



FoodBytes

Wash Water Sanitation on Produce Farms

At this year's Indiana Horticultural Congress Dr. Trevor Suslow, Extension Specialist, focused on pre-harvest and postharvest research at University of California, Davis. He spoke on managing sanitizers in fresh produce wash water, and brought to light the importance of maintaining appropriate concentrations of sanitizer as well as ensuring other water parameters do not interfere with sanitizer efficacy. The idea behind adding a sanitizer to produce wash water is to kill any pathogens or spoilage organisms in the water during the washing process. Without a sanitizer, pathogens on one fruit or vegetable could potentially contaminate all other produce that contacts the water. This is more of a risk in re-circulated wash water or dump tanks rather than single-pass water systems.

Many factors can have a significant impact on the sanitizer's ability to do its job – the water pH, temperature and hardness, contact time, amount of organic debris introduced into the water type of produce being washed, and sanitizer sensitivity to UV light. Dr. Suslow focused on chlorine based sanitizers, which are very dependent on the pH of the water to be effective. After chlorine is added to water, it becomes available in two forms – hypochlorous acid (HOCl) and hypochlorite ions (OCl⁻) in amounts that vary depending on water pH. HOCl is 80 times more active than OCl⁻, so it is ideal to have as much HOCl available as possible. To achieve effective sanitation, water must be maintained at the proper pH. This means that even though a chlorine test strip reads 100 ppm, if

the pH is too high or too low, the sanitizer will not be as effective as it should. When organic matter is added, chlorine combines with the organic matter and the sanitizing effect decreases even further. Produce that brings high amounts of soil, leaf litter or other debris will significantly increase the chlorine demand compared to relatively “clean” produce. Additionally, produce that is cut or peeled prior to washing will increase chlorine demand, due to plant tissue secretions that result after cutting.

pH of water	Approximate % chlorine	
	HOCL	OCl ⁻
5.0	100	Trace
5.5	100	Trace
6.0	98	2
6.5	95	5
7.0	78	22
7.5	50	50
8.0	22	78
8.5	15	85

Test kits or strips are essential for any sanitizing program. They should be able to measure sanitizer concentration, as well as pH, particularly for chlorine sanitizers.

This chart illustrates how pH changes the amount of HOCl present in the water.

Dr. Suslow also discussed the use of measuring the oxidation-reduction potential (ORP) of the water, which indicates its anti-microbial potential.

Because HOCl has a higher ORP value than OCl⁻, a low ORP is a sign that the sanitizer will not be very effective at killing pathogens. He indicated that



Inside this issue:

School Inspection Guidance	2
Foodborne Disease Spotlight: 2013 Highlights	3
Indiana Horticulture Congress and Trade Show	4
New SOP used to Investigate Skittles	5
Cryptosporidium – anatomy of an investigation	6
Microbreweries Inspection Process	7
Did you Know? New FDA Gluten Free Labeling Rule	9

Meet the new Consumer Specialist—Kris Gasperic

Kris is originally from New Berlin, a suburb of Milwaukee, WI. She is a cheesehead who loves the Green Bay Packers, but is a Colts fan as long as they do not play each other.

Kris graduated from the University of Wisconsin – Milwaukee in 1993 with a Bachelor of Science in Biological Science. Her first position out of college was at Swans Environmental, an environmental lab, where she did organic sample preparation and sample receiving for about three years. That company closed



and she then found a position at Foran Spice Company. There she made custom spice blends and wrote ingredient statements. After about six months, in No-

vember 1996, Kris was offered a position with Milwaukee Cooperative Milk Producers. As a lab technician, she tested raw milk for butterfat, protein, Lactose, other solids and somatic cells along with bacteria and antibiotics for producer pay. In 2006, Kris became the lab manager.

In the fall of 2012, for a variety of reasons, Kris made the decision to change her life dramatically. She left her lab manager position in Brookfield, WI to find a new life and career in Indianapolis. As the new Consumer Specialist, Kris will be responsible for recalls, complaints, and sampling. She looks forward to working with everyone!

