STAGES OF CONTAMINATION BY ASPERGILLUS SPP. AND AFLATOXIN IN THE MANUFACTURING PROCESS OF COCONUT OIL: A CASE STUDY

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Aspergillus flavus and *Aspergillus prasiticus* are fungi producing toxic metabolites such as aflatoxins. Coconut provides a favourable environment for the growth of Aspergillus spp. This study identified the possible stages of contamination by Aspergillus spp. and aflatoxin in the manufacturing process of coconut oils. Coconut oil samples were obtained from a leading manufacturing plant at major unit operations in the manufacturing process of virgin coconut oil (VCO) and yellow coconut oil (YCO). Aspergillus spp. inoculated on potato dextrose agar were identified based on distinctive morphological characteristics. Serial dilution plate technique was used to quantify Aspergillus colonies. Coconut kernels and meat, which were spoiled, cracked, or contaminated with microorganisms, were identified. Presence of aflatoxin was qualitatively determined using a UV fluorescence detector. Results indicated that aflatoxin was detected in the VCO production line. The percentages of samples detected with aflatoxin at receiving/storage, de-shelling, paring and cutting, washing, grinding, and cooling were 100%, 80%, 73%, 67%, 33%, and 33%, respectively. In the YCO production line, aflatoxin contamination was 100%, 67%, 33%, and 20% at the storage of coconut testa and kernel, grinding, cooling, and storage of coconut oil cake, respectively. The presence of aflatoxin was significantly reduced along the processing line. In VCO production, cracked nuts from coconut storage recorded the highest count of Aspergillus spp. (6.0 log cfu g^{-1}), while it was highest (5.8 log cfu g^{-1}) in testa and kernel in YCO production. Although Aspergillus was present up to drying, secondary data revealed that aflatoxin was present in finished oil, but less than the maximum allowable limits (5 µg kg^{-1} aflatoxin B1 and total 10 µg kg^{-1} aflatoxin). In conclusion, contaminated coconut with Aspergillus spp. and aflatoxin are entering the production line, which should be minimized.

Keywords: Contamination, Drying, Kernel, Virgin coconut oil, Yellow coconut oil