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# CAS JAMAICA

FOOD SAFETY NEWSLETTER

IN THIS ISSUE



## A letter from the editor

Microbes are everywhere. We have the good, the bad and the ugly. "Good" microorganisms are utilized in the process of fermentation to make products such as sake (rice wine), yoghurt, soy sauce, kimchi (fermented cabbage), chocolate, kombucha and cheese. Probiotics such as yoghurt contain bacteria which are beneficial to gut health, for example, Bifidobacteria. Prebiotics encourage the growth of beneficial bacteria and can be found in foods such as chicory root, onions and garlic. "Bad" microorganisms can however lead to foodborne illnesses which in extreme cases can be life threatening.

A foodborne outbreak results when two our more people get sick from eating a particular food. Examples of pathogenic bacteria include *Clostridium botulinum*, *Listeria monocytogenes*, *Salmonella*, *Staphylococcus aureus*, *Bacillus cereus* and *Escherichia coli* O157:H7.

During food processing various methods are utilized to prevent, kill and control the growth of undesirable microorganisms. Thermal processing methods such as blanching, pasteurization and canning have been mainly utilized. These methods however have a significant impact on the organoleptic, sensorial and nutritional properties of the final product.

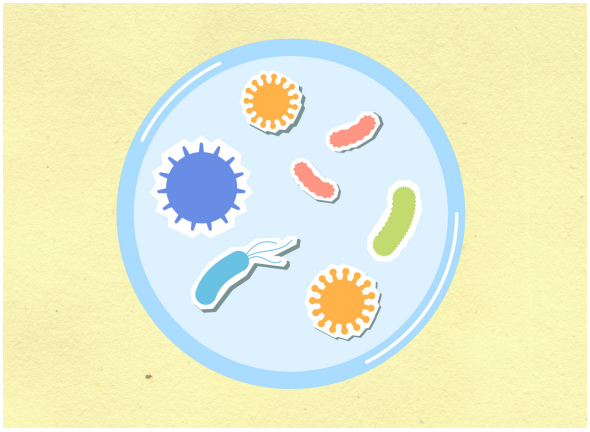
New and emerging food processing techniques aim to minimize the use of heat while maintaining a safe, wholesome and aesthetically appealing food product. Less heat facilitates better flavour and colour retention with the final product having a closer resemblance to the original starting material. Non thermal processing methods include, High Pressure Processing, Pulsed Electric Fields, Irradiation, Cold Plasma and Ultraviolet light. The mode of microbiological inactivation is different for each of these methods.

Irradiation also referred to as cold sterilization cleaves the DNA of the microorganisms thereby inhibiting their ability to replicate. This method is mainly utilized for food products with low water activity such as spices. This is due to water being able to split during irradiation producing harmful radicals. The method has also been utilized for the shelf life extension of fruits such as strawberries and mangoes and to inhibit the sprouting of potatoes.

Microbial inactivation during Pulsed Electric Fields is as a result of electroporation. In High Pressure Processing (HPP) proteins are denatured due to the high pressures applied. HPP is also utilized in shellfish shucking which facilitates the easy removal of the shell from crustaceans. This technology has widespread application in the seafood industry in Prince Edward Island, Canada

Preservatives such as nitrites, sodium benzoate and parabens may also be added to foods to inhibit the growth of microorganisms. Nitrites are mainly utilized in cured products to inhibit the growth of *Clostridium botulinum*. A combination of any of these techniques to ensure the safety of our foods is referred to as the Hurdle concept.

In this edition we will look at particular examples of pathogenic bacteria which have led to the contamination of food products and resulted in foodborne illnesses.



**Bacteria**

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# Food Safety: Raw Milk & Campylobacteriosis

*By Anissa Walters and Javion Green*

**Abstract**

Food safety is important as it prevents consumers from contracting foodborne illnesses. Food should be handled and stored properly to prevent contamination. Proper preparation is another essential aspect of food safety that must be followed before purchasing and consuming food. A recent food safety issue was linked to *Campylobacter*. Improper practices such as not composting animal waste regularly and not pasteurizing raw milk can cause campylobacteriosis. *Campylobacter* can easily be destroyed when heated to certain temperatures. A recent outbreak of campylobacteriosis happened in April of 2021 in the United States which caused several persons to become ill.

**Introduction**

Food safety is best known as the preparation, handling and storage of food in the best way to reduce the risk of contamination which can cause foodborne illnesses in individuals. One food that must be properly prepared before consumption is raw milk. Dairy milk is a widely consumed product as it is used in many preparations of different foods and beverages. Humans, since the beginning of civilization, have been consuming milk from different animals such as cows, goats and sheep. Cows milk is the most popular as it is filled with many nutrients such as calcium and protein. Milk can be beneficial for human health but may be also dangerous. This is because raw milk contains viable pathogenic bacteria. Raw milk needs to be processed before being used safely for human consumption.

