EFFECT OF PROTEIN COMPOSITIONS OF WHEAT FLOURS ON THE RHEOLOGICAL PROPERTIES OF DOUGH AND THE QUALITY OF DEEP-FRIED GLUTEN BALLS

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ABSTRACT

The wheat flours milled from different varieties of wheat and collected at an extracting rate of 60% were used as raw materials in this study. The proximate compositions, farinographic and extensographic dough properties, and the protein compositions of these wheat flours and the quality of deep-fried gluten balls prepared from these flours were analyzed. The effect of the protein compositions of different wheat flours on the rheological dough properties and the quality of deep-fried gluten balls were also studied. In the aspects of relationship between flour proximate compositions and farinographic dough properties, the crude protein content, wet and dry gluten contents of flour was positively correlated with the water absorption, departure time and valorimetric index of farinographic properties, however, negatively correlated with the weakness of farinographic properties. The ash content of flour was positively correlated with the dough extensibility of extensographic properties, and the water content of flour was positively correlated with dough resistance of extensographic properties. In the aspects of relationship between the quality of deep-fried gluten balls and rheological dough properties, the sensory evaluation score of appearance of deep-fried gluten balls was positively correlated with the water absorption of farinographic properties, however, the peak force, brittleness breakdown, and Hunter color B value of deep-fried gluten balls were negatively correlated with the water absorption of farinographic properties. The Hunter color A value of deep-fried gluten balls was negatively correlated with the departure time and valorimetric index of farinographic properties. The sensory evaluation score of color of deep-fried gluten balls was also negatively correlated with the weakness of farinographic properties. The quality of deep-fried gluten balls showed no correlation with extensographic dough properties. In the study of the relationship between flour protein compositions and rheological dough properties, the flour protein compositions were grouped into six fractions according to the results of protein electrophoresis. The molecular weight of the proteins in these six fractions was as follows, I: 116~97.4, II: 66.2, III: 45.0, IV: 36.0~24.0, V: 24.0~19.7, and VI: 19.7~6.5 KDA. The results showed the contents of protein fractions of I, II, III, IV, and V were positively correlated with the water absorption of farinographic dough properties. The contents of protein fractions of V and VI were positively correlated with the departure time of farinographic dough properties. The contents of protein fractions of I, III, V, and VI were positively correlated with the valorimetric index of farinographic dough properties. The contents of protein fractions of I, IV, and V were negatively correlated with the weakness of farinographic dough properties. In addition, the contents of glutenins (protein fraction I + III), gliadins (protein fraction II + IV), and albumins and globulins (protein fraction V + VI) were positively correlated with the water absorption and valorimetric index of farinographic dough properties, but were negatively correlated with the weakness of farinographic dough properties. The contents of different protein fractions showed no correlation with extensographic dough properties. The results of the study of the relationships between flour protein compositions and the quality of deep-fried gluten balls showed that the contents of protein fractions of I, II, and V were negatively correlated with the expansion volume, peak force and Hunter color B value of the
量與物理性之相關係數分析

面粉中三種主要蛋白群含量與物理性之相關係數分析

面粉中各蛋白質含量與其油炸麵筋球品質之相關性分析

以不同溶劑抽取所得蛋白質區分與麵糰物性及油炸麪筋球品質之相關性

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