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Annex 3 Module 6

Module 6: CULINARY MEDICINE IN PRACTICE

This module aims to provide the knowledge needed to develop culinary skills and to apply culinary techniques according to the foods and the nutritional requirements of healthy children and their families, as well as of children with overweight or obesity, vegan or vegetarian, and of those under particular medical conditions, such as food allergy or coeliac disease.

Unit 1: MEAL PLANNING

Introduction

Meal planning can be defined as the anticipated preparation of meals and snacks for a specific period of time. Meals can be prepared for the following days, for a week or for several weeks at once. Different meal planning methods have been described in the scientific literature. In fact, there is not a single correct method to meal prep, as it can be tailored based on cooking skills, schedules, food preferences and family eating habits.

QUESTION: Is meal planning **only** a helpful strategy to cook and eat healthier? A) Yes B) No

Explanation: Planning is an essential component of successful home meal preparation, healthy and balanced diets, and meeting the nutritional needs of the whole family. Nonetheless, meal planning is also a great tool for:

- saving money and time at the grocery store
- body weight control, as you previously choose the ingredients and portions served in each meal
- achieving a higher Food variety score (FVS), defined as the number of different food items reported to be eaten over a reference period of time
- and reducing stress as you avoid improvised and impulsive decisions regarding food, or rushed preparations

A few studies have researched meal planning practices within the general population. These studies have shown that meal planning is positively associated with having better dietary quality, including higher adherence to nutritional guidelines as well as increased food variety. Additionally, meal planning has also been positively associated with family meals, frequencies of home food preparation, a higher consumption of fruits for dinner, and less likelihood of having overweight or obesity. Other previous studies show the effect of meal planning over adequate diets in diabetic subjects.



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At the same time, children's participation in family meals, particularly dinner, has received a great deal of attention by researchers, who have found that such meals promote healthier eating among children and adolescents in the form of greater fruit and vegetable consumption and less soft drink consumption.

Previous studies have evaluated the feasibility of the intervention with specific behaviorally based parent-training curriculums to address feeding problems associated with autism spectrum disorders or diabetes.

All these benefits suggest a potential interest in promoting meal planning to improve dietary quality and to prevent obesity and overweight in the general population, and in a family context. It is necessary to design applications and provide individuals with tips and steps for a successful meal planning.

- Learn the sequence of steps for healthy meal planning and tips for making a grocery list
- Understand the main principles of designing a healthy and seasonal diet for your family
- Prepare a weekly family menu implementing batch cooking to your circumstances
- Learn simple ideas for eating a healthy diet

References:

- Abbot, Jaclyn Maurer et al. A Tool for Facilitating Meal Planning. *Journal of Nutrition Education and Behavior* 2010;42, Issue 1:66 – 68
- Punam Ohri-Vachaspati . Quick and healthy meals: tips and tools for planning meals for your family. *J Nutr Educ Behav* 2008;40(4):265-6.
- William AlexMcIntos, Karen S.Kubena, GlenTolle, Wesley R.Dean, Jie-shengJan, JennaAnding. Mothers and meals. The effects of mothers' meal planning and shopping motivations on children's participation in family meals. *Appetite* Volume 55, Issue 3, December 2010: 623-628
- William G Sharp, T Lindsey Burrell, David L Jaquess. The Autism MEAL Plan: a parent-training curriculum to manage eating aversions and low intake among children with autism *Autism* 2014;18(6):712-22

Steps to Meal Planning Success (Topic 1)

Making a meal plan before heading to the store can help you get organized, save money, and choose healthier options. When you decide to plan meals for your family, you should choose options with high nutrient density and low in sodium, saturated fat and added sugars by reading the nutritional facts label. Avoid separating meals for each child, and also between adults and the kids.

According to the prestigious Harvard School of Public Health it is very important meal prep following these steps:

- Discuss with all family members which types of foods, meals or recipes they would like to eat.





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- Start a monthly calendar or spreadsheet to record your meal ideas, favorite recipe websites, and food shopping lists. You should plan your meals considering these five food groups— grains, vegetables, fruits, protein foods, and dairy products. You can find a worksheet example to plan your meals in this link (<https://www.myplate.gov/tip-sheet/meal-planning>)
- Collect healthy recipes. Clip recipes from print magazines, newspapers or apps and save in a binder, or copy links of recipes onto an online spreadsheet. Try out some new recipes. Find new ideas for healthy and low-cost meals based on what you have on hand, foods your family enjoys, and foods that are good buys.
- Consider specific meals or foods for different days of the week. Some families enjoy the consistency of knowing what to expect, and it can help to ease your meal planning. Some examples are Meatless Mondays, Whole Grain Wednesdays, Stir-Fry Fridays, etc.

On the other hand, the U.S. Department of Agriculture published easy tips to get everyone started to plan your meals.

- See what you already have on hand. Look in your refrigerator, freezer, and pantry. Always check the expiration dates of each product. It is the best way to avoid food waste and make sure we use up the ingredients we have on hand before buying something new.
- Write down your meals and use it as a guide. Choose meals you can easily prepare when you don't have much time. Take into account special events during the week, including when you might enjoy dinner out.
- List out recipes to try
- Think about your schedule
- Plan to use leftovers
- Make a grocery list
- Build your shopping list as you go
- Finally, buy a combination of fresh, frozen, and non-perishable foods

It is very interesting to share the meal plan with your family members so they can help with shopping and meal preparation. For some, the plan can be posted on a white board, or a calendar posted on the fridge.





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Nowadays, there is a lot of free menu planning apps or tools, available on the internet that will help the families with your weekly menu plan. Next, we present some of the most used platforms. Some of them allow plan special meals such as gluten-free, paleo or vegetarian meal plans for example.

| Name | LINK |
|------------------------|---|
| Food planner | http://www.foodplannerapp.com/ |
| Noodle | https://www.nooddle.es/ |
| Mealime | https://www.mealime.com/ |
| eMeals | https://emeals.com/ |
| Recipe calendar | https://www.recipe-calendar.com/ |

References:

- (1) <https://www.myplate.gov/eat-healthy/healthy-eating-budget/make-plan>
- (2) <https://www.hsph.harvard.edu/nutritionsource/meal-prep/>
- (3) <https://www.myplate.gov/tip-sheet/meal-planning>

Create a grocery list and tips for supermarket savings (Topic 2)

Before shopping for food, families can follow these recommended food conservation times which offer the best flavors, maximize nutritional value, and optimize food safety.

| Refrigeration (Between 0° and 5°C), | Freezing (less than -18°C). |
|---|---|
| 1-2 days: Cooked ground poultry or ground beef | 2-3 months: Soups and stews; cooked beans |
| 3-4 days: Cooked whole meats, fish and poultry; soups and stews | 3-6 months: Cooked or ground meat and poultry |
| 5 days: Cooked beans; hummus | 6-8 months: Berries and chopped fruit (banana, apples, pears, plums, mango) stored in a freezer bag |
| 1 week: Hard boiled eggs; chopped vegetables if stored in air-tight container | 8-12 months: Vegetables, if blanched first for about 3-5 minutes (depending on the vegetable) |
| 2 weeks: Soft cheese, opened | |
| 5-6 weeks: Hard cheese, opened | |



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Several organizations with well-recognized international prestige in the field of Nutrition and Dietetics, such as the British Dietetic Association or the Academic of Nutrition and Dietetics, recommend following these easy tips when going shopping for food to help you spend less at the grocery store.

From the supermarket to the kitchen, here are some strategies to get the best selection:

- Make a meal plan, particularly for your main meals, and a shopping list and stick to the food you already have at home to avoid buying unnecessary things. Don't overbuy to avoid food waste
- Shop for groceries when you are relaxed during the week. If it's possible, you should shop after you have eaten and avoid shopping on an empty stomach. This can lead to impulse purchases which may affect what and how much you buy.
- Avoid peak hours at grocery stores, which are typically from 4 p.m. to 6 p.m. on weekdays, and afternoons during the weekend
- Organize your grocery list into sections according to the layout of the supermarket and based on in-season local produce. This cuts down time and the number of times you cross through the aisle
- Check for supermarket offers and weekly store circulars for sales and coupons for items you regularly purchase. Also, try company websites and apps for coupons. Be aware that special offers are not always the cheapest option and sometimes sale prices are only valid with the loyalty card
- Avoid purchasing more than you need or can store. Use within the specified date or freeze for later
- Value brands often taste just as good for a lower price
- Local food markets offer locally sourced produce which usually offer a good value for money
- Cheaper products are not always at eye level or clearly positioned. Check out all the shelves (including top and bottom)
- Larger supermarkets offer a better range of produce, often at a cheaper cost, so do your main shop there if you can
- Stock up on staple foods when they go on sale. Browse your grocery aisles for sale items and stock up on foods you can store in the pantry and freezer. Load your cart with non-perishable foods such as canned and bottled goods; dried beans and peas; whole-grain pastas, crackers and cereals; brown rice; tomato sauces and nut butters.
- Buying frozen fruits and vegetables can be a more economical option
- To reduce food waste, you can freeze foods that are just about to go bad. For example, frozen bananas can make delicious healthy "ice-cream" recipes

QUESTION: Myth: Buying everything in bulk is better. A) True B) False

Even though this practice can lower the price by unit, buying in bulk is not always the cheapest option. Consumers may shop extra food and the overall spending is higher than the one of just buying what you need for the week or month. Also, in general, foods that are sold in bulks are usually processed and high in sugars and salt.

QUESTION: Is it good practice to go grocery shopping without the kids? A) Yes B) No



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Most parents think that going to the supermarket with their kids will lead to them asking for unnecessary items like candy and cookies. However, the visit to grocery store could be an excellent opportunity for kids to get involved in the foods they eat and learn basic meal recipes. Besides, if parents teach the kids to choose healthier food options, it is more likely that they will eat them, lowering money and food waste. A useful simple advice to the parents may be to give the kids a healthy snack before, which can help to avoid those impulse buys.

QUESTION: How to identify if products are healthy for the kids?

Food products can be marketed to seem like they are healthy options, specially within the children population. It is important to identify foods that are high in added sugars.



References:

- <https://www.fda.gov/consumers/consumer-updates/are-you-storing-food-safely>
- <https://www.bda.uk.com/resource/food-facts-eat-well-spend-less.html>
- <https://www.hsph.harvard.edu/nutritionsource/meal-prep/>
- <http://www.fao.org/fao-stories/article/en/c/1309609/>
- <https://www.eatright.org/food/planning-and-prep/smart-shopping/save-time-and-money-at-the-grocery-store>
- <https://www.eufic.org/en/healthy-living/article/how-to-eat-healthily-on-a-budget>
- <https://www.eatright.org/food/planning-and-prep/smart-shopping/shop-healthy-on-a-budget>





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Seasonal Meal Plans (Topic 3)

Seasonal meal planning means that we plan our meals based around the produce that grows during a certain season. Basically, focusing on what grows in your area, during that specific time.

- When comparing local and seasonal produce with its equivalent out-of-season imported fruits and vegetables, we learn that there are some pros and cons regarding its consumption. Seasonal produce is considered to be more tasteful, fresher, and overall better quality than the latter. Nonetheless, it can also be more costly, less convenient, more tedious to obtain, and limit diet variety – which all proves why consuming ONLY seasonal food would be impractical.
- Although these foods are classified depending on the season they naturally grow-in and are produced, people commonly associate seasonal foods with what they eat during certain holidays and cultural events throughout the year. A very common example is eating turkey during Christmas. This leads to supermarkets having a high stock of turkey during the month of December, insinuating it is a seasonal product. Due to these different interpretations of what seasonal foods are, it is important to define the public message that we want to set out.

QUESTION: Are all foods seasonal? A) No B) Yes

Nowadays we can buy and eat a wide variety of foods all year around because a) foods can be transported around the world on lorries, boats and even planes and b) farms use large greenhouses to control the temperature and create perfect growing conditions. Thus, tropical fruits can come from places with hot climates like Asia, Latin America, and Africa.

However, some foods are not seasonal. Meat and dairy can be produced all year around. Cows are milked and chickens produce eggs from January all the way to December.

QUESTION: The only reason to eat local food is to save money. A) False B) True

Explanation: It is true that the longer food travels from the farm or food industry to the grocery store, the higher the cost for the families – as food grown locally in-season is tastier and cheaper to buy. However, there are other reasons to prefer seasonal food.

- Eating seasonally is fresher, tastier and more nutritious than when it is grown and consumed in its natural season than the equivalent imported produce or those produced out of season.
- Thus, even though we all like to eat strawberries year round, the best time to eat them is when they can be purchased directly from a local grower shortly after harvest. Seasonal fruits and vegetables produced on local farms are often fresher, as they do not require long distances for transport. Additionally, studies have shown that fruits and vegetables contain more nutrients when allowed to ripen naturally on their parent plant. In conclusion, a seasonal eating plan is healthier for you and your family.
- Having a seasonal food calendar in your fridge door can be helpful
- Purchasing locally grown foods helps support local farms and maintains farmland and open spaces in your community.





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- Local food supports the local economy. The money you spend on products from local farmers and growers stays in the community and is reinvested in other local businesses. In addition, food grown, processed, and distributed locally (for example, to local restaurants) generates jobs and subsequently helps stimulate local economies.
- Local growers can tell you how the food was grown. When you buy directly from farmers, you have the opportunity to ask what practices they use to raise and harvest their crops. When you know where your food comes from and who grew it, you know a lot more about your food.
- Eating seasonal produce is better for the environment, because less fuel is used when choosing in-season produce that is local to your area.
- Seasonal meal planning is just plain easier

When you create your own meal plan for a season, then you could transfer it to the next month or season, according to seasonal or recipes for every season or months.

