Flavor Improvement of a Complex Extract from Poor-quality, Individually Quick-frozen Oysters Crassostrea gigas

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To develop an effective use for poor-quality individually quick-frozen (IQF) oysters Crassostrea gigas stored for a long period, the extract conditions, quality characteristics, and optimum reaction flavoring (RF) conditions of a complex extract from these IQF oysters were investigated. The moisture, pH, and volatile basic nitrogen contents of IQF oysters stored for 18 months (18M-IQFO) were 77.9%, 6.32, and 17.9 mg/100 g, respectively. Three different kinds of extract were prepared from 18M-IQFO: a hot-water extract (HE), scrap enzymatic hydrolysate (EH), and complex extract (CE). The respective extracts contained 5.5, 8.6, and 6.6% crude protein and 281.7, 366.0, and 343.0 mg/100 g amino nitrogen, and had 811, 359, and 1,170 mL/kg extraction yields. The CE was superior to the traditional HE in terms of the extraction yield, amino-nitrogen content, and organoleptic qualities, except for the odor. To improve flavor via the Maillard reaction, the reaction system used to produce a desirable flavor comprised CE (Brix 30°B), 0.4 M glucose, 0.4 M glycine, and 0.4 M cysteine solution (4:2:1:1, v/v). The reaction time and pH were the independent variables, and the sensory scores for baked potato odor, masking shellfish odor, and boiled meat odor were the dependent variables. The surface response methodology (RSM) analysis of the multiple responses optimization gave a reaction time of 120.6 minutes and pH 7.33 at 120°C. The reaction improved the flavor of CE considerably, as compared to that of the unreacted extract.

Crassostrea gigas; IQF oyster; Complex extract; Reaction flavoring; Maillard reaction
Quality of frozen oysters is affected by several factors such as storage temperature and time, packaging and thawing conditions. The pH of the oyster gradually changes during freezing storage at -20 °C and -35°C, but moisture and crude protein contents do not change significantly during freezing storage at -20°C for 12 months. Freshness of raw oysters is an important factor affecting the quality change of oysters during freezing storage. The self-life of fresh seafood depends on conditions such as storage time and temperature. Flavor Improvement of a Complex Extract from Poor-quality, Individually Quick-frozen Oysters Crassostrea gigas. ABSTRACT: To develop an effective use for poor-quality individually quick-frozen (IQF) oysters Crassostrea gigas stored for a long period, the extract conditions, quality characteristics, and optimum reaction flavoring (RF) conditions of a complex extract from these IQF oysters were investigated. The moisture, pH, and volatile basic nitrogen contents of IQF oysters stored for 18 months (18M-IQFO) were 77.9%, 6.32, and 17.9 mg/100 g, respectively. Three