Alternaria Toxins

Cereals, Fruits, Vegetables and Oil Seeds in the Spotlight

Fungi of the genus Alternaria (black fungi) are common representatives of field fungi. They make part of the natural microbiological growth on pre- and post-harvest crops. The genus Alternaria consists of about 50 species, which may produce toxins and secondary metabolites in a varying scope.

High relative humidity in summer may lead to proliferation of Alternaria and thus a potential contamination with Alternaria toxins.

There are about 70 known different mycotoxins and phytotoxins of the genus Alternaria.

Only a small portion of these mycotoxins occur in food, the most important being:

- Alternariol
- Alternariol monomethylether
- Altenuene
- Tenuazonic acid
- Tentoxin

Occurrence and Spreading

Due to their ubiquitous spreading, Alternaria toxins occur in many different types of food. They are present in cereals, vegetables (tomatoes, carrots, potatoes) and in fruits such as apples and grapes. Even oil seeds like sunflower seeds, rapeseeds and olives may get infected.
Toxicology and Regulatory Provisions

The various Alternaria toxins are differentiated by their toxic impact. Depending on the substance, cytotoxic, teratogenic, fetotoxic, mutagenic, antiviral and antibacterial characteristics have been found.

Moreover, Alternaria spores are amongst the most frequent in- and outdoor allergens and thus the main cause for children’s asthma.

In 2011, the European Food Safety Authority (EFSA) published a Scientific Opinion on Alternaria toxins. Six of these substances are of major importance in the food chain. Grain, vegetables, fruit, alcoholic beverages, oilseeds and vegetable oils mainly contribute to the dietary exposure to Alternaria toxins. For a final evaluation additional data have to be collected.

Presently, food law regulations on Alternaria toxins defending maximum levels do not exist.

Analysis

The Eurofins experts from the Competence Centre for Mycotoxins & Biotoxins have long-term experience in the analysis of the entire mycotoxin spectrum occurring in food. A method for the quantitative determination of Alternaria toxins is offered by the Competence Centre for Mycotoxin Analysis. This method is based on LC-MS/MS, and offers the clear identification and quantification of relevant Alternaria toxins in smallest concentrations possible.

It is applicable for juices (apple, pear, grape, tomato, carrot), tomato and carrot products, grapes and wine, and additionally for cereals, cereal products and vegetable oils.