

NEWS *from* NEOGEN



FOR THE POULTRY & EGG INDUSTRIES

NEOGEN CORPORATION
a Leader in Food Safety Solutions

Mycotoxin Impacts on Animals

Neogen chats with Dr. Chidozie Amuzie, DVM, Ph.D.

Michigan State University Department of Pathobiology and Diagnostic Investigation

Neogen: What types of mycotoxin research does your lab conduct?

Dr. Amuzie: We are conducting research on the use of biomarkers to indicate the effect of mycotoxins on animals. The most consistent indices of effect are cytokines—which are proteins that cells use to communicate with each other. We have seen an increase in cytokines from DON and others have reported similar changes with aflatoxin. Both mycotoxins have been associated with forms of growth reduction/growth faltering. We have determined that in growing mice, cytokine increase is associated with a growth deficit and reduction in circulating growth-associated proteins.

Neogen: Why is this research important?

Dr. Amuzie: Mycotoxins, specifically aflatoxin, have been shown to impair growth rates in humans as well as livestock. If we can get a better understanding of the effect pathway of mycotoxins and the relevant concentrations of concern, we will be better able to assess animal and human safety. Currently we don't have as much knowledge about the effect of mycotoxins in chronic low-dose levels. We understand what can happen at extreme levels but low to mid levels we really don't have a good understanding. We also don't have a good understanding of the effects of other mycotoxins that are present at the same time in low concentrations. For instance, in various research observations it has been evident that other mycotoxins were impacting animal performance even though DON levels were considered relatively low.

The use of biomarkers of effect will allow the industry to determine when mycotoxins become a concern as well as identify the current mycotoxin exposure. This information could then be used in an iterative fashion, to refine mycotoxin regulations/guidance and enhance animal and human safety.



Dr. Chidozie Amuzie

Neogen: Have there been any studies on the new grain-based co-products and by-products that the feed industry is using, like DDGS?

Dr. Amuzie: A few years ago there was a lot of interest in studying DDGS for optimal feeding levels. I think the interest is still there. However, neither I nor anyone known to me are actively performing studies in this area.

Neogen: How does the concern about mycotoxins vary between underdeveloped countries and developed countries?

Dr. Amuzie: As I said before, aflatoxin and other mycotoxins have been shown to impair growth in humans and animals due to elevated cytokine levels. Growth “faltering” has been reported in African countries. My sense is that the human population in developing countries is at increased risk due to monotonous diets, poorer quality grains and inadequate food supply. In ad-

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dition, the concern for mycotoxins in some developed countries is based on other factors, such as resorting to the lowest precautionary concern level. The perception of risk due to mycotoxins is inherently tied to sociopolitical and economic realities in developed countries. Since the science on mycotoxins is similar across countries, the regulatory differences across countries is, in my view, a reflection of risk perception/management differences. Unfortunately, these differences can and do create trade barriers.

Related Websites:

- U.S. Wheat and Barley Scab Initiative, Fusarium Focus: scabusa.org
- U.S. National Library of Medicine: Research papers by Dr. Amuzie: [www.ncbi.nlm.nih.gov/pubmed?term=amuzie percent20cj](http://www.ncbi.nlm.nih.gov/pubmed?term=amuzie+percent20cj)
- MSU Department of Microbiology & Molecular Genetics: www.mmg.msu.edu/about-microbiology.html
- Society of Toxicology newsletter: www.toxicology.org/ai/pub/SP11/SP11.asp

Dr. Chidozie Amuzie is an instructor/resident in Michigan State University's Department of Pathobiology and Diagnostic Investigation. Dr. Amuzie earned a double major Ph.D. from Michigan State University in Comparative Medicine and Integrative Biology, and Environmental and Integrative Toxicological Sciences. He also received a DVM from the University of Nigeria. Dr. Amuzie is a member of the American Association for the Advancement of Science, Society of Toxicology, Society of Toxicologic Pathology, and African Society for Toxicological Sciences. Dr. Amuzie has the distinction of being awarded the 2009 McClellan Award for his research. Dr. Amuzie's extensive experience includes over 10 co-authored peer reviewed papers on mycotoxins as well as presentations at U.S. and Canadian Fusarium Head Blight Forum, California Animal Nutrition Conference and others.



Grain producers face challenges during 2011 growing season

The 2011 growing season has been very challenging for farmers, and these challenges can have an impact on poultry producers.

When grain prices rise, inventory shrinkage or deterioration in quality becomes even more significant so testing grain for heat damage, mold, infestation and mycotoxin presence is critical. A number of studies show that the synergistic impact from various mycotoxins can have serious effects on livestock.

High energy prices causing high grain and feed prices will continue to pressure livestock producers for the foreseeable future.

This year, much of the corn planting was late due to very wet fields across major growing areas. In addition to delayed planting, the cooler than normal soil temperatures have slowed corn's emergence.

The USDA reported that corn acres are 6 percent behind last year. Also, the severe flooding along the Mississippi and Ohio rivers early this year cut corn acres and production.

