



Chicken egg

Eliseeva Tatyana, editor-in-chief of the EdaPlus.info project

Alena Tarantul, nutritionist

E-mail: eliseeva.t@edaplus.info, tarantul.a@edaplus.info

Abstract. The article discusses the main properties of a chicken egg 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 product are indicated, the use of chicken eggs in various types of medicine and the effectiveness of its use in various diseases are considered. The potentially adverse effects of a chicken egg on the human body under certain medical conditions and diseases are analyzed separately. The scientific foundations of diets with its use are considered.

Key words: chicken egg, benefit, harm, beneficial properties, contraindications

Beneficial features

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

Main substances (g/100 g):	Raw yolk [1]	Raw protein [2]	Boiled or poached egg (whole) [3]	Egg fried on rast. oil (whole) [4]
Water	52.31	87 , 57	75 , 58	66.82
Carbohydrates	3.59	0.73	0.72	0.76
Squirrels	15.86	10.9	12 , 47	13.27
Alimentary fiber	0	0	0	0
Sugar	0.56	0.71	0.37	0.39
Fats	26.54	0.17	9.44	17.24
Calories (kcal)	322	52	142	215
Minerals (mg/100 g):				
Phosphorus	390	fifteen	197	209
Calcium	129	7	56	59
Potassium	109	163	137	146
Sodium	48	166	429	457
Magnesium	5	eleven	12	13
Iron	2.73	0.08	1.74	1.86

Zinc	2.3	0.03	1.28	1.36
Copper	0.077	0.023	0.072	0.076
Vitamins (mg/100 g):				
Vitamin E	2.58	0	1.04	1.95
Vitamin B2	0.528	0.439	0.431	0.459
Vitamin A	0.38	0	0.16	0.17
Vitamin B6	0.35	0.005	0.16	0.171
Vitamin B1	0.176	0.004	0.034	0.036
Vitamin PP	0.024	0.105	0.071	0.075
Vitamin C	0	0	0	0

The first two columns of the table show the content of vitamins and minerals per 100 g of the product, which allows you to correctly compare raw protein and yolk and see that the content of phosphorus, calcium, iron, zinc, vitamins E, A, B1 and B6 is almost completely "responsible » yolk. It also contains 23-26% neutral fat, 16% protein, phospholipids (11%), minerals (3%), cholesterol (0.8-1.5%). Includes polyunsaturated, monounsaturated and saturated fatty acids.

But in the protein of the same mass there is more potassium, sodium, magnesium, vitamin PP . In addition, the protein part of the egg is represented by ovalbumin (54%), antibacterial ovotransferrin (12%) and lysozyme (3.5%), etc. But in one egg, the masses of the yolk and protein are not equal. The average ratio of yolk, protein and shell in a chicken egg that has completed maturation is 8:14:3, respectively, which must be considered when including eggs in nutrition programs.

Medicinal properties

The therapeutic effect of the egg is achieved primarily due to the easily digestible protein. With regular use, it helps:

- increase muscle mass
- strengthen the bones
- maintain tissue integrity
- fight overweight
- activate brain functions
- lower blood pressure,
- prevent cataracts and improve vision,
- reduce the deposition of cholesterol formations on the walls of blood vessels,
- keep the liver working.

Chicken egg protein is generally considered the most easily digestible source of all essential amino acids, many of which have an antioxidant effect (ovotransferrin, lysozyme).

The yolk has a more controversial reputation. On the good side, it is characterized by the fact that it is useful for skin diseases, protects against osteoporosis and has a choleretic effect. And the appearance of a negative assessment is provoked by the cholesterol contained in the yolk , which can potentially cause the development of cardiovascular pathologies.

The problem of cholesterol in chicken eggs

On the issue of the influence of cholesterol contained in eggs on the state of the cardiovascular system, two antagonistic camps were clearly identified:

Opponents of egg nutrition, citing scientific research, argue that an abundance of cholesterol increases the risk of sudden death and significantly worsens the condition of blood vessels. Moreover, only one egg per day is called a “dangerous dose”.

Supporters of egg nutrition also, with references to numerous, but more modern scientific studies, argue that one egg per day not only does not threaten the cardiovascular system, but also improves its condition. Even for risk groups (smokers, diabetics and people with heart problems), moderate consumption of eggs (1 pc. in 2-3 days) is quite acceptable.

In this debate, we will refer to the opinion of Anthony Komaroff, a physician from Harvard Medical School [5]. According to him, for most healthy people, one egg a day is normal and does not contribute to the development of heart disease or stroke.

Previously, both in medicine and among the people, it was believed that since there is cholesterol in the egg yolk, and cholesterol in the blood increases the risk of developing cardiovascular pathologies, it is logical that it is better to exclude eggs from the diet. However, since then, many studies have shown that the main cholesterol in our body is produced by the liver, and does not come directly from foods. The liver produces it from the processing of saturated and trans fats. One large chicken egg contains only about 1.5 g of saturated fat. At the same time, it has many useful components: lutein, zeaxanthin (for the eyes), choline (for the brain and nerves), vitamins A, B, D.

