Fusarium mycotoxins are toxic chemicals produced by a group of fungi called *Fusarium*. These fungi infect cereal grains (such as wheat and corn). Currently, poultry feeds may contain *Fusarium* mycotoxins from infected grains. This study looks at the effects these mycotoxins may have on the immune cell responses of poultry. Immune responses can be measured by testing when and how many types of immune cells react to infection. The infection given to the chicken was called coccidiosis.

This infection is caused by a parasite called *Eimeria maxima*. This parasite causes injuries only in the middle portion of the small intestine (the jejunum).

**What you need to know:**

*Fusarium* mycotoxins are toxic chemicals produced by fungi in some grains. Chicken feed may contain *Fusarium* mycotoxins.

Researchers studied the effect of the mycotoxins on the immune response in the jejunum of chickens. They concluded that *Fusarium* mycotoxins found in chicken feed and GMA have the potential to modulate immune response to a particular infection.

**How can you use this research?**

*Poultry producers* can use this research to help make informed decisions about the feed they give their flocks.

*Crop Producers* can use this research to help them understand the impacts their grain crops may have on livestock that consume their grains.
What did the researchers do?
264 female chicks were divided into 4 groups. Each group was fed one experimental diet type. The 4 experimental diets were:
- Control (regular) diet
- Control + GMA diet
- Contaminated diet (feed containing corn and wheat naturally contaminated with mycotoxins)
- Contaminated + GMA diet
GMA = glucomannan mycotoxin adsorbent; GMA reduces mycotoxin absorption in the animal.

All chicks were infected with the *E. maxima* parasite at 2 and 4 weeks of age. Regularly after being infected, chicks were killed, and sections of their intestines were collected. The intestine sections were fixed and then treated with antibodies. Antibodies bind to immune system cells of the chicks. This allows the researchers to study the immune cell reaction to the infection. The three immune cells studied were called CD4+, CD8+ and macrophages.

What did the researchers find?
The percentage of immune cells at the infection site varied over the study period. Birds fed the contaminated diet had less immune cells at the infection site compared to birds fed the control diet. This suggests a delayed response or preventing recruitment of these immune cells. Birds fed a diet with GMA had different recruitment pattern of immune cells than birds fed the control diet.

The researchers concluded that feed-borne *Fusarium* mycotoxins and GMA modulate the populations of immune cells in the jejunum of *E. maxima*-infected chickens.

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