Every family should know the guideline of what produce, especially fresh fruits and vegetables, is in season for Spring, Summer, Fall, and Winter or in every month, in their country or region, because the weather conditions vary around the world and also the seasonal grown produce.

Next, we attach several national guides of seasonal foods to several countries:

| Country | LINK |
|-----------|--|
| Europe | https://www.eufic.org/en/explore-seasonal-fruit-and-vegetables-in-europe |
| US | https://www.seasonalfoodguide.org/ https://snaped.fns.usda.gov/seasonal-produce-guide |
| UK | https://www.bda.uk.com/food-health/your-health/sustainable-diets/seasonal-fruit-and-veg-a-handly-guide.html https://eatseasonably.co.uk/ |
| Australia | http://seasonalfoodguide.com/ |
| Canada | https://www.foodnetwork.ca/in-season/blog/whats-in-season-in-canada/ |
| Spain | https://www.alimentosdespana.es/es/campanas/historico-de-campana-y-programas/frutas/ https://dietamediterranea.com/en/season-food/ |

It is possible only eating seasonal food?

Some countries have been involved in several projects that aim to encourage the consumption of seasonal and local food, and thus reduce the environmental impact of diets. Examples include 'The Fife Diet' in Scotland, 100-mile diet in Canada, and the Nordic diet. There have been attempts to eat *only* locally produced foods for a whole year – actually, this is how the 100-mile





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diet started. A couple in Canada wanted to see if it was possible to only consume food produced within a 100-mile radius of Vancouver. Even though they were in fact able to achieve this, they explained that preparing food was too time-consuming and laborious, comparing it to a part time job. Also, they shared how difficult it was to eat a varied and balanced diet throughout the year. This is just an extreme, yet interesting, approach to seasonal eating, however, it works to identify some of the obstacles that can appear and need to be appreciated when implementing this practice.

References:

- <https://www.bbc.co.uk/food/seasons>
- <https://www.bbcgoodfood.com/seasonal-calendar>
- <https://www.seasonalfoodguide.org/why-eat-seasonally>
- Jennie I Macdiarmid. Seasonality and dietary requirements: will eating seasonal food contribute to health and environmental sustainability? Proc Nutr Soc 2014;73(3):368-75

Healthy kids meal plans (Topic 4)

The U.S. Department of Agriculture recommends that children between 2 and 18 years old consume a diet rich in whole grains, fresh produce, lean protein and low-fat dairy products while only sparingly eating high-fat, high-sugar items and processed products. Ask your child's pediatrician or a nutritionist to help you develop a basic weekly meal plan your family will enjoy.

Case: Complementing lunch and dinner and healthy alternatives to snacks

| First courses | | | | Second courses | | |
|---------------|------------|-------------|------------|----------------|-----------|----------|
| Lunch | Vegetables | Rice /Pasta | Legumes | Meat | Egg | Fish |
| Dinner | Rice/Pasta | Vegetables | Vegetables | Egg/Fish | Meat/Fish | Meat/Egg |

Case: Healthy alternatives to snacks

The Kid's Healthy Eating Plate

The Kid's Healthy Eating Plate a visual guide to help educate and encourage families to their children eat well and emphasizes physical activity as essential part for staying healthy.

<https://www.hsph.harvard.edu/nutritionsource/kids-healthy-eating-plate/>





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References:

- <https://www.eatingwell.com/category/4296/healthy-kids-meal-plans/>
- <https://www.nal.usda.gov/fnic/child-nutrition/>
- <https://www.healthychildren.org/spanish/healthy-living/nutrition/>
- <https://www.myplate.gov/life-stages/kids>
- <https://www.dietaryguidelines.gov/>
- <https://www.healthychildren.org/English/ages-stages/gradeschool/nutrition/Pages/Making-Healthy-Food-Choices.aspx>

Batch cooking for families (Topic 5)

Batch cooking is a method of meal preparation which implies cooking in batches – more food, less often. Batch cooking means preparing food ahead of time in large batches to be eaten later as meals or to be used as ingredients for multiple meals or snacks.

Batch cooking has no standard definition or process for all. Batch-cooking for one family could mean having several meals pre-cooked or prepped and frozen for the following weeks. For another family, it may mean cooking three or four meals at the same time. First, you must know how much your family really eats to define batch-cooking for your own family's preferences and needs, and with experience you may perfect your practice until you find your sweet spot.

Batch cooking offers very interesting benefits to the families from the point of view of dietary practice. Thus, batch cooking allows families to:

- Cook less often and, consequently, maximize the time spent in the kitchen by preparing multiple meals in about the same amount of time
- Enjoy more time together
- Save money on groceries, time and stress
- Avoid unhealthy food foods and recipes or eating out
- Have ready-to-go meals on hand for busy weeknights



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- Cut down on wasteful packaging and reduce our environmental impact
- Reduce the energy bill

As explained above, there is not an absolute correct method on how to batch-cook. However, there are some pointers that can be followed:

- Meal plan the week considering portion sizes depending on your family members (how many people, their age, how they eat...)
- Make an ingredient list considering that some will be incorporated in multiple recipes. For instance, potatoes can be implemented into several recipes (mashed potatoes or baked wedges)
- Based on the ingredients list, make a grocery shopping checklist with the items you need to buy
- Find your nearest grocery store
- Go back home
- Clear a few hours off your schedule to cook
- After the food is ready, cooked meals need to be stored in the refrigerator or in the freezer, depending on when you are planning to eat them
- If you have the time and space, sectioning meals into different containers can be helpful

The following advice aims to help you make the most out of this practice:

- Plan ahead: organize your schedule and set some time apart to make a list of meals and snacks you and your family would like to eat during the week. Transfer this list into a menu plan, and have the recipes for each meal on the side.
- Start simple: big changes require small steps. Start planning for a few days until you get to plan the whole week. Look for simple and easy recipes
- Find your batch-cooking method: as explained above, batch cooking can be done in many ways. Choose the one that better suits your situation. When starting, decide if you will be cooking full meals or meal components to assemble meals later on. You choose to either double or triple the recipes. Remember to cook with minimal seasoning and sauces so you can repurpose the foods as much as possible
- Repurposing is key: one single ingredient can be used for several recipes. This will save you time and money. Versatile foods include: quinoa, rice, potatoes, pasta, etc...
- Batch-cook effectively: before cooking, read over all of the recipes to find common ingredients, for example chopped onions, minced garlic, lemon juice. This will save you time and avoid food waste. You can have a list of commonly used ingredients that usually repeat between recipes.

Nowadays there are a lot of resources available to learn tips for beginners about these essential questions: how to batch-cook with easy recipes and kitchen tips, what equipment you'll need, how to plan ahead and which meals you can freeze.





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QUESTION: Which equipment or materials are necessary to prepare lots of meals at one?

You don't need any special equipment for batch cooking. To start with, just check you have the following:

- Several large pans because you could need more than one. Make sure the recipe you want to cook will fit into your available pans
- Sharp knives and a cutting board to prepare and cut all ingredients
- Storage containers with the right size for your meal plan and your family needs
- Labels to mark your food or recipes, date and number of portions, so you can keep track of what's in your freezer. Label your meals with the recipe.

Examples of batch-cooking

(https://www.5aldia.org/datos/60/1613633115_DESCARGABLE_BATCHCOOKING.pdf)

VÍDEOS:

- [Seasonal Batch Cooking](#)
- [Batch cooking vegano \(https://www.veritas.es/batch-cooking-vegano/\)](https://www.veritas.es/batch-cooking-vegano/)

Activity:

- Make a list of 5 versatile simple food recipes that can be stored easily (as safely) and further implemented into several meals
 - Possible answers:
 - Cooked rice: tacos, rice with veggies,
 - Boiled potatoes: mashed potatoes, baked potato wedges, Spanish tortilla
 - Cooked pasta: pasta with sauce, pasta salad
 - Cooked ground poultry/meat: Bolognese pasta, tacos, rice and meat, tortilla wraps, meat sandwich

*Refer to Topic 2 for conservation times for each food

References:

- <https://www.culinarynutrition.com/healthy-batch-cooking-101/>
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7232892/>
- <https://www.bda.uk.com/food-health/lets-get-cooking/cooking-at-home/cooking-on-a-budget/batch-cooking-and-freezing-food.html>
- https://www.5aldia.org/datos/60/1613633115_DESCARGABLE_BATCHCOOKING.pdf
- <https://www.institutotomaspascualsanz.com/el-batch-cooking/>
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7232892/>



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Unit 2: HEALTHY CULINARY TECHNIQUES

In this unit we will explore the following aspects:

1. The relevance of eating raw and cooked fruits and vegetables and how to preserve them
2. Boiling and steaming vegetables
3. Sofrito and Sautéing
4. Healthy Cooking Techniques for Meat and Fish

Fruits and vegetables: raw and cooked (Topic 1)

Fruits and vegetables are plant-based foods that should be present in all our meals.

Both fruits and vegetables are our main source of several **vitamins**. In particular, they provide almost all of our vitamin C, much of our folic acid, and at least half of our vitamin A needs. Leaves and other plant parts are also full of **antioxidant** compounds that give color to many fruits and vegetables. The carotenoid family is an example of these antioxidant compounds so that each type of carotenoid is responsible for a specific color. Chlorophyll in plants, which is responsible for the green color, is also an antioxidant, as are vitamins C and E. Some examples are represented in the following table:

| Carotenoid | Color |
|-----------------------|--------|
| Beta-carotene | Orange |
| Lutein and zeaxanthin | Yellow |
| Lycopene | Red |

Instead of resorting to vitamin supplements, the important thing is the variety in the consumption of vegetables and fruits following such a simple criterion as the **variety of colours**. This will ensure a variety that will allow us to benefit more from antioxidants. The **intensity of the colour** is also important. The more intense a food is, the healthier it will probably be as it will have higher concentrations of the pigment responsible for the colour, which also has antioxidant properties. For example, the leaves of romaine lettuce can contain up to 10 times more lutein and zeaxanthin than the light, tightly packed leaves of iceberg lettuce. Lettuces that form heads keep better than those with loose leaves and in fact iceberg lettuce triumphed in the United States because they were better preserved for storage and transport.

The same thing happens when we compare dark-colored fruits with lighter-colored equivalents. Fruits high in antioxidants are cherries, black grapes, blueberries, and strawberries,



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and among vegetables some examples are garlic, red or yellow onions, green asparagus and beets.

Salads are an easy dish to prepare and can be a good strategy for introducing raw vegetables. Fruits can also be included. Dressing salads with healthy oils, vinegar, herbs or spices can increase the antioxidant capacity of the dish. Herbs are high in antioxidant and anti-inflammatory compounds. For example, several studies have shown that herbs and spices can lower blood pressure. **You have to be creative and there is a lot of variety so you can always find dishes that suit the tastes of the youngest members of the household as well as the rest of the family.**

A couple of simple dishes that can be prepared are:

1. Baby spinach, tomato, and white cheese salad.
2. Chickpea hummus with beetroot

There are fat-soluble vitamins such as vitamins A, D, E and K that are more resistant to the heat and processing that vegetables are subjected to when cooked.

Fruits are one of the few natural products that are made to be eaten directly. In fact, this facilitates their reproduction as animals eat the fruit and disperse the seeds inside. The fruits have attractive colours and aromas. Fruits also soften on their own to a tender and juicy consistency. Fruits are therefore generally eaten raw, although they can also be cooked.

Unlike fruits, vegetables maintain a firmer consistency over time and taste too mild (like green beans or potato) or too strong (like onion or garlic). For this reason, vegetables mostly need to be cooked to make them tasty.

The following table shows the maximum loss of vitamins in foods during cooking.

| Vitamin | Maximum loss during firing (%) |
|--------------|--------------------------------|
| Vitamin A | 40 |
| Vitamin B6* | 40 |
| Vitamin B12* | 10 |
| Vitamin C | 100 |





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| | |
|-------------------|-----|
| Vitamin D | 40 |
| Vitamin K | 5 |
| Niacin | 75 |
| Riboflavin | 75 |
| Thiamine | 80 |
| Folic acid | 100 |

water-soluble vitamins

Raw tomatoes are high in vitamin C. When they are green, they contain a substance, tomatine, which is also in the leaves, which can help to reduce cholesterol. In many supermarkets tomatoes have been harvested when they are green and then the ripening process has been stimulated with ethylene gas, which is why these tomatoes are so tasteless when eaten. For this reason, it is best to consume seasonal fruits and vegetables whenever possible.

VIDEO: SALADS

Conservation of fruits and vegetables

Fruits and vegetables lose nutrients and organoleptic characteristics from the moment they are cut. From this moment on they have to use their own vitamins and nutrients to survive. In view of this what we can do is to try to slow down this process of deterioration.

To maintain freshness as long as possible, **fruits and vegetables must be protected from 2 powerful enemies: light and heat.** Both destroy sensitive vitamins such as B vitamins and vitamin C that are in citrus fruits, peppers, tomatoes, broccoli, and leafy vegetables. Root vegetables are more resistant and although local distribution is optimal it is less important in terms of preserving their nutrients.

