



# Mid-Atlantic Food Recovery Summit

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EIGHTH  ANNUAL  
**FOOD DAY**

October 24, 2018



Maryland  
Department of  
the Environment





**8 a.m. - 9:30 a.m.**

## Registration, Breakfast, and Student Posters

**9:30 a.m. - 10 a.m.**

### Welcoming Remarks *Wiseman Ballroom*

- **Anne Osano Ph.D**, Coordinator, Healthy Living Initiative & Annual Bowie State Food Day Symposium
- **George Ude, Ph.D**, Chair, Natural Science Department & Chair, Faculty Senate, Bowie State University
- **Guy-Alain Amoussou, Ph.D**, Associate Provost For Academic Affairs, Bowie State University
- **Secretary Ben Grumbles**, Maryland Department of the Environment
- **Deputy Regional Administrator Cecil Rodrigues**, EPA Region 3

**10 a.m. - 10:45 a.m.**

### Keynote: Opportunities from Food Waste Reduction Goals -

**Moderator: Kaley Laleker, MDE *Wiseman Ballroom***

Keynote speakers will discuss new goals for food waste reduction and the opportunities created by these goals to spur innovation, entrepreneurship and new partnerships.

- *Using Surplus Food Data to Strategically Target the 50% Food Waste Reduction Goal*, Tom O'Donnell, EPA Region 3
- *Montgomery County's Recycling Program – Getting Closer to the Goal*, Patty Bubar, Montgomery County, MD
- *Food Waste: A Grocer's Tale*, Alexandra DySard, MOM's Organic Market

**10:45 a.m. - 11:15 a.m.**

### Networking Break

**11:15 a.m. - 12:30 p.m.**

### Addressing Gaps in Surplus Food Donation

**Moderator: John Sullivan, MDE *Wiseman Ballroom***

This session will explore the top barriers and gaps in the recovery of food for donation, and how these have been overcome across various food industry sectors.

- *Enabling Food Rescue to Feed Those in Need*, Liz Baldrige, Feeding America
- *Beyond the Myths: Getting Past Misperceptions in Food Recovery Efforts*, Rachel Sylvan, Sodexo
- *29 Million Pounds of Food Waste Diverted*, Kathy Egan and Adria Aceto, Maryland Food Bank
- *Some Surprising Findings About Food Waste: An Industry Perspective*, Jeff Clark, National Restaurant Association

**12:30 p.m. - 1:45 p.m.**

### Lunch *Wiseman Ballroom*

**Moderator: Dr. Otis Thomas, Communications Chair, Bowie State Univ.**

Cooking Demonstration - Paul E. Brown III, Executive Chef, Bowie State Univ.

**1:45 p.m. - 3:00 p.m.**

### Building Food Recycling Infrastructure in the Mid-Atlantic

**Moderator: Dave Mrgich, MDE *Wiseman Ballroom***

Composting and anaerobic digestion capacity for food scraps is a major challenge in the region. Reaching food waste reduction goals will require viable models for recycling food from a variety of sectors and in all areas of the region. This panel will explore effective food recycling options at different scales and settings.



# Agenda

- *Organics Recovery in the District: Community Composting & the Food Waste Drop-Off Program*, Howard Lee, DC Office of Waste Diversion
- *City of Philadelphia – Department of Prisons Urban Greening and Sustainable Land Care Vocational Certificate Program*, Laura Cassidy, City of Philadelphia, Department of Prisons
- *BTS BioEnergy: Global Leaders in Anaerobic Digestion*, Vinnie Bevivino, BTS Bioenergy, Inc.
- *A Distributed Infrastructure Is Key: Support Small-Scale and Home Composting*, Brenda Platt, ILSR

3 p.m. - 3:15 p.m.

## Networking Break

3:15 p.m. - 4:45 p.m.

## Concurrent Sessions

### Concurrent Session 1: Developing College & University Food Recovery Programs

**Moderator: Dr. George Ude, BSU Wiseman Ballroom**

- *Free Food Alert at Johns Hopkins University: Feeding People, Not the Bin*, Leana Houser, Johns Hopkins University
- *Fearless Ideas: Student-Led Food Recovery at the University of Maryland, College Park*, Allison Tjaden, University of Maryland, College Park
- *Let Students Lead the Way – Helping Students Partner with Staff for Food Waste Recovery*, Michelle Bennett, University of Delaware
- *Identifying and Responding to Food Insecurity in College Students through Food Recovery Partnerships*, Bridgette Behling, George Washington University

### Concurrent Session 2: Waste Reduction in the Hospitality Industry

**Moderator: Erica Chapman, MDE The Beacon, Center of Natural Sciences, Mathematics and Nursing**

- *How Reducing Food Waste in Hotels is Linked to Wildlife Conservation*, Pete Pearson, World Wildlife Fund
- *Hilton's Commitment to Fighting Food Waste*, Caitrin O'Brien, Hilton
- *Moving Food Up the Recovery Hierarchy at the Baltimore Convention Center*, Aurora Dawn Benton, Astrapto; and Joan Plisko, Plisko Sustainable Solutions

### Concurrent Session 3: Food Recovery in the Agriculture Sector

**Moderator: Tom O'Donnell, EPA Theatre**

- *Recovering Food Waste at Reinford Farms*, Bret Reinford, Reinford Farms
- *Consumer Food Waste - a Potential Animal Feed Resource*, Dr. David Galligan, University of Pennsylvania
- *Gleaning: Reducing Farm-Level Food Loss to Feed Hungry Neighbors*, Lynette Johnson, Society of St. Andrew
- *A Fresh Approach to Food Access*, Amy Cawley, Maryland Food Bank

4:45 p.m. - 5:15 p.m.

