

# **TOMATOES AND HEALTHY DIET**



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# The Unity

<b>Title</b>	<b>Tomatoes and Healthy Diet</b>
<b>Area</b>	small scale organic cultivation
<b>Main Target Audience</b>	<p>The end users of the module are ...</p> <ul style="list-style-type: none"> <li>➤ Students of the participant institutions</li> <li>➤ Trainers in the partner' institutions</li> <li>➤ Consumers' associations</li> <li>➤ Adult training centers</li> <li>➤ Teachers of primary and secondary education that teach lessons related to environmental awareness and nutrition</li> </ul>
<b>Description of the module and general aims</b>	<p>This module allows the participant to understand ...</p> <p>Origin and characteristics of tomatoes</p> <p>Valuable local varieties of tomatoes</p> <p>Differences between organic and conventional tomatoes</p> <p>Organic growing tomatoes / technology /</p> <p>Benefits from traditional cuisine and recipes with tomatoes</p>
<b>Learning Time and Duration</b>	<p>Learning time and maximum duration for the training related to the module:</p> <p>The maximum duration of training is 24 hours, distributed as follows - 8 hours of theoretical training; 8 hours for visits (farms, processors, markets) and 8 hours of practical work.</p>
<b>Learning Objectives</b>	<p>Specific learning goals, i.e. what is going to be trained and will be learnt by the target after a successful completion of this module.</p> <p>Once you have completed this course you will be able to:</p> <p>which local varieties to use for the production of organic tomatoes;</p> <p>what distinguishes organic from conventional production;</p> <p>how to cultivate organic tomatoes;</p> <p>what benefits there are for health consumption of organic tomatoes and foods in which they are the main ingredient;</p> <p>how to prepare foods with tomatoes.</p>
<b>Competences achieved</b>	<p>Specific competences related to the project theme</p> <p>knowledge about values of tomatoes;</p> <p>how to cultivate organic tomatoes;</p> <p>how to prepare healthy foods with tomatoes.</p>
<b>Pedagogical methods used (selfstudy, group work, distance learning, etc.)</b>	<p>Type of activities considered useful for the training of this module:</p> <ul style="list-style-type: none"> <li>• Theoretical learning /blended learning/: <ul style="list-style-type: none"> <li>- face to face;</li> <li>- online learning.</li> </ul> </li> <li>• Practical learning: <ul style="list-style-type: none"> <li>- case study /field survey/;</li> <li>- workshop;</li> <li>- self study.</li> </ul> </li> </ul>

# 1. Abstract

This unit is structured into two main sections: (1) Characteristics of tomatoes and benefits of organic cultivation and (2) Production of organic tomatoes and Traditional recipes with tomatoes.

In the first section the basic knowledge of origin and characteristics of tomatoes are presented. There are several local varieties of tomatoes which are suitable for healthy diet. It gives distinction about benefits from organic and conventional tomatoes. The second section consists of a technology of organic cultivation and the presentation of various recipes of traditional Bulgarian cuisine and on their health benefits.

Keywords:

Tomatoes, organic cultivation, Traditional Bulgarian dishes.

# 2. Introduction

Tomatoes are traditional and one of the most consumed and the main vegetable crops grown in Bulgaria, according to the MAF in 2012 the acreage planted with tomatoes - 34 011 da. And total production of fresh vegetables occupy second place with a share of 9.84%. Production amounts to about 94 016 t. Used for fresh consumption in the domestic market, for processing into canning and export fresh and processed. Their widespread use due to their high taste and nutritional value. Raw tomatoes contain different antioxidants, vitamins and minerals that have the potential to protect us from serious diseases.

The vitamin C content is from 2 to 50 mg%. Rich are mainly active mineral salts - calcium and magnesium, iron, malic and citric acid. Acids transmit flavor of the fruit and help the kidneys and digestive system authorities. This is also due to their curative properties.

The fresh tomatoes have anti-inflammatory properties and even protect the brain from the occurrence of conditions, worsening memory and cognitive abilities. The tomatoes have more specific benefits for men. Nutritionists recommend men to eat tomatoes at least once a week, because lycopene in them contributes to prostate health.