Delicate vegetables such as tomatoes, asparagus or salad leaves need special protection. These vegetables are more easily damaged and are therefore less resistant to damage during transport. For this reason, **it is especially recommended to consume local products as** they are transported over short distances and can be consumed within a few days after harvesting. When these foods are transported over long distances, they are usually harvested before they ripen in order to protect them better. Root vegetables such as **carrots, turnips and radishes are**



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best kept in the refrigerator. Hard leafy vegetables such as kale also keep better. However, there are vegetables such as potatoes, sweet potatoes, onions and pumpkins that are best kept in a cool, dark, well-ventilated cupboard.

The most effective way to extend the shelf life of these fresh products is to **control the storage temperature.** This temperature depends on where the fruits and vegetables come from. Those from temperate climates are best stored near freezing point. For example, apples. Fruits and vegetables from warmer or tropical climates are damaged at very low temperatures, so it is better to store them at a higher temperature (10 degrees) or even at room temperature. For example, banana skins turn black, avocados darken and stop softening and citrus fruits can develop spots on the skin.

Herbs, such as basil, suffer more in the fridge and keep better if exposed to light. Tomatoes or avocados ripen better outside the fridge and can be stored in the fridge when they are already ripe.

Freezing is the most effective method of stopping the general metabolism of fruits and vegetables. However, most microbes are revived by heating the vegetable because they are resistant to freezing. Freezing that can be done at home can also spoil the texture and cause vitamins and pigments to be lost. If you are going to freeze vegetables or fruit for a long time it is best to first subject them to a blanching process. This consists of placing them in boiling water for 1-2 minutes and then transferring them to ice water to prevent further cooking and softening of the walls of the vegetable. In this way their texture, colour and properties are better preserved.

Non-heat techniques are best suited to minimise nutrient loss, such as cured, marinated or pickled foods. It is important to wash raw vegetables thoroughly, but **do not soak them because some of the vitamins and minerals will be lost in the water.**

You can also make homemade preserves at home. They are very useful to combine it later in different dishes. In these preserves ingredients are introduced to help preserve food for a longer period of time. One method is to use an acidic medium, such as vinegar, which destroys microorganisms and inhibits enzymatic growth. These methods are more like semi-preserved so cold or sterilization is necessary.

Another technique for preserving in fat (confit) can be used for vegetables and also for meat and fish. They are usually sterilized as well.

Video. Pickled onions and tomatoes confit.

Benefits of cooking vegetables

- Question: Cooked vegetables have lower nutrient availability compared to raw vegetables. A) Yes B) No

Explanation: Cooking methods reduce the availability of most vitamins, especially water-soluble vitamins, but also increase the availability of other nutrients.

In many instances, cooking of food is necessary to make food safer and to facilitate digestion. Cooking always involves a chemical change in the food and food processing can have





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beneficial effects by increasing the bioavailability of antioxidant compounds. It is important to **cook as gently as possible, trying to preserve the highest level of nutrients.**

The following table shows which foods preserve their nutrients best when eaten raw and which foods preserve their nutrients best when cooked.

- Question: The bioavailability of phenolic compounds is higher in raw tomatoes than in cooked tomatoes. A) True B) False

Explanation: Mechanical and thermal techniques during tomato processing improve the bioavailability of certain phenolic compounds. In addition, the addition of fat is necessary to improve the bioavailability of dietary carotenoids.

| Best raw | Best stew |
|---|--|
| Broccoli and watercress Increased amount of an enzyme responsible for creating anticancer compounds | Carrots Increased amount of carotenoids |
| Garlic Increased amount of an enzyme needed to produce allicin, a healthful compound | Spinach Better absorption of carotene and iron |
| Onions Antioxidant compounds are better preserved | Cabbage Increased amount of carotenoids |
| Peppers Much higher amount of vitamin C | Tomatoes Increased amount of lycopene |

Taken from Farrimond S. The science of cooking.

Processing vegetables also changes the availability of some of their beneficial compounds. For example, crushing garlic instead of mincing it increases the production of allicin, which is one of the compounds that gives it health-giving properties. Similarly, it is better to finely chop onions. Similarly, chopping cruciferous vegetables, such as broccoli, increases the levels of isothiocyanates, which are bioactive products of glucosinolates.

VIDEO: AND CHERRY TOMATOES WITH FETA CHEESE

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Boiling and Steaming (Topic 2)

Vegetables are easy to cook compared to other foods such as fish and meat. Fruits and vegetables are mainly composed of carbohydrates which are heat resistant molecules. Boiling vegetables gives them a soft and succulent texture. It is a method that makes vegetables more tender compared to steaming. The challenge however is to get vegetables and fruits with the right texture but without losing colour, flavour and nutritional value.

There are several factors that determine the cooking time of vegetables or fruits in water. One is the hardness of the water. Hard water has a higher amount of lime, and this lengthens the time needed for cooking. Another factor that lengthens the cooking time is acidity. If they are cooked in an acidic liquid, such as tomato sauce or fruit puree, the cooking time will also be longer. Conversely, in alkaline water, vegetables may become too soft when boiled. Salt is a factor that helps to soften them earlier. These factors are interesting in the kitchen to get the vegetables to boil to the desired consistency.

Question: What do you get when you add a pinch of baking soda to the water in which you are going to boil a vegetable?

This is a trick to soften the vegetables in a faster way. In green vegetables if they are boiled with a pinch of salt and a little baking soda also preserves the bright color of chlorophyll.

Steaming is one of the healthiest cooking methods. It is a technique that preserves water-soluble nutrients much better because the food is not submerged in water. The heat is transmitted by the steam and when it touches the cold food, a film of water droplets forms, known as a condensation film. In this way the heat passes through this film and gradually cooks the food. For even cooking it is advisable that the pieces are arranged in a single layer or are very loose so that the steam has access to all surfaces.

The availability of carotenoids is also increased in boiled and steamed carrots, cabbage and spinach. However, there are vegetables where it may be better to grill, such as asparagus, broccoli and zucchini.

When boiling vegetables, it is not advisable to put too much water in the pot. Add the vegetables when the water starts to boil, and it is best to cover them to take advantage of the steam. It is important, however, that the amount of water is sufficient so that the boiling does not stop when the vegetables are added. The important thing is not to boil the vegetables more than necessary. For example, it is estimated that at 100 degrees centigrade, and after 20 minutes of cooking, 50% of the vitamin C is destroyed. Once cooking is finished, and in order to preserve the vitamins and minerals, do not let the vegetables cool in the water; drain them as soon as possible, even if they are not going to be consumed immediately. In fact, if they are





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not going to be consumed immediately, it is better to put them in ice water as it gives them a more intense flavour, texture and colour.

Cruciferous vegetables such as cabbage, broccoli or cauliflower are often boiled in water because it helps reduce the purgative taste of most of these vegetables. However, boiling reduces the bioavailability of healthful compounds. For example, it is estimated that it can cause a 25-75% reduction in glucosinolates. Consumption of the cooking liquid, which is common in some dishes such as stews and soups, is important to increase the availability of these compounds. An alternative to liquid-retaining preparation techniques is the consumption of raw cruciferous vegetables, such as raw rocket leaves in salads.

VIDEO: STEAMING; CREAM; WOK

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Cooking with Vegetable Fats: Sofrito and Sautéing (Topic 3)

Another way to cook vegetables in a healthy way is to use the stir-fry technique. Stir-frying is a long cooking technique. The vegetables are cooked gently in a little fat until they are cooked through and take on some colour. An example is the sofrito of tomato and onion, with or without garlic. This sofrito serves as a base for many preparations. Stir-frying with extra virgin olive oil is part of the Mediterranean diet. It is a very healthy technique as it increases the availability of phenolic compounds with antioxidant and anti-inflammatory properties. Sometimes aromatic herbs, such as thyme or rosemary, are added to this stir-fry, which further reinforces its healthy potential.

- Activity: Make a stir-fry with extra virgin olive oil, tomato, onion, garlic, red pepper and green pepper.

In the following video you can see how to make a sofrito. This sofrito can be used as a base for an infinite number of dishes. An example shown in the video is in combination with a legume, chickpeas and egg.

The sofrito is a preparation that is present in many culinary traditions although with different fats and vegetables.

Extra virgin olive oil improves taste and acceptability, and this may be an important reason for the high levels of vegetable consumption in Mediterranean countries. Olive oil is also rich in polyphenols with anti-inflammatory properties. However, the variety and quantity of these polyphenols depends on the type of olive oil. Extra virgin olive oil contains up to 36 types of phenolic compounds in much higher levels than olive oil. Phenolic compounds are affected by their exposure to heat. For example, oleuropein can be reduced by up to 80% when fried with EVOO. However, hydroxytyrosol or oleocanthal are quite resistant to the high temperatures reached when frying with EVOO (up to 180°C).

- Question: Is raw olive oil healthier than cooked olive oil? A) Yes B) No



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Explanation: Most prospective epidemiological studies have not distinguished between raw and cooked olive oil. The PREDIMED study, a pivotal intervention study on the beneficial effect of the Mediterranean diet, promoted the consumption of both raw and cooked extra virgin olive oil and demonstrated a 30% reduction in cardiovascular risk compared to a control group. However, the type of olive oil, the frying technique, the duration and temperature of frying and new or reused oils should be controlled.

Another technique for eating vegetables is sautéing. Sautéing is a quick cooking technique that requires high heat, low fat, and small amounts of vegetables cut into similar sizes. The aim is to keep the vegetables juicy, so they are subjected to high temperatures for a relatively short time. It is also important to keep the vegetables constantly moving so that they cook evenly. Normally a wok is used as it has higher sides than a normal frying pan. In addition to the fat, you can add some sauces such as soy sauce, preferably low in sodium.

Oven roasted vegetables can also be delicious. It is a technique that uses dry heat, so the important thing is that the moisture is kept inside the vegetables. Let's not forget that vegetables have a very high percentage of water. For example, around 90% of carrots are water. If they lose too much water, the vegetables dry out and shrivel. Sometimes they are first subjected to a pre-cooking technique such as steaming or simmering (45 and 65°C) to prevent the vegetables from losing water and wilting. One way is to cover them during cooking in the oven to prevent moisture loss for about 10-15 minutes and then roast them uncovered until they are tender and their edges begin to brown (for another 35-40 minutes or so).

VIDEO: WOK

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Some Healthy Cooking Techniques for Meat and Fish (Topic 4)

Marinating consists of placing a food (meat or fish) in an acidic liquid for a few hours. This technique aims to give more flavour and leave the meat or fish more moist. The acidic medium also softens the product to be cooked. Vinegar, wine, or lemon juice are commonly used acids. However, it is important to note that the effect of marinating, especially on meat, is very superficial as the liquid penetrates little into the meat. The reason why this happens is because it is very difficult for the molecules of the liquid to penetrate the cells of the muscle tissue, which





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is why it is not necessary to keep the product for a long time, as a few hours (even as little as 30 minutes) will modify the flavour.

Marinades can be very varied although there are a number of elements that should not be missing, as indicated in the table.

Table. Ingredients to make a marinade

| Basic ingredients | Salt Grease |
|---------------------------|---|
| Acidic ingredients | Vinegar Wine Lemon juice |
| Condiments | Herbs Spices Sauces, homemade or low in additives such as sugars and salt |

Salt is an important ingredient in marinating because, in addition to enhancing the flavour, it breaks down the protein structure of the top layers of the meat or fish. This allows some moisture to penetrate.

The fats in the marinade allow the flavour to spread evenly and lubricate the meat or fish during cooking. Yoghurt is used in Indian marinades.

Vinegar, wine, or lemon juice provide the acidity that helps to soften meat or fish. The acidic environment is also very important in reducing the formation of advanced glycation compounds (AGEs). These compounds are formed when foods are subjected to high temperatures and dry heat. The moisture and acidity achieved with the marinating technique significantly reduces the production of these compounds that increase the risk of diabetes and obesity.

The papillote technique consists of wrapping the meat or fish in a sheet of aluminium foil or greaseproof paper with a few drops of fat, vegetables, and flavourings (herbs and spices), making a tightly closed package. These packages are baked at 180-200°C for about 25 minutes per Kg of weight. This technique allows the product to be protected from the direct heat of the oven and the humidity of the product to escape, so it is cooked with its own juices. This technique also allows the vitamins and minerals of the food to be better preserved as it avoids exposure to high direct heat. It also achieves a very juicy texture of the vegetables, without becoming too soft as can happen with boiling, and the colors are kept more vivid and very natural flavor.

VIDEO: MARINATED CHICKEN; BEEF MEAT WITH RED WINE; PAPILOTE (STEAMING)





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Unit 3: HEALTHY AND EASY RECIPES FOR THE WHOLE FAMILY

Unit Overview:

- The promotion of home cooking is very relevant to increase healthier nutrition in families. This is challenging since many families lack the knowledge, skills, and time to cook at home. For this reason, it is important to be able to provide examples and tips on how to cook tasty, easy and cheap recipes every day and how to involve the whole family.

