INTERNATIONAL OLIVE COUNCIL





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OLIVE OIL HEALTH NOTES



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INTRODUCTION

A lot has been written and said recently about the nutritional properties and health benefits of olive oil and, though new research is acknowledging and confirming its good points by the day, much ground has yet to be explored.

Olive oil is the chief source of fat in the Mediterranean diet, an eating pattern whose healthy benefits have always been known to the Mediterranean peoples. A host of studies in recent years have demonstrated that this diet, which equates with a particular lifestyle, is healthy, balanced and good for everyone. The fact is that the olive tree is part and parcel of the history of the Mediterranean peoples.

It is therefore a pleasure for us to present this publication of the International Olive Council in which our chief aim is to provide simple, up-tothe-minute information about the health benefits of olive oil.

It is hard to discuss certain subjects in terms that are easy to understand for the layman but still interesting for health professionals, but we hope we have taken a big step forward in doing so and that we have managed to make this publication pleasant reading for everyone. Research never stops, revealing more and more about the properties of olive oil. Because this body of knowledge is growing constantly and will have to be updated with time, we have opted for the format of a booklet of detachable fact cards. The cards come with a CD-Rom where readers will find the contents of the booklet along with a list of our other publications and an introduction about the Council, what it does and who its members are.

All that remains for us to say is that we hope that readers will get a lot of enjoyment out of this booklet and that it will help to give them a broader and better understanding of the health-related benefits of olive oil and to step into the world and culture of the olive tree and its products.

> Executive Secretariat International Olive Council





THE MEDITERRANEAN DIET AND OLVE OIL

THE MEDITERRANEAN DIET: SHARED INGREDIENTS IN DIVERSITY

The Mediterranean diet is the combination of the lifestyle and eating habits of the peoples of the Mediterranean countries.

Considered nowadays to exemplify balanced, healthy eating, it is attributed a number of health-promoting properties and a lead role in the prevention of various diseases.

THE MEDITERRANEAN DIET AND HEALTH

Paradoxically, the United States was where the interest in the Mediterranean diet all began, and the main fat in that diet is olive oil with its high content of monounsaturated fatty acids, mainly oleic acid. In the 1950s Professor Ancel **Heys of Minnesota University** in the United States was struck by the low incidence of cardiovascular disease and high life expectancy in the Mediterranean countries. This made him reason that there might be a correlation between fat intake, high blood cholesterol and the risk of death from cardiovascular disease. And so, Professor Heys started to track the eating habits of the Mediterranean peoples.

This dietary tracking culminated in a body of research known as the Seven Countries Study (Hevs. 1970), which presented epidemiological evidence of the effects of fats and fatty acids on blood cholesterol levels. Comparing the eating habits of populations in countries such as Greece. Italy, Yugoslavia, Finland, Japan, the Netherlands and the United States, it was the first prospective international study in this subject area and a scientific landmark on the health-related benefits of the Mediterranean diet It showed that the incidence of cardiovascular disease amongst middle-aged males on the island of Crete was lower than expected owing to their low levels of total cholesterol, and that their traditional diet included a high intake of total fat, primarily olive oil.

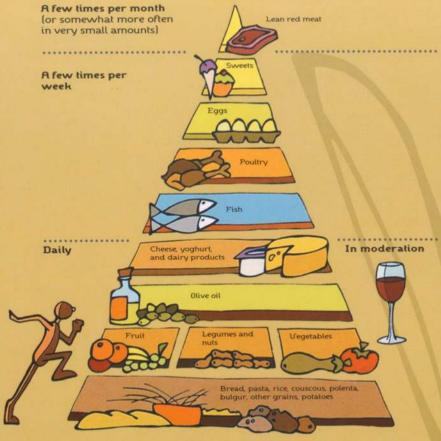
Olive oil is the main fat consumed in the Mediterranean countries where the incidence of chronic diseases is one of the lowest in the world and life expectancy is amongst the highest.

THE MEDITERRANEAN DIET PYRAMID

The pyramid representing the optimal traditional Mediterranean diet is based on the traditional eating habits of Crete and southern Italy around the 1960s. Its structure emerged from a nutrition study carried out in 1993 and presented by Professor Walter Willett of Harvard School of Public Health at the 1993 International Conference on the Mediterranean Diet held in Cambridge. Massachusetts.