The nutritional value of tomatoes is determined by contained therein antioxidants and other beneficial ingredients. The main antioxidant in tomatoes - lycopene, neutralize harmful free radicals that damage cells in the body. Tomatoes also contain beta-carotene, folic acid and vitamins A, C and E. They are low-calorie food.

# Section I

## 3. Core contents

### 3.1. Origin and characteristics of tomatoes

Homeland of tomatoes is South and Central America. It is derived from the wild along the Pacific coast of Peru tomato, which was a very small fruit, reaching 2.5 cm in diameter. This form was common in Mexico, but also in other South American and Central American countries. It is believed that it is the founder of cultural tomato. It originated in their homeland long before the discovery of America by Christopher Columbus. Ancient inhabitants of Peru fought unconscious selection to its cultivation. In Europe, it was brought by the Spanish in the XVI century, shortly after the conquest of Peru. From there it was in Italy, where he was known as "Peruvian apple." The most interesting thing about tomatoes is that it was originally grown as an ornamental plant because of its beautiful colors and berries. In North America, tomatoes were considered as deadly. There is a case where, to please the English King George wanted to poison rebel army chief North American General George Washington, who then "attempted poisoning" experience for many years and became the first president of the United States. In 1811 was issued botanical dictionary you carefully announcing: "... although the tomato is considered a poisonous plant in Italy eat it with pepper, garlic and oil ...". Although in his homeland Mexico and Peru as early V century BC ancient Incas and Aztecs cultivated and used it for food. Distribution in Europe, acquired only in the XV-XVI century, in Italy it was called "golden apple", and in France - "apple of love." Today, tomatoes are grown throughout the world, not just in the south but in the mid-latitudes, and even in the north, and having passed through the Arctic Circle. They grow them even in such areas of perpetual frost, as far Yakutia.

Curiously, the original tomato weighed about 1 g, while today's cultivated can reach more than 1 kg.

#### Botanical description

Tomato (*Solanum lycopersicum*) is vegetable specy that belongs to the nightshade family (Solanaceae). Tomatoes are grown for berries as annual crops, but in areas where air and soil temperature doesn't drop below 0° C, can be grown as a perennial.

Root system of the plant is very well developed. The location and extent of its development are determined by varietal characteristics, method of cultivation and processing. The main part of the root is arranged in a one-meter deep of the soil but sometimes the root reaches a

depth up to 1,5 m. When the tomatoes are grown from seed, root system is shallow. Every part of the stem is able to develop additional roots.

The stem of tomatoes may end with a top that grows constantly, or a truss. Tomatoes have branches at the base of leaf petiole. Their number varies and is usually large. Higher branches are shorter or do not develop. Trying to produce larger fruits that ripen jointly, the branches are removed. The stem is one of essential features which differ from the variety.

The leaves may be of ordinary type, or of the potato type depending on the size of the leaf partitions. Leaves are entire, with one, two or multiple toothed periphery. The peculiarities of the leaves are used as an important sign of the variety.

Inflorescence can be simple (no branches), complex (with many branches) and intermediate (two branches). Inflorescences are formed mainly in internodes of the stem and rarely at the base of the leaf stalks. Inflorescence of tomatoes is attached by short stalks with knees to the axis. There are varieties of tomatoes that have no knees on the handles and fruits are always harvested without handle. The blossoms are normal if there are 5-6 flower parts (sepals, petals and stamens) and abnormal if the number of flower parts is greater or any part is missing (usually lacking stamens). Because the varieties formed several types of inflorescence simultaneously, this feature can be used for approbation hardly.

Tomato fruits are juicy strawberry. During ripening are colored by light green to dark green. Sometimes green fruits have a dark ring around the handle. Upon ripening tomatoes become red, pink, yellow or orange color of varying intensity. The weight of the fruit is in a broad range - from 10 to 200 g or more. Fruits have seeds or without seeds (parthenocarpy). This is an important sign of approbation.

The seeds of tomatoes are flat or rounded triangular shape with cream-colored or brown color, with or without hairs. When properly storing the seeds of tomatoes retain their germination 5-6 years.