Unit Topics:

- Simple is the best (Topic 1)
- Involving the youngest in home cooking (Topic 2)
- Cooking with the Microwave (Topic 3)
- How to Increase Fruit and Nut Consumption (Topic 4)

Learning objectives per unit:

Upon completion of this Unit participants should be able to:

- List the basic foods that should be available at home
- Know how to elaborate simple recipes with vegetables
- Provide tips on how to cook foods which are sources of healthy protein
- Describe how to cook with the microwave

Simple is best (Topic 1)

You don't have to be an expert chef to cook at home. As you will see in another unit the important thing is planning. Planning menus allows us to save time because it is decided what to cook. Planning also helps us to know what to buy and to always have some basic foods at home with which to prepare simple dishes. These foods will depend on the tastes and the type of healthy diet followed.





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The following table shows ingredients that it is advisable to have at home on a regular basis.

| | |
|---------------------|--|
| | |
| Pantry | Salt and spices Dried vegetables (garlic, onions, etc.) Jars of cooked vegetables Crushed natural tomato Brown rice Whole meal pasta Flours Dried pulses Nuts (roasted or natural, unsalted) Oils of vegetable origin Vinegars |
| Refrigerator | Milk or vegetable drinks Eggs Natural yoghurt Cheese Lemon Tofu |
| Freezer | Broths Homemade preparations (pesto sauce, tomato sauce, sofrito...) Vegetables (peas, spinach...) |

Nowadays there are hundreds of recipe books and thousands of sites on the internet and social networks where recipes are offered. From a health point of view, it is enough to have a simple reference, such as the Harvard plate. To assess the environmental impact, we should give more prominence to plant-based foods, as well as local and seasonal products, and if they are organic products.

Taking all this into account, there are a series of questions that can help us to always answer these 4 questions:

| To follow the recommendations of Harvar's dish | To follow healthy cooking techniques |
|---|---|
| Vegetables, local and seasonal, as protagonists of the dish. | Eat raw, at least once a day (salads, gazpacho, smoothies). Use culinary techniques that best preserve their nutrients |





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| | |
|---|---|
| Foods that provide us with proteins, preferably of vegetable origin. | Boil pulses and then cook them for salads, and in combination with vegetables and cereals. |
| Cereals, whole grains, at least once a day | For breakfast, with yogurt and fruit are ideal When boiled, they are ideal to combine with vegetables, fruits, meat or fish. |
| Seasonal fruits, which are our great source of vitamins and other nutrients. | Fruits can be consumed all day long, either on their own or when preparing different dishes such as salads. |

Involving the youngest in home-cooking (Topic 2)

A fundamental role in the kitchen is to involve children in the whole process, from planning and buying the food to preparing the dishes. The earlier you start this the better. Children value more a meal in which they have contributed. This contribution will be adapted according to their age. Keeping them involved also helps to give them a say and the meals will also suit their tastes.

Children's knowledge and skills need to be increased. Knowledge is increased by making them interested in what they eat. For example, fruits and vegetables should be presented as an important source of vitamins and nutrients. It is important to have variety, to introduce them to new vegetables, to let them know where they come from and why they are important. A simple activity is to show them why vegetables come in a variety of colours. With the little ones, you can show them how many different colours there are in nature: green, red, orange, yellow, white, brown, purple, etc. Curiosity can also be provoked with small experiments in the kitchen. Each of these vegetables provides different nutrients, which makes them unique. The same goes for flavours. It is good that they know how to experiment, that they dare to try new flavors of fruits and vegetables, both raw and cooked.

The kitchen is a place to experiment and think about the chemical processes that occur. When cooking with children at home, you can explain to them the sweet flavors that are naturally in foods and those that are produced by cooking. One example is caramelizing onions when they are simmered in oil for a long time. Onions do not accumulate starch, but the energy reserves are in the form of chains of fructose polymers. These chains are broken during a long and slow cooking and are the cause of this sweet taste. Another example is roasting vegetables such as pumpkin in the oven until they are lightly browned. To do this, cut the pumpkin into cubes, add a drizzle of extra virgin olive oil, a little salt and put them in a preheated oven at 200 degrees for about 40 minutes.

Another activity that can be fun with children is cooking dishes that are typical of other countries. You can always prepare healthy versions of these meals and adapt them to the tastes of each household. This can be an activity that can be left for the weekend as more time can be spent exploring the characteristics and customs of a country. It is an opportunity to try new foods and new flavors. There are books and recipes about foods from other countries such as Mexican, Thai, Chinese or Japanese food. Many of these countries eat vegetables in a





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different way that may be more appealing to children. Recipes can be adapted to suit the tastes and preferences of the household and even inspired to create new dishes.

The following table shows a series of spices with the country or countries where they are most frequently used. Many of these spices have healthy properties and also allow cooking with less salt as they give a lot of flavor and aroma to food.

| Group | Characteristics in the kitchen | Example |
|------------------------|---|---|
| Sweet warming terpenes | Strong and persistent flavour | Cinnamon, Clove, Fennel, Vanilla |
| Warming terpenes | Evaporate easy and flavour is reduced with long cooking | Annato, dill, Nutmeg |
| Fragrant terpenes | Fast-acting and short-lived | Coriander, Juniper |
| Earthy terpenes | Flavour is tenacious and lingering | Cumin |
| Penetrating terpenes | Use in moderation or toasted, penetrating and tenacious flavour | Cardamom |
| Citrus terpenes | Can withstand with long cooking | Lemon grass |
| Sweet-sour acids | Tolerant to long cooking. Suitable to dishes containing sugar | Tamarind, Sumac |
| Fruity aldehydes | Cook briefly or use raw | Cacao |
| Toasty pyrazines | Create pyrazines by dry-toasting over 130°C | Paprika, Sesame |
| Sulphurous compounds | Meaty taste for vegetables | Curry leaf, Garlic, Mustard |





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| | | |
|-------------------|--|-----------------------|
| Pungent compounds | It is better to combine spices for more round heat | Chili, Ginger, Pepper |
| Unique compounds | Bring unique aromas to a dish | Saffron, Turmeric |

It is also interesting to share the food. Let the children of the house be the protagonists in preparing the food that is prepared when bringing family and friends home. This also serves to convey the health and environmental benefits that certain foods can have, and at the same time that they are very tasty meals.

Cooking with the Microwave (Topic 3)

Microwaves transfer heat by electromagnetic waves. It is a technique that heats the water molecules in the food instead of heating the air around it. It is a fast and efficient cooking method. With a little practice, microwaves can be a very easy way to cook and have food ready in no time.

A disadvantage of microwave cooking is that it can cause a greater loss of fluids, which greatly affects the texture of the food. If it is cooked for too long, the food will be very dry. In addition, microwaves make it more difficult to control the doneness of the food and it can easily burn.

When cooking with microwaves the following aspects are recommended:

- Introduce small or medium-sized pieces and make sure they are uniform. Microwaves penetrate between 1 and 2 cm deep so it is advisable not to introduce large pieces. It is also advisable to place the food on the plate in a uniform way and without accumulating.
- Stir the food from time to time during cooking. Stop cooking and stir as the food on the edges is usually done first.
- Use little water. It is not necessary since the liquid of the food itself is used.
- Covering. It is important to cover the food to achieve better cooking as it has a similar effect to steaming.
- Use suitable materials. Glass, ceramic, porcelain, or earthenware containers are recommended. Metallic materials or aluminum foil should not be used as the microwaves bounce off these materials and the microwave would be damaged. It is also not recommended to use paper or cardboard because when they are not suitable for microwaves, they can release toxic substances.
- Fill the containers half full.

Microwave recipe:

Potato chips



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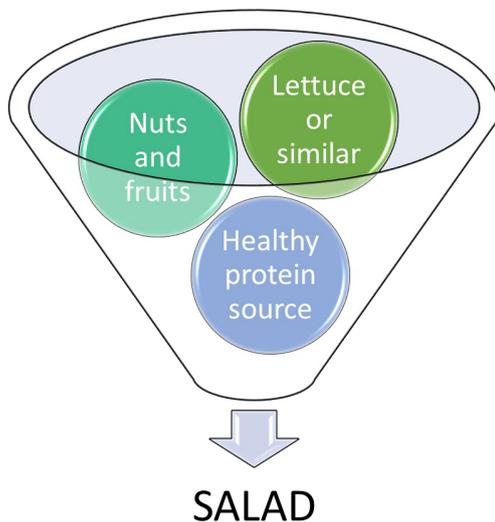
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How to Increase Fruit and Nut Consumption (Topic 4)

Fruits are a staple food in any diet. Fresh fruits are the best option for the nutritional contribution compared to canned fruits or dried fruits where the amount of sugar can be higher, for example. They are also a better alternative to juices because of the higher amount of fibre that fresh fruit provides.

Fruit is usually eaten raw. One way to make fruit more popular in the home is to make it easy to eat. Seasonal fruit can be cut into pieces and stored in the refrigerator. They can also be put on skewers to combine with different types of fruit, combining different degrees of sweetness and a variety of colours. Another option is to combine the fruit pieces with cereals and/or yoghurt.

Fruits can also be present in dishes such as salads. The following videos show three recipe suggestions in which the protagonists are vegetables, fruits, and nuts.



Salad recipes:

The first recipe combines lettuce hearts, peaches, and walnuts, to which goat's cheese is also added, and is dressed with olive oil, Modena vinegar and mustard.

The second recipe is a tomato salad with bonito and chives. Chives are a vegetable of the liliaceae family and of the genus *Allium*, like onions, garlic, shallots, and leeks. All of them stand out because they have Sulphur compounds which are those "tear-producing" compounds that irritate the eyes and nose. In this recipe cumin is used as a spice which is mixed with Modena vinegar and extra virgin olive oil.

The third recipe of lamb's lettuce with lemon and cherries, hazelnuts, and natural yoghurt. The lamb's lettuce is a vegetable with small and tender leaves, slightly mucilaginous and with the aroma of flowers and fruits. You can use other vegetables such as endive. You can also use other fruits such as raspberries, blueberries, apricots, or pineapple.





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Fruits can also be allies in the preparation of desserts. Oranges, peaches or apples can be added when making sponge cakes. Banana pancakes can also be made when they are very ripe. Dried fruits can be used to sweeten these dishes as a substitute for sugar.

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Unit 4: CULINARY MEDICINE IN VEGAN/VEGETARIAN FAMILIES

Introduction (Topic 1)

QUESTION: Are we clear about what it means to be a vegetarian? A vegetarian person...

1. Only eats vegetables.
2. May eat eggs.
3. Do not consume dairy products.
4. May eat meat or fish.

According to the International Vegetarian Union, a vegetarian is a person who follows a plant-based, with or without dairy, eggs and/or honey. That is, the term vegetarian includes all those who do not eat meat or fish, regardless of whether they consume products that do not represent the death of the animal, such as dairy and eggs.

Recently, the concept of flexitarianisms, a variation of the vegetarian diet, has emerged. A flexitarian eats mainly fruit and vegetables, but from time to time may also eat meat and fish or derivatives thereof.

| | eggs | dairy | meat | fish | honey |
|----------------------------|--------------|--------------|--------------|--------------|-------|
| Flexitarians | occasionally | occasionally | occasionally | occasionally | ¿? |
| Pescatarians | Yes | Yes | No | Yes | ¿? |
| Ovolactovegetarians | Yes | Yes | No | No | ¿? |
| Lactovegetarians | No | Yes | No | No | ¿? |
| Ovovegetarians | Yes | No | No | No | ¿? |
| Strict vegetarians | No | No | No | No | ¿? |
| Vegans | No | No | No | No | No |

The difference between a strict vegetarian and a vegan is usually that the vegan extends his opposition to the consumption of animal products to other areas such as leisure and the cosmetics, and textile industry. So, the term vegetarian usually (though not always) refers to a dietary pattern while the term vegan usually refers to a lifestyle.



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QUESTION: Myth or reality? The vegetarian or vegan diet is not suitable in childhood or adolescence.

Myth

According to the 2016 U.S. Academy of Nutrition and Dietetics' position on vegetarian diets (1), the vegetarian and the vegan diets are suitable at all stages of life, including childhood, adolescence, pregnancy, lactation, and senescence. It is also suitable for athletes.

QUESTION: Myth or reality? Adolescents who follow a vegetarian or vegan diet may have an insufficient caloric intake since adolescence is a period of life with a higher energy requirement.

Myth

It is true that adolescence is a period of growth and development that demands greater energy consumption. However, it is not true that a vegetarian or vegan diet is insufficient to meet that demand. Regardless of the type of diet they follow, adolescents often have a physiological increase in appetite. In this sense, the only precaution that must be taken is that the energy supply is sufficient. This increase in demand is usually solved by adding a snack between breakfast and lunch and another between lunch and dinner.

Here are some healthy snack ideas for kids and teens who follow a vegetarian or vegan diet.

VIDEO WITH HEALTHY SNACKS:

- Potato chips
- Pickle onions

QUESTION: Myth or reality? The vegetarian or vegan diet may be deficient in micronutrients; not everything can be replaced.

Reality

In fact, all macros and micronutrients can be substituted except one: vitamin B12, because it is the only one that is only found in animal products. Until recently, it was thought that ovo-lacto-vegetarian people ingested the necessary amounts of vitamin B12 thanks to eggs and dairy products and derivatives. However, with the 2015 recommendations of the European Food Safety Authority (2), the number of eggs, dairy products and derivatives that should be consumed are unviable. For this reason, dietary supplementation with vitamin B12 is essential for vegans and highly recommended for vegetarians.

QUESTION: Myth or reality? Vegetarians or vegans need iron supplements.

