more nutritious and healthy and can reduce the impact on the environment. These foods, which include eggs, meat, fresh fruit and vegetables, are sold without food labels, especially when you buy directly from the farmers, in local markets or small local shops. When you don't have labels you can use the portions and quantities as discussed in the sections above to create a **balanced diet**.

In addition, when buying food you should always try to buy as fresh as possible from places that you trust to ensure it is nutritious and safe. Learn more about food safety in Section C on p. 98.

More to explore:

- British Heart Foundation Food Labelling Guide: **www.bhf.org.uk/get-involved/campaigning/food-labelling.aspx**
- Food Smarts: **www.pbskids.org/itsmylife/body/foodsmarts/article4.html**
- Kids Health Figuring Out Food Labels: **www.kidshealth.org/kid/stay_healthy/food/labels.html**

PADMORE PAASEWE, aged 19, LIBERIA

THE HEALTHY EATING CHECKLIST

Creating a **nutritious** and **balanced diet** is a fun project! There is such a variety of food out there, bursting with all sorts of healthy **nutrients**; those of us fortunate enough to have access to enough food should enjoy the opportunity to try different things, learn about what's out there, and how to get the most benefit out of every meal!

A healthy eating plan will show you how much you need from each food group to get all the nutrients you need, stay within your **calorie** needs and be healthy. A healthy eating plan can also help you learn:

* How much of each type of food you should **consume**.
* How to make healthy choices for different food types.

Remember: there is no single diet that is right for everyone! Work out what is best for you based on your age, body type, sex, health status and how much exercise you do.

ADELIA DEWANTARI, *aged 14*, INDONESIA

PRACTISING A HEALTHY DIET BEGINS WITH GOOD PLANNING AND SMART FOOD SHOPPING. HERE ARE SOME SUGGESTIONS TO FOLLOW:

- Plan meals in advance.
- Remember what foods and meals you've eaten in the last few days and try to eat different foods.
- Check what foods you already have at home to avoid repetition and waste.
- Buy some foods from all of the food groups. You can check what products are in season and make sure you get a nice variety.
- Within each food group, vary the foods you eat.
- Buy small amounts of foods that should make up only a small amount of your diet (sugar, sweets, fats and oils).
- Buy smaller amounts of more expensive foods (e.g. meats, fish, milk and milk products and certain fruit and vegetables), so you can still afford them. You can substitute them with less expensive similar foods from the same group (e.g. by buying dried beans or other **legumes** instead of meat for protein, or only choosing vegetables and fruits that are in season).
- Make sure what you eat is safe – free from toxins, chemicals or **micro-organisms**. We will learn more about this in Section C.
- Buy as few **processed foods** as possible; choose fresh, basic ingredients instead. **Processed foods** often contain a lot of salt, fat, sugar, artificial flavours and **preservatives**, making them less healthy than fresh, natural ingredients. So avoid the prepared, ready-to-eat packaged foods and buy the fresh ingredients to make it yourself.
- Remember variety and discovering different food can be fun and nutritious.

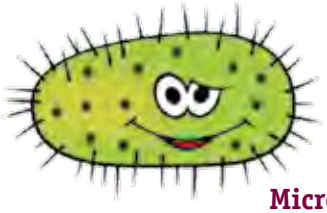
FOOD SAFETY

We've learned a lot about the benefits of eating a **balanced diet**, but it is also important that the food we buy and cook is safe to eat. In this section we will learn all about **food safety**, and what we can do to make sure the food we eat is safe. Most illnesses from eating **contaminated** or spoiled food can be avoided if food is handled, prepared, cooked and stored properly, and if basic cleanliness and personal **hygiene** practices are followed.

People who are elderly, very young or already sick are more likely to become ill. Children under five years of age are at particularly high risk, with 125 000 children dying from food-borne diseases every year (*Source*: Estimates of the Global burden of food-borne diseases, WHO 2015). The type of illness can range from diarrhoea to cancers. We can get sick right away or the symptoms (such as vomiting, abdominal pain and fever) may take a few days to develop. For a number of serious **food-borne diseases** (e.g. cancer), the disease can take years to develop.

Therefore, we need to think about **food safety** all the time. Let's take a look at some of the things that can make us sick.

WHAT MAKES US SICK

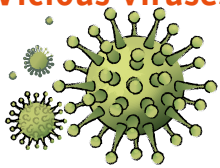


There are a number of **micro-organisms** and chemical substances that can make us sick. Some examples are given in this section.

Micro-organisms are everywhere – in people, in the air, water and soil, as well as in and on plants and animals. **Bacteria**, viruses, yeasts, moulds and **parasites** are all micro-organisms. There are three different types of **micro-organisms**: the good, the bad and the dangerous. Good **micro-organisms** are useful, for example, to make cheese or yoghurt, or to make medicine (e.g. penicillin), and help digest food in the gut. Bad **micro-organisms**, or spoilage micro-organisms, do not usually make people sick, but they cause our food to smell bad, taste horrible and look disgusting. Dangerous micro-organisms make people sick and can even kill. These are called '**pathogens**'. Most of these **micro-organisms** do not change the appearance of the food.

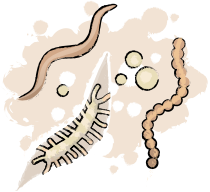
Micro-organisms grow by multiplication. To multiply they need food, water, time and warmth. One example of a **pathogenic bacteria** that can make us very sick is *Salmonella*. This is caused by eating raw or undercooked food like eggs or egg products, meat (especially poultry), or raw fruit and vegetables that have been **contaminated** during production. E. coli (*Escherichia coli*) is another type of **bacteria** that can get into food such as beef and vegetables. *Campylobacter* is **pathogenic** to humans and other animals and is now recognized as the main cause of **food-borne disease** in many developed countries.

Vicious viruses



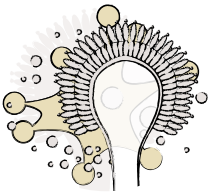
Viruses are **infectious** agents that reproduce themselves only when living inside the cells of other **organisms**. Even before you start to feel sick, you can be passing the virus on to food and spreading it to other people. Many **food-borne viruses** (e.g. rotavirus and norovirus) cause diarrhoea (as do many food-borne **bacteria**) but some viruses cause more serious diseases (e.g. hepatitis caused by the hepatitis virus).

Pesky parasites



Parasites range in size from tiny single-celled **organisms** to worms that are visible to the naked eye, and that live off other **organisms**. They may be transmitted from animals to humans, from humans to humans, or from humans to animals, and can be found in foods such as undercooked fish or meat, as well as raw fruit and vegetables that have been **contaminated** by human or animal faeces. For example, Toxoplasma can cause serious disease for infants (including reduced mental development) and typically comes from **contamination** with cat faeces, whereas tapeworm can come from pork from pigs raised under poor conditions.

Fearsome fungi



Some fungi are good for us, such as edible varieties of mushrooms, but others produce toxins called mycotoxins. One of the most important mycotoxins is aflatoxin, which is produced by a fungus (Aspergillus) which grows in cereals and other foods when they are not properly stored. Aflatoxin causes liver cancer in a significant number of people, especially in **developing countries** with poor infrastructure.

Criminal chemicals

There are many chemicals in our food, some are added intentionally for a specific purpose, such as **preservatives** to keep food fresh and safe; or residues of **pesticides** and veterinary drugs that are used to keep agricultural products pest free and food-producing animals healthy. Generally these chemicals, when used appropriately, are not of health concern. However, there are other chemicals that can end up in food from the environment, such as heavy metals that occur in the soil (arsenic, cadmium) or in water (arsenic, mercury) that can seriously affect human health when present in levels above the regulatory and safe levels. Other chemicals can be formed through processing such as roasting and frying (e.g. acrylamide in coffee, crisps or chips), or are formed from mould growing and spoiled food, such as aflatoxins, which are very potent cancer-causing compounds. Food production and processing need to be tightly controlled to avoid unsafe levels of such environmental and processing **contaminants**.

CHING MAN AU, aged 17, HONG KONG

SOME GOOD MICRO-ORGANISMS

FRIENDLY BUGS: NOT ALL BUGS ARE BAD – LET US MEET SOME OF THE GOOD GUYS

Not all **micro-organisms** are bad for you, in fact we depend on them for much of the food we produce. We now know that the good **micro-organisms** in our gut (which mainly stem from our food) has a major influence on proper digestion and health.
Let us look at some examples of when we use **micro-organisms** to produce our food.

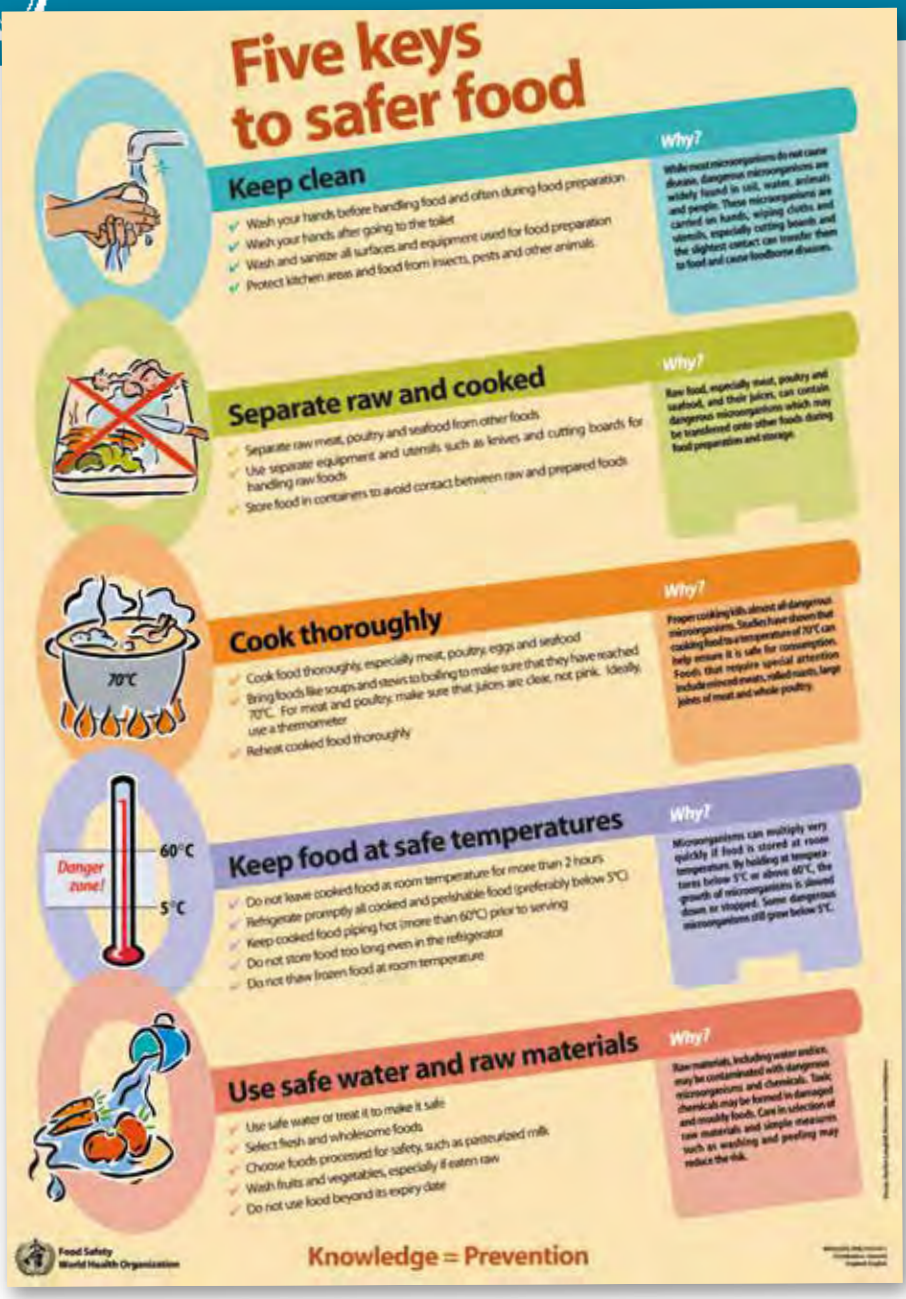
- **Yoghurt, cheese, probiotic drinks:** Different cultures of **bacteria** and **fungi** are used to ferment milk and change it into yoghurt, cheese and other products. As the culture grows in the milk, it converts the sugar lactose into lactic acid, giving the right level of acidity that thickens the liquid.
- **Baking:** yeast is used as a raising agent for a number of baked products, including bread. The most common yeast feeds on the sugars present in the bread dough, producing **carbon dioxide** gas. This forms bubbles within the dough, causing it to expand.
- **Soy sauce:** soy sauce is made by mixing soybeans and other grains with a mould – either Aspergillus oryzae or Aspergillus sojae – and yeast.
- **Cured meats:** meat starter cultures are used to make dried, fermented products such as salami, chorizo and dried ham. Lactic **bacteria** develop the flavour and colour of the products. In addition, a wide variety of moulds are used to ripen the surface of processed products.
- **Wine:** yeasts are responsible for the fermentation process that produces alcohol in wine. However, lactic **bacteria** also play an important role, as they convert the unstable malic acid that is naturally present in wine into the stable lactic acid.

So now that we know what makes us sick, let us look at five simple messages to help consumers prepare and handle food in safe ways. WHO developed the Five Keys to Safer Food to teach the basic principles that everybody should know all over the world to prevent **food-borne diseases**.

Take a look at this animated video available in English:
www.youtube.com/watch?v=0NkKy68HEIM#t=10.

The video is also available in several languages at
www.who.int/foodsafety/areas_work/food-hygiene/5keys/en

Five Keys to Safer Food animated movie, © WHO 2015.



WHO Five Keys to Safer Food poster is available in 90 languages at **www.who.int/foodsafety/areas_work/food-hygiene/5keys/en** © WHO 2015

FIVE KEYS TO SAFER FOOD

1. KEEP CLEAN

It is particularly important to wash hands, surfaces and kitchen equipment with clean, hot soapy water before handling food. This means that **micro-organisms** do not have a favourable breeding ground and growth is therefore restricted.

Hand washing

Before you start to prepare food, you need to make sure that you have washed your hands to ensure they are clean and you don't **contaminate** the food that you are preparing.
You should also wash your hands when moving from one food item to another. Remember to use hot water and lots of soap when washing hands and utensils. This simple process will help remove a significant amount of **micro-organisms** or chemical products reducing the risk of certain **foodborne illnesses**. Of course, you should always wash your hands before eating too. For more about hand washing, see p. 41.

Clean environments

You need to make sure to keep the surroundings of your home clean! It is important to keep rubbish in a covered bin and empty it regularly so it does not attract insects, rodents (mice, rats, etc.) or other animals (as well as spoiling food themselves, they often carry **infectious** diseases). Kitchen and bathroom countertops, and surfaces and objects that are touched on a regular basis by various people, should also be disinfected regularly to stop **micro-organisms** spreading.

Other good practices are:

* Use safe water to prepare and cook foods.
* Keep the kitchen clean. Use clean, hot, soapy water to clean all kitchen surfaces regularly.
* Avoid drinking, smoking and eating while preparing and cooking food.
* Avoid sneezing or coughing on food and scratching or touching the head and body.
* Keep food preparation surfaces and utensils clean. Prepare food on a clean surface such as a cutting board.
* Store dishes and utensils in a clean place protected from flies and dust.
* Cover all foods to keep flies, dust and dirt away.
* Use clean, carefully washed dishes and utensils to store, prepare, serve and eat food.
* Wash pots, bowls, cutting boards, dishes and utensils (knives, spoons, forks) in hot soapy water, or run them through a dishwasher. This reduces the opportunity for food residue to breed **micro-organisms** that could **contaminate** food the next time the tools are used.

2. SEPARATE RAW AND COOKED FOOD

Raw food, especially meat, poultry and seafood, and their juices, can contain dangerous **micro-organisms** that may be transferred on to other foods during food preparation and storage. Therefore, we need to be very careful about how we deal with raw and cooked foods. The key points are:

* Separate raw meat, poultry and seafood from other foods – this includes when shopping, storing, preparing and cooking these foods.
* Use separate equipment and utensils such as knives and cutting boards for handling raw foods; e.g. red for meat, green for vegetables, white for bread, etc.
* Store food in containers to avoid contact between raw and prepared foods.

3. COOK THOROUGHLY

Proper cooking kills almost all **pathogens**. Studies have shown that cooking food to a temperature of 70 °C can help ensure it is safe for **consumption**. Foods that require special attention include minced meats, rolled roasts, large joints of meat and whole poultry. The key points are:

* Cook food thoroughly, especially meat, poultry, eggs and seafood.
* Bring foods like soups and stews to boiling to make sure that they have reached 70 °C . For meat and poultry, make sure that juices are clear, not pink. Ideally, use a meat thermometer, available in most department stores.
* Reheat cooked food thoroughly.

It is important to cook food at the right temperatures and for the right time to kill **micro-organisms**.

Learn some cooking tips for cooking vegetables

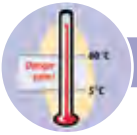
	Easy to slice	*Hard to chop*	*Don't cook*
Type of vegetables	Broccoli Cabbage Cauliflower Cherry tomato Eggplant Fennel Garlic Green bean Onion Pea Pepper Spinach Summer squash Tomato	Artichoke Beet Cassava Carrot Parsnip Potato Pumpkin Rhubarb Rutabaga (swede) Sweet potato Turnip Winter squash Yam	Avocado Cucumber Lettuce Radish Sprout
Best approaches to cooking	• On a grill • On a steamer • Sauté • In the microwave • Some might be boiled • Some can be eaten raw	• In the oven • In a pressure cooker • In the microwave • Boiled • Some might be thinly sliced and sautéed • Some can be eaten raw	• As a salad • Sliced into wedges • Shaved thinly
Cooking tips	• Different vegetables need different cooking times, and they are also affected by the amount of heat you use. So, the best way to tell if they're done is to taste a piece every so often.		• They are delicious with salad dressing or dip
	• These vegetables will cook much more quickly, so cook them gently until crisp-tender, but so they still have a bite to them (think green beans or broccoli that remain firm rather than droopy). • Overcooking will make them mushy	• These vegetables take longer to cook, but you will know they are ready when you can easily stick a knife into the vegetable. • You can chop these vegetables in evenly sized chunks so they cook faster.	

Source: **https://foodandhealth.com/easier-way-to-cook-vegetables-2/?printPost=1**

Learn some cooking tips for cooking meat

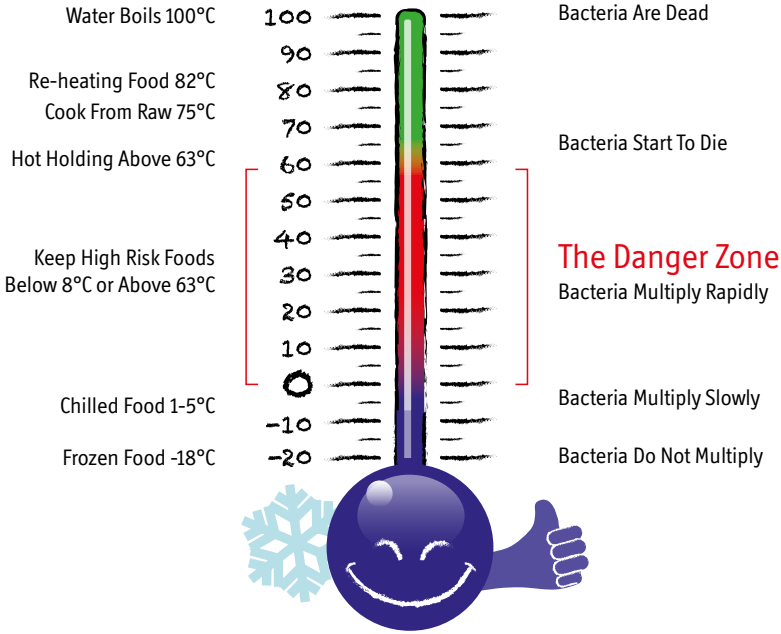
What should I you do when preparing meat?	• Always throw the wrapping/package in the bin immediately and thoroughly clean any surfaces it came into contact with.
Which meats must be cooked thoroughly?	• All raw meats can carry dangerous **micro-organisms** and proper cooking can kill almost all **pathogens**. Studies have shown that cooking food to a temperature of 70 °C can help ensure it is safe for **consumption**. Meats that require special attention include minced meats, rolled roasts, large joints of meat and whole poultry. • Bring foods like soups and stews to at least 70 °C or boiling to make sure meat is properly cooked. • Avoid overcooking when frying, grilling or baking food as this may produce toxic chemicals.
How do I know meats are properly cooked?	• For meat and poultry make sure that juices are clear not pink. Ideally use a thermometer. • Cut the meat with a knife and make sure it is piping hot throughout.
What should I do once the meat is ready?	• Keep cooked food piping hot (more than 60 °C) prior to serving. • Do not leave cooked food at room temperature for more than 2 hours.

