

## Synergistic effects between mycotoxins in pigs and poultry

The presence of different mycotoxins in single feed may lead to synergistic interactions between multiple mycotoxins. Synergistic effects occur when the combined effects of two mycotoxins are much greater than the individual effects of each toxin alone (example:  $2+2 \geq 5$ ).

In the field, the response of affected animals to exposure to more than one mycotoxin can be the same as the response from each toxin individually (additive), more than the predicted sum of the responses from each individual mycotoxin (synergistic) and, more rarely, less than the predicted response from each toxin individually (antagonistic).

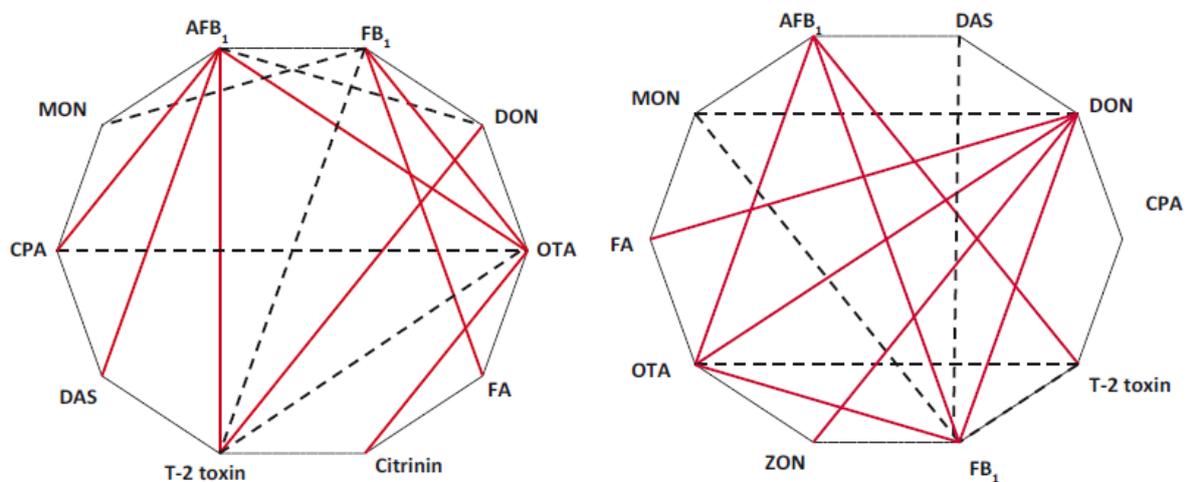


Figure 1. Synergistic and additive effects of mycotoxins in poultry Figure 2. Synergistic and additive effects of mycotoxins in pigs

— synergistic effect  
 - - - additive effect

**Legend:** AFB<sub>1</sub> – Aflatoxin B<sub>1</sub>; FB<sub>1</sub> – Fumonisin B<sub>1</sub>; DON – Deoxynivalenol; OTA – Ochratoxin A; ZON – Zearalenone; FA – Fusaric acid; DAS – Diacetoxyscirpenol; CPA – Cyclopiazonic acid; MON – Moniliformin



Why are livestock animals responding to (low) mycotoxin levels which are not supposed to cause any harm if only scientific studies are taken into account? The fact that one fungus is able to produce more than one mycotoxin; that more than one fungus is usually infecting one commodity and that an animal diet is usually a combination of feedstuffs reiterate then importance and occurrence of multiple mycotoxins and their synergistic effects. All this, in combination with the fact that every year several new mycotoxins are “discovered”, tells us that a great deal of attention must be given to this issue. No matter how strong the nutrition and health program are, if livestock farms are not able to keep mycotoxins under control, they will never achieve the greatest genetic potential from the animals or make the greatest profit. Mycotoxin risk management is the key in managing the peak performance of the livestock business.

For further information contact the author:



**Radka BORUTOVA** MVDr., PhD.  
Technical Manager

BIOMIN Holding GmbH  
Industriestrasse 21  
3130 Herzogenburg, Austria

[radka.borutova@biomin.net](mailto:radka.borutova@biomin.net)