Myth



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Vegetarians and vegans have been observed to have lower serum iron levels, but this does not translate into a higher prevalence of anemia. That is, these lower levels of serum iron do not have any clinical consequences and, therefore, supplementation is not necessary (3).

The best-known sources of iron are meat and seafood, however, vegans/vegetarians can intake iron from the consumption of legumes, nuts, seeds, whole grains, and dried fruits. Because of its chemical structure, the iron present in plants is absorbed less than the iron present in meat. In addition, the phytates present in whole grains, legumes and seeds may interfere with iron absorption. However, given its adaptive capacity, the body of people who follow a vegan/vegetarian diet undergoes modifications that favor absorption and reduce iron excretion.

Some products suitable for vegans/vegetarians are fortified in iron, but in addition, there are strategies that favor the absorption of iron in a vegan/vegetarian diet (4):

1. Germinate, cook, soak or ferment whole grains, legumes, and seeds to avoid the effect of phytates.

DOCUMENT ON HOW TO GERMINATE, WASH AND PEEL AND COOK LEGUMES.

2. Include foods rich in vitamin C in meals. Beyond citrus fruits (orange, lemon, and grapefruit), other fruits such as strawberry and melon, and vegetables such as red pepper, green pepper, broccoli, and tomato are also sources of vitamin C.

QUESTION: Myth or reality? Milk and dairy products are an essential source of calcium in childhood.

Myth

Milk and dairy products are a good source of calcium, but calcium can be found in many plant-based products so it cannot be concluded that milk and dairy products are essential for a balanced diet.

Almonds, beans, tofu and cruciferous vegetables (cabbage, collard greens, cauliflower and broccoli), watercress and arugula are sources of calcium. Calcium in tofu has an absorption of 30%, similar to that in milk. Green leafy vegetables, such as chard and spinach, are rich in calcium, but they are also rich in oxalates, which bind to calcium in the gut and prevent its absorption.

Vegan/vegetarian diets have not been seen to be associated with lower bone density or an increased risk of fractures as long as the intake of calcium and vitamin D is adequate (5). Although the availability of plant calcium is not as high as that of dairy products, intestinal absorption is dependent on nutritional status, and may increase when necessary to maintain adequate levels.

An increased risk of bone fractures has been observed in vegans with insufficient calcium intake. In those cases, it is advisable to correct the dietary intake of calcium, ensure an adequate supply of vitamin D, responsibly expose to sunlight and exercise.



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QUESTION: Myth or reality? Vegetarians or vegans need vitamin B12 supplements.

Reality

Vitamin B12 is only found in animal products. That's why vegetarians and vegans need supplements of this vitamin. Until recently, it was thought that ovo-lacto-vegetarian people ingested the necessary amounts of vitamin B12 thanks to eggs and dairy products and derivatives. However, with the 2015 recommendations of the European Food Safety Authority (2), the number of eggs, dairy products and derivatives to be consumed is unviable. For this reason, dietary supplementation with vitamin B12 is essential for vegans and highly recommended for vegetarians.

QUESTION: Myth or reality? Vegetarians or vegans need omega-3 fatty acids supplements.

Doubtful

This is a controversial issue. The omega-3 fatty acids EPA and DHA are considered essential fatty acids because our body cannot generate them and therefore must be ingested through the food. EPA and DHA are found in fish, some microalgae, and meat from grass-fed animals. However, our body can obtain, although in very small amounts, EPA and DHA from alpha-linolenic acid present in nuts, soybeans, and flax seeds.

It has been seen that serum level of DHA in vegetarians is similar to that of people who do not consume fish, so, if the conclusion was that vegans or vegetarians need supplementation, the same recommendation should be extended to the entire population that does not consume fish regularly.

However, it is important to note that vegan diets are usually poor in omega-3 fatty acids and rich in omega-6 fatty acids, present in nuts and cereals, which have a pro-inflammatory effect. The omega-6: omega-3 ratio in diet is very important. Since the recommended ratio is 2:1 or 4:1, omega-3 supplementation may be necessary in some vegan diets.

QUESTION: A person who wants to become vegetarian or vegan may need advice for a correct intake of one of the following macronutrients: do you know which one?

1. Carbohydrates
2. Proteins
3. Saturated fatty acids
4. Unsaturated fatty acids

In an omnivorous diet, animal products that are excluded from a vegetarian or vegan diet are, above all, the main source of protein. It is not uncommon for a person without knowledge in nutrition and dietetics who wants to start a vegan diet to replace animal products with carbohydrate-rich products (pasta, rice, potato, and bread) or ultraprocessed vegan products which provide no or very few proteins. That is why some people believe vegetarian/vegan diets





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do not provide the required amount of protein. However, that idea is based on dietary ignorance, since there are plant foods that guarantee a sufficient supply of protein and can substitute animal products, which are the main source of protein in omnivorous diets.

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Main sources of protein in vegan/vegetarian diets (Topic 2)

In a vegan/vegetarian diet, all main meals should include a serving of protein. While ovo-lacto vegetarians can consume eggs and dairy products, the options seem more limited for strict vegetarians and vegans.

1. LEGUMES

Legumes represent the main source of protein in vegan/vegetarian diets. Indeed, the quality of protein of legumes is similar to that of meat in chickpeas and soy.

Legumes and cereals were considered "incomplete foods" because they are deficient in methionine and lysine respectively. For that reason, it has been classically recommended that, to obtain a complete protein, legumes and cereals be combined in the same dish. Nowadays it is known that it is not necessary to consume legumes and cereal in the same meal to obtain a complete protein and that it is enough to ingest legumes and cereal throughout the day.

Between cereals and legumes, we find the quinoa, a pseudocereal rich in protein that also contains methionine.

Here are some ideas for introducing legumes into the diet in a diverse way:

[VIDEO: LENTIL STEW WITH RICE](#)

[VIDEO: RED BEANS BURGUER](#)

[RECIPE OF CHICKPEA SALAD](#)

[RECIPE OF TRADITIONAL HUMMUS](#)





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2. SOY DERIVATIVES: TOFU, TEMPEH AND TEXTURED SOY

Tofu is made with soybeans, water, and a gelling plant. In the market there are different kinds of tofu such as with fine herbs, tomato, basil, sesame, olives, smoked ... The firmness of tofu depends on the amount of water it contains. Softer tofu (like silken tofu) has a higher water content and, therefore, its nutrient content for the same amount of product is lower.

The quality of the protein of tofu is very good, since it preserves the entire aminogram of soy. It provides between 11 and 16 g of protein per 100 g of product, that is, similar to egg (13 g per 100 g) and more than yogurt (10 g per 100 g). Besides, tofu is digested more easily than soybeans.

The detractors of tofu mainly complain about its poor taste. That's why we propose some ideas to cook tofu in a tasty way:

Tempeh is a food product from the natural fermentation of soybeans. Being a fermented product, it is especially good for the intestinal flora. Tempeh is firmer than tofu and has a strong flavor. From a nutritional point of view, tempeh is more complete than tofu; it contains about 19 g of protein per 100 g of product, has a higher fiber content and is rich in minerals.

Textured soy is obtained by extruding degreased soy flour obtained as a sub-product of soy oil extraction. Textured soy is equally rich in protein, minerals, vitamins, and fiber. It is usually purchased in dehydrated form. To cook it, it must be mixed with water, after which it acquires a fluffy texture.

VIDEO OF TOFU BURGUERS

3. NUTS AND SEEDS

Nuts are a very healthy snack, and, in vegan/vegetarian diets, they represent an extra source of protein. The nuts with the highest protein content are peanuts and almonds, followed by pistachios and cashews. The list would be completed by walnuts, pine nuts and hazelnuts.

Young children should not consume whole nuts, but there are many other ways to introduce nuts into their diet.

RECIPES OF SAUCES/COMPLEMENTS WITH NUTS AND SEEDS

4. SEITAN

Seitan is a preparation from wheat gluten, so it is not suitable for people with coeliac disease. Its texture similar to meat and its versatility allow it to be introduced into a large number of dishes. Seitan contains a high amount of protein, but being a cereal derivative, they are of lower biological value than those of tofu or tempeh.

VIDEO WITH SEITAN

5. THIRD-GENERATION PLANT PROTEINS





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In recent years, different products have emerged to cover protein needs in vegan/vegetarian diets. They are usually marketed as substitutes of meat because they have a similar texture and can be cooked in a similar way. Although they do not provide added benefits to the first- (tofu, tempeh and seitan) or second-generation plant protein (textured soy), their versatility and easy preparation have made the third-generation plant protein have a greater acceptance.

Among these third-generation plant protein stand out heura, a soy beans derivative, and quorn, made from the mycoprotein of the fungus *Fusarium venenatum*. Initially, "heura" and "quorn" were born as registered trademarks, but now they serve to generically name this type of products that, colloquially, are known as "vegetable meats".

One of the negative aspects of this type of products is their degree of processing. Unlike first- and second-generation vegetable proteins, in the case of "vegetable meats, the consumer do not buy the ingredients, but a pre-cooked meal which is, indeed, an ultra-processed product.

From market to the plate (Topic 3)

1. BEFORE GOING TO THE MARKET.

Planning the weekly menu before shopping helps design a balanced diet and reduces food waste. Unit 1 of this module is dedicated to meal planning. In this unit we present a version of one of the proposals included in unit 1 with small modifications to make it suitable for a vegan/vegetarian child.

Weekly planning (copy from unit 1)

2. IN THE SUPERMARKET.

Options for vegans and vegetarians have grown exponentially, but not all vegan/vegetarian foods are equally healthy. Let's go step by step:

QUESTION: Do you know how to identify vegan/vegetarian products?

The V-Label is an internationally recognized symbol for the labeling of vegan and vegetarian products and services. For consumers, it is a simple and reliable reference to help them when they are shopping. Standardized criteria ensure that the V-Label is a unique seal of quality for vegan and vegetarian products across Europe.



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Source: <https://www.v-label.eu/>

QUESTION: Myth or reality: Labeling a product as vegan or vegetarian means it is a healthy product.

Myth

Labeling a food as vegan or vegetarian does not automatically make it healthy. In fact, the 4 main ingredients that make a product unhealthy are vegan: sugar, unhealthy fats, refined flours and salt.

This brings us directly to talk about ultra-processed products.

QUESTION: Do you know what the definition of ultra-processed product is?

The WHO defines ultra-processed products as industrial formulations mainly based on substances extracted or derived from food, as well as additives and cosmetics that give color, taste or texture to try to imitate food. On a practical level it is said that an ultra-processed product is as industrial formulations that has more than 5 ingredients and in which no fresh food can be identified.

Ultra-processed products have a high content of free sugars, total fat, unhealthy fats and sodium, and a low content of protein, dietary fiber, minerals, and vitamins. From a nutritional point of view, they are very unbalanced products, and their consumption has been associated with an increased risk of chronic noncommunicable diseases in both adults and children (1).

Considering all this information, it can be understood that a product can be, simultaneously, vegan and ultra-processed.

This brings us directly to talk about the importance of food labeling.

QUESTION: what aspects of labeling are helpful in identifying a healthy food?

The aspects we should look at are the same as those we would look at in any non-vegan/vegetarian product.

1. The number of ingredients: if a product has more than 5 ingredients it is very likely that it is an ultra-processed and, therefore, unhealthy.
2. The order of the ingredients: the ingredients are ordered from highest to lowest content. If sugar, refined flours, or saturated fats appear among the first ingredients, you are facing an unhealthy food.
3. The predominant type of fats: the best option is extra virgin olive oil. The second best option is olive oil, or high oleic sunflower oil. We should not choose a product that uses as the predominant fat a refined oil of seeds, coconut, or palm. We will also not choose it if it contains hydrogenated or partially hydrogenated fats (trans fats).



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4. Salt content: Foods with more than 1.24 g of salt per 100 g of product are not healthy. It is important to note that some products do not include information about salt content, but sodium. In this case, to calculate the salt content we must multiply the sodium content by 2.5.

In relation to salt content, 3 intervals are distinguished:

- High: ≥ 1.25 g of salt per 100 g of product.
- Average: between 0,26 and 1,24 g of salt per 100 g of product.
- Low: ≤ 0.24 g of salt per 100 g of product.

Some products include some specifications such as:

- Low salt content: ≤ 0.12 g of salt per 100 g of product.
- Very low salt content: ≤ 0.04 g of salt per 100 g of product.
- Without salt: ≤ 0.005 g of salt per 100 g of product.

Be careful when comparing two ultra-processed foods. We should not be fooled by phrases such as "with extra virgin olive oil" or "reduced in salt". It is important that we look at the content of each nutrient. "With extra virgin olive oil" can mean a ridiculous content of this fat compared to others much less healthy. In the same way, a "reduced in salt" product can have a lot of salt since that phrase only means that it has 25% less salt than another similar product. This kind of phrases leads us think one ultra-processed product is healthier than another one, when the reality is that no one is healthy.

The so-called "vegetable meats" (including "vegetable sausages") have been promoted as a healthy alternative to meat for both omnivorous people who want to reduce meat consumption and vegans/vegetarians. A careful reading of nutrition labelling will lead us to realize that these are in fact ultra-processed and, therefore, unhealthy products.

In addition, those "vegetable meats" are usually offered as the protein serving of the meal, when, in fact, their protein content is minimal. Most of those products are made from third-generation plant proteins, which do not reach the nutritional value of tofu, tempeh, textured soy or, of course, legumes. Most of "vegetable meats" are made from refined flours, unhealthy fats and dyes. Although some of those products are made from tofu or legumes, they never represent a main ingredient. As far as burgers are concerned, the best option is still to make them at home.

