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### CAUGHT 'N THE NET

## Advances in Our Understanding of Some BSE Issues

By Dr. Gary C. Smith



Consumption of central nervous system (CNS) tissue from cattle infected with an abnormal form of prion protein is believed to be the cause of neurological disease spread among cattle (Bovine Spongiform Encephalopathy—BSE) and humans (variant Creutzfeldt-Jakob Disease—vCJD). Contamination of beef muscle with infective CNS tissue could result from: (a) pre-slaughter stunning, (b) cross-contamination during harvesting/fabrication/processing and/or (c) generation of advanced meat recovery (AMR) products. Six recent studies involving scientists from Colorado State University have advanced our understanding of some BSE issues.

With the assistance of beef packers from throughout the US, a "Visual Reference Guide for Identification Of Potentially Prohibited Tissues Including Specified Risk Materials" was developed and distributed. DVD, PowerPoint and pictorial presentations, available in Spanish and English, are intended for use in training harvest-plant workers on the identification and removal of BSE Specified Risk Materials<sup>1</sup>.



Of the three methods widely used in the US to detect the presence of CNS tissue in beef products, the fluorescent enzyme-linked immunosorbent assay (F-ELISA) is much more sensitive and repeatable than either the colorimetric Ridascreen Risk Material 10/5 ELISA (R-ELISA) or USDA-FSIS Immunohistochemical (IHC) procedure<sup>2</sup>. And, recent modifications introduced to the original F-ELISA sampling protocol resulted in an even more sensitive and repeatable assay for detection of CNS tissue on meat surfaces and on equipment<sup>3</sup>.

The risk of CNS tissue dissemination to edible tissues via blood circulation following stunning of cattle with non-air-injecting, penetrating captive-bolt (PCB) devices or following Kosher slaughter (without stunning) was very low—suggesting that post-stunning mitigation practices would not be necessary<sup>4</sup>.

In December 2005, the Japanese government agreed to import beef from the US if it was from cattle verified as <21 months-of-age or from carcasses verified as having an A<sup>40</sup> or more youthful maturity score. A study just completed found no significant difference of BSE-infectivity in beef between a BSE-infected Japanese animal slaughtered at < 21 months-of-age and a BSE-infected US animal with a carcass maturity score of A<sup>40</sup> (or even with scores of A<sup>50</sup>, A<sup>60</sup> or A<sup>70</sup>)<sup>5</sup>.

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# WHAT'S THE MAGIC NUMBER?

By Wendy Warren Serna, Ph.D., Vice President of Technical Services

## “What is the appropriate level of target microorganisms in my product?”

Specifically, we are often asked to suggest a level for general microbial indicators, such as aerobic plate count, coliform count and/or yeast and mold counts for a product in question. The truth is, unless the product in question has been the focus of routine food commodity testing in response to microbial criteria set forth by industry or regulatory agencies, we often return from a gallant effort of scanning the technical literature empty handed with regard to what the “magic number” is for a given food type. Further, even if we are lucky enough to uncover information relevant to the product type, it is very likely that the process and handling techniques are not relevant, thus making the information interesting, but likely not appropriate for making important decisions about microbial performance criteria.

So, what is one to do with regard to setting the parameters for microbial performance criteria of the product(s) you produce, aside from throwing darts? It is advisable that you step back and review your process as a whole. It is indeed simple and basic in approach, but nonetheless quite effective!

- **First, what levels are entering your process?**

This is best uncovered by reviewing information provided with your incoming raw materials. Importantly, you should build and maintain a strong supplier verification program to prove the reproducibility and accuracy of the information you're using to establish incom-

ing levels of microorganisms. Ask yourself if you are allowing someone else to control this very important information for you.

- **Second, what processing and/or handling techniques may increase, maintain or reduce microbial levels during processing?**

You will likely want to perform some investigatory, in-process sampling over time to adequately support an informed perspective on this question. In-process assessments may need to be extensive to ensure that you are in fact capturing all the necessary processing variables that contribute to the overall microbial levels in the product from beginning to end.

- **Finally, what is the reproducible range of target organisms in the finished product?**

This is information best captured over a period of time such that you have a working range of values that accurately reflects your process from day-to-day.

In following this basic approach you can establish a well-founded, relevant decision for the designation of microbial performance criteria for your product(s) involving no magic (or dart throwing) whatsoever! Further, a comprehensive working knowledge across your production system will undoubtedly support a knowledgeable stance on making and measuring process improvements. ■

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# HACCP

## Atlanta, Georgia

February 26-27, 2008

Join us for this 2-day course — fully accredited by the International HACCP Alliance — taught by **Dr. Gary C. Smith** of Colorado State University and **Sherri Jenkins**, Director of Auditing and Consulting at FSNS.

Registration fee is \$695 per person. **Discounts:** 10% if registering more than one person for the course; 10% if registered before February 11, 2008. **Registration fee includes:** All course materials, Lunch on both days of course, Certificate of Completion. **Cancellation Policy:** No penalty if registration is cancelled before February 11, 2008; \$100 fee if cancellation occurs after February 11, 2008. FSNS holds the right to cancel the course if a minimum of 10 people are not registered by February 11, 2008. If this situation occurs, all registrations will be fully refunded.

**Please contact Terri Pease at [tpease@food-safetynet.com](mailto:tpease@food-safetynet.com) or 888.525.9788 x244** if you are interested in receiving more information on this course.

