Italian
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of Dietitians

guide to food cooking methods

Project by ANDID – Italian National Association of Dietitians

Member of

EUROPEAN FEDERATION OF THE ASSOCIATIONS OF DIETITIANS

International Confederation of Dietetic Associations

Italian Association of Dietitians

andid in brief

Dietitians are healthcare professionals with expertise in all activities designed to ensure the correct application of healthy dietary and nutrition habits (Italian Ministerial Decree 744/1994).

In practice, they promote and manage dietary and nutritional issues in both physiological and pathological situations: from the creation of personalised therapeutic diet plans (medically prescribed) and the development of menus for both the healthy (school and company canteens) and the sick (hospital catering), through to the design and implementation of teaching, educational and informative activities.

ANDID is the association of reference for Italian dietitians: it represents them, protects their interests, promotes training initiatives and ensures that high levels of professionalism are maintained in the industry. ANDID is the only representative body for dietitians in Italy (Italian Ministerial Decree of 19 June 2006).

ANDID represents Italian Dietitians at the European Federation of the Associations of Dietitians **(EFAD)**. It contributes to developing policies adopted by the European Federation to promote and protect the health of people in Europe and complies with the European Code of Ethics drafted by the Federation.

ANDID represents Italian Dietitians at the **International Congress of Dietetics (ICD)**.

ANDID strives to facilitate communication and information sharing between dietitians and the private and public sectors and industry.

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cooking food: nutrition, flavour and health

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"Gastronomy" can be defined as *the art and the techniques of food preparation*. In a nutshell, *"knowing how to cook"*. In this respect, the notion that food cooking techniques are not merely ways of producing good food but, in themselves, a potential source of nutrition, flavour and healthiness, has continued to gain ground.

Cooking food is a little like carrying out a "magical" laboratory experiment. Behind the everyday practice of preparing a sauce, a pasta dish or a side of vegetables is an entire world of techniques, materials and methods that can play a far more important role than we can possibly imagine in making sure that food has a key say in shaping our overall health.

Although our food purchasing and consumption choices are shaped by numerous different factors, knowing how to cook properly certainly plays a crucial role. In fact, various studies have shown how people that know how to cook are able to make healthier choices and that cooking methods, in terms of techniques and traditions, are important for studying the close connection between healthiness and cultural, environmental and economic factors.

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cooked to perfection
the effect of cooking on food

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Cooking makes food edible and delicious, preserves its nutritional qualities, and gives it new flavours, fragrances and colours. It also guarantees “food safety” in terms of hygiene, by eliminating or reducing heat-sensitive microorganisms, and in terms of nutrition levels, enabling us to inactivate substances with potentially undesirable effects. One such example is avidin, a biotin-binding protein substance found in egg whites that cannot be used by our bodies but can be inactivated by cooking.

However, when it comes to cooking, food safety also depends on our actions because the choices we make in terms of cooking methods (a decision influenced by ingredients but also by personal habits, traditions, expertise and circumstantial factors – primarily the amount of time we have available) can have a positive or negative influence on the nutritional value and quality of the foods we cook.

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all is not lost when cooking

cooking and the nutritional quality of foods

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All preparation and cooking activities can alter the composition of foods in terms of their nutrients: not all, however, negatively impact on their nutritional qualities. Proteins, for example, tend to undergo denaturation, losing their intricate, globular structure and expanding and becoming easier to digest as a result.

Other substances with antioxidant properties, such as lycopene, found mainly in tomatoes, become more bioavailable when cooked, i.e. easier for our bodies to use.

The most sensitive nutrients to cooking and preparation activities are vitamins, especially water-soluble vitamins and those from groups B and C in particular. The loss of these substances during regular cooking activities - but also, for example, in the reheating of already-cooked foods - is quite significant, coming to around 50% in the case of vitamin C and as much as 70% for folates.
Fat-soluble vitamins such as vitamins A, D, E and K are more resistant (percentage loss of around 25%) as are mineral salts, which to a minor degree tend to dissolve in cooking liquids; these range from a 20% loss in the case of calcium, to 25% for magnesium and 40% for copper.

There is no need to fear though. The right balance of raw and cooked foods in our diet guarantees all the nutrients that we need without exposing us to the risk of deficiencies and, above all, without requiring us to take vitamin and mineral supplements which, if not properly evaluated by healthcare professionals, can be both pointless and counterproductive.

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a multitude of methods
foods and comparing cooking techniques

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We get better acquainted with the pros and cons of the most common cooking techniques and learn a few little tricks in order to maximise them.

