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CAUGHT 'N THE NET

It's Not Just *E. coli* O157:H7

By Dr. Gary C. Smith

Food Protection Trends (March 2008) reported that: (1) When *E. coli* O157:H7 infects people, physicians would like to know—as soon as possible—which of the two Shiga toxins (Stx 1 or Stx 2) the microorganism is producing. (2) Stx 2 puts the person at significant risk of developing Hemolytic Uremic Syndrome (a cause of brain damage, renal failure and death), while Stx 1 is only weakly associated with development of HUS. (3) Alison Weiss and co-workers (University of Cincinnati) have identified two glycoconjugates that can differentiate between the two Shiga toxins, at less expense than with monoclonal antibodies and without need for refrigeration. (4) This new approach could be developed into a rapid and accurate point-of-care diagnostic tool that would help physicians decide whether or not they need to worry about HUS.



Manning and co-workers (Proc. Natl. Acad. Science; March, 2008) assigned >500 strains of *E. coli* O157:H7 to one of nine "clades" (i.e., groups of isolates of a bacterial pathogen that are identical or very similar in DNA) using 96 gene markers. Findings included: (1) Different "clades" produced different kinds of Shiga toxins—and in different amounts. (2) Patients with clades 2 and 8 were more likely to have bloody diarrhea than were patients with clade 7. (3) Patients with HUS were seven times more likely to be infected with clade 8 than with clades 1 through 7 combined. (4) Further study is needed into why the prevalence of clade 8 is increasing and what factors enhance its virulence and promote transmission in food and water. (5) The identification of a "hyperpathogenic" strain of *E. coli* O157:H7 probably won't have much regulatory impact—all O157 strains will still be considered adulterants in ground beef and ready-to-eat food—but public health officials may respond more aggressively if they know an outbreak contains a more virulent strain.



Carlson and associates (Final Report to National Cattlemen's Beef Association; June 2008) reported that: (1) Clades of *E. coli* O157:H7 molecular subtypes that persist in cattle populations show a significantly greater ability to adhere to human intestinal epithelial cells, and enhanced virulence, than do clades that do not persist in cattle. (2) After screening >65,000 novel compounds, 43 compounds were identified that inhibit *E. coli* O157:H7 growth. (3) The compounds will now be evaluated by these Colorado State University researchers to determine their ability to reduce the load of these clades on hides, carcasses and equipment surfaces.

The more completely we can understand this deadly pathogen, the more effective we can be in fighting it. ■

For questions or comments about this article, please email Dr. Smith at gsmith@food-safetynet.com.

NUTRITIONAL LABELING... WHICH ANALYSIS IS RIGHT FOR YOU?

By Jamie Stuller, Chemistry Assistant Laboratory Manager

The Food and Drug Administration (FDA) requires that all products have a nutritional panel; however, many customers do not know when they need a full nutritional analysis performed and when a database label is a viable option. *Do you know which analysis is right for you?*

A full nutritional analysis is the best option if the recipe can not be fully disclosed for proprietary reasons. Also, this is the best option if nutritional panels can not be provided for multi-component ingredients, or if the cooking process has significant product loss that is not all due to moisture. Historically, there are a few groups of products that do not lend themselves well to a database-generated nutritional label such as pure dairy products, like cheese, and pickled products, where it is difficult to determine what has been absorbed into the product and what portion of ingredients are left in the juice.

Database-generated labels provide a cost effective route to a nutritional label if all of the following items can be accurately provided:

- Full recipe with the amount of each ingredient provided
- Nutritional panels and ingredient statements from multi-component ingredients such as tomato sauce, baking mixes, etc.
- Specifics on fruits, vegetables and some spices (canned, fresh, dry, dehydrated, etc.)
- Yield of recipe
- Container size
- A sample of the finished product for any proximate verification that may be necessary

Since 2006 when the FDA required trans fat levels to be provided on labels, the database has been continuously updated, but it is not complete. On some products known to have trans fat, naturally occurring or not, but where the database has still not been updated, a trans fat analysis will occasionally be required on the finished product to ensure it is accurately portrayed on the label. There are also times when a database can be provided, but an additional verification of one piece of the label must be added, such as sodium.

In order to better serve our customers, Food Safety Net Services' Chemistry Department has recently expanded its capabilities with the purchase of a GC/MS (Gas Chromatograph/Mass Spectrometer) and HPLC (High Performance Liquid Chromatograph). With these new state-of-the-art instruments, Food Safety Net Services is able to provide all analyses required in a traditional nutritional analysis panel.