#### Content of fruit

Ripe tomato fruits have high nutritional qualities and are health products. Their chemical composition varies widely depending on soil and climatic conditions, applied agrotechnology and the variety. Tomatoes are rich vitamin composition (C, carotene, B vitamins - B1, B2, B3, B6, B9 and PP, vitamin H). They also contain minerals (sodium, potassium, calcium, phosphorus, magnesium, iron, sulfur, chlorine), and microelements - zinc, cobalt, copper, manganese, iodine, fluorine). They contain organic acids (citric, malic, lactic, oxalic acid), but considerably less than in the potatoes, beets, spinach and dock. Malic and citric acid give the

tomatoes especially refreshing taste, but also increase the appetite and enhance digestion. They also contain nitrogenous substances, sugars, pectin, flavorings, colouring agents (yellow, orange pigment, lycopene, carotene). The tomatoes have little fibers, which are soft and don't irritate the gastrointestinal mucosa.

Much of dry matter are carbohydrates, which are mainly soluble sugars (glucose and fructose) and very little sucrose (0.5-1.5%). Contents of other carbohydrates is very small - starch - 0.05%, dextrin - 0.06 to 0.2%, hemicellulose - 0.1-0.2%, cellulose - 0.16 to 0.31%; Pectin is on average 3.9% of the dry matter. Tomatoes should not be excluded from the diet of people suffering from kidney diseases, and various diseases of the joints associated with impaired metabolism. Meanwhile, unripe tomatoes contain solanine which is poisonous substance. Its content decreases with ripening and in ripe tomatoes solanine disappears completely. Therefore, it should not eat unripe tomatoes in view of the fact that 0.2 grams of solanine can cause headaches, scratching in the throat and sometimes convulsions. In unripe canned tomatoes solanine are diluted by the brine that prevents its toxicity.

### 3.2. Local varieties of tomatoes

**Ideal** - an indeterminate variety (that is to say, high-), medium early, traditional, large-fruited 130-200 g, slightly ribbed, orange-red color and palatable for fresh consumption, grown on a supporting structure.

**Rila F1** - a very fertile variety, high-growing and is suitable to be grown in plastic greenhouses or outdoors. The fruits are smooth, fleshy, without a green ring when ripe, grown on a support structure, very resistant to tobacco mosaic verticillium.

**Milyana** - a determinate variety, medium early, with large round fruits, 150-200 g, intense red. Around the stalk has a green ring that disappears when ripe. With a very good taste and suitable for fresh consumption and for producing high quality purees and juices.

**Elena F1** - a hybrid variety, for cultivation without supporting structure. The fruits are intensely red, flat, round, smooth, and delicious, non cracked, 220-300g. The plants are resistant to high temperatures, tobacco mosaic, Fusaria.

**Triumph F1** - an indeterminate variety (a cross between two varieties, artificial selection), very high fertility, for fresh consumption and processing. The plants require frequent pinched. Fruits are 100 g, flat round, smooth, hard, very tasty and resistant to diseases and adverse weather conditions.

**Plovdiv carotene** - an indeterminate variety of medium early production. The variety is about 60% carotene and lycopene 40% of the total pigment that reaches 6,5 mg%. Fruits are

an average weight of fruit 70-80 grams, round, smooth, medium-hard. The flesh is orange red. Vitamin C is 50-60 mg%. Growing period 115-118 days. Average yield is 4200-4800 kg / ha. Designed for fresh consumption and industrial processing into juice and children's dietary intakes. Disease resistance: Verticillium wilting and Fusarium.



### **3.3. Differences between organic and conventional tomatoes**

The terms organic, ecological or organic food mean the same thing - food grown without the help of genetic engineering, pesticides, soil conditioner and other synthetic substances to protect it from insects or poor yield. It is packaged and stored in a manner that does not impair its taste qualities.

#### **Organic tomatoes**

Organic tomatoes are significantly healthier than those grown with the aid of chemicals, show a study conducted by the Federal University of Ceara in Brazil and the University of Avignon in France. Although they are smaller in size, they contain large amounts of vitamin C and polyphenols, which enhance the immune system to fight a number of chronic diseases and cancers.