Source: WHO (WHO Five keys to Safer Food) and **www.safefood.eu**



4. KEEP FOOD AT SAFE TEMPERATURES

Most **micro-organisms** like temperatures between 5 °C and 60 °C, commonly referred to as the 'Danger Zone'!
So when food sits at room temperature it is in the 'Danger Zone' and **micro-organisms** grow very quickly making you and others sick. Note that many of these **micro-organisms** produce toxins that are heat resistant, so if you allow them to grow even if you cook or reheat food properly afterwards, killing the **micro-organisms**, you will still get sick as the toxins will still be present. So at danger zone temperatures, food should be kept for as short a time as possible and **consumed** quickly. For the rest of the time food should be kept below 5 °C or above 60 °C. Food should therefore be refrigerated (temperatures below 5 °C) to help limit **micro-organism** growth (find out more about what items



should be refrigerated on p. 112) and properly cooked (or re-heated) to ensure harmful **micro-organisms** are killed. Note, however, that some dangerous **micro-organisms** still grow below 5 °C (which is why food cannot be stored in the fridge forever).

The key points are:

* Do not leave cooked food at room temperature for more than 2 hours.
* Refrigerate promptly all cooked and perishable food (preferably below 5 °C).
* Keep cooked food piping hot (above 60 °C) prior to serving.
* Do not store food too long even in the refrigerator.
* Do not thaw frozen food at room temperature.

Safe storage

Storing foods properly at home can help safeguard your health and also prevents food from spoiling and going to waste. While different practices are needed for different types of foods, all foods must be kept clean and free from **contamination** by harmful chemicals, **micro-organisms**, rodents or insects.

Refrigerating rules

As we know, micro-organisms need food, water, warmth and time to grow. Refrigerating foods promptly and properly, especially during hot weather, is important to keep food safe. Fresh, perishable foods, including milk and milk products, raw meat and eggs, should always be stored in the fridge or in a cold environment.

It is especially essential that raw meat and fish are refrigerated promptly after purchase. Remember to always check the use-by date. Remember if you can't refrigerate, only buy what you will consume on a day-to-day basis; in this way there is less chance of food spoiling.

HOW TO STORE ITEMS IN YOUR FRIDGE

Different types of food need to be stored in slightly different conditions, even within the cold environment of your fridge! But there are also important safety considerations to think about. For example, raw meat should be wrapped or kept in sealed containers at the bottom of the fridge to prevent liquids from leaking onto other foods and **contaminating** them, which could make people sick.

Freezing

Freezing is another great way of preserving food at home and keeping the bugs at bay. Freezing retains the taste, texture and nutritional value of food better than any other preservation method. However, it is important to know that freezing temporarily stops **micro-organisms** from growing, but doesn't actually kill them. In fact, some **micro-organisms** still grow in freezing conditions, but just very, very slowly. So, if your food went into the freezer **contaminated**, it will still contain the same harmful **micro-organisms** when thawed.

Thawing frozen foods

There are three safe ways to thaw (defrost) food:

* in the refrigerator (simply put it in and wait until it's thawed);
* in cold water (submerge the item – you will need to change the water every 30 minutes to help defrost the item);
* in a microwave oven (just set your microwave to 'defrost').

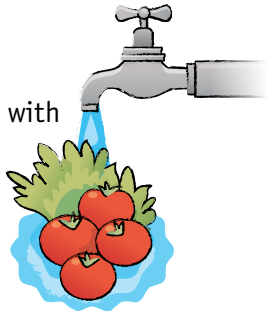
You should not refreeze food after it has thawed, because once food is at room temperature, the **micro-organisms** in it have had a chance to wake up and get busy again, meaning they will multiply in numbers. If you refreeze and re-thaw, you expose your food to a higher **micro-organism** growth, and a much higher risk of **contamination**.

Cupboard storage

Of course, not all food needs to go in the fridge or freezer! Dry, non-perishable foods such as cereals, pasta, rice and **legumes** (beans or lentils) should be kept in a dry, clean place free from insects, rodents or other animals. After you have opened them, store them preferably in airtight containers

or tightly reseal the original packaging (this removes the oxygen and moisture that **micro-organisms** need for survival and therefore slows the spoilage, and also stops insects from getting in). Bread can be kept as fresh as possible by storing it in a bread bin or covering it well to stop moisture loss.

5. USE SAFE WATER AND MATERIALS



This fifth key is very important – it is all to do with making careful and safe choices when buying our food items and using other safe materials (including water and ice). Dangerous **micro-organisms** and toxic chemicals may be formed in damaged and mouldy foods. Care in selection of raw materials and simple measures such as washing and peeling may reduce the risk.

The key points to remember are:

- Use safe water or treat it to make it safe.
- Select fresh and wholesome foods.
- Choose foods processed for safety, such as **pasteurized** milk.
- Wash fruit and vegetables thoroughly with clean water, especially if eaten raw.
- Do not use food beyond its expiry date and do not eat anything that has a strange smell, colour or that you suspect may be spoiled.

Throw out foods that are mouldy, rotting or have an unusual colour or bad smell, **but be aware that many harmful micro-organisms in foods are tasteless and have no smell.**

If you don't eat all of the food that you cook, you can store it as leftovers in the fridge and eat it later, but be sure to:

* Place leftovers in a sealed container, or cover with food wrap (cling film) to prevent **micro-organisms** from **contaminating** the food.
* Put a label on the container or dish with the date, so that you know how old it is when you come to use it.
* Keep leftovers at the front of the fridge – this way you will see them first and be reminded that they are there and need eating!
* If you are reheating leftovers be sure to heat them thoroughly to kill off any **micro-organisms**.

If you do have to throw food away when it has gone bad, make sure to dispose of it carefully and responsibly. Keep rubbish in a covered bin and empty it frequently.

GOOD FOOD SHOP CONDITIONS TO LOOK OUT FOR:

* The shop, inside and out is clean and free of rubbish.
* Food is kept off the floor and protected from dust, birds, pests, vermin, etc.
* Food is stored in airtight, covered containers and protected from moisture, insects, rodents and other pests.
* Different kinds of foods, such as eggs, meat, fish and vegetables, are kept separate from each other.
* Foods are kept at appropriate temperatures; hot foods are kept hot and foods that need refrigeration are kept sufficiently cold.
* Frozen foods are kept frozen, but look out for signs (e.g. discolouration, ice crystals) that it has already been defrosted and refrozen.
* Foods are kept separated from non-food items (such as cleaning products).
* Foods that have expired or spoiled are removed promptly.
* Food handlers and preparers have access to hand-washing facilities (clean water and soap) and use gloves to handle food.
* Packages should be free from cracks, tears and holes.
* There should be no signs of dirt, mould or moisture on any food packages.

HOW TO RECOGNIZE SPOILED, POOR QUALITY FOODS:

Note: This is a general guide to help you when selecting food. However, be aware that even though food may look fine, it can still contain harmful **micro-organisms** that you cannot see. Therefore, follow all previous advice on how to store food safely too.

* **Cereals and other dry foods.** Presence of insects, dirt, stones or other objects in the product. Product is wet, damp, or has spots of colour or mould. Change in appearance of the product, such as lumps in flour or wrinkles in legumes. Bags or packages are open, torn or broken. In packaged products, the use-by date has passed.
* **Roots and tubers.** Product is soft, not firm, or has sprouts. Has bruises, rotten spots or other signs of damage or spoilage.
* **Vegetables and fruits.** Show signs of general softness or wilting, soft spots, rotten spots or other kinds of damaged spots.
* **Meat and poultry.** Has a bad smell or strange colour. In meats, liver and other organs: strong smell or unusual colour.
* **Fish.** Bad smell. Soft flesh, instead of firm. Dull eyes; dry, dull and loose scales, gills or fins.
* **Milk and milk products.** Product has a bad smell or has been exposed to dirt, flies or other insects. Products needing refrigeration or cool temperatures that have not been kept cold enough may be spoiled. In packaged products, the use-by date has passed.
* **Canned foods.** Can is swollen, bulging, dented, rusty or has other signs of damage inside or outside. Food has leaked out of the can. When the can is opened, food looks and smells bad. The use-by date has passed.

Source: FAO, Eating well for good health, Lessons on nutrition and healthy diets, 2013.

Raw materials: buying food that is safe

To ensure you buy safe and nutritious food be aware of safety issues when you buy food. Make sure you shop at reliable stores, markets and food sellers. Pay attention to the cleanliness of the shop, the seller and the surroundings in which the food is sold.

The personal **hygiene** of food sellers is very important; their clothing and hands should be clean and washed frequently (that way they will carry less **micro-organisms**). Another sign to look out for is if the shop has many clients. Look at the food before you buy it, check the freshness, appearance, variety, quality and price. Check that the food is kept at safe temperatures and that raw food is separated from cooked food.

More to explore:

- WHO 5 Keys to Safer Food:
  www.who.int/foodsafety/consumer/5keys/en/index.html
- WHO Fact Sheet on Food safety:
  www.who.int/mediacentre/factsheets/fs399/en
- FAO Food Safety:
  www.fao.org/food/food-safety-quality/home-page/en
- FDA Food Safety & Nutrition Information for Kids and Teens:
  www.fda.gov/Food/ResourcesForYou/Consumers/ucm2006971.htm
- Kids' Health Food Safety:
  www.kidshealth.org/teen/food_fitness/nutrition/food_safety.html
- Quirky food preservation methods:
  www.thinkeatsave.org/index.php/be-informed/traditional-and-indigenous-food-preservation-methods

EAT GREEN – TIME FOR SUSTAINABLE DIETS

In Sections B and C we examined the effects of food on our bodies and health. However, did you realize that YOUR food choices also affect the environment and other people? To produce, transport, process, store, sell and prepare food uses of a lot of **natural resources** (such as land, water and **nutrients**), energy, and involves a large number of people. How the food is produced and how it arrives on your plate greatly influences what impact that food has had on the environment and the individuals within the communities that are involved in producing it. Making food choices from limited resources or unsustainable production systems, like eating certain species of wild fish, can cause the loss of the species or the destruction of natural habitats. In addition, we are currently literally throwing away large amounts of energy and resources that go into food production because globally one-third of all the food that is produced is lost or wasted every year. Although it's not that simple, this could feed the world's 850 million hungry people. In this section we explore how food is having an impact on the world around us and the **sustainable** food choices we can make to reduce these impacts. So let's get going! First let us look at some of the main reasons why food production has such a big impact.

REMEMBER, ULTIMATELY FOOD PRODUCERS AND RETAILERS ARE GOVERNED BY YOUR CHOICES AS A CONSUMER,

SO YOU CAN MAKE A DIFFERENCE!

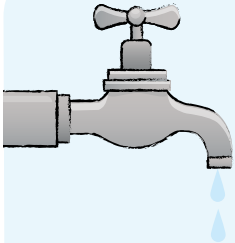
HOW DO OUR EATING HABITS IMPACT THE ENVIRONMENT?

As the population continues to grow from 7 to 9 billion by 2050, and food choices and habits change, it is estimated that global food demand will increase by a further 60 percent. However, already many of our food production systems are unsustainable – let's investigate why.

Land use

Some 30 percent of the Earth's land is already being used for growing crops and raising animals. However, often, unsustainable practices cause soil erosion and the loss of soil **nutrients**. When the land is no longer usable farmers need to move to new locations often causing the clearing of natural vegetation (such as forests) and the loss of **biodiversity**. Increasing production on already cultivated land can be done, but if not done properly it can have environmental impacts, like water pollution and losses of **biodiversity** in and around the field. What, how and where we grow crops and rear animals greatly influences how much land we need, but also how environmentally friendly and **sustainable** we are.

Learn more about this topic through the SOILS CHALLENGE BADGE



Water consumption

All of the crops farmers grow – like wheat, rice or fruit and vegetables – need water. The animals we keep to produce meat, eggs or milk all need to eat plants (which, as you know, have already **consumed** water) and drink water themselves, too. Just think, the one potato you ate last night for dinner took 25 litres of water to grow. And for those of you who are hamburger fans, did you know your favourite food 'drank' 2 400 litres of water while being produced? Surprisingly, it takes 1 000 times more water to feed the human population than it does to satisfy its thirst! Overall, the crop and livestock sectors use 70 percent of the world's available freshwater resources.

Learn more about this topic through the WATER CHALLENGE

Water for food

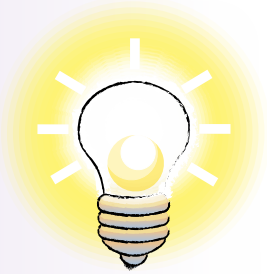
Commodity	Water needed to produce (litres)
1 hamburger	2400
1 glass of milk	200
1 egg	135
1 apple	70
1 slicce of bread	40
1 potato	25

More information

www.unwater.org/worldwaterday
www.fao.org/nr/water

World Water Day 2012
Coordinated by:

Energy consumption

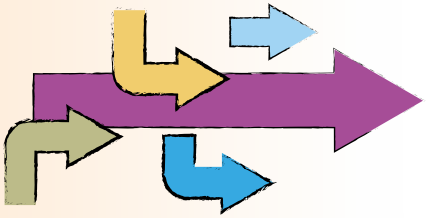


About 30 percent of global energy currently is used to produce, transport, process, store, sell and prepare our food. Not so surprising when you stop to consider that energy is required every step of the way. Producing crops and rearing fish and livestock requires electricity, fuel and machinery. Many crop production systems today use nitrogen-based **fertilizers**, which require an extremely energy-intensive process to produce. Food transportation, storage, processing and distribution also **consume** energy.

Find out more about energy issues and **sustainable** and unsustainable energy sources in the Energy Challenge Badge.

Learn more about this topic through the ENERGY CHALLENGE BADGE

Other needed resources



To grow crops and rear animals also requires a lot of other inputs: it requires farm infrastructure, fencing, **nutrients** for plants, chemicals and medicines, as well as machinery for harvesting, processing, packaging and transport to markets and shops. The more complex the process of producing the food is, the more steps it takes to get to your plate, and the more energy and resources need to be used.

Biodiversity loss

Industrial food production is increasingly relying on fewer and fewer crop varieties and animal breeds, favouring high-yielding monocultures over a variety of plant and livestock species. FAO estimates that during the last century, 75 percent of crop genetic diversity has been lost. This loss in plant crops and animal breeds is dangerous because it makes our food supply more vulnerable to pest outbreaks and disease. Less diversity in the field also means less diversity on our plates. If we are not careful about it, there are some fruit and vegetables that we will not be able to eat in the future. Think about all the varieties that your grandparents knew and that you cannot find in the supermarket. The food choices we make can also contribute to biodiversity loss of wild species as some agricultural systems affect natural habitats; for example, the cutting down of forests to grow crops or raise livestock. Ensuring that your food is coming from **sustainable** sources is therefore very important.

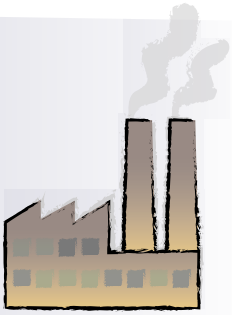
Learn more about this topic through the BIODIVERSITY CHALLENGE BADGE

DID YOU KNOW?

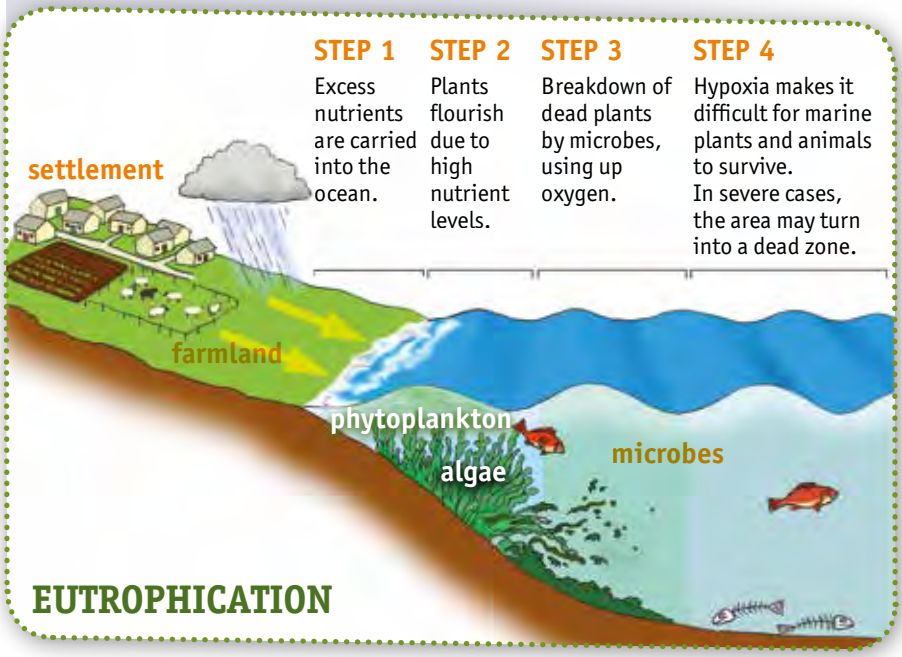
Fishing is central to the livelihood and **food security** of 200 million people. One in five people on this planet depends on fish as their primary source of protein.

However, two-thirds of the world's fish stocks are either fished at their limit or overfished. FAO has estimated that over 70 percent of the fish population is fully used, overused or in crisis.

Pollution

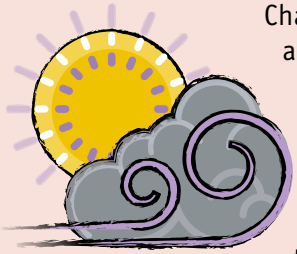


Fertilizers are fundamental for the healthy growth, flowering, fruiting and reproduction of all plants.
However, using too much **fertilizer**, or using it incorrectly, can actually damage our environment.
The excess use of **fertilizer** in the environment can pollute local groundwater, as well as lakes and streams, causing **eutrophication** (see graphic).
Pollution can also be caused by the overuse of **pesticides** and **herbicides** to kill off pest species. These products are highly toxic and can damage the soils and waterways, polluting the area for many years after their use.



Source: YUNGA, Emily Donegan

Climate change



Changes in temperature and rainfall, and droughts, are already affecting agriculture, making it more difficult to grow crops and raise livestock in some regions of the world. However, food production and **consumption** are also important sources of **greenhouse gases** that cause **climate change**. The main sources include **deforestation** (that releases carbon), methane from ruminants and rice production, the use of **fertilizers**, and the use of energy all along the **food chain**. In total, 20 to 25 percent of all **greenhouse gas** emissions originate from food production and **consumption**.

Learn more about this topic through the CLIMATE CHANGE CHALLENGE BADGE

Food losses and waste

As already mentioned, around one-third of food produced for human **consumption** is lost or wasted globally. This amounts to about 1.3 billion tonnes per year! (*Source*: FAO). Already, we are struggling to feed everyone: an estimated 850 million people are hungry worldwide (*Source*: FAO), and by 2050 the population will grow by another 30 percent.

When food goes to waste or is lost it means that huge amounts of the resources and energy used to produce it were used in vain. Also the pollution and **greenhouse gas** emissions released in producing this food were unnessary. Moreover, when food is wasted it ends up rotting in landfill sites and generates even more **greenhouse gas**

(methane). Food losses and waste cause a lack of food, higher food prices, people going hungry, and environmental damage – so it's bad news all around. Food losses are caused by pests and diseases, climatic events and bad storage and transport systems, all of which especially affect developing countries. Food waste, on the other hand, is throwing away food, even good food, for different reasons. In many countries a large percentage of food waste is happening in our homes! How much of the food that you buy ends up in your bin?

