Studies on Stability of Immunoglobulin Y of Microencapsulated Quail Egg

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ABSTRACT

In this study, quail IgY was purified from egg yolk and was microencapsulated with four different materials, chitosan, gum arabic, β-cyclodextrin (β-CD) and Acryl-EZE, spray-dried method. The effects of pH, temperature, proteases, lipopolysaccharids (LPS) (from E. coli serotype O55:B5), and storage time on the activity of microencapsulated IgY were investigated. The microencapsulated quail IgY with chitosan, gum arabic and β-CD have higher IgY activity at pH 5-9. The IgY activity was protected by the encapsulated material. The residual binding ability of IgY to antigen in un-encapsulated IgY decreased when the temperature increased. The residual of IgY activities microencapsulated with chitosan, gum arabic and β-CD were 90% under the digestion of pepsin for two hours. After further digestion by pancreatin for four hours, the residual of IgY activities microencapsulated with Acryl-EZE were 80%. The E. coli (serotype O55:B5 form) was found to have an antigen-antibody affinity with the IgY. The activity of IgY, microencapsulated with Acryl-EZE, was higher than that of un-encapsulated IgY under the digestion of pepsin for two hours, pancreation for four hours. Storage temperature and packaging materials have a significant effect on the residual IgY activity. The IgY activity stored for 60 days at 4℃ was higher than that stored at room temperature. Aluminum bag-packaged IgY has a higher IgY activity than that of transparent plastic bag-packaged IgY.

Keywords : Quail egg ; Quail egg yolk IgY ; Chitosan ; Gum arabic ; β-Cyclodextrin (β-CD) ; Acryl-EZE ; Microencapsulation

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