The reason for the high concentration of nutrients is due to the more difficult and challenging environment which face the organic plants. While conventionally grown tomatoes are treated with pesticides and fertilizers, organic farming is forcing the plants to protect themselves. The larger the stress to which they are subject lead to the accumulation of more substances which are beneficial to human health.

The study, published in the specialized edition Public Library of Science ONE (PLOS ONE), compared the composition of tomatoes grown on nearby farms with conventional and



organic production in the same region of the state of Ceara in Brazil. The farms were less than 1.5 km. from one another, so that the soil and climatic conditions, for both producers were identical. Experts gathered at random fruits of 30 plants from both farms and analyze them.

Organic tomatoes were on average 40% smaller than conventionally grown, but the concentration of vitamin C in them was 57% higher. Ripe organic tomatoes contained more than two times antioxidants from the class of polyphenols. These include flavonoids which reduce oxidative stress and damage of the cells associated with chronic conditions such as cardiovascular disease, cancer, and various types of dementia.

**Lycopene**, a flavonoid which is in the highest concentration in tomatoes, not only reduces the risk of cancer, but also reduces the growth and proliferation of tumor cells.



**Organic tomatoes features:**

- ✓ organic tomatoes do not contain pesticides, nitrates and Mitotoxin (heavy metals and antibiotics);
- ✓ there is no content of genetically modified organisms;
- ✓ have higher costs because of the extensive nature of production that require more manpower and certification costs of production;
- ✓ lower yields of production;
- ✓ limited market.

**Conventional tomatoes features:**

- ✓ conventional tomatoes contain pesticides, nitrates and toxins;
- ✓ have a higher yields of production;
- ✓ lower costs due to the use of chemicals;
- ✓ easy to transport;
- ✓ larger market.

## Section II

### 4. Put into practice

#### 4.1. Organic growing tomatoes / technology /



Tomato is a warm-loving plant. The optimum temperature for proper development of the plant is 24-25°C. At temperatures below 15°C, colouring substance can not be formed and fruits become yellowish. The colouring substance is not formed at a temperature over 42°C when the fruits turn yellow, the leaves stay small and tomatoes appear scorch.

The tomato plant is a medium demanding of moisture. It can be grown without irrigation. But regular watering obtains abundant harvest. If soil moisture fluctuates sharply after the fruits are formed, they are massive and heavily cracked. Air humidity is very important. High humidity, increases the risk of fungal diseases, thus impeding pollination. Tomatoes can be grown on different soils but they must be well structured and fertile. Preferred varieties of tomatoes are Triumph, Augusta and Balkan /for peeled tomatoes/, Hebros and others.

#### **The early growing tomatoes on open field**

Early growing tomatoes on open field is done by seedlings. Seedlings are grown in greenhouses, using special boxes with a grid. To produce seedlings for 1 ha should be sown 25-30 grams seeds. Seedlings are prepared between 1 and 10 February. As per 1 sq. m. are needed 3 g seeds. Between 1 and 15 March, when the first pair of leaves are formed /phase crossover/ the seedlings must be pricked in the greenhouse at 10x10cm distance.

The soil must be prepared two to three weeks prior to prick in the seedlings. Where there will be furrows the soil must be dug in 12 cm depth. Approximately 7 cm from this depth is filled with a mixture of compost and wood ashes. Seedlings prick in and high ridges must be formed. Immediately after this operation the plants are sprayed with detergent 500. To

strengthen the seedlings recommended trimming root about 1/4 and soaking up the young plants in liquid of Yarrow. The recipe is 1 kg fresh colors Yarrow / or 300 g dry / soaked in 5 liters rainwater. For 2-3 days, the liquid is periodically stirred and it is ready to use.

The furrows can be covered with a thin layer of dry leaves or straw after planting the seedlings. The high furrows favour the "plant bed" to get warm, as opposed to the flat surface. Warm soil is necessary for young plants and it favours rooting.

