



Lemon

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Abstract. The article discusses the main properties of lemon and its effect on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. The chemical composition and nutritional value of the fruit are indicated, the use of lemon in various types of medicine and the effectiveness of its use in various diseases are considered. The potentially adverse effects of lemon on the human body under certain medical conditions and diseases are analyzed separately. The scientific foundations of diets with its use are considered.

Keywords: lemon, beneficial properties, potentially dangerous effects, side effects, contraindications, diets

Beneficial features

Table 1. Chemical composition of lemon (according to [Food+](#)).

Main substances (g / 100 g):	Fresh lemon contains [1]
Water	88.98
Carbohydrates	9.32
Squirrels	1.1
Fats	0.3
Calories (kcal)	29
Minerals (mg/100 g):	
Potassium	138
Calcium	26
Phosphorus	16
Magnesium	eight
Sodium	2
Vitamins (mg/100 g):	
Vitamin C	53
Vitamin B4	5.1

Vitamin B5	0.19
Vitamin E	0.15
Vitamin B6	0.08

The pulp of lemon fruits contains citric and ascorbic acids, sugars, vitamins A, B1 and B2, flavonoids, coumarin derivatives, sesquiterpenes, pectins, potassium and copper salts. Lemon peel contains essential oil and flavonoids. The main constituents of the essential oil are the terpene limonene and the aldehyde citral.

Lemons contain 7.1% carbohydrates in the form of sugars. The latter are dominated by fructose and glucose, which are easily digested. The amount of pectins in the peel is 16% of dry matter, and in the pulp - 11%. The predominant fruit acid is citric acid. The acidity of fruits harvested in late autumn increases to 8%, the acidity of fruits picked in spring (April) ranges from 4% to 5%. Essential oils contained in the peel have a powerful bactericidal effect. The content of mineral salts (especially potassium) is high in lemons. Vitamin C is found in lemon fruits in a stable form, i.e. Lemon juice, which is heated for 5 minutes to boiling point, practically does not lose the initial amount of vitamin C (therefore, the benefits of lemon in combination even with very hot tea do not decrease).

In medicine

The increased content of vitamins in fruits determines the medicinal properties of lemon. Lemons (in its natural form, with tea, in the form of juice diluted with water) are prescribed for a lack of vitamins A and B, fever, mineral metabolism disorders, kidney stones, gout and rheumatism. Externally, lemon juice, diluted with water, is used for rinsing in inflammatory processes in the oral cavity and pharynx. With nausea and vomiting accompanying toxicosis of pregnant women, a freshly cut lemon is applied to the cavity between the mammary glands, using it as a retractor. With comedones, wipe the face with a slice of fresh lemon (before that, make a steam bath for the face). Lemon essential oil is used to improve the taste and smell of many medicines. [3,8]

In folk medicine

- With seborrhea, a face mask is used: one egg white is beaten with a teaspoon of lemon juice and applied evenly to the skin. Wash off with warm water after half an hour. The frequency of use of this remedy is once or twice a week.
- With hypoacid gastritis (which is characterized by low acidity), a recipe is useful: 250 g of yogurt is mixed with one grated lemon and egg yolk. Take 3 tablespoons three times a day before meals. The course of treatment is no more than 5 days.
- For constipation, combine the juice of one lemon with 400 ml of water and add honey to taste. Drink the drug daily on an empty stomach, about an hour before the first meal.
- To improve intestinal motility and eliminate constipation, a decoction is also advised: boil 300 g of figs in 4 liters of water until the amount of water decreases to 3 liters. Add the slightly boiled and mashed zest of one lemon to the boiled composition. Take the composition in an amount of approximately 200 ml several times a day, with a break of 3-4 hours.
- With an exacerbation of gallstone disease, a "cocktail" helps: dilute the juice of one lemon with 200 ml of water and add half a teaspoon of soda. Drink it all in one go after meals.
- With cholecystitis, the following course of treatment is recommended. Melt 0.3 kg of honey in a water bath and mix with two crushed lemons, from which the "pits" were previously removed. Leave the mixture in a dark place for 3 days. Take the composition on an empty stomach for 10 days, 3 tablespoons, diluting them in a glass of cold water.
- For gout, grind 3 large lemons, peeled from seeds, in a meat grinder and mix with finely chopped garlic (2 small heads) and pour all 1.5 liters of boiling water. Boil the mixture for

about 10 minutes and then insist for 3 days. Strain and take a tablespoon twice a day, after meals. The course of treatment is from one to two months.