While this is a general guide as to whether full nutritional analysis or a database nutritional label is a viable option for your product, we know there are many complex products and situations that may not fit perfectly into either category. FSNS is excited about its new capabilities and the personal service we can provide our customers. Please contact your local FSNS lab or technical sales representative to see if a database nutritional label or full nutritional analysis is the best option for you. We look forward to serving you. ■

For questions or comments about this article, please email jstuller@food-safetynet.com.

Nutrition Facts	
Serving Size 1 cup (228g) Servings Per Container 2	
Amount Per Serving	
Calories 260 Calories from Fat 120	
% Daily Value*	
Total Fat 13g	20%
Saturated Fat 5g	25%
Cholesterol 30mg	10%
Sodium 660mg	28%
Total Carbohydrate 31g	10%
Dietary Fiber 0g	0%
Sugars 5g	
Protein 5g	
Vitamin A 4%	Vitamin C 2%
Calcium 15%	Iron 4%
*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.	
Calories: 2,000 2,500	
Total Fat	Less than 85g 80g
Sat Fat	Less than 20g 25g
Cholesterol	Less than 300mg 300mg
Sodium	Less than 2,400mg 2,400mg
Total Carbohydrate	300g 375g
Dietary Fiber	25g 30g
Calories per gram:	
Fat 9 • Carbohydrate 4 • Protein 4	

DR. KEITH BELK JOINS FSNS AS DIRECTOR OF SCIENTIFIC AFFAIRS

Food Safety Net Services is pleased to announce that Dr. Keith Belk has joined FSNS as Director of Scientific Affairs. Dr. Belk will have various



responsibilities in his new role, such as providing technical troubleshooting to customers, performing facility audits, and conducting industry research. He is also a professor in the Department of Animal Sciences at Colorado State University and has numerous years of experience in the food industry.

Dr. Belk received a B.S. and M.S. in Animal Science from Colorado State University and a Ph.D. in Meat Science from Texas A&M University. He has received numerous awards for his contributions to the meat industry from the U.S. Meat Export Federation, the American Society of Animal Science, Colorado State University, and the American Meat Science Association, among others. In 2005, Dr. Belk received the Marketing Assistance Award for Re-establishment of Export Markets for US Beef from the USDA-AMS-LS.

He is currently President-Elect for the American Meat Science Association, and is a member of ASAS, IFT, NCBA, IAFP, the Colorado Cattleman's Association, the National Western Stock Show Association, and the Colorado Livestock Association. He has presented over 300 professional addresses and guest lectures, and has authored hundreds of abstracts, articles, reports, book chapters, and reviews. Dr. Belk's research interests include red meat safety and quality, live animal development, international trade, and quality management. ■

WASHINGTON UPDATE

By Danny Spellacy, FSNS Washington Representative

Congressional talks over a \$700 billion rescue plan for at-risk financial institutions, known as the **Emergency Economic Stabilization Act of 2008**, have required House and Senate negotiators, along with representatives of the President and Treasury Secretary Henry Paulson, to work around the clock to craft a compromise bill on the financial bail-out. Rank and file Congressional members have complained about a lack of details and information about the multi-billion dollar bail-out package. This is cause for concern as votes on the bailout plan are being scheduled in order for Congress to adjourn for members to get back to their districts with the November elections looming. The Senate has held a procedural vote on a more than \$600 billion continuing resolution package that would fund the federal government through March 6, cover three FY09 appropriations bills, and provide \$22.9 billion for disaster relief due to Hurricanes Gustav, Ike, and Midwestern flooding. This vote is one of the last hurdles that Congress must accomplish before adjourning.

As Congress considers these large legislative packages, it is necessary to keep a watchful eye on potential proposals that can be attached as riders while no one is looking. Food Safety Net Services continues to monitor bills such as the Food Safety Modernization Act of 2008 and Food and Drug Import Safety Act of 2007.

Recent outbreaks of food-borne illness and nationwide recalls of contaminated food from both domestic and foreign sources highlight the need to modernize and strengthen the food safety system to meet the current challenges of a global food supply. The Food Safety Modernization Act of 2008 is a bipartisan plan intended to give FDA new authorities, tools, and resources to update food safety standards in order to improve the food safety system. As discussed in earlier newsletters, the Food and Drug Import Safety Act of 2007 attempts to strengthen federal oversight through tougher standards for imported foods and increased collaboration with foreign governments through user fee generated funds.

While the number of illnesses due to *Salmonella* Saintpaul grew to over 1200 and consumers began questioning the safety of the food supply, Congress and industry recognize that this is far too long for an outbreak to spread unresolved and it is unacceptable for public health, farmers and the food and produce industry. The Congress has held FDA's feet to the fire with nine hearings on the safety and security of the nation's food supply since January 2007. As the 111th Congress convenes in January, the debate on this legislation will continue.