(*Source*: FAO, 2012)

SOCIAL AND ECONOMIC IMPACTS

Sustainability is not only about the environmental impacts of our actions, but also about social and economic considerations, and the three are linked. If we want lots of cheap food, it means that the people who produce it cannot care about its quality or about its impact on the environment. Our food choices also have important impacts on the lives of people who produce and sell food. For example, in many countries agriculture is one of the key sources of employment for people, but often there is no minimum wage and producers can struggle to earn more than a couple of dollars a day.

Small-scale farmers often struggle to get a fair price for their produce, making it very difficult for them to support themselves and their families. Initiatives such as **Fair Trade** allow farmers and producers to get a fair price for their products while ensuring that certain standards are followed, such as banning child and slave labour, guaranteeing a safe workplace and protecting the environment.

Find out more about **Fair Trade** on p. 138, 215.

CARING FOR YOUR FOOD IS ALSO CARING FOR THE PEOPLE WHO PRODUCE IT SO THAT THEY CAN CARE FOR THE PLANET.

IT IS TIME FOR A SUSTAINABLE DIET

You might feel as though you can't do anything about the problems mentioned above. You might be asking: what can I do about any of this?

Actually, **there is a lot YOU can do!** If all of us make minor changes in the way we shop, store, cook, eat and dispose of food and its packaging, we can reduce our negative impact and that of our food production systems. Moreover, our choices as consumers have the power to send a strong message to farmers, food producers, supermarkets and others involved in the **food chain**: we want and will only buy food that is produced **sustainably** and responsibly. In the end producers and retailers only sell what consumers buy. If everyone adopts a **nutritious** and **sustainable diet** then the way things are produced will also change.

WHAT IS A SUSTAINABLE DIET?

Broadly speaking, a **sustainable diet** is one that has a low environmental impact, contributes to food and nutrition security around the world, and to a healthy life for present and future generations. **Sustainable diets** are also protective and respectful of **biodiversity** and **ecosystems**, culturally acceptable, economically fair to producers and consumers, nutritionally **adequate**, safe and healthy. Oh, and they make the most efficient possible use of natural and human resources. In particular, sustainable diets ensure:

1. **Health and well-being:** **sustainable diets** promote a nutritionally balanced and safe diet that is healthy for both the body and the land.
2. **Environment, biodiversity and climate:** **sustainable diets** try to limit negative impacts by making efficient use of **natural resources** and respecting **biodiversity**.

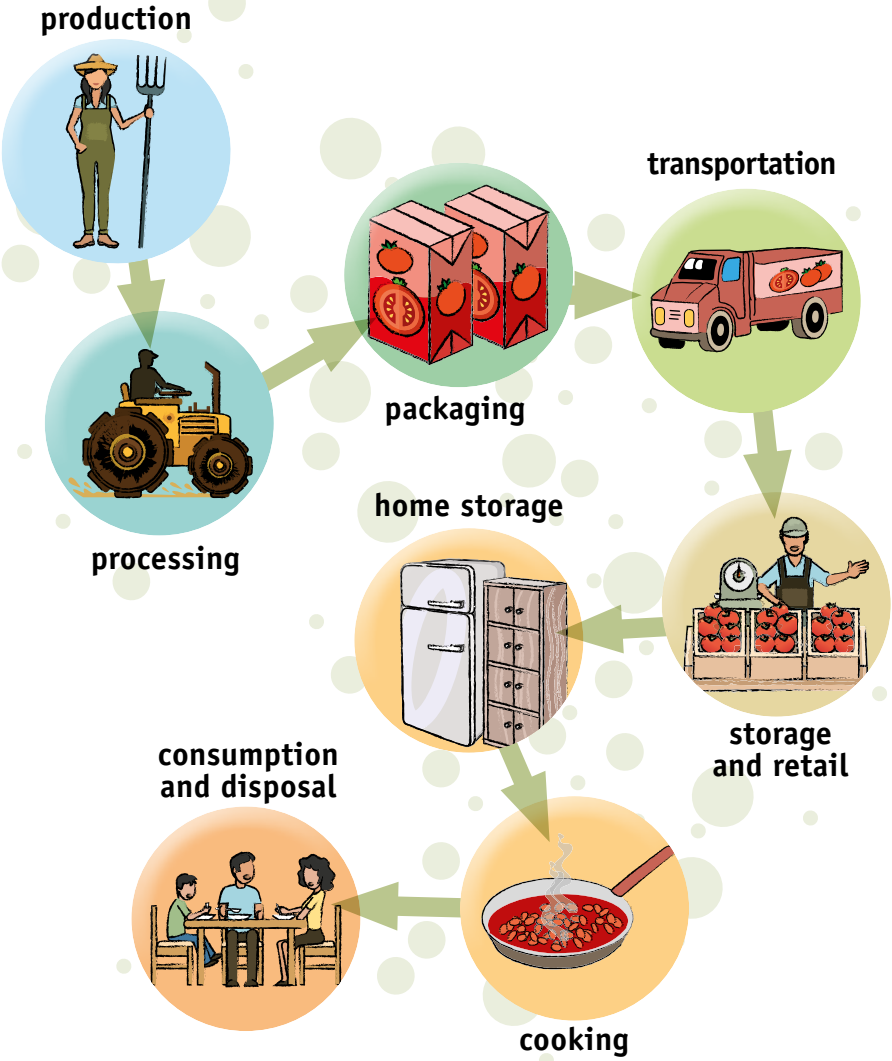
3. **Equity and Fair Trade:** sustainable diets are economically fair to both producers and consumers.
4. **Food security and accessibility:** a sustainable diet promotes food security and accessibility by championing local production and enables access to food.
5. **Cultural heritage and skills:** a sustainable diet promotes traditional knowledge systems for the production of local food varieties and agricultural methods.
6. **Local and seasonal foods:** buying local and seasonal products reduces impact from, transport, provides better-quality produce and boosts the local economy.

Sustainable diet fundamentals

Now that we know what a **sustainable diet** is, let's see how to actually go about adopting a **sustainable diet**.

Some stages in the **food production chain** are out of our control, yet we have some power as consumers to choose more **sustainable** options!

Many of us do not realize that the simple matter of choosing what to eat, and being careful in the way we cook and prepare it, can have big impacts for our planet. In other words, a well-planned menu and smart shopping, storing and cooking not only will meet our nutritional needs, but can also do a lot to protect our planet. Check out the step-by-step guide below.



SAVING BIG

Have you heard the term '**environmental footprint**'?
It refers to the way we affect the environment through our everyday actions; for example, how much energy and water we use, if we drive a car or ride a bike, use plastic shopping bags or bring our own cloth bags, etc. The smaller the footprint we leave, the less harm we cause to the environment.
Our food choices make up a large part of our **environmental footprint**. So simple changes in our food habits can have great benefits to our planet.

A good way to reduce our **environmental footprint** is by remembering the 'three Rs', which are the major pillars of environmentally responsible behaviour. They are:

* **Reduce:** Try to lower the amount of stuff you throw away by buying less and buying things with minimal or no packaging. Preventing food waste reduces the use of resources needed for food production and reduces all the environmental, economic and social impacts linked to food waste disposal.
* **Reuse:** As far as possible, try to reuse things instead of throwing them away. Reusing is generally better than recycling because it **consumes** less energy and resources.
* **Recycle:** Recycling means turning waste into a new substance or product, such as **compost**. Learn about recycling services in your area and make the effort to sort your rubbish and recycle whatever you can.

BUYING AND ACQUIRING FOOD SUSTAINABLY

Sustainable shopping choices

You can make some big impacts with the way you shop and the food options you buy. Here are some considerations and general tips to think about.

Back to basics: To eat more **nutritiously** and **sustainably**, it is better to buy more whole foods and fewer **processed foods**. For example, choose fresh fruit over sweetened fruit drinks. Choose fresh, whole ingredients (with little or no packaging) over ready made dinners, unsalted nuts as a snack over potato chips, and whole grains over refined flour. As we learned earlier, **unrefined** foods are better for your health because they provide more **fibre**, **vitamins** and **minerals**, and have less added salt, sugar, fats and preservatives. Whole foods are also better for the planet as there has been less processing and packaging involved in their production. Making your own food is also fun, allows you to know exactly what ingredients have been used and can be much more tasty too. Think of freshly made bread, for example – yummy!

Improve your diet through biodiversity: A diverse diet is good both for your health and for nature. By eating a variety of foods, you increase your chances of getting all the **nutrients** your body needs. You also encourage farmers to produce diverse crop varieties and breeds and save the genetic resources of plants and animals. These are the raw materials that local agricultural communities and researchers rely on to improve food quality and food production. You have probably heard about **biodiversity** as the variety of life on Earth, but have you ever thought about its role in

our food? Whether it is the insects that pollinate plants, the microscopic **bacteria** used for making cheese, the diverse livestock breeds used to make a living in harsh environments, or the thousands of varieties of crops that sustain **food security** worldwide. **Biodiversity** is also yummy; discovering and tasting local and traditional varieties of food is fun, diversifies your diet and contributes to protecting the varieties of food available by supporting the farmers who grow them.

Plan before you go and shop: Check your fridge and cabinets to see what you already have, what needs using, what needs to be bought. Start by planning your menu carefully. What needs using up? How can it be prepared to make a **nutritious** and balanced meal? How can it be prepared in an energy efficient manner? For example, can it be cooked with other food to save energy and water perhaps? What additional ingredients do you require? What are the environmental and social impacts of the ingredients you have selected? Are there other more **sustainable** options? From these questions you can then make a detailed shopping list, which means you don't have to keep going back to the grocery store later for items you forgot. Planning carefully also means you'll waste less food, by being organized and only buying what you will use.

Shopping bags: Don't forget to bring your shopping bags; cloth bags are stronger and easier to carry, and you won't have to buy plastic bags at the shop.

Plan your route: You have probably heard about **food miles**, the distance that food is coming from. But do you know that when you count the total of energy and **greenhouse gas** emissions from food transport, half of them are caused by consumers doing the shopping. This is because commercial transport is in bulk, often by boat or train, and fully packed, while we may take the car to buy just a few items. So reducing the number of trips and combining with other tasks are all good ways of reducing your energy use. Once you have your shopping list you can also evaluate which is the most efficient route to collect the goods, how much can be done on foot or using public transport, or whether you can go together with neighbours and friends in the same car.

Make shopping fun: Don't consider going shopping as a drag or a waste of time. It is actually a great way to learn more about what foods are available; where they are coming from; what is their nutritional composition; and how to cook them. It can give you ideas to diversify your diet with new meals and new tastes.

Tip: Avoid doing the food shopping when you're hungry. Everything looks appetizing on an empty stomach and you'll be tempted to pick all sorts of things that either aren't **nutritious**, or that might just go to waste.

Ingredient quantities: Try to develop a sense of the right quantity and avoid buying food that you will never eat. Remember, wasting food is not only an inexcusable loss of food, but it also wastes precious resources like land, water and energy. And, of course, it's also a waste of money. So avoid grabbing something off the shelves just because it looks exciting at the time, and carefully choose only those foods that are **nutritious** and that you are sure you will eat.

Be careful with bargains: Be careful of 'specials' such as two for the price of one, or multipacks, etc., that get you to buy more food than you need. This might be less expensive by weight, but ends up costing more for you – and the environment – if the food gets wasted. However, with food that has a long shelf life, such as canned or bottled food, it might make sense to buy and store it, if you are sure you can use it before it expires.

Wasteful packaging: Packaging is essential to make sure our food is safe to eat but it uses a lot of energy and resources to produce and creates a great deal of waste. Check out your household bins – how much of your rubbish is from food packaging and kitchen waste? Often some packaging is only there to make the product look better and sells faster. As a consumer, you can greatly influence how products are packaged, i.e. if it is not environmentally friendly, don't buy it. For example, avoid products that have too many layers of useless packaging or packaging in which the different components (plastic wraps and cards, etc.) cannot be separated and recycled. Choose foods with recyclable

packaging, such as glass bottles and jars. Buy loose foods: dry beans instead of canned ones; loose-leaf tea instead of tea bags. Choose unpackaged fruit and vegetables over those that come in plastic wrappings, boxes, etc. Meat from a butcher shop often comes with less packaging than meat in a large supermarket. Set yourself a challenge and see how much you can reduce the food packaging in your recycle and rubbish bins!

Sustainable storage: As you stroll through your local market, think about the products you're buying and how they are stored. For example, canned or bottled tomatoes don't require energy to store, i.e. until you open them you don't have to keep them in the fridge, but the processes of creating the bottles or cans and bottling and canning the tomatoes used energy. Frozen food, on the other hand, had to be frozen in the factory, transported frozen, stored frozen in the shop and will have to go into your freezer, using energy all the way. As far as possible, try to do the research and find out as much as you can about what you're buying, what went into its production, and what will be required once you get it home.

Buy local food: Look for the country of origin label. Transportation uses a lot of energy and produces **greenhouse gas** emissions. However, bear in mind that in some cases it can be more eco-friendly to import food than to produce it locally. For example, growing certain fruits in hot climates and exporting them **consumes** less energy than creating the right temperature for them to grow in a cold climate in heated

greenhouses). Therefore, try to buy local varieties that do not require special treatment in your region. It will help to learn where different products come from and what their production involves. Buying locally also helps to boost your local economy!

Hit the farmers' market: If you have a local farmers' market, shopping there is a great way to find fresh, nutritious, locally grown food, and support local small farmers. You will also become more familiar with your food and where it comes from, because you can directly ask the farmers any questions you have about their produce and get good advice about storage and preparation.

Opt for organic and sustainable agriculture: Try to buy food that has been produced using more **sustainable** methods of production. For example, **organic farming** aims to limit environmental impacts by avoiding the use of **pesticides**, **herbicides** and chemical **fertilizers**. In addition, farmers use a number of practices such as growing and rotating a mixture of crops, and adding **organic matter** such as **compost** or manure to build and maintain healthy, fertile soils. **Organic farming** also includes livestock and poultry farming, i.e. raising cows, chickens, etc. In this case, animals are fed a diet free of hormones and antibiotics and given more space to live. By choosing **sustainably** produced food, we make a statement about our preferences as consumers, which, in the long-term, will make a difference to food production practices.

Fair Trade: While eating locally and seasonally most of the time is a good idea, you can also enjoy some healthy imported treats once in a while if they aren't produced in your region. In such cases, consider buying **Fair Trade** products to make sure the imported foods you buy are produced **sustainably** and that the farmers are treated fairly. Also, sometimes importing certain foods is actually more **sustainable** than a food that is grown locally (can you think which ones? discuss this as a group).

Grow your own produce: Lastly, if you have a garden, a balcony or access to a communal space where you have permission to grow plants, consider growing your own food. This is a great to have your own fresh, healthy, locally grown produce. You will save money on groceries and also reduce your impact on the environment. If you stick to **organic** methods, you will improve soil quality, contribute to the overall health of the **ecosystem**, and also reduce the energy **consumption** used to transport the produce. You also get some exercise while planting, weeding, watering and harvesting. Growing your own food is a great way to connect with your food and understand what it takes to produce it.

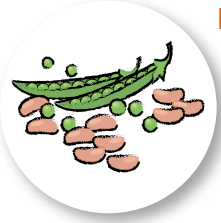
DID YOU KNOW?

Over 2 million people around the world **eat insects as a source of protein!** Insects are found everywhere, they reproduce quickly and have very low environmental impacts. For example, crickets need twelve times less feed to produce the same amount of protein as cattle. For more information take a look at: **www.fao.org/forestry/edibleinsects/en**

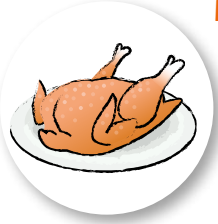
Selecting specific food groups

Now that we have the overview of **sustainable** buying choices, let us look at ways of making choices about specific food types.

Grains: As discussed earlier, not only are whole grains better for you than refined grains, their production has less impact on the environment. This is because there is less processing and packaging involved in their production. However, it is a good idea to also think about the differences in grain types and production systems; for example, rice can be grown using both 'dry' and 'wet' farming methods. Which do you think is more **sustainable**?



Legumes: **Legumes** (lentils, beans, chickpeas) are a great source of proteins – cheaper and with less impact on the environment than animal products. They also have the capacity to capture nitrogen from the air and transfer it to the soil, making it more fertile for the next crop.

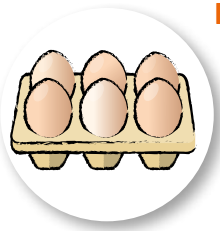


Meat: Replace processed meat products and some of the red meat with tasty alternatives. Meat and meat products are the largest agricultural contributors of **greenhouse gas** emissions, **deforestation**, **land degradation** and **biodiversity** loss. This is because large areas of land are needed to raise the livestock (especially cattle) or to grow their feed. Overall, livestock production is responsible for 18 percent of global **greenhouse gas** emissions, livestock grazing occupies 26 percent of the Earth's ice-free land surface, and the production of livestock feed uses 33 percent of agricultural cropland. Moreover, the livestock sector accounts for about 8 percent of global water use. So, there's no

denying that producing steak and burgers takes its toll on our Earth's resources! You can cut down on how often you eat red meat and opt for good alternative protein sources such as beans, peas, lentils, grains, nuts, seeds, tofu, milk, cheese, eggs, poultry and fish. When you do eat red meat try to eat locally produced, **sustainably** sourced meat (e.g. if you live in Australia kangaroo meat is a great **sustainable** protein source, as is ostrich in many parts of the southern hemisphere). Perhaps you could make one day a week meatless, e.g. launch Meatless Mondays in your home.

Fruit and vegetables: Whenever possible, always try and choose fruit and vegetables that are in season. They are cheaper, riper and have more **nutrients** and flavour. Out-of-season food is not environmentally friendly because it involves artificial heating and lighting of greenhouses or being kept in fridges for a long time, both of which **consume** a lot of energy and cause **greenhouse gas** emissions. Don't forget that the fruit and vegetables that are in season will depend on where you live! Make a chart or a table like the one on the right of what fruit and vegetables are in season and what to look for in your area.

Also dont discard the odd and funny: some fruit and vegetables get thrown out just because they look 'funny'. They might have an odd shape, colour or size, but they are perfectly good. Buying these funny fruits can help reduce overall food waste.
http://eatseasonably.co.uk/what-to-eat-now/calendar



Eggs: You may have heard about the different types of eggs one can buy: **organic**, cage-free and free range. So what's the difference and which ones should we buy? Conventionally farmed eggs come from hens that typically spend their lives in cramped conditions without access to natural light. Cage-free eggs, on the other hand, are allowed to roam in an open space. **Organic** eggs come from hens that are cage-free, have access for at least part of their lives to the outdoors and natural light, and are fed certified **organic** feed free of **pesticides** or **fertilizers**. While **organic** seems like the more humane option, the hens often do not get to spend their whole life roaming freely, only part of it.

A relatively new label, pasture-raised eggs, refers to eggs from hens that spend their entire lives outdoors, roaming and foraging freely on a natural diet. Some argue that eggs from pasture-raised hens are not only tastier but healthier too. Bear in mind that labelling standards and practices vary from country to country, so take some time to research the different ways in which eggs are farmed in your area. A great way to get fresh eggs is by buying them from local small farms, if possible. You could also consider raising your own chickens if you have a bit of space in your garden or at school.

Dairy: Dairy products usually come in a variety of pack sizes or from the deli counter, so you can choose the amount you need to avoid wastage. Again, consider buying products that were produced **organically**, as these products come from animals that grazed on pasture and were not treated with antibiotics, hormones and other drugs.

