Effects of boiling and microwave treatment on nutritional quality and antioxidant capacity of mushrooms

Edible mushrooms have unique flavor and good functionality, and are increasingly favored by consumers. Agaricus blazei Murill is a valuable edible fungus, which can be used in medicine as well as in food. It has significant physiological activities, such as anti-tumor, hypolipidemic and immune enhancing. It has a prominent market position in functional foods. With the development of planting industry, letinous edodes has entered ordinary household recipes in various ways. The results showed that heating cooking had a significant effect on the nutritional composition and antioxidant activity of edible mushrooms, but the effect of home cooking methods on the nutritional quality of mushrooms has not been reported. The effects of boiling and Microwave heating equipment on the nutritional quality and antioxidant activity of fresh mushrooms were studied. The changes of nutrient composition, amino acid and monosaccharide composition, reducing power and DPPH scavenging capacity before and after treatment were determined.

Fresh mushrooms from the mushroom market in Kunming on the same day. The edible part was removed. Wash mushrooms with tap water and distilled water and remove surface water with filter paper. According to family eating habits, the samples were divided into three parts: the first part (recorded as FA) was used to determine the nutritional quality of bacteria, the other part (20g bacteria added to 200ml distilled water, 10min, recorded as FAB), the third part (microwave cooking) (20g bacterial advertising). Distilled water 200 ml, output power 600 W, 6min, sample as FAM record.

Equipped with quaternary pump, variable wavelength ultraviolet detector and fluorescence detector; AL204 electronic balance Metro-Toledo Instrument Co., Ltd; VARIAN CP 3800 gas chromatographic flame ionization detector; TU-1901 double beam ultraviolet-visible photometer.

GB/T 5009.5-2003; total ash GB/T 8306-2002; crude fat GB/T 5009.6-2003; vitamin C GB/T 6195-1986; polyphenol content-chlorophyll phenol colorimetry; soluble total sugar-anthrone-sulfuric acid colorimetry; soluble protein-trace Kjeldahl method; monosaccharide complex NT gas chromatography; amino acid composition-high performance liquid chromatography.

After a certain amount of treatment, the reducing force of mushroom heating equipment is determined accurately. With the ratio of material to liquid at 1:20, 60% methanol solution was added into the mushroom and treated by ultrasonic wave for 30 minutes. The methanol extract was obtained by centrifugation. The extract was diluted to a certain concentration gradient in a 10 ml centrifuge tube. 1 mL phosphate (PBS) buffer solution (0.2 mol/L, pH 6.6) and 1 ml 1% potassium ferricyanide solution were added. The extract was extracted for 20 minutes in 50 degree water bath and mixed with 1mL 10% three chloroacetic acid to cool quickly. Mix 1 ml mixture in 5 ml centrifugal tube with 1 ml distilled water and 0.2 ml 0.1% ferric chloride solution. The absorbance (A700 nm) was measured at 700 nm. The reduction capacity of the sample is expressed as A700 nm.

Dilute 0.4 mL to a certain concentration gradient with 5 mL centrifugal tube, add 2 mL 0.1

mmol/L DPPH methanol solution, mix, put in darkness for 30 minutes, oscillate continuously, determine DPPH free radical scavenging rate. The absorbance was measured at 517 nm. The inhibition rate was calculated as follows: inhibition rate (%) = [1 (A1-A2) /A0}* 100]. In the% formula, the A1-absorbance of the sample is added; the A2-absorbance of the sample and reagent blank is added; the A0-absorbance of the sample is not added.

RESULTS AND DISCUSSION: The total protein content of fresh mushrooms was 1.36g/100g fresh weight (FW), and the soluble protein was 0.84g/100g FW. After boiling and microwave treatment, the loss of total protein and soluble protein were 0.38 and 0.32 g/100g FW, respectively. The loss of soluble protein was mainly caused by the dissolution of soluble protein into water medium. High protein, low fat and low calorie are typical characteristics of edible fungi. The results showed that the fat content of fresh mushroom was 82.46 mg/100g FW, which was hardly affected by boiling and microwave treatment. For the content of crude ash, the loss rates of boiling and microwave heating were 55.56% and 44.44% respectively, indicating that heating treatment had a more serious impact on the ash content, which might be caused by the dissolution of a large number of soluble mineral elements into the water medium. The content of soluble sugar in fresh mushroom was 1.72g/100g FW. The effect of heating treatment on the content of soluble sugar was greater, and the loss rate of microwave treatment was significantly lower than that of boiling treatment. Mushroom has high antioxidant activity. The antioxidant activity of different maturity mushroom extracts was studied. The results showed that the antioxidant substances of mushroom were mainly phenolic substances, and the VC content of mushroom was considered to be higher in known edible fungi.

The effects of boiling and microwave treatment on total phenols and VC in fresh mushrooms were determined. The contents of total phenols and VC in fresh mushrooms were 255.19mg GAE/100g FW and 218.47 g/g FW respectively. The content of total phenol and VC was lower than 1/3 after boiling and microwave heating, which indicated that the antioxidant capacity of mushroom was seriously lost after heating.

The total amino acid content of fresh mushrooms was 923.72 mg/100g FW, and the essential amino acid was 423.33 mg/100g FW. The content of glutamic acid and aspartic acid was the highest, which was 20.20% and 9.43% of total amino acids respectively. After boiling and microwave heating, the loss of total amino acid content was 27.44% and 23.27% respectively, of which glutamic acid was the most serious. The loss rates were 61.26% and 38.74% respectively. This may be caused by the partial influx of some protein into the medium water during heat treatment. In addition, our results show that heating treatment can increase the value of TEAA / TAA, thereby reducing the value of TNEAA / TAA, and the effect of boiling heating treatment is slightly higher than that of microwave heating.

The main monosaccharides of fresh Brazilian mushrooms were mannose, glucose and galactose. The highest content of glucose was 852.23mg/100g FW, followed by galactose. After boiling, the loss of glucose, galactose and mannose was 38.12%, 51.41% and 37.79% respectively, and that of the three monosaccharides was 15.36%, 37.06% and 25.60% respectively after microwave heating, which indicated that the loss of monosaccharide by boiling was significantly higher than that by microwave heating. The loss of monosaccharides may be partly in the form of soluble sugars that are lost to heated water, and partly in the form of

Maillard reaction or thermal degradation during heating.

The antioxidant activity of FA, FAB and FAM showed a linear relationship with the total phenol content (R2 > 0.9534, P

conclusion

Boiling and microwave heating reduced the nutrition of Brazil mushroom.

The composition of amino acids and monosaccharides was affected to some extent. plus

Heat treatment significantly destroyed the antioxidant capacity of Brazil mushrooms.

The degree of influence is obviously higher than that of microwave treatment. This study can be used for elimination.

The daily life of the consumers provides scientific basis for the rational cooking of edible fungi.

Correctly assess consumers' daily dietary intake and antioxidant substance

Inter intake is of great importance.