

# THE USE OF COLD IN THE FRUIT AND VEGETABLE CANNING INDUSTRY

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In recent years, the functions of the refrigeration industry, which were previously reduced mainly to storage of products, have been supplemented by the organization of production of frozen products. High nutritional value allows them to be used for baby food, and the ability to produce a wide range of ready meals and semi-finished products creates conditions for improving the nutrition of the population through the catering system, promotes productivity in this area, is of great social importance because it facilitates household work. and increases the free time of employees. However, the production of quick -frozen products, low-temperature cooling and product freezing have not yet become widespread.

The use of cold in the fruit and vegetable canning industry, which processes large volumes of perishable raw materials, has two main directions:

for technological purposes;

to improve the organization of production - mitigation of seasonality, ensuring the smooth operation of the enterprise during the processing of raw materials.

The least studied is the problem of using cold for the production of frozen fruits and vegetables.

Rapid freezing of food products today is the most progressive and promising method of canning.

Quick-frozen fruits and vegetables have the following advantages over products that have been canned in other ways:

1. Higher degree of preservation of the original properties of raw materials, which is especially important for the production of baby food and dietary food.

When deciding on the feasibility of storing fruits and vegetables in fresh or frozen form, it is necessary to take into account the safety of vitamins in one case or another. Thus, in favor of freezing carrots, for example, we can say that when stored fresh until February, it loses about 50% of carotene, and by April - about 70%, while when stored frozen for 12 months - only about 40 %.

Lower energy consumption for the production of frozen products compared to heat sterilization. At the stage of production and factory storage, the frozen product consumes 16.5% less energy, in production - 4.4 times, transportation - 1.5 times.

When stored in the wholesale and retail trade network (8 months), the energy consumption for frozen peas is 8 times higher, sales through the retail trade network - 4 times, consumption at home (including storage for 2 weeks) - 2.5 times .

In general, energy consumption during freezing is lower than during thermal sterilization by 7.1%.

Lower level of total costs for production, storage and delivery to consumers. According to American researchers, complete the cost of production, storage and

delivery to consumers of frozen green peas is 20% lower than that of canned sterilization.

Ability to produce a wide range of products with a high degree of readiness for individual consumption and catering, which significantly saves labor costs in these areas.

Reduction of losses of potatoes, vegetables and fruits during long-term storage compared to their storage in fresh form.

The possibility of replacing scarce glass and tin containers with more economical types of packaging based on polymeric materials.

The range of quick-frozen fruit and vegetable products produced by the fruit and vegetable industry is characterized by a higher proportion of semi-finished and ready meals, as well as vegetables.

The range of vegetables frozen in refrigerators of canneries consists mainly of bell peppers and green peas. The range of fruits is dominated by stone - plums, cherries, apricots, peaches.

It should be noted that the total volume of freezing of fruits and vegetables in the canning industry is much higher than marketable production, but in most cases it is not sold to consumers, but used as semi-finished products for canning in the off-season, when fresh fruit and vegetables stop.

Compared to other branches of the food industry, the fruit and vegetable industry is the least equipped with refrigerators. It accounts for only 2.2% of the total number of low-temperature refrigerators and 1.5% of their capacity.

The fruit and vegetable industry does not have specialized technological lines for the production of quick-frozen canned food, mainly equipment for the production of canned food is used. Only some companies have lines for preparing raw materials for freezing, equipped with separate equipment.

The industry is poorly equipped with equipment for packing and packaging of finished frozen products. The capacity of compressor equipment, power inflows, heat exchangers is often insufficient to produce cold in the amount necessary for the production and storage of frozen products. To increase the production of high quality frozen plant products, a single refrigeration chain is needed, which includes refrigerated road and rail transport, refrigerated containers for storage of products in places of consumption, refrigerated cabinets and counters of commercial enterprises. It is important to ensure the production of raw materials that meet the requirements of technological instructions.

It is known that for freezing it is necessary to use only those varieties of fruits, berries and vegetables that are recommended as a result of varietal testing for suitability for freezing. Therefore, companies that produce frozen products must have appropriate raw material zones.