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EFFECTS OF SUPERFINE GRINDING ON PHYSICAL AND CHEMICAL PROPERTIES OF PACIFIC OYSTER (*CRASSOSTREA GIGAS*) PROTEIN

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The oyster protein was ball-milling treated in this work in order to provide a better solubility. The effects of ball-milling on the solubility of oyster protein were firstly investigated and the mechanism of the effects were preliminarily revealed by the changes of particle size, conformation structure and the protein surface hydrophobicity. It was observed that the solubility was increased firstly from $17.55\% \pm 0.68\%$ to $28.17\% \pm 0.66\%$ followed by a significant decrease resulting in a point of inflection at ball-milling treatment for 8 min. The increase of solubility of oyster protein ball-milled within 8 min mainly attributed to the decrease of the particle size of oyster protein. While the decrease of oyster protein ball-milled for more than 12 min was the result of

combined effects of re-enlargement of the particle size, the changes in higher molecular structure and the increase of the protein surface hydrophobicity. With a better solubility of the oyster protein ball-milled within 8 min, the digestibility increased significantly up to 65.89% compared with the control group (54.58%). A further increase of the digestibility from 54.89% to 82.39% was observed when the oyster protein was ball-milled for more than 12 min, mainly attributed to the denaturation of the oyster protein. These results provided theoretical basis for the application of ball-milling treatment in the utilization of oyster protein in the food industry.

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