The Mediterranean diet pyramid highlights the importance of the main groups of foods, each of which separately provides some, but not all, of the nutrients we need. In other words, the foods in one group cannot replace those in another; they are all needed in a balanced diet. The traditional Mediterranean diet has a number of staple elements and characteristics:

- Grains, pulses, fresh fruit and vegetables, fish, olive oil and nuts are consumed regularly.
- Throughout the Mediterranean region olive oil is normally used for cooking. Suited to every use in the kitchen, olive oil is excellent when eaten raw. This is the best way to appreciate its aroma and flavour and to get the full benefit of its natural compounds.
- Dairy products (above all yoghurt and cheese), eggs and poultry are eaten in moderate amounts.
- Fish is a prime source of protein, in front of eggs and poultry.



Mediterranean Diet Pyramid Source: 1993 International Conference on the Mediterranean Diet

- Red meat (pork, lamb and beef) is at the tip of the pyramid, i.e. its consumption is advised least often and in the smallest quantities, with sweets positioned just below.
- Garlic, onion, oregano and pepper are used to flavour food.
- Regular exercise is vital to maintaining good health and optimal weight.
- Wrine can be consumed in moderation, primarily with meals (1-2 glasses/ day). It is optional and

should be avoided if it puts the individual or others at risk.

Getting enjoyment out of meals, and taking a short rest afterwards, are fundamental parts of this concept and lifestyle. Good lifestyle habits and regular exercise should form a healthy complement to the Mediterranean diet and the use of olive oil.

THE COMPOSITION OF OLVE OIL

The key to the biological potential, nutritional properties and organoleptic characteristics (taste and smell) of olive oil lies in its composition, which is also central to the continuing research to find out more about its functions.

Saponifiable fraction

98.5% triglycerides

Unsaponifiable fraction

1.5% minor components

Olive oil has two fractions. The saponifiable fraction accounts for around 98.5-99% of the oil and is made up of triglycerides. The unsaponifiable fraction accounts for approximately 1-1.5% and is made up of so-called minor components. Though contained in small quantities, these components are very important. The constituent fatty acids of the triglycerides in olive oil can vary to a certain extent depending on the variety of olive and the growing conditions. Monounsaturated oleic acid is predominant, with a share of between 55% and 83% of the fatty acid composition. This good level of unsaturation, combined with its large amount of antioxidants, makes olive oil very stable.

The composition of olive oil is made special by the fatty acids and minor components in its make-up, particularly the large amounts of antioxidants and vitamins (tocopherols, phenolic compounds and carotenoids). Cardiovascular diseases are the top cause of death in the industrialised world.

OLVE OIL AND

DISEASES

CARDIOVASCULAR

A host of studies have documented that arteriosclerosis is closely linked to eating habits, lifestyle and some aspects of economic development. The progression of arteriosclerosis depends on many factors: the most important ones are high blood cholesterol, high blood pressure, diabetes and cigarette smoking.

WHAT IS ARTERIOSCLEROSIS?

Arteriosclerosis is the condition in which cholesterol-rich patches (known as atheromas) deposit on the walls of the arteries. This stops blood from reaching the tissues and obstructs the functioning of vital organs, such as the heart and brain.

WHAT ARE ITS CONSEQUENCES?

When the heart is affected, arteriosclerosis causes angina and heart attack and it increases the risk of sudden cardiac death. When the brain is attacked, cerebral thrombosis occurs, leading to muscular paralysis, loss of cognitive capacity and the risk of dementia. The aorta and leg arteries may also be damaged, causing pain and difficulty in walking and the risk of necrosis and gangrene.

When a fatty patch bursts, for instance because of a rise in blood pressure, the small arteries in the patch also burst. This triggers a response where certain cells found in blood, known as platelets or thrombocytes, join together to form a thrombus or blood clot.

The blood clot travels through the arteries, but when it is larger than the vessel it causes blockage. Because blood cannot get through, the tissue or organ dies.

OLIVE OIL AND ARTERIOSCLEROSIS

It has been demonstrated that olive oil has an effect in preventing the formation of blood clots and platelet aggregation. It has been observed that by avoiding excessive blood coagulation, olive-oil-rich diets can attenuate the effect of fatty foods in encouraging blood clot formation, thus contributing to the low incidence of heart failure in countries where olive oil is the principal fat consumed.

WHAT IS CHOLESTEROL?

Cholesterol is a fatty substance contained in foods of animal origin.

Diets containing a large amount of animal fats raise blood cholesterol level, which is one of the chief risk factors of cardiovascular disease.

Fats (triglycerides) and cholesterol are transported in the blood by lipoproteins. The cholesterol bound to lowdensity lipoproteins (very low-density lipoproteins (ULDL) and low-density lipoproteins (LDL)) is atherogenic, damaging the vessel walls. In subsequent stages this may lead to acute heart attack. Such cholesterol is known as "bad cholesterol". In contrast, the cholesterol bound to highdensity lipoproteins (known as HDL- cholesterol) is called good cholesterol" because it provides protection against the onset of cardiovascular diseases. The high-density lipoproteins remove free cholesterol from the cells, then esterifying it and transporting it to the liver where it is eliminated with bile.

