Suppliers’ Night Moved to Next Year

Dear NCIFT members, Suppliers’ Night exhibitors and Suppliers’ Night event attendees:

At NCIFT, we share your concern for the spread of 2019 Novel Coronavirus (COVID-19), with our primary concern for the health and well-being of our members. As a non-profit dedicated to bringing together the Northern California food scientist community, NCIFT extends its concern and support to our members, friends, colleagues, and peers who have been impacted by the current health emergency.

As you are aware, we have been planning our annual Suppliers’ Night events for April 27 and 28, 2020. The Suppliers’ Night events include a golf outing and dinner, a symposium and exposition. These are our increasingly popular annual events where many people gather to network, learn and create business opportunities. Given the extraordinary amount of media coverage for the Coronavirus recently, the potential for spread of the virus is a concern for all of your leadership teams.

Due to the current national public health emergency surrounding COVID-19 and the recent recommendations issued by the US Center for Disease Control (CDC) and the Shelter-In-Place directive by California’s Governor, the decision has been made to cancel all of these events. The health and safety of you, our members and community, is our number one priority.

Although the events will no longer take place, NCIFT intends to keep our commitment to our local food scientist community. We are currently exploring the opportunity to provide the symposium “Recipes for Success, Take-Aways from Real Life Product Launches” as a dual live event and webcast, scheduled for the fourth quarter. In addition, we have rescheduled the Hot Topics in Food Labeling & Advertising as a 2 part series Friday March 27th and Friday, April 3rd. Trust also that we will continue to build additional educational events for our members this year.

Exhibitors and golfing/dining members who have pre-registered: We will maintain a list of pre-registered exhibitors on our website and refer potential attendees to it. This will be completed in the next two weeks. Please let Imelda Vasquez at our office know if you have any edits. All vendors, even those who have previously notified us of company travel bans, will be offered a deferral of their fee to be used for the NCIFT Suppliers’ Night 2021 – currently planned for May 10 and 11. Imelda will be in contact with you regarding your rollover or refund determinations. You are our partners and we will do our best to show our appreciation and honor that partnership for years to come.

Again, given recent events evolving in the last 24 hours, we no longer feel we can move forward and hold this event in good conscience.

Regretfully,
Your NCIFT leadership team
and Suppliers’ Night Committee

From the Editor’s Desk

by Carol Cooper

In these uncertain times, we have decided that this issue of the Hornblower will be digital-only. You should have received an e-mail regarding this. I would love to hear about the possibility of going all-digital in the future. Please let me know your thoughts.

I am also pleased to announce that the IFT Board of Directors has approved our section’s petition to include Reno/Western Nevada in our territory. We want to welcome these new members and hear from them as to how we can better serve them. These new members are marked with an * in the Welcome New Members list. We had a very successful event in Reno last year and hope to have another one in the future.

I would like to congratulate two of our members for receiving IFT Achievement Awards. They are Carl Winter who received the Carl R. Fellers Award and Christine Bruhn who received the Trailblazer Award and Lectureship. Both are retired Extension Specialists from the UC Davis Food Science and Technology Department and will be acknowledged during the Annual IFT Meeting and Expo, which will also be a virtual event this year.

And, please congratulate Pam Vaillancourt (Account Manager, IMCD) who was recently elected to the IFT Board of Directors. If you have any concerns or suggestions for IFT, I am sure she will pass your messages along.

Stay well (and 6 feet apart)!
Carol Cooper
cac95758@gmail.com
Officers of NCIFT and Subsections