- For hypertension, the composition is used: half a lemon and an orange (along with the peel and seeds) are crushed with a meat grinder and mixed with a teaspoon of granulated sugar. Store in the refrigerator and take 0.5 teaspoon four times a day after meals.
- For arthritis, a course of treatment is prescribed for a month: peel the shells of 7 boiled eggs from the films and boil for 5 minutes, then crush. Combine the eggshell with the juice of 7 lemons and soak the infusion for a week. Strain and add 400 mg of honey and chopped garlic (5 heads) to the mixture. Infuse the composition in a dark place for 7 days. Take once a day, in the middle of the day, after meals, dividing one dose of 4 teaspoons into 4 stages, each with a break of 10 minutes.
- A proven folk remedy helps with tuberculosis: 4 whole raw eggs are placed in a glass jar and poured with the juice of one large lemon. The jar is closed, wrapped in paper and kept for a week until the eggshell is completely dissolved. Then the egg-lemon mixture is poured with vodka (the jar is filled to the top). Take the infusion for a month, a tablespoon three times a day after each meal.
- For bronchitis, the following recipe is used as an expectorant: bake 4 lemons in the oven at medium temperature until softened, let cool. Mash the lemons with a spoon, squeeze out the juice and mix the juice with the pulp with 400 ml of boiling water, 3 tablespoons of red wine and 4 tablespoons of honey. Drink the composition in one go.
- With hoarseness, a debilitating cough and loss of voice, a decoction is useful: mix the juice of 0.5 kg of carrots with a tablespoon of sugar and the zest of one lemon, bring to a boil and cook over low heat for an hour, boiling until the volume is reduced by half. Take 0.5 tablespoon every 2 hours throughout the day.
- Angina is treated with a drink: 250 ml of hot milk is mixed with the juice of one lemon and 2 tablespoons of honey. Drink hot, in small sips.
- General tonic based on lemons, especially useful after suffering a debilitating flu: Grate 10 large lemons together with the zest on a coarse grater, lightly knead the grated lemon mass with a spoon, add 5 cups of liquid honey and 10 small heads of chopped garlic. Mix all the ingredients, insist in a warm place for 7 days. Take 4 teaspoons daily.

Externally:

- When sweating hands, use the composition: glycerin, lemon juice and vodka are mixed in a ratio of 0.5: 0.25: 0.25. This mixture is generously lubricated hands after each wash. Lemon juice is also recommended to wipe the feet with excessive sweating.
- Brittle nails are strengthened by systematic rubbing using a slice of lemon.
- Rough skin on the heels is treated with compresses from the peel of a squeezed lemon.
- To the calluses on the legs (previously steamed in hot water), apply the top of a lemon, cut off with a small amount of pulp. The lemon top is pressed tightly against the corn, fixed with a bandage and left overnight. ^[2,8]

in oriental medicine

Avicenna used freshly squeezed lemon juice in the treatment of patients with heart disease. The healer also practiced the use of lemon for jaundice, toxicosis in pregnant women.

In ancient Chinese medicine, lemons were used to heal wounds, pneumonia, and scurvy.

In the countries of Asia Minor and the Middle East, lemon was an indispensable ingredient in many dishes: in this way, cholera was prevented.

In scientific research

The healing properties of lemon were described in his scientific works by the Armenian scientist, naturalist and doctor Amirdovlat Amasiatsi (15th century).

At the beginning of the 20th century, two major studies on lemon juice treatment were simultaneously published by L. Gdanský and K. Drexler. The books were published in 1910 in Pskov and St. Petersburg, respectively.