Evidence that the amount of cholesterol in an egg (if you eat one a day) is safe for most people comes from a large-scale study at Harvard Medical School that followed hundreds of thousands of people over several decades. They filled out questionnaires describing their diet and illnesses they had. According to the results, it turned out that the presence of eggs in the diet (no more than 1 per day) was not associated with a higher rate of development of heart disease or death from these diseases.

Anthony Komaroff noted at the same time that what is eaten with eggs is of great importance. Saturated fats from butter, cheese, bacon, sausages, sweets, or starchy foods increase cholesterol by a fraction more than 1 egg a day.

Based on this, apparently, it would be possible to determine the consumption rate of this product at the level of 1 egg per day for healthy active people. However, more cautious nutritionists call 2-3 eggs per week the optimal amount. For Russia, for example, the recommended norm is 260 pcs. in year. Below, in the relevant section, we review other studies supporting the cholesterol safety of the moderate egg diet.

Use in medicine

The enzyme lysozyme and shells are used as raw materials for the pharmaceutical industry.

Lysozyme is an antibacterial agent that is able to break down the cell walls of bacteria. In the food industry, it is known as food preservative E1105. And in medicine it is used as a local antiseptic, for example, as part of the preparations "Lizobakt", "Lysoprim Lor".

On the basis of the shell, some calcium preparations are prepared - for example, Calcid. Such funds are often additionally enriched with vitamins (including those that contribute to better absorption of calcium: D 3, C).

A number of vaccination bases are grown on chicken embryos, including vaccines against influenza, causative agents of typhus, yellow fever, and encephalitis. In immunology, the main egg protein, ovalbumin, is used to stimulate test allergic reactions.

In addition, chicken eggs are part of therapeutic diets No. 1 and No. 5. Diet No. 1 is prescribed in therapeutic recovery programs after acute gastritis, with stomach and duodenal ulcers. Diet number 5 is aimed at reducing the risks of digestive problems.

In folk medicine

Since ancient times, eggs in folk medicine have been used to treat diseases of the respiratory system, pathologies of the gastrointestinal tract, stop bleeding (including hemorrhoidal origin), and relieve burns. In the daily diet of men in their raw form, they were introduced to enhance potency.

- **Respiratory organs .**

In the handbook of traditional medicine, a case of an amazing healing of a patient from tuberculosis is described with the help of chicken yolks alone. The girl, who was refused by official medicine, daily drank up to fifty yolks of chicken eggs at the beginning of treatment and up to a hundred yolks at the end of treatment, which lasted 4 months. Although such therapy can be called extreme, it, according to the author of the reference book, led to a complete recovery of the patient.

But a much simpler folk way to treat tuberculosis also involves the use of raw yolks (2 pcs.), Which in the recipe are ground with butter (1 tbsp.), Honey (1 tbsp.) And starch (1 des. l.). This mixture is kept in the refrigerator, taking 1 tbsp. l. twice a day.

And to get rid of a slight cough, people often prepare a mixture, the recipe of which is generally more similar to the usual eggnog, which healthy people make for breakfast: a raw egg is beaten with sugar or honey and taken on an empty stomach, drinking plenty of water an hour later.

- **Gastrointestinal tract .**

Helicobacter pylori plays an active role in the appearance of gastritis, stomach ulcers, inflammation of the duodenum . To combat it, traditional healers recommend in the morning two hours before breakfast and be sure to drink a raw and preferably still warm chicken egg on an empty stomach.

This recommendation can be explained by the fact that crude protein reduces the acidity of gastric juice, which in the morning, before eating, is normally about 1.5-2 pH. Since bacteria remain active at 4-9 pH, they can be controlled by reducing the acidity of the environment. In addition, the egg enzyme lysozyme begins to act as an antibiotic on the bacterium, which only increases the effectiveness of the method.

If in the previous method it was enough just to drink one egg every morning, then for the treatment of dysentery, healers used a whole scheme of egg nutrition, designed for 6 days:

1-2 day: 12 pcs. - 2 pcs. every 2 hours.

3-4 day: 8 pcs. - 2 pcs. every 3 hours.

5-6 day: 4 pcs. - 2 pcs. in the morning and in the evening.

- **Treatment of hemorrhoids**

An egg-oil mixture is prepared to stop various kinds of bleeding, but as an example, we will give a recipe compiled for the treatment of hemorrhoids. The yolk of a boiled egg and a piece of butter of the same size are mixed together, and then copper sulfate is added to them (a pinch the size of a match head). The resulting product is stored in the refrigerator, but before going to bed 1 tsp. This mixture is

rolled into a small cylindrical candle and inserted overnight into the anus. To obtain the effect, the procedure will need to be repeated several times.

egg infusions

There are egg infusions that traditional medicine positions as an ancient remedy for fighting cough, bronchitis, tuberculosis, and pneumonia. In one of the existing recipes, washed whole eggs (7 pcs.) Are placed on the bottom of a 3-liter jar and covered with gruel from lemons passed through a meat grinder (1.5 kg of citrus are ground together with the peel). The jar is closed with gauze and placed in the refrigerator for three days. Then its contents are transferred to another bowl, thoroughly kneaded and passed through a sieve. And in the end, all this is poured with a mixture of honey (1 l) and cognac (0.5 l).

You need to take the tincture three times a day, 20 minutes after eating, 1 tbsp. l. Store a 3-liter jar in the refrigerator, covering the neck with gauze. But usually such a remedy is prepared in smaller volumes in order to have time to drink it within 2 weeks until it deteriorates.

