Feed Industry HACCP Training Available Online This Fall

Hazard Analysis and Critical Control Point (HACCP) training for the feed industry will be available online this fall. The course — Feed Industry HACCP; Agro 689 — is being offered by Texas A&M University. HACCP in the feed industry utilizes a process approach directed toward ensuring food safety. Although HACCP is not a regulatory standard for the North American feed industry, food processors and export customers are placing an increasing emphasis on this approach, which in turn necessitates the voluntary adoption of this technique by all sectors of the feed industry to retain their competitiveness.

This course emphasizes a science-based risk-management approach to identifying and managing hazards in feed ingredients and finished feed combined with the application of management science. The latter includes quality assurance, regulatory standards, ISO 9001, and ISO 22000 quality management systems, and hazard analysis and critical control point principles needed to maintain a system to manufacture safe foods and feeds.

Course objectives are to:

- Understand the relationship between pre-requisite programs and HACCP.
- Possess the information and knowledge to assess feed hazards.
- Prepare a HACCP plan.

This course addresses the relationship between quality assurance and HACCP and may be taken for two graduate-level credits or as a continuing education course (3 CEU). The course is accredited by the International HACCP Alliance. Agro 689 will be delivered totally online using a course web site in the WebCT course management system, e-mail, discussion boards, mail, and CDs. Information about the course may be found at: http://agonline.tamu.edu.haccp.

Online materials for this course, including articles, will be accessed through WebCT at http://elearning.tamu.edu, which will become available on the first day of class on Sept. 4, 2007. Web CT provides class communication tools and allows participants secure access to materials and grades.

The total cost for the course is $476, which includes a processing fee and a Texas Online fee. Visa, MasterCard, Discover, American Express, and Web Checks are accepted. Online registration will be available by July 16 at http://www.texasonline.state.tx.us/NASAApp/tamu/ODEManage.

Dr. Tim Herrman, professor of grain science at Texas A&M and director of the Office of the Texas State Chemist, will be the lead instructor. For more information, contact Dr. Herrman at 979-845-1121 or tjh@tocity.tamu.edu.

The course is being presented by Texas A&M’s Department of Soil and Crop Sciences in collaboration with the American Feed Industry Association, the National Grain and Feed Association, and the National Renderers Association.

NC-213 Prepares for the Renewal Approval Process

NC-213 is beginning preparations to seek renewal approval for another five-year term. Dr. Michael D. Montross, University of Kentucky, has been named leader of the NC-213 writing committee. Mike and his committee will create a proposal that will take NC-213 into its next five-year term (October 2008 — September 2013). NC-213’s current term began October 2003.

North Central Regional Association (NCRA) projects are reviewed every five years. For NC-213, this process really begins at the annual meeting scheduled in the year prior to the term. NC-213 will soon be completing its current five-year term. We are still known as “NC-213: Management of Grain Quality and Security in World Markets” with three main objectives:

- Develop practices and technologies to support quality-management systems for production, distribution, processing, and utilization of quality grains and oilseeds.
- Develop basic knowledge, science-based standards, and technologies that promote crop quality, food security, and food safety in grain markets.
- Create and disseminate scientific knowledge that will enhance public confidence in market-driven quality-management systems for grain.

If you are interested in joining the writing committee, please contact Mike Montross at montross@bae.uky.edu or call 859-257-3000 extension 106.

The Grain Quality Newsletter is published and distributed at no charge to NC-213 (formerly NC-15) participants and supporters of research on “Management of Grain Quality and Security in World Markets.”

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**NC-213 Engineers, Scientists, Economists Share Their Research...**

### Biological Evaluation of Reduction of Fumonisin B1 Toxicity in Corn Grits by Extrusion Processing

The overall objective of this project was to assess reduction of the toxicity of fumonisin B1 (FB1) during extrusion cooking of contaminated corn grits using in vivo bioassay methods.