OLIVE OIL AND CHOLESTEROL

Olive oil lowers the levels of total blood cholesterol, LDL-cholesterol and triglycerides.

At the same time it does not alter the levels of HDLcholesterol (and may even raise them), which plays a protective role and prevents the formation of fatty patches, thus stimulating the elimination of the low-density lipoproteins.

The beneficial effect of olive oil consumption with regard to cardiovascular disease has been demonstrated in primary prevention, where it reduces the risk of developing the disease, and in secondary prevention, where it prevents recurrence after a first coronary event.

At present, research is revealing the effectiveness of the Mediterranean diet in the prevention of secondary coronary events and the positive influence of olive oil on the depression associated with such events and on mood. These findings are very important in view of the high incidence of depression in the modern-day world and the great risk it poses in recurrent heart disease.

"...The lowest rates of death from coronary heart disease are currently recorded in the countries where olive oil is virtually the only fat consumed".

Professor Francisco Grande Covián



THE ANTIOXIDANT PROPERTIES OF OLVE OIL

WHAT ARE ANTIOXIDANTS AND OXIDATIVE STRESS?

Oxidation is a process that occurs not only when oil is being produced but also inside our own bodies. Reactions occur continually inside the body, giving rise to the formation of free radicals (peroxidants). As a rule. free radicals do not cause severe damage thanks to the protection provided by antioxidants, which help to keep a balance up to a point. If the balance is spoiled, however, "oxidative stress" occurs, leading to deterioration of normal cell functions and even cell death.

Oxidation is a complex, fundamental phenomenon in the process of cell ageing. Lipid or fat peroxidation tends to be proportional to the number of double bonds in a compound, explaining why oleic acid shows little susceptibility to oxidation.

Cell membranes contain a large amount of fat and cholesterol and their composition depends on diet. When the diet contains a lot of olive oil, the cells are more resistant to oxidation, they do not deteriorate as much and ageing is slower.

Approximately 1.5% of olive oil is made up of the unsaponifiable fraction, which contains antioxidants. Virgin olive oil contains the largest quantities of these substances and other minor components.

ANTIOXIDANTS IN OLIVE OIL

Uitamin E (α-tocopherol), carotenoids and phenolic compounds (simple phends such as hydroxytyrosol and complex phenols such as oleuropein) are all antioxidants whose activity has been demonstrated in vitro and recently in vivo, revealing further advantages in the prevention of certain diseases and also of ageing.

The phenolic content of olive oil varies according to the climatic conditions in the producing area, when the olives are harvested and how ripe they are when picked. Oil production and storage methods also have an influence. Phenols have countless biological properties, for instance hydroxytyrosol inhibits platelet aggregation and it is anti-inflammatory and oleuropein encourages the formation of nitric acid, which is a powerful vasodilator and exerts a strong anti-bacterial effect.

Oxidised LDLs are known to be atherogenic, which is where olive oil steps in because it has a beneficial, protective effect against LDL oxidation. Moreover, it also strengthens other cells in the body against the toxic effects of oxidants.

The high antioxidant content of the Mediterranean diet appears to contribute significantly to its effect on longevity. These antioxidants are found in fresh fruit and vegetables. Because it is the only oil to be obtained from a fruit, olive oil retains a host of substances, antioxidants and vitamins that give it added nutritional value.

The explanation behind this high content of antioxidants is probably that because the olive is a fruit that is exposed to the air, it has to defend itself from oxygen. It therefore synthesises a larger amount of antioxidants, which pass through to the oil.

Uirgin olive oil. i.e. olive oil that has not been refined or industrially treated, is particulary rich in these substances and it has a strong antioxidant effect, protecting against damage from free radicals (scavenger activity) and against the formation of cancer. OLVE OL

AND

CANCER

Cancer is one of the chief causes of death in the developed countries, and its incidence is on the increase.

It is now conceded that there is a relationship between diet and the development of a large number of malignant tumours. Cell oxidation is one of the major risks in the formation of cancer: the more susceptible the cell is to oxygen, the greater the risk of cancer.

The types of cancer most closely associated with diet are colon-rectal, prostate and breast cancer.

Recent research has revealed that the type of fat seems to have more implications for cancer incidence than the quantity of fat.

WHAT IS CANCER?

A tumour is an abnormal swelling or enlargement of a part of body tissue. Tumours may be benign or malignant.

Benign tumours are tumours whose cells remain at their original site. They form a localised cell mass which, when it grows, encapsulates and very rarely causes death.