*by Sharon Pattee, MFRPS
ISDH Training and Auditing Coordinator*

School Inspection Guidance now available to LHDs

The Department of Education (DOE), School and Community Nutrition, and ISDH Food Protection Program (FPP) collaborated to provide the first ever school inspection guidance for Local Health Departments (LHDs). Sarah Kenworthy and John Todd, DOE, worked with Sharon Farrell and Dan Miller, ISDH FPP, to design this new resource. According to the most recent DOE data, improvements were needed to assure that all sites get inspected. One of the requirements of the Richard B. Russell National School Lunch Act is that **each site** participating in the National School Lunch (NSLP) and Breakfast Programs (SBP) must obtain **two** food safety inspections each school year, which is a reporting period of July 1-June 30. The Summer Food Service Program (SFSP) must have **one** inspection.

Identified by the authors of the guidance was a need for an easier way for LHDs

to know what programs needed inspections. This need resulted in a re-engineered list where all sites are listed under the county that inspects rather than the county where the school sponsor is located.

In addition, sponsors are required to notify the LHDs if they open a site, at least two weeks prior to opening. This is helpful to learn about new summer sites. SFSP often opens a new location just for the summer and this site may not be on the list.

If a LHD is not able to get all the required inspections scheduled, they have the option of giving the site a letter verifying this fact. This will allow the sponsor to receive reimbursement that would otherwise be denied if they did not obtain the inspections.

The United States Department of Agriculture (USDA) is serious about food safety and requires sites to post the LHD inspections.

Other than prisons and mental health facilities, the LHDs are responsible for most school site inspections. Also identified by the group was some confusion being reported about the Food Safety HACCP plans required by USDA. HACCP plans are required but inspectors are not required to review them.

State Legislation Programs

by Gordon W. Gunderson

“By 1937, 15 States had passed laws specifically authorizing local school boards to operate lunchrooms. Although the laws commonly authorized the serving of meals at cost, usually the cost of the food only, four States made special provisions for needy children. In Indiana (for cities of over 300,000 inhabitants -Indianapolis was the only one), and in Vermont, the boards were authorized to furnish lunch without cost to poor children, and in Missouri (for cities over 500,000 -St. Louis was the only one and Wisconsin at less than cost prices.”

The Bureau of Agricultural Economics, USDA, The School Lunch Program and Agricultural Surplus Disposal, Miscellaneous Publications No. 467, October 1941.

Foodborne Disease Spotlight: 2013 Enteric Diseases

The ISDH is continually working to improve the enteric disease outbreak reporting capabilities. As a result, the ISDH investigated 120 enteric disease outbreaks in 2013. Comparatively, in 2012, the ISDH investigated 28 enteric disease outbreaks.

Enteric disease outbreaks are defined as two or more cases of similar illness associated with a common exposure, outbreaks with cases within the same household, or a single case of foodborne botulism and foodborne toxin.

Investigating enteric disease outbreaks requires a collaborative effort from state and local partners. In the case of multistate outbreaks and some instate outbreaks, collaboration also include federal partners. Of the 120 enteric disease outbreaks in Indiana in 2013, 38 were multistate investigations.

Among the 120 outbreaks of enteric diseases, the most commonly identified confirmed pathogens were *Salmonella* (44), Norovirus (18) and Shiga toxin-producing *E. coli* (14). Additionally 31 suspected Norovirus outbreaks were investigated by Indiana in 2013.

Salmonella

Outbreaks of *Salmonella* infections are often identified through a type of “DNA fingerprinting” on *Salmonella* laboratory samples, known as pulse-field gel electrophoresis (PFGE). In most cases, bacteria with the same PFGE pattern indicate a common source of exposure. With PFGE testing, investigators can determine if there is a link between an infected case and contaminated food, water or an infected animal. Food sources commonly associated with *Salmonella* infections include eggs, poultry, meat, unpasteurized milk or juice, cheese, contaminated

raw fruits and vegetables.