In the literature, there are variants of a similar recipe, in which whole eggs (3-4 each) and lemon "porridge" (3-4 cm) are stacked in layers until the vessel is completely filled. The jar is then kept in a dark place for 10 days, and after adding lemon, brandy, and collecting herbs (sage, licorice root, sweet clover), another 3 days in the cold. In such a recipe, cake is first used for treatment, which is brewed in a thermos at the rate of 3 tbsp. l per 0.5 l of boiling water to drink 150 ml before meals. And when the cake ends, go to the main drug. Healing liquid 1 tbsp. l. take three times a day 20 minutes before meals.

As a means to strengthen bone tissue in folk medicine, infusions of calcium-rich eggshells are used. Before use, the shell is first thoroughly washed, disinfected, ground into powder, and then the powder is poured with hot water to obtain a calcium infusion.

However, from a biochemical point of view, this is meaningless. Calcium carbonate, which forms the basis of the eggshell (it is 90-95% there), is present in a water-insoluble form, and an aqueous infusion will not work from it. But since such a powder dissolves the hydrochloric acid contained in the stomach well, it makes sense to eat a spoonful of the shell to compensate for calcium deficiency if, for some reason, numerous calcium preparations are not available. Only this will require additional effort: you will first need to thoroughly wash and then grind the shell. Although, for example, the famous Avicenna treated his patients in this way, giving them a pinch of ground eggshell per day.

In the mystical tradition, another truly folk method of treatment is practiced - rolling out spoilage and various diseases with an egg. This procedure has acquired numerous details over the centuries. On the territory of our country, from some point on, elements of pagan and Christian rituals have firmly merged in it, the choice of which varies in different regions and healing "schools". However, the purpose of the procedure is the same everywhere: as a result, the egg should take on all the negativity and illness of the patient.

in oriental medicine

Hen egg treatment is very common in Chinese medicine, often combined with vinegar and lemon. But to get the maximum effect, you need to review the rest of the diet for compliance with the rules of the Eastern worldview. Below are examples of some classic "egg" recipes for various diseases:

- **Prevention of atherosclerosis** . An egg (1 pc.) Is immersed in apple cider vinegar (180 ml) for 2 days. Then the softened shell is removed, and the contents are shaken and divided into 7 parts (for a weekly course). The remedy is taken in the morning with two parts of honey dissolved in water.
- **Ischemic disease** . Chicken eggs (2 pcs.) Are immersed in vinegar (400 ml), closed and cleaned in a dark place for 4 days. After that, the eggs are broken, and the contents are mixed and infused for another 3 days. The remedy is drunk in 1-2 tsp. three times a day for a week.
- **Hernia** . Eggs (2 pcs.) Are mixed with anise (20 g), overcooked with salt until a yellowish color appears. The remedy, together with a sip of rice vodka, is drunk before going to bed for 4 days.
- **Diabetes mellitus** . The contents of the eggs (5 pcs.) Are mixed with vinegar (150 ml) and infused in the refrigerator for a day and a half. Then honey and vinegar (150 ml each) are added to the mixture. The drug is taken twice a day for 1 tsp.
- **Male infertility** . Raw chicken eggs (2 pcs.) Are mixed with boiled milk (500 ml) and honey (2 tablespoons). Such a "cocktail" should be drunk every day for a month.

However, there are even more interesting ways to restore health in China. For several centuries, there has been a tradition in Zhejiang province to prepare a healing dish called tongzidan, which literally translates as "boy's egg" every new spring. Chicken eggs for him are placed in a vessel with the urine of immature boys (up to 10 years old), and then boiled for a whole day. In the process of cooking, the urine is first brought to a boil with eggs dipped into it, and then the shell is slightly pierced and left on low heat, adding liquid from time to time.

Since such a tradition is still alive throughout Zhejiang province (since 2008, the practice of cooking tongzidan has become an object of intangible cultural heritage), a lot of urine is needed for the dish. Therefore, in the educational institutions of the region, special buckets are put up, where healthy boys relieve themselves of a small need. The spring delicacy costs twice as much as an ordinary chicken egg, but there are more benefits from it. According to representatives of traditional Chinese medicine, tongzidan as a medicine can stop bleeding and reduce high fever.

In scientific research

The scientific community, which used to be mostly critical of the regular consumption of eggs due to the harm of cholesterol in the yolk, has rediscovered this product in the last decade and is revisiting previous restrictions and prohibitions.

Regular consumption of eggs reduces the risk of developing cardiovascular pathologies .

A group of Chinese and British scientists tried to establish a link between the consumption of eggs and cardiovascular pathologies (coronary heart disease, heart attack, ischemic and hemorrhagic hemorrhage - stroke). For this, during 2004-2008. The study involved 416,213 people aged 30 to 79 who had previously been free of cancer, cardiovascular disease, and diabetes. And then the scientists observed the subjects until the development of cardiovascular disease or death.

At the start of the study, 13.1% of participants reported eating eggs daily (mean 0.76 egg/day) and 9.1% reported eating eggs very rarely or not (0.29 egg/day). A subsequent analysis of the results showed that, compared with people who did not eat eggs, those who ate them every day had a lower risk of developing cardiovascular pathologies.