Malignant or cancerous tumours, on the other hand, invade the tissue where they grow. Often they pass into the bloodstream and the lymphatic system, forming secondary tumours at other sites known as metastases. The speed of growth and metastasis varies according to the type of tumour.

Various environmental factors (physical factors: radiation; chemical factors: certain constituents of foods) and genetic factors are at play in the formation of tumours. In most types of cancer, environmental factors are most important.

OLIVE OIL AND CANCER

Epidemiological studies suggest that olive oil exerts a protective effect against certain malignant tumours (breast, prostate, endometrium, digestive tract, ...).

A number of research studies have documented that olive oil reduces the risk of breast cancer. Eating a healthy diet with olive oil as the main source of fat could considerably lower cancer incidence. The reason is that the cell mutations caused by cancer are partly due to toxins which, when consumed through the diet. attack DNA. On passing through the liver, these toxins produce free radicals that then attack DNA. To combat such free radicals the body needs vitamins and antioxidants like those contained in olive oil

It has also been reported that an olive-oil-rich diet is associated with reduced risk of bowel cancer. The protective effect of olive oil is irrespective of the amount of fruit and vegetables eaten in the diet.

Recent studies have demonstrated that olive oil provides protection against cancer of the colon. Lately, research has been looking into the metabolic implications of fats, more specifically the protective role of olive oil in chronic liver disease and in the disorder of the intestines known as Crohn's disease Results point to beneficial effects of olive oil on pre-cancerous lesions. After analysing three types of diet, research scientists arrived at various conclusions. The olive oil diet reduced the number of cancerous lesions, the number of tumours that developed was clearly and significantly low: and the tumours were less aggressive and had a better prognosis.

This beneficial effect could be related to oleic acid, the predominant monounsaturated fatty acid in olive oil. It has been observed that this fatty acid lowers the production of prostaglandins derived from arachidonic acid, which in turn plays a significant part in the production and development of tumours.

However, it is not excluded that other constituents of olive oil, such as antioxidants, flavonoids, polyphenols and squalene may also have a positive influence. Squalene is believed to have a favourable effect on the skin by reducing the incidence of melanomas.

Olive oil also adds to the taste of vegetables and pulses whose benefits in cancer prevention have been amply proved.

Some very promising, current research is centred on the protection provided by olive

oil against child leukaemia and various cancers, such as oesophageal squamous cell cancer.

Much has still to be discovered about how olive oil affects cancer and concrete data are still lacking on the mechanisms behind the beneficial role it plays in the prevention or inhibition of the growth of different types of cancer. However, according to the information available at present, olive oil could act simultaneously during the different stages involved in the process of cancer formation.



OLVE OIL AND BLOOD PRESSURE

Uarious research studies have reported a close relationship between diet and blood pressure. Certain foods can raise blood pressure besides having an effect on body weight.

WHAT IS HIGH BLOOD PRESSURE?

High blood pressure is known as arterial hypertension and is considered to occur when blood pressure readings are constantly over 140/90 mmHg. High blood pressure is one of the chief coronary risk factors in the development of arteriosclerosis. Along with high blood cholesterol, cigarette smoking, obesity and diabetes, it is one of the main health problems of the developed world.

Like other risk factors, lifestyle can contribute to high blood pressure.

One in every four adults is hypertensive. This increases the risk of early death because of the damage to the body's arteries, especially the arteries that supply blood to the heart, kidneys, brain and eyes.

OLIVE OIL AND BLOOD PRESSURE

It has not vet been clearly established what elements of the Mediterranean diet are responsible for its effects in reducing blood pressure. It has been demonstrated. however that the addition of olive oil to a diet that is not changed in any other way has a clear lowering effect on blood pressure, which seems to be specific to this oil. Regular consumption of olive oil decreases both systolic (maximum) and diastolic (minimum) blood pressure.

There is recent evidence that when olive oil is consumed the daily dose of drugs needed to control blood pressure in hypertensive patients can be decreased, possibly because of a reduction in nitric acid caused by polyphenols.



Diabetes mellitus is one of the leading health problems in the developed countries, and the sixth cause of death. It is one of the major metabolic diseases and it is potentially very serious because it can cause many complications that severely damage health, such as cardiovascular diseases, kidney failure, blindness, peripheral circulation disorders, etc.

OLVE OIL AND

DIABETES

There are two types of diabetes mellitus: type-I or insulin-dependent diabetes, found in children and teenagers, and type-II or noninsulin-dependent diabetes, which appears in adulthood, generally from the age of 40 onwards. Insulin is required to control the first type while the second, more frequent type is generally associated with obesity and does not call for insulin treatment. Nowadays a person is considered to be a diabetic when, two hours after an oral overdose of glucose, he or she has a fasting blood sugar level of more than 126 mg/dl, or of more than 200 mg/dl in non-fasting conditions.