## Wrap-Up and Student Poster Awards

### **Adria Aceto, Maryland Food Bank**

Adria Aceto is the Director of Food Safety & Facilities at Maryland Food Bank where she drives to protect the safety and health of staff and food bank clients. Previously, Adria worked as Regional QA for a major food retailer, a third-party auditor, and in the culinary industry. She holds a graduate certificate in Public Health Policy from The University of Maryland and is a Certified Professional in Food Safety.

### **Liz Baldrige, Feeding America**

Liz Baldrige is the Director of Sustainability and Food Waste Initiatives at Feeding America, the largest food rescue organization in the United States. Liz works to build awareness around food rescue for those in need, is a first line solution against food waste and helps create programs that enable greater, more efficient food rescue. Additionally, Liz works to develop sustainable practices within Feeding America's network of more than 200 food banks. Liz graduated from Ohio University and began her non-profit career sourcing previously untapped resources of food for donation from national manufacturers.

### **Bridgette Behling, George Washington University**

In the more than 15 years that Bridgette Behling has worked in higher education, she has gained valuable experience in admissions, program development and implementation, higher education policy, strategic planning, leadership development, and student activities. She currently serves as the Director of Community Support and Leadership in the Center for Student Engagement at The George Washington University, where she leads a team which specializes in retention and community building programming for first-generation, transfer, graduate students, and students from low socioeconomic backgrounds. She currently oversees The Store, GW's food pantry, which partners with local businesses and organizations to serve students experiencing food insecurity at GW, and advises the Food Recovery Network, a student organization that fights food waste and hunger.

Prior to her current role, she served as the Director of Administration and Hallmark Programs, where she implemented undergraduate orientation annually for 5,000 domestic, international and transfer students

and their families. She also has served as an Assistant Director of Student Activities at GW and Manager of the College and University Program at the American Association of University Women, focusing on community organizing and teaching college women to run for elected office.

### **Michelle Bennett, University of Delaware**

Michelle Bennett started as the first ever Sustainability Manager at the University of Delaware in 2015. She has been working in sustainability in higher education for about 10 years, and got her Masters in Environmental Studies from Macquarie University in Sydney, Australia. Michelle balances her time between UD's Facilities Department, working with student intern teams, coordinating with faculty across all seven of UD's colleges, and serving on a wide variety of committees at UD and beyond. Michelle regularly works with UD's Dining Services to find ways to improve operations, infrastructure, communication and education around issues of food waste. She is on the founding committee of the Center for Food Systems and Sustainability and is working with several colleges to innovate new infrastructure solutions to close the loop on food, agriculture and yard waste at an industrial scale. She is the staff advisor for UD's chapter of the Food Recovery Network.

### **Dr. Aurora Dawn Benton, Astrapto**

Dr. Aurora Dawn Benton designs, implements, and scales sustainability programs in hospitality, events, and travel. She founded Astrapto LLC to provide practical, business-oriented solutions to social and environmental issues in these industries. As a project leader for World Wildlife Fund's hotel food conservation program expansion, Aurora brought together a diverse group of stakeholders and helped one venue and its catering partner transform their culture and processes for food waste. She has written for Travindy, Green Lodging News, and the Hotel Yearbook, and regularly speaks at industry conferences. She chairs the Global Sustainable Tourism Council Business Travel working group, is a member of Global Business Travel Association's sustainability committee, and is on the Events Industry Council APEX redesign and rewrite task force.



## Speaker Bios

### **Vinnie Bevivino, BTS BioEnergy**

Vinnie Bevivino has been a leader in food waste recycling and soil fertility in Maryland for more than a decade. He was a co-founder of ECO City Farms, where he demonstrated and taught intensive and sustainable urban agriculture based on composting and soil health. He went on to start Seed and Cycle, a construction company that built greenhouses and composting systems for many of the small rural and urban farms in the DC / Baltimore region. He then started and operated Chesapeake Compost Works, at the time the largest food waste composting facility in Maryland. There he and his team received 18,000 tons of material per year from many of the region's largest food waste generators and processed it into a line of bagged compost-based soil amendments sold throughout the mid-Atlantic. He now is the Director of Organics for BTS BioEnergy, analyzing and sourcing feedstocks and developing markets for digestate for a series of anaerobic digesters in and around the east coast of the United States, starting with a 100,000 ton per year facility at the Maryland Food Center in Jessup, Maryland.

### **Patty Bubar, Montgomery County Department of Environmental Protection**

Patrice (Patty) Bubar is serving as the Acting Director of the Department of Environmental Protection in Montgomery County, Maryland. She came to the county in December 2015 as the Deputy Director for the department. In her acting role she oversees the policy and direction for environmental programs in the county as well as corporate administrative functions in support of Montgomery County's environmental protection and compliance programs. The county's staff of approximately 150 provides trash and recycling collection services for the residents, ensures protection of water quality resources and ensures that the county ordinances related to the environment and quality of life in the county are enforced. Prior to coming to Montgomery County, Ms. Bubar spent 38 years in the federal government in a variety of executive positions. Ms. Bubar holds a Bachelor of Science Degree in Civil Engineering from the University of Pittsburgh.

