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Gene expression as a good indicator of aflatoxin contamination in dry-cured ham

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Highlights

- Effect of environmental factors on AFs-related genes on ham-based media was evaluated.
- The temporal expression profile of *aflP* gene differs to those for *aflR* and *aflS* ones.
- AFs-related gene expression is related to AFs levels on ham-based media.
- The expression of regulatory genes could be an indicator of AFs presence in ham.

â€¢ This study will help in the development of tools to avoid AFs hazard in dry-cured ham.

Abstract

Aspergillus flavus and *Aspergillus parasiticus* are mould species producers of aflatoxins (AFs) and may grow on dry-cured ham during the ripening process. In this study, the influence of different water activity (a_w) and temperatures on the temporal relative expression of three genes involved in AFs biosynthesis and their relationship with AFs production on dry-cured ham-based medium were evaluated. In general, the regulatory *aflR* and *aflS* genes showed similar expression patterns, and the expression of the structural *aflP* gene was much higher than that obtained for *aflR* and *aflS* genes. Regarding *A. flavus*, a decrease of a_w regardless of temperature caused an increase of the expression of the regulatory *aflR* and *aflS* genes. Concerning *A. parasiticus*, the highest and lowest expression values of the regulatory *aflR* and *aflS* genes were found at 0.95 a_w and 0.85 a_w , respectively. The expression of the structural *aflP* gene of both species was stimulated at low temperature and a_w . The PCA analysis indicated that both toxigenic species showed a strong correlation between the relative expression of the *aflR* and *aflS* genes and the concentration of AFs under conditions which simulate dry-cured ham ripening. This suggests that an early detection of the expression of regulatory genes can be a good indicator of possible AFs contamination of dry-cured ham through ripening.



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Keywords

Aspergillus flavus; *Aspergillus parasiticus*; Aflatoxins; Dry-cured ham; Gene expression

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