Norovirus

Transmission of norovirus can occur by contacting with an infected person, consuming contaminated food or water or touching a contaminated object. While norovirus infections can occur any time throughout the year, they are most common during the winter months. In the United States, about 50 percent of food-related illness outbreaks are caused by norovirus. Any food that is served raw or handled after being cooked can become contaminated; however, foods most commonly associated with norovirus infections include leafy greens, fresh fruits and shellfish.

Shiga toxin-producing *E. coli* (STEC)

Outbreaks of STEC infections are identified by the specific strain infecting individuals or contaminating food. *E. coli* O157:H7 is the most common strain associated with outbreaks of STEC. Food sources commonly associated with *E. coli* O157:H7 infections include undercooked beef (especially hamburger), unpasteurized milk and juice, raw fruits and vegetables (e.g., sprouts) and contaminated water.

All enteric disease outbreaks are to be reported immediately to the ISDH Contact the District Field Epidemiologist or the Enteric Epidemiologist to report an outbreak during normal business hours. After hours, enteric disease outbreaks can be reported to the ISDH Duty Officer at 317-233-1325.

From previous outbreaks, we are able to learn more about how to prevent foodborne outbreaks from happening in the future. Actions taken by many partners in

the food production chain are important to preventing future foodborne outbreaks. Improving the ability to detect and respond to outbreaks will hopefully in turn improve foodborne illness prevention techniques and ultimately reduce the burden of enteric diseases across Indiana.

References

http://www.cdc.gov/salmonella/outbreaks/reporting_timeline.html

<http://www.cdc.gov/norovirus/trends-outbreaks.html#trends>

<http://www.cdc.gov/ecoli/general/index.html>

<http://www.cdc.gov/foodsafety/outbreaks/prevention-education/future.html>

by Tess Gordon, ISDH
Enteric Epidemiologist



Indiana Horticultural Congress and Trade Show

Each year, the Indiana Horticultural Congress draws a diverse crowd of attendees from every aspect of the produce industry, from organic growers, to wine producers, to processors. The congress was held January 21-23, 2014 in Indianapolis, and hosted a variety of educational sessions, including updates on produce quality, food safety, pest management, product marketing and production practices. ISDH Food Safety Farm Consultant Jennifer Coleman presented an update on the produce safety initiative and its activities over the course of the past year. The program was implemented in 2013 after recognizing the need to address food safety on produce farms. Throughout the year, the Farm Consultants conducted on-site visits to review farming and food handling practices, discussing with growers any practices needing improvement. It was noted that common problem areas throughout Indiana were a lack of well water testing, using unsuitable materials for food contact surfaces and inadequate sanitation practices.

They demonstrated the use of Adenosine Tri-Phosphate (ATP)

swabs and luminometers to illustrate how ATP testing can be utilized to monitor cleaning effectiveness on the farm. With farms varying widely in size, type and complexity, it is clear that it will be necessary to find workable solutions that address the individual needs of each farm.

Farm Consultants also conducted surveillance sampling of produce from a variety of locations, including farmers' markets, retail food establishments and directly from produce farms. They followed up positive test results with on-farm assessments to determine if farm practices may have contributed to contamination. Environmental samples, including soil, water and equipment swabs were collected as needed to further identify sources of contamination. Recommendations for the improvement of specific practices were made as necessary, and outlined in letters sent to the grower. Produce sample results for the year were largely negative for pathogens, with a few exceptions where *Salmonella* was found on produce and in soil and *Listeria monocy-*

togenes was found on produce and equipment.