## PRE-OP SANITATION: SOMETHING TO CONSIDER

By Sherri Jenkins, Director of Auditing and Consulting, FSNS



Most food processing companies perform regularly scheduled sampling of their processing areas before operations begin. This is done to verify that the cleaning procedures were performed adequately. Something else to consider is the point at which these types of pre-operational samples are taken. Are they taken prior to the sanitizer or after the sanitizer?

Most companies take their pre-operational samples after the sanitizing step. While this is the end of the sanitation process, one must ask if this is a true assessment of the cleaning procedures. Taking the samples at the end of the total process validates all of the procedures from beginning to end. Whether the procedures work as they were designed or not depends solely on the results of the samples. A low microbiological count would suggest that the system was effective for cleaning the area; whereas, a high microbiological count would suggest that either the procedures were not followed or that they were not adequate for cleaning the area.

Common sense tells us that we cannot expect a sanitizing agent to work effectively on an area that is not free from product residue. Taking samples prior to sanitizing allows you the opportunity to validate that the cleaning procedures are correct for complete cleaning of the area and that you are applying sanitizer to a clean surface, which will allow it to be more effective.

Validation of total processes is always a good idea, however, do you really know if the cleaning steps work like you thought they would or is the sanitizer covering up some flaws in the cleaning process? Let's face it, in today's production environment it is essential for your processes to work at an optimum level with minimum cost. Applying a sanitizer to a "not so clean" surface is not optimum and is a waste of time and money.

Something to consider...validate not only the total process, but the steps in-between to ensure that each component of the system works as it was designed to. ■

Email Sherri at [sjenkins@food-safetynet.com](mailto:sjenkins@food-safetynet.com) or call 210-308-0675 x264.



## upcoming tradeshows



### January 23-25

International Poultry Expo  
Atlanta, Georgia  
Booth #853

### February 25

Dixie IFT Suppliers' Night  
Atlanta, Georgia

### March 18-20

Food Safety and  
Security Summit  
Washington, DC  
Booth #715

### March 27

Longhorn IFT  
Suppliers' Night  
Frisco, Texas  
Booth #114

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## CAUGHT 'N THE NET

By Dr. Gary C. Smith

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In a comprehensive review of literature, it was concluded that: (a) worldwide prevalence of BSE is declining due to implementation of successful control measures, (b) because of a low and decreasing prevalence of BSE, the risk of humans contracting vCJD from eating beef products is extremely low, and (c) agreement on, and implementation of, international testing policies for prevalence of BSE in the indigenous cattle herd of countries, and on methods for determination of CNS tissue presence would allow for trade to occur based on knowledge of risk, as opposed to zero tolerance policies<sup>6</sup>. ■

### REFERENCES:

<sup>1</sup>Dewell *et al.* (2007), Identification of Potentially Prohibited Tissues Including Specified Risk Materials: Visual Reference Guide. Colorado State University, Fort Collins, CO.

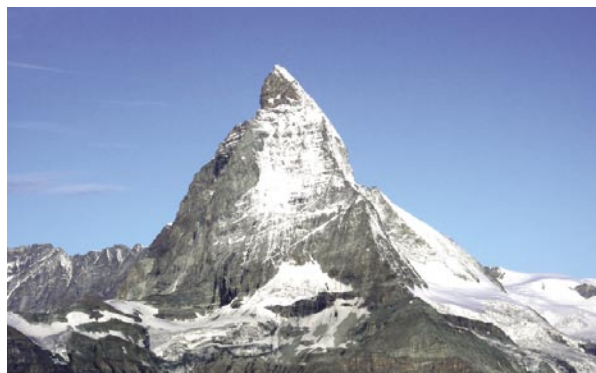
<sup>2</sup>Hossner *et al.* (2006), *J. Food Protection* 69:644-650.

<sup>3</sup>Reddy *et al.* (2006), *J. Food Protection* 69:1966-1970.

<sup>4</sup>Rovira *et al.* (2007), *Food Protection Trends* 27:524-529.

<sup>5</sup>Sugiura and Smith (2008), *J. Food Protection* 71:In Press.

<sup>6</sup>Bowling *et al.* (2007), *Advances in Food and Nutrition Research* 53:39-64.



## ON THE FRONTLINE IN SWITZERLAND

Dr. Wendy Warren-Serna of Food Safety Net Services participated in the International Forum for Transmissible Animal Diseases and Food Safety (TAFS) Workshop on Paratuberculosis/MaP in Unterägeri, Switzerland in November. Over 35 industry experts from around the world gathered for the workshop in order to produce a database of information related to control measures for bovine Paratuberculosis caused by *Mycobacterium paratuberculosis* (MaP) both at the animal (farm) and animal product (food) level.

The TAFS Forum is a non-profit Swiss foundation that began in 2002 as the International Forum for Transmissible Spongiform Encephalopathies (TSE) and Food Safety, in response to the urgent need to address the BSE/TSE issue. However, in 2006 TAFS extended its scope to include other transmissible animal disease, such as avian influenza and Paratuberculosis, and the risks they may pose to food safety. TAFS' next conference, entitled "Fix it Before it Breaks<sup>1</sup>: Managing a Crisis Before it Happens", will take place June 4-6, 2008 in San Antonio, Texas. ■

### REFERENCE:

<sup>1</sup> From "Truth or Consequences" by Al Golin

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