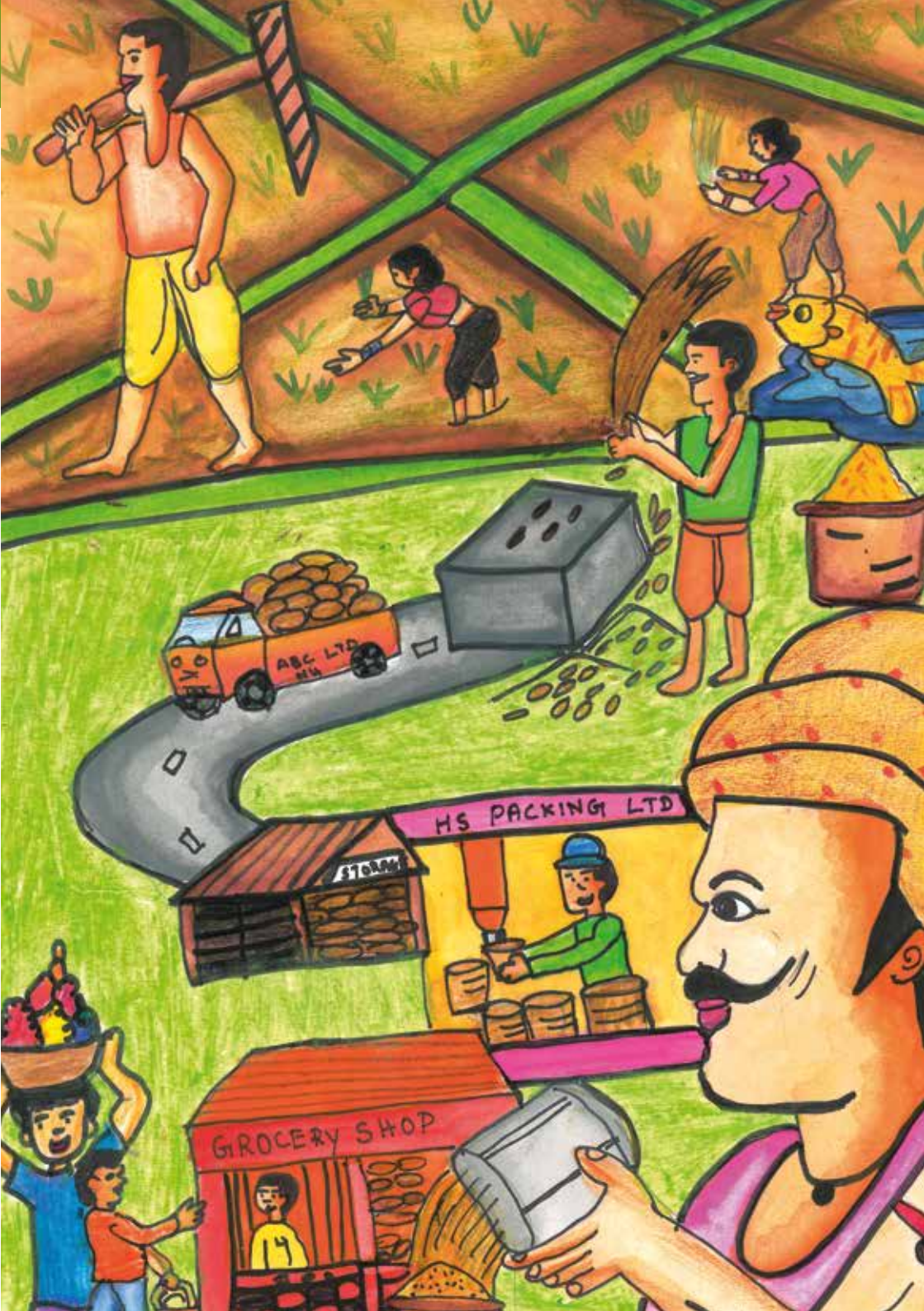
Fish: Buy fish selectively – only from **sustainable** stocks. Over 70 percent of the world's fish stocks are either fully exploited or overfished. Create a pocket guide that tells you which seafood to enjoy and which fish to avoid for now. Ask the vendor where and how the fish is caught or farmed. In restaurants, too, always ask where the fish comes from. When shopping, look for the Marine Stewardship Council (**www.msc.org**) certification, which is an easy way to identify and purchase seafood from well-managed sources.

CERTIFIED SUSTAINABLE SEAFOOD MSC www.msc.org

Bottled water: If you are in the habit of buying bottled water, here are some startling facts: Every year 1.5 million tonnes of plastic are used in bottling water! Producing and disposing of water bottles releases toxic chemicals into the environment. Moreover, a huge amount of bottled water is **consumed** far away from the place where it was produced, which means it has to be transported far and wide, which **consumes** energy and releases **greenhouse gases**.

When tap water is safe, there is no need to buy bottled water at all. Still, make sure you do some research before you switch over. Find out if your local tap water is safe and, if not, what makes it unsafe? Switching to tap water will reduce environmental impacts from packaging, transportation and waste.

Next page: S. LALITH MOHAN, aged 9, INDIA


ABC LTD
HS PACKING LTD
STORE
GROCERY SHOP

SAVING AND STORING

So you have made your suitable food choices, but storing food correctly and learning to manage your kitchen efficiently can also go a long way towards preventing food waste and reducing your **environmental footprint** in general. Here are some pointers to keep in mind:

FIFO (First In First Out): FIFO is good guidance on storage and keeping food at its best. As a kitchen rule:

1. Check the expiry dates of the food in your pantry and fridge (you could keep a list if it helps);
2. Cook and eat first what you bought or expires first;
3. Store newly bought canned goods at the back of the cabinet;
4. Keep older ones in front for easy access.

(*Source*: **www.thinkeatsave.org**).

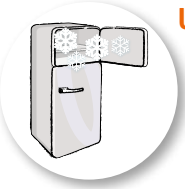
Keep a diary or log book: Writing things down is a great way to keep track of your eating habits and stay organized. Plan your week's menu ahead and list everything you will need to buy for each meal.

You don't have to buy everything in advance; in fact, it's best to buy things fresh at regular intervals, but planning ahead will help you stay on top of things and use what you have as efficiently as possible. Keeping track of these things will also save food, time and money. You should also start keeping track of your **environmental footprint** while shopping, storing and cooking. Make a note of things like packaging, food waste, energy **consumption** and all the other factors we discussed earlier.

Learn how to store different types of food: A key to preserving food is knowing how to store it properly so it stays fresh, lasts longer and conserves its nutrients. Carrots, for example, should be kept in the fridge in a perforated plastic bag. Bread, on the other hand, should not be put in the fridge – it is better to place it in a bread container on the counter.

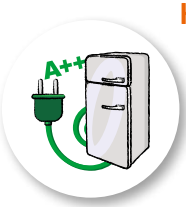
Keep a clean area: Avoid food being spoilt by pests and **micro-organisms** by keeping storage areas clean and food in sealed airtight containers.

Choose the right containers: The ideal container should be air and moisture tight, easy to open and reseal, and easy to lift and handle. Remember, the easier food is to access, the more we use it, thereby reducing waste! Also, choose containers that can be easily stacked, and don't forget to put labels on everything, including the date when it was stored. This way, you will easily know when to use it by.

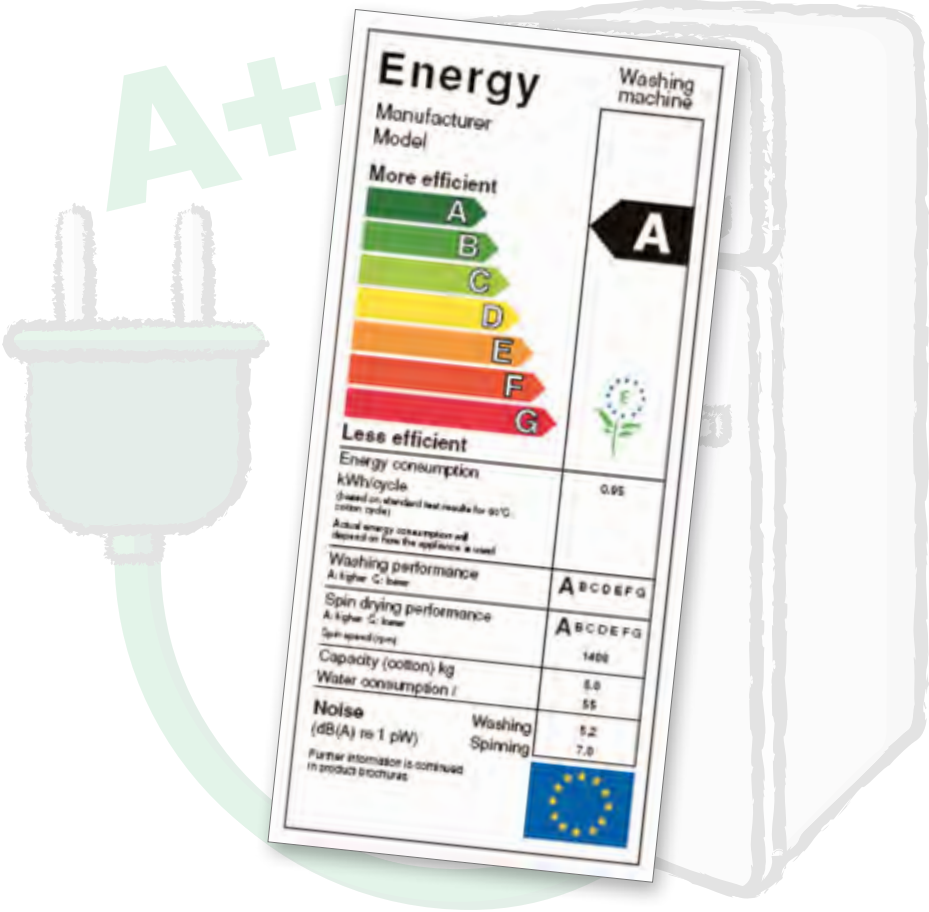


Use your freezer: If you have a freezer, you can store a number of food items to keep them fresh for longer. Meat, fish, dairy products and even vegetables and bread can be stored this way.

There are different ways to defrost the food when you want to eat it: putting it in the fridge, in cold water, in the microwave or cooking it directly. Discuss which way is safer, which way is more environmentally friendly?



Keep an eye on energy: When buying new appliances, such as a fridge, freezer, dishwasher, cooking range, etc., check out the energy-efficiency. These days, many appliances come with energy efficiency labels that indicate how much they **consume**. A+++ labelled appliances can **consume** 60 percent less energy than the conventional appliances. There is also a surprising difference in the efficiency of gas and fire cookers; investigate which ones are more efficient, it will save you money and be more healthy for you and the environment.



Make your fridge freezer use less energy:
You can preserve your food and also save money with some simple steps to make your fridge freezer more efficient: make sure your refrigerator is not pushed completely up against the wall – heat gets trapped and causes the fridge to work harder. For the same reason, keep fridge freezers away from heat sources (like an oven) and direct sunlight. A well-stocked freezer and fridge that are regularly defrosted and cleaned will also use less electricity and last longer.

COOKING FOR A HEALTHY YOU AND A HEALTHY PLANET

There are many advantages to cooking your own food instead of eating out or buying readymade food. For one thing, you know exactly what has gone into your food, and can rest assured that it was prepared **hygienically** with good quality ingredients. Plus, the more we cook, the more we learn about food and nutrition. We can experiment with different foods and spices, and make sure to include a variety of healthy foods in our diet. Cooking can be a lot of fun and is an opportunity to use your creativity and then (literally) taste the fruits of your imagination!

How you cook can also have a strong environmental impact. In this section, we will delve into cooking and discover ways to maximize nutrition and minimize environmental harm. The two often go hand in hand!

> 'THIS IS MY INVARIABLE ADVICE TO PEOPLE: **LEARN HOW TO COOK, TRY NEW RECIPES, LEARN FROM YOUR MISTAKES, BE FEARLESS, AND ABOVE ALL HAVE FUN!'**
>
> *JULIA CHILD,* **FAMOUS CHEF**

Save energy

You can cut down on energy **consumption** while cooking in a few simple ways:

* Use clean fuels when cooking (e.g. no carbon, no kerosene fuels – these can give off harmful substances when burned).
* Keep pans covered while cooking – this prevents heat loss and lets you cook more efficiently.
* Use low or medium flame whenever possible.
* Make sure the pot or pan covers the burner; if you see the burner peeking out around your pan, you are losing energy and need to use a larger pan or a smaller burner!
* Cook your meal in one pot. Soups or stews are energy efficient, as they use only one burner to cook.
* Switch off the oven or burner before your meal is completely ready, and allow the heat in the pot to finish the cooking process.
* Use less water and oil – your meal will cook faster.
* Use a pressure cooker if you have one, as they save a lot of energy.
* Do not overcook food. This will not only preserve **nutrients** but will also save fuel (gas, wood, electricity). Reduce cooking time by soaking dry **legumes** (beans, lentils, soya, chick peas) in clean water for a few hours before cooking them.
* When using the oven, try to cook the whole meal in it at once (and maybe even tomorrow's meal if it will fit).
* Avoid keeping your fridge or oven door open for a long time.
* Reduce the temperature of boiling hot foods to room temperature before placing them in the fridge. This is because hot foods raise the temperature of the fridge, which wastes energy because your fridge has to work harder to cool down again. It is also risking the safety of all the food inside the fridge.

Save water

Cooking can use huge amounts of water if we are not careful. Here are some pointers to keep in mind:

* Install a low-flow faucet (tap) on your kitchen sink. Conventional faucets flow at around 19 litres per minute, whereas low-flow faucets flow at 5 litres per minute.
* Wash vegetables and fruits in a large bowl or tub of water and scrub them with a vegetable brush and then rinse them, instead of washing them under running water for the whole process.
* Thinking ahead will also help you save water. For example, instead of using water to defrost frozen foods, leave them in the fridge overnight.
* Boil food in as little water as possible to save water and fuel. You need just enough to submerge your pasta or potatoes, and with less water you also preserve more flavour and **nutrients**.
* When steaming, place your vegetable steamer right on top of any starchy foods such as rice, potatoes or pasta that you might be boiling. You'll save energy, water, dishes and space on your stove.
* Use the water left over from boiling to make soup or water your plants (be sure to let it cool down first!).

Have a green kitchen

You can also have these simple ideas in mind to help you keep a green kitchen:

* Choose cookware and utensils that stand the test of time and won't have to be thrown away after a short time.
* Use long-lasting cloth towels instead of paper.
* Buy and use non-toxic, biodegradable kitchen cleaners and detergents.

* Serve smaller portions so that there are no leftovers on the plate; you can always take seconds, and what is remaining can be put in the fridge and eaten the next day.

Tip: Avoid using disposable plastic or paper glasses, plates, spoons, forks and knives. They cannot be recycled and produce a lot of waste. Also, get cloth napkins, dishtowels and tablecloths, and stop buying paper napkins and towels.

SUSTAINABLE REUSE AND DISPOSAL SOLUTIONS

Can't eat all the food that you have bought? Do you have to dispose of some fruit or vegetable peelings and inedible parts? Obviously we should try to reduce the amount of food that we dispose of in the first place, but here are some ideas to make the food that we do have to throw away more **sustainable**.

Lunch on leftovers

* Tonight's leftover chicken roast can be part of tomorrow's sandwich.
* Diced older bread can become croutons.
* Get creative! Ask your restaurant to pack up what you couldn't finish so you can eat it later. Freeze it if you don't want to eat it immediately. Very few of us take leftovers home from restaurants, but don't be embarrassed to do so!

(*Source*: **www.thinkeatsave.org**).

Make compost

* Put your **organic** materials – fruit and vegetable peelings, egg shells, tea leaves, flowers and grass – in the **compost** bin for free natural **fertilizer** that will nourish your garden and potted plants.
* If you live in a city and don't have a garden, find out if your urban community garden accepts biodegradable kitchen waste for **composting**.

Donate

* If you cannot finish what you have at home, then donating it is a great way to prevent waste. Non-perishable and unspoiled perishable food can be donated to local food banks, soup kitchens, pantries and shelters. Find out about local and national programmes, which often provide free pick-up and reusable containers to donors.

Reuse and recycle

When you can't avoid buying food in packages and containers, try and reuse these whenever possible. Start paying attention to food containers around your house and get creative!

* Use plastic shopping bags as bin bags.
* Wash out glass containers and use them for storage
* Yoghurt pots can make handy plant pots.
* Lids and foam trays make good saucers for flowerpots.
* Paper bags can be used as wrapping paper.
* Egg cartons can be used for art projects in schools.
* Transparent plastic bottles can be used in the garden to protect seedlings from the cold.

Find out what materials are recycled in your local area.

* Keep your recycling bin next to the main bin and sort your paper, glass, aluminium, steel and plastic.
* When recycling bottles and containers, rinse them out, remove the cap and squeeze them to reduce their volume.
* Find out if your area recycles used cooking oil. It can be collected by a recycling company and turned into fuel and electricity.

More to explore:

- Facts on food waste:
  www.fao.org/save-food/key-findings/en
- FAO videos on food waste:
  www.youtube.com/watch?v=IoCVrkcaH6Q and
  www.youtube.com/watch?v=RytEgwymDr0
- Sustainable diets and biodiversity:
  www.fao.org/docrep/016/i3004e/i3004e.pdf
- Tips for planning your menu:
  www.thinkeatsave.org/index.php/planning
- Reduce food waste:
  www.thinkeatsave.org/index.php/about/eat-tips

LORD AZHRIN D. BACALLA, aged 12, PHILIPPINES

DISHES: PUTTING KNOWLEDGE INTO PRACTICE

Now that we have learned some of the different things that we can do to be more **sustainable** in the way that we purchase, store and cook food, let's look at some examples of how to make our meals more **sustainable**. Remember, the sustainability of the foods will differ depending on where you live in the world and so there is no single **sustainable diet**. However, you can use the ideas in this section in order to adapt and create meal options for your specific location and needs.

Oats and milk, and a glass of freshly squeezed orange juice

Oats and milk are really good for you. Oats are a slow energy-releasing carbohydrates that will keep you full until lunchtime, and milk is an excellent source of calcium and protein. To make this meal even better, you could top the oats with local fruits or nuts that are in season. You could also replace milk with plain yoghurt. Even better, you can grow your own! By using **organically** home-grown fruit you can reduce your **environmental footprint**! This is because you do not need to transport, package or store but just pick it when you need it. If you can't grow, try and buy at your local food market without any packaging.

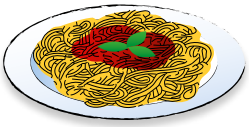
Orange juice is a great way of having one of your five portions of fruit and vegetables. Oranges are an excellent source of **vitamins** and **minerals**, especially **vitamin** C. Try squeezing your own orange juice rather than buying juice that needs to be manufactured and packaged to be sold at the store.
If oranges are not in season or grown in your area, what other fruits could you use?

Lentil, quinoa and kale soup

Soups are **nutritious**, filling and packed with flavour. Another good thing about soups is that they retain the **vitamins** and **minerals** of cooked vegetables because the water you cook them in becomes part of the delicious broth. The lentils and quinoa are high in protein, fibre and **minerals**. In addition, kale is an extremely **nutritious** vegetable that contains high amounts of beta carotene, **vitamins** K and C and is very rich in calcium.

Pumpkin cream with beans, peas, lentils and corn soup

This soup is full of nutrient-dense **legumes** like beans, peas and lentils, which combine not only to deliver great health benefits but also a great taste. **Legumes** are a source of both carbohydrates and proteins and are full of **vitamins** and **minerals**. Lentils and beans are very low in saturated fat and cholesterol. They are a good source of iron, phosphorus, copper, manganese and folate. Peas are also a good source of **vitamin** A, **vitamin** B6, and **vitamins** C and K. On the other hand, corn is also a nutritional powerhouse, rich in antioxidants and **fibre**.



Spaghetti with tomato sauce

Pasta is a favourite of many people, especially Italians. It's delicious and is a **sustainable** and practical choice for a quick meal. However, to make your pasta more nutritious and healthy for both you and the environment, don't use a premade sauce, which can often be high in sugars and salt and took energy to process and transport; instead use fresh tomatoes, basil and other ingredients to make the sauce. Tomatoes are widely known for their outstanding antioxidant content and

are also a rich source of **vitamins** such as A and C. You can also add other vegetables to the sauce, such as courgettes and aubergines, or even beans and lentils. Use your imagination – a pasta sauce can be made of almost anything. You may also want to try wholemeal pasta or pasta made of other cereals or pulses, which are healthier and use less energy to produce. To make this dish more sustainable, buy the vegetables at your local farmers' market, that way you will be avoiding packaging and reducing transport. Even better, why don't you try to grow your own vegetables and make your pasta sauce.