*Information UPDATED as of 12/16/19

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Welcome New Members

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Emeritus
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Ryan Brown
Account Manager, Ingredion Inc.
Jasmine Chang
Patent Engineer
Ibrahim Elandaloussi
Lori Fulmer
Sr. Manager, R&D, Peet’s Coffee
Karen Gallagher
Regional Sales Manager, IMDC N.V.
Joanna Haas
Associate Food Scientist, Perfect Day
Diane Wright Hoffpauer*
Managing Director,
Mary’s Gone Crackers, Inc.
Marielle Kane
Sr. Product Development Manager,
CannaCraft
David Killilea
Research Specialist, Children’s
Hospital Oakland Research Institute
Allison Kino
SBC Global
Veronique Lagrange
Director, Strategic Development
American Dairy Products Institute
Sueellan Le
Food Scientist, Kagome
Sowmya Lingareddy
Food Safety and Quality Control
Technician, Compass Group
Robert Lipnik
Sales Specialist, Oregon Spice
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Professor, University of Nevada
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Associate, Keller and Heckman LLP
Shruti Sawant
QA Supervisor, Bettera Brands
Dave Soika
Falcon Trading Company
Carl A. Staub*
Agrton Inc.
Daniel Aaron Vlodaver
Brian Wentzel
Enterprise Business Leader,
YUM! Brands at Cargill
Eric Yale
R&D Food Technologist, Miyoko’s
Andrei Zuzin
EFKO
*New members from the newly annexed northern Nevada area

STUDENTS

Jordan Beiden-Charles
Marsha Bridgette
Xiangyu Cao
Jennifer Chen
Abigail Fine
Isaac Ho
Gyeon Hwang
Yilin Li
Alysa Lopez
Mariah Mier
Thong Thomas Nguyen
Jeremy Pack
Jeremy Rains
Megha Ramesh
Andrew Reagan
Kasai Richardson
Stefanie Santora
Melvinna Tania
Ruiye Yao
Greetings to our membership and am pleased to announce that your chapter has been successful in acquiring Western Nevada into our already expansive geography. Looking back many years, we coached and nurtured San Juaquin Valley section until they were ready to branch off on their own. Most recently we revived the Central Valley IFT section, adding them to our chapter and will continue to support them until they’re able to become their own chapter. Our goal is to support this new area with funding, events and education until they’re able to branch out on their own. If you know of anyone in the greater Reno or Carson City area who’s not aware of this, please let them know!

The Food Industry in Northern California continues to grow at warp speed, with the vast majority of us running from project to project. Our in-box continues to overflow, with seemingly little time for anything other than work. Understandably, this complicates our efforts to secure more volunteers, but also demonstrates the need to review the programs we offer. Trust that our goal remains to increase our value to you and your membership in IFT, by offering frequent and interesting networking events along with our upcoming educational series.

As always, we welcome your ideas and suggestions for how to serve you better. To that end please feel free to email me at crothe@elitespice.com and let me know your thoughts.

Craig R. Rothe, NCIFT President
crothe@elitespice.com

NCIFT Makes Strong Showing at CLFP

by Bruce Ferree

CLFP show was a success for NCIFT again this year. NCIFT had an expo booth at the California League of Food Processors at the Santa Clara Convention Center on February 12 and 13. Erin Evers and Bruce Ferree manned the booth providing information about NCIFT and IFT to EXPO attendees. We had lots of success letting attendees know about our professional society and what food scientists at local companies can gain from being members. We also provided handouts about careers in food science, and advertised upcoming meetings like the UC Davis Student Recognition meeting on March 11 and the Suppliers’ Night events of April 27 and 28. We believe we recruited some new members and created buzz for existing members to become more active in the organization. A BIG thank you to Erin Evers for being able to man the NCIFT booth on both days and to SPI Group for allowing Erin to be at the booth both days. NCIFT could not have had this success without Erin and SPI.

The NCIFT lunch at the CLFP EXPO was also great as we had 74 attendees and a presentation by Dr. Dave Lundahl of InsightsNow. Dr. Lundahl presented some of his recent work on consumer insights towards clean labeling and how those insights can be used to help manufacturers design a label that attracts ‘cleanlabel’ proponents. These insights may also be used to find gaps in the education of consumers so that food scientists can improve messaging about products and ingredients. Further info can be found at the website: insightsnow.com

All in all, the event was very worthwhile for NCIFT as an organization and for attendees who gained insights as well as being able to catch up with clients, suppliers and friends. See you again next year at the event back in Sacramento.

Encapsulating Nutrients Makes It Easier to Fortify Foods with Iron and Vitamin A

by Kara Gonzales (Department of Nutrition, Food Science and Packaging, San Jose State University, San Jose, CA 95012)

About 2 billion people are affected by malnutrition and vitamin deficiencies. Two million children die each year from iron and vitamin A deficiencies. Other symptoms of malnutrition are blindness, anemia, and cognitive impairments. People living in under-developed or developing countries have a higher susceptibility to these deficiencies and therefore its symptoms. Many children will experience measles and have a greater chance of cognitive impairment at a young age or possibly in the womb because their mother did not receive the proper micronutrients during pregnancy. This leads to an ongoing cycle of poverty continued from mother to child.

