

# Reserves for combating the bread deficit

## Abstract

Current information on increasing the volume of baked bread by adding a variety of vegetable substances is reviewed. Recommendations are given for the use of pine bark, acorns, vegetables, herbs, and other plants for cooking.

**Keywords:** survival learning, learning project, increasing baked bread, making flour from plants

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## Introduction

In times of poor harvests, acute social crises, pandemics and military conflicts, populations often experience shortages of bread, often due to logistical and financial problems. At the same time, there are dozens of available remedies that are always at hand (useful plants). But schools do not sufficiently teach the ways to provide shelter, water and food for themselves. Although in some countries, populations are already facing extreme conditions and food shortages. It is therefore useful to remind the population, through propaganda and education systems, of the biological reserves available to increase the mass of food received. Plants have been used since ancient times by humans and animals as a source of energy and useful substances. About 10,000 years ago, man used stones to grind grain to produce a floury grain porridge, which was baked and turned into tortillas. The human stomach requires not only calories and vitamins, but also fiber and biomass to keep functioning properly. Two thousand years later, the Sumerians began to make bread with various fillings from grains of cereal plants.

**The purpose of the article and our tested learning project:** to find and study additional resources for human survival by utilizing plant reserves and expired products from the food industry.

## Learning project objectives

Gather information on plant raw materials suitable for addition to food.

- I. Collect available raw materials and make flour additives from them.
- II. Determine the nutritional value of adding different substances to flour.
- III. Prepare flour tortillas at home with additives.
- IV. Conduct a tasting of prepared tortillas with additives.
- V. Explore feedback from family and student tasters.
- VI. Create a report on the use of natural plant material.

**Customer -** project office "Medical Classroom in a Moscow School"

Let's consider two ways of studying in school technologies for increasing the volume of products obtained by using available bioresources in nature and society:

**Using natural plant material:** There are many plants around us that are suitable for food: mushrooms, berries, seeds, roots, sawdust, bran, leaves can help us survive in times of hunger. Adding impurities to bakery products, for example, bark of birch and pine trees, namely bark layer and cambium, which, in addition to useful substances, contain from 80 to 100 kcal per 100 grams of bark. Also, apples, pears, other fruits, vegetables can serve as admixtures - remember about pies with apples, carrots, pumpkin, cabbage and sorrel! Many salads, soups and other healthy dishes are recommended with additions of up to 20-30% of nettle leaves, dandelion, plantain, young pine buds.

The northern Sami people used pine bark as a remedy for scurvy, it is nutritious all year round, and the movement of the sap does not stop in winter. The primary bark is a cork layer, it consists of dead cells that have a protective function. It contains tannins (procyanidins), aromatic terpenes and phenols, which give a "pine" odor and antibacterial properties. The secondary bark is the husk, phloem. This layer is more nutritious and contains ascorbic acid (vitamin C). The sap that nourishes the trunk moves through it. Behind the husk is the thin cambium, which is responsible for the formation of annual rings. The secondary bark has the highest nutritional value. When preparing the raw material, the authors discarded the rough surface part of the primary bark. Following the example of northern peoples, we baked bread (breadcrumbs) from whole wheat flour, adding 30% of secondary bark ground into powder. If yeast was used, the bread, due to fermentation, was more aromatic and tasty.<sup>1,2</sup> Many ingredients of wild plants are overlooked. Students are encouraged to actively seek information about the use of wild plants.<sup>3</sup>

**Using spoiled food,** or dry food with an expired shelf life. Many products do not turn into ashes at the end of their shelf life, but retain a quite normal appearance and do not have unpleasant odors. An example is children's dry mixtures for porridge with exceeded shelf life for 2-3 years. Some people throw them away. Expired cereals, flour, bread are also thrown away. With proper biothermal treatment (fried at high temperature) fragments of mold, bugs and other harmful substances are successfully eliminated. We turned the resulting masses into powders and added them to regular flour when kneading dough. The tortillas turned out hearty and tasty.