Chicken tikka, poha and fresh cucumbers

The word tikka means bits or pieces. Chicken tikka is an easy-to-cook Indian dish in which chicken chunks are marinated in special spices and then grilled on skewers. Chicken tikka can be accompanied with fresh cucumber slices, which are mostly made of water and important **nutrients** that are essential for the human body. The flesh of cucumbers is rich in **vitamins** A and C, and folic acid, while the hard skin of cucumbers is rich in **fibre** and a range of **minerals** like magnesium, molybdenum and potassium. Meat is an important part of healthy eating, so this dish is a delicious way to obtain the protein you need. Moreover, the water footprint of chicken meat is smaller than the footprints of other types of meat, such as beef or sheep, so it is better for the environment too. Poha is made from flattened rice and it is full of flavour as it contains many different spices, nuts and seeds that are excellent sources of essential **fatty acids** and **vitamin** E. To make this meal greener, you can use brown rice poha; brown rice has not yet gone through the refining process and, therefore, it requires less energy to produce. Brown rice is also richer in proteins, thiamine, calcium, magnesium, **fibre** and potassium.

Fish, chips and peas

Instead of frying the fish you could grill or bake with the chips. You could also switch from chips to boiled potatoes or other food items such as brown rice, which could be cooked by complete evaporation method, i.e. a small amount of water is used to cook the rice so that it is all absorbed and evaporated so does not have to be drained. That way you don't lose the nutrients, and you use less energy as there is less water to heat. Fresh peas can be used instead of frozen ones and you could even switch to other vegetables such as broccoli. You can steam the vegetables over the cooking rice, saving even more nutrients and energy. Another important thing to consider is where you get your fish and what kind it is; make sure you investigate which choices are **sustainable**.

Vegetable and chickpea curry

Vegetables are high in **nutrient** content, loaded with **vitamins** and **minerals** that contribute to growth and maintenance of good health. This meal is a great way to include vegetables in your diet. It is also a good way to use whatever vegetables are in season, which means that every time you make it, it will be a little different. Chickpeas are a good source of carbohydrates and protein and have significant amounts of all the essential **amino acids**.

More to explore:

If you are new to cooking, the Internet is a fabulous resource for recipes and cooking tips. Check out these Web sites for some ideas:

- Change for Life Recipe Finder: **www.nhs.uk/Change4Life/Pages/meal-planner-recipe-finder.aspx**
- Choose My Plate Kids' Place: **www.choosemyplate.gov/kids/Recipes.html**
- Cool Treats: **www.cdc.gov/bam/nutrition/cool-treats.html**
- Health: **www.health.com/health/food-recipes**
- WebMD: **www.webmd.com/food-recipes/guide/health-cooking-recipes**
- The Kitchn: **www.thekitchn.com/recipes**

SUSTAINABLE CHOICES CHECKLIST

1

1 BEFORE YOU HEAD OUT TO THE STORE

- Check your cupboards so that you don't buy what you already have.
- Plan your meals to especially include food items you already have that are about to expire.
- Think about what fruit and vegetables are in season as you plan your meals.
- Ensure you have a balanced and nutritious meal and snack plan.
- Make a shopping list and buy only what you need from the store.
- Bring your own shopping bags.
- Walk or take public transport to the store, if possible (if not take the car with friends and neighbours).

2 ONCE AT THE STORE – WHAT TO LOOK FOR

- Is it on my shopping list? If not, should I add it to the list?
- Where did it come from? Was it produced locally? Did it travel far?
- Is it in season?
- Did it take a lot of energy, water, and other natural resources to grow, process and transport?
- Are there any social impacts with its production (i.e. are the farmers and workers paid and treated fairly? Are there any health implications associated with harvesting the food?)
- Does it have a sustainability certification or was it produced **organically**?
- Does it have a lot of useless packaging or packaging with different materials that cannot be easily separated?
- Is there a whole grain, **unrefined** or unprocessed option you could choose instead?

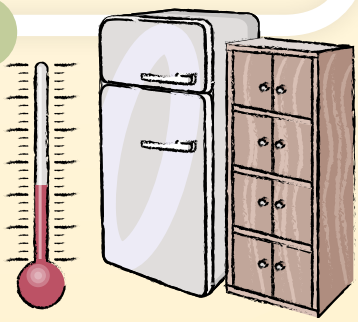
2

- Is it very energy/water-intensive to cook or prepare (e.g. needs to be heated for hours at a high temperature)?
- Are you really going to eat it, or might it get wasted?
- With the choices you have made, are you getting a balanced nutritious diet?

3 AT HOME – STORAGE

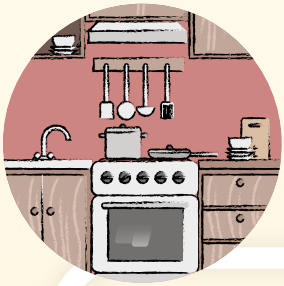
- Put foods that need refrigeration in the fridge immediately to keep them good and fresh.
- Put foods that must be stored at room temperature in your kitchen cabinets, which should be kept cool and dry.
- Put products that are about to expire or need eating first at the front so they can be easily spotted.

3



4 AT HOME – COOKING

- Only use as much water as you need for cooking; this will conserve water and speed up cooking time!
- Put lids on pots and keep the oven door shut to maintain the heat while cooking.



4

- Can you cook something else in the oven with your main meal to make the most of your energy use?
- Use leftovers for another meal (e.g. a packed lunch the next day) or to feed to animals.

5

5 AT HOME – WASTE AND RECYCLING

- Reduce waste to a minimum by preparing the right quantities and using leftover food in subsequent meals.
- Organic unusable leftovers should be given to chickens, **composted** or put in the organic recycling bins if available.
- Reuse or recycle paper or plastic packaging.
- Monitor how much food and other waste your household is producing and evaluate how it can be reduced.
- Remember: Reduce, Reuse, Recycle!

TAKE ACTION

ACTIONS OF GOVERNMENTS AND INTERNATIONAL ORGANIZATIONS

You've learned a great deal about how to eat well and practice a healthy lifestyle. Putting it all into practice may seem like a daunting challenge. Not to fear! Governments and organizations around the world are working on this too, and have put together useful information and guidelines that make being healthy easier for all of us. Below are some ways in which the international community is working to promote good nutrition and healthy living.

Agency action

International development agencies such as the Food and Agriculture Organization of the United Nations (FAO), the World Health Organization (WHO), the United Nations Children Fund (UNICEF) and the World Food Programme (WFP) are just a few in the international agencies that focus on improving nutrition around the world. Their approach involves understanding the big picture and tackling the causes behind hunger and **malnutrition**.

Public policy

Governments can do lots of things to encourage us to eat more healthily; one way is through implementing specific policies. For example, Sweden and Norway, in accordance with WHO's food marketing recommendations, have banned the advertising of 'junk food' during children's television programmes. Another way of

promoting healthy eating is by either making unhealthy food more expensive, or making healthy food cheaper or easier to get hold of. In Hungary, there is an extra tax on packaged food high in salt, fat or sugar. In 2009, the European Union launched the EU School Fruit Scheme that provides incentives and free fruit and vegetables to schools. So it is important to keep food and nutrition issues at the top of policy-makers' priorities!

Public campaigns

Governments and organizations in different parts of the world are also creating interesting and visible campaigns inspiring people to eat **nutritious** food and lead healthier lives. For example, in the United Kingdom, the 5 A DAY campaign provides useful tips and guidelines for people to get their recommended daily five servings of fruit and vegetables. In the United States of America, the Choose My Plate Web site provides recipes, daily food plans and information on nutrition. The Brazilian Government runs a programme called Fome Zero (Zero Hunger) to combat hunger by providing financial aid, educating people about healthy eating habits and opening low-cost restaurants. Brazil also organizes an annual Organic Food Week to promote and celebrate **organic farming** through workshops, exhibitions and tastings held across the country.

Food quality

Most countries have regulatory bodies that monitor food quality and protect consumer health, such as the United States Food and Drug Administration (**www.fda.gov**), the Tanzania Food and Drugs Authority (**www.tfda.or.tz**), the UK Food Standards Agency (**www.food.gov.uk**), or China's Food and Drug Administration (**http://eng.sfda.gov.cn/WS03/CL0755/**). These 'watchdog' agencies are important because they keep an eye on safety standards in the food industry and provide useful information and advice to consumers on nutrition and **food safety** issues. Some of these organizations are also responsible for food labelling regulations and how food is marketed, especially to children.

YOUR ACTIONS

You have the information you need – so what are you waiting for? It's time to get started! You don't have to transform your lifestyle all at once, but you can start by taking small steps each day, whether it means substituting that bag of crisps with an apple or raw vegetables, or planting a few herbs in a flowerpot. Oh, and don't forget to take others on this fun trip as well. Here are some ideas.

Get moving

As you know by now, getting healthy – and staying healthy – does not depend only on eating well. Exercise is a huge part of it, too. There are so many ways how you can start leading a more active lifestyle. There are lots of sports and recreational activities to choose from. Perhaps you can take up a

new sport, such as football or tennis. Or just go for a jog or bike ride each day. Exercise can be fun, a great way to socialize, and it makes you feel great. However, whatever you do, remember to be careful. Don't overdo it by exercising too much all at once. Start small and work your way up. Always warm up before exercise and start and finish by stretching your muscles.

Nutrition-friendly schools

WHO, FAO and partners are supporting countries in developing and implementing policies and programmes to make schools nutrition-friendly. For example, the Nutrition-Friendly Schools Initiative (NFSI) provides a framework for designing school-based programmes that address both **undernutrition** and **obesity**. It consists of 26 essential criteria that schools need to fulfil, like having a school nutrition action plan, training staff on nutrition, including nutrition in the curriculum, creating a nutrition-friendly environment (no advertising, hygienic, opportunities to perform physical activity, etc.) and supporting health and nutrition services. Ask your teachers to help your school become a nutrition-friendly school!

Get local

Find out what are the foods traditionally eaten in your community. Which foods are locally produced in your area, and which ones are imported? Are there farmers' markets where you can support local producers and buy seasonal produce? What traditional herbs and spices are used in your cuisine, and what are their benefits? What types of crops does your local climate support? What is the state of agriculture and livestock production in your country? Learn about the connections between the health and vitality of your natural environment and your own health. Talk to the people at your local market or even contact the department of agriculture or food and health to learn more about these matters.

Shop smart

In this badge, you have learned a variety of ways to make smarter choices when buying food. Putting them into practice requires getting organized. Plan your weekly menu in advance, making sure to get a balance of all essential **nutrients** in your meals. Buy seasonal fruit and vegetables. Follow the other suggestions in the **sustainable diets** section of this Challenge Badge. Ask your family and friends to change their shopping habits to become more environmentally-friendly. Also look out for products from certification schemes, like organic or Fair Trade, which guarantee that certain environmental and social principles were followed in producing the product – for example the EU **organic** label of the Fairtrade Foundation (**www.fairtrade.org.uk**) and the Marine Stewardship Council (**www.msc.org**).

Team up

It's often easier to do things in a group. Join forces with your friends and family to cultivate healthy habits. You can play a sport or go running together. Walk to school as a group rather than going alone. You can also divide up the grocery shopping and cooking to make them into fun activities you can enjoy together, rather than boring chores. Discover exciting new recipes as a team, and invite others to share! You could even explore the possibility of starting a vegetable garden together, if there is a community space you can use, or if someone is willing to volunteer their garden. Remember that looking after a garden takes effort and responsibility, so the more of you to share the work, the better.

Spread the word

Throw some food facts at your family, friends, and community members to help them understand the importance of nutrition. Even a small action like posting a healthy recipe on your social media profile is a good way to inspire your friends to start thinking along healthier lines. Perhaps you can start a blog about the healthy new habits you are implementing day-to-day, or write an article for a magazine or newspaper. Find out other ways to spread useful information and actions through your community.

WYNNETH ARIDELYNGEES, aged 9, INDONESIA

SECTION A:

HEALTHY LIFESTYLES

DO EITHER A.1. OR A.2. AND (AT LEAST) ONE OTHER ACTIVITY OF YOUR CHOICE.

AFTER COMPLETING THE HEALTHY LIFESTYLES ACTIVITIES, YOU WILL BE ABLE TO:

- **IDENTIFY AND EXPLAIN the main factors that affect our health.**
- **RECOGNIZE that your personal choices and habits can improve or harm your health.**

DO ONE OF THE TWO COMPULSORY ACTIVITIES BELOW:

A.01 HEALTH FÊTE. Organize a Health Day in your community. Invite local residents, friends and family members to attend and organize different fun activities. For example, you could hold a 'mini Olympic games' with participants taking part in lots of activities such as running, long jump, high jump, relay races, etc., or even more 'unconventional' games such as sack races, egg-and-spoon races, three-legged races, etc.! You could also hold quizzes on health and nutrition facts, and get people exercising with some lively games. Get creative and prepare brochures, posters and leaflets providing information about nutrition, hygiene and physical activity. Invite local healthcare professionals to attend and answer questions, too.

LEVEL 3 2 1

A.02 GAME ON! Keep track of all the physical activity you do on a normal day (walking, studying, playing games, running, jumping, chores, etc.). Compare notes in your group. How active are you compared with your peers? How much time a day do you spend sitting? Should you include more movement in your daily life? Then, as a group, make a list of all the team sports and games you would like to try, and put them into action at your next meeting. Produce an exercise activity plan for the first 15 minutes of your following group meetings.

LEVEL 3 2 1

S. BHARADWAJ, aged 17, INDIA

CHOOSE (AT LEAST) ONE ADDITIONAL ACTIVITY FROM THE LIST BELOW:

LEVEL 1

A.03 ACTIVE ANIMALS. Here is a fun game to get you moving more! Form a circle in your group and get each person to pick an animal that they like. Then assign actions to each animal, for example, monkey walk, frog jump, inch worm, spider crawl, bear crawl, etc. Play a game where one person says the name of their animal and does their action followed by the name and action of another group member's animal. The game continues using everybody's animals and actions and getting faster and faster. For extra fun you can also add animal sounds to the mix!

LEVEL 3 2 1

A.04 SING FOR YOUR SUPPER. Have you heard of Weird Al Yankovic? He has made a lot of funny songs parodying famous ones, including a song called Eat It (**www.youtube.com/watch?v=ZcJjMnHoIBI**) based on Michael Jackson's *Beat It*. Pick a song you love and give it new words, focusing on nutrition. Perform the song as a group in your next meeting.

LEVEL 3 2 1

A.05 KEEPING CLEAN. Start keeping track of **hygiene** in your daily life. Start with your personal life. Do you shower or bathe every day? Are you washing your hands whenever necessary, e.g. after using the toilet, before eating or after playing sports outside? Also pay attention to **hygiene** at home and in school. Is there room for improvement? How would better **hygiene** affect your life? For example, how are the bathrooms at your school? Would it make things easier for you if they were cleaner? If you are not happy with any aspects of the **hygiene** situation at your home or school, talk to family members and teachers about improving things.

A.06 SWEET DREAMS. Are you getting enough sleep? Children and adolescents need between 8 and 10 hours of sleep each night, on average. Start keeping track of your sleep patterns, not just the number of hours, but also the quality of sleep. How many times do you usually wake up in the night, if at all? Do you find it easy to fall asleep? Do you sometimes have dreams? Do you wake up feeling well-rested or tired? Do you start feeling sleepy during the day at school? If you have access to a smartphone you could download an app to track your sleeping patterns. If you are not sleeping well, try to find out what could be causing this, e.g. eating right before going to bed, or watching too much TV before sleeping. You can get some ideas and tips here: **http://kidshealth.org/teen/your_body/take_care/tips_sleep.html.**

LEVEL 3 2 1

A.07 HEY DOC! Invite a doctor or nutritionist to speak to your group. Ask them your questions about health, diet and exercise. What are some healthy, delicious alternatives to your favourite treats? What are the main nutrition challenges in your region? Is there any truth to the whole Popeye/spinach thing? Make use of their visit to ask all your questions. Afterwards, compare notes as a group. What information did you find surprising? What did you already know? Back home, give your family a report about what you learned.

LEVEL 3 2 1

LEVEL 3 2 1

A.08 HEALTH WATCH. Prepare a checklist for each member of your family with all the factors for good health that you learned about in the Healthy Lifestyles section of this badge: a good diet, regular physical activity, getting enough sleep, etc. Place the lists in a prominent place and get everyone to check off whatever they accomplished, e.g. a whole day without any junk food, fitting in some exercise, or going to the doctor for a check-up. If you have access to a smartphone, you can download some apps that help you record similar healthy lifestyle aspects. At the end of the month, whoever has checked off the most items is the 'winner', and the rest of the family cooks a nice, nutritious meal in celebration.

LEVEL 3 2

A.09 HEALTHY CAMPING TRIP. Together with your group, organize a healthy camp or a hike. Each of you can prepare a one-day menu. Put your menus together into a menu book. Share cooking tasks to make sure everyone contributes to the camp meals. Include some physical activities into your camp programme: trekking, rock-climbing, dancing, yoga, horse-riding, team sports.

LEVEL 3 2

A.10 WATER WORKS. Count all the times you use water; what would it be like if you did not have water for the specific activity or task? Make a list of all the ways a lack of water disrupts life. Think about the millions of people who face this situation on a daily basis. How can you save water? Make a pledge to reduce your water use in one key area. Split into teams and pick a region of the world for your group to focus on. Investigate the water situation in your chosen region. Are there any shortages? Are there health issues due to lack of safe drinking water and sanitation? How serious are the problems? One useful place to find information on regional and national access to safe water and sanitation is the WHO/UNICEF Joint Monitoring Programme (**www.wssinfo.org**). Prepare a presentation as a group and present each region one by one at your next meeting.

A.11 VISIT A HEALTH CENTRE. Visit a local health centre or invite a health worker to speak to your group about the challenges of the job. Find out what kind of services the health centre offers to people who suffer from **malnutrition** or ill health and how your group can volunteer to help.

LEVEL 3 2

A.12 GERMY TRUTHS. Learn more about what germs are, where they are found how they are spread, how they affect our health (common infectious diseases), who is at risk and how we can protect ourselves against harmful germs and reduce their spread. Make a chart of the most common infectious diseases, what causes them and how they are spread (malaria, measles, tuberculosis, influenza, diarrhoeal diseases, cholera, etc.) and also germs that cause food poisoning and related diseases. Present your chart to the group.

LEVEL 3 2

A.13 HEALTH TALK. Research which health issues and diseases are prevalent in your country. How many of these are preventable? How much public funding goes into healthcare for people suffering from these problems, and how much money could be saved if these diseases were prevented before people could contract them? What are your ideas for better prevention – do people need to be better informed, or have better access to certain foods, safe water and sanitation, etc.? Organize a 'panel report' with your group or at school, where you delve into these issues, discuss them and take questions from the audience.

LEVEL 3

A.14 Do any other activity approved by your teacher or leader.

LEVEL 1 2 3

SECTION B:

HEALTHY EATING CHOICES

DO EITHER B.1 OR B.2 AND (AT LEAST) ONE OTHER ACTIVITY OF YOUR CHOICE. AFTER COMPLETING THE HEALTHY FOOD CHOICES ACTIVITIES, YOU WILL BE ABLE TO:

* **RECOGNIZE** the importance of eating a variety of foods to meet all of your nutrient needs and to stay healthy.
* **IDENTIFY** locally available foods that are good sources of carbohydrates, protein, fats, and essential vitamins and minerals.

DO ONE OF THE TWO COMPULSORY ACTIVITIES BELOW:

B.01 POT LUCK. Make a list of all the essential nutrients (such as vitamins/minerals and proteins). Then organize a 'pot luck' meal, with everyone responsible for preparing a dish. Invite friends and family to attend and take them on a 'nutrient tour' of the meals to see if they can guess what nutrients each meal contains.

LEVEL 3 2 1

B.02 KEEP A FOOD DIARY. Keep a food diary for one week, in which you keep a record of all the foods you eat for meals and snacks. If you have access to a smartphone you could download an app to help you track your diet. Check the box on p. 174 for some things to keep in mind. Conduct an assessment at the end of the week. Do you have a balanced diet? What could you improve? Talk to your parents about any changes you think should be made (and then implement them).

LEVEL 3 2 1

LAI WALUI, aged 17, HONG KONG

THINGS TO KEEP IN MIND FOR YOUR FOOD DIARY (B.2):

Do you eat 3 meals every day?
Do you have 2–3 snacks in between?

Do you have a nutritious breakfast before going to school?

Do you have a school lunch or a packed lunch at midday?

Does your diet include:

- *plenty of rice, maize, cereals, potatoes, cassava, bread, pasta?*
- *plenty of vegetables, especially dark leafy greens and orange vegetables?*
- *plenty of fresh and dried fruits?*
- *enough meat, fish, beans, peas?*
- *enough milk, yoghurt, cheese, eggs?*
- *a little fat?*

How much sugar and sugary foods do you eat?