MIT researchers were able to develop a new technology that was inspired by the successful strategies of fortification. Fortification was first used in salt with iodine in the 1920s in order to help people around the world receive the micronutrient in their daily diet and avoid symptoms such as goiter and weakness. However, vitamin A and iron are continued on facing page
Black Pepper

by Craig Rothe,
Regional Manager, Elite Spice

Black pepper (Piper nigrum), referred to as the “king of spice” is the nation’s top selling spice with over 600 varieties. Commonly paired with salt, it typically commands a constant presence on our dinner tables and countertops. While also available in a rainbow of colors (pink, white and green), black pepper is the most dominant. People have used black pepper for over 2,000 years to season food, but it was also discovered to be part of the Egyptian mummification process. It was even used as currency at one point in history. So what else do we know about these little black berries?

We all know it makes you sneeze! The causative nature of this is the compound peperine which is an alkaloid and a nasal irritant.

Pepper is good for you. It has anti-inflammatory properties, aids in digestion, contains important minerals and B-complex vitamins, vitamins C, A, and is rich in anti-oxidants. Past generations even used peppercorns as an antiseptic for oral and dental concerns. While some are reducing their salt intake, pepper actually helps in ridding our body of toxins through stimulating our bodies to perspire.

Fact is, most of us just shake or grind it on our foods from meat to potatoes to vegetables, giving little thought to its history, properties or even derivation. Many households buy pepper already ground, even though we readily accept it “freshly ground” when dining in a restaurant. Who can resist the server who offers freshly ground pepper from a 2-foot pepper grinder to season your salad or pasta? The pungent black specks that scatter among your food are actually the cracked form of pepper, typically in a larger mesh size than you’d serve in your home.

Household use aside, most of us in the food industry use it in enormous quantities in our plants. Our main concern is often mesh size and price per pound, but little thought is given to purity and safety. So what are the challenges of sourcing black pepper that’s safe for your products? With reduced Piperine and VO levels.

While black pepper can be sourced from a variety of countries including India, Indonesia, Brazil and others, Viet Nam has become the largest exporter. From berry size to Piperine and VO levels, the quality is difficult to beat.

The research done by MIT explored the link between the nature of foods, including how they deteriorate, and how they can be improved by food processing techniques for people in every country. The researchers found that an 18% iron sulfate particles presence in bread flour led to iron absorption rates similar to the percentage level for unencapsulated iron sulfate among the same test group. These research findings could help combat micronutrient deficiencies and families around the world who are dealing with the hidden hunger of malnutrition.

The food process of microencapsulation is very important for the future of food science and the war on food poverty in not only developing and under-developed countries, but developed countries as well.

Reference
Food Tech Club at UC Davis Activities:  
Fall and Winter Quarters 2019-2020

by Jacqueline Yee, Secretary

The Food Tech Club has been very active these past two quarters, including general meetings, industry trips, food demos, volunteer events, and club socials.

FALL QUARTER 2019

Several general meetings were held, including:

First meeting at which attendees learned about IFT, NCIFT, IFTSA, Food Tech Club and all the opportunities available through the year. Adam Yee from the podcast “My Food Job Rocks” recorded a session with Food Tech Club members. Kat Fernandez moderated the discussion with the help of live questions from the audience. Given were advice on college and tips on navigating post-grad life. The episode is listed as Episode 195, and can be found here: https://myfoodjobrocks.com/episodes/

UC Davis FST graduate students: Andrea Tam, Katie Uhl, Kay Senn, Jessica Hallstrom and Derrick Risner participated in a panel about their individual experiences as well as tips for applying and choosing a grad school.

Yvonne Wang from Wild Earth, a plant-based pet food company, spoke to members about the future of the food industry and about the processes and nutrition behind manufacturing plant-based pet foods.

Industry tours included Morning Star in Williams, Norcal Beverage Company in Sacramento, and Clif Bar in Emeryville.

