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(POS-10) Effect of High Voltage Atmospheric Cold Plasma on Aspergillus flavus Inactivation and Aflatoxin B1 reduction on Inoculated Raw Peanuts

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Peanuts are highly susceptible to contamination with Aspergillus spp. mold in the field or during storage, which may lead to moldy peanuts or generation of aflatoxin, both of which are food safety issues. A. flavus is the main mold that produces aflatoxin B1 (AFB1). High voltage atmospheric cold plasma (HVACP) is an emerging non-thermal technology with short treatment time, low energy consumption, that leaves no chemical residue on the food. In this study, peanut samples were inoculated with A. flavus spores and AFB1 toxin. Subsequently, samples were treated with HVACP at 90 kV and a power of 160 W for several treatment times (2, 5, and 10 min), relative humidities (RH, 5, 40, and 80%), and post-treatment storage times (0, 4, and 24 h) with a direct exposure mode using air (78% N2:22% O2) as the working gas. A reduction of 2.20 log cfu/sample of A. flavus spores was observed for the peanut treated for 5 min. More than 99.9% (3.0 log cfu/sample) of A. flavus was obtained with a HVACP treatment for 10 min at an 80% RH and post-treatment time of 24 h. A 67.8% AFB1 reduction was achieved in pure toxin with a treatment for 2 min with 5% RH air and no post-treatment. AFB1 toxin on peanuts was reduced by 71.3% and 84.5% by 2 and 10 min, respectively, for HVACP direct treatment in air with 80% RH at 90 kV. The reduction of AFB1 toxin increased in function of RH, with no differences in the color, texture and peroxide value of treated and control peanuts. Results indicate that HVACP is a promising technology to effectively inactivate A. flavus and reduce AFB1 on raw peanut kernels without adversely affected peanut quality.

Keyword-1

Cold plasma

Keyword-2

Food safety

Keyword-3

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