Studies on the Application of Fresh and Blanched Onion in the Preparation of Meat Flavor

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ABSTRACT

Abstract Onion contains nonvolatile flavor precursors, i.e. S-alk(en)yl-L- cysteiene sulfoxides in the intact cells. After the cellls are physically broken down, these precursors can be transformed into alk(en)yl thiosulfinates, the primary flavor compounds of onion, and contributing the fresh flavor of onion. On heating of slice or homogenate of allium vegetables, the primary flavor compounds can further transformed into sulfides, disulfides, polysulfides, or thiophenes, the second flavor compounds. The flavor precursors of onion can be transformed into sulfur-containing volatile compounds or conducting Maillard reactions with sugars during high temperature thermal processing of onion. Most of the pork flavors used in food industry were prepared by reacting the flavor precursors of pork in close systems. In this study, fresh onion or blanched onion was hydrolyzed using commercial available pectinase and cellulase. The best conditions for the fresh onion or blanched onion hydrolysates preparation were determined. The fresh onion or blanched onion hydrolysate with higher hydrolysis degree and less bitterness was then used to react with some meat flavor precursors, ie. Thiamine.HCl and cysteine.HCl or pork hydrolysate to prepare a meat flavor. The best addition amounts of these precursors were determined using a response surface methodology and the sensory evaluation method. After reaction using a formula consisting of the best addition amount of fresh or blanched onion, thiamine.HCl, cysteine.HCl or pork hydrolysate, volatile compounds was compared after being isolated and analyzed using GC-MS. Two stage enzyme hydrolysate of the fresh onion by cellulase – pectinase treatment was found to have the highest hydrolysis degree; the blanched onion hydrolysate by the mixture enzyme of cellulase and pectinase treatment was found to have the highest hydrolysis degree. Volatile compounds found in the fresh or blanched onion by (celluclate-pectinex) C-P a two stage treatment or the mixture enzymes of cellulase and pectinase can be grouped into acids, aldehydes, esters, furans, hydrocarbons, ketons, cyclic sulfur- containing compounds, and acyclic sulfur-containing compounds. By using response surface methodology combine with a sensory evaluation methodology analysis, it was found that the best addition amount of thiamine.HCl, cysteine.HCl was 1.06g, 0.14g individually, when the amount of C-P treated fresh onion hydrolysate was fixed at 200g; in blanched onion, the best addition amount of thiamine.HCl, cysteine.HCl was 0.52g, 0.59g. individually, when the amount of the mixture enzyme of cellulase and pectinase treated blanched onion hydrolysate was fixed at 200g. Volatile compounds in heated solution using the best addition amount mentioned above were found to be acids, aldehydes, furans, ketons, cyclic sulfur-containing compounds, and acyclic sulfur-containing compounds. The different composition model reaction mixtures of fresh onion or blanched onion, pork hydrolysate and some meat flavor precursors, (ie. Thiamine.HCl, cysteine.HCl and xylose) combine with a sensory evaluation methodology analysis, the best sensory acceptance reaction mixtures in fresh or blanched onion systems was analyzed using GC-MS. Volatile compounds in the best sensory acceptance heated solutions were found to be acids, aldehydes, alcohols, esters, furans, hydrocarbon, ketons, miscellaneous, cyclic sulfur-containing compounds, and acyclic sulfur-containing compounds.

Keywords : onion hydrolysate ; pectinex ; celluclate ; model reaction ; thiamine · HCl ; cysteine · HCl ; volatile compounds

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