The major volunteer activity was with the Food Recovery Network Solano Park Free Farm Fare, during which Food Tech Club volunteers helped the Food Recovery Network distribute surplus produce from the Davis Farmer’s Market to the Solano Park Apartments.

Other events included pizza and apple pie food demos, a welcome back pizza social, a seminar with the Food Science and Technology Department Leadership Board, hosting a booth at the World Food Festival where students highlighted the science behind “popping boba,” a cover letter workshop with the Internship and Career Center, a seminar at which FTC partnered with FSGSA and the Good Food Institute (GFI) focusing on emerging research and careers in the plant-and-stem-cell-based meat space, and a trip to Apple Hill. They also attended a Cultured Meat Symposium in San Francisco where they learned about the future of cultured meat and cell agriculture. A major fundraiser was the annual raffle at the NCIFT Holiday Meeting. Thanks to all who donated raffle prizes!

WINTER QUARTER 2020

Four general meetings were held, including Amy Fletcher and Dr. DiCaprio, who gave a short talk on food safety in...
the food industry and discussed the importance of the food safety teams for Picnic Day ice cream production.

UC Davis alum Danielle Rath gave a virtual presentation on caffeine content in beverages and how to consume caffeine efficiently for studying.

Leslie Herzog, a member of the UC Davis Food Science and Technology Department Leadership Board and VP of Understanding and Insight Group, gave a virtual presentation and Q/A session about entering the industry as a new professional, internships, and his own experience working at Unilever.

Danone representatives gave a virtual presentation about their company, and the R&D summer internship they were recruiting for. The presentation was moved virtual, due to unforeseen health circumstances in Yolo County. Danone representatives talked about being a certified B-corporation, their different products and brands, and how their R&D team operates.

Craig Rothe, of NCIFT, and Dr. Linda Harris gave a presentation to attendees about the importance of elevator pitches and putting together a resume to prepare for the industry fair, and for internship and job searches in general.

Industry Tours included Impossible Foods in Redwood City, Eurofins in Livermore, Blentech and Henhouse Brewing in Santa Rosa, and Mariani Nut Company in Winters. Students also visited the Winter Fancy Food Show in San Francisco. Attendees had the opportunity to talk to vendors, taste new products, network, and see the latest trends in the food industry. Attendees included undergraduate and graduate students.

Food Tech Club members again helped the Food Recovery Network distribute surplus produce from the Davis Farmer’s Market to the Solano Park Apartments. Also, FTC members shared the science behind making mozzarella cheese through a live food demonstration at the Rotary Foundation Food Science Show Case.

On Biodiversity Museum Day at UC Davis, volunteers helped give tours around the Robert Mondavi Institute of Wine and Food Science, assist with exhibits about yeast and fermentation, and helped children with running microscope and other coloring activities. It was a great way for volunteers to highlight the Food Science Department at UC Davis, as well as give back to the community. In addition, FTC volunteers helped Mycokind, an all things mushroom related start-up by UC Davis alum Brian Chau, with their pop-up restaurant event. In return, volunteers got to forage for mushrooms in secret locations in the Bay Area!

At the annual Food Industry Fair and NCIFT/FST Student Recognition Banquet graduate and undergraduate student scholarship recipients were recognized for their hard work and academic achievements. Jamie Rudolph Reeves, the director of R&D for Broth, Fruit, Innovation and Thermal Processing of Del Monte Foods, also gave a presentation on the developments of snacking in the food industry, and how Del Monte has adapted to the changing trends.

Other events included a food demo on astronaut ice cream, a BBQ fundraiser and a Valentine’s Day Gram Fundraiser.