It is very important, "the bed", in which it we plant seedlings to be warm, even in the greenhouse. Gardeners sometimes experience disappointments because ignore that plants do not like cold soil. In cold weather it is recommended that in future beds of seedlings to be put bottles with hot water. Soon afterwards to plant seedlings in warmed beds. The method of soil preparation before transplantation, can also be used in the cultivation of tomatoes outdoors.

In order not to grow, pricking domatov seedlings grown at relatively low temperature / approximately 17°C / and in reduced soil moisture. Important for patenting plants have drought in the last 10 days before planting them in an open field.

Transplanted tomato soon forms new roots in the shallow soil layer. To encourage the formation of a deep root there is a practice to put / about 10 cm depth / empty cups of yoghurt with pre-drilled holes in the bottom. Periodically fill the cups with water, thus providing irrigation deeper soil layer. Tomato plants with deep root system, are more resistant to diseases and heat in summer.

Preparation of the soil for growing early tomatoes includes tillage at a depth of 25-30 cm and import of compost / about 4 tons per decare /. Also the soil must be harrowed two times before planting. Before ripening, tomatoes must be watered less frequently, but soil moisture does not fall below 70% of the PPV. When the fruit begins to take shape, there is a further strengthening of the plants by spraying with preparation 501. Early morning is treated with the preparation. If at later stage, the plants are not strong enough - the operation is repeated.

In his agricultural course Rudolf Steiner advises to prepare a special compost for tomatoes. Autumn after the harvest, gather the stems and leaves of tomato plants in a separate pile. Add manure top and prepare own biodynamic compost. When the next year, we will plant new tomatoes and they have already begun to form fruit, add some of the special compost. Thus stimulate fruiting. After adding the compost should not be forgotten to cover furrow again with dry leaves or straw, in order to maintain the soil moisture.

Once the fruit is fully grown and start ripening and harvest, soil moisture should not fall below 80% of PPV. Irrigations are performed every 4-6 days and pay attention not to put a

wide variation of soil moisture because it causes cracking of the fruit. Greenhouse whitefly is a big enemy of greenhouse tomatoes. For the expulsion of the greenhouse whitefly recommended planting marigolds in the beds of tomatoes.

It is possible that the tomatoes in the greenhouse to get sick from the virus, spread through touching the leaves of smokers. The virus is transmitted through the tobacco. Infected leaves turn white, fold and all infected plants should be eradicated and discarded. Tomatoes outdoors may occur black spots on the leaves. This happens most often when there is potatoes next to tomatoes and the infection is transferred. Diseased plants must be destroyed.

Before ripening plants can be watered with tap water or by sprinkling. But then - only running water in the late afternoon, in the evening or early morning when fruits are sufficiently chilled. If this is not respected, leaves burn and fruits crack. The first weeding is done soon after planting tomatoes to improve conditions. It is important for initial growth of the roots and proper growing.

Later there can be made two or three weeding if necessary. Common practice in growing tomatoes is pruning. It is done in order to obtain larger fruits. Harvest of early tomatoes usually starts around June 15 to 20. It is important when picking tomatoes to follow the biodynamic calendar. Tomatoes must be harvested on day FRUIT when the moon is ascending.

## **4.2. Traditional cuisine and recipes /shopska salad, lyutenitsa, tomato juice/**

### **Tomato juice**



The tomato juice with no added salt and freshly squeezed is very healthy. It contains very few calories, saturated fat and cholesterol. Furthermore it has a low sodium content and a rich

source of vitamins A, C, and K B6, thiamine (vitamin B1), niacin (vitamin B3). It contains also folic acid and minerals iron, calcium, phosphate, magnesium, copper, potassium and manganese. Not least, tomato juice is rich in fiber, and most of the calories comes from natural sugars in it.

If you drink even one glass of tomato juice a day, it will help you to prevent many serious disease processes and take advantage of the many health benefits.

### **Antioxidants**

Tomatoes are a rich source of antioxidants. They help the body to cleanse itself from free radicals that cause oxidation of tissues, leading to inflammation and potential risk of developing serious diseases. Antioxidants help us to slow down the effects of aging.