Glucose intolerance is a situation where a person has high blood sugar levels (between 110 and 125 mg/dl) without any clear signs of disease, but with a major risk of suffering from diabetes in the future.

OLIVE OIL AND DIABETES

An olive-oil-rich diet is not only a good alternative in the treatment of diabetes; it may also help to prevent or delay the onset of the disease. How it does so is by preventing insulin resistance and its possible pernicious implications by raising HDL-cholesterol, lowering triglycerides, and ensuring better blood sugar level control and lower blood pressure.

It hast been demonstrated that a diet that is rich in olive oil, low in saturated fats, moderately rich in carbohydrates and soluble fibre from fruit, vegetables, pulses and grains is the most effective approach for diabetics. Besides lowering the "bad" low-density lipoproteins, this type of diet improves blood sugar control and enhances insulin sensitivity.

These benefits have been documented in child and adult diabetes.

OLVE OIL AND OBESITY

Obesity is a major health issue in the West because people eat large amounts and get little physical exercise. Nowadays, in cities especially, people are adopting a sedentary, stressful life. Over half the population of some industrialised countries is overweight, leading to increased risk of high blood pressure, diabetes, high cholesterol and triglycerides, all factors that increase the risk of cardiovascular diseases.

WHAT IS OBESITY?

Obesity or overweight is when energy reserves, primarily in the form of fat, are excessive. It occurs when the amount of energy obtained through the diet is greater than the amount of energy expended. It is corrected by ensuring that energy expenditure (physical exercise, basal metabolic, rate, etc.) is greater than energy intake.

A good weight-reducing diet should:

- provide less energy than is needed to maintain body weight;
- supply adequate amounts of all the nutrients;
- be acceptable, affordable and palatable.

OLIVE OIL AND OBESITY

Olive oil is a nutrient of great biological value. Like all other fats and oils it is high in calories (9 kcal per gram), which could make one think that it would contribute to obesity. However, experience show that there is less obesity amongst the Mediterranean peoples, who consume the most olive oil.

It has been demonstrated that an olive-oil-rich diet leads to greater and longer-lasting weight loss than a low-fat diet. It is accepted better because it tastes good and it is a stimulus to eat vegetables.

OLVE OIL AND THE IMMUNE SYSTEM

It has also been demonstrated that olive oil plays an important role in the immune system.

WHAT IS THE IMMUNE SYSTEM?

The immune system defends the body against invasion by foreign substances (toxins, microorganisms, parasites, tumour processes, etc.) by coordinating specific and non-specific mechanisms.

The non-specific or innate defences are the frontline protection against microorganisms. They are made up of the skin, mucous membranes, the complement system (the complement, a group of some 20 proteins manufactured in the liver, helps to destroy microorganisms), hormonal factors, etc. and their action is not affected by prior contact with the foreign substance.

Specific mechanisms occur following exposure to the substance and they require the involvement of the B-lymphocytes (humoral system) and the T-lymphocytes (cell system).

Innate immunity responds in a similar way to the majority of microbes whereas the specific immune response varies according to the type of microorganism in order to eliminate it as effectively as possible.

OLIVE OIL AND THE IMMUNE SYSTEM

It has been documented that olive oil intake bolsters the immune system against external attacks from microorganisms, bacteria or viruses.

It has been known for some time that mineral and vitamin deficiencies can have an adverse effect on the immune system.

Recent research has concluded that the fatty acids in the make-up of olive oil are good allies in lowering important immunological parameters such as the proliferation of lymphocytes induced by specific mitogens of both B-and T-cells.

These fatty acids have been reported to play an important part in various immune functions. They are involved in regulating inflammatory processes and they may be effective in the treatment of some autoimmune diseases and in the regulation of the immune system in general.

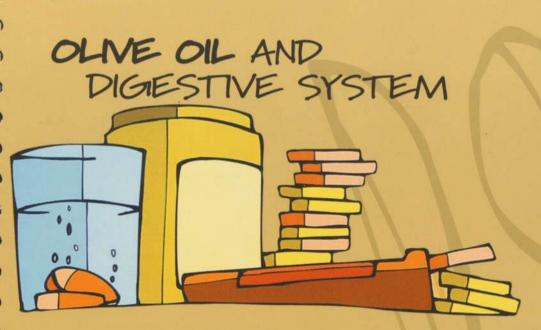
OLIVE OIL AND RHEUMATOID ARTHRITIS

Rheumatoid arthritis is a chronic inflammatory immune disease of unknown causes that affects the joints. Genes, infective factors, hormones and diet have been suggested as possible associates in its onset. Although some studies had suggested that olive oil could help to alleviate its symptoms they did not provide confirmation of such a protective effect.