In modern science, interest in the medical potential of the famous citrus remains. The effect of daily consumption of lemons (in the direction of improving performance) on blood pressure is highlighted in the work of Japanese researchers Y. Kato, T. Domoto, M. Hiramitsu and others.

The European Nutrition Herald published the results of a study by Dutch scientists on the chemical composition of lemon peel and its use in cholesterol-lowering products (2002).

Indian researchers have proposed data on the substance hesperidin (extracted from lemons), which restores liver function (2005).^[9,10]

Weight regulation

How to use lemon for weight loss? Nutritionists offer a lot of recipes aimed at cleansing the body of toxins and toxins, accelerating metabolism: the systematic use of water with lemon juice, a honey-lemon diet, the aromatic effect of essential lemon oil (according to the Alan Hirsch system). Back in the 19th century, Johann Schroth proposed a scheme for detoxifying the body with lemons (using fresh lemon juice).

In cooking

The pronounced taste and aroma of lemons are appreciated by chefs and gourmets. Lemon zest is added to pastries, puddings, pastry cream; marmalade, jam, ice cream, candied fruits are prepared from lemons. Lemon juice is used as a marinade in the preparation of meat and fish; add juice to dressings for vegetable and fruit salads. Sauces are prepared on the basis of lemons; salted lemons are one of the traditional national dishes of Moroccan cuisine. Fresh sliced lemon is served as an appetizer to a range of alcoholic drinks.^[9]

In cosmetology

For the preparation of lemon-based cosmetics, use the peel, zest, lemon pulp, lemon juice or lemon essential oil.

Lemon for the face

- Skin prone to comedones is helped by rubbing with lemon juice. First you need to steam your face over a steam bath.
- For oily skin with enlarged pores, rubbing with the composition is useful: combine beaten egg white, 100 ml of vodka and juice of one lemon.
- Mask for oily skin prone to acne: dilute 2 tablespoons of white clay (in powder) in 2 tablespoons of alcohol, add 15 drops of lemon juice. Keep the mask on your face for a quarter of an hour and rinse with cold water.
- For normal or sensitive skin, a homemade lotion is prepared: the juice of half a lemon is mixed with a teaspoon of glycerin and a quarter cup of water.

- Mask for whitening freckles with dry skin: mix lemon juice, cream and hydrogen peroxide (5%) in equal proportions. Apply to face with a cotton swab and rinse with warm water after half an hour.
- Nourishing milk for dry skin: mix 200 ml of fresh cream, 1 beaten egg, 100 ml of vodka, juice of one lemon and a teaspoon of glycerin. Rub everything thoroughly and wipe the face and décolleté area with the composition before going to bed.
- Nourishing mask for dry skin: prepare flour from dried lemon peel by grinding the peel in a coffee grinder. Mix a teaspoon of this lemon flour, egg yolk and sour cream. Hold the mask for 20 minutes, applying to the face and neck.
- Mask "Madame Pompadour" for dry skin: grate one lemon on a plastic grater, pour 100 ml of alcohol, let stand, then strain and combine with a glass of sour cream or cream, one beaten egg white and a teaspoon of glycerin. Apply to the face for a quarter of an hour, and then gently remove the remnants of the mask with a cotton pad.
- Tonic for any skin type: mix 2 tablespoons of boiled water, a teaspoon of honey and the juice of half a lemon. Wash your face before going to bed.
- Tonic face mask: mix a tablespoon of oatmeal or wheat flour with a little milk (bring to a mushy state) and add the juice of half a lemon. Apply the mixture on the skin of the face and neck and wash off after half an hour with warm water.

Lemon for hair

- For oily skin and increased greasiness of the hair, it is useful to rub a composition of 2 parts of lemon and one part of carrot juice into the scalp before washing. Wrap your head with a towel, keep the composition on your hair for at least an hour. Rinse your hair after washing with water with lemon juice (a tablespoon of juice per 1.5 liters of water).
- For dandruff, rinse your hair after washing with a prepared decoction: boil the peel of 4 lemons for a quarter of an hour in a liter of water.
- Mask for dry and split ends: mix an egg yolk with a little warm water, add a tablespoon of lemon juice and vegetable oil. ^[3]

Combination with other products

The sourness of the lemon favorably sets off the taste of vegetable and fruit salads, in which lemon juice is used as a dressing. Lemon goes well with fish and seafood: mussels, oysters, shrimps.