Using water or stock, the most commonly **boiled** foods are vegetables, legumes, pasta and rice, but also fish, meat and eggs. This cooking method makes it possible to substantially limit the use of cooking fats and to season food with the addition of herbs and spices.
We can reach water boiling point (approx. 100°C) using traditional pans but with pressure cookers we can reach even higher temperatures (at least 120°C) thanks to the specific system they use, and this enables us to reduce cooking times considerably.
Whatever type of pan we use, the amount of cooking water required varies according to the type of food we are preparing. Particularly with vegetables and legumes, it is important to use as little water as possible in order to minimise the loss of vitamins and mineral salts, which can be quite considerable in this case. No problem for soups or boiled meats and fish: in fact, stock is normally used as an additional ingredient in these types of dishes.
Experts make a distinction between boiling and simmering, which means cooking food in water that has almost reached boiling point (therefore around 95°C rather than 100°C), and also parboiling, a pre-cooking technique used to soften some foods or for home freezing purposes.
Finally, poaching consists of slowly cooking foods in water but without reaching boiling point. It may or may not involve the addition of a mirepoix of mixed vegetables (onions, garlic, herbs etc.).

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a multitude of methods

Vegetables, fish and shellfish are the most suitable foods for **steaming**, a technique whereby foods are cooked using the steam of boiling water without coming into contact with the water itself. This is done using special pans ('steamers') or steaming baskets. There is no significant loss of nutrients and often the organoleptic qualities of the food, such as flavour and texture, are better maintained. In addition, there is no need for cooking fats. However, it is only possible to cook foods that have been chopped into little pieces or slices as cooking times would be too long otherwise.
This same "gentle" cooking technique is also employed when cooking using a bain-marie, which is generally used for sauces and for gently heating food.

Braising and **stewing** are cooking methods that involve cooking food for an extended period of time over a low heat. One classic stew is ragù, the meat sauce par excellence, which is cooked slowly over several hours. The long cooking times result in a fair loss of vitamins and minerals but these end up in the cooking liquid which is generally also consumed as an integral part of these types of dishes. In addition, the use of non-stick pans certainly makes it possible to limit the amount of fat that goes into such dishes.

Meanwhile, **oven cooking** employs dry heat. The temperature of a domestic oven ranges from 150°C to 240°C and the warm air heats the food directly, creating a thin crispy layer on its surface (this is why ovens are generally pre-heated) and preventing the loss of important juices and, therefore, nutrients. Food can be cooked in numerous different ways in the oven, from classic roasting to baking in salt or in tin foil. There are also numerous ways to reduce the use of additional fat including, for example, the use of oven-proof paper. Many ovens are also equipped with fan-cooking functions which reduce cooking times because the fan generates a flow of warm air that is distributed to the food more quickly and evenly.

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a multitude of methods

Dangerously good. **Frying** has always been regarded as "fairly unhealthy". And this can certainly be true, not only for the amount of oil absorbed by the food but also because of the formation of potentially toxic substances such as acrolein, if we don't pay due attention. The first thing to get right is the temperature. The ideal temperature for frying food - which must be completely immersed in the oil - is 170/180°C, a sufficient enough heat to immediately create the classic crispy surface which, as well as providing flavour, also makes the fried food "lighter" as it absorbs less oil. In general, fried foods absorb around 10% of their initial weight in oil but this percentage varies according to the size and the type of food, above all. The most suitable oil for frying is extra virgin olive oil, which is stable also at high temperatures, thanks to its relatively high smoking point, and rich in protective antioxidants. Peanut oil, rich in polyunsaturated fats, can also be suitable but the various seed oils, margarine and butter are to be avoided at all costs. Finally, it is also a good idea to avoid frying food in oil that has already been used for cooking.

In recent times, **grilling**, **griddling** and **barbecuing** have come under fire for producing potentially harmful substances such as polycyclic aromatic hydrocarbons and heterocyclic amines. Excessively high temperatures are the main cause of this, particularly in the case of coal or wood barbecues where it is difficult to control the temperature and where different areas of the same grill can vary dramatically in temperature. With these cooking methods the food comes into direct contact with the fire and can burn on the surface: a classic example is barbecued meat cooked over a flame or pizza baked in a wood-fired oven. In such cases, the burnt parts may contain harmful substances. It is therefore a good idea to dispose of the burnt parts and to thoroughly clean the grill after using it. The classic grill marks left on the surface of grilled or griddled meat, bread and vegetables are not harmful however. Do not burn the surface of food, keep the grill well away from the hottest areas, and, where possible, prevent melted fat from falling directly onto the embers: these are just a few useful

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healthy cooking tips. It is also a good idea to accompany barbecued foods with plenty of fresh vegetables and lemon juice, well-known for being rich in antioxidants.
In any event, grills and griddle pans covered with non-stick materials or which allow you to control the temperature are the most appropriate choices if you want to prepare healthier food. One good tip to remember is to avoid salting food before cooking it as the loss of moisture due to the addition of salt can leave the food dry.