How much sugary drink do you consume?

What fibre foods do you eat?

What protein foods do you eat?

Do you think you get enough protein?

Does most of your protein come from plant foods or from animal foods?

What foods do you eat that are high in fats?

Do you eat the right amount of fat? Too much? Too little?

Do you think you get enough of the essential vitamins and minerals from the foods you eat?

Do you eat a variety of different foods to be sure you get all of the vitamins and minerals you need?

What health benefits are associated with the nutrients in your foods?

What health problems are associated with the nutrients in your foods?

Are you drinking enough water?

What changes can you make in your meals to be sure you meet all your body's needs?

CHOOSE (AT LEAST) ONE ADDITIONAL ACTIVITY FROM THE LIST BELOW:

LEVEL

B.03 FAVOURITE FOODS. What are your favourite foods? Make a list and then explore which essential **nutrients** they contain. Are there ways you could make them healthier, e.g. by making your own pizza from scratch instead of eating a take-away or frozen pizza? Make a list of five ways you could make your favourite foods more **nutritious** but also more **sustainable** for the planet.

LEVEL

B.04 CULTURE QUEST. Eating/meal times/habits vary in different cultures. Explore eating habits in other countries and cultures. What kinds of differences do you come across, not just in food preferences but in eating timings and traditions? For example, in some cultures people eat with their hands, and in others they sit on the floor to eat instead of at the table. You could also investigate eating habits in different cultural groups within your community.

Talk with your friends from different cultures to discover their eating habits (how many meals a day; times; does the family all eat together; do children eat separately; who shops and cooks; which is the biggest meal of the day; does everyone have breakfast, etc.). Re-group and compare your findings.

LEVEL 3 2 1

B.05 INVENT A GAME. Brainstorm with your group and invent a game (a quiz, puzzle, true-or-false, crossword, board game, memory game, bingo) to educate people about **nutrients** in foods and about the need to eat a variety of foods from each of the major food groups. Play the game with your families and friends.

LEVEL 3 2 1

B.06 LEARN MORE. Use the Eating well for good health materials found at **www.fao.org/docrep/017/i3261e/i3261e00.htm** to find out more about the **nutrients** we get from foods, their functions and about the importance of having a balanced diet. Study Lesson 4 (**macronutrients**) and Lesson 5 (**micronutrients**) (access them through the link above). Do at least three activities from each of these lessons.

LEVEL 3 2 1

B.07 LEARN ABOUT FOOD LABELS. Create a table with the nutritional information on different foods your family eats. List the foods in one column and the **nutrients** they provide in the opposite column. For example:

- Beans give us...
- carbohydrates, protein, fibre, folate, iron

The food labels are a useful source of information on the **nutrients** in packaged foods. Collect as many food labels as possible and copy the **nutrient** facts from the labels into the table. Pin the table in your kitchen, in the school cafeteria or on the notice board, where children, parents and visitors can see it.

LEVEL 3 2 1

B.08 FIGURES AND FOOD. Make a poster of the human body, adding as many details as possible: eyes, teeth, hair, nails, etc. Then label it according to which foods are important for different parts of the body. For example, milk is important for healthy bones, teeth and nails, and carrots are good for your eyes. Present your posters in a group.

B.09 MEAL PLANNER. Split into groups of two with each one responsible for planning a day's menu for their teammate. Keep in mind factors such as their body size and physical activity levels when planning their meals. Make sure they eat the right amounts from each of the five food groups, and try to make sure their meals taste good, too! Don't forget about snacks. If possible, prepare the meals and snacks for each other, or strictly follow the menu provided to you. Regroup and discuss. What did everyone think of their menu? Is it something they could follow on a regular basis? How different was it from their usual eating habits?

LEVEL 3 2 1

***Participants in levels 1 and 2 must have help from adults for this task, as it may involve using sharp kitchen implements and the oven.**

B.10 QUIZ TIME. Organize a quiz in your school, with different categories for different age groups. First prepare the questions and answers, along with your teacher or leader. Prepare healthy snacks as prizes. The idea of the quiz is to have fun while getting your peers to think about food and nutrition. So, get quizzing! Include questions such as:

LEVEL 3 2 1

- Name three nutrients that are especially important at your age.
- Why are these nutrients important at your age?
- Name five foods that provide these nutrients.
- Name three foods you should eat to have enough energy to study and play.
- Name five foods you should eat to grow properly.
- Name three foods that are good for your bones.

LEVEL 3 2 1

B.11 MAKE A BREW. Experiment with creating healthy drinks that contain little or no sugar. For example, water with some mint leaves and lemon juice makes a refreshing drink. Herbal teas, too, are an interesting option. Since ancient times people all over the world have used herbs, leaves, roots, fruits and grains to prepare teas. Find out what herbs grow in your area. Can you harvest and use them to make tea? Learn how to make infusions with peppermint, camomile, basil, thyme, ginger root, citrus peel. You can also learn how to use medicinal herbs, such as calendula, dill, aloe and eucalyptus, to ease the symptoms of illness, stimulate appetite, soothe sores in the mouth, throat and on the skin. What other ideas can you come up with for healthy, low-sugar drinks? Attention: seek a doctor's advice before using medicinal herbs and always check with a knowledgeable adult to make sure you use the right plant.

***Participants in levels 1 and 2 must have help from adults for this task, as brewing tea involves using hot water.**

LEVEL 3 2

B.12 MALNUTRITION INVESTIGATION. Split into teams and pick a form of **malnutrition** to research as a group (see p. 86 for details):

- **Micronutrient deficiencies** (e.g. anaemia)
- Overweight and **obesity**

Whatever the type of **malnutrition** you are researching, explore the causes and effects. Where is it most prevalent? You may be surprised to find that malnutrition still exists even in the wealthiest countries. Prepare a presentation on the different forms of malnutrition. Re-group with the other teams and present your findings team by team.

B.13 UNDERSTANDING OBESITY. As a group, discuss the major causes of childhood **obesity**. For example, some of the main causes are: drinking too many soft drinks, eating too many sweets or junk food, spending too much time watching TV or playing computer games instead of exercising, not eating enough fruit and vegetables, skipping breakfast, taking the car to school instead of walking or biking, and not enough physical education. Do you think any of these habits are particularly common in your community? Why is this the case? Or is childhood **obesity** not really a problem in your area? If so, why?

LEVEL 3 2

B.14 DIET DEBATE. There is a lot of discussion these days about body size, self-image, and **eating disorders**, especially in the case of girls. Some people argue that the media (TV shows, magazines, etc.) contribute to these problems by providing unrealistic ideals of body image that many people strive for. This can cause unhealthy behaviour, such as eating far too little in order to stay thin. Is the media to be blamed, or are people responsible for staying informed and making healthy choices?

LEVEL 3 2

B. 15 DISCOVER FORTIFIED FOODS. When people cannot have a varied diet or **absorb** enough **nutrients**, for example, during pregnancy and early childhood, a doctor may recommend **fortified** foods or dietary supplements. Find out what **fortified** foods are produced in your country. For example: **vitamin** A can be added to milk and some vegetable oils; iodine can be added to salt (which of course should only be eaten in small amounts); and the B-**vitamins** and iron are often added to flour, bread and other cereal products. Make a table of the **fortified** foods you find and what they're used for.

LEVEL 3 2

LEVEL 3 2

B.16 MASTER OF THE MENU. Put together a menu for one week of evening meals which contain all the components of a healthy, balanced diet. First, put all the foods you and your family eat into categories – using the same food groups listed in Section A of this booklet. Then find recipes that incorporate these groups. Perhaps you could have a different theme for each meal: Indian, Chinese, Moroccan or Greek. Remember to create variety and use lots of different types of food even within the same food group.

***It is important that participants in level 2 are supervised by an adult, as utensils for preparing and cooking food, and the stove top and oven can be dangerous.**

LEVEL 3 2

B.17 VISIT A FOOD-PROCESSING PLANT. With your teacher or leader plan a trip to a farm or a food-processing factory and learn about different crops that are grown and animals that are raised in your area. What foods are made from these plants and animals? What nutrients do these foods contain? Document your trip by taking notes, photos or videos. Share these materials with your local media (newspapers, TV, radio, Web sites), post them on a social network or use them to make a presentation at your school, local library or summer camp.

LEVEL 3 2

B.18 YOUR FOOD GUIDE. To help people choose good diets, many countries have developed food guides. These guides indicate which foods to eat more often or less often. Some guidelines include a recommended number of servings and portion sizes. Find out if your country has its own food guide and, if so, analyse it, make posters, distribute it widely to the people in your community.

B.19 DELVE INTO DEFICIENCIES. Research the health problems and illnesses caused by **deficiencies** of major **vitamins** and **minerals**. Split into groups, with each group in charge of a different **deficiency** to investigate. Why does a lack of certain **vitamins** and **minerals** cause this problem? Where is this problem most prevalent? Why is it so prevalent in that region? Is it possible to cure the problem, and if yes, how? Each team then presents its findings to the group.

LEVEL 3

B.20 TALKING ABOUT TABOOS. Research which foods are banned in certain religions and cultures. Delve deeper to find out why the foods are banned and if those communities suffer any **deficiencies** as a result. What replacement foods do they eat? What would you miss most if those foods were banned in your culture or religion? Discuss as a group.

LEVEL 3

B.21 Do any other activity approved by your teacher or leader.

LEVEL 1 2 3

ABI ABRAHAM, aged 15, QATAR

SECTION C:

FOOD SAFETY

DO EITHER C.1 OR C.2 AND (AT LEAST) ONE OTHER ACTIVITY OF YOUR CHOICE. AFTER COMPLETING THE FOOD SAFETY ACTIVITIES, YOU WILL BE ABLE TO:

- **UNDERSTAND what factors contribute to food safety and nutrition levels.**
- **LEARN what to look out for at home, school, and in shops in order to ensure food safety.**

DO ONE OF THE TWO COMPULSORY ACTIVITIES BELOW:

LEVEL 3 2 1

C.01 INSPECT YOUR KITCHEN. The food we eat and the water we drink need to be safe and free from harmful micro-organisms. Inspect your home, kitchen and places where you store food. What can you and your family do to improve the way food is stored and cooked? What can you do to keep your water clean and safe? Create a poster where you list and illustrate the basic hygiene rules to prepare and store foods safely. Put the poster in a visible place in your house or donate it to your school canteen, a local market or a restaurant.

LEVEL 3 2 1

C.02 FOOD SAFETY IN ACTION. Visit a farm, food processing unit/factory, restaurant or retail outlet (supermarket or restaurant). Talk to the person who is taking you round to learn how food is managed to ensure freshness and safety. This can include issues related to food storage, handling and preparation, cooking, serving and waste disposal. Who is responsible for buying the food and what is checked to ensure it is healthy? Take some photos or do some drawings and then discuss how these actions affect you and your community. What are the similarities and differences with how you buy and prepare food?

GULUH EDELWEISS SAYYIDINA ROS YAD, aged 9, INDONESIA

CHOOSE (AT LEAST) ONE ADDITIONAL ACTIVITY FROM THE LIST BELOW:

LEVEL 3 2 1

C.03 SHOPPING SPREE. Visit a few different supermarkets (and if possible, a farmers' market) in your area and take note of different food safety measures. Do you notice any problems? What are they doing right? Compare notes as a group.

LEVEL 2 1

C.04 CHARADES. In a group, create a set of cards, each labelled with a word related to food safety or nutrition, such as 'healthful', 'expiration date' and '**bacteria**'. Be as creative as possible! Then mix all the cards up and split up into teams. Play a game of charades, where each person has to act out the word on their card, while their team has to guess what they are.

LEVEL 3 2 1

C.05 QUICK GUIDE TO EASY COOKING. Research the different cooking methods and cooking times for **nutritious** foods. Make a chart to help you determine exactly how long to boil, bake, roast, stew and fry foods to keep them safe. List the different foods in the first column, their cooking methods in the second column and their cooking time in the third column. Place the chart in a visible place in your kitchen for everyone to use as a guide.

LEVEL 3 2

C.06 PRESERVATION. What are traditional food preservation techniques in your culture? Does someone in your family, e.g. a grandparent or an aunt have a special technique that's been handed down in the family? Write a report about it. Also find out about similar practices in other cultures and include this in your report.

C.07 LEARN TO MAKE SAFE WATER. Do you know that drinking unsafe water can cause serious and deadly diseases? Find out how to make water safe to drink. Learn how to destroy most types of **germs** that may cause water-borne diseases by: filtering water, boiling water, exposing water to sunlight (solar disinfection) and chlorinating water. For more information on water treatment see FAO *Eating well for good health* (Lesson 11): **www.fao.org/docrep/017/i3261e/i3261e00.htm** and the WHO Scheme to evaluate household water treatment technologies: **www.who.int/household_water/scheme/en**

LEVEL 3 2

C.08 Q&A MEETING WITH AN EXPERT. Contact local authorities responsible for food and nutrition in your area. Arrange a Q&A session (questions and answers) where your group can ask a guest speaker about good and bad food safety practices in your community. Where is there room for improvement? Are there certain foods one should avoid because they are not prepared or stored **hygienically**? Take notes and write a report about the event. Blog about it or publish your write-up in a local paper.

LEVEL 3 2

C.09 BUGGED. What are some local problems with **micro-organisms** such as **bacteria**, **parasites**, etc. in your area? Is food poisoning a common occurrence? Does the climate play a role in this? What kinds of illnesses or diseases occur as a result? Prepare a slide presentation with graphs and statistics and present it in your group.

LEVEL 3

C.10 Do any other activity approved by your teacher or leader.

LEVEL 1 2 3

SECTION D:

EAT GREEN – TIME FOR SUSTAINABLE DIETS

DO EITHER D.1 OR D.2 AND (AT LEAST) ONE OTHER ACTIVITY OF YOUR CHOICE.
AFTER COMPLETING THE EAT GREEN – TIME FOR SUSTAINABLE DIETS ACTIVITIES, YOU WILL BE ABLE TO:

- **UNDERSTAND the different factors that affect the sustainability of the food system and the food we consume.**
- **IDENTIFY what you can do to make more sustainable food choices.**

DO ONE OF THE TWO COMPULSORY ACTIVITIES BELOW:

D.01 MEAL MANIA. Do you generally choose the food you eat, or does someone else (for example, a parent) decide for you? When you get to choose, what kinds of foods do you select? Are you making good food choices? Discuss your daily food choices and habits as a group. Now that you know more about the importance of a **sustainable** and **nutritious** diet, it is time for you to choose a healthy and environmentally friendly meal! Get permission to use a kitchen at your school or someone's home. Plan a menu as a group and make a list of the ingredients you will need. Go as a group to your local supermarket or farmers' market and buy what you need, keeping in mind factors such as avoiding packaging, buying seasonal and locally grown products, etc. Invite your friends and families to share the meal, present the recipes and talk about the importance of sustainable eating habits.

LEVEL 3 2 1

D.02 WATCH OUT FOR WASTE. How much food goes wasted in your home? Keep an eye on your rubbish bin for a week or two to find out how much food your family throws away. What food do you throw away? Is it still edible? Why did it get thrown? Keep track in a diary and then present your findings to your family. Discuss ways to reduce food waste with them, and explain why it is important. Provide suggestions on better planning and storage to prevent waste. For example like having an 'Eat Me First' shelf or box in the fridge.

LEVEL 3 2 1

CHOOSE (AT LEAST) ONE ADDITIONAL ACTIVITY FROM THE LIST BELOW:

LEVEL 3 2 1

D.03 LEARN TO SHOP. Help your family with the food shopping. Go to the grocery store or to the market along with an older member of your family and choose foods keeping in mind what is good for you and for the planet. Learn how to choose fresh foods such as seasonal vegetables and fruits; they are cheaper, riper and more nutritious. When buying snacks, choose healthier foods – can you avoid products such as chips? Are there any organic options? Choose products with less packaging. Think about how many times you shop per week? Where? What do you usually buy there? Where is it coming from? Remember that buying more whole foods and less processed foods is better for your health and for the environment.

LEVEL 2 1

D.04 DRAW A SEASONAL STILL LIFE. List all the vegetables and fruits sold in your local markets or grown by your family. Find out when each fruit and vegetable is ripe and ready to eat. Group them by seasons and draw all the seasonal fruit and vegetables. Hang your drawings in your kitchen or classroom for everyone to see, or give them to whoever does the shopping in your home, to use as a pocket guide when choosing fresh produce.

LEVEL 2 1

D.05 MAKE A COLLAGE. Make a collage of a healthy and eco-friendly diet. Use old magazines to cut out pictures of different foods and stick them on a sheet of paper. Show your collage to your family and the rest of your group and explain why you chose these foods to illustrate a green diet.

D.06 SUSTAINABLE SHOPPING. Have a look around your home to keep an eye on your family's kitchen habits and their environmental impact. Watch out for things like inefficient energy usage while cooking, or washing vegetables under running water instead of scrubbing them in a tub or bowl. Prepare a checklist of **sustainable** practices and place it in a prominent place, such as on your fridge. Do your family members follow the checklist? Compare results with your group. What were some of the least **sustainable** practices you came across at home? What about the best ones?

LEVEL 3 2 1

D.07 PLANT YOUR OWN VEGETABLES. Growing your own vegetables and fruits can help make sure you have a healthy **balanced diet**. This could be done in your garden, balcony or on community land (such as allotments) or school garden. Plant and take care of a variety of vegetables and herbs. Learn which ones are local plants and what other plants could be suitable to grow in your climate. Vegetables could include: beans, potatoes, carrots, onions, spinach, garlic, pumpkin, tomatoes, peppers, eggplants. Edible herbs can include: parsley, basil, marjoram, thyme, dill, fennel, mint, rosemary, sage, chilli peppers.).
Document your garden by taking photos, videos, creating a blog. Invite people on garden tours and explain the nutritional value of the plants you grow.
Find out more on setting up and running a school garden at: **www.fao.org/docrep/009/a0218e/A0218E00.htm.**

LEVEL 3 2 1

LEVEL 3 2 1

D.08 COMPOST ORGANIC WASTE. Set up a **composting** corner in your garden. Use pieces of old wood to build a simple box with spaces for air circulation. Put fruit and vegetable peelings, eggshells, tea leaves, coffee grounds, flowers, grass, branches and other biodegradable waste in it. When the **compost** is ready use it to nourish your garden and indoor plants. If you live in a city and have no garden, take your biodegradable waste to an urban garden for **composting**.

LEVEL 3 2 1

D.09 MAKE A RECIPE BOOK. Create your own recipe book. Remember to include a list of ingredients and information on the **nutrients** provided by each of the ingredients. Also include tips for how people can shop, cook and store food **sustainably**, with minimal environmental impact. Make it a seasonal recipe book with healthy meals for winter, spring, summer and autumn. Find out what vegetables, fruits and other foods are ripe and harvested in your area in different seasons. Include colourful drawings as well. Ask friends and family members for their input. Then use the book to cook healthy eco-friendly meals for your family. Make several copies of the book and give it as a gift to friends.

D.10 WHERE DOES YOUR FOOD COME FROM?

LEVEL 3 2 1

Inspect your kitchen and find out where the different foods you eat come from. Ask your family to help you find these places on the map and mark them with a pin. Does your food travel long distances to reach your plate? How does it travel? Is it flown or shipped from distant lands? Which of the foods that you eat travels the longest distance to reach your plate? What food travels the least? Share this information with your family and discuss what you can do to reduce the impact of your food on the environment. For example, your family could choose more local foods that are not flown or shipped from distant lands.

LEVEL 3

Extension: Can you find out the carbon footprint for your favourite foods? If these foods have high carbon footprints, are there alternatives you could buy instead?

D.11 IMPROVE YOUR DIET THROUGH BIODIVERSITY.

LEVEL 3 2 1

A diverse diet is good both for your health and for nature. By eating a variety of foods, you increase your chances of getting all the nutrients your body needs. You also encourage farmers to produce diverse crop varieties and breeds and save the genetic resources of plants and animals. Did you know we can find many different varieties of the same species of fruit or vegetable? And the best part is that each variety can have a different shape, colour, smell and taste! Visit a farmers' market and find different varieties of at least three products. Find the similar and different characteristics between them and make a presentation about your findings. You can also include a delicious meal prepared with all these amazing products!