### **Laura R. Cassidy, Department of Prisons - City of Philadelphia**

Laura Cassidy is the Project Manager of Sustainability, Operations, Compost, Orchards and acts as Recycling Program Coordinator for the Department of Prisons – City of Philadelphia. She is responsible for implementing, planning and maintaining successful energy efficient sustainable green programs. She is the project manager for our vocational certificate program for inmate participants. This program coordinates a two-acre orchard with over 200 trees, compost operations and classroom instruction at Temple University. It recieves and processes on average a ton of food waste each day, with plans for expansion. The program promotes sustainability and is a successful tool for inmates to be integrated back into the community with gainful employment. She has been working for the City of Philadelphia for 24 years, with a Bachelor's Degree in Business Administration from Temple University.

### **Amy Cawley, Maryland Food Bank**

Amy Cawley is the Farm to Food Bank Coordinator for the Maryland Food Bank. The Farm to Food Bank Program engages a network of farms across the state in a partnership to provide hungry Marylanders with local produce. In FY '17, Amy worked with a combination of 50 farm partners, volunteers, and pre-release inmates to procure 3.1 million pounds of farm fresh produce. Amy is a graduate of LEAD MD Class VIII and Annie's Project and is a board member for the Maryland Agriculture Education Foundation (MAEF) and LEAD MD. In addition, she is an active member of the Maryland Christmas Tree Growers Association, is the Volunteer Coordinator for Farmers and Hunters Feeding the Hungry, and volunteers for Caroline County Recreation and Parks.

### **Jeff Clark, National Restaurant Association**

Jeff Clark manages the National Restaurant Association's sustainability education efforts and Kids Live Well initiative, healthier children's meal program for restaurants. He acts as an environmental liaison to the restaurant industry and regularly speaks to audiences about environmental topics. Jeff received his Bachelor of Science from the University of California, Santa Cruz and holds a Master of Public Policy from Duke University.

### **Alexandra DySard, MOM's Organic Market**

Alexandra DySard is the Environmental & Partnership Manager for MOM's Organic Market. She also serves on the Maryland Pesticide Education Network Board and the Trash Free Maryland Board. From 2009 to 2013, she served as the City of Bellevue, Washington's Environmental Programs Coordinator, and has held positions at the Pacific Science Center and Museum of Flight in Seattle, Washington. She graduated with a Bachelor's Degree in Environmental Studies from the University of Washington. Alexandra is an outdoor and zero waste enthusiast residing in Baltimore, MD.

### **Kathy Egan, Maryland Food Bank**

Kathy Egan, RDN, LD, MEd, is Manager of Nutrition Programs at Maryland Food Bank. Kathy's perspective on food waste is informed by over 15 years of food service management experience in healthcare, hospitality and college settings. Prior to her arrival at Maryland Food Bank in November 2017, Kathy held a similar position at Oregon Food Bank. There she managed a robust network of volunteers, teaching nutrition-focused, budget-friendly cooking classes throughout the state. In addition to her foodbanking experience, Kathy has advanced training in obesity prevention, nutrition counseling and fitness.

### **David Galligan, University of Pennsylvania, School of Veterinary Medicine**

David Galligan is an endowed Professor of Animal Health Economics at the University of Pennsylvania, School of Veterinary Medicine. He is the director of the Center for Animal Health and Productivity at the veterinary school. He graduated from the University of Pennsylvania, with a major in biology and completed veterinary training at the University of Pennsylvania, School of Veterinary Medicine in 1981. In 1982 he returned to the U of Pa Vet School to complete a residency in clinical dairy nutrition. He graduated from the Wharton School with an MBA with a focus on decision sciences. His area of research is in understanding the economic value of veterinary and associated technologies applied to animal production systems.

Dr. Galligan's major interest is in improving the decision making abilities of veterinary

consultants and producers in the dairy industry. He is keenly interested in helping veterinary medicine position itself in a manner that promotes economic, environmental efficiency and animal health in meeting emerging global demands for animal products. His current economic research includes the development of a number of visual analytical tools to facilitate management decision making in dairy production.

### **Leana Houser, Johns Hopkins University, Homewood Campus**

Leana Houser is the Recycling Manager for the Johns Hopkins University Homewood campus. She received her Bachelor's in Public Policy from St Mary's College of Maryland and her Masters in Environmental Science and Policy from Johns Hopkins University. Her tenure at JHU began in 2003 in the School of Public Health. After earning her Masters degree she worked as the Program Manager for the Center for a Livable Future, working with Facilities to roll out their Community Supported Agriculture program, the first institution-wide GHG inventory, as well as single stream and electronics recycling programs. In the Office of Sustainability in 2008, she developed the Green Office Certification and Green Team program. In January 2013, she became the Recycling Manager for the Homewood campus. She has established a host of new waste reduction and diversion programs including Zero Waste events, Preferred Green Caterers, Hop Reuse Hub and the Free Food Alert contributing to an increase in the recycling rate from 26% in 2013 to 44% as of 2018. In her spare time she struggles at home to teach her husband how to properly sort his waste and thankfully has a much easier time with her 7 year old.

### **Lynette Johnson, Society of St. Andrew**

Lynette Johnson is the Executive Director of the Society of St. Andrew (SoSA). The Society of St. Andrew, founded in 1979, was one of the nation's first gleaning organizations and, today, is the only gleaning organization national in scope. Johnson joined SoSA in 2010 as Regional Director for Tennessee and Alabama, overseeing day-to-day operations in both states, developing gleaning networks that now engage thousands of volunteers each year in hands-on food recovery work. In just three years, that work put about 14 million servings of nourishing food on the tables of hungry



## Speaker Bios

Alabamians and Tennesseans. In late 2013, Johnson moved to SoSA's national staff, serving as Director of Church Relations. In this capacity she invited congregations into conversation about hunger and food waste, introducing them to the possibility of gleaning to feed people in need right in their own communities. She became the organization's Executive Director in January 2017. Johnson's prior careers have included stints as a church educator, pastor, editor, and magazine art director. She holds degrees from the College of William & Mary and Scarritt Graduate School.

