

# Malic acid - description, benefits, effects on the body and the best sources

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**Abstract.** Malic acid belongs to the class of organic acids and is a colorless crystalline powder with a sour taste. Malic acid is also called hydroxysuccinic acid, malanic acid, or simply designated by the coding E-296.

Many acidic fruits and some vegetables are rich in malic acid. It is also present in dairy products, apples, pears, birch sap, gooseberries, tomatoes, and rhubarb. Large amounts of malic acid are produced through fermentation.

At enterprises, malanic acid is added to many soft drinks, some confectionery products, and in wine production. It is also used in the chemical industry for the production of medicines, creams and other cosmetics.

*Keywords:* malic acid, general characteristics, daily requirement, digestibility, beneficial properties, signs of deficiency, signs of excess

## Products rich in malic acid:

- Green apples [1]
- Barberry
- Cherries [2]
- Quince
- Plums [3]
- Gooseberry
- Rowan [4]
- Rhubarb
- Tomatoes [5]
- Dogwood
- Apricots [6]
- Raspberry [7]
- Wine
- Carbonated drinks
- Fruit and berry products (sorbet, marmalade, pastille)

## General characteristics of malic acid

Malic acid was first isolated in 1785 by the Swedish chemist and pharmacist Carl Wilhelm Scheele from green apples. Further, scientists discovered that malanic acid is partially produced in the human body and plays a certain role in the metabolic processes of the body, its cleansing and energy supply.

Today, malic acid is usually divided into 2 forms: L and D. At the same time, the L-form is considered more beneficial for the body, since it is more natural. The D-form is formed at high temperature by reduction of D-tartaric acid.

Malic acid is used by many microorganisms for the fermentation process. Often used in the food industry as a stabilizer, acidity regulator and flavoring agent.

### **Daily requirement for malic acid**

Nutritionists believe that the body's need for malic acid will be fully satisfied by 3-4 apples a day. Or an equivalent amount of other products containing this acid.

### **The need for malic acid increases:**

- when metabolic processes in the body slow down;
- fatigue;
- with excessive acidification of the body;
- with frequent skin rashes;
- problems with the gastrointestinal tract.

### **The need for malic acid is reduced:**

- for allergic reactions (itching, herpes [8]);
- with discomfort in the stomach;
- individual intolerance.

### **Absorption of malic acid**

The acid is highly soluble in water and is quickly absorbed by the body.

### **Beneficial properties of malic acid and its effect on the body:**

Malic acid plays an important role in metabolic processes. Cleanses the body, regulates the acid-base balance in the body. In pharmacology, malic acid is used in the production of medicines for hoarseness; it is part of laxatives.

### **Interaction with other elements**

Promotes complete absorption of iron [9], interacts with vitamins, and is soluble in water [10]. Can be produced in the body from succinic acid.

### **Signs of malic acid deficiency:**

- violation of acid-base balance;
- rashes, skin irritation;
- intoxication, metabolic disorders.

### **Signs of excess malic acid:**

- discomfort in the epigastric region;
- increased sensitivity of tooth enamel.

## Factors influencing the content of malic acid in the body

In the body, malic acid can be produced from succinic acid, and also comes from food products containing it. In addition to the consumption of appropriate foods, the sufficient amount of malic acid in the body is influenced by the daily routine and the absence of bad habits (smoking and excessive alcohol consumption). Physical activity helps the body absorb many nutrients more fully, including malic acid.

## Malic acid for beauty and health

Malic acid, or malanic acid, is often included in various creams with moisturizing, cleansing and anti-inflammatory properties. Thus, in the composition of creams you can often find extracts of lingonberries, cherries, apples, rowan, where malic acid is an obligatory component.

Malanic acid gently cleanses the skin, dissolving dead cells, thereby creating a peeling effect. At the same time, wrinkles are smoothed out and the deep layers of the skin are renewed. Pigment spots fade, and the skin's ability to retain moisture increases [11].

Malic acid is a frequent companion to homemade face masks. For lovers of such procedures, it is no secret that the skin after fruit masks (apple, apricot, raspberry, cherry, etc.) smooths out and becomes more elastic, fresh and rested.

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