INSERT TOFU AND RED BEANS BURGERS VIDEO

Something similar happens with bakery; that it is suitable for vegans and vegetarians does not make it healthy. Most vegan desserts are made from refined flours, unhealthy fats and sugar. The advice is the same as for the general population: baking, no matter how vegan or vegetarian, should be consumed occasionally.





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3. THE PURCHASE...

ESSENTIAL FOODS:

1. Seasonal vegetable.
2. Seasonal fruit.
3. Extra virgin olive oil.
4. Natural or roasted nuts.
5. Seeds.
6. Iodized salt.
7. Vitamin B12 supplement.

OPTIONAL FOODS:

1. Whole grains.
2. Legume paste.
3. Potato or sweet potato
4. Pseudocereals: quinoa, amaranth.
5. Sugar-free soy yogurt.
6. Sugar-free vegetable drink.
7. Tofu.
8. Tempeh.
9. Seitan.
10. Textured soy.
11. Third-generation plant proteins such as quorn or heura.
12. Eggs (for ovovegetarians).
13. Whole sugar-free dairy products (for lactovegetarians).

WHAT WE CAN HAVE IN THE PANTRY:

1. Canned cooked legume.
2. Canned natural tomato.
3. Frozen vegetable.
4. Dried fruit: raisins, blueberries, dates...
5. Vinegar (different types).
6. Spices and aromatic herbs.
7. Condiments: soy sauce, mustard, tabasco...
8. Cream of nuts: peanut, almonds, tahín...
9. Cocoa 100% degreased powder.
10. Chocolate with more than 85% cocoa.

Remember that you can cook and can your preserves yourself.

VIDEO OF PICKLE ONIONS



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4. ... AND TO THE PLATE

Having good raw materials in the pantry will allow us to prepare a large number of quick and healthy dishes with 3-5 ingredients. We recover here a video of unit 3 (Healthy and easy recipes with 3-5 ingredients) suitable for vegan children.

Regarding culinary techniques, the recommendations are the same as for the omnivorous population. Unit 2 (Healthy culinary techniques) of this module is dedicated to healthy culinary techniques.

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Design a healthy vegan/vegetarian menu (Topic 4)

QUESTION: You are attending to a teenager who has decided to move from an omnivorous to a vegan diet and asks us for help in developing a balanced menu. What general recommendations would you give him/her?

1. WHAT CAN A VEGAN BREAKFAST BRING?

Some ideas to include in a vegan breakfast are:

- Fruit or dried fruit.
- Soy drink enriched in calcium or soy yogurt without added sugar.
- Whole meal bread toast with: tomato, hummus, tahín, nut cream, avocado...
- Oatmeal flakes or other cereals without added sugar.

2. WHAT SHOULD THE MAIN MEALS OF A VEGAN /VEGETARIAN INCLUDE?

There are 3 basic rules:

- 50% of the intake (250-300 g) should be composed of vegetables. It is recommended that, at least once a day, they are raw.
- A serving of protein (see below).
- A healthy fat: extra virgin olive oil for cooking and dressing. Fats from avocado, nuts and seeds are also healthy.

And three optional rules:

- If we add cereals, let them be whole grains. They can also be potatoes or sweet potatoes, preferably roasted or cooked.
- Seek accompaniments with nutritional value: nuts, seeds, or brewer's yeast.
- Dessert is not mandatory. In case of dessert, the fresh fruit should be prioritized. Other options include sugar-free soy yogurt or a piece of chocolate with more than 85% cocoa.

3. AND FOR SNACKING?



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Snacks should complement the main meals, so they should adapt and vary depending on what the child had for breakfast or ate before.

Some ideas for vegan snacks:

- A serving of fruit or dried fruit.
- Sugar-free soy yogurt.
- A handful of natural or toasted nuts.
- A small sandwich of wholemeal bread with: tomato, hummus, tahín, nut cream, avocado...

4. WHAT IS A PROTEIN SERVING?

Although protein intake recommendations depend on age, sex and level of physical activity, it is recommended to add at least one serving of protein to each main meal. A simple way to calculate the size of protein servings is as follows:

Animal proteins (for ovo-lacto-vegetarians):

- Eggs: 1 or 2.
- Dairy products: 2 yogurts, or 80 g of fresh cheese, or 35 g of semi-cured cheese, or 1 glass of milk.

Proteins of vegetable origin:

- Legumes: A full plate, or half a plate if accompanied by cereal or potato, or 2 homemade burgers the size of the palm of each one's hand, or a cup (150 ml) of hummus.
- Quinoa: Half a plate.
- Tofu, tempeh, and seitan: a portion the size of the palm of each one's hand.
- Textured soy: Half a glass of the hydrated product.
- Soy drink and soy yogurt: 2 yogurts, or 1 glass of vegetable drink. The protein content of vegan cheese is variable, but generally low. Many types of vegan cheese are considered ultra-processed products and, therefore, not recommended.
- Nuts and seeds: they complement the serving of protein since, due to the little amount of protein they contain, it is difficult that they reach the recommended intake amounts on their own.

As in any other healthy and balanced diet, it is important to limit the consumption of bakery and avoid ultra-processed products such as chips, soft drinks. Remember that pre-cooked meals that are marketed as substitutes for meat (vegan burgers, vegan nuggets...) are ultra-processed products as well.

In addition, we must recommend vitamin B12 supplements at the appropriate dose for patient's age.

QUESTION: And what recommendations would you give to a vegan family who want to instill vegetarianism in their newborn child?





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Exclusive breastfeeding is the best form of feeding for all infants in the first six months of life. In case the nursing mother is vegan/vegetarian, it is important that she takes vitamin B12 supplements and consults with her doctor about the need to take other supplements such as iodine and omega-3 fatty acids. If breastfeeding is not possible, the child shall take infant or follow-on formulae based on soy protein asylees or hydrolyzed rice (lactovegetarians may take derivatives from cow's milk). Vegetable drinks are not a substitute for infant or follow-on formulae and should not be introduced before the year of age.

Complementary feeding will be introduced, as in omnivorous infants, from the 4th or 6th month. The basis of the complementary diet of a vegan/vegetarian child are fruits, vegetables, legumes, nuts, cereals and, in the case of ovolactovegetarians, also eggs and yogurts. The sources of vegetable protein in a vegan/vegetarian diet to replace those from meat, fish and eggs are legumes, nuts and soy derivatives such as tofu, which can be introduced from 6 months. Natural yogurts can be replaced by sugar-free soy yogurts.

As in children with omnivorous diet, in the case of vegan/vegetarian children it is recommended to introduce new foods one at a time and with a temporary window between them to be able to detect any intolerance or adverse reaction.

In relation to nuts, it should be noted that they should be offered in the form of cream, since the consumption of whole nuts is not recommended until 6 years of age due to the risk of choking.

It is important to remember that vegan/vegetarian infants should also take vitamin B12 supplements at the dosages indicated for their age.

Other recommendations to consider are the same as those followed with omnivorous infants:

- Extra virgin olive oil will be recommended as the main source fat. Alternatively, flax oil can be used.
- The introduction of green leafy vegetables such as spinach, chard, borage, and arugula will be postponed until 12 months due to their high nitrate content.
- From the 12th month, iodized salt will be introduced in small quantities.
- The introduction of sweets and soft drinks (including juices) should be postponed as much as possible because of their high sugar content. Never before the age of 2.
- The introduction of ultra-processed products should be postponed as much as possible because of their high salt content and unhealthy fats. Never before the age of 2.





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Unit 5: CULINARY MEDICINE IN CHILDREN WITH OVERWEIGHT/OBESITY

Introduction:

Obesogenic home environment plays an important role in development and maintenance of childhood obesity. With respect to parental culinary skills and family dietary habits, managing strategies related with calorie density, food portion size, free sugars, eating out and emotional eating are crucial.

Calorie density (Topic 1)

QUESTION: Are high-dense energy foods usually rich in fiber and water?

1) YES 2) NO

Evidence suggests that eating a lower energy-dense diet could be a key strategy to weight control and to consume fewer calories without feeling hungry. Satiety and hunger control are important for long-term compliance with an eating plan (1,2).

Calorie density is the amount of calories or energy in particular weight of food, generally presented as kcal / g or kcal /100 g. Content of water and fiber lower the energy density of foods, while fat is the most energy dense component of foods, providing more than twice calories per gram than carbohydrates or protein. Thus, in general, low energy dense foods tend to have either a higher content of water, fiber, or little fat.

Food rich in water and fiber are also generally high nutrient dense foods, whereas ultra-processed foods tend to be energy-dense, and nutrient-poor (3).

Foods can be classified depending on its energy density as follows:

| Energy Density of foods | | Examples |
|-------------------------|--------------------------|---|
| Very Low | Less than 0.6 kcal/g | Most types of fruit and vegetables Most types of low-fat soup Bran flakes |
| Low | 0.6 kcal/g to 1.5 kcal/g | Low fat and fat free- milk products potatoes Boiled brown rice |
| Medium | 1.5 kcal/g to 4 kcal/g | Low fat cheese Lean meat, poultry, and fish Whole grains Legumes |
| High | More than 4 kcal/g | Biscuits and confectionery Fried crisps Nuts and seeds Cheese Butter, oil and mayonnaise. |

Source: Adapted from British Nutrition Foundation (4)



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VIDEO: GUACAMOLE; PUMPKIN

How to reduce energy density of dishes?

When behavior change only targets reducing high energy-dense foods, parental attitude focuses on what the child cannot eat, while when focusing on nutrient-dense foods, emphasis is on what they should eat. So, it is important to reduce energy density, avoiding **empty calories** and increasing nutrient density to ensure adequate children growth.

Here are some tips to modify recipes and cut down calories in children's diet (5-8):

- Start meal with an appetizer low in energy density, such as a broth-based soup or a green salad
- Add variety to grilled or steamed vegetables with spices and low-fat sauces. You can also panfry them in a non-stick pan with a small amount of oil.
- Try frozen or canned vegetables for a quick side dish—just microwave and serve. Look for canned vegetables without added salt, butter, or cream sauces.
- When making lasagna, use part-skim ricotta cheese instead of whole-milk ricotta cheese. Substitute shredded vegetables, such as carrots, zucchini, and spinach for some of the ground meat in lasagna
- When making pizza, choose vegetables as toppings and just a light sprinkling of cheese instead of fatty meats.
- Modified versions of traditional or preferred recipes: baking or grilling, electing lean meats, using low-fat cheese, adding extra vegetables.
- Reduce the availability at home of ultra-processed high energy dense foods and snacks: if you don't buy it, you won't eat it
- Try snacks that are 100 calories or less: 1 cup carrots, broccoli, or bell peppers with 2 tablespoons hummus, a medium apple or banana. 1 cup blueberries or grapes, one-fourth cup of tuna wrapped in a lettuce leaf, a few homemade oven-baked kale chips, etc.
- Rethink your drink: choose beverages that are naturally calorie-free
- Keep always a jug or bottles of cold water in the fridge and serve water with meals.
- Carry a water bottle and refill it throughout the day.
- Make water more exciting by adding slices of lemon, lime, cucumber, watermelon or fresh, frozen cut-up fruit, a splash of 100% juice, etc.

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Food portion size matters (Topic 2)

A portion of food may reflect an own choice, a decision from a food producer or restaurant, or a recommendation by a health professional or the government. Portion sizes at supermarkets, vending machines or restaurants have increased in recent decades, also highlighting the introduction of 'super-sized' portions. Even more, larger portion sizes can usually be offered at a proportionally low cost. In this context, managing food portions could be especially conflicting in case of overweight and obesity (1-3).

The effect of portion size on total energy intake has been observed with foods and beverages, especially those energy-dense, known as "portion size effect" (4,5). When controlling calorie intake, understanding how energy density and portion size work together can lead to more effective nutrition education messages, than simply encouraging to eat less. In fact, portion management for children should also target increasing portion sizes for low energy density foods such as fruit and vegetables or larger snack packs for healthy foods.

QUESTION: Is it easy to make home a portion friendly zone?

1) YES 1) NO

In the home setting, parents or caregivers serving sizes are strongly associated with the amounts children consume, so it is crucial for parents to have experience with age-appropriate portion sizes and the energy density of foods. Managing food portions could be confusing and challenging for parents.

It does not consist of measuring and counting everything the child eats, but parents should recognize age-appropriate serving sizes.





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Here are several strategies and resources that could improve portion control in children when eating at home (6-8)

- Serve the food on individual plates, instead of putting the serving dishes on the table.
- Keep the excess food out of reach may discourage overeating.
- Eat a healthy snack to avoid overeating during the next meal if child feels hungry
- Try to avoid eating or snacking in front of TV or other screens. If occurs, don't let children eat straight from the package. Instead, serve food in a small bowl.
- Be aware of regular household items that you can use to quickly estimate portions: a cup, a tablespoon, etc.
- It could help using handy guide to serving sizes to determine portion sizes: palm of the hand, both palms cupped together, a thumb, a handful, a fist, etc.
- It could be useful that both parents and children to know portion equivalence to familiar objects such as a tennis ball, computer mouse, deck of cards...

