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Gelation of Porcine Globin by Pepsin Treatment

Yuji MIYAGUCHI[1)], Masakazu TSUTSUMI[1)] and Kiyomi NAGAYAMA[1)]

1) School of Agriculture, Ibaraki University

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The effects of pepsin treatment on the gelation of porcine globin were studied by measurements of surface hydrophobicity, extent of hydrolysis, gel strength and polyacrylamide gel electrophoresis. Gel formation occurred below pH 4.0 at 30-50°C above 3% globin concentration. After 48-h incubation at pH 3.0 and 50°C in the pepsin concentration used (0.005-1.0% (E/S)), 0.01% (enzyme-substrate ratio: E/S) pepsin gave the highest gel strength. Sodium dodecyl sulfate-polyacrylamide gel electrophoresis (SDS-PAGE) showed several peptides with molecular weight of 4000-6000 to be present in the resultant gel after 48 h of pepsin treatment. Gel strength after 12-h incubation was highly correlated with surface hydrophobicity and markedly elevated at 2-3% hydrolysis. As longer incubation time (over 12 h) is required for maximum gel strength, the gelation of globin would thus appear to occur as follows: pepsin yields peptides from globin, which aggregate to produce a three-dimensional gel network during incubation.

Keywords: globin, gelation, pepsin treatment, surface hydrophobicity, hydrolysis

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