A QUARTERLY NEWSLETTER *from* FOOD SAFETY NET SERVICES

THE FOOD SAFETY NETWORK

3rd Quarter :: 2007

In This Issue

CAUGHT 'N THE NET

E. coli O157:H7 In Leafy Greens

By Dr. Gary C. Smith

CDC has reported twenty outbreaks of *E. coli* O157:H7 on lettuce or leafy greens since 1995. The latest of those occurred during Fall 2006, from spinach grown in the Salinas Valley of California, sickening more than 200, and killing three persons. On March 5, 2007, I accompanied representatives of California Cattlemen's Association (CCA) to Sacramento to offer the assistance of the beef industry to state legislators and health officials, the Secretary of Food & Agriculture and the Western Growers Association. CCA recommendations were: (1) Benefit from the experience of the beef industry by focusing – initially – on the "choke point" at packing/processing. (2) Develop in-plant HACCP programs, identify multiple-hurdle microbiological interventions and develop/use "test-and-hold" protocols. (3) Then, move back to pre-harvest firewalls—testing water and soil, assuring cleanliness of workers and equipment, and minimizing entry of run-off and wildlife.

"Investigation Of An *Escherichia coli* O157:H7 Outbreak Associated With Dole Pre-Packaged Spinach" (California Food Emergency Response Team, March 21, 2007): (a) identified environmental risk factors and areas most likely involved in the outbreak, (b) could not definitely determine the origin of the contamination, and (c) concluded that because plants can take up *E. coli* O157:H7 from contaminated soil into their tissues, washing produce cannot prevent human infections. Western Growers Association (March 27, 2007) proposed "Food Safety Standards For Leafy Greens" that focus on: (a) Good Agricultural Practices (GAPs) with regard to soil amendments, sanitation, water testing, harvesting and food risk, plus (b) protection from animals through fencing, securing fields from wildlife, and "set-backs" of 400 ft from confined-animal feeding operations and 20 ft from grazing lands.

A "complete" risk-mitigation program, to essentially preclude the possibility that *E. coli* O157:H7 would be present on leafy greens, would include irradiation of the packaged product. Short of that, a reasonable protocol would include: (1) Develop buffer zones between livestock and produce fields. (2) Test soil and irrigation water for the pathogen. (3) Use GAPs for gathering produce. (4) Test-and-hold produce packaged in the field or in the processing plant. (5) Use GMPs and a HACCP program for washing, decontaminating, handling, chilling and transportation of produce. (6) Test-and-hold produce prior to shipment to customers. (7) Use third-party audits to assure that items 1 through 6 above are followed – – religiously.

There are two primary research questions yet to be answered regarding presence and/or survival of *E. coli* O157:H7 in/on leafy greens: (1) to what extent does the pathogen move up the body of the plant and into the leaves during its growth, and (2) are there chemicals or combinations of treatments (other than irradiation) that will destroy the pathogen if it is in/on the plant? ■

ARE YOU UP TO THE CHALLENGE? CHALLENGE AND VALIDATION TESTING

By Bill Centrella, FSNS Lead Microbiologist

A variety of Special Projects are performed at Food Safety Net Services. In fact, sometimes it seems the only constant with our special projects is variety!

While the majority of projects are performed at the San Antonio facility, we've run projects at almost every lab in our network, and in some far-flung offsite locations. We've performed studies on an array of foods and food products, including beef hides, deli meats, chicken carcasses, hot dogs, nuts, pies, pineapples, and yogurt. Embarking on such studies has required that we broaden our arsenal of laboratory and processing equipment from vacuum sealers to turkey fryers! Despite this wide diversity in project themes, there are some similarities in the general types of projects we perform. Challenge and validation studies, in particular, have many common factors we can examine.

GETTING CULTURED :: The most basic commonality for challenge and validation studies is that we start with a bacterial culture. Whether we're investigating the ability of an antimicrobial to control the outgrowth of *Listeria monocytogenes* in a ready-to-eat product (RTE), or whether a product can be safely held at room temperature if it gets exposed to *Staphylococcus aureus,* or whether a certain set of cooking instructions will eliminate a sufficient amount of *Salmonella spp.,* we have to create a cocktail of organisms to inoculate the product to be tested. It's at this point of the study that we focus on the organism or group of organisms that we're trying to eliminate or control. In many cases, there is a specific target in mind, either because of a specific regulatory issue, like *E. coli* O157:H7 in raw beef, or because a specific organism has already caused a problem, like a specific spoilage organism identified as reducing a product's shelf life. In other cases, there may not be a specific challenge organism in mind, in which case a preliminary discussion and literature search would be needed to determine an appropriate target. In either case, cultures are streaked from frozen stocks, checked for purity, and, if necessary, adapted to the environment of the product (i.e., cold-adapted, acid-adapted, etc.). Several different strains of the target organism will be selected - since different strains will have different tolerances to heat, pH, or the chemical action of certain treatments. Importantly, a range of strains helps support the staging of a worst case scenario. The organism cocktail will be diluted to a level appropriate for verification purposes: high levels of inoculum for a validation, where we want to see large reductions; and lower levels for a challenge, where we want to make sure the organisms don't grow out over time.