In relation to tableware, it could be interesting to use eating/drinking utensils included differently sized, calibrated or specially designed: (6-8)

- tall, thin, and small volume glasses and mugs
- smaller diameter and volume plates, bowls and serving utensils
- plates with rims
- plant-based diet plates
- oil /cheese/ nuts dispensers
- sector or restricted volume tupperware

There are several websites and resources to get ideas and further information on portion size control:

| Resource | Website |
|--|---|
| How to Measure Portion Sizes with your Hands | https://www.eufic.org/en/healthy-living/article/how-to-measure-portion-sizes-with-your-hands-infographic |
| Handy Guide to Serving Sizes | https://www.unlockfood.ca/EatRightOntario/media/PDFs-new-website/Portions%20Toolkit/Handy-Servings-Guide-EN-v04-July-2018.pdf |
| Portion distortion | https://www.nhlbi.nih.gov/health/educational/wecan/eat-right/portion-distortion.htm |
| Nutritplato→. Nestlé | https://www.nutriplatonestle.es/ |





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| | |
|--|---|
| The Diet Plate→. Portion control made easy. | https://www.thedietplate.com/ |
| Portion Perfection. Great Ideas in Nutrition. | https://www.greatideas.net.au/portion-perfection.html |

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Tips when buying or eating out (Topic 3)

It is well known that portion sizes of numerous energy-dense foods have increased in the past decades, also highlighting the introduction of 'super-sized' portions, particularly in ultra-processed and fast food. Besides, larger portion sizes can usually be offered at a proportionally low cost (9). Thus, controlling calories and portions size out of home is challenging.

In this case, some additional tips to avoid portion size pitfalls when buying or eating out.

- Don't buy jumbo-sized packages
- Be aware that serving size indicated in food labels could be lower than real quantity of children's portions, even in small containers
- At restaurants, choose plates that include healthy techniques





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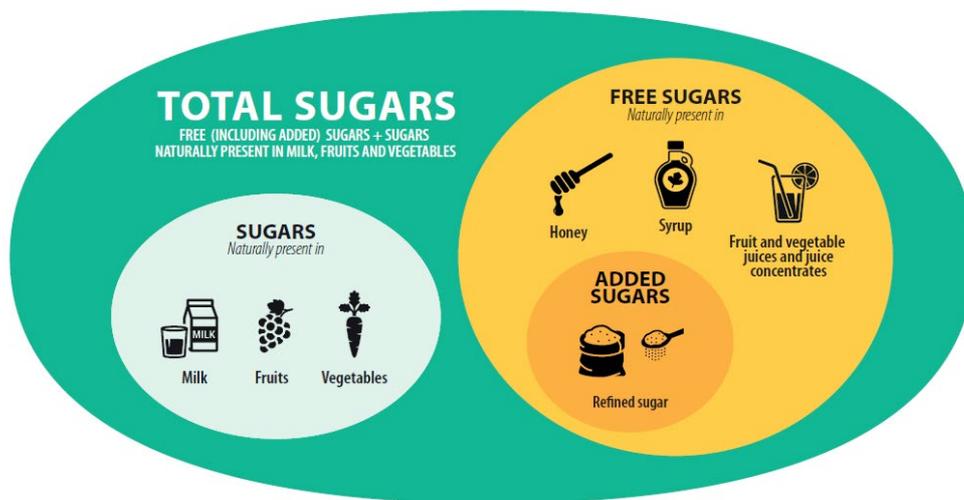
- Ask for a half-portion or share plates and desserts
- Eat a salad or veggies first and skip appetizers than could stimulate appetite leading to eat more at restaurants
- Prefer for vegetable, fruit, or herb-based sauces or vinaigrettes, avoiding creamy sauces and soups, and if possible, ask to serve them separately
- Ask the possibility of excluding or substituting an ingredient for a healthier option or adding vegetables if plate does not have.
- Ask to serve the breadbasket at the same time as foods, not first
- Don't lose sight of what and how much your child is eating during holidays and special occasions.

Cutting down free sugars (Topic 4)

QUESTION: All sugars are the same?

1) YES 1) NO

Sugars consumption in European children and adolescents exceeds current recommendations. First of all, not all sugars are equal in terms of metabolic and health effects. In fact, they can be divided into sub-categories as follows:



Source: https://www.efsa.europa.eu/sites/default/files/2021-07/Sugar_infographic_multilingual_EN.pdf

Free sugars are different from intrinsic sugars found in whole fresh fruits and vegetables or sugars naturally present in milk, which are not associated with adverse health effects. On the contrary free sugars must be limited in a healthy diet. Intake of free sugars should be reduced and minimized with a desirable goal of <5% energy intake in children and adolescents aged ≥ 2 to 18 years. Intake should probably be even lower in infants and toddlers <2 years (1) With respect to **honey**, it is also a source of free sugars and although it could be apparently healthier, it isn't and should be avoided.



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How to reduce free sugars in children's diet?

Sugar should preferably be consumed as part of a main meal and in a natural form as human milk, milk, unsweetened dairy products and fresh fruits and vegetables (2). Cutting down free sugars is essential for a dietary intervention in overweight/obesity. These tips could be useful for families:

1) Don't "drink" sugar

Although many parents do not realize, one of major contributor of added sugar in childhood and adolescence are **sugary drinks**, such as soda, soft drinks, flavored milks, sports drinks, flavored water with sugar and juice drinks contain added sugars. Is crucial to eliminate and substitute them for healthier drink options, being water the best one. As it was explained before, drinking water reduces energy density and sugar content of diet.

In case of energy drinks, after water, sugar is the main ingredient, and apart from high quantity of sugar, level of caffeine could be harmful. Furthermore, in adolescence, co-consumption with alcohol is increasing.

Myth or Fact: 100% fruit juice is as healthy as fruit

Several food guides include 100% fruit juice as another alternative to whole fruit in children older than 1 year. However, it remains controversial (3,4). Furthermore, there is overconsumption of fruit juices in childhood. They provide higher free sugars and lower fiber and have no benefit over whole fruit, which should be the best option, particularly in overweight or obese children. In addition, commercial fruit juices usually contain added sugars, so it is important to check nutrition labels and list of ingredients.

2) Limit processed pre-packed food and drinks. Carefully check food labels.

Sugar is added to many processed foods frequently consumed in children such as breakfast cereals and bars, candy, bakery, juices, sweetened, milk/dairy milk and yogurt, desserts, etc. Unfortunately, including quantity of added sugars in food labels is not yet mandatory in many countries. So, at the moment parents could test if a product contains added sugar, only by reading the **list of ingredients**. As they are listed in a descending order according to their ingoing weight, skip foods that include "sugar" as the first or second ingredient. However, it not that simple, the growing use of alternative sweeteners can make it difficult to determine which ingredients count as sugar, because there are multiple sources of sugar with different names: maltose, sucrose, cane sugar, dextrose, sucrose, maltodextrin, etc.

3) Be familiar with sugar content of foods:

There are available some resources on food composition, visual aids to illustrate how much sugar contains typical foods and tips for healthy drinks:

- <https://world.openfoodfacts.org/>
- <https://healthydrinkshealthykids.org/video/>
- <https://www.sinazucar.org/>
- <https://www.nhlbi.nih.gov/health/educational/wecan/downloads/tip-sugar-in-drinks.pdf>





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- <https://www.bhf.org.uk/information-support/heart-matters-magazine/nutrition/sugar-salt-and-fat/sugar-in-different-foods>

4) “Sugar-free” or “diet” labeled foods are not the solution.

The use of **non-nutritive sweeteners** could lead to weight stabilization or a small degree of weight loss by helping lower total caloric intake, especially among children and adolescents with obesity. However, data are conflicting as the use of non-caloric sweeteners may promote the intake of sugary food and drinks by affecting taste preferences (5).

Parents should be advised that a processed “sugar-free” product does not mean that it is healthy.

5) Avoid **sugary rewards** and **sugary celebrations**

Foods that are used as rewards often become extremely liked. They tend to be unhealthy foods and restricted foods in a weight control diet. Thus, it is important to avoid rewarding a good behavior of children with sugary treats. Instead, offer experiences or a sticker, a comic, a little toy, etc. depending on child preferences.

Far too often we celebrate holidays, birthdays, and other special occasions with sweets. There are healthier alternatives of snacks and homemade bakery, that parents could include

VIDEO: Strawberries marinated with orange juice

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Hunger or Emotional eating? (Topic 5):



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Eating is not only meeting energy and nutrient requirements; it also implies an emotional dimension, which could be harmful, if overeating compensates negative emotions as insecurity, anger, stress, boredom, etc. and becomes a habit for children.

Obesity in childhood or adolescence could be associated with **eating disorders**, so it is crucial an early detection of risk behaviors related to dietary habits. Being unhappy with own body and dieting could put the children at risk.

We refer to eating mindlessly when children are not paying attention to their hunger, how much they are eating, or why they're eating. It usually occurs with foods that are less healthy, particularly those high in sugar, fat or salt.

How to manage emotional eating?

It is important that families promote a proper relation with food since birth. Here are some tips that could be useful to avoid eating mindlessly (1-3)

- In infants promote a **responsive feeding** and pay attention to hunger and satiety cues. Do not force children to eat.
- Promote regular mealtimes. Skipping meals altogether may cause you to overeat later in the day.
- Encourage kids to sit down while they eating
- Give children enough time to eat slowly.
- Have a neutral attitude to food. Do not use foods to reward or to punish
- During mealtimes, try to avoid playing or any distractions with screens.
- Avoid eating while children is walking, doing other activities or while parents are driving.
- Do not let the child eat alone
- Get kids involved with menu planning, buying, and cooking.

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How to deal when child is overweight? (TOPIC 6)

It is frequent that excess of weight affects to several members of a family, but sometimes, only one child is overweight/obese, while parents and siblings are normal weight.

Parents could be concerned about the effect of dietary changes, particularly on siblings. However, a healthy diet is the same for all children and adults, regardless of their weight. Furthermore, improvement in obesogenic home environment suggests potential benefits to the entire family (1,2).

The key is to improve family diet and lifestyles vs dieting, as explained before selecting high nutritional dense foods while cutting down calories and free sugars, managing portion sizes, avoiding emotional eating and engaging children in more active free-time activities, menu planning and cooking.

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Unit 6: CULINARY MEDICINE AND CELIAC DISEASE

Introduction

Coeliac disease is an autoimmune disorder that primarily affects the small intestine and is caused by the ingestion of gluten in genetically susceptible individuals. This unit includes an overview of the diagnosis, symptoms, and treatment of celiac disease, from a practical and applied prism.

Celiac disease: a case study (Topic 1)

General information of the case

Name: Raul Moreno

Gender: male

Age: 7 years and 4 months

Raul and his mother attend the Nutrition Unit.

Symptoms:

Raul's mother reports low weight and height for his age, since always. Abdominal pain, flatulence abdominal distension, and feeling of early satiety. She considers that Raul does not eat too much small since he rejects some foods on occasions and does not finish the preparations. He manifests chronic tiredness that does not stop after vacation period. He is very tired at the end of the day and he cannot finish dinner for many days. He shows a decreased appetite in some seasons. He has come to use a dietary supplement. He has irregular bowel movements and periods of 1 stool/day of normal consistency and periods of diarrheal stools (5-8 a day).



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Anthropometric data

Weight: 19 kg

Size: 116 cm

Head circumference: 52 cm

Energy evaluation data

BMR WHO: 926 Kcal/day

Moderate activity

TEE WHO: 1482 Kcal/day

Psychosocial data

Raul lives with both parents at home.

He has a 10-year-old brother.

Both parents work.

He attends the school to the corresponding course and with average academic results on, usually, eats in the school dining room.

Other Clinical Data

There are no relevant data on previous illnesses, hospital admissions or surgical interventions.

Physical activity

He does physical education at school 2 days a week.

He plays soccer and he trains 2 days a week in the afternoons.

In the afternoons, weather permitting, he goes to the park with his brother.

Weekends are usually quite sedentary.

Dietary data

The have dinner almost every day as a family.

Weekend don't change diet habits much. Maybe you don't have midmorning every day because you get up and eat breakfast later.

Drink water regularly with meals. About 3 glasses of water a day.

Have some commercial juice some days.

At home, they usually cook with virgin olive oil.

Take in general from all food groups.

He rejects certain foods, but not an entire group in general.

His favorite dishes are the potato omelet and burgers.

Foods he does not eat because he does not like them: cauliflower, broccoli, spinach, and chickpeas. He reports that he is eating less bread because sometimes he feels heavy after eating it.

No known allergies **or intolerances**.