The new officers for 2020-2021 are:
- President: Heesun Kim (heekim@ucdavis.edu)
- Vice President: Mirai Miura (mfmiura@ucdavis.edu)
- Secretary: Thong Thomas Nguyen (thonguyen@ucdavis.edu)
- Treasurer: Megha Ramesh (megramesh@ucdavis.edu)
- External Relations Chair: Myhan Nguyen (mhnngu@ucdavis.edu)
- Activities Co-chairs: Amber Sun (aysun@ucdavis.edu) & Karen Cai (klcai@ucdavis.edu)
- Product Development Chair: Bryan Magaline (bjmagaline@ucdavis.edu)

www.ncift.org
From the NCIFT/FST Student Recognition Banquet
Let’s Talk Training

by Bruce Ferree (Insight Food Safety Consulting, independent consultant for Eurofins Laboratories)

We have training programs because we need to assure our staff is trained on tasks that are important. So how do we execute a plan for all that training? What’s the required training that meets regulatory expectations? What is required to meet your GFSI scheme expectations? And what training do you need to satisfy your own internal expectations? I’ve given considerable thought to training programs and my personal thought about training is that your internal company expectations should exceed those of either GFSI or regulators. Let’s go back to inception of training and think about why we have training programs. My belief is that training is used to create positive behaviors and to assure those trained understand the ‘WHY’ of whatever it is we do. What’s a positive behavior? It is those behaviors that employees (and leaders) exhibit that match to the company expectations. Does the trainee know AND understand what they are doing, what the expectation is, and why they are doing it?

Our training programs should be designed to create these positive behaviors. To that end, we need to assure that we create training and classes that get the trainees all the knowledge they need. We also need to assure that the trainees can demonstrate the positive behaviors after the training. Similar to my last article which discussed the Plan, Do, Check, Act (PDCA) cycle, we need to start by planning our training. The training plan should include:

Planning for all training needed. Development of a training curriculum that notes all trainings that an employee (or leader) needs to have at a basic level, and should have to move to an advanced level. This may mean a matrix for each employee type or position against all the potential trainings we may provide.

Scheduling. We must assure that we provide the time for training and we must make training a priority in our operations. Planning training events so that everyone receives the training, and assuring that those who missed it get a follow-up class.

Development of interesting training methods. Training course materials must inform the employee but also must interest the employee and assure they learn what is needed. Making the curriculum interactive and engaging is key to assuring trainees are receiving the message. We must understand our mission and vision to be able develop training materials that create enthusiasm toward demonstrated excellence and food safety culture. The plan should excite our trainees to be a part of a food safety culture driving toward a full understanding of everyone’s job, responsibilities and knowledge, and that we are each accountable for living up to that level of expectation and culture.

Assurance of understanding from the employee. Part of the training must include a process for the trainee to demonstrate that they remember what they were taught and that they are following the procedures. How will we know the training was effective? Shall we use a quiz during or after the training? We, as trainers, need to (you’ve heard this from me before…) follow up with friendly questioning of the trainees after they have returned to the tasks and even to audit and review with the trainees at their worksite to assure they are following the principles and procedures that they learned in the training. Trained individuals must be able to demonstrate that they are fitting in with the culture.

A plan for remedial training for those who cannot demonstrate an understanding of the training they have received. When we identify that an individual, or a group, has not understood the training materials, we must retrain before there is a food safety incident. Does this need to be a repeat class? Does this mean we need to redesign our training materials? We each get to make these decisions in our individual workplaces but, we need to assure everyone is on board and following the principles and procedures that are expected.

Now that we have planned, we only need to implement and monitor our success (plan, do, check, act). It’s important to note that regular communication, education, metrics, teamwork and personal accountability are vital to advancing a food safety culture, and your training program is where this all starts.

Bottom Line for me is that our training plans must be built to meet our demanding internal expectations. If done properly, we will exceed the GFSI and regulatory expectations. As trainers, we need to assure that what is important to us and to regulators and to the GFSI schemes is known and understood by the trainees. Making our vision ‘visible’ to our employees through our training program assures that there is understanding. Understanding by all employees results in those positive behaviors and helps the company achieve, not just compliance, but culture.

Reprinted with permission from QA and Food Safety Magazine.
the other direction. The message is that processors need to understand where their products are sourced, how they are harvested and what kind of history is associated with the products in question.