Although a relatively recent invention, **microwave ovens** are now common additions to our kitchens, even if many people still only use them for heating up or defrosting food. The flow of microwaves generated inside this type of oven excites the water molecules in food. By causing these molecules to oscillate very quickly, the inner-most part of the food is heated; as such, heat is not transferred from the outer surface towards the centre, as in a traditional oven, but is generated within the food and then transmitted towards the surface. This is why microwave-cooked food is sometimes lukewarm on the surface but very hot inside. This principle makes it possible to halve cooking times and, therefore, reduce the loss of nutritional substances and the addition of condiments to a minimum. Today, the most modern microwave ovens also have additional functions, from grilling to "crisping", so you can "fry" foods without needing to use many condiments.
Despite the overabundance of falsehoods that still exist, it is important to underline there are still no studies that prove that microwave cooking is dangerous to human health. However, it is not possible to cook large pieces of food in the microwave because the electromagnetic waves are only able to penetrate 4-5 centimetres below the surface of foods; in the case of large pieces of food it is therefore difficult to reach a temperature that is uniform and sufficient enough to cook them properly. Vitamin and mineral losses are partially reduced compared with other cooking methods, but they do occur, particularly with regard to vitamin C.

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and to finish ... let's cook!
a few practical tips

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We have seen how time and temperature are the two most critical aspects when it comes to cooking. Manage them well and we can minimise the loss of nutritious substances; conversely, excessively long cooking times and excessively high temperatures may not only impoverish many foods, they might also lead to the formation of potentially harmful substances. Other highly crucial factors to consider both before and after cooking are exposure to air and light. For example, our habit of dicing up vegetables into very small pieces, exposing a greater surface area to the air, can therefore also result in a greater loss of vitamins such as vitamin C. The same principle applies when we prepare and chop salads well ahead of time rather than leaving vegetables uncovered at room temperature and therefore exposed to light and air. One key tip, therefore, is to prepare vegetables - whether raw or cooked and wherever possible - just before eating them. Another important tip is to avoid using excessive amounts of water to wash food, again primarily vegetables, and to avoid soaking them for too long. This practice can also "wash" away some vitamins, such as niacin and thiamine.

Remaining on the topic of water, it is good practice to reduce to a minimum the amount of water we use to cook vegetables, pasta and rice. With regard to vegetables, this will enable us to minimise the amount of vitamins and mineral salts that are lost in the cooking water, which can in any case be reused in stocks and soups. Rice and pasta, meanwhile, can absorb almost all of their cooking water in this way, again preventing amides, mineral salts and vitamins from being thrown away with the excess liquid. Finally, for foods that can be cooked in their skins, such as potatoes, we believe that this method enables nutritious substances to migrate within the food, thus greatly limiting their loss.

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each to their own...

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We can't make a straightforward comparison between different food cooking methods because no one technique is preferable to another. Each one, in fact, can be employed correctly according to the recipe, the time we have available, and circumstances.
In the table below we have summarised the main cooking techniques and a series of pointers to help you get the best out of each method.

Cooking technique	Temperatures reached	Considerations
Boiling		
	*100°C* *120°C in a pressure cooker*	*Makes it possible to minimise the addition of fats, favouring the use of herbs and spices.* *Use as little water as possible to avoid the excessive loss of vitamins and minerals.*
Steaming		
	*Less than 100°C*	*Reduced loss of nutrients, organoleptic qualities of foods preserved.* *No cooking fats required.*
Braising and stewing		
	*Less than 100°C*	*The long cooking times required lead to a significant loss of vitamins and minerals which, however, collect in the cooking liquid.* *It is possible to limit the addition of cooking fats by using non-stick pans.*

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each to their own...

Cooking technique	Temperatures reached	Considerations
Traditional oven cooking		
	*150/240°C*	*There is a very limited loss of nutrients, particularly if the oven is pre-heated. A few little extra additions (oven-proof paper, non-stick baking tins) can help to reduce the need for cooking fats.*
Frying		
	*170/180°C*	*Fry in a sufficient amount of hot oil and always keep the oil at a constant temperature. Always use extra virgin olive oil and avoid reusing oil that has already been used for cooking.*
Grilling/griddling - barbecuing		
	*Over 200°C*	*Prevent foods from coming into direct contact with the flame and do not consume burnt parts. Opt for non-stick griddle pans which allow you to control the temperature. Do not salt food before cooking it.*
Microwave ovens		
	-	*Reduces cooking times. Very limited loss of nutrients. Little cooking fat required. Not possible to cook large pieces of food.*

And now, armed with healthy food, pots and pans, let's get cooking!

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Key reading

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