

Study on optimization of potato chip under normal pressure frying process



The potato chips produced by the atmospheric frying process have a high acrylamide content and an oil content of more than 30%. The research team found that the [microwave drying machinery](#) technology can reduce the oil content of the finished product to less than 12%. According to the experimental analysis, the potato of Atlantic variety is used as raw material, soaked in 0.5% citric acid aqueous solution, and dried at 85 °C. Min, finally fry until cooked at an oil temperature of 180 °C to obtain a low content of [acrylamide crisps](#).

According to the research of this group, the concentration of citric acid solution (0.10%~0.25%) was obtained by optimizing the processing technology of atmospheric pressure fried potato potato chips by L16(43) orthogonal test and analysis. In the range of pre-drying time (10~40 min) and frying temperature (170~200 °C), the optimum combination of low acrylamide content of normal-fried potato potato chips is 0.20% of citric acid solution. The pre-drying time is 30 min and the frying temperature is 180 °C.

The acrylamide content of the optimum process product at atmospheric pressure frying is 0.89 mg/kg, which

is lower than that of commercially available potato chips (acrylamide content 0.96 mg/kg, oil content 32%, brittleness 471.243 g). About 7.29%, and the oil content (30%) decreased by 2%, and the brittleness (479.221 g) did not change much.

When the frying temperature reaches 190 and 200 °C, the acrylamide content in the potato chips is also high due to the high temperature, and the potato chips are easy to burn, the sensory quality is poor; the frying temperature is too low, and the frying time is prolonged. The fried potato chips have higher oil content. In addition, as the frying time is prolonged, the peroxide value and acid value of the oil in the product increase correspondingly, which does not meet the requirements of people for healthy food. Too low a frying temperature will also increase the water content of the product, which will have a certain impact on the sensory quality of the fried potato chips and its shelf life. Therefore, taking into account the above indicators, when the frying temperature is 180 °C, the quality of the potato chips is the best in all aspects.

Through the comprehensive analysis of the influence of each of the above factors on the indexes of potato chips, it is concluded that the comprehensive best frying process of the atmospheric pressure fried potato potato chips is A3 B3 C2, that is, the concentration of citric acid solution is 0.20%, pre-drying time. For 30 min, the frying temperature was 180 °C.

The selected fresh Atlantic variety potatoes were sliced into 1.5 mm slices, rinsed with water, then immersed in a 0.20% citric acid solution for 30 min, dried in an 85 °C oven for 30 min, and then in oil. Deep-fried until cooked at a temperature of 180 °C.

The amount of acrylamide in the potato chips obtained after frying is 0.82 mg/kg, which is lower than that of commercially available potato chips (acrylamide content of 0.96 mg/kg), and the oil content of potato chips (30%) Lower, brittleness (479.221 g) and sensory evaluation (87) are also better.

in conclusion

Through the orthogonal test and analysis of L16 (43), the concentration of citric acid solution (0.10%~0.25%), pre-drying time (10~40) min and frying temperature (170~200) °C were obtained. The optimum combination of low acrylamide content of the fresh-fried potato potato chips is 0.20% of the citric acid solution, the pre-drying time is 30 min, and the frying temperature is 180 °C.