### **Howard Lee, District of Columbia Department of Public Works, Office of Waste Diversion**

Howard Lee is a program analyst with the District of Columbia's Department of Public Works Office of Waste Diversion. Howard provides outreach, social media, marketing, and graphics support to engage residents of Greater DC with city services that focus on recycling and composting. Howard is responsible for managing the District's Food Waste Drop-Off program, currently operating in all 8 of the District's wards. He is also a member of the DC Food Recovery Working Group which helps to promote food recovery programs, organizations and resources already happening and help develop new food recovery partnerships, programs, and resources for greater DC. Howard has been a resident of the District of Columbia for over 20 years and is a graduate of Howard University School of Business with a degree in Marketing.

### **Caitrin O'Brien, Hilton**

Caitrin O'Brien is a member of Hilton's Corporate Responsibility team, where she oversees the environmental pillar of the company's Travel with Purpose program. In her role, Caitrin manages Hilton's global environmental initiatives, including the company's efforts to reduce energy, carbon, water and waste across its portfolio of over 5,400 hotels. Prior to joining Hilton, Caitrin worked as a corporate sustainability consultant at EY in Washington, DC and in London, assisting companies in the hospitality, real estate, technology, and consumer products industries in green building operations, developing sustainability strategies, and corporate responsibility reporting. She also

previously held positions at ICF International and the US EPA. Caitrin is a LEED AP and holds a BA in Environment, Economics and Politics from Claremont McKenna College.

### **Thomas O'Donnell, US Environmental Protection Agency**

Thomas O'Donnell - a geologist, environmental scientist, entrepreneur, and teacher - is currently a sustainability coordinator at the US Environmental Protection Agency (NAHE) where he specializes in the Agency's Sustainable Management of Food Program. Tom is the primary architect of the Urban Surplus Food Recovery Model, a 2014 winner of the Public Service Excellence in Government Award. He is also the inaugural Engagements with the Common Good Fellow at Cabrini University, Pa. where he teaches classes in food insecurity and hunger. Current activities include training workshops to help people use data to achieve a 50% or greater food waste diversion in their communities. He is also an advocate for expanding business opportunities and jobs to reduce food waste in the United States.

Tom earned a Doctorate in environmental science from the University of Virginia and holds both Bachelor and Master of Science degrees in geology from Franklin & Marshall College and the University of Texas, respectively. His research has been broadly published in peer-reviewed, international scientific journals, trade association publications, and blog posts on food insecurity.

### **Pete Pearson, World Wildlife Fund**

Pete Pearson leads work at WWF on food loss & waste prevention and food recovery, helping businesses and communities understand agriculture's impact on wildlife and habitat conservation. Pete has led local and national sustainability programs within the retail grocery industry; has over 10 years of technology experience with companies including Hewlett-Packard, Accenture and Albertsons; has worked with public schools and hospitals as an independent sustainability consultant, co-founded a sustainable agriculture non-profit, and co-produced a documentary film on local and regenerative agriculture ([www.ToLiveLocal.com](http://www.ToLiveLocal.com)). Pete currently lives in Washington, DC and enjoys exploring the outdoors with his family.

### **Brenda Platt, Institute for Local Self-Reliance**

Brenda Platt leads the Institute for Local Self-Reliance's Composting for Community program, which is advancing composting to create jobs, enhance soils, and reduce waste. She has authored numerous reports including "The State of Composting in the US" and "Growing Local Fertility: Guide to Community Composting." She has been licensed to operate commercial compost facilities in Maryland. In 2017, she received the USCC's H. Clark Gregory Award for outstanding service to the composting industry.

### **Joan Plisko, Plisko Sustainable Solutions, LLC**

Joan Plisko, PhD, is an award-winning environmental health and sustainability director, strategic planner, researcher, author, and educator. Joan's life work is based on the premise that people and the environment in which they live, work, play, and pray can become healthier and more resilient with knowledge, assistance, and recognition. As the President and Founder of Plisko Sustainable Solutions, LLC, a woman-owned micro business, Joan creates and implements customized sustainability programs for triple bottom line results. Examples of Joan's projects include: researching the health benefits of green infrastructure for urban communities, identifying and implementing interventions for reducing food waste in Baltimore's hospitality sector, and serving as the Community Sustainability Director for a 180-acre conference, retreat, and education center in Reisterstown, MD.

For 10 years, prior to starting Plisko Sustainable Solutions, LLC, Joan was a Director at Maryland Hospitals for a Healthy Environment, where she provided technical assistance, networking, and recognition services to over 60 healthcare facilities in Maryland. Joan has a Ph.D. in Environmental Systems Engineering from Clemson University, an M.E. in Systems Engineering from the University of Virginia, and a B.S. in Commerce and Engineering from Drexel University.

### **Brett Reinford, Reinford Farms**

Brett Reinford is the office manager for Reinford Farms, a 720 cow dairy farm located in central Pennsylvania. Mr. Reinford's interest in finance and business management has made him a valuable employee on his family's dairy. A majority of his day is spent keeping detailed information on every transaction, providing cost analysis reports, and looking for ways to increase the farm's profit margins. The farm has several enterprises, including an anaerobic digester which helps to process and recycle between 3,000 and 4,000 tons of organic food waste a year. Brett, his dad, and two brothers are always looking for ways to improve their dairy operation and together they have been able to make their dairy farm a successful business.