Several educational opportunities were available to growers in 2013, including good agricultural practices workshops offered by Purdue University Extension, as well as on-farm packing shed sanitation workshops hosted by Purdue food scientists and ISDH. ISDH and Purdue hope to provide more educational opportunities this year, allowing for a more hands-on experience for growers. Throughout 2014, the Farm Consultants will continue to assist growers in developing food safety plans, reviewing farm and packing shed practices, identifying best practices from other states and working with industry and academia to develop solutions for Indiana farms. The Horticultural Congress provided a great opportunity for the Farm Consultants to learn more about the produce industry while opening the dialogue between ISDH and local growers in the interest of public health.

*by Jennifer Coleman,
ISDH Food Safety
Farm Consultant*

Wash Water Sanitation on Produce Farms

(continued from page 1)

30 seconds with ORP values above 650mV. Growers who utilize this typically use either hand held probes or in-line sensors that provide continuous monitoring of ORP values.

Another reason it is important to maintain wash water quality is the potential for internalization of water into the produce. When fruits or vegetables are submerged during washing, water may be drawn into their flesh if the temperature of the water is more than 10°F colder than the temperature

of the produce. Any pathogens present in the water may be internalized as well, presenting a problem for produce that is likely to be eaten raw.

Dr. Suslow stressed that with the availability of many different types of sanitizers on the market, growers should consider the advantages and disadvantages of each when choosing one that will be appropriate for their operation. Some are less affected by organic debris, some are less affected by pH, some are less corrosive and some provide residual anti-



microbial activity on the surface of produce after washing. The overarching message was that there is no “one size fits all” sanitizer, and regardless of what kind is used, growers should be aware of its limitations, what parameters to monitor and how to monitor them.

*by Jennifer Coleman,
ISDH Food Safety
Farm Consultant*

New SOP Used to Investigate Skittles Complaint

The recent Skittles related illnesses reported in Richmond, Indiana presented the ISDH's FPP with the opportunity to utilize its Foodborne Illness Investigation and Recall written standard operating procedures which proved very useful. A Standard Operating Procedure (SOP) is a document that details the necessary actions that are taken when performing a task. The SOP can be thought of as a manual used in performance of a duty. SOPs are widely utilized in various industry segments like laboratories, health-care establishments and the military to mention a few.

ISDH FPP has adopted the Voluntary National Retail Food Regulatory Program Standards (VNRFRPS). A key tenet of VNRFRPS is the need to have written guidelines or SOPs for the actions undertaken by the FPP. This helps to define terms, clarify roles and responsibilities as well as spell out the activity-tree or flow chart to carry out a procedure.

There are a number of advantages to having written SOPs.

These can include ensuring uniformity in the enactment and enforcement of policy by food inspectors in a jurisdiction. The actions of staff members can be evaluated based on how well the policy is being implemented. SOPs can also serve as a training aid for food inspectors.

The creation of an SOP should be an ongoing process not a made-and-done document. Constant improvement and predetermined review interval of SOPs is critical to its usefulness and effectiveness. The existence of an SOP should not exclude personal initiative as well as flexibility which are essential in carrying out the activities that protect the safety of the public's food supply. If you have any questions on how to create and use SOP or want to know more about VNRFRPS and how it relates to the work of the

FPP, please do not hesitate to contact Stephen Fakoyejo, VNRFRPS Coordinator, by phone at 317-233-8476.

By Steven Fakoyejo, VNRFRPS grant coordinator

"Who is this ?" see page 7



Not for Profit Food Safety Training

A new food safety training, "Cooking for Groups", is available through IN-Train. IN-Train stands for Indiana Training Finder Real-time Affiliate Integrated Network (IN-TRAIN) and is sponsored by the ISDH Office of Public Health Performance Management

With IN-Train, it is now possible to provide training programs for the public as well as internal partners.

It is estimated that thousands of Indiana volunteers serve food each year at festivals, school events, church dinners, fairs and food banks. Most volunteers do not work in food service on a routine basis and may not be aware of current best practices. Traditional training is often too costly for volunteers or takes too long to complete.

"Cooking for Groups" is a 20 minute basic overview available



24/7 at no cost. An endorsement video created by Indiana not for profit organizations is part of the Purdue Extension and ISDH Food Protection collaboration. Registration is required allowing ISDH access to records of who has trained and can then be shared.