In particular, 1 egg per day reduced the risk of hemorrhagic stroke by 26%, death from hemorrhagic stroke by 28%, and death from other diseases of the cardiovascular system by 18%. It was also found

that the introduction of eggs in the diet (5.32 eggs/week) reduced the risk of developing coronary heart disease by 12% compared to those who excluded eggs from the diet or ate them rarely (2.03 eggs/week) [6].

One egg a day reduces the risk of diabetes in middle-aged men .

Finnish scientists conducted a study of risk factors for coronary heart disease, which often occurs as a complication in type 2 diabetes. They concluded that eating an average of one egg per day was associated with a reduced risk of developing this type of diabetes in middle-aged men who were participants in the experiment.

To establish the link between the introduction of eggs in the daily diet and diabetes, scientists used a metabolomic approach (analysis at the molecular level). They were able to find out that in the blood of men with diabetes who ate eggs, there were lipid molecules that are present in blood samples of men without diabetes [7].

Eating eggs is likely to help lower blood pressure .

Canadian scientists in laboratory studies have found that some peptides (short fragments of proteins), which enzymes produce in the stomach and small intestine from boiled and fried eggs, act similarly to ACE inhibitors, which are prescribed to prevent heart disease and lower blood pressure. Fried eggs provided the greatest activity of ACE inhibitors. And although the study was conducted so far only in the laboratory without testing in humans, the identified dependence opens up new horizons for further research [8].

The yolk helps build muscle .

Usually, when building muscle, people go on a protein diet, so it's common practice to throw away the yolk and eat only the protein. But scientists at the University of Illinois say it's counterproductive. First, the yolk also has protein. Secondly, it contains components that are absent in the protein, but allow the body to enhance the incorporation of protein into the muscles.

In the study, 10 young people did strength training, after which some of them ate a whole egg, and some - an egg white containing 18 g of protein. In this experiment, special eggs were used, in which the amino acid leucine was specially labeled, so that scientists at any time (after eating the egg), taking blood and biopsy from the muscles, could understand how this amino acid was distributed.

Using these labeled eggs, the researchers were able to find that after both eating the whole egg and eating protein alone, about 60-70g of amino acids were available in the blood for new muscle protein synthesis. Usually, it is this indicator that gives reason to evaluate the potential benefits of a product for building muscle mass. However, when the scientists directly measured muscle protein synthesis, they found that a whole egg immediately after a workout led to increased synthesis compared to eating just protein.

At first, the researchers thought it was all about fat. In a whole egg, in addition to 18 g of protein, there are also about 17 g of fat. But when they began to add 17 g of fat to the protein, the intensity of protein synthesis remained unchanged. As a result, scientists came to the conclusion that there are some components in the whole egg that enhance synthesis and make muscle building more effective [9].

Fosvitin from egg yolk can slow down the synthesis of melanin, inhibiting skin cancer .

Egg yolk contains the protein fosvitin, which has the ability to bind metals. Scientists tested whether it would help stop the synthesis of melanin in cells in melanoma (skin cancer). The results showed that fosvitin reduced the activity of the enzyme tyrosinase, which catalyzes the synthesis of melanin. The

addition of 50 μ g / ml fosvitin to melanoma cells resulted in a 42% decrease in tyrosinase activity and a 17% decrease in melanin synthesis compared to the control group of cells (no addition of fosvitin).

This study suggests that fosvitin can be used as an inhibitor of melanin synthesis in the cosmetic industry and nutrition [10].

Weight regulation

The calorie content of the “yolk + protein” complex in the proportion in which they are present in a chicken egg (8:14, respectively) per 100 g is approximately 150-160 kcal. Moreover, the main share of calorie content falls on the yolk - it is 6-7 times more caloric than protein. In one medium raw egg that weighs 50 g (without shell) there will be about 75-80 kcal. In large eggs of the highest category weighing more than 75 g - about 120 kcal.

When including eggs in the diet, the method of preparation should also be considered. Depending on it, egg dishes can increase the calorie content by 2 or more times. In addition, the rate of assimilation of the product is also changing. So, for example, hard-boiled eggs will be digested more slowly than soft-boiled eggs: 3 and 1-2 hours, respectively.

There are no strict rules in egg diets, but athletes and bodybuilders, when losing weight, usually leave only protein in large quantities and, at the same time, either completely exclude the yolk from the diet or reduce it to a minimum (for example, mixing protein from 8 eggs and yolk from 1-2).

Egg diets outside of sports programs aimed at losing weight allow the use of a whole boiled egg for breakfast: from 1-2 to 7 pcs. in Week. But switching to a 7-day mono-diet is not recommended, since it is rather difficult to tolerate. It has low balance, and the effect of it is greatly exaggerated.

American scientists specifically compared how breakfast with an egg will be more effective than a breakfast with a yeast bagel (equal to an egg in terms of calories and energy value) in the fight against extra pounds in obese people during a low-calorie diet. Under the conditions of this diet, participants in the experiment who received breakfast with an egg showed a trend towards a greater decrease in waist circumference (by 34%) than participants who ate a bagel breakfast. And in general, the first group lost weight 65% more effectively than the second. However, a concomitant low-calorie diet proved to be an important factor, since without it the difference between “egg” and “donut” blurred [11].