One hundred years ago, during the famine of 1921-23, the administration of some regions of Russia disseminated ancient folk recipes on how to increase the volume of bread by using different biological additives in grain flour:

- I. Potatoes - 50% with vegetable or animal oil. Potato husks should not be eaten raw.
- II. The cake (duranda), 50%, which was recommended to be dried and ground into flour. Unground duranda causes intestinal colic.
- III. Oak Acorns. Acorn coffee and flour are valuable reserves. Acorns are collected in the fall, dried in a dry place, and then in a hot oven. The acorn's crust should be peeled off when it is dry. Acorn bread is baked **half and half** with grain flour. The bread is well salted to avoid acid poisoning. Dried and roasted acorns, without crusts, keep for a long time in a ventilated dry place. Other plants should be stored under the same conditions.
- IV. Pumpkin bread. We add 50% steamed pumpkin to the grain flour.
- V. Swanberries - add 10-20%, as they contain poisonous essential oils. Count Leo Tolstoy, who visited famine areas in 1891, wrote in his article about famine that peasants added up to 50% of swede. This made the bread sticky and black and caused vomiting. (The article was published in English in "The Daily Telegraph" January 26, 1892).

**The following dried and finely ground plants may be used as additives to grain flour and bran:**

- I. Raspberry leaf.
- II. Birch bark.
- III. A young lime tree.
- IV. Beet leaf and stem.
- V. Flax stalks and straw.
- VI. Rhizomes of hornwort and reed. Pickled rhizomes are also edible.
- VII. Birch sap can be used to make a sugar substitute.

Our stomach is not able to fully digest these substances. They come as fiber.

**It is forbidden to eat:**

- I. Flour from rotting plants
- II. Moss flour.
- III. Potato haulm flour.
- IV. Bread baked with charcoal and earthy substances.

***They're a health hazard.***

**Learning Project Roadmap:**

- I. Search for information on the topic, consultations with specialists.
- II. Collection of samples of plant raw materials, making flour from them.
- III. Determination of the content of bioactive substances in flour from this raw material, as well as the nutritional value of prepared cakes.
- IV. Making bread cakes with the addition of collected raw materials.
- V. Conducting a tasting of the products created.

VI. Comparative characterization of flour products.

VII. Creation of an electronic bot and an information booklet.

Here are 5 wild plant species that the UN believes are neglected.

**Argania.** In southwestern Morocco, argan trees provide income opportunities for three million people. Demand for argan oil is growing, but argan forests face threats from droughts.

**Shea tree.** Shea nuts are harvested throughout Africa to produce shea butter, the equivalent of cocoa butter. It is widely used in cosmetics and in the food industry.

**Baobab.** Its fruits are rich in vitamin C and fiber, they are ground into powder and eaten, and the oil from its seeds is used in the production of cosmetics. In Africa, baobab leaves and flowers are eaten, and the roots and bark are used for medicinal purposes.

**Licorice.** A wild species, it comes more often from Uzbekistan and Azerbaijan. It is able to regenerate through its roots, so it is less threatened with extinction. Licorice helps to restore the nitrogen content of the soil.

**Golden Seal or Yellowroot,** Occurs in North America. Rhizomes and roots are useful in powder form.

## Conclusion

Survival skills, i.e. shelter and food, should be taught in school. Many people will face extreme conditions of various kinds, including loss of orientation, lack of food, cold and other hazards.

**Practical significance:** the technology of surrogate food preparation can be used for educational purposes, as well as used as a memo for the local population at risk of crisis situations. Learning about practical issues of survival and hunger alleviation increases young people's interest in learning. Conducting survival training sessions at school and in natural settings helps students:

- I. Gain useful skills;
- II. To deal with anxiety and fear;
- III. Analyze what to look for that might be useful in providing food.
- IV. To act more confidently to ensure life safety in extreme conditions.<sup>4-6</sup>

The authors believe that schools need to learn more about crisis cooking techniques, know poisonous plants, and be able to neutralize the harmful effects of improper storage.<sup>7-12</sup>

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## Conflicts of interest

The author declares there is no conflict of interest.

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