

Title Degradation of insect myosin affects reliability of ELISA test for internal insect infestation of wheat.  
Authors Atui, M. B., Flinn, P. W., Lazzari, F. A. and Lazzari, S. M. N.  
Citation Advances in stored product protection. Proceedings of the 8th International Working Conference on Stored Product Protection, York, UK, 22-26 July 2002 (2003); 263-266

### **Abstract**

Current tests for assessing insect contamination in stored grain and milled products are based on insect fragment counts. These procedures have a certain degree of subjectivity, are time consuming, require highly trained personnel, and are relatively expensive. The ELISA test is a novel tool for detecting insects and their fragments inside the kernels or in flours. The method is based on the immuno-diagnostic assay of insect muscle myosin. However, myosin tends to degrade after the insect dies. Therefore, the aim of this research is to measure myosin degradation in flour samples over a period of time and to evaluate the efficiency of ELISA in detecting decreasing amounts of this muscle protein. Testing was carried out using flour samples obtained from 1500 g of wheat kernels, some of which were infected with *Rhyzopertha dominica* larvae. The samples were kept at room temperature (24 deg C) for 32 days. At the beginning of the study (day 1), insect myosin concentration in the samples averaged 3.3ng/well. At the end (day 32) the concentration had decreased to an average of 2.3 ng/well. The study showed that the ELISA methodology is appropriate for measuring myosin content in flour samples, which results from the presence of insect muscle fragments in the kernels. Equations were developed to predict the original amount of myosin in the samples, based on time and temperature. Although the test is sensitive to small amounts of myosin, it is best to process samples within one week of milling, or to freeze the samples if they cannot be processed within a week. Further studies are needed to improve this methodology and to develop specific ELISA kits for the main stored-insect species.