### **Tomatoes protect against cancer**

Tomatoes are a rich source of lycopene. It forms red color of tomatoes. Scientific studies have shown that lycopene is effective in the prevention of many types of cancer, particularly cancer of the breast, prostate, lung, pancreatic and colorectal cancer.

### **Tomato juice stimulates immunity**

As a rich source of vitamins C and A, tomato juice stimulates the immune system. It was found that people who drink a glass of tomato juice a day, get sick rarely by the flu or colds. These vitamins also help to prevent infection and inflammation.

### **Reduce bad cholesterol**

Bad (LDL) cholesterol in blood is accumulated in the consumption of foods with a high content of cholesterol and represents the fatty plaques on the walls of arteries. As a result, the heart has to work much harder to pump blood through these arteries, which in turn leads to high blood pressure. These fatty plaques can detach and move through blood, which can lead to stroke or heart failure. Tomatoes contain fiber and niacin that eliminate the fatty plaques in blood vessels.

### **Tomatoes reduce the risk of heart disease**

Substance in the blood called homocysteine, damaging the walls of the blood vessels and leads to heart diseases. Tomatoes contain vitamin B6, which actively breaks up key homocysteine molecules that are harmless to the body.

### **Prevents Macular Degeneration**

Researches demonstrate that tomatoes may protect from developing macular degeneration. This is relevant to decrease risk of blindness in aging population because of the extension of the average life.

### **Prevents constipation**

Tomatoes are rich in natural fiber. Eating fibers helps to prevent slow performance of the intestines. Fibers also purify the digestive system of toxins. Tomato juice can have a laxative effect and to protect us from swelling.

### **Prevents stomach and muscle cramps**

When the body lacks potassium may occur stomach or muscle spasms. Tomatoes are a rich source of potassium, which helps prevent cramps.

### **Tomatoes and treatment of diabetes**

Tomatoes are often recommended by doctors diabetics by helping to stabilize blood sugar levels.

Tomato juice is a very healthy alternative when we are thirsty. Tomatoes can be found in all sorts of colors and different shapes, but they will provide us with approximately the same nutritional content and the same health benefits. Several tomatoes to your daily diet will make it more healthy and protect us from a number of serious diseases.

### **Ingredients:**

- 1 kg tomatoes
- 1 liter water
- 2 tablespoon /tsp/ salt
- 2 tsp sugar
- 2 tsp vinegar

### **Preparation**

Wash tomatoes and cut them into small pieces. Mash the pieces through a sieve.

Add water, sugar and salt. Mixed well and put to boil. Boil for 10 minutes until dissolved tomatoes. Remove from the heat and cover it up for 5 minutes.

Put the juice in pre-prepared bottles. Store in a cool dark place!

## Shopska salad



Shopska salad is a dish from the category of appetizer, spread to the kitchen in Bulgaria, Serbia and Macedonia. It is widespread in Wallachia under the name *salată bulgărească* (Bulgarian salad). Represents a salad of chopped tomatoes, cucumbers, raw or preferably roasted peppers, onions, fresh parsley and grated or crumbled white cheese. It is served with dressing of vegetable oil and wine or cider vinegar. Sometimes may be put a little garlic, especially if there is roasted peppers.

Eat mostly in summer.

### Ingredients for Salad Shoppe:

- **tomato** - 2 ripe red
- **pepper** - 2 green cash
- **cucumber** - 1 peeled cucumber
- **onion** - 1 head, small onion
- **parsley** - for sprinkling
- **cheese** - 150-200 g
- **salt** - 2 pinches
- **vinegar** - 1 tbsp
- **oil** - 1-2 tbsp

### Preparation

Cut the onion into thin crescents. Optionally, you can use red onion.

Cut the tomatoes and cucumbers into pieces and add them to the onions.

Bake, peel and cut into small pieces the peppers and add them to the salad.

Mix all ingredients and pour with the dressing of vinegar and oil.

Crumble the cheese over the vegetables, sprinkle with chopped parsley and serve in the middle. The salad is enough for 3-4 servings.