Foreign materials in foods may be controlled at each of the areas noted above. It starts with the supplier and wraps up in the plant. Control methods include the development, implementation and maintenance of good manufacturing practices, preventive maintenance of equipment, the physical plant, vendor quality programs, and the installation of different tools and systems to detect and remove different objects. These programs can be used to minimize the potential for foreign material contamination and detect and eliminate many kinds of actual contamination. The wild card is employee sabotage. If someone takes it into their head to sabotage product, it is hard to prevent. There was a recent incident in Australia where a farm worker placed needles in fresh strawberries (https://www.standard.co.uk/news/world/farm-worker-charged-over-australias-needles-in-strawberries-scandal-a3987171.html)

Evaluation of the potential for physical contamination should involve the following steps:

- A plant audit aimed at evaluating systems for pest control, foreign object removal, plant condition, shipping and receiving practices, and plant maintenance procedures.
- A review of packaging materials and container/package handling procedures, particularly when glass is the packaging material.
- A review of agricultural practices.
- A review of personnel practices, including those of maintenance staff.
- Package evaluation to ensure that it is tamper-proof, or tamper-evident

Using these steps to assess potential physical hazards when developing and implementing a HACCP program should be more than adequate. The best means for assuring that physical hazards are properly controlled may be through the use of a well-designed preventive maintenance program.

Properly maintaining all equipment and the physical plant will minimize potential problems. Each and every piece of equipment will be on a maintenance schedule. The assessment mentioned above should flag those unit operations that pose the greatest risk for foreign material contamination. This assessment will also allow the maintenance department to establish maintenance schedules and procedures to address potential high-risk units. The same should hold true for the physical plant. Older plants tend to pose higher risks for foreign materials contamination, especially plants that have wooden ceilings or have walls or ceilings that are painted.

There are a number of other programs that most companies have implemented which may also minimize potential foreign material issues. These include establishing and enforcing policies for clothing and personal hygiene. Providing employees with uniforms that have no buttons and pockets below the waist that are kept in good condition help prevent product contamination issues. Hairnets and snoods (beard nets) are worn to contain hair and keep it out of food. Plant workers are not allowed to wear jewelry in production areas simply to ensure it does not get lost and end up in food. Food processors have made great strides in recent years when it comes to controlling physical hazards. Most plants include metal detectors, magnets or other devices to minimize the potential for foreign material contamination. Screens and sieves for juice products are common in-line mechanisms for removing materials. For processors that filter or screen products before filling, concerns with physical hazards will be significantly reduced, assuming that the filters are properly monitored and maintained.

We discussed the fact that processors receiving raw agricultural produce regularly find a wide range of foreign materials in the incoming commodities. It is for this reason that processors of raw agricultural products destined for freezing, canning or any other type of processing usually install one or more systems to remove what might come in with the product. Flumes or
float tanks can remove small stones and mud/dirt which sink. Air blowers remove light materials such as chafe. The flumes and wash tanks used in the fresh cut industry clean the produce and remove other foreign objects. However, there are occasional things that get through the washing process. Frogs, slugs, snails and other things may actually attach themselves to the products and not be removed during washing.

The most common unit operations used to minimize foreign material contamination are metal detectors and magnets. Metal detection technology has improved over the years. There are two types of detectors: gate systems where the materials being scanned pass through an open aperture; and enclosed systems which are used for pumpable products. Metal detectors will detect and eliminate metals of a certain size or above. The sensitivity of a metal detector depends upon the type of product, the state of the product (frozen, cold, room temperature), and the size of the aperture. One of the advantages of metal detectors is that they continuously monitor the process.

Magnets are also commonly used in food processing. There are two basic kinds of magnets: ferrous magnets which remove ferrous metals (iron) only; and rare earth magnets which can pull out different kinds of metals. Magnets may be used at any point in the process where the raw unpackaged materials are being handled. They can be used in conjunction with metal detectors and x-ray machines. Dried fruit packers often install bar magnets immediately before packaging as a last line of defense against metal contamination.

X-ray technology is not a panacea . . . There are products such as breakfast bars that contain large inclusions such as nuts that simply will not work. There are also more and more operations using x-ray systems, since they can not only detect a number of different kinds of foreign materials such as rocks, hard plastics, and bone, but also may detect materials in metal or metalized containers. X-ray technology works by detecting density differentials in the food being scanned. X-ray detection equipment has dropped in cost which has encouraged processors to adopt the technology. In addition, the ability to scan on-line at greater speeds has also led to an increased use of these systems. In addition, there are large purchasers of foods and ingredients who have stated that they prefer that their suppliers adopt x-ray technology. X-ray technology is not a panacea, however. There are products such as breakfast bars that contain large inclusions such as nuts that simply will not work.