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Dietary records: The following 3 tables represent the Raul's diet during 2 working days and 1 weekend day

| Day 1 (business day) | |
|------------------------|---|
| Breakfast | Glass or whole cow's milk with 2 teaspoons of cocoa (takes half) 2 assorted cookies with chocolate coating |
| Midmorning | 30 g sandwich white bread with 20 g serrano ham 200 ml commercial orange juice. |
| Meal | Green bean with potato Breaded chicken breast fillet Peach 10 g white bread |
| Afternoon snack | Whole fruit flavored yogurt |
| Dinner | Broth pasta soup 1 egg cheese omelette (takes half) No dessert No bread |

| Day 2 (business day) | |
|----------------------|---|
| Breakfast | Glass or whole cow's milk with 2 teaspoons of cocoa (takes half) 2 assorted cookies with chocolate coating |
| Midmorning | Apple 3 maria type cookies |
| Meal | Lentils with rice Baked hake slice with lemon |





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| | |
|------------------------|--|
| | Sweetened plain yogur No bread |
| Afternoon snack | 30 g sandwich white bread wich chocolat |
| Dinner | Tomato in salad 1 Wheel of pork loin in sauce No dessert |

Day 3 (weekend or holiday)

| | |
|------------------------|--|
| Breakfast | Glass of whole cow´s milk with 2 teaspoons of cocoa (takes half) 1 commercial sponge cake |
| Meal | Paella with vegetables and prawns Ice cream No bread |
| Afternoon snack | Banana Small bag of corn chips |
| Dinner | Sandwich with 2 slices of sliced bread and 1 slice of cooked ham and 1 slice of cheese Apricot No bread |





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Calibration values (DIAL dietary calibration program)

| Fact | Amount | Fact | Amount | Fact | Amount |
|-----------------|--------|-------------|--------|------------------|--------|
| Energy | 1091 | Cholesterol | 285 | Vitamin B2 | 0,8 |
| Protein | 37 | Calcium | 456 | Vitamin B3 | 15 |
| % Proteins | 14 | Iron | 6,7 | Vitamin B6 | 0,7 |
| Carbohydrates | 107 | Iodine | 54 | Folic acid | 108 |
| % Carbohydrates | 39 | Magnesium | 129 | Biotin | 16 |
| Sugars | 57 | Zinc | 4 | Pantothenic acid | 2,2 |
| Fiber | 8 | Selenium | 41 | Vitamin B12 | 1,8 |
| Fats | 57 | Sodium | 753 | Vitamin C | 51 |
| % Fats | 47 | Potassium | 1324 | Vitamin A | 306 |
| SFA | 17 | Phosphorus | 675 | Vitamin D | 0,4 |
| MUFA | 26 | Fluorine | 117 | Vitamin E | 4 |
| PUFA | 4 | Vitamin B1 | 0,7 | Vitamin K | 48 |

Raul is referred to the gastroenterology consultation and, after performing the diagnostic test, the diagnosis arrives:

CELIAC DISEASE

QUESTION: How is celiac disease diagnosed?

Myth: An intestinal biopsy is necessary in all cases to confirm the diagnosis.

Reality

In the 2020 Guide of the European Society for Pediatric, Gastroenterology, Hepatology and Nutrition (ESPGHAN) there are some news regarding the diagnosis criteria for celiac disease in



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children and adolescents. It is established that a person is celiac if they present symptoms compatible with the disease or, without presenting symptoms, they have these two factors:

Positive IgA anti-transglutaminase antibodies in blood with values 10 times higher than the normal value.

Positive anti-endomysial IgA antibodies in blood (in different blood simple)

The more specific symptoms, although many times they do not appear, are malabsorption that leads to growth failure, weight loss and chronic symptoms. In parallel, diarrhea, chronic constipation, iron deficiency or dental enamel hypoplasia imply an increased risk of celiac disease. Pain, bloating or dyspepsia may be present, but are more nonspecific.

In these cases, it would not be necessary to perform an intestinal biopsy or genetic study.

Histological study (biopsy)

In cases where the diagnosis requires an upper gastrointestinal endoscopy with intestinal biopsies for evaluation, it is recommended to take at least 1 simple from the bulb and at least 4 samples from the distal duodenum, and it is considered that the mucosa is damaged when the villus: crypt ratio is less than 2, which corresponds to Marsh type 2 (crypt hyperplasia) and Marsh type 3 (villus atrophy) lesions.

Genetic study (HLA)

HLA genetic testing is not necessary to reinforce a diagnosis. It is used to rule out disease due to its high negative predictive value, when there is no associated HLA protein variant (DQ2, DG8 or one of the alleles of the DQ2 protein: DQA1*05 or DQB1*02).

Questions on the case study

QUESTION 1: With which tool is the adequacy of weight and size in pediatric age?

- a) Weight and height percentile curves according to age.
- b) Percentile curves that relate weight and height according to age and sex.
- c) Obtain BMI with the formula.
- d) None is correct.

ANSWER: b) Percentile curves that relate weight and height according to age and sex.

For the correct assessment of weight and height, percentile tables should be used, differences according to sex. Although you can also use those that relate weight and height to each other. It is possible, for example, to use the WHO tables. Regarding the section of directly using the data obtained from the BMI formula, in pediatric age, this data is not valid by itself and its interpretation through percentile curves is necessary. The specific data obtained from the BMI is only valid in adults.

QUESTION 2: According to Raul's initial dietary assessment, what modifications can be introduced to improve the diet by adapting to current circumstances?

- a) Increase total energy.
- b) Increase carbohydrate foods.



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- c) Increase his intake at dinner.
- d) All of the above.

ANSWER: d) All of the above.

QUESTION 3: How is celiac disease defined?

- a) It is a chronic, immunological-based systemic disease.
- b) It is a disease that, with proper treatment, can be cured.
- c) It is an allergy to gluten in foods.
- d) It is a disease always diagnosed in childhood.

ANSWER: a) It is a chronic, immunological-based systemic disease.

Celiac disease is an immune-based systemic disorder caused by the ingestion of gluten and other related proteins that affects genetically predisposed individuals. Once it develops, celiac disease is not cured, it is chronic. The mainstay of celiac disease treatment is a strict gluten-free diet for life. It is true that, on many occasions, it is diagnosed in childhood, but it is possible to develop it at any stage of life. There is a genetic predisposition, but some people develop the disease and others do not.

QUESTION 4: What foods in Raul's diet of day 1 have gluten by nature?

- a) Natural yogurt, white bread, assorted cookies.
- b) Green beans, natural yogurt, white bread.
- c) Green beans, whole milk, white bread.
- d) White bread, assorted cookies, pasta soup.

ANSWER: d) White bread, assorted cookies, pasta soup.

All these foods are derived of wheat.

QUESTION 5: In Raul's diet of day 2, what are gluten-free foods by nature?

- a) Apple, lentils, hake, tomato.
- b) Lentils, maria biscuit, cocoa powder, natural yogurt.
- c) Cocoa powder, Apple, hake, lentils.
- d) Loin pork, tomato, biscuits, hake.

ANSWER: a) Apple, lentils, hake, tomato.

MYTH: Celiac disease and non-celiac gluten sensitivity are the same disease.

People with non-celiac gluten sensitivity cannot be diagnosed as celiac because they do not meet the criteria for it. However, by removing gluten from their diet, the symptoms they suffer from are noticeably improved.

One of the fundamental differences is found the symptomatology picture. In the case of celiac disease, the symptoms are very wide and distributed practically by all the organs and body systems. On the other hand, in the case of non-celiac gluten sensitivity, the symptoms are concentrated in the digestive tract with abdominal pain, flatulence, diarrhea or constipation, a sensation of slow and heavy digestion as the main complications associated with gluten intake. Thus, non-celiac gluten sensitivity is not an immune disease and has no genetic component.





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However, there is still much to investigate in this pathology.

Foods and celiac disease (Topic 2)

Myth: A gluten-free diet is healthier than a gluten diet for a healthy person.

Currently there is an increasingly large group of people who do not suffer from celiac disease or non-celiac gluten sensitivity, and they decide to remove gluten from their diet. The main reasons are usually from fashion or to improve physical performance. This fact is also related to the perception of improvement in some health problems, which are not related to digestive symptoms.

However, at this time and with the scientific evidence available, the relationship between a gluten-free diet and improvement in health or performance is not established and there is no serious study with a sufficient sample to support that eliminating gluten from the diet in non-celiac people, improve their pathological processes, increase their performance, or even contribute to the desired weight loss.

On the other hand, it has been shown that gluten-free diets that are not well planned and carried out indiscriminately and without supervision, can lead to certain nutritional deficiencies, especially in fiber, selenium, magnesium, calcium, iron, zinc or some vitamins such as vitamin D or vitamin B₁₂.

Likewise, gluten is a protein naturally present in certain cereals and there is no evidence that it is supposed to be detrimental to the health of healthy people.

Oats does not contain gluten by nature

Reality

The cereals that contain gluten by nature are: wheat, barley, rye, spelled, kamut, triticale, bulgur.

Oats do not contain gluten naturally, but it is true that is very easily contaminated during collection, transport, handling or distribution. On the other hand, it is common to find oats sharing food composition with other cereals or flours of the same. For example, oatmeal breads and barley or wheat flour.

On the other hand, oats contain a protein called avenin, which structurally resembles glutenin, a component of gluten. However, strictly speaking, oatmeal is gluten-free in its composition.

Myth: Lentils contain gluten by nature

Lentils are naturally gluten-free. So, why do so many people with celiac drop out of the diet? The reason is because if there is no certification of the purity of the crop and that this product has not been mixed with others, it is highly likely to be contaminated, mainly with wheat grains, during cultivation, harvesting, storage or distribution.

There are components, within the labeling, and without being their foods, which may contain gluten.

Reality

As gluten has emulsifying, binding and gelling properties, it is frequently used as an additive. European Union Regulation 828/2014 of the Commission on the requirements for the transmission of information to consumers on the absence or reduced presence of gluten in food.





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Food labeling and cross-gluten contamination

FOOD LABELING

There are food lists where foods that are naturally gluten-free are reflected. Also, foods that, by composition, always contain gluten. There is also the section on specific products made for people with celiac disease, which must always bear the "gluten-free" mark.

The main problem arises in the rest of foods that, depending on the components, handling, use of ingredients, contaminations, etc. they may or may not have gluten. In these circumstances, whenever that product contains a gluten-containing cereal as an ingredient, there is an obligation to communicate it.

On the other hand, if the risk of the presence of gluten comes from a possible cross contamination or the presence of traces, there is no obligation to indicate it. For this reason, in this group of products it will be safer to consume those specifically labeled with the "gluten-free" brand.

At the European level, the European License System for gluten-free products (ELS) is used, known as Barred Spike, which certifies that the products that carry it have less than 20 ppm, that is, they are suitable for consumption by people with celiac disease. Therefore, if the barred spike appears on the product and the rest of the information required by the European certification, it is a gluten-free product. If the product is labeled with the expression gluten-free and is not accompanied by the barred spike or some other international seal, it will also be suitable.



These ingredients may contain gluten:

| MODIFIED STARCHES | |
|-------------------|-------------------------------|
| E1404 | Oxidized starch |
| E1410 | Monostarch phosphate |
| E1412 | Distarch phosphate |
| E1413 | Phosphated distarch phosphate |
| E1414 | Acetylated distarch phosphate |



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| | |
|-------|--------------------------------------|
| E1420 | Acetylated starch |
| E1422 | Acetylated distarch adipate |
| E1440 | Hydroxyproyl starch |
| E1442 | Hydroxypropylated distarch phosphate |
| E1450 | Sodium starch octenyl succinate |

| OTHER INGREDIENTS THAT MAY CONTAIN GLUTEN | |
|---|---------------------|
| Amylacetes | Aromas |
| Cereals | Condiments |
| Fiber | Flour |
| Gofio | Malt |
| Malt extract | Malt syrup |
| Protein | Protein hidrolizate |
| Semolina | Starch |
| Thickeners | Vegetal protein |
| Vegetal protein hidrolizate | |

What is gluten cross-contamination?

Gluten cross-contamination occurs when a product, food, utensil or surface with gluten comes into contact, even minimally, with another that is gluten-free or that is to be used by a person with celiac disease.





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Recommendations to avoid cross contamination:

At home

- ✓ Use os exclusive and identified cutlery for the person with celiac disease.
- ✓ Keep gluten-free and gluten products away.
- ✓ Always place gluten-free products on upper shelves.
- ✓ Serve first, common dishes, to the person with celiac disease.
- ✓ Do not pass bread with gluten on the plate, napkin, glass, etc. of the celiac person.
- ✓ Do not put a cutlery that has been in contact with gluten back in a commonly used container.

At restaurant

- Check in advance if they cook food suitable for people without gluten.
- Identify yourself upon arrival and to anyone who attends the table.
- Choose dishes from the menu identified as gluten-free.
- Do not hesitate to request an explanation of the elaboration or handling of a product.
- When in doubt as to whether a dish contains gluten, do not consume it.

The more basic a dish, food, preparation, etc. the less likely it is that it contains gluten in its composition. For example, a grilled dish if the oil is a single use, has less risk of containing gluten than, for example, a stew.

In this section, cooks and waiters have a great responsibility.

Shopping tips

- Go to trusted establishments and always with labeled products.
- Avoid buying in bulk.
- Preferably choose packaged products that cannot have been contaminated by customers who touch gluten and gluten-free foods.
- Avoid the rush.
- Check the products labels. On conventional products, look for the gluten-free symbol on the label (barred spike).
- Whenever possible, place gluten-free and gluten foods in different bags.
- When in doubt as to whether or not the product contains gluten, do not buy.
- Do not abuse products made especially for people with celiac disease, you can get a healthy, balanced, and tasty diet using a significant amount of fresh gluten-free foods.
- Increase the variety of cereals consumed.

QUESTION: What recommendations should be given when making the purchase?

- a) Know foods that are gluten-free by nature, with gluten by nature and those dependent on the handling and distribution processes.
- b) Know and read labels.
- c) Use the more basic food, the better. Limit the use of prepared foods or dishes.
- d) All of the above.

ANSWER: b) All of the above



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