D.12 CHECK THE LABELS. Learn about labels! Look in your local shops and supermarkets for sustainability labels. Find out what they stand for and compare them. Which products did you find? Are there any price differences between products with sustainability labels and others? Why do think this is? Can you encourage your family and friends to choose these products? What are the benefits of doing so? Discuss your findings as a group and prepare a cool poster to put in a visible place in your local supermarket!

LEVEL 3 2

D.13 MEATLESS MONDAYS. As you learned in the badge, producing meat has a high environmental impact and uses valuable **natural resources** such as land, water and energy. How about making one day of the week 'meat-free'? Explore vegetarian recipes and try new vegetables, cereals and **legumes** that you haven't eaten before.

LEVEL 3 2

You can even make it a group project, with everyone bringing a different vegetarian dish for the group to try each Monday. Organize a veggie recipe exchange and place all the recipes on a blog or online space where everyone in the group has access to them.

D.14 THIRSTY FOOD. Inspect your kitchen and find out which of the foods you eat requires the largest amount of water to grow. What food takes the least water? Make a chart that shows how much water is needed to produce each food. Share this information with your family and discuss what you can do to reduce the impact of your food on the environment. For example, you could replace 'thirsty' foods with more **sustainable** foods of a similar nutritional value.

LEVEL 3 2

D.15 LOCAL VS IMPORTED. Visit your local market or supermarket. Where was the food produced? How far did it travel to get to the shop? Transportation of products from one place to another **consumes** a lot of energy and produces **greenhouse gas** emissions. Whenever you can, it is better to choose products that have been produced locally. But, in some cases it can be more eco-friendly to import food than to produce it locally; these products might need artificial heating and lighting in greenhouses, as well as more water and fertilizers to grow well. So enjoy some healthy imported treats, while eating locally and seasonally most of the time. It is even better if you can find some imported Fair Trade products (e.g. bananas, coffee, tea, spices and chocolate) that guarantee that the food has been produced sustainably and that the farmers are being treated fairly. Make a poster about your findings and present it to your class, group and/or family, and help them to make better food choices in the future.

LEVEL 3 2

D.16 GO ON A GREEN PICNIC. Organize a green and healthy picnic in your group. You can cook outdoors together or each of you can bring a dish from home to contribute to the common meal. Follow the guidelines in the Sustainable Diets section of this badge to make your picnic as environment-friendly as possible. For example, put the food in reusable boxes instead of aluminium foil or plastic wrap. Do not use disposable plasticware: bring reusable mugs, plates and cutlery or serve finger foods that require no cutlery. Choose environmentally friendly and healthy ingredients for the meal or grow them yourself. Include some physical activities in your picnic programme. Play active games and sports (e.g. football, badminton, dancing, yoga, etc.).

LEVEL 3 2

D.17 FROM THE FIELD TO MY PLATE. Choose one food item you often eat and investigate its full lifecycle from the field to your plate. Where is this food produced? Locally, regionally, imported from overseas, field-grown, greenhouse grown, an organic farm, etc.? What natural resources (water, land, fossil fuels) are needed to produce this food? Does it need fertilizer? Where and how is it processed and packaged? What resources are needed to process and pack this food item? Where is it stored? Does it need cooling or freezing to stay fresh? How is it transported from the field to your plate? Where is it sold? How do you prepare and cook it? How much does it contribute to greenhouse gas emissions? How much does it contribute to air, water and land pollution? Is it an environment-friendly food choice? Can it be replaced with a more sustainable alternative? Sum up the results of your investigation in a story, a blog or make a slide presentation to the rest of your group.

LEVEL 3 2

D.18 BUY FISH SELECTIVELY. Our appetite for fish today is exceeding the oceans' ecological limits with devastating impacts. Over 70 percent of the world's fish stocks are either 'fully exploited', 'overexploited' or significantly 'depleted'. Some species have already been fished to commercial extinction, and more are on the verge of extinction. Investigate about the fisheries in your region and create a pocket guide that tells you which seafood you can enjoy and which fish to avoid for now. Where and how are the different species of fish caught or farmed? Prepare a creative collage you can share with your family. Here is a useful example: *Know your seafood:* **www.oneworldoneocean.com/blog/entry/know-your-seafood-infographic**

LEVEL 3 2

D.19 REDISCOVER FORGOTTEN FOODS. The world has 50 000 edible plants and farmers have domesticated at least 5 000 of them over time. However, global crop production today concentrates on only 12 plant species. Rediscover abandoned foods. Ask your parents and grandparents what they ate when they were young. Where did they get these foods? Can you find them now?

LEVEL 3 2

*** Make sure you get expert advice and use the right species; it can be dangerous to eat the wrong ones.**

D.20 Do any other activity approved by your teacher or leader.

LEVEL 1 2 3

TRISHA REYES, aged 15, PHILIPPINES

SECTION E:

TAKE ACTION

DO EITHER E.1 OR E.2 AND (AT LEAST) ONE OTHER ACTIVITY OF YOUR CHOICE. AFTER COMPLETING THE TAKE ACTION ACTIVITIES, YOU WILL BE ABLE TO:

- **ORGANIZE and PARTICIPATE in a community initiative to raise awareness about the importance of a balanced and varied diet to lead healthy lives and protect against malnutrition.**
- **ENCOURAGE others to practise sustainable diets and have healthier lifestyles.**

DO ONE OF THE TWO COMPULSORY ACTIVITIES BELOW:

E.01 CREATE A NUTRIENTS CORNER. Set up a food and nutrients corner in your canteen or school library. Decorate it with posters and stock it with books and brochures on the importance of eating a variety of foods to have a healthy balanced diet. Organize a ribbon-cutting ceremony to open the corner and invite people to come and discover what nutrients they get from their foods and how they can create variety on their plates for an even more balanced and nutritious diet.

LEVEL 3 2 1

E.02 HEALTHY AND BALANCED DIET CAMPAIGN. Celebrate a Health Day or a Nutrition Week in your school or neighbourhood. Invite a guest speaker to talk to you about creating healthy balanced diets and making good food choices. Distribute educational materials, run workshops and interactive stands, and give presentations. Take notes, photos, videos of the event and post them online.

LEVEL 3 2 1

JAMILLE BIANCA TAN AGUILLAR, aged 18, PHILIPPINES

CHOOSE (AT LEAST) ONE ADDITIONAL ACTIVITY FROM THE LIST BELOW:

LEVEL 2 1

E.03 PERFORM AN ACTION SONG. An action song is a song you can sing while clapping, moving your hands and feet, jumping, miming. Get together with your group and compose an action song about the importance of physical activity and exercise. Invent a catchy tune, funny movements and rehearse the song several times to make sure everyone remembers it. Sing the song to your teachers, leaders and parents on parents' day at school. You can pass a hat around the crowd and raise funds for a community nutrition project.

LEVEL 3 2 1

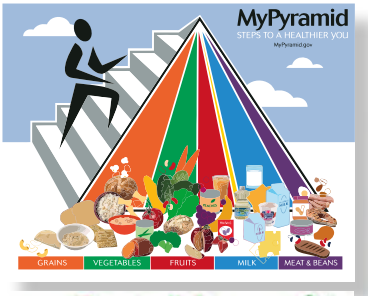
E.04 ORGANIZE A STORYTELLING EVENT. Food is so important for human life and well-being that all countries have their fairy tales, myths, legends, folk songs and poems about it. In your group, organize a storytelling event around the topic of food. Talk to your grandparents and other elders to see if they remember any interesting tales. Look for stories in the library or on the Web. Be creative and make an interesting presentation – a puppet show, a sketch, a recital. Use noises, actions, gestures, music to make the story interesting. Perform your story for an audience. Award prizes to the best storytellers. Take photos and videos and post them online. See if you can publish your collection of folklore as a separate booklet or Web site.

E.05 BECOME A GRAPHIC DESIGNER. Different countries use different graphic designs to represent a healthy balanced diet. A food pyramid is one of the most common formats. Other examples include a plate, a basket or a rainbow. Think of your own way to represent a healthy balanced diet graphically. Use a simple graphic format understandable to people in your family and community. Add some short messages to explain your graphic.

LEVEL 3 2 1

E.06 POSTER DISPLAY. Design colourful awareness-raising posters on healthy diets for children and adolescents. How does having a balanced diet protect children and youth from all forms of malnutrition? Include basic hygiene rules to prepare and store foods safely. Create clear take-home messages that will change people's behaviour. Get permission to hold an exhibition of the posters in a prominent public place.

LEVEL 3 2 1



E.07 PLAY A GUESSING GAME. Play a guessing game with children in your community. Prepare samples of many different foods (grains, beans, fruits, vegetables). Have the children close their eyes and touch, smell and taste the food samples. Can they guess what these foods are? Talk to them about the importance of eating many different foods.

LEVEL 3 2 1

E.08 BALANCED DIET MONITORING. Have you ever stopped to think how balanced and varied your school meals are? During two consecutive weeks, monitor how many lunches include: fresh fruits, fresh vegetables, deep fried foods, sugary drinks, etc. What is your conclusion? Are school lunches and foods sold in vending machines healither? Are they varied? What could be changed to make the food more fun and healthy? Make some recommendations and present them to the head teacher and canteen manager.

LEVEL 3 2 1

E.09 EDUCATE YOUR COMMUNITY. Initiate a healthy balanced diet education programme for your friends, school, neighbourhood. Organize a series of meetings, workshops, talks, seminars, roundtables, interactive displays about healthy diets and lifestyles. Design an eye-catching poster presentation or a slide presentation. Prepare some questions about nutrients in foods and the importance of having a varied diet and invite a speaker (a nutritionist, a doctor, a science teacher) to answer them. Hold a demonstration session where you present a variety of nutritious foods and explain how to use them to meet the dietary needs at your age. Take notes, photos, videos and post them online. Publish and distribute the materials of your nutrition education programme to inform everyone in the community about the nutrients we get from foods.

LEVEL 3 2

E.10 A SURVEY OF FOOD CHOICES. How healthy are the diets of people in your community? Conduct a survey of food choices and eating habits in your local community. You can target one particular age group – for example, your peers – or the entire community. If possible, inform the audience about your survey in advance and get their agreement to participate. Prepare a short and straightforward questionnaire. See what people eat. How regularly do they eat? Do they diet? What snacks do they eat? After the interview, read and analyse all the answers and summarize them in a table, graphic or text report. Include a paragraph with your own ideas and suggestions. Is the community eating balanced, sustainable diets? What changes in the diets could be made? Share the results with your community, including those who took part in the survey. Hang up the survey report in your meeting room, school or library. Contact the media and see if they are interested in publishing it.

LEVEL 3 2

E.11 VOLUNTEER WITH A COMMUNITY ORGANIZATION. Find a non-governmental organization or an association working on food and nutrition issues and join their projects and activities. Examples may include collecting food donations, volunteering for food banks, school meals programmes, community gardening, raising small animals (chicken, rabbits, fish, etc.), school-based deworming programmes, fund-raising, providing support to the elderly, etc.

LEVEL 3 2

LEVEL 3 2

E.12 WRITE LETTERS. Write a letter to put pressure on decision-makers (politicians, MPs). Express your concern about malnutrition and enquire on the following topics:

- What your country is doing in order to fulfil Sustainable Development Goal 2 (eradicate hunger and poverty) and what proportion of your national budget is spent on nutrition and social needs.
- Request policies and campaigns to fight childhood obesity. What is the government doing to restrict marketing of unhealthy foods and beverages to children?
- Do they have any programmes to promote healthy eating in schools?

Try to get other signatures under your letter as well.

LEVEL 3 2

E.13 MARKETING VIOLATIONS DETECTIVES. In 2010, countries endorsed a set of WHO recommendations on policy to reduce advertising to children of foods high in saturated fats, trans-fatty acids, sugars or salt (find out more at: **www.who.int/dietphysicalactivity/marketing-food-to-children/en/index.html**). Act as a detective and find out if there are violations of these marketing recommendations in your community or country. For example, you could count advertisements of junk food targeting children, using comic characters, marketing on social media, billboards, sports events, school grounds, etc. Pay special attention to food and beverage marketing in your school. Look for branding of school catering menus, school signs, vouchers as educational rewards, donation of branded gym equipment, sponsorship of events, publications, school vehicles, etc. Prepare a report and share it with your group and school principals. Don't forget to make some recommendations.

E.14 RAISE FUNDS. Organize a raffle to raise funds for a nutrition project in your community or somewhere else in the world.

LEVEL 3 2

E.15 NETWORK. Create a network against malnutrition with a group of young people in your country or abroad. Exchange your ideas and work together to raise awareness and fight different forms of malnutrition. Plan a joint nutrition project. Keep in touch by post, email, chat; set up Skype sessions and video conferences; create a blog; link in the social networks.

LEVEL 3

E.16 EXCHANGE VISITS. Organize an exchange visit or a summer camp with a youth group working on issues of malnutrition in your country or abroad. Share experiences and opinions.

LEVEL 3

E.17 Do any other activity approved by your teacher or leader.

LEVEL 1 2 3

CHECKLIST

Keep track of the activities you are undertaking in this checklist. When you show that you have completed them, you will have earned the Nutrition Challenge Badge!

YOUR NAME: .....

AGE OF PARTICIPANT: 1 (5–10 years) 2 (11–15 years) 3 (16+ years)

	Activity n°	Activity name	Completed on (date)	Approved by (signature)
A Healthy lifestyles				
B Healthy eating choices				
C Food safety				
D Eat green – time for sustainable diets				
E Take action				

RESOURCES AND ADDITIONAL INFORMATION

STAY UPDATED

This Challenge Badge is one of several complementary resources and activities developed by YUNGA and its partners. Please visit **www.fao.org/yunga** for additional resources or subscribe to the free newsletter to receive updates of new materials by sending an e-mail to **yunga@fao.org**

SEND US YOUR NEWS

We would love to hear about your experience of undertaking the Challenge Badge! Which aspects did you particularly enjoy? Did you come up with any new ideas for activities? Please send us your materials so we can make them available to others and gather ideas about how to improve our curricula. Contact us at **yunga@fao.org**

CERTIFICATES AND BADGES

E-mail **yunga@fao.org** for certificates and cloth badges to reward course completion! Certificates are FREE and cloth badges can be purchased. Alternatively, groups can print their own cloth badges; you can download the template and graphics files from **www.fao.org/yunga**

WEB SITES

The following Web sites provide useful educational materials, including lesson plans, experiments, articles, blogs and videos, which could be useful when undertaking the Challenge Badge with your class or group.

BAM! BODY AND MIND has fun facts, games and recipes to help you eat healthy and stay fit.
www.cdc.gov/bam/nutrition/index.html

CHANGE 4 LIFE has lots of helpful information, recipes, tools, tips and games to help you eat well and move more.
www.nhs.uk/Change4Life/Pages/healthy-eating.aspx

CHOOSE MY PLATE KIDS is a great resource on how to stay healthy, and includes games, recipes, activities and videos.
www.choosemyplate.gov/kids/index.html

FAO EATING WELL FOR GOOD HEALTH is a learning module designed to explore basic concepts of good nutrition, health and healthy diets.
www.fao.org/docrep/017/i3261e/i3261e00.htm

Food and Agriculture Organization of the United Nations

FAO NUTRITION EDUCATION AND GUIDELINES is for everyone who wants to improve the feeding and nutrition of families and communities.
www.fao.org/ag/humannutrition/nutritioneducation/62758/en
and **www.fao.org/nutrition/nutrition-education/food-dietary-guidelines/en**

Food and Agriculture Organization of the United Nations

FAO NUTRITION AND CONSUMER PROTECTION DIVISION has a wide range of information about nutrition, including reports, videos, data sheets and e-learning modules, to help you understand that by learning about nutrition we can improve our diets, our health and our impact on natural resources. **www.fao.org/food/en**

Food and Agriculture Organization of the United Nations

FAO SUSTAINABLE FOOD SYSTEMS PROGRAMME aims to add value by bringing together various initiatives and work streams of FAO and its partners to build capacity f or the uptake of more sustainable consumption and production practices across food systems. It organizes events and dedicated workshops on specific topics, such as sustainable diets.

FRIDGE: Food-Related Intergenerational Discussion Group Experiences is a Penn State curriculum that includes great activities designed to enhance family communication about food, increase learning about food and nutrition, and improve family eating habits through teamwork. **http://extension.psu.edu/youth/intergenerational/program-areas/nutrition-health/fridge**

FRUIT AND VEGGIE COLOR CHAMPIONS contains some great games and activities to help you get excited about fruit and vegetables and encourage you to start eating healthier. **www.foodchamps.org/activity.php?char=4&name=beebee&aktiv=rec.htm&poz=4ebfe5**

WEB SITES

Global Handwashing Day
October 15

GLOBAL HANDWASHING DAY, held on 15 October each year, is a global advocacy day dedicated to increasing awareness and understanding about the importance of hand washing with soap as an effective and affordable way to prevent diseases and save lives. **www.globalhandwashingday.org**

HEALTHY HARVEST is a training manual for community workers on good nutrition, and the growing, preparing and processing of healthy food. **motherchildnutrition.org/healthy-nutrition/pdf/mcn-healthy-harvest.pdf**

LET'S MOVE!

LET'S MOVE has some great suggestions about how to kick-start a healthier lifestyle and become more physically active. **www.letsmove.gov**

LOVE FOOD hate waste

LOVE FOOD HATE WASTE has meal planning ideas, food storage tips and other useful advice to help prevent food wastage.
www.lovefoodhatewaste.com

Food and Agriculture Organization of the United Nations

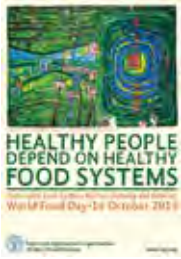
RIGHT TO FOOD: A WINDOW ON THE WORLD is a Web-based version of the cartoon book and activity guide on the human right to food produced jointly by FAO and the World Association of Girl Guides and Girl Scouts (WAGGGS).
www.fao.org/righttofood/publications/publications-detail/en/c/49586

SAVE FOOD: encourages dialogue on food losses between industry, research, politics and civil society. For this purpose, the initiative brings together people involved in the food supply chain from the food industry, retail, packaging and logistics for conferences and projects, and supports them in developing effective measures. Raising the awareness of consumers is another major goal.
www.save-food.org

Food and Agriculture Organization of the United Nations

SETTING UP AND RUNNING A SCHOOL GARDEN – a teaching toolkit that contains step-by-step guidance on how to set up and run a school garden. **www.fao.org/schoolgarden**

THINK.EAT.SAVE is a campaign to reduce global food waste and has inspiring ideas, projects and resources for everyone to take action on this global concern. **www.thinkeatsave.org**



WORLD FOOD DAY, held on 16 October every year, is organized by the Food and Agriculture Organization of the United Nations (FAO) to highlight issues of food security, hunger and nutrition around the world. Learn more at: **www.fao.org/world-food-day/home/en**

WEB SITES

WORLD FOOD PROGRAMME STUDENTS AND TEACHERS section has information, resources and activities about nutrition and hunger, as well as ideas about how to take action. **www.wfp.org/students-and-teachers/students/fun-and-learn**

WORLD HEALTH ORGANIZATION aims to improve diets and increase levels of physical activity worldwide. The Web site includes a wide range of documents, events and factsheets related to childhood nutrition, diets, physical activity and more. See:
Main site:
www.who.int/nutrition/about_us/en/index.html.
Joint estimates infographics:
www.who.int/nutgrowthdb/jme_brochure2015.pdf
Healthy diet fact sheet:
www.who.int/mediacentre/factsheets/fs394/en/
Growth references for 5-19 years:
www.who.int/growthref/en
Diet, physical activity and health:
www.who.int/dietphysicalactivity/en
Marketing recommendations:
www.who.int/dietphysicalactivity/childhood/en
School policy framework: **www.who.int/dietphysicalactivity/marketing-food-to-children/en**
Physical activity recommendations:
www.who.int/dietphysicalactivity/schools/en and www.who.int/dietphysicalactivity/factsheet_recommendations/en
Joint fruits and vegetables intiative:
www.fao.org/agriculture/crops/thematic-sitemap/theme/hort-indust-crops/fao-who-fruit-and-vegetable-for-health-initiative-profavprofel/en

World Health Organization

NUTRITION-FRIENDLY SCHOOLS INITIATIVE (NFSI) aims to provide a framework for ensuring integrated school-based programmes that address the double burden of nutrition-related ill-health.
www.who.int/nutrition/topics/nutrition_friendly_schools_initiative/en/index.html

WHO Programme on Food Safety and Zoonoses (FOS) leads global efforts to lower the prevalence of foodborne diseases.
www.who.int/foodsafety

WHO Five Keys to Safer Food programme:
www.who.int/foodsafety/areas_work/food-hygiene/5keys/en

WHO Programme on Water, Sanitation, Hygiene and Health (WSH) leads WHO's normative and monitoring work on drinking water and sanitation and also works to streamline WSH within health efforts including in emergencies, in healthcare facilities and among vulnerable groups, including the malnourished.
www.who.int/water_sanitation_health/en

GLOSSARY

ABSORB/ABSORPTION: To take something up or retain it; for example, our bodies absorb **vitamins** and **minerals** from the food that we eat.