Now, the results of a recently published study suggest that regular consumption of olive oil may reduce the risk of developing rheumatoid arthritis.

According to the authors of the study, the people on diets containing high levels of olive oil had less risk of suffering this disease. The study found that the people who consumed less olive oil had 2.5 times more possibility of developing rheumatoid arthritis than those who consumed it more frequently.

Although the mechanism involved is not yet clear, antioxidants are suspected to exert a beneficial effect.



As soon as we eat olive oil it has a number of effects all the way along the digestive system.

As far back as in ancient times it was recommended for assorted digestive disorders, and its beneficial properties are now being corroborated by epidemiological studies and a wealth of scientific data.

OLIVE OIL AND THE STOMACH

When olive oil reaches the stomach it does not reduce the tonus of the muscular ring or sphincter at the base of the oesophagus. Because of this, it reduces the risk of the flow or reflux of food and gastric juice up from the stomach to the oesophagus. Olive oil also partially inhibits gastric motility. As a result, the gastric content of the stomach is released more slowly and gradually into the duodenum, giving a greater sensation of "fullness", and favouring the digestion and absorption of nutrients in the intestine.

OLIVE OIL AND THE HEPATO-BILIARY SYSTEM

One of the effects of olive oil on the hepatobiliary system is that it is a cholagogue, ensuring optimal bile drainage and full emptying of the gall bladder. Another effect is that it is cholecystokinetic, i.e. it stimulates the contraction of the gall bladder, which is extremely helpful in the treatment and prevention of disorders of the bile ducts. It stimulates the synthesis of bile salts in the liver and it increases the amount of cholesterol excreted by the liver.

In short, owing to its beneficial effect on the muscle tone and activity of the gall bladder, olive oil stimulates the digestion of lipids, because they are emulsified by the bile, and it prevents the onset of gallstones.

OLIVE OIL AND THE PANCREAS

When consumed, olive oil produces a small amount of secretion by the pancreas, making this organ "work" little, but efficiently and enough to carry out all its digestive functions. Olive oil is recommended in diseases where pancreatic function has to be maintained, such as pancreas failure, chronic pancreatitis, cystic fibrosis, malabsorption syndromes, etc.

OLIVE OIL AND THE INTESTINES

Owing to the sitosterol it contains, olive oil partially prevents cholesterol absorption by the small intestine. It also stimulates the absorption of various nutrients (calcium, iron, magnesium, etc.).

Olive oil, therefore, is a fat that is digested and absorbed really well. It has choice properties and a mild laxative effect that helps to combat constipation and bad breath.

OLVE OIL DURING PREGNANCY AND CHILDHOOD

OLIVE OIL DURING PREGNANCY

Olive oil plays a key role in foetal development during pregnancy.

It has been demonstrated that the post-natal development of babies of mothers who consumed olive oil when pregnant is better in terms of height, weight, behaviour and psychomotor reflexes.

The foetus needs vitamin E to grow. The newborn baby also needs a store of vitamin E to fight against the oxidative stress caused on entering an oxygen atmosphere. Although not very abundant in olive oil, it is present in sufficient quantity thanks to the resistance of olive oil to oxidation. So, both the amount and the type of food consumed in the diet during pregnancy play a key part in the metabolic adaptations that occur in the mother and in her functional relationship with the foetus.

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OLIVE OIL AND BREAST FEEDING

During labour, the vitamin E in the mother's blood is concentrated in the breast glands and so, during breast feeding, the mother continues to supply vitamin E. It is essential to maintain the levels of this vitamin during breast feeding.

Uitamin E is also recommended for premature and new-born infants with kidney or pancreas failure because of the favourable effect it has on the hepatobiliary system.

But olive oil not only provides enough essential fatty acids for the development of the new-born child; its ratio of linoleic acid to linolenic acid (essential fatty acids) is similar to that of breast milk.

The beneficial effect of oleic acid lasts beyond pregnancy. Besides its documented effectiveness in preventing hypercholesterolaemia and arteriosclerosis, which is a process that can begin in childhood, oleic acid also appears to exert a positive influence on growth and bone mineralisation and development during infancy.

DIETARY REQUIREMENTS

During pregnancy and breast feeding it is advisable to consume more fat, primarily monounsaturated fat, while reducing saturated fat and cholesterol as far as possible. General dietary guidelines should be followed and calorie intake should be controlled to avoid excessive weight gain.

Under-three-year-olds have different dietary requirements to children over this age. Forty per cent of the energy they consume comes from fat, whether it be in breast milk or any other kind of milk. It is recommended to maintain this dietary pattern and to ensure that energy and nutritional intake cover the developmental requirements of the child.



