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Environmental and Food Safety of Spices and Herbs along Global Food Chains

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Environmental and Food Safety of Spices and Herbs along Global Food ChainsAndrás Székács^{a,*}, Martin G. Wilkinson^b, Bernd Appel^c^a Agro-Environmental Research Institute, National Agricultural Research and Innovation Centre, Herman Ottó u. 15, 1022 Budapest, Hungary^b Department of Biological Sciences, University of Limerick, Castletroy, Limerick, V94 T9PX, Ireland^c German Federal Institute for Risk Assessment (BfR), Max-Dohrn-Straße 8–10, 10589 Berlin, Germany**HIGHLIGHTS**

- An overview on food safety of dried spice and herb products is provided.
- A description of EU FP7 project SPICED is provided.
- Scientific reports on food safety of spices within project SPICED are discussed by topic.

ABSTRACT

Spices and herbs, which are consumed in small quantities, but used in a wide range of foods and food products, represent a unique segment within the food sector. Moreover, being distributed as mostly in their dried, low water activity formats and associated with very complex distribution product chains, specific concerns as regards food safety apply to these particular commodities. To promote the capability of the food sector and the society to detect, respond to and prevent bio-threats, data generated from the EU FP7 project “Securing the spices and herbs commodity chains in Europe against deliberate, accidental or natural biological and chemical contamination” (SPICED) are presented thematically including: general considerations and issues of sampling, chemical and microbial contamination, and to food chain and societal aspects.

Keywords: Herbs and spices; Accidental or deliberate contamination; Pesticide residues; Mycotoxins; Pathogenic microorganisms; Trade network; Vulnerable points

1. Introduction

Herbs and spices have long been associated with the human culture, and these condiments have been used to flavour our foods since ancient times. Moreover, as they represent highly valued ingredients, spices have affected human activities such as exploration and trade, and thus, indirectly impacted on human history. Currently, spices and herbs are highly commercialised, similarly to the vast majority of marketed goods, within globalised systems, where the source of cultivation and harvesting may be quite distant from the points of consumption, and spice products may reach the consumers through a series of long and complex food commodity chains. Moreover, timeline from harvest of raw material till consumption can be years which often results in hardly transparent product pathways of spices. Consequently food safety of herbs and spices became an issue of high priority to protect the health of the consumers.

The European Union (EU) is one of the world’s largest markets for herbs and spices, most of which are imported as dried raw materials from regions outside the EU. Despite the low water

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