

# Portuguese Coffee – Is there a concern regarding mycotoxins contamination?

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## Introduction

According to the International Coffee Organization, global coffee production is rising driven by an increase in total demand. However, similar to other crops, coffee cherries and beans are exposed to contamination and consequent colonization by fungi during different phases of plant development, harvesting, transport and storage. Consequently, mycotoxins also contaminate coffee beans although roasting process has an important role in reducing mycotoxins presence, depending upon the combination of time and temperature. Since each country applies different roasting conditions, significant differences in mycotoxins concentrations occur across Europe with respect to contamination levels even when the origin of the coffee is the same. A previous paper showed high contamination by toxigenic fungi of coffee beans to be used in Portuguese coffee industries.

## Aim of Study

Analyze mycotoxins (ochratoxin A (OTA), aflatoxins (AF) and citrinin (CIT)) contamination in coffee ready to be consumed and available in Portuguese market.

## Methods

Six samples were collected from all the different types of brands sell as roasted beans in Portuguese market. The extraction of OTA, CIT and AF was done on the immunoaffinity column Ochraprep (R-Biopharm), CitriTest HPLC and AflaTest HPLV (Vicam), respectively. Mycotoxins were analyzed with HPLC-FLD (Merck-Hitachi) (Fig. 1).

## Results

✓ Only in one of the samples was detected OTA (< 0.4 ppb).



Figure 1: Sampling and analytical methods

## Conclusion

- ✓ The roasting process adopted in Portuguese coffee industries seems to contribute to reduce or eliminate the presence of these mycotoxins.
- ✓ Further studies should be developed to allow other mycotoxins to be analyzed.
- ✓ Additionally, a European study should be developed to allow identifying the optimal roasting conditions to eliminate the presence of mycotoxins in coffee.

## References

- Batista, L.R.; Chalfoun, S.M.; Silva, C.F.; Cirillo, M.; Varga, E.A.; Schwan, R.F. Ochratoxin A in coffee beans (*Coffea arabica* L.) processed by dry and wet methods. *Food Control*, 2009, 20, 784–790.
- Culliao, A.G.; Barcelo, J.M. Fungal and mycotoxin contamination of coffee beans in Benguet province. Philippines, *Food Additives e Contaminants: Part A*, 2015, 32:2, 250-260.
- EFSA. Opinion of the scientific panel of contaminants in the food chain on a request from the Commission related to Ochratoxin A in food. *The EFSA Journal*, 2006, 365, 1 - 56
- Viegas, C.; Pacífico, C.; Faria, T.; Cebola de Oliveira, A.; Aranha Caetano, L.; Carolino, E.; Quintal Gomes, Q.; Viegas, S. Fungal contamination in green coffee beans samples: A public health concern. *Journal of Toxicology and Environmental Health, Part A*, 2017, 1-10.