Beverages

Lemon juice is used to make lemonade, alcoholic and non-alcoholic cocktails, liquors, the traditional limoncello drink. Kissel is boiled from lemon zest and juice; in drinks, lemon juice works great paired with honey, cinnamon, mint, and sweet fruit juices.

How to make lemonade at home? Remove peel and seeds from lemons and squeeze out 600 ml of juice. Pour 300 g of powdered sugar into lemon juice and mix thoroughly until completely dissolved. Fill glasses three-quarters full with crushed ice, pour over sweet lemon juice and garnish with fresh mint leaves.

Other uses

- Lemon is a natural stain remover. With a mixture of lemon juice and salt, rub and wash the stains on white linen before the main wash (after allowing the composition to dry). A slice of

lemon, generously flavored with salt, perfectly cleans copper and makes it shine. Lemon juice cleans hands from dirt and stains left after working in the kitchen.

- From lemons, pieces of copper wire and galvanized nails, you can assemble a lemon battery, the “power” of which is quite enough to run a standard watch. The principle of operation of such a battery is a chemical reaction resulting from the contact of the acid contained in lemon juice, copper and zinc.
- Lemon can be used to quickly and easily clean your microwave. The zest of one lemon is poured into 500 ml of water and left in the microwave for 2 minutes, turning it on at full power. After that, it remains only to thoroughly wipe the microwave from the inside with a damp sponge: lemon essential oil, as it were, “dissolves” even the most inveterate contaminants.
- You can get rid of yellowness on the teeth, which arose as a result of prolonged smoking, using lemon juice. On a damp toothbrush, apply a small amount of baking soda and 3 drops of lemon juice and massage your teeth with this composition.
- A good protection against mosquito bites is the following method: exposed areas of the body should be wiped with lemon juice. This will reduce the irritation from bites and prevent the appearance of new ones.
- Essential oil of lemon is an effective tool in aromatherapy, characterized by tonic, antiseptic and other properties. ^[9]

Dangerous properties of lemon and contraindications

Given the significant amount of citric acid contained in fruits, lemons should be limited or completely excluded from the diet for diseases of the stomach, liver, intestinal tract, gallbladder, biliary tract, pancreas (acute or chronic pancreatitis), with gastroesophageal reflux.

Lemon applications during cosmetic procedures outdoors in direct sunlight can cause a painful burn (to a greater extent this applies to people with fair and sensitive skin). In some cases, after using lemon-based products, an acute allergic reaction may occur. ^[8,14]

It must be remembered that irrational or excessive use of lemons can harm even an absolutely healthy person.

Botanical description

It is the fruit of an evergreen tree plant representing the genus *Citrus*, family *Rutaceae*. Among the whole variety of citrus fruits, lemon is, if not the most popular, then, undoubtedly, one of the most useful and significant fruits in terms of medicinal properties, second only to orange in the vitamin rating.

origin of name

The word “*lemon*” according to one of the existing versions is borrowed from the Italian language (“*limone*”), and the Italian name of the fruit, in turn, is the result of the assimilation of the Persian “*limun*” (meaning any citrus fruit among the Persians).

Story

It is difficult to reliably determine the homeland of lemons. There are suggestions that in ancient times they were grown in northeastern India, northern Burma and China. Studies of the lemon's genetic code indicate that it is a hybrid of earlier citrus fruits from a historical point of view: citron and bitter orange. Lemons first came to Europe (south of modern Italy) as early as the 2nd century AD. (although they became widespread much later) thanks to the external trading activities of Ancient Rome. In

parallel with these events, the lemon was distributed in Persia, Iraq, and Egypt. In a 10th century Arabic treatise on agriculture, there is information about the lemon, which was cultivated not only as a food product, but also as an ornamental plant. In the 9th century, as a result of the conquests and the aggressive policy of the Moors, lemons began to be grown in southern Spain, Sicily. Thus, the lemon conquered the Mediterranean and Arab regions. The production of lemons on a large scale began in Genoa in the middle of the 15th century. Lemon came to America thanks to Columbus, where, centuries later, it took root perfectly due to the optimal climatic conditions in Florida and California.