The research found that corn grits, contaminated with fumonisin B1 (FB1), were produced by direct addition of FB1 (spiking) and by fermentation of the grits with a fumonisin-producing strain of *Fusarium verticillioides* M2552. Spiked and fermented corn grits were extruded with and without 10% added glucose at 160°C and 60 rpm screw speed. The extruded grits were then analyzed by enzyme-linked immunosorbent assay (ELISA), high performance liquid chromatography (HPLC), and by high performance liquid chromatography linked to a mass spectrometer (LC-MS). Extruded grits were also tested for fumonisin toxicity using a rat feeding bioassay.

Analyses indicate that fumonisin concentrations in extruded corn grits plus 10% glucose were reduced by 79 to 86% by the extrusion process.

**Ozonation of Corn, Wheat, and Barley for the Control of Pests and Spoilage Agents and the Removal of Off-Odors in Commercial Grain Storage Structures**

The goal of this project was to test the ozonation technology in commercial silos and/or bins for three grains — corn, wheat, and malting barley — at three grain elevator locations (Indiana, Kansas, and North Dakota) during two consecutive storage seasons (2005-2006, 2006-2007).

This project focused on expanding the application of grain ozonation to large scale commercial grain storage systems including bins, tanks, silos, and ground piles. An important part of this effort was the analysis and prediction of the non-uniform airflow through the grain mass in these large-scale systems.

Numerous aeration system designs exist to aerate large outdoor grain piles (up to 50,000 tons) in North America. Suction airflow is used to hold tarps covering these piles in place. Airflow through the peaked grain mass is presumed to be non-uniform.

A procedure was established to estimate the percentage of grain volume having a flow velocity above a critical value needed for ozonation. A comparison between airflow distributions with varying ratios of mass inflow rates between the central tower, flexible perforated air ducts under the tarp, and the perforated side wall was made. The velocity profile of the air movement and absolute pressure exerted by the airflow inside the grain pile and between the tarp and grain surface interface were also studied.

For each mass flow case, the velocity magnitude and the absolute pressure exerted by the airflow increased near each of the three air inlets. The mass flow ratio of 1:1:1 had the highest percentage (77%) of flow velocity above the critical velocity of 0.03 m/s needed for ozonation.

**Physical and Chemical Properties of Shelled Corn Related to Conditioning and Processing**

The goal of this project was to determine and quantify differences in physical properties and chemical composition among corn hybrids that are related to their processing characteristics.

The moisture in these samples is low, and there are differences in moisture content of up to 2 percentage points among the samples. The white corn hybrids, which are usually selected for hardness during breeding programs, had the highest average kernel and bulk densities, while “regular” yellow hybrids had the lowest.

**Ozonation of Corn, Wheat, and Barley for the Control of Pests and Spoilage Agents and the Removal of Off-Odors in Commercial Grain Storage Structures**

**Table 1. Average Values of Bulk and Kernel Density for Classes of Hybrids Grown During the 2004 or 2005 Crop Season.**

<table>
<thead>
<tr>
<th>Hybrid class</th>
<th>% Moisture content (range)</th>
<th>Number of hybrids averaged</th>
<th>Average kernel density (g/cm³) and std. dev.</th>
<th>Average bulk density (kg/m³) and std. dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>White Corn Hybrids</td>
<td>9.5-11.5%</td>
<td>9</td>
<td>1.245 ± 0.03</td>
<td>805.8 ± 13.6</td>
</tr>
<tr>
<td>Yellow Food Corn Hybrids</td>
<td>9.8-11.2%</td>
<td>4</td>
<td>1.229 ± 0.04</td>
<td>794.2 ± 31.4</td>
</tr>
<tr>
<td>Yellow “Regular” Hybrids</td>
<td>10.0-11.5%</td>
<td>19</td>
<td>1.211 ± 0.03</td>
<td>783.4 ± 21.7</td>
</tr>
</tbody>
</table>