



REDUCTION OF AFLATOXIN

Project No: 96-ARS Reduction of Aflatoxin in Manufactured almonds by Means of Sorting
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Objectives

1. To establish the extent and location (in terms of process streams) of Aflatoxin contamination in almonds.
2. To find methods of identifying unblanched almonds containing insect pinhole damage.

Results

The analysis of the total distribution by grade for the 1993 crop has been computed, based on DFA and individual processor in-house data, covering 78% of the 1993 handled. Aflatoxin is concentrated virtually entirely in the natural almonds of unknown grade and in fine chopped and ground almonds. Overall Aflatoxin level amounts to 0.67ppb, or 0.17ppb when the above mentioned process streams are removed. This material has been prepared as a manuscript which has been submitted to the J. Food Agric. Chem. A copy of this manuscript, currently in review at this journal, is submitted herewith as part of the final report.

Pinhole damage due to attack by small worms occurs in almonds and is nearly impossible to detect in natural almonds (unblanched). It is possible that similar to other types of insect damage, pinhole damage carries with it potential for mold introduction and toxin production. We have found that pinhole damage in almonds can be revealed in film x-ray images. An image database consisting of 522 almonds containing pinholes and 1565 control amounts has been created. This image set is being used to develop recognition algorithms. Preliminary results indicate that we can easily detect 65% of the pinhole almonds with 4% of the control being misclassified. Other algorithms will detect the controls increases to 10% to 15%. We are currently working on subroutines which will eliminate the primary cause of misclassified controls, cracks between the germ and cotyledons of the nut.