Lemon arrived in Russia along with Dutch suppliers and merchants: in the second half of the 17th century, seedlings of lemon trees were delivered to the royal court. The citrus crop was recognized as so valuable and rare that even a special position was introduced at the court - the "caretaker of lemons". The second wave of popularity of lemons swept the empire two centuries later, during the delivery of Georgian lemons to Russia. ^[1,2]

Varieties

The varietal variety of lemons is extremely large, the most popular and demanded varieties on the world market are:

- Novogruzinsky is a remontant variety (the tree blooms and bears fruit all year round). A popular variety characterized by high yield, almost complete absence of seeds in the fruit.
- "Pavlovsky" lemon - the variety is perfectly adapted to growing at home. Trees of this variety tolerate shading. The fruits are thin-skinned.
- 'Eureka', also known as 'Four Seasons'. Lemons of this variety grow almost all year round and are champions in the market in terms of popularity and quantity.
- Variety "Meyer" refers to thin-skinned varieties. More frost-resistant than other varieties, but also more demanding on transport conditions. It is not a common variety in a commercial sense. The cultivar was named after Frank Meyer (1908).
- «Yen Ben» and "Bush" are Australian varieties. Variety "Bush" grows wild in the subtropical zone of the mainland. 'Bush' is a thick-skinned variety popular in cooking.
- Sorrento is an Italian variety whose zest is traditionally used to make limoncello.

Other famous varieties: "Lisbon", "Maikop", "Verna".

Lemons are also conditionally divided into **sour varieties** (real), **sweet varieties** (whose pulp is sweet and juicy) and "**ponderose**" lemons (thick-skinned, with a lot of seeds). Lemons with a thick rind are used to make candied fruits.

By type of plant, lemons are divided into **bushy** (bushes up to 4 m high, fruits are formed at the ends of branches) and **tree-like** (trees up to 6 m high, with a dense crown, in the depth of which fruits are formed). ^[1,3]

Growing features

The site for planting lemon seedlings should be a place well lit and protected from the winds. It is recommended to plant trees of standard size with an interval of 3.5 to 7.5 m (dwarf trees are planted with a smaller interval - up to 2 m). The best soil option is loamy soil.

To grow a lemon from a stone, it is necessary to remove all seed-seeds from the fruit, soak them in water overnight, then plant them in moist soil in a pot to a depth of 1.2 cm. Wrap the pot with a plastic bag and leave it in a warm sunny place for seeds to germinate.

A few weeks after planting the seedlings, you can start top dressing with a mixture of citrus fertilizers. Top dressing is carried out further for several years. The watering schedule is systematic and slightly more than moderate. When growing citrus fruits, mulching is not recommended.

How to grow lemon at home? Meyer and Pavlovsky lemons are best suited for this. A lemon tree needs to be provided with enough lighting, heat and good drainage. You should also protect the plant from drafts, moisten the air in the room where the lemon grows, in the summer - put the pot with the tree in fresh air. In the cold season, you need to extend the daylight hours for the plant with the help of additional lighting. In favorable conditions, the lemon tree is able to bloom and bear fruit throughout the year.^[four]

Selection and storage

Quality fruits are dense, with a smooth skin, there are no dents or dark spots on them. When warmed for a short time in warm hands, a lemon exudes an intense aroma inherent only in this citrus.

Lemons keep well in the refrigerator. Additional storage time is added by wrapping each fruit in clean paper and placing lemons wrapped in a plastic bag in a separate fruit and vegetable compartment.

Long-term storage reduces the acidity of fruits, since a significant amount of citric acid is transformed into sugars over time.

Prolongs the "life" of lemons by immersing them for seconds in moderately hot melted paraffin: this creates a protective layer covering the fruit. Lemons are well stored in boxes with sand, which is pre-calcined for the purpose of disinfection.^[3]

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