ADEQUATE: If something is said to be 'adequate' it means there is enough of it, or that it is of suitable or acceptable quality – if something is 'inadequate' it means there is not enough, or it isn't of suitable or acceptable quality.

ADOLESCENCE: The time period in which a young person develops from a child to an adult. It is particularly important to have a healthful, **balanced diet** in this period, as this is a time of intense growth.

AEROBIC: Aerobic activities speed up your heart rate and breathing, and improve heart and lung fitness. Some good aerobic activities are brisk walking, jogging, cycling and swimming.

AMINO ACIDS: These are biologically important **nutrients** that build the proteins humans need to survive.

ATOM: Everything in the world is made up of miniscule particles called 'atoms'. These particles are like small 'building blocks'. Different atoms combine to make up **molecules** of different substances.

BACTERIA: Single-celled **organisms** that live in, on and around other living beings. Some are harmful and can make us sick, but many others actually help us stay healthy.

BALANCED DIET: A balanced diet is a diet that contains **adequate** amounts of all the necessary **nutrients** required for healthy growth and activity. It is only by eating a variety of **nutritious** foods that we can grow and be healthy.

BIODIVERSITY: The variety of all the different kinds of plant and animal life on Earth, and the relationships between them.

BODY MASS INDEX (BMI): The weight in kilograms divided by the square of the height in metres; used as a population-based measure to establish if a person is underweight, normal weight, or overweight and **obese**.

CALORIES: A way of measuring how much energy your body could get from eating or drinking something.

CARBON DIOXIDE: A gas made up of carbon and oxygen, which makes up less than one percent of the air. A carbon dioxide **molecule** is made up of one carbon **atom** (C) and two oxygen **atoms** (O_2). CO_2 is produced by animals and used by plants and trees. It can also be produced by human industrial processes such as burning **fossil fuels**. CO_2 is a **greenhouse gas** and can speed up **climate change**.

CIRCULATORY SYSTEM: The body's network that delivers blood to the various organs and muscles around the body.

CLIMATE CHANGE: A change in the overall state of the Earth's climate caused mainly by human activities. The build-up of **greenhouse gases**, such as **carbon dioxide**, in the Earth's atmosphere is an example of how some human activities (e.g. energy production, transportation, farming and the manufacturing of goods) can cause climate change.

COMPOST: Decayed **organic** material that is used as a plant **fertilizer**.

CONSUME, CONSUMPTION: Consumption is a big word! In its most literal sense, 'consumption' means eating – we 'consume' food. But 'to consume' also means 'to use': we 'consume' (use) energy to light our houses in the evening, for example. So we are 'consumers', people who use things. In this sense, 'consumption' also means 'buying', because to be able to 'consume', we need to buy the goods we want to consume first.

CONTAMINATE, CONTAMINATION: To contaminate something means to make it impure, either by contact or mixing. Food can be contaminated by **micro-organisms** or chemicals that it comes into contact with, so it is important that food is stored, cooked and eaten with safe and clean utensils and materials.

DEFICIENT, DEFICIENCY: This means to not have enough or **adequate** supplies of something. For example, if you do not have enough iron in your diet, you become iron deficient.

DEFORESTATION: Removing a forest or part of a forest (e.g. by cutting it down or burning it) to use the wood (e.g. to make paper or furniture) or to use the land for something else (e.g. farming or building on it).

DIGESTION: The process of changing food into nutrients that the body can absorb and use as energy or as raw materials to repair and build new tissue. The human digestive system is a complex series of organs and glands that process food.

EATING DISORDER: An illness caused by a mixture of physical and psychological factors, often leading to extreme weight loss. Anorexia (which literally means 'having no appetite'') and bulimia (when someone is sick after every meal) are the most common examples of eating disorders.

ECOSYSTEM: A community of living **organisms** (plants and animals) and non-living things (water, air, soil, rocks, etc.) interacting in a certain area. Ecosystems don't have a defined size: depending on the interactions you are interested in, an ecosystem can be as small as a puddle or as big as the entire ocean. Ultimately, the whole world is one big, very complex ecosystem.

ENVIRONMENTAL FOOTPRINT: Refers to the way we mark or affect the environment through our everyday actions; for example, how much energy and water we use, whether we use plastic shopping bags or bring our own cloth bags, etc. The smaller a footprint we leave, the less harm we cause to the environment.

ENZYMES: **Molecules** that accelerate chemical reactions in our body. Wherever one substance needs to be transformed into another, nature uses enzymes to speed up the process. The enzymes in the stomach ensure that food is broken down into tiny particles that can be converted into energy in the body.

EUTROPHICATION: Is caused by the presence of excessive levels of **nutrients** being washed into water bodies such as rivers, lakes or the ocean. It results in the fast growth of plants and algae, which can contribute to the creation of dead zones.

FAIR TRADE: Products that are produced according to certain social standards and sold at a fair price. These standards include banning child and slave labour, guaranteeing a safe workplace and ensuring a fair price to farmers. A fair price is understood to mean that more of the money made goes to the farmers and less to intermediaries. The ultimate goal of Fair Trade is to help producers in poorer countries.

FERTILIZER: A natural or chemical substance added to the soil to increase its fertility (the amount of crops it can grow).

FIBRE: Fibre is an important part of a healthy diet; it passes through the gut and helps the body get rid of its waste products, 'cleaning out' the digestive track. Whole grains, **legumes**, fruit and vegetables such as leafy greens, asparagus, artichokes, eggplant, raspberries and broccoli are good sources of fibre.

FOOD PRODUCTION CHAIN: The steps that are used to get food from the farm to our plate. The steps can include production (on the farm), processing (in a factory), distribution (transport to the shops), **consumption** (eating the food at home) and disposal (rubbish).

FOOD SAFETY: All measures to ensure that food will not cause harm to the consumer when it is produced, prepared and/or consumed according to its intended use.

FOOD SECURITY: Food security is the state in which all people at all times have both physical and economic access to sufficient, safe and **nutritious** food that meets their dietary needs for an active and healthy life (Source: FAO).

FOOD-BORNE DISEASE: A general term used to describe any disease or illness caused by eating **contaminated** food or drink. Traditionally referred to as 'food poisoning'.

FORTIFIED: If food is fortified it means that it has had extra **vitamins** or **minerals** added to it to make it more **nutritious**. For example, adding **vitamin** D to milk.

FOSSIL FUELS: Fossil fuels form over millions of years from prehistoric plant or animal remains. The three fossil fuels are coal, oil and natural gas. When we burn fossil fuels to fuel vehicles or generate energy, the **greenhouse gas** **carbon dioxide** is released into the atmosphere, contributing to climate change.

FUNGUS (PLURAL: FUNGI): An **organism** that grows in the soil, on dead matter or on other fungi by decomposing **organic** matter. This process means **nutrients** are reused ('**nutrient** recycling'). Mushrooms, for example, are the fruit of specific kinds of fungi.

GERMS: Germs are tiny **organisms** that can cause disease or make us sick. Germs are so small and sneaky that they get into our bodies without being noticed. When they get in our bodies, we don't know what has hit us until we have symptoms that say we've been attacked!

GREENHOUSE GASES: Gases (such as **carbon dioxide**, methane or ozone) whose build-up in the atmosphere prevents heat from escaping (like the glass in a greenhouse). Human activities, like industrial production, energy production, food production and transportation, have increased the levels of greenhouse gases in the atmosphere to such an extent that the Earth's temperature is starting to rise: this is known as **climate change**.

HERBICIDES: Chemicals used to prevent, destroy, or repel unwanted plants.

HYGIENE, HYGIENIC: Practices, such as frequent hand washing, which help ensure personal cleanliness and good health.

IMMUNE SYSTEM: Your immune system is your body's natural defence against **germs**, infections and disease. This system has a lot of different parts that work together to keep out any harmful **germs**, and attack and destroy those that manage to get inside your body. To work properly, the immune system needs good nutrition.

IMMUNIZATION: The act of making a person immune to (having a defence against) a disease or illness.

INFECTIOUS: A disease or disease-carrying **organism** that can be spread to people through the environment.

INORGANIC: Material that is not derived from living **organisms**.

LAND DEGRADATION: Land degradation happens when the soil is damaged in a way that reduces its fertility and makes it less productive for crop growth as well as less biologically diverse (see **biodiversity**).

LEGUMES: Legumes are a vegetable food group that is rich in protein fibre and essential **minerals** and **vitamins**. For example, peas, beans and lentils are all legumes.

MACRONUTRIENTS: These are **nutrients** that the body needs in relatively large amounts to provide energy for daily activities. The main macronutrients are carbohydrates, proteins and fats.

MALNUTRITION: A state in which a body can no longer maintain even its basic physical functions because of inadequate (see adequate) or unbalanced food intake. 'Malnutrition' covers a range of problems from being dangerously thin or too short for one's age, to lacking **vitamins** and **minerals**, or being too fat or **obese**. Eating too little food (**undernutrition**) and eating too much food (overweight and **obesity**) are both forms of malnutrition.

METABOLIZING, METABOLISM: The chemical reactions that take place in your body's cells in order to convert the food you eat into energy.

MICRONUTRIENTS: These are **vitamins** and **minerals** that the body needs in relatively small amounts, but which are essential for human health and well-being.

MICRO-ORGANISM: A creature that is too small to be seen with the human eye alone, but that can be seen through a microscope. Micro-organisms include **bacteria**, viruses, yeasts, moulds and **parasites**.

MINERALS: A solid, **inorganic** substance that occurs in nature. For example, gold and silver are minerals, as are iron, iodine, magnesium, potassium, zinc, calcium and sodium.

MOLECULES: When individual **atoms** stick together, they make up small clusters, which are called 'molecules'. Different molecules make up different substances.

MUSCULOSKELETAL SYSTEM: This is our body's core frame and comprises our bones, joints and muscles. The musculoskeletal system is essential for all body movements.

NATURAL RESOURCES: Natural resources are useful materials found in the natural environment around us. Water, soil, wood or rocks are examples of natural resources we rely on to survive. We need water for drinking, water and soil for growing food, wood for making paper and furniture, and wood and rocks for building materials. And those are only a few of the uses we can put those resources to! Can you think of more?

NERVOUS SYSTEM: This is the highway along which your brain sends and receives information about what is happening in the body and around it. This network is made up of billions of nerve cells, which are essential for how we think, learn, move and behave.

NUTRIENTS: Chemicals that animals and plants need to live and grow.

NUTRITIOUS: Nutritious foods supply **adequate** amounts of essential **nutrients** to allow our bodies to function, grow and develop healthily.

OBESE, OBESITY: This means being very overweight. Overweight and obesity are defined as abnormal or excessive fat accumulation that may impair health.

OMEGA-3 FATTY ACIDS: These are a form of **unsaturated fat** and are essential for human health.

ORGANIC: As opposed to **inorganic** substances, organic materials are derived from living matter or **organisms**. They almost always contain carbon.

ORGANIC FARMING: A type of farming in which fruit, vegetables and livestock are farmed using only natural **nutrients** such as **compost** and manure, and natural methods of weed and pest control, instead of using chemical **fertilizers** and **pesticides**.

ORGANISM: An individual living creature such as a tree, a virus or a human being.

PARASITE: An **organism** (animal) that lives on, in or with an **organism** of another species, obtaining food, shelter or other benefit at the expense of the host **organism**, which it may directly or indirectly harm.

PASTEURIZED: The act of heating a drink or other food (such as milk) to a specific temperature to kill off any **micro-organisms** that could cause disease or spoilage to the product and the consumer.

PATHOGEN: Any disease-producing agent, especially a virus, **bacteria**, or other **micro-organism**.

PESTICIDE: A chemical used to prevent, destroy, or repel unwanted animals, insects or plants.

PRESERVATIVES: Preservatives are chemical compounds that are added to food to help it last longer. Many **processed foods** contain preservatives.

PROCESSED FOOD: Food that has been changed from its natural state. Freshly harvested fruit, vegetables or grains are still in their natural state. But bread, for example, where the wheat has been ground and mixed with water, oil and other ingredients and is then baked, has been 'processed'. Many processed foods are high in fats, sugar and salt, so take care to check the labels and try to limit your **consumption**.

SANITATION: Maintaining clean conditions that help prevent infection and disease through services such as garbage collection and functioning sewerage systems.

SATURATED FATTY ACIDS: These are fats that are found in many animal products (meat, cheese, butter, etc.) and palm and coconut oil. Our bodies only need very small amounts of saturated fatty acids, and too much can be bad for your heart.

SUSTAINABLE/SUSTAINABLY: The state in which we humans use the natural environment to meet our needs without damaging its long-term productivity (i.e. it can no longer support plant, animal or human life). Making sure that our actions are sustainable means that other humans, as well as future generations, will be able to live well, too.

SUSTAINABLE DIET: Broadly speaking, a sustainable diet is one that is healthy, has a low environmental impact, contributes to food and nutrition security around the world, and to a healthy life for present and future generations. Sustainable diets are also protective and respectful of **biodiversity** and **ecosystems**, culturally acceptable, economically fair to producers and consumers, nutritionally **adequate**, safe and healthy.

TRANS FATS: Short for trans-fatty acids, trans fats can be made in food processing by adding hydrogen to vegetable oil, which makes the oil less likely to spoil. Trans fats are often found in **processed foods**, fast food, snack food, fried food, frozen pizzas, pies, cookies, margarines and spreads. They are very unhealthy and one should avoid eating foods containing trans fats as far as possible.

UNDERNOURISHED/UNDERNUTRITION: If people only have very little to eat for long periods of time, or if the food they eat contains too few **nutrients** (e.g. proteins, **vitamins**, **minerals**), they will suffer from undernutrition, which means their bodies are less healthy and energetic than they should be.

UNREFINED GRAINS: These are whole grains that have not been processed in any way. Unrefined grains contain many **vitamins**, **minerals** and **fibre**, which help your digestive system to work.

UNSATURATED FATS: Unsaturated fats (when eaten in the right amounts) are good for you, especially for your heart. These fats can be eaten in nuts, seeds, fish and olives, and sunflower, canola and olive oils, among other foods.

VITAMINS: Vitamins are **organic** compounds made by plants and animals, which can help prevent severe illness and support longer, healthier lives. Fruits, vegetables, meat, dairy products, eggs, beans and grains are rich in vitamins.

YOUR NOTES

ACKNOWLEDGEMENTS

Great gratitude goes to everyone who made the Nutrition Challenge Badge a reality. We would particularly like to thank the different organizations, and all the enthusiastic Guides, Scouts, school groups and individuals all around the world who thoughtfully pilot-tested and reviewed the numerous drafts of the badge.

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Some of the illustrations in this booklet are a selection from the over 20 000 drawings received from various drawing competitions. See our Web site (www.fao.org/yunga) or register to our free mailing list (e-mail yunga@fao.org) to find out about current competitions and activities.

This document was developed under the coordination and editorial supervision of Reuben Sessa, YUNGA Coordinator and Youth Focal Point for FAO.

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Schweizerische Eidgenossenschaft
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Swiss Confederation

Federal Department of Economic Affairs, Education and Research EAER
Federal Office for Agriculture FOAG

This badge was developed in collaboration with and is endorsed by:

Convention on Biological Diversity

Secretariat of the Convention on Biological Diversity (CBD)

The Convention on Biological Diversity came into force on 29 December 1993 with the objectives to conserve biodiversity, use it in a sustainable fashion and to share its benefits fairly and equitably. The CBD Secretariat manages biodiversity policy discussions, facilitates the participation of countries and groups in biodiversity processes and supports the implementation of the Convention.
www.cbd.int/youth

Food and Agriculture Organization of the United Nations

Food and Agriculture Organization of the United Nations (FAO)

FAO leads international efforts to improve nutrition, increase agricultural productivity, raise the standard of living in rural populations and contribute to global economic growth. FAO is working towards creating sustainable improvements in nutrition, as well as providing information, assessments and analysis to combat hunger and reduce all forms of malnutrition. Serving both developed and developing countries, FAO acts as a neutral forum where all nations meet as equals to negotiate agreements and debate policy.
www.fao.org

The World Association of Girl Guides and Girl Scouts (WAGGGS)

The World Association of Girl Guides and Girl Scouts (WAGGGS) is a worldwide movement providing non-formal education where girls and young women develop leadership and life skills through self-development, challenge and adventure. Girl Guides and Girl Scouts learn by doing. The association brings together Girl Guiding and Girl Scouting associations from 145 countries, reaching 10 million members around the globe.

www.wagggsworld.org

World Health Organization (WHO)

WHO is the coordinating authority on international health within the United Nations' system. It does this by providing leadership on matters critical to health and engaging in partnerships where joint action is needed. Promoting good health through the life-course cuts across all work done by WHO, and takes into account the need to address environment risks and social determinants of health, as well as gender, equity and human rights.

www.who.int

The World Organization of the Scout Movement (WOSM)

The World Organization of the Scout Movement (WOSM) is an independent, worldwide, non-profit and non-partisan organization that serves the Scout Movement. Its purpose is to promote unity and the understanding of Scouting's purpose and principles while facilitating its expansion and development.

www.scout.org

The Youth and United Nations Global Alliance (YUNGA)

is a partnership between United Nations agencies, civil society organizations and other entities that develops initiatives, resources and opportunities for children and young people to learn, get involved and make a difference.

www.fao.org/yunga

YOUTH & UNITED NATIONS GLOBAL ALLIANCE

YUNGA

THE YOUTH AND UNITED NATIONS GLOBAL ALLIANCE (YUNGA) IS A PARTNERSHIP BETWEEN UNITED NATIONS AGENCIES, CIVIL SOCIETY ORGANIZATIONS AND OTHER ENTITIES THAT DEVELOPS INITIATIVES, RESOURCES AND OPPORTUNITIES FOR CHILDREN AND YOUNG PEOPLE TO LEARN, GET INVOLVED AND MAKE A DIFFERENCE.

YUNGA ACTS AS A GATEWAY TO ALLOW CHILDREN AND YOUTH TO PARTICIPATE IN THE ACTIVITIES AND INITIATIVES OF THE UNITED NATIONS.

WE ARE MANY. WE ARE YUNGA!

Design: Pietro Bartoleschi;
Layout: Gabriele Zanolli (gabrielezanolli.it)

The purpose of the United Nations Challenge Badges is to raise awareness, educate and, most of all, motivate young people to change their behaviour and be active agents of change in their local communities. Challenge Badges are appropriate for use with school classes and youth groups, and are endorsed by WAGGGS and WOSM. They include a wide range of activities and ideas that can easily be adapted by teachers or leaders. Additional badges are available or are being developed on a number of other topics, including: Agriculture, Biodiversity, Climate Change, Energy, Forests, Gender, Governance, Hunger, the Ocean, Soils and Water.

The NUTRITION CHALLENGE BADGE is designed to help children and young people learn about the importance of a balanced and varied diet to ensure that all the nutritional needs of the body are met for a happy and healthy life. This booklet includes information about how to make healthy food choices, and understand the importance of food safety and provides guidance on how to adopt a sustainable diet reduces impacts on our environment. Most of all, the booklet is packed with activities and curriculum ideas to stimulate learning and encourage children and young people to lead healthy lifestyles that are good for themselves and for the planet.

FOR MORE INFORMATION ON THIS AND OTHER MATERIALS CONTACT

YOUTH AND UNITED NATIONS GLOBAL ALLIANCE (YUNGA)

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This Challenge Badge supports

SUSTAINABLE DEVELOPMENT GOALS

2 ZERO HUNGER

3 GOOD HEALTH AND WELL-BEING

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