Olive oil is rich in various antioxidants (vitamin E, polyphenols, ...) which play a positive, biological role in eliminating free radicals, the molecules involved in some chronic diseases and ageing, and in extending life expectancy, which has been demonstrated in several epidemiological studies.

Many ageing-related diseases are influenced by diet, in particular osteoporosis and deteriorated cognitive function.

WHAT IS OSTEOPOROSIS?

Osteoporosis is a reduction in bone tissue mass that increases the risk of fractures. There are two types. Type I occurs in middle-aged, postmenopausal women and type II in the elderly.

OLIVE OIL AND OSTEOPOROSIS

Olive oil appears to have a favourable effect on bone calcification, and bone mineralisation in better the more olive oil is consumed. It helps calcium absorption, thereby playing an important part during the period of growth and in the prevention of osteoporosis.

OLIVE OIL AND COGNITIVE FUNCTION

Olive-oil-rich diets may prevent memory loss in healthy elderly people. Less possibility of suffering agerelated cognitive decline has been observed in a study conducted on elderly people administered diets containing a large amount of monounsaturated fats, the case of olive oil particularly.

Exactly how large quantities of these fats prevent cognitive decline is not known. However, this effect is believed to occur because the monounsaturated fatty acids may help to maintain the structure of the brain cell membranes since the demand for these acids appears to grow during ageing.

The same study observed that the quantity of olive oil consumed was inversely proportional to age-related cognitive decline and memory loss, dementia and Alzheimer's disease.



In human beings ageing leads to gradual structural and functional skin damage.

Skin tissue goes through a number of changes. Some of the chief ones are that the inner and outer layers of the skin (dermis and epidermis) grow thinner, elasticity is lost, the area joining the dermis to the epidermis becomes less cushioned, fibrosis occurs with the accumulation of collagen and the tissue is less able to fight against and repair damage.

External factors, such as the sun's rays, speed up ageing by generating free radicals. Though cells are equipped with mechanisms that neutralise their action, it is possible to reduce cell damage by using inhibitors that lower the risk. One such natural inhibitor is olive oil, whose lipid profile is very similar to that of human skin.

On top of polyphenols, olive oil has a large proportion of vitamins A, D and K, as well as vitamin E, the main source of protection against the free radicals that produce cell oxidation. This makes it a good aid in specific therapies to treat skin disorders such as acne, psoriasis and seborrheic eczemas.

It has also been suggested that because of its pronounced antioxidant effect, olive oil could play a choice part in the prevention of continuous oxidation, one of the processes that influences the development of certain types of skin cancer. Uttamin E studies have begun, but these kinds of observations take a long time, which means that conclusive data are not yet available. However, the theory is that oleic acid is believed to play a major part in counteracting continuous oxidation.

FRYING WITH

Frying is one of the few characteristics shared by all the countries of the Mediterranean world, whether in Europe, Asia or Africa, and by the three religions practised in the area, Christian, Muslim and Jewish. It is, in fact, one of the oldest existing cooking methods.

It can be asserted from recent research that frying is beneficial for man from the physiological point of view because it does not cause heat-related damage to food. For this reason it is now spreading to areas where it was hitherto unpopular. Whether fried food is "heavy" or not depends largely on the kind of oil used, how the food is fried and at what temperature. The results of studies conducted on healthy individuals and patients with gastro-duodenal disorders (gastritis, ulcer, liver and

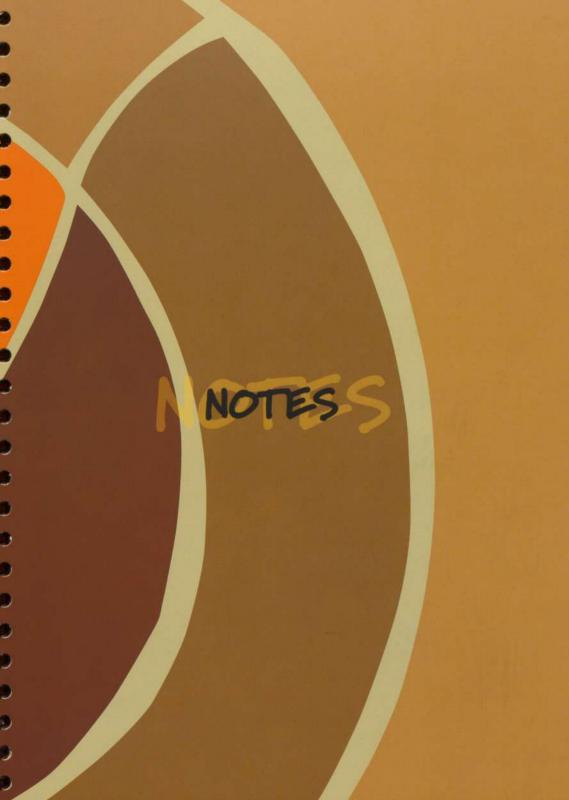
bile disorders) have shown no relationship between the consumption of food fried in olive oil and these diseases.