### **Rachel Sylvan, Sodexo**

Rachel Sylvan is a sustainable business strategist and leader focused on integrating sustainability and corporate responsibility into the operation and culture of large-scale businesses. At Sodexo, she develops and manages a wide range of global and national initiatives to advance environmental sustainability, wellness, and women's empowerment while enhancing customer value and corporate performance. Rachel also developed and led the first enterprise-wide sustainability function for U.S. Foods, the second largest food distributor in North America, leading to the creation of sustainable packaging, sustainable sourcing, and green transportation initiatives. She holds both an M.B.A. and M.S. from the University of Michigan with a focus on sustainable business strategy.

### **Allison Tjaden, University of Maryland, Department of Dining Services**

Allison Tjaden is the Assistance Director for New Initiatives for the University of Maryland's Department of Dining Services. She is also a Lecturer for the Plant Science and Landscape Architecture Department teaching an introductory course on urban agriculture. She spearheads projects that help connect Terps with their food such as the Terp Farm, Farmers Market at Maryland, and UMD Campus Pantry. Allison received her Master of Public Health degree from the University of Maryland School of Public Health, with a focus on environmental health, and her BA from the University of Virginia.

## Exhibitor Descriptions

### **Anne Arundel Medical Center - Kelly**

**Bickford, MS** - Kelly Bickford holds a Master's of Science in Community Health and Health Administration and has been working as a Community Health Education Specialist at Anne Arundel Medical Center for 5 years. Kelly's expertise is in developing community-based health programs aimed at the prevention of disease and promotion of health. Kelly is also responsible for tracking, evaluating and managing data in regards to the implementation and outcomes of each program. To partner on current or future health promotion initiatives, please email Kelly directly at [KBickford1@aahs.org](mailto:KBickford1@aahs.org).

**BTS BioEnergy** - BTS BioEnergy is a technology leader in the biological transformation of excess organics typically destined for incineration or already crowded landfills, residues and agricultural by-products and crops into sustainable energy and organic fertilizer. BTS serves industrial and agricultural companies, local cities and counties, the food and composting industry as well as providers and users of renewable energy.

**FOR Solutions** - FOR Solutions provides state-of-the-art, value engineered, aerobic in-vessel rotary drum composting systems based on patented biotechnology for on-site or local recycling of recovered food. The five standard FOR Solutions composting systems are designed to process between 2,500 and 8,000 pounds of recovered food per week based a five loading days/week schedule. Please visit [www.forsolutionsllc.com](http://www.forsolutionsllc.com) for more details.

**Maryland Green Registry** - The Maryland Green Registry is a free state program created in 2009 to promote and recognize sustainable practices at organizations of all types and sizes within the state. Businesses, churches, schools, government agencies and other organizations are all invited to join and share the steps they've taken to reduce their environmental footprint. Members benefits include a window decal for display, use of the logo for marketing materials, an online profile promoting your environmental commitment, access to free technical assistance programs, and eligibility for the annual Maryland Green Registry Leadership Awards. Collectively, members have saved over \$107 million annually through sustainable practices! To learn more, visit [www.green.maryland.gov](http://www.green.maryland.gov)

**MEANS Database** - MEANS Database is a non-profit online communications platform for food donors and recipients. American University student Maria Rose Belding is the founder of MEANS Database, a website that allows excess food to be shared with food banks to combat hunger. We are based in DC and work throughout Maryland as well. MEANS was

started with the belief it should be easy for those with excess food to share it with those in need. It didn't take long to find people who agreed – everyone from Starbucks to The Washington Post. We're now in 48 states and counting, helping divert food from the trash to local emergency feeding services with the ease and speed of the internet.

**MOM's Organic Market** - MOM's Organic Market is a local grocery store chain committed to protecting and restoring the environment. They provide all organic produce, excellent product variety and great customer service to the communities they serve. There's a comprehensive recycling center for customers including composting, plastic bag recycling and more. Please stop in for a relaxing shopping experience.

**Re4ormed Organics** - Re4ormed Organics is a Maryland-based food and farm-animal waste recycling company that provides innovative management of organic waste through proven anaerobic digestion technology, while maximizing the market value of the four commodities generated. Re4ormed's technology was born from the Navy and Marine Corps' need for forward-deployable renewable energy systems. Their dry-digester technology is unique in that it is scalable, transportable, affordable, and remotely operated. Prior to joining Re4ormed, members of the team built the Naval Academy's digester in Annapolis, MD to demonstrate how midshipmen food waste from a table, or Marine food waste from the field, can be processed into electricity. The Maryland Energy Administration recently awarded Re4ormed a grant to build their first farm-digester on a Maryland beef-cattle farm.

**University of Maryland Extension** - University of Maryland Extension (UME) is a statewide non-formal education system funded by federal, state, and local governments within the University of Maryland – College Park and the University of Maryland – Eastern Shore. Our mission is to support Maryland's agricultural industry; protect its valuable natural resources; enhance the well-being of families and individuals, both young and old; and foster the development of strong, stable communities. The Prince George's County office, partially supported by the Maryland-National Capital Park and Planning Commission, serves the community from two locations including the main extension office in Clinton and the Center for Educational Partnership in Riverdale. We offer programs in the following areas: youth development education (4H); financial wellness home, school & community gardening (Master Gardeners); nutrition, health & food safety; agricultural profitability and promotion and natural and environmental resources.