CDC records show that many outbreaks result from these events and are contributing to foodborne illness rates, especially in the summer months.

Statistics can be found at:

<http://wwwn.cdc.gov/foodborneoutbreaks/Default.aspx>

CDC has written an article about [Food Safety at Fairs and Festivals](http://www.cdc.gov/Features/FairsAndFood/) found at: <http://www.cdc.gov/Features/FairsAndFood/>

*by Sharon Farrell,
ISDH Food Protection Specialist.*

CRYPTOSPORIDIUM - Anatomy of an Investigation

Although there was no final source located, this article describes a recent investigation and the process and the partnerships needed to thoroughly investigate an outbreak. Pictures were taken during the investigation and illustrate the cider manufacturing process described.

On November 15, 2013, Elkhart County health officials notified the ISDH Epidemiology Resource Center (ERC) of an elevated number in reported cases of



Cases of Unlabeled Cider cryptosporidiosis in the past six weeks. Symptoms of cryptosporidiosis include watery diarrhea, stomach cramps, upset stomach, fever, weight loss and vomiting. Case investigations revealed that five of the six cases reported drinking unpasteurized apple cider in the two weeks prior to illness onset. After further investigation and follow up questionnaires, two more cases of cryptosporidium with a common exposure to unpasteurized apple cider were identified. Case investigations and consumer complaints identified three locations where the potentially-contaminated unpasteurized ciders were purchased.

The ISDH FPP sprang into action and completed a traceback,

constructing a diagram of producers, distributors and farms linked



Apple Press

to the three points of purchase, some of which were in Michigan. Since ISDH labs did not have the capacity to test for cryptosporid-



Unidentified black residue in hose

ium, Iowa labs agreed to run samples for Indiana's investigation.

ISDH ERC notified Michigan State Health Department of the traceback results to their state, but their local health departments reported no increased case counts of cryptosporidium. However, because of the investigation's inter-

state complexity, the Food and Drug Administration (FDA) was consulted.

In total, 13 environmental samples were collected from places where the cider was purchased or processed. All environmental samples were sent to one of three labs for sampling: ISDH laboratories received two water samples which were tested for coliforms; Iowa laboratories received four environmental samples, two cider samples and one water sample, all tested for *Cryptosporidium*; and the FDA received four samples of apple cider for *Cryptosporidium* testing. All samples tested



Grinder and Chute

negative for *Cryptosporidium* and coliforms, therefore, the investigation was closed before assessments were accomplished at the Michigan firms.

Although lab results were unable to show that the apple cider was contaminated, most of the ill cases reported drinking unpasteurized apple cider in the two weeks prior to onset, which is consistent with the incubation period of *Cryptosporidium*¹. Therefore, it is highly suspect that this outbreak was introduced by unpasteurized apple cider.

Unpasteurized apple cider associated with a previous outbreak of cryptosporidiosis.²

Continued on page 7

CRYPTOSPORIDIUM - Anatomy of an Investigation

Continued from page 6

Although apple cider is acidic, *Cryptosporidium* is acid-tolerant and can survive in environments like apple cider for up to four weeks. Consumers should drink pasteurized or boiled ciders in order to reduce their risk of becoming ill with enteric conditions such as *Cryptosporidium*.

ISDH extends its deep appreciation to Elkhart County Local Health Department, LaGrange County

Health Department, the Iowa State Hygienic Laboratory (University of Iowa) and the FDA for their contributions to this investigation.

¹ <http://www.cdc.gov/parasites/crypto/disease.html>

² Millard PS, Gensheimer KF, Addiss DG, et al. An outbreak of cryptosporidiosis from fresh-pressed apple cider. JAMA 1994;272:1592-6.

by Shawna Feinman,
Waterborne Epidemiologist, ISDH ERC

Mystery Photo from page 5

Do you remember Robert L. Jump R.P.S.? Bob was formerly the Food Protection Program Director. He retired in 1997 after 40 years of service. During his career, he was 1970 President of the Indiana Association of Sanitarians. Bob is pictured here at the Food Protection pitch-in on December 20, 2013.