So, do foreign materials pose a potential risk with your products and processes? Conduct the assessments highlighted earlier to determine the potential for foreign material contamination and then develop, document, implement and maintain the necessary programs to protect your products. These programs may be Good Manufacturing Practices (GMPs), preventive maintenance, or the installation of equipment to remove or detect and remove foreign materials. What you do depends upon your products, processes and physical plant.

NCIFT and Judging at Local Science Fairs

by Anjali Ganpule

This past March NCIFT provided special awards and judged STEM fairs in Alameda, San Jose, and San Francisco. This year was quite unique, in the midst of social distancing requirements, that fairs adapted their formats anywhere from special hours, limited audience, to moving the entire fair to a video call format.

Middle and high school students covered a variety of topics; however, we chose those that best represented food science applications. It was inspiring to observe food industry trends such as sustainability and nutritional awareness in students’ work. Some of the award winning projects focused on creating bioplastics, measuring the effect of dietary fats on the gut microbiota, and evaluating properties of various gluten free flours. The 8 winners from grades 6-12 received a cash prize and NCIFT certificate. Many thanks to our special judges who adapted to a unique fair environment this year and represented NCIFT: Brian Chau, Carl Anderson, Earl Weak, and Ravi Tadapaneni. If you are interested in being a special judge next year, please reach out to Reshmi Raman (resmiraman@gmail.com).
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If you poll your friends and family, it is very likely that each and every one of them will tell you if asked that “Yes, I have found a foreign material in my food at some point in time.” A foreign material may be defined as;

Any potentially harmful extraneous matter not normally found in food.

Foreign materials can be anything; glass, wood, plastic, stones, metals, bone-in meat, plastic, insects, etc. Some of these contaminants may cause illness or injury as may be seen in Table 1:

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>INJURY POTENTIAL</th>
<th>SOURCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glass</td>
<td>Cuts, bleeding; May require surgery to find or remove</td>
<td>Bottles, jars, light fixtures, utensils, gage covers</td>
</tr>
<tr>
<td>Wood</td>
<td>Cuts, infection</td>
<td>Fields, pallets, boxes, buildings</td>
</tr>
<tr>
<td>Stones</td>
<td>Choking, broken teeth choking, may require surgery to remove</td>
<td>Field, buildings</td>
</tr>
<tr>
<td>Metal</td>
<td>Cuts, infection, may require surgery to remove</td>
<td>Wire, employees, machinery, fields</td>
</tr>
<tr>
<td>Insects</td>
<td>Illness, trauma, choking</td>
<td>Fields, plant, post-process entry</td>
</tr>
<tr>
<td>Insulation</td>
<td>Choking, long-term if asbestos</td>
<td>Insulation</td>
</tr>
<tr>
<td>Bone</td>
<td>Choking, trauma</td>
<td>Fields, plant, improper processing</td>
</tr>
</tbody>
</table>

These materials can come from anywhere in the environment or from any of the employees. There are five main sources of physical hazards.

1. **Inadvertent from the field or farm** (stones, metal, insects, undesirable vegetable matter such as thorns or wood, dirt, or small animals)
2. **Inadvertent resulting from processing and handling** (bone, glass, metal, wood, nuts, bolts, screening, cloth, grease, paint chips, rust, etc.)
3. **Materials entering the food during distribution** (insects, metal, dirt, stones, or anything else)
4. **Materials intentionally placed in food** (employee sabotage)

5. **Miscellaneous** – struvite and other materials in this class.

Anyone who has ever worked for a company processing agricultural commodities that are mechanically harvested has probably seen all kinds of “stuff” come in with products. Spend some time at the receiving areas in such a plant and you will see some surprising things come in. The most amusing incident for me was at a green bean processor in Oregon. As the beans were dumped into the wash tank, a five-foot long black snake dropped out and onto the ground. The snake went one way and four dump tank workers went the other direction. As the beans were dumped into the wash tank, a five-foot long black snake dropped out and onto the ground. The snake went one way and four dump tank workers went the other direction. **CONTINUED ON PAGE 10**