## **Analysis of Bananas *Musa acuminata*, Peel as Insecticide Repellent.**

Fidji-Ruth Endene, Mentor: Dr. Anne Osano; Department of Natural Sciences, Bowie State University

**Abstract:** Bananas, *Musa acuminata*, has many health benefits such as increase in energy, lowering blood pressure, fighting obesity, and alleviating irritation and swelling from bug bites. In this research our goal was to focus on the benefits of the banana peel, specifically, how the banana peels can be used as an alternative to insect repellent. We did this by comparing the chemicals extracted from natural bug repellent and the chemicals extracted from banana peels to find any correlation between the two.

## **Bananas (*Musa acuminata*) Peels are More Valuable Than You May believe**

Antwan Haskins, Mentor: Anne Osano.

**Abstract:** Bananas are one of the most widely consumed fruits in the world. The banana itself is known to contain a good number of vitamins, that are helpful for the body. Eating bananas as part of a regular diet can cut risk of death by strokes by as much as 40%. Our research question is to find out if the banana peel has nutritional value as the fruit itself. Our experiment was conducted to compare the banana and the peel. This was done by extracting the phytochemicals from both fruit and peel and analysis done using High Performance Thin layer chromatography (HPTLC). The results show that the banana peel contains, just as much, if not more nutrients in them. This "waste" shouldn't be labeled as waste but should be noted as an important source for many products.

## **Comparing The Oil Content In Fourteen Cultivars of Soybeans**

Dante' L. Hamiel, Mentors: Dr. Anne Osano and Dr. Davenand Luthria

**Abstract:** The overall goal is to be able to determine which cultivar has the highest oil content. The importance of the project is to be able to produce cultivars with high oil content because the world has a short limited source of fossil fuels. My research was carried out by endless reading, and extracting the soybeans with basic lab techniques. Out of all 14 cultivars, only about half showed decent results, while the others were not on target. Dante's worse cultivar was #14 because it produced the lowest amount of oil yield. On the other hand, cultivar 2 produced the most oil content.

## **Direct and Indirect-Heptaplex PCR Marker-Assisted Screening in Food Forensic for Detection of Meat Constituents in Processed Food Products.**

Kayla Adams, Jacquan Hilliard and Olukayode Komolafe

Mentors: Drs. George Ude and David Igwe. Department of Natural Science Bowie State University.

**Abstract:** With many food items being adulterated with other substances, food fraud has become a global issue. Methods of identification of these adulterated products have become important to reduce food fraud and falsification. Therefore, the purpose of this study is to identify seven commonly consumed meats (turkey, chicken, pork, beef, goat, lamb, and duck) within processed meat products as well as to ascertain the degree of adulteration and mislabeling of the meat products. For this study, 46 meat samples were purchased from markets within Prince Georges County and Montgomery County. Multiplex method was modified and used to determine the components present within the processed meat samples. First, 7 pure samples of meat (pork, chicken, beef, turkey, goat, lamb, and duck) were used to create standards using a singleplex method. Next, heptaplex polymerase chain reaction (PCR), a modified multiplex method, was used to verify each sample content. Indirect methods (Cetyl trimethylammonium bromide (CTAB) and Dilution and Storage Protocol) were used to extract DNA from each meat sample, while the direct method had no DNA extraction. Both methods utilized PCR and gel electrophoresis. Singleplex PCR was used to verify the specificity of the primers (mitochondrial and nuclear) prior to multiplex. Our developed heptaplex proved to be efficient especially when we used DNA extracted with CTAB and our prepared mastermix (cocktail). Food adulteration and falsification were detected to be 10% among the samples. Validation of our findings as well as completion of direct method is in progress. This approach when fully validated will become a useful tool in food industries and any agency for food safety and inspection service.

## **Enhancing the levels of Beta-Carotene in Carrots by application of Elicitors Benzoic Acid and Salicylic Acid.**

Sydney Jones, Mentor: Anne Osano, Natural Sciences, Bowie State University.

**Abstract:** The objective of this research was to enhance the level Beta - carotene in carrots by elicitation technique towards the creation of super carrots. Beta-carotene is the most common type of Pro-vitamin. When consumed, beta-carotene is converted by your body into vitamin A. Literature reports that increasing your intake of beta-carotene can protect against a host of health issues. Elicitors, Salicylic acid and Benzoic acids were used in this research to treat the carrot plants. High Pressure Liquid Chromatography (HPLC) was used to analyze the carrots for increased Carotene.

# Student Poster Abstracts

## HPTLC Method Development for Classifying 23 Different Dried Bean Cultivars

Rita Dill, Mentors: Dr. Anne Osano and Dr. Davenand Luthria

**Abstract:** This research goal is to develop a mobile phase solvent system to analyze for HPTLC (high performance thin-layer chromatography) analysis of twenty-three bean samples. Beans are legumes and are heavily consumed in the United States due to their high-protein content and their plethora of phytochemicals. Two major contributing factors are ethnicity and income levels. Literature reports that those of particular ethnic backgrounds and/or of lower income levels are more likely to consume beans. Currently, there are no literature reports that show classification of beans by phytochemical profiles; nor methods for comparing polar, semi-polar and non-polar phytochemical profiles of various beans using HPTLC. This research will be beneficial to consumers, scientists, farmers, dieticians and nutritionists. Using twenty-three dried bean samples provided by a USDA breeder, sequential extractions were performed using ultrasonication with following solvents systems: Hexane, Ethyl Acetate, Methanol: Water 50:50 v/v. HPTLC analysis was performed using the following mobile phase systems: Petrol ether: Ethyl ether: Formic acid 70:30:1 v/v, Ethyl Acetate: Formic acid 99:1 v/v, Ethyl Acetate: Methanol: Formic acid 70:30:1 v/v. Chromatograms of plates were generated using VisionCats 2.3 sp1 software from CAMAG instruments. X and Y data points were retrieved from chromatograms, and further analyzed using Eigenvector software to place the bean into classes, subclasses and multiple sub-subclasses.

