

Influence of Thermal Treatments on Ovomuroid as Allergenic Protein

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Abstract : Food allergens are most common non-native form when exposed to the immune system. Most food proteins undergo various treatments (e.g. thermal or proteolytic processing) during food manufacturing. Such treatments have the potential to impact the chemical structure of food allergens so as to convert them to more denatured or unfolded forms. The conformational changes in the proteins may affect the allergenicity of treated-allergens. However, most allergenic proteins possess high resistance against thermal modification or digestive enzymes. In the present study, ovomucoid (a major allergenic protein of egg white) was heated in phosphate-buffered saline (pH 7.4) at different temperatures, aqueous solutions and on different surfaces for various times. The results indicated that different antibody-based methods had different sensitivities in detecting the heated ovomucoid. When using one particular immunoassay, the immunoreactivity of ovomucoid increased rapidly after heating in water whereas immunoreactivity declined after heating in alkaline buffer (pH 10). Ovomuroid appeared more immunoreactive when dissolved in PBS (pH 7.4) and heated on a stainless steel surface. To the best of our knowledge, this is the first time that antibody-based methods have been applied for the detection of ovomucoid adsorbed onto different surfaces under various conditions. The results obtained suggest that use of antibodies to detect ovomucoid after food processing may be problematic. False assurance will be given with the use of inappropriate, non-validated immunoassays such as those available commercially as 'Swab' tests. A greater understanding of antibody-protein interaction after processing of a protein is required.

Keywords : ovomucoid, thermal treatment, solutions, surfaces

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