Food safety is threatened by environmental toxicants which were contaminated from industrial processes. Di-(2-ethylhexyl) phthalate (DEHP) is among the most-produced phthalates used as plasticizer in industry to increase the flexibility of polyvinyl chloride (PVC) products. DEHP was intentionally blended into emulsifier in Taiwan and has been ubiquitously detected in numerous drinks and food. The incident of phthalate-contaminated foodstuffs raises the concerns of exposure of DEHP-tainted foods on public health. Epidemiological studies revealed a positive association between DEHP exposure and the development of asthma, allergies and atopic disorders. Although several toxicology studies indicate the adjuvant effects of DEHP to disturb the T cell functionality systemically or in the lung tissues of allergic animals, however, little is known regarding the effects of DEHP on intestinal immunity and its underlying mechanisms. As the primary source of DEHP exposure for most people is through gastrointestinal tract and one of the major health concerns of DEHP is its deteriorated effects on immune system, the objective of this study is to evaluate the effects of DEHP on intestinal immunity. The allergen-induced diarrhea mice model were applied to study the adjuvant effects of DEHP on the incidence of allergic symptoms and pathological changes. The present data demonstrated that exposure of DEHP dose-dependently induced the severity of OVA-induced allergic responses. Several aspects were affected by DEHP including acceleration of the occurrence of OVA-induced diarrhea, increased serum level of OVA-specific IgE, infiltration of IL-4-secreting T cells in the villus and the degranulated mast cells with the crypt of duodenum. Collectively, exposure of DEHP will exacerbate antigen-specific allergic responses in the food allergic BALB/c model.