## Phytochemical fingerprinting of novel value-added products from Citrus wastes.

Dana Cadet, Mentor: Dr. Anne Osano; Department of Natural Science Bowie State University.

**Abstract:** Citrus sinensis belongs to the Rutaceae family and includes the cultivated sweet oranges. Citrus peels are one of the most popular and promising source of nutrients for human beings. There is an ample amount of Vitamin C, folic acid, potassium and pectin which are known to decrease the life threatening diseases. This present study aimed at the phytochemical evaluation of the Citrus sinensis peel. High Performance Thin Layer Chromatography analysis was performed on extracted phytochemicals from the peel.

## Phytochemical profiles from Mango (*Mangifera indica*,) Peel .

Elizabeth Akingbade; Mentor Dr. Osano, Department of Natural Science Bowie State University.

**Abstract:** Mango peels are said to have a great source of functional compounds such as phenolic compounds along with antioxidant activity and are rich in polyphenols, carotenoids and dietary fiber. Peel extract are reported to exhibit antioxidant properties that protect against DNA damage. Studies also show that that mangos processes antidiabetic, anti-inflammatory, anti-viral, cardio tonic, anti-oxidant, hypotensive properties. This study examined the phytochemical profiles of mango peel using High Performance Thin Layer Chromatography(HPLC).

## Should we Continue to Discard Lemon Peels? Are the Peels Worth Keeping?

Aleah Jones, Mentor: Anne Osano, Department of Natural Sciences, Bowie State University.

**Abstract:** Citrus is a major processed fruit that results in large quantities of waste and byproducts rich in various bioactive compounds such as water soluble and insoluble antioxidants. These byproducts pose a complex waste problem and additional economic burdens on environment. The objective of this research project was to determine if Vitamin C is equally present in the peel and the fruit of a lemon using high performance thin layer chromatography and thus determining whether or not the peel should be kept or discarded. Three samples of lemon were gathered from various grocery stores across Maryland. The samples were freezer dried, extracted using a mixture of methanol and water, and lastly analyzed using high performance thin layer chromatography (HPTLC).

## Surveying Structural Variants in a Population of *Solanum lycopersicum* Accessions.

Chanais Martinez, Department of Natural Science Bowie State University.

**Abstract:** Tomato (*Solanum lycopersicum*) is an essential crop plant and a model system for fruit development in flowering plants. Research deciphering shape regulatory genes and how they affect the phenotypes of tomatoes has made substantial progress but is not yet complete. Plant genomes are particularly variable, incorporating many variants ranging from single nucleotide polymorphisms to the larger-scale deletions, translocations, duplications, inversions, insertions, and transpositions, collectively called structural variants (SVs). Several SVs affecting fruit shape have been identified in tomato, including mutants of SUN and certain Ovale Family Proteins (OFPs). To identify SVs in silico, BAM files from 244 tomato accessions were aligned to the tomato reference genome and visualized with an Integrative Genome Viewer (IGV) and JBrowse, focusing around a list of candidate fruit shape genes informed by homology, interaction, and coexpression relationships with SUN and some OFPs. Accessions were selected containing SV alleles hypothesized to disrupt candidate fruit-shape genes based on expression data, and their SV genotype was confirmed by PCR product size fractionation via gel electrophoresis. The results confirm that SV alleles are present in potential regulatory regions of our candidate genes for individuals with altered expression levels for said candidate genes. Overall, understanding the molecular mechanisms of tomatoes can lead to insights in plant processes and expedite breeding efforts.

# Student Poster Abstracts

## The Contribution of Agricultural Uses of Antibiotics on Drug Resistance

Authors: Imani Vega, Daniel Ogunmiloro, and Kari Debbink. Department of Natural Science Bowie State University.

**Abstract:** Treating bacterial diseases is increasingly complicated by widespread development of antibiotic-resistant strains. While many factors drive antibiotic resistance including inappropriate prescription and use in hospital settings, agricultural uses are also hypothesized to impact development of drug-resistant microbes. Antibiotics are used in agriculture to prevent and treat diseases in livestock, thus protecting our food sources. However, over half of all antibiotics used in the United States every year are used non-therapeutically to increase livestock growth, and the impact of this use in livestock on the development of drug resistance in human pathogens is not well studied. The PARE project (Assessing the Prevalence of Antibiotic-Resistance in the Environment) is an initiative aimed at involving undergraduates in measuring antibiotic resistance of bacteria found in soil samples from a variety of sites across the United States. This poster explains the problem of antibiotic resistance, the potential impacts of agricultural uses of antibiotics, an overview of the PARE project, and a description of our future directions involving BSU students in PARE research.

## The waste from kiwifruit (*Actinidia deliciosa*) is just as beneficial as the consumed portion

Gregory W. Smallwood: Mentor: Dr. A. Osano, Department of Natural Science Bowie State University.

**Abstract:** The purpose of this experiment was to determine if there were any benefits to peeling the kiwi fruit before consumption. The signature of the kiwifruit involves the presence of high amounts of Vitamin C. Nutritional and health attributes of kiwifruit are related to improved nutritional status, digestive, immune and metabolic health. Our research question was whether the kiwifruit and the peel has the same phytochemical profiles. We extracted the phytochemicals from both the fruit and peels and compared the two using High Performance Thin Layer Chromatography(HPTLC).