**Milk**

A well-known step in milk production is pasteurization which involves the application of heat for a certain amount of time to destroy pathogens (MacDonald et al., 2011). When raw milk is unpasteurized or not pasteurized properly it can cause serious illness in consumers. There have been several outbreaks of foodborne infections in recent times. In April of 2021, there were 5 cases of *Campylobacter* infections in Washington across four different counties. The department of health reported that the individuals consumed unpasteurized raw milk produced by Dungeness Valley Creamery. It was speculated that the products were contaminated with *Campylobacter* and all the products with the “best by” date of April 13, 2021, had to be recalled. According to Wieczorek & Osek (2013) campylobacteriosis is the most widely known cause of gastroenteric infections in first world countries. *Campylobacter* causes millions of cases of foodborne illnesses worldwide every year and one of the main causes of this is unpasteurized milk.

**Discussion**

In April 2021, a recall of all milk products was made by Dungeness Valley Creamery. This was done when positive tests from consumers for *Campylobacter* were discovered and reported by the Washington Department of Health after they consumed milk/milk products from the creamery. It was stated that the milk was raw and possibly contaminated with harmful bacteria. The bacteria in question is *Campylobacter* that is known to cause of foodborne illnesses.

These bacteria can cause an infection after the consumption of raw milk which is known as campylobacteriosis. After consuming the contaminated milk, a microbial infection will occur after 2-5 days. The *Campylobacter* will attach to the stomach and intestinal lining and start to multiply. Symptoms that can occur include:

- Nausea
- Vomiting
- Diarrhea
- Bloating
- Fever
- Stomach Cramps

This infection usually lasts about a week and sometimes, persons don't have any symptoms but there can be serious risks, even though it can be uncommon. There can be many different risk factors of campylobacteriosis such as untreated water, uncooked poultry/meat, cross-contamination from raw poultry/meat and contact with infected domestic animals. The main risk associated with this infection is the intake of raw/contaminated milk. *Campylobacter* can be carried through animals on farms. During milking, the bacteria pass through the udder of the cow and will be present in the raw milk. These bacteria can live in an animal's digestive system. Between the years 2007 to 2012, 81 outbreaks were reported in the United States of America from the consumption of raw/unpasteurized milk. 78 outbreaks were with the association of a single causative agent. Out of the 78, 62 outbreaks were caused by *Campylobacter* as it is the most common pathogen. These outbreaks caused almost 1000 illnesses and about 70 hospitalizations (Mungai et al., 2015). These risk factors can be avoided by the implementation of precautionary measures.

Prevention of contamination by *Campylobacter* should start from the farm of domestic animals. Precautionary measures should be put in place to prevent foodborne illness from raw/contaminated milk. Animal waste should be regularly composted. Usually, new bulls are bought for breeding. It is very important to know where these bulls are being sourced. A test can be done to know the medical status of the bulls. Bulls infected with *Campylobacter* unknowingly can spread it to the herd.

Slurry tanks are structures that collect animal waste and other organic materials. These tanks should not be overfilled as they can increase pathogenic batches in the tank.

Food safety standards should be followed at all stages in milk processing, from the farm to the shelf. Pasteurization is the main step which kills harmful microorganisms that can cause serious illness and also prolongs shelf life by destroying spoilage causing microorganisms.

**Conclusion**

Every year, hundreds of people die due to foodborne illnesses worldwide. With proper handling, storage and preparation of foods, foodborne illnesses can be minimized or eliminated.

**Cows**

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# The 2018 outbreak of Escherichia coli O157:H7 linked to Romaine lettuce

*by Shanna-Lee Garth & Shay-Ann Raymond*

**Abstract**

The 2018 outbreak of *Escherichia coli* O157:H7 linked to contaminated Romaine lettuce occurred from October 7, 2018, to December 4, 2018. An investigation conducted by the Centers for Disease Control and Prevention (CDC), Food and Drug Administration (FDA) as well as the state partners, traced the infection back to farms and cooling facilities located in Santa Maria, California. It was reported that sixty-two people were infected with the outbreak strain of *Escherichia coli* O157:H7. The infected people were between the ages of 1 to 84 years old. Thirty-eight per cent (38%) of the infected persons were hospitalized, additionally, two people developed haemolytic uremic syndrome and there were no reported deaths. It was reported that infected persons were from sixteen states and the district of Columbia. The contraction of *E. coli* can lead to severe illness, hospitalization, or death. Individuals should therefore educate themselves of the symptoms, causative factors, associated risk, and precautionary measures of this bacteria.

**Introduction**

Foodborne illness can result from consuming food or beverages that are contaminated with disease-causing microbes or pathogens (Minnesota Dept. of Health, 2019). According to the World Health Organization, over two hundred diseases are a result of consuming food contaminated by bacteria such as *E. coli*, viruses, chemical substances, or parasites. *E. coli* O157:H7 is just one strain of the many *E. coli* bacteria that can lead to severe foodborne disease or even death. According to Slayton et al., (2013), *E. coli* O157:H7 is the name given to a group of gram-negative, rod-shaped *E. coli* bacterium that produces a powerful Shiga toxin that causes severe illness in a human.