Many commodity market observers are nervous with low carryover stocks and the prospect of reduced acres and lower yields. Significant global demand for corn may push prices even higher and any quality concerns will impact markets further.



We have your mycotoxin testing solutions

Neogen offers an array of natural toxin test kits to detect aflatoxin, deoxynivalenol (DON), fumonisin, ochratoxin, T-2/HT-2 toxins and zearalenone. Each provides results in minutes, and requires only a minimal amount of training and equipment.

Many of the major trends in grain consumption are anticipated to continue in 2011, such as nearly 40 percent of total U.S. corn production being used for ethanol. The resulting production of DDGS for both domestic use and export markets is growing, with higher inclusion rates in feed.

Quality concerns for stored grain remains an important factor to monitor in these uncertain times.

Neogen announces developments in *E. coli* testing, research

Neogen food safety and genomic research scientists are partnering to further *E. coli* research. Neogen launched a breakthrough genomic testing system for *E. coli* and its GeneSeek subsidiary is participating in research that seeks to better understand the role cattle genetics may play in food contamination by *E. coli* O157:H7.

NeoSEEK™

Neogen's new NeoSEEK pathogen DNA detection method provides next day, DNA-specific test results for seven pathogenic *E. coli* strains. The technology could be adapted to target almost any bacterium of concern in almost any food sample type.

The testing system is the first food safety laboratory technology developed through the close collaboration of Neogen's food safety research group and the company's GeneSeek research team. Acquired by Neogen in April 2010, GeneSeek is considered the leading commercial agricultural genetics laboratory in the United States.

Initially, Neogen will provide next-day results from enriched samples through its GeneSeek laboratory facilities for seven *E. coli* strains — O26, O45, O103, O111, O121, O145, and O157. Like the better known and widely regulated *E. coli* O157:H7 strain, these other six *E. coli* strains are known food safety concerns, and produce Shiga toxins, which are well known to cause severe illness.

USDA Research

GeneSeek is also a participant in USDA-funded research that seeks to better understand the role cattle genetics may play in food contamination by the pathogen *E. coli* O157:H7.

Researchers have shown that while some cows have no *E. coli* O157:H7 in their systems, others present a greater risk for beef contamination by shedding higher concentrations of the pathogen in their feces. The existence of the pathogen does not cause illness in cattle, but *E. coli* O157:H7 is a significant cause of foodborne illness in humans.

The research is being conducted by University of Nebraska-Lincoln scientists, in partnership with USDA's Meat Animal Research Center in Clay Center, Neb., and Lincoln-based GeneSeek. GeneSeek will perform genotyping on the cattle genetic samples.

New member joins Neogen's team

Dave Melton is the newest member of the meat, poultry and seafood sales team.

How has your transition been to the meat, poultry and seafood team?

Learning about Neogen's vast array of product offerings has been an exciting but big undertaking. Luckily, I joined such a welcoming and knowledgeable team, and everyone has been helpful during my transition.



Melton

What has been the biggest challenge for you?

Neogen offers hundreds of products and learning about each test's capabilities, testing protocol and certifications has been a challenge. In spite of the challenge, it's great to work for a company that offers so many solutions for the people who produce everything from the burger I have for dinner to the eggs I eat for breakfast.

What's your favorite part of the job and why?

I get a lot of satisfaction from helping customers meet their goals. My goal is to make my customers' jobs easier and help them find the best solutions to fit their needs.

How can Neogen's tests make your customers' jobs easier?

Our customers face a lot of challenges, so they want testing methods that are simple to use, but they do not want to risk compromising the results. I have found they want to quickly ensure that the food they produce or import is safe so they can confidently send products out to their customers. That's why Neogen's rapid tests for foodborne pathogens and allergens are a perfect choice, since they quickly give you results you can rely on.

Ask about new pipette tips offered by Neogen

- New convenient design
- Fits 1-200 μ L pipettors
- The reload decks fit right into your new rack, or you can refill your rack by hand from the bulk bag.



Our Sales Team

Neogen's Meat, Poultry and Seafood sales group is backed by unparalleled teams of experienced technical support and research and development personnel, and we offer the most comprehensive line of food, feed and animal safety and quality testing products.

Please feel free to contact us at any time about anything that you may read in this publication, or about any safety and quality testing issue.

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Neogen reports 30% increase in net income in FY 2011

Neogen's net income for its 2011 fiscal year, which ended May 31, increased 30% from the previous year to \$22,839,000. Net income in the fiscal year increased to \$0.96 per share, compared to the prior year's \$0.76 per share.

The fourth quarter was the 73rd consecutive profitable quarter from operations for the company, and the 77th quarter of the past 82 quarters to show increased revenues as compared

with the previous year—including the last 25 quarters.

For the first time, Neogen's percentage of sales from international markets exceeded 42% of total revenues. Neogen's FY 2011 operating income increased 33% compared to the prior year to \$35,835,000, or to 20.8% of revenues, compared with \$26,879,000, or 19.1% of revenues in FY 2010.



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