Studies on the Volatile Compounds Formation in Shiitake Chicken

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ABSTRACT

Shiitake chicken broth is favored by most of Chinese people. Most of the meaty notes of chicken have been found to be sulfur-containing compounds. Shiitake is an abundant source of sulfur-containing compounds. During the preparation of shiitake chicken, these sulfur-containing compounds were proposed to involve in the formation of meaty compounds to enhance the flavor of shiitake chicken broth. Four parts of investigation were involved in this study. In the first part of this study volatile compositions of dry shiitake, fresh shiitake, chicken, dry shiitake plus chicken, and fresh shiitake plus chicken were compared. Fresh shiitake was found to contain higher amount of total volatile compounds but less amount of sulfur-containing volatile compounds than dry shiitake. Higher amount of volatile compounds were found in dry shiitake plus chicken than in fresh shiitake plus chicken. It therefore proved that the sulfur-containing volatile compounds in dry shiitake involved in the formation of sulfur-containing volatile compounds in dry shiitake chicken. In the second part of this study, Liken-Nickerson steam distillation dichloromethane extraction method combined with an acid-base fractionation method was used to investigate the difference in flavor composition of dry shiitake chicken and fresh shiitake chicken. Four fractions were obtained in each flavor concentrate from dry shiitake chicken and fresh shiitake chicken. Higher amount of volatile compounds was found in second fraction (basic fraction) in each sample. Thiazoles with meaty character were found mostly in first fraction (slightly basic fraction). Volatile compounds with shiitake sulfurous note were found in the second and third fractions. In the third part of this study, shiitake, chicken hydrolysate, cysteine.HCl, thiamine.HCl, and methionine were used and reacted in a closed reactor to prepare shiitake chicken flavors. Response surface methodology was used to investigate the optimum use level of each reactant. When the preference score was used as the response factor, the amount of dry shiitake and chicken hydrolysate used was fixed in 15 g and 60 g individually, the reaction was conducted at a temperature 105 ℃ and reaction time 2 hr, the optimum use level for cysteine.HCl, thiamine.HCl, and methionine needed to give the highest preference test score was found to be 0.09g, 0.101g, and 5.08 g, respectively. In the fourth part of this study, volatile compositions of a dry shiitake chicken flavor prepared using the optimum reaction condition mentioned above and that of dry shiitake chicken were compared. Higher amount of volatile compounds carrying meaty, shiitake, and roasted note were found in the dry shiitake flavor than in the dry shiitake chicken. It therefore showed the possibility of the preparation of shiitake chicken flavor by thermal reaction using the flavor precursors of both of shiitake and chicken.

Keywords : 1-octen-3-ol ; lenthionine ; dimethyl disulfide ; dimethyl trisulfide ; 2-methyl-3-furanthiol

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