INOCULATING YOUR PRODUCT :: Many different inoculation methods are available depending on the nature of the product and the type of contamination we're trying to simulate. In many cases, a simple surface inoculation is the best option — simply use a pipette to drip a volume of the diluted culture onto the product. This can be combined with spreading (to evenly distribute the inoculum over a fairly flat product, like a pancake) or mixing (with a loose product, like ground beef). Some products, like modified atmosphere products, require an injection through a septum. In all cases, the goal is to apply the inoculum as evenly as possible - both to maximize the ability of the organism to attach to the product (too much in one spot may not be representative of actual conditions!), and to minimize the effect of dumping a liquid inoculum in one spot (causing possible changes in water activity).

TREATMENT TIME :: Depending on the nature of the study, after allowing the organism time to attach, either the treatment or process will be applied (in the case of a validation study), or the organism will be stored under the appropriate conditions (for a challenge study), or possibly both. At this point, organisms are enumerated. Generally, replicates of samples that haven't been inoculated will be assessed, to provide perspective on background organisms. Replicates of inoculated and untreated samples will be assessed, to verify the starting amount of organisms in the product. In the case of a validation study, where a treatment or process is applied to the test roducts, we will assess additional replicate samples post-treatment, to determine the effects of treatment on the target organism. For a challenge or validation study, for which the goal is to determine any additional effects on stored products, a series of additional assessments will be carried out over a series of days or weeks (or even months) to determine how long it takes the organisms to grow out to unacceptable levels in the product over time.

HOW DATA BECOMES INFORMATION — THE REPORT :: While most clients observe the progress of the study by receiving raw data spreadsheet updates, especially over the course of a long-term challenge study, each study ends with a comprehensive summary report. The purpose of the report is to provide an overall view of the entire study, from the procedures used to create the cocktails, through the inoculation protocols used, and including a presentation of the raw data. An important part of the report is the discussion and conclusions, where the data generated is expressed as useful information that can be applied to the process. Generally, for a validation, a certain level of reduction is expected, either from past experience with similar interventions, or from previous testing by internal or external studies. Alternatively, some cooking processes have a required amount of reduction to be classified as being effective (a 6 log reduction of *Salmonella spp.,* for example). For challenge studies, the key term is usually outgrowth, the increase in the level of organisms above the level of inoculation over the course of product storage. Beyond a certain level of outgrowth (i.e., 2 log for *Listeria monocytogenes* in RTE products), the ingredient or treatment can no longer be described as effective at controlling the outgrowth of the organism. For both types of study, the discussion and conclusions section of the report will indicate whether the treatment or product meets these criteria. Challenge and validation studies help our clients produce safer food and food that has greater shelf life. Such studies are an important tool for our clients to continuously improve their products and processes, while maintaining food quality and wholesomeness. The next time you're looking at the cooking instructions on a frozen pizza, or wonder if that pie will really keep on the shelf for a whole week, it may be a FSNS challenge or validation study that verified that information! ■

WASHINGTON OUTLOOK

By Danny Spellacy, FSNS Washington Representative

Recent spinach, pet food and peanut butter recalls have prompted proposals in Congress that are intended to increase food safety research and bolster the Food and Drug Administration's inspection force. **Congresswoman Rosa DeLauro, D-Conn,** the chairwoman of the House Agriculture Appropriations subcommittee and food safety enthusiast, may use the fiscal year 2008 spending bill to incorporate these and other food safety measures. For example, while testifying before DeLauro's committee, **Under Secretary for Food Safety at the U.S. Department of Agriculture Richard Raymond** expressed the Department's will to proceed with a risk-based inspection system for meat processing facilities. The plan would concentrate inspection in the parts of the production process where food contamination is most likely. Chairwoman DeLauro believes that approach does not do enough to ensure food safety and may undermine inspection efforts already in place.