### **Lyutenitsa - chutney**



**Lyutenitsa** is a food product, a type of tomato sauce, traditional Bulgarian cuisine. It is usually made from roasted peppers, tomato paste, onions, carrots, eggplants and spices. The peppers are the main ingredient in lyutenitsa, which give the nature red color. Lyutenitsa contains fat (oil), and among the most important spices are cumin, chilli and garlic, to which it owes its spicy taste. In rare cases, the recipe for lyutenitsa can contain potatoes.

Products for lyutenitsa must be cleared well, the peppers are roasted and peeled. Peppers and tomatoes must be grinded in a grinder, add spices in the mixture and fry with vegetable oil in a big tray. Density is considered good once while stirring with a wooden spoon leaving a trace on the bottom of the tray. Out lyutenitsa and put it in prepared jars. Lyutenitsa can be stored for a long time.

You can consume it a greased slice of bread and sprinkled with crumbled cheese, or as a side dish to grilled meat, potatoes, rice or pasta. Ttraditional Bulgarian salad with onion and mixed with cooked beans is made with lyutenitsa.

Industrially produced lyutenitsa is usually much more finely ground. It is not fried and contains additives such as starch, and other substituents.

#### **Ingredients for Lyutenitsa:**

1. 10 kg peppers
2. 4 kg eggplant
3. 6-7 kg of tomatoes ( or 2 kg tomato puree)
4. 1 cup oil
5. 3 tablespoons salt
6. 1 tablespoon black pepper
7. 1 teaspoon cumin
8. 1 teaspoon sugar



**Time required to prepare:**

3 hours preparation

30 minutes cooking

**Home-made lyutenitsa in three steps:**

1. The first step of the recipe for lyutenitsa is the preparation of ingredients. The first and most time-consuming phase is the preparation of tomato paste. To prepare 2 kg of tomato paste you need 6-7 kilograms of tomatoes. It is better to choose ripe fleshy tomatoes. Wash the tomatoes and peel them, then grind them with a grinder. Separate the seeds when you grind the tomatoes. Put the tomato puree in a large saucepan and put it on the stove. Tomato puree boils until a thick tomato paste. Of course, you can use ready tomato paste in order to save time, but lyutenitsa will lose its authentic taste.
2. Bake peppers and eggplant. You can bake them in Pepper roaster, but if you can it is best to bake the vegetables on fire, to have pepper and eggplant characteristic smoky aroma of baked vegetables. To achieve the desired flavor of baked vegetables, you can use charcoal barbecue. Once roast peppers and eggplant peel them, leaving them to drain well and grind them with a grinder, but not a smooth paste and remain shreds to get the desired consistency of traditional lyutenitsa.
3. There comes a moment when you need to start boiling lyutenitsa. Is a classic home-made lyutenitsa in a large pan on the fire in the yard. Note that during cooking mixture sprays, so choose the greatest and deep pan or distributed and boil the mixture twice. Pour the slurry from the ground peppers and eggplant in the pan and then put on the stove and stirring constantly, otherwise the mixture is bubbling and splashing and risks you burn. The mixture needs to boil 10 minutes, until the water boil off. Then add tomato paste, keep mixing continuously for 10 minutes. So to the boiled mixture add the oil and spices and continue to stirring constantly for 5 minutes to allow the lyutenitsa to be condensed well. There is a classic sign that lyutenitsa has reached the appropriate density - stirring the mixture in the pan, it leaves a trace at the bottom.

### ***Tomato paste***



Pass tomatoes machine that separates the skins and seeds. If you don't have such machine, you can easily peel tomatoes if you put them for a minute in boiling water. Grind tomatoes and leave the mixture in gauze to drain for 2-3 hours.

Then heat the oil on the stove with sugar and can add a little vinegar to taste. Pour the drained tomato pulp and cook over low heat until thickened. Spill the mixture in jars or bottles and close them. Sterilize for 10 minutes.

### **Stuffed tomatoes with cottage cheese and cheese**

Ingredients:

- 3 large tomatoes (about 150 gr one)
- 150 g of cottage cheese
- 50g cheese
- 1/4 bunch of parsley



On the "top" of the tomato cut a little cover and excavate the tomato core. This is made with all the tomatoes. 1/3 scoop of tomato core mixed with cheese - grated advance retail and the cottage cheese. In the resulting mixture are added and 1/2 of chopped parsley. Tomatoes should be filled in and covered. There are two methods for the preparation of the dish. The first option tomatoes wrapped in foil for baking and cook in the oven, in the second bake directly in the oven.