In cooking

Today, chicken eggs are present in culinary recipes in almost all countries of the world. They are fried, boiled, baked, pickled, salted and simply eaten raw. The constituent parts of the egg become elements of many recipes. Egg yolk is considered the basis of mayonnaise and many other sauces (for example, hot egg-and-butter “hollandaise”), and whipped egg white is the basis of biscuit dough, meringue and soufflé (if sugar is added to it).

Eggs make excellent dessert drinks and cocktails:

In America and Europe, sweet eggnog, a mixture of raw eggs and milk, is very popular during the Christmas period.

In our country, eggnog is better known among sweet egg drinks, to create which they take beaten egg white, sugar (salt) and add wine, honey, rum, juice or even cocoa to taste.

Italian sabayon (egg cream with wine, rum and cinnamon, whipped in a water bath) has become so popular that it is made in Argentina, Colombia, and Venezuela under their own names. There is a similar dessert in France. There, a dish in a water bath of yolks and wine is called shodo.

A beaten chicken egg is even mixed with beer. So, for example, British hot flip-type cocktails are prepared by pouring rum or other strong alcohol into them.

"Hard" and creamy egg desserts are no less common. Among the most famous are: French meringue (cake made from whipped proteins), Spanish "flan" (caramel pudding), Portuguese "barriga de freira" (yolk dessert created by nuns back in the 17th century), etc.

One of the most common egg dishes is the classic omelet. It is prepared by mixing (without beating) several eggs with the addition of spices. In some countries, milk is added to the resulting mixture. The mixture is fried in a pan, preheated and greased with butter, bringing the mass to a thickening. In this state, an omelette can be folded in half or an "envelope", stuffed with vegetables, rice, meat and other products traditional for the national cuisine.

So, thanks to the peculiarities of cooking or the choice of filling, there appeared:

- Spanish tortilla in olive oil with potatoes,
- Italian frittata stuffed with cheese, vegetables and sausages, which is brought to full readiness already in the oven,
- Belarusian drochena, in which eggs are kneaded with yogurt or milk with the addition of flour or cereals, etc.

Today, omelettes are also very popular in Japan. In the middle of the 20th century, the famous Japanese dish appeared - tamagoyaki, which is a spicy and sweet omelette, very fond of Japanese children. Tamagoyaki is fried in special rectangular pans (makyakinabe). The egg in this recipe is first rolled into a thin layer, and then rolled into a rectangular roll with chopsticks. But in recent years, tamagoyaki in Japan has had other competing egg-based dishes:

- usuyaki-tamago from even thinner layers than tamagoyaki,
- similar to our iri-tamago scrambled eggs,
- consisting of thin threads of kinsi-tamago.

But perhaps the most exotic approach to egg cooking is China. We have already mentioned the tongzidan dish - a chicken egg that is boiled all day in the urine of healthy immature boys. But this is not the only egg delicacy in Chinese cuisine.

A very popular snack in the PRC and neighboring countries of Southeast Asia is called the "centenary egg" (a variant of the name is "thousand-year-old egg"). There are several regional recipes, but they all have one thing in common: to create a snack, a chicken (or duck) egg is immersed in a special alkaline mixture, and "the vessel is sealed so as to exclude air. Traditionally, an alkaline environment was created with a mixture of lime, clay, ash, tea and salt wrapped in a cocoon of straw and rice husks. Then this cocoon was buried in the ground for a period of 0.5 to 4 months. In modern conditions, sodium hydroxide is more often used as an alkaline coating and polymer films as a sealed container.

During the time spent in a sealed state, the protein and yolk change chemical and physical characteristics:

- the pH level rises to 9-12 (for comparison, it is 9-10 for fatty hand soap, and 11.5 for ammonia),
- the protein changes color to dark brown, becoming elastic,
- the yolk turns into a creamy state, starts to smell like ammonia and darkens very much, sometimes turning almost black,

- the surface of an egg without a shell can be covered with crystals resembling frost or a coniferous branch, which caused another alternative name for the snack - "pine eggs".

Such a dish is served, as a rule, without additional processing, simply cutting them into slices or crumbling into salads. Often, the appetizer is seasoned with oyster or soy sauce.

In cosmetology

In home cosmetology, chicken eggs are used very widely, being part of dozens of face and hair masks, shampoos and mousses.

Protein is introduced into masks to shrink pores and cleanse the skin. After the raw protein dries, both dirt and excess sebum are removed along with the film.

The yolk is used as a nourishing agent with a moisturizing effect, it is usually included in the care programs for dry and normal skin.

Manufacturers of skincare cosmetics have also begun to actively use the chicken egg. Some companies produce whole series of cosmetic products on an egg basis. For example, the Korean brand Too Cool For School released a line in which they collected egg masks for narrowing pores, moisturizing the skin, an emollient face cream, a cleansing hair mousse mask, and even an egg oil for the body.

Dangerous properties and contraindications

The danger of chicken eggs for health is associated with three main factors: an allergic reaction, the effects of cholesterol on the body and the risk of salmonellosis.