For questions or comments about this article, please email Danny at danny@thespellacygroup.com.



Farm Bill Implementation

A bipartisan group of 31 senators led by Tim Johnson (D-SD) and Mike Enzi (R-WY) have begun urging Agriculture Secretary Schafer to make changes in USDA's interim final rule for the 2008 farm bill provision on country of origin labeling (COOL) of certain products. The senators said that their top priority is for the USDA to rewrite the rule so that beef coming from cattle born, raised, and slaughtered in the United States must be labeled "U.S. Beef" rather than "North American." Meat packers have said that under the current rule they can label all beef from the United States, Mexico and Canada as North American. Secretary Schafer has stated that he does not believe identifying meat as coming from multiple countries meets the intent of the law. COOL went into effect September 30.

Other news

FDA has approved the use of irradiation on fresh lettuce and fresh spinach. Irradiation has been approved for many uses in approximately 36 countries. In the United States, FDA has allowed irradiation in certain cases, including pathogen reduction in meat and poultry and for insect control of fruits and vegetables. However, until this announcement, FDA had not approved irradiation for pathogen reduction in fresh produce. A petition seeking the approval of irradiation for pathogen reduction in fresh fruits and vegetables and other ready-to-eat foods has been sitting at FDA since 1999.

Elizabeth (Beth) Johnson has been designated Acting Under Secretary of Food Safety. The designation is pending the October 1 retirement from federal service of Dr. Richard A. Raymond, MD, who has been responsible for overseeing the policies and programs of the Food Safety and Inspection Service (FSIS) since July 2005. ■



Coming Soon: FSNS Fresno!

Food Safety Net Services is opening our newest laboratory in Fresno, California later this fall. Stay tuned for more information!

WHAT EXACTLY IS GFSI?

By Sherri L. Jenkins, Vice President of Auditing and Consulting Services

The GFSI stands for "Global Food Safety Initiative" and was developed by CIES – The Food Business Forum in May 2000. The GFSI mission statement is simply stated as "Continuous improvement in food safety management systems to ensure confidence in the delivery of safe food to consumers."

There are four GFSI benchmarked schemes that are recognized throughout the world: British Retail Consortium (BRC), Dutch HACCP, IFS, and Safe Quality Foods (SQF). In the United States, there are two main schemes available to food manufacturers – BRC and SQF.

Generally, the BRC Global Standard for Food Safety, Issue 5, encompasses not only Food Safety, but Quality systems as well. Once the food manufacturer decides to implement the BRC Standard, they must first be trained in it, perform a gap analysis, and then either initiate a pre-audit or the initial certification audit with an approved Certification Body. Once the audit is completed, and providing there are no deficiencies noted against a fundamental clause, the food manufacturer will need to submit corrective actions for the findings. After the corrective actions have been approved by the Certification Body, a BRC certificate is issued and then the facility will be on an annual re-certification audit program. This annual certification audit can be announced or unannounced depending on the route the food manufacturer decides upon.

In general, the SQF 6th edition for the 2000 code, levels 2 and 3 are the only ones recognized by GFSI. SQF 2000, level 2 deals with HACCP systems and level 3 contains both HACCP systems and Quality systems. If the SQF approach is chosen, then the food manufacturer must be trained in the SQF code, perform a self analysis for compliance to the program, and apply to the Certification Body for an audit. The audit has two main parts; first, an off-site document review, followed by the facility issuing any corrective actions required, and then the on-site audit is performed at the facility. When a passing score (> or = a C) is met and corrective actions are reviewed and accepted, then the SQF certificate is issued. An audit rating of "Excellent" or "Good" would allow a facility to be audited on an annual basis to maintain certification. An audit rating of "Comply" would mean a six month surveillance audit until an audit rating of "Excellent" or "Good" is obtained.

This information is only the tip of the iceberg, but hopefully will prove useful in answering any initial questions about GFSI. FSNS is an approved BRC Certification Body and is willing to assist you in answering any additional questions you may have. For additional information, visit our website at www.food-safety.net. ■

For questions or comments about this article, email Sherri at sjenkins@food-safety.net.

We are now able to better assist our clients with their data management needs by offering **FSNet**, a state-of-the-art client extranet system that provides anywhere, anytime access to critical client data in a secured manner. Certificates of Analysis (COA), as well as other value added reports, are available at the site. The certificates are available within 15 minutes of final approval in the laboratory and can be full text searched, printed or saved by the client as needed. Value added reports include daily and weekly tracking of samples submitted to FSNS, the ability to download raw data in Excel and delimited files, and trending reports for *Salmonella*, *E. coli*, and *Listeria* testing for the previous 90 days. Contact us today to learn more about **FSNet!** ■



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