The monounsaturated fatty acids in olive oil make it more resistant to heat. These acids are more stable because of their structure: they have only one double bond in their molecules.

Olive oil is ideal for frying. When heated to the right temperature, without overheating, there is no substantial change in its structure and it retains its dietary properties really well because of the antioxidants it contains and its high content of oleic acid. It has a high smoke point (210 °C), well above the ideal temperature for frying food (180 °C). Another advantage of olive oil in frying is that a crust forms on the outside of the food that stops the oil from penetrating through and makes the food tastier. For this to happen the oil must be hot, so that the food is sealed and does not soak up the oil, and there must be enough of it to make sure that the food is not burned. Food fried in olive oil contains less fat, which makes it recommended for controlling obesity. Olive oil is, therefore, the most suitable, lightest and tastiest fat for frying.

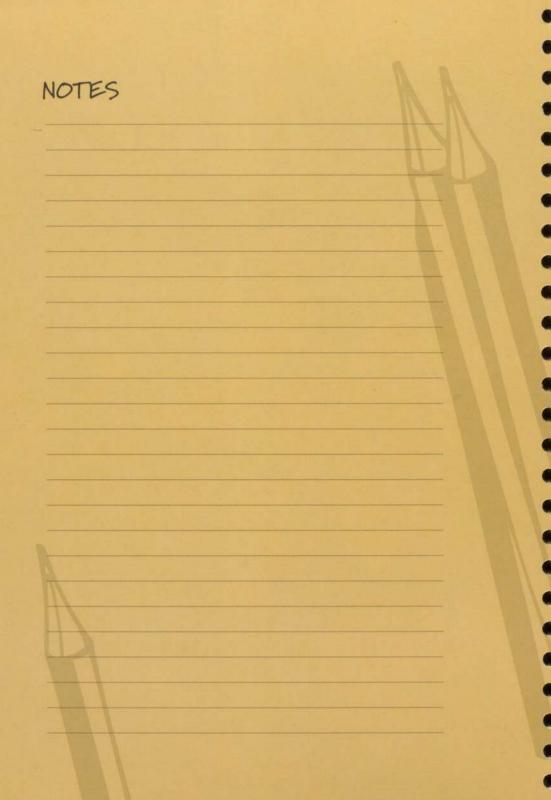
Another point to remember is that olive oil can be reused several times for frying. When re-used, its monounsaturated fatty acids do not undergo hydrogenation or isomerisation processes that cancel out its beneficial effects on lipid metabolism or that affect its digestibility.

TEMPERATURE	FOODS		
Medium 130-145 °C	High moisture foods: vegetables, potatoes, fruit,		
Иоt 155-170 °С	Food coated in batter, flour or in breadcrumbs, forming a crust		
Very hot 175-190 °C	Small, quickly fried foods.		

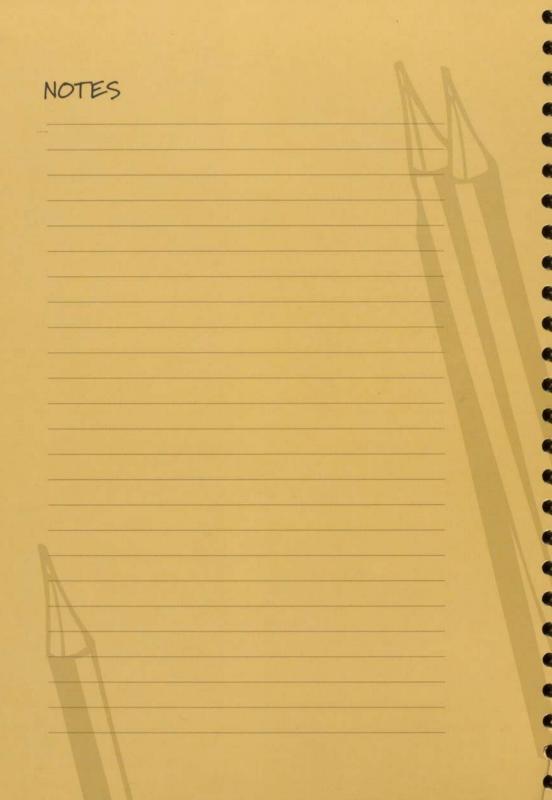




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