Allergy to eggs is considered one of the most common in 2-3-month-old children. By the age of 4-5 or a little later, it most often disappears and in adults it is already quite rare. The ovomucoid contained in the protein, also known as the f233 allergen, causes allergies. But if a reaction to chicken protein is detected, in order to exclude cross-reactivity, both the yolk and eggs of other birds can be completely excluded from the diet.

Cholesterol from chicken eggs, when consumed in moderation, will not harm a healthy person. But people with damaged vascular walls and an increased risk of developing atherosclerosis, suffering from diabetes, acute pancreatitis, diseases of the liver and gallbladder, do not recommend eating fried eggs at all, and the number of boiled eggs is significantly reduced. In this case, special emphasis is placed on the exclusion of the yolk from the diet.

There are no fresh salmonella eggs inside. Normally, this bacterium should not be on the surface of the egg. But chicken can be infected with salmonellosis, the droppings of which sometimes fall on the shell. Gradually, the bacteria begin to penetrate the natural barrier and infect the contents of the egg. This process can take from several hours to 5 days. If the shell is damaged (cracks on the surface), infection occurs much faster.

Low temperatures and even freezing do not kill this bacterium, but rather preserve it for a long time (for a year or more). But high temperatures are detrimental to salmonella, but to destroy the microbe, the whole egg should be fried or boiled. That is, scrambled eggs with liquid yolk remains a potentially dangerous product, although the risk of infection is not very high, given that there is bacteriological control in poultry farms. However, to reduce the risk, it is better to take fresh eggs and wash the shell with soap before breaking it so that the bacterium (if it was still on the egg) does not get into the pan from the surface of the shell.

It is not advisable to wash the eggs in advance (for example, before putting them in the refrigerator), since the protective layer is washed off the shell and the shelf life of such eggs is drastically reduced. But before cooking each egg, you still need to wash it with warm water.

In addition, over time, even an initially well-protected whole egg naturally begins to lose the antibacterial enzyme lysozyme, so its protein and yolk become more vulnerable to the growth of various bacteria and molds that penetrate through the pores of the shell. And this means that fresh eggs are not only healthier, but also safer.

Selection and storage

In addition to the fact that the eggs must be clean - without traces of droppings and feathers - they must also not have foreign odors. A fishy aroma, even with an outwardly normal egg, can indicate contamination of the product. However, it is not always possible to catch the smell without breaking the eggs. Therefore, an important guideline for a buyer who purchases eggs in a store (and not from housewives "from hands") remains the marking that is applied at the final stage of egg selection at poultry farms and on the general packaging, and on each individual egg (on the side or at the blunt end). According to the state standard, the division into 3 classes of eggs intended for domestic sales is accepted (the export classes of eggs "extra", "A" and "B" are separately divided):

Dietary are designated by the letter "D" - the highest class for the domestic consumer. Such eggs should be stored for no more than 7 days (starting from the day following the marking) in a temperature range of 0-20 C.

Canteens are designated with the letter "C" - eggs are transferred to this class, the implementation period of which does not exceed 25 days under the same storage conditions.

Food chilled - a class of eggs that were stored at a low temperature of -2-0 C for no more than 90 days.

There is also a class of eggs intended for industrial processing, but such a product does not get into stores. A similar (though not always identical) class division persisted in some other countries of the post-Soviet space.

In addition, there is an additional division by weight of eggs indicating one of 5 categories. Ukrainian producers use Latin letters for marking eggs for export, as in the dimensional grid of clothes. For the domestic market - just like Russian and CIS manufacturers - an alphanumeric designation. Moreover, if the largest (heaviest) eggs according to the Ukrainian state standard are considered "Choice", then in Russia these are eggs of the "Highest" category, although both are marked with the same letter "B". The requirements for categories by the criterion of the mass of one egg can be presented in the following table:

Ukraine (DSTU 5028:2008)				Russia (GOST 31654-2012)		
Weight, g	Category	Marking	Export	Weight, g	Category	Marking
73+	selected	AT	XL	75+	Higher	AT
63-72.9	Higher	O	L	65-74.9	selected	O
53-62.9	First	one	M	55-64.9	First	one
45-52.9	Second	2	S	45-54.9	Second	2
35-44.9	Small*	3		35-44.9	Third	3

*for table and chilled

The standard by which the eggs have been sorted and labeled must be written on the packaging. On dietary eggs (as opposed to table and chilled), in addition to the group and category, the date and month of egg laying are also indicated. The name of the farm in which the egg was collected is also applied to the shell.

With domestic eggs devoid of any markings, in matters of the date of laying and storage conditions of the product, you usually have to take the word of the seller. But there are a few tricks that help the buyer determine the quality of the goods on the spot.

Transillumination .

This method involves transilluminating the shell with a flashlight or ovoscope. Modern ovoscopes are more like flashlights, but the classic model looks like a "box" with a lamp inside and forms to hold the egg - such are still found in some deli and grocers. First of all, transillumination will show the size of the air chamber, which should not be in a "warm" freshly laid egg at all. In a lying egg, an air bubble begins to form between the shell membranes of the blunt end. It appears due to the evaporation of water through the pores of the shell. The longer the egg is stored, the larger the bubble.

Diet eggs (up to a week old) have a chamber no larger than 4 mm. In eggs aged 1.5-2.5, it is about 6-7 mm. And in an egg that has lain for 3-4 weeks, the air chamber can increase to 1 cm. Moreover, if storage conditions are violated, it will also begin to "wander" around the egg, although normally it should remain at the blunt end even when turned over.