Meet the new CodePal Specialist—Eli Shevanov

Eli is a contractor assisting with CodePal implementation. He is a .Net Developer who graduated from IUPUI in 2003 and eventually found work there at the Department of Biostatistics. He joined the Food Protection Project Team at the beginning of 2014. Eli originally came from Kiev, Ukraine,



but he lived here for a long time and is a proud citizen of the United States. He likes to play volleyball and poker with friends on weekends. He can be reached at 317-233-7605.

by Irene Jamison, OTC
Application Systems Analyst/Program Supervisor

Microbreweries Inspection Process

Microbreweries are a limited production brewery and typically produce specialty beers and sell products locally. It is considered a craft beer industry that focuses on flavor and technique. Most are independently owned and some have brewpubs that brew their own beer for customers.

Beer is a relatively safe beverage and it is not common to hear about beer contamination. However, there are other hazards that can arise during production. Human pathogens do not usually grow in beer due to the acidity and fermentation process.

As with all facilities, a brewery must undergo a pre-operational inspection and a plan review of the facility which

includes floors, walls, ceilings and ventilation. Adequate lighting, warewashing and hand-washing stations and are also reviewed.

Inspections should focus on the 5 Foodborne Illness Risk Factors which are food from unsafe sources, inadequate cooking, improper holding temperatures, contaminated equipment and poor personal hygiene. For a brewery, inadequate cooking and improper holding temperatures do not apply. Inspections focus on ensuring the cereal grains, barley, hops and yeast are from an approved source, stored correctly, and free from pests. Equipment is inspected to ensure it is clean and sanitized and the cleaning for “clean in place”

Most sanitation methods are industry specific and are not the typical sanitizers found in retail food establishments. Employees are monitored to ensure they are practicing good hygiene.

The ISDH will inspect breweries that sell wholesale, but it is up to the local health department to permit and inspect if they sell retail. If any brewery acts as a brewpub with a restaurant attached, they fall under the local jurisdiction to permit and inspect.

by Lisa Harrison,
FPP Retail Inspection and Training
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Did You Know? New FDA Gluten Free Labeling Rule

Popularity of gluten free products grew 44 percent from 2011 to 2013 and product sales are expected to grow from \$10.5 billion to \$15.6 billion in sales by 2016, according to Food Quality and Safety



magazine (Apr/May 2014).

But, gluten free is not just a fad. The FDA estimates that three million Americans are affected.

Persons diagnosed with celiac disease and many with type 1 diabetes require a gluten-free diet. Celiac disease interferes with carbohydrate absorption and can cause serious fluctuation in blood sugar levels in patients with type 1 diabetes. It does not seem to affect those with type 2 diabetes, however. Life can be complicated for patients trying to read labels to determine if a

product is safe. Beginning August 5, 2014, they will have better information. Labels must meet new requirements based on the FDA's final rule that defines gluten-free label claims. Foods may be considered misbranded if they do not meet the new requirements. Misbranded products are subject to monetary penalties, no-sale orders, product seizures and/or injunctions by FDA. The final rule applies to all FDA regulated food and beverages, including dietary supplements. Restaurants using gluten-free claims on menu items should also follow the rule. For those eating out frequently, a big challenge is cross contamination. The law does not apply to USDA regulated meat, poultry, and egg products or distilled spirits and malt beverages. To be gluten free, the product must not contain more than 20 parts per million (ppm) gluten.

Resources

American Diabetes Association (www.diabetes.org)

Celiac Disease Foundation (www.celiac.org)

FDA
<http://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/Allergens/ucm362880.htm>

Gluten-Free Drugs (www.glutenfreedrugs.com)

University of Chicago Celiac disease Center (www.cureceliacdisease.org)