## Tocopherol Profile in Orange Citrus Sinensis Peel .

Tanisha Veasley, Mentor: Dr. Anne Osano. Department of Natural Sciences, Bowie State University.

**Abstract:** The goal of this research was to establish the presence of Tocopherol in the citrus, Citrus sinensis peel. Tocopherols are among the most important lipid-soluble antioxidants in food as well as in human and animal tissues. C. sinensis, orange is one of the most popular consumed fruits globally. They are popular because of their natural sweetness and their diversity especially with regards to variety and uses. When people eat an orange, the peel is always the part that gets thrown away but what many fail to realize is that the orange peel contains very important phytochemicals. Our hypothesis is that there will be as much tocopherol in the peel as much as the fruit. We used High performance Thin Layer chromatography to compare the tocopherol profile in the peel.

## Reducing Food Waste at School Lunches - NURS 215 Nutrition Project

By Maryam Isa & Morgan Epps

**Abstract:** Americans waste enough food to fill a whole stadium every day. School lunch food waste is among the major contribution that many of us are facing. When plate waste measurements were conducted, many students disregarded the healthy food items on their plates such as vegetables, fruits, and milk. There are many ways to reduce, recycle, and recover food waste in school cafeterias. By implementing these ideas, schools play a vital role in scaling back the amount of food taking up landfill space. Some may argue that serving high quality foods will attenuate the waste issue and increase consumption, but with the high price of foods and with the amount of dollar per plate, increasing food quality is almost exceptional. So, the problem is, how can we really reduce or recycle the amount of food that is being wasted? In the accompanying presentation, audience will be able to identify strategies for managing food waste at schools, recognize or list ideas on why food waste occur, and identify its impact to the community and environment.

## Reducing Food Waste at College All You Can Eat Buffet - NURS 215 Nutrition Project

By Briana Gaines, Chinedu Chiaghanan, Earl Gray, & Tammia Johnson

**Abstract:** This presentation is on how dining in an all you can eat buffet with college friends leads to food waste and how to change the culture of food waste. Buffets seem to be a great place for college students because they can eat an unlimited amount of food for a great price. However, buffets play a major factor in food waste. It is very harmful to the environment in many ways. Almost one-third of all the food that is produced worldwide is wasted which contrasts the 800 million people that are considered chronically hungry. Students seem to overload their plates to try everything the buffets has to offer which leads to more food waste; this has a negative impact on the environment. At the end of this presentation, participants will be more likely to demonstrate the ability to follow a healthy diet plan while avoiding unhealthy food choices. Recommended strategies on food waste reduction include reducing the portion sizes of food taken at a time.



## Student Poster Abstracts

### **Reducing Food Waste at Celebrations - NURS 215 Nutrition Project**

By JeanPaul Palisoc, Delosreyes Trisha, Monica Veney, & Maria Fernandez

**Abstract:** This poster presentation reviews the culture of food waste and illustrates the practices that can allow people to better manage and reduce the amount of food thrown away at celebration event. At such events, Americans amass massive amounts of food waste that cost billions of money and resources. Along with its economic impact, food waste affects the environment as well - emitting large amounts of methane to the atmosphere. This presentation details a list of strategies for either the host or the guest that allows people to decrease the amounts of food and resources wasted, along with limiting their impact on the environment. These strategies include understanding and recognizing wasteful practices, and identifying helpful methods that will reduce them. Being able to change the culture of food waste is a good starting point to the much needed goal of reducing the billions of food thrown away in money and resources.

### **Reducing Food Waste in a Typical American Household - NURS 215 Nutrition Project**

By Valerie Hyacinth, Erica Burke, Tiara Billy, & Stephanie Hyacinth

**Abstract:** This presentation discusses the culture of food waste as it relates to the typical American household. Food waste has seen an increase over the years and has created a plethora of economic, social, and environmental problems. The objective of the presentation is to educate the general public on the different ways to manage food waste within their homes. Accordingly, it identifies behaviors that contribute to food waste at home as well as how much food is wasted in the typical American household. In addition, it suggests several interventions that can be incorporated into one's daily activities that may help reduce food waste at home, and these solutions range from portion size management to alternative uses for leftovers. Diet planning principles are also explored in this presentation; these six principles simply suggest things to consider when planning a meal. By taking them into account, one can learn how to plan a reasonably sized meal while still ensuring an adequate supply of energy and nutrients from the meal.

### **Reducing Food Waste at High School Lunches - NURS 215 Nutrition Project**

By Mariah Gibau, Monique Nelson, & Channel Slaughter

This presentation is on the culture of food waste at high school lunches. Its purpose is to provide awareness of more efficient ways to eliminate and decrease food waste as it pertains to high school lunches. Various factors have contributed to such food waste including lack of taste, excessive amounts of servings, expiration and spoilage guidelines, and lack of choices. Food waste in schools, particularly high schools accounts for a great amount of food waste. Food waste in high schools has unfortunately been a problem for years. Studies show that approximately \$1.2 billion is wasted annually on unopened food, thrown away food, and liquids. The three main strategies proposed to reduce food waste are waste audits, changing school menus, and donating to food pantries. At the end of this presentation, participants will be able to identify strategies that will reduce such food waste, summarize what is currently known or observed about food waste in high schools, and be encouraged to eliminate food waste and spread awareness to those contributing to the issue.

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