In addition to the air bubble with the help of translucence, you can notice other flaws, in the presence of which it is better to refuse to buy:

- large, dark yolk, displaced or even "stuck" to the shell,
- too mobile yolk, which occurs due to the liquefaction of the protein over time,
- mixed (spread) protein and yolk, which occurs due to damage to the yolk membrane,
- blood clots and any dark spots (red, gray) that may indicate a fungal disease.

It is also not advised to buy multi-yolk eggs, as this is considered a violation of the standard.

Immersion in water .

For testing, water is poured into a transparent container and the egg is lowered into it. The larger the air cavity under the shell, the more the egg will "want" to float. Therefore, by the position of the egg and by the angle of inclination, one can approximately determine its age:

- horizontally at the bottom - fresh egg (up to 3 days),
- the sharp end is at the bottom, and the blunt one rises up at an angle of 30-60 ° - 7-14 days,
- the sharp end is at the bottom, and the blunt one is located vertically (90 ° to the bottom plane) - about 3 weeks,
- the egg rises to the surface or the blunt end is lower than the sharp one - the terms and / or storage conditions are violated.

The first method is more suitable when choosing eggs with a white shell, because the contents of brown ones (due to the dark color of the shell) are less visible. But the peculiarity is that in the markets at the hostesses, buyers often look for brown eggs, considering them better and more useful than white ones.

This is a delusion, and it often coexists with another erroneous opinion that the color of the shell depends on the color of the bird's plumage. To deal with this, let's take a closer look at how brown chicken eggs differ from white ones.

The difference between white and brown eggs

From a consumer point of view, there is no difference between eggs with shells of different colors. The nutritional value, physical and chemical properties and, accordingly, the therapeutic effect of such eggs, all other things being equal, are the same. The opinion that brown-shelled eggs are more useful should be attributed, rather, to the peculiarities of psychological perception, which may have different reasons. For example, it is often believed that the brown color of the shell is a sign that the egg was laid by a domestic chicken, which was fed better and better, but this is not the case either.

The color of the shell is due to the genetic characteristics of the bird. In some breeds and crosses of chickens, the eggs will be white, in others they will be brown (with various shades), in others they will be blue or green (as, for example, in birds of the Araucan breed). Neither the nutrition of the laying hens nor the color of the plumage affect the color of the shell. The only thing that matters is belonging to one or another breed or cross.

Chicken crosses are interbreed hybrids that are bred to improve the consumer characteristics of the product - eggs and / or meat -, and only for this (without getting offspring from birds). Accordingly, in order to improve egg production, geneticists bred special crosses of chickens of the egg direction, and to increase the share of chicken meat, special poultry of the meat direction. There are also combined (meat and egg) crosses, thanks to which, mainly, brown eggs appear on store shelves.

Modern crosses of the egg direction lay exclusively white-shelled eggs, because they were all bred from a breed called Leggorn, which is genetically inherent in laying white eggs. The hens of this breed themselves can wear both white and brown plumage, but their eggs are still white.

But all modern crosses of the combined and meat direction give brown eggs (from dark brown to creamy beige). And also - regardless of the color of plumage. For example, white plymouth rock birds lay light brown eggs. Although most chicken hybrids of these directions were bred on the basis of New Hampshire, red and white Rhode Island breeds.

Thus, if eggs of chickens of an egg direction turn out to be in the store, then their shell will be white. If combined or meat direction, then the shell will be brown. (Although the "meat" hybrids of chickens are bred, first of all, for the sake of meat). Why, then, in the popular mind, a brown egg is often associated with a homemade one? This can be explained.

For the preparation of eggs in poultry farms, they often prefer to keep birds of egg crosses, that is, laying white eggs (therefore, there are more of them in stores). Such chickens, as the name of the direction implies, are distinguished by the best egg production. The most productive hybrids carry about 300 eggs in the first year, but they are not able to maintain high productivity further, and they are usually slaughtered.

Purebred birds lay one and a half to two times less often (up to 200 eggs per year), but they do not lose egg production for several years. Therefore, in households and on mini-farms, purebred chickens (rather than crosses) are more often kept, and often those breeds that genetically tend to lay eggs with colored shells. This freedom of breed choice increases the frequency of brown eggs in households. And when you consider that homemade food is considered healthier for chicken, it all works together to improve the reputation of brown eggs.

The difference between store-bought and homemade eggs

The difference between domestic eggs and shop eggs is not only that laying hens at conveyor-type poultry farms are not fertilized by a rooster and carry sterile eggs from which a chick cannot hatch. Poultry, unlike chickens in poultry farms, tends to lead a free-living lifestyle, eating a varied and usually natural diet, which is believed to ultimately affect the quality of the eggs. Some egg-eaters even claim that a homemade egg smells like "health" because of this.

However, it is difficult for the consumer to check what the hostess actually feeds her layers, and, all the more, it is difficult to compare with the composition of the feed at poultry farms. As a rule, in factories, the feeding process is a multi-stage program focused on the needs of a particular breed or hybrid. The composition of the feed may include wheat, corn, alfalfa, nutritional supplements that promote digestion, processed substandard product from the same factory, etc.