### **Cold tomato soup**

Ingredients:

- 400g ripe tomatoes soft
- 100g peppers
- 50g cheese
- 1 tsp oil
- salt to taste
- 1-2 sprigs of fennel



Bake peppers on a hotplate and peel them. Tomatoes are finely chopped and strained. Pour into a bowl, then add to it chopped roasted peppers already. Add the fennel, oil and crumbled cheese. The dish is low in protein and moderate fat and carbohydrates. Can be consumed at any time of day from people with slow metabolism type. The dish is rich in lycopene. It is important to note that this is not the main course and you should not rely on it.

## QUESTIONS:

### Homeland of tomatoes is?

- a) South and Central America;
- b) Africa;
- c) Asia;
- d) Europe.

### Ripe tomato fruits are rich of...

- a) vitamins, minerals and microelements
- b) organic acids and fibers.

### Plovdiv carotene is a name of...

- a) carrot variety;
- b) cucumber variety;
- c) pumpkin variety;
- d) tomato variety.

### Write 2 advantages of organic tomatoes.

- 1.....
- 2.....

### The optimum temperature for proper development of the plant of tomato is...

- a) 15-16°C;
- b) 19-20°C;
- c) 24-25°C;
- d) 28-29°C;

### When must tomatoes' seeds be planted?

- a) between 1 and 10 January;
- b) between 1 and 10 February;
- c) between 1 and 10 March.

### How often tomatoes' plants must be irrigated?

- a) every day;
- b) every 4-6 days;
- c) over 1 week.

### Which are the main Bulgarian products from tomatoes?

- a) Tomato's juice;
- b) Shopska salad;
- c) Tomato's paste
- d) Lyutenitza;
- e) Cold tomato soup;
- f) All are correct

# Are you interested?

## 5. Further readings

**Вогтман, Х.** Екологично градинарство. Фондация „Екологично земеделие”, 1990

**Дойкова, М., Г. Георгиев.** Зеленчукова градина. Изд. Дионис, София, 1992

**Данаилов, Ж.** Селекция и семепроизводство на домати. Марин Дринов, 2012

**Каров, С.** Биологично производство на домати. Изд. Асоциация за биологично земеделие, Пловдив

**Мермерски, Хр.** Българска енциклопедия на народната медицина и здравето. Самиздат, 2007

**Митова, Ив.** Доматите - отглеждане, болести и неприятели, съхранение. Еньовче, 2006

**Панайотов, Н.** Въведение в биологичното зеленчукопроизводство. Изд. Агроекологичен център при ВСИ-Пловдив, Пловдив, 2000

**Сурлеков П.** Сеитбообращения в зеленчукопроизводството. Изд. „Христо Г. Данов, Пловдив, 1984

**Тринговска, Ив. и др.** Биологично производство на разсад домати и краставици. ИЗК „Марица”, 2013

**Хайниц К. и Г. Меркенс.** Наръчник по екологично градинарство. Изд. Къща „Емас”, София. 2005

**Чолаков, Д. и др.** Домати. Изд. Агропрес. София, 1996

**Янчева Х. и др.** Производство на биологични зеленчуци на открито. Изд. Биоселена, Пловдив, 2011

**Янчева Х., И. Манолов.** Основи на органичното земеделие. Изд. ЕТ „Васил Петров”, Пловдив. 2003

## 6. Bibliography

<http://www.agris.bg>;

<http://www.fermer.bg>

<http://www.yambiz.com/agro>

<http://fitnesbg.com/po-malki-no-po-polezni-organichnite-d/>

<https://www.google.bg/search?q=домати>

<http://www.agro-consultant.net/>

<http://www.fermer.bg>

[http://www.bb-team.org/recipes/1271\\_studena-domatena-supra](http://www.bb-team.org/recipes/1271_studena-domatena-supra)

<http://bio.bg/>