

## Effect of quick freezing process and vacuum negative pressure on the quality of fried potato chips (2)

Operation points:



1 raw material selection. Strictly remove germinated, green potatoes and rotten, diseased potato pieces. Potato tubers are required to be large, long tubular or elliptical, neatly shaped, uniform in size, thin in epidermis, shallow in buds, and free of scabs and other mites. The flesh is white or yellowish. [Microwave drying machine](#)

2 peeled. After cleaning the dust, silt and dirt adhering to the surface of the raw material with clean water, the potato skin is removed by a potato peeler. [French fries machine](#)

3 trimming and cleaning. A small amount of unsalted potato skin remains on the surface of the potato cake treated by the peeling machine. The potato skin is removed with a planer or a hand-controlled air mill. At the same time, the bud eyes are dug, washed with water, and immersed for use.

4 cut strips. The peeled potato is cut with a slitter, and the size of the fries is uniform, the appearance is uniform, and the cut surface is smooth, and the size is 8 mm × 8 mm.

5 screening, rinsing. The cut fries are cut through the vibrating mesh screen to remove the chopped French fries or the

French fries that do not reach the specified length. If the amount of potato is large, the sieve can be sieved twice or three times. After sieving, rinse the starch granules and impurities on the surface of the French fries with plenty of water.

6 color treatment. Color protection time is 20 ~ 30 min.

7 pre-cooked, twice rinsed. Pre-cooking is an important part of the potato strip production process and has a great impact on the quality of the finished product. During operation, the potato strips are poured into the pre-cooking tank of the stainless steel basket and blanched in boiling water for 4 to 6 minutes. In actual operation, the degree of blanching can be determined according to the change of the elasticity of the French fries. Fully cooked. Pre-cooked French fries are rinsed with water and drained.

8 quick freezing and thawing. The cooled and drained chips are placed in a cold storage and frozen in a cold storage. The temperature in the center of the reservoir is maintained at  $-18^{\circ}\text{C}$ , and the quick freezing time is 30 to 35 minutes. The frozen French fries are thawed in the thawing chamber, and the thawing temperature is  $40. \sim 50^{\circ}\text{C}$ , thawing time is 20

$\sim 30\text{min}$ , drained and frozen water for use.

9 vacuum frying and deoiling. When the oil temperature vacuum is maintained at  $-0.075 \sim -0.080 \text{ MPa}$ , the frying time is  $35 \sim 45 \text{ min}$ ; the centrifuge speed is  $500 \text{ r / min}$ , and the deoiling time is 3 min.

10 seasoning, packaging. After the vacuum frying, the French fries are cooled, sorted and UV-sterilized, and the nitrogen-filled packaging is quantitatively prepared according to the specifications, which is the finished product and stored in the warehouse.

Effect of quick freezing process parameters on product quality

Quick-frozen processing is an important part of the processing technology of potato strips. The temperature, time and thawing parameters of quick-freezing have a great influence on the quality of finished products. In the experimental design, the test variety Weiwei 3 has a temperature of 5 gradients. ( $-30 \sim -15^{\circ}\text{C}$ ), each temperature segment corresponds to 3 different quick freezing time ( $15 \sim 35 \text{ min}$ ), the frying vacuum is  $-0.082 \sim -0.085 \text{ MPa}$ , frying temperature  $90 \sim 95^{\circ}\text{C}$ , time 45 min, deoiling time 3 min, speed  $500 \text{ r / min}$ .

The test results show that the comprehensive quality of the finished product is best when the quick freezing center temperature is  $-20\text{ }^{\circ}\text{C}$ , the quick freezing time is 40 min, the thawing temperature is  $45\text{ }^{\circ}\text{C}$  and the thawing time is 25 min. The quick freezing temperature is too low ( $-30\sim-25\text{ }^{\circ}\text{C}$ ), not only can The consumption is increased, the frying time will be extended under the same thawing conditions, the French fries are hollow, the taste is hard and lacks crispness; the quick freezing temperature is high ( $-15\sim-10\text{ }^{\circ}\text{C}$ ), under the same frying conditions The quality of finished products can not meet the requirements of product quality. Only by prolonging the frying time can the process requirements be basically met, and the energy consumption is also increased. From the production point of view, it is not consistent with shortening the processing time and reducing the energy consumption. need.

Different varieties of potato, the best quick-freezing parameters and frying parameters are different, because the dry matter content (starch, mineral elements and cellulose) of different varieties of raw materials cause different processing parameters difference, the test The same experiment was carried out using the potato varieties Fiorui, Atlantic, Zhongshu No. 7 and Cooperative 88. It also confirmed the above viewpoints. Due to space limitations, it will not be repeated here.