Among other things, elements that affect the color of the yolk are often added to the feed. Despite the fact that this measure increases the final cost of the product, it also increases the consumer attractiveness of eggs with an orange yolk, because the rich color "hints" to many buyers of a higher content of nutrients. The only problem is that domestic chickens, in the same way and for the same purpose, can be fed with food additives, from which both the color and the consistency of the yolk change. Therefore, the buyer, even breaking an egg, is unlikely to be able to objectively choose which is better: homemade or store-bought.

Storage

In the first week after laying, chicken eggs retain almost all of their valuable qualities and generally age very slowly. But then the rate of biochemical and morphological changes in the egg increases rather quickly, so it is better to immediately create the most favorable storage conditions for this product.

Chicken eggs should be kept in the refrigerator in compartments specially designed for this. But to prolong the term, it is better to turn them over with the sharp end down. Then they can lie up to 3 weeks, retaining most of the consumer qualities and healing properties.

If the refrigerator is not available for some reason, then eggs are better stored in the heat, the shells of which are rubbed with sunflower oil or fat rendered from lard (lard). After applying oily protection, the eggs are wrapped in paper, placed in a ventilated container (for example, a basket) and hidden in the coolest possible place. At the same time, eggs should be isolated from strongly smelling products so that the porous shell does not absorb odors.

Literature

1. US National Nutrient Database, <https://fdc.nal.usda.gov/fdc-app.html#/food-details/339018/nutrients>
2. US National Nutrient Database, <https://fdc.nal.usda.gov/fdc-app.html#/food-details/339017/nutrients>
3. US National Nutrient Database, <https://fdc.nal.usda.gov/fdc-app.html#/food-details/339005/nutrients>
4. US National Nutrient Database, <https://fdc.nal.usda.gov/fdc-app.html#/food-details/339008/nutrients>
5. Harvard Health Letter. Are eggs risky for heart health? <https://www.health.harvard.edu/heart-health/are-eggs-risky-for-heart-health>

6. Chenxi Qin, Jun Lv, Yu Guo, Zheng Bian, Jiahui Si, Ling Yang, Yiping Chen, Yonglin Zhou, Hao Zhang, Jianjun Liu, Junshi Chen, Zhengming Chen, Canqing Yu, Liming Li On Behalf of the China Kadoorie Biobank Collaborative Group . **Associations of egg consumption with cardiovascular disease in a cohort study of 0.5 million Chinese adults** . *Heart* , 2018 DOI: [10.1136/heartjnl-2017-312651](https://doi.org/10.1136/heartjnl-2017-312651)
7. Stefania Noerman, Olli Kärkkäinen, Anton Mattsson, Jussi Paananen, Marko Lehtonen, Tarja Nurmi, Tomi-Pekka Tuomainen, Sari Voutilainen, Kati Hanhineva, Jyrki K Virtanen. **Metabolic Profiling of High Egg Consumption and the Associated Lower Risk of Type 2 Diabetes in Middle-Aged Finnish Men** . *Molecular Nutrition & Food Research* , 2018; 1800605 DOI: [10.1002/mnfr.201800605](https://doi.org/10.1002/mnfr.201800605)
8. Majumder et al. **Angiotensin I Converting Enzyme Inhibitory Peptides from Simulated in Vitro Gastrointestinal Digestion of Cooked Eggs** . *Journal of Agricultural and Food Chemistry* , 2009; 57 (2): 471 DOI: [10.1021/jf8028557](https://doi.org/10.1021/jf8028557)
9. Stephan van Vliet, Evan L Shy, Sidney Abou Sawan, Joseph W Beals, Daniel WD West, Sarah K Skinner, Alexander V Ulanov, Zhong Li, Scott A Paluska, Carl M Parsons, Daniel R Moore, Nicholas A Burd. **Consumption of whole eggs promotes greater stimulation of postexercise muscle protein synthesis than consumption of isonitrogenous amounts of egg whites in young men** . *The American Journal of Clinical Nutrition* , 2017; 106 (6): 1401 DOI: [10.3945/ajcn.117.159855](https://doi.org/10.3945/ajcn.117.159855)
10. Jung S., Kim DH, Son JH, Nam K., Ahn DU, Jo C. **The functional property of egg yolk phosvitin as a melanogenesis inhibitor** . *food chem.* 2012 Dec 1;135(3):993-8. DOI: 10.1016/j.foodchem.2012.05.113.
11. J. Vander Wal, A. Gupta, P. Khosla, and N. V. Dhurandhar. **Egg breakfast enhances weight loss** . *Int J Obes (Lond)*. 2008 Oct; 32(10): 1545–1551. Doi: 10.1038/ijo.2008.130

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Chicken egg - useful properties, composition and contraindications

Eliseeva Tatyana, editor-in-chief of the project EdaPlus.info

Alena Tarantul, nutritionist

E-mail: eliseeva.t@edaplust.info, tarantul.a@edaplust.info

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Abstract. The article discusses the main properties of a chicken egg 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 product are indicated, the use of chicken eggs in various types of medicine and the effectiveness of its use in various diseases are considered. The potentially adverse effects of a chicken egg on the human body under certain medical conditions and diseases are analyzed separately. Considered scientific basics diets With his application .