

Contamination of Corn Grits by Gases and Microorganisms

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Introduction

Corn is one of the most cultivated cereals in Brazil. However, its grains are continuously uncovered to illness by using mycotoxins. Corn grits are used by means of the meals enterprise to produce a giant range of corn merchandise such as canjiquinha, a cultural meals without difficulty bought through the Brazilian patron at low prices. Some research have verified excessive infection of this product by way of aflatoxins (AFs), representing a viable hazard of publicity due to such a contamination [1]. The efficacy of gaseous ozonation used to be evaluated on the degrees of aflatoxins and on the microbial illness of corn grits.

The utility of gaseous ozone was once examined in specific mixtures of publicity time, ozone concentration, and canjiquinha mass. After the ozonation treatment, samples have been accumulated for aflatoxin and microbiological analyses. Aflatoxins have been evaluated the usage of a high-performance liquid chromatography with fluorescence detection (HPLC-FD) machine the use of pre-column derivatization, and the microbiological analyses had been carried out for toxin-producer fungi and mesophilic bacteria. After ozone detoxification, effects confirmed discounts up to 57% in aflatoxin levels. Total fungal matter used to be decreased round three cycles log CFU g⁻¹ and whole mesophilic counts have been decreased to non-detectable levels. These consequences validated that ozonation is an high-quality choice for decreasing aflatoxin and microbial infection in merchandise like canjiquinha, thereby enhancing meals safety [1-3].

Description

Maize or corn (*Zea mays* L.) is a cereal of intense significance in the diets of many populations, contributing particularly as a source of electricity due to the fact of its excessive content material of starches (up to 73% of kernel weight), proteins (8–13.7%), fatty acids (4-5.4%), as properly as nutritional vitamins and minerals. Corn grits are produced by way of getting rid of the outer bran, the germ, and the tip cap of the grains, accompanied with the aid of grinding into smaller coarse bits. A broad range of merchandise can be produced from corn, relying on the measurement of the grain, such as soups, roasts, sweets, extruded products, and many types of corn snacks [3]. In Brazil, the product of floor corn kernels recognized as canjiquinha is extensively fed on with the aid of the populace and disbursed due to its low cost.

Some species of toxigenic fungi, such as *Aspergillus* spp., can increase in corn kernels and produce aflatoxins (AFs) below appropriate conditions. These metabolites are exceedingly poisonous to human beings and animals, specially the varieties AFB1, AFB2, AFG1, and AFG2, which have been labeled with the aid of the International Agency for Research on Cancer as

genotoxic and carcinogenic molecules. Different authors have said aflatoxin infection, demonstrating that it is a counted of public fitness concern, specifically due to the fact corn grit merchandise are bump off really all through the world. The adoption of great administration structures at some stage in the corn manufacturing chain, such as suitable agricultural practices (GAPs), desirable manufacturing practices (GMPs), and hazard evaluation and integral manipulate factors (HACCPs), is critical to make sure the protection of the corn grits in phrases of infection by using mycotoxins.

On the different hand, when mycotoxins already exist in the kernels, some emerging applied sciences have been studied to decrease this illness to protected tiers. The use of ozone (O₃) has been regarded an fascinating approach for the remediation of cereals contaminated by way of mycotoxins. The United States Food and Drug Administration (FDA) has diagnosed the ozone utility as an oxidizing agent in meals processing and as a normally diagnosed as protected (GRAS) substance for use. When at once utilized on cereal grains, the molecular O₃ and the hydroxyl radicals (·OH) generated in the system can react with mycotoxins, merchandising their degradation to decrease molecular weight products, therefore doing away with or lowering their organic endeavor in phrases of toxicity.

The efficacy of O₃ in decontaminating mycotoxins relies upon on various factors, such as the O₃ concentration, publicity time, moisture content, and temperature of the food. Using one-of-a-kind conditions, some current research have established it is feasible to reap a excessive discount in aflatoxins degrees and microbiological infection in cereal merchandise. However, greater research should be carried out to understand the attainable of O₃ to decrease mycotoxins and microorganisms in a wider range of cereal products, considering that the infection of these ingredients is a applicable trouble in phrases of fitness and economics. In this study, we evaluated the results of gaseous ozonation utilized to corn grits, such as the tiers of aflatoxins (B1, B2, G1, and G2), fungal contamination, and complete mesophilic count [3-5].

Conclusion

Gaseous ozonation is an wonderful non-thermal technological know-how to minimize aflatoxins and microbial illness in corn grits. Using special concentrations of O₃ by means of full factorial design, it used to be viable to gain savings of 54.6%, 57.0%, 36.1%, and 30.0% for AFG1, AFB1, AFG2, and AFB2, respectively. Fungal infection used to be decreased round three cycles log CFU g⁻¹. The equal microbicidal impact used to be proven in the whole mesophilic count. Since corn grits are a uncooked fabric used to produce a giant range of foods, gaseous ozonation can be viewed a very promising alternative to enhance their safety, via efficaciously lowering aflatoxin and microbial illness.

Conflicts of Interest

The authors declare no conflict of interest.

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