In addition, the country-of-origin labeling debate appears to be heating up. This is not a food safety issue but is often portrayed as one. This labeling provision requires labels at retail to indicate the country of origin and method of production of covered commodities. In the 2002 Farm Bill, this labeling requirement was made mandatory for all meat, poultry, fish, and produce. However, the Agricultural Marketing Service of USDA found the administration of the program to be untenable and, in turn, the program became voluntary. The debate over making this program mandatory in nature will likely occur either in the 2008 Appropriations Bill or in the 2007 Farm Bill deliberations. According to **Senator Harkin, D-Iowa,** the Farm Bill expects to release his Chairman's mark and hold a markup on the 2007 farm bill in the last week of June but is having trouble getting cost estimates from the Congressional Budget Office. **House Agriculture Chairman Peterson, D-Minn,** has stated that full House consideration of the Farm Bill might "slip" to the third week in July. ■

WELCOME ANGELA MOLOCK & SHERRI JENKINS

Food Safety Net Services welcomes Angela Molock as the new Customer Services Manager. Angela joins FSNS after 7 years of combined experience in customer service, information technology, and project management. She received her Bachelor of Business Administration in Information Systems Management and a Master in Business Administration from Saint Mary's University in San Antonio, Texas. Angela's experience and educational accomplishments will enable FSNS to continue to enhance and strengthen customer service by establishing a centralized customer relationship management program. Please join us in welcoming Angela to the Food Safety Net Services' family!

Food Safety Net Services also welcomes Sherri Jenkins as the new Director of Auditing and Consulting Services. Sherri joins FSNS after 11 years with Swift and Company where most recently she held the position of Director of Food Safety, Technology and Validation. She received her BS in Equine Science and her MS in Animal Science with an emphasis in Microbiology and Meat Science from Colorado State University. Sherri's experience and educational accomplishments, combined with her training in HACCP, USDA-FSIS regulations, and microbiology, will ensure the continued success of auditing and consulting services provided by FSNS. Please join us in welcoming Sherri to the Food Safety Net Services' family!

FSNS™
Food Safety Net Services

RECALLS...IS YOUR COMPANY READY?

By Sherri L. Jenkins, FSNS Director of Auditing & Consulting

Every day a recall is announced in various industries for one reason or another. Vehicle manufacturers recall products because they found out the control panel will catch on fire or the parking brake doesn't work. Toys are recalled when they are determined to be unsafe for children. Food is recalled due to improper labeling, allergen contamination, and especially for bacteria that can cause illness to the consumer if the food is eaten. Consumers don't like recalls because they are burdensome and usually have a tendency to interfere with their well laid out plans. As difficult as recalls are for the everyday consumer, they are worse yet for the company that has to issue the recall. In the food industry, recalls conjure up images of companies that are no longer in business, some due to raw ground beef products and a little bacterium now commonly known as *E. coli* O157:H7. There have been many recalls in the food industry, but not every company that incurs a recall is automatically out of business. However, the road to recovery is not an easy one. Therefore, one would recommend prevention as the key to a recall. Prevention...sure, no worries, just tell bacteria not to get into the product. Sounds simple enough, but the fact of the matter is that it doesn't happen that way so it is best to have plans in place to deal with unfavorable situations that can occur. A company that has a thorough recall plan that is routinely tested will be much better prepared to deal with the "real thing" should it ever happen. There are inherent risks with manufacturing products and being prepared for the "what if" will make your process stronger. The recall plan should contain at a minimum:

- Flowchart of necessary personnel with titles, contact information and description of duties.
- How to determine what product is involved.
- Who contacts your customers, regulatory agencies, etc.
- Media contact and how to handle the media.
- Responsibilities of personnel.

There are many more caveats in dealing with a recall than a plan can account for. However, having the bulk of the information at your fingertips will be invaluable if or when it ever happens to you. Testing the recall plan on a frequent basis will prove invaluable to your company if it is performed correctly. It cannot be stressed enough that when doing a "mock" recall you should treat it as a "real" recall. Thinking ahead and learning from those that have gone before you will help insure that your company has a strong recall plan in place. Prevention isn't just keeping the bad stuff out of the product, but it is also being prepared to handle a crisis if it does happen. Is your company prepared for a recall? ■

UPCOMING TRADESHOWS

July 8-10	International Association of Food Protection (Lake Buena Vista, Florida)
July 18-21	Southwest Meat Association Annual Convention (Bastrop, Texas)
July 28-31	IFT Food Expo (Chicago, Illinois)

For comments on this newsletter, please contact Terri Pease at (210) 477-3626 or newsletter@food-safetynet.com.

EXPERT RESOURCES.
UNSURPASSED RESULTS.

Gina Bellinger
President

Dr. Gary C. Smith
Partner, Board of Directors

Dr. Scott Brooks
Chief Operating Officer

Alan Uecker
Chief Financial Officer

Dr. Shanna Boleman
Vice President, Technical Sales & Marketing

Dr. Wendy Warren-Serna
Vice President, Technical Services

Sherri Jenkins
Director, Auditing & Consulting Services

Jim Bell
Director, Laboratory Operations

Terri Pease
Marketing Manager

Angela Molock
Customer Service Manager

Ray Collins
Laboratory Manager, San Antonio

Jay Hinkens
Laboratory Manager, DFW

David Bosco
Laboratory Manager, Phoenix

Greg Schultz
Laboratory Manager, Green Bay

888-525-9788
www.food-safetynet.com