This outbreak strain of *E. coli* O157: H7 is responsible for more than 96,000 cases of diarrheal illness and resulted in 3,200 persons being hospitalized annually due to infection in the United States (Slayton et al., 2013). Shiga toxin-producing *E. coli* lives in the intestine of healthy cattle such as deer, elk, and other ruminant animals. It can be found in areas such as water, food or soil that has been contaminated with human or animal faeces. *E. coli* O157:H7 that causes humans to become ill generally does not cause illness in animals. *E. coli* O157: H7 works by travelling down the digestive tract and releasing the Shiga toxin which is a destructive toxin. The Shiga toxin results in damage to the lining of the small intestine which is the cause of diarrhoea and kidney damage.

Romaine lettuce is classified as a cool-season crop that is typically grown under conditions that are favourable to *E. coli* O157:H7, among other pathogens. Because of this, consumption of raw Romaine lettuce can lead to illness depending on the level of contamination as well as the health of the individual consuming it (Ortega & Posts, 2021). In October 2018, an outbreak of *E. coli* O157:H7 infection resulted from the consumption of contaminated Romaine lettuce.

Research conducted by the CDC to trace the source of the outbreak revealed that the *E. coli* O157:H7 strain was present in sediment collected within an agricultural water reservoir on Adam Bros. Farming Inc. located in Santa Maria, California. This farm was the supplier of the contaminated Romaine lettuce which was recalled. The consumption, selling or serving of the contaminated lettuce was prohibited.

**Discussion**

The 2018 outbreak of *E. coli* O157:H7 linked to contaminated Romaine lettuce led to sixty-two people being infected. E. *coli* O157:H7 can infect people of all age groups however, those with a weakened immune system are more likely to experience more severe symptoms. Those of higher risk include new-borns, children, pregnant women, and the elderly. This was reiterated in the fact that the infected people were between the ages of 1 to 84 years old. The symptom starts to show in a person infected with *E. coli* 1-3 days after consuming contaminated food, however, sometimes it can take up to nine days before the symptoms appear. Confirmation of *E. coli* O157:H7 requires a test to identify the H7 antigen. Laboratory testing that can be conducted include the polymerase chain reaction (PCR), coliform test and Membrane-Thermotolerant *Escherichia coli* agar test to analyze the wastewater.

According to the Centre for Disease Control and Prevention, *E. coli* can be harmful or pathogenic. A small amount of *E. coli*, if ingested, can result in serious issues. Some strains such as *E. coli* O157:H7 can cause symptoms such as loss of appetite, severe stomach cramps, watery or bloody diarrhoea, vomiting, fever or even kidney failure. The *E. coli* O157:H7 infection can be contracted from drinking even a mouthful of contaminated or inadequately chlorinated pool water or contact with the stool of an infected human or animal. The main source of transmission is from raw or undercooked ground beef along with raw vegetables such as Romaine lettuce and raw milk.

The *E. coli* infection goes away on its own, however, the symptoms can be managed by replacing the fluid that was lost through vomiting and diarrhoea by drinking a lot of fluids and getting as much rest as possible. The Romaine lettuce outbreak was spread across sixteen states and resulted in 25 people being hospitalized, of which two persons developed haemolytic uremic syndrome (HUS) which is a severe form of kidney failure. HUS usually comes about seven days after contracting the bacterial infection. Signs of HUS are dehydration, exhaustion, loss of pink colour inside lower eyelids and cheeks along with decreased urination. This syndrome can result in hospitalization, permanent damage to organs or death. In addition to HUS, *E. coli* can give rise to haemorrhagic colitis, also called “bloody diarrhoea”. This is a type of gastroenteritis where *E. coli* O157:H7 produces toxins that damage the lining of the intestines. Even though the mortality rate of *E. coli* O157:H7 is less than one per cent, it can result in serious complications and in very few cases, it results in death. In June of 2018, there was an *E. coli* O157: H7 outbreak which resulted in 210 reported cases across 36 states. This outbreak led to 96 persons being hospitalized and 5 reported deaths. Additionally, in November and December of 2019 alone, there were 340 reported cases with 204 hospitalizations and 36 persons developing HUS (Centers for Disease Control and Prevention, 2018).

The necessary precautionary measures must be followed to prevent the transfer of *E. coli* O157:H7 infection. According to the Center for Food Safety and Applied Nutrition, some precautionary measures that can be taken to prevent the spread of infection includes ensuring that any food product that has the potential to be contaminated is washed and stored in properly sanitized areas. The refrigerator used for storage should be properly cleaned along with any utensils that may have been used in the preparation of contaminated food. For cleaning, a tablespoon of chlorine bleach to one gallon of hot water can be used to remove bacteria. After cleaning the surfaces and utensils they should be properly dried with a clean cloth or paper towel that was not previously used to handle contaminated food. Additionally, the person handling the contaminated food should ensure their hands are washed with warm water and soap after the cleaning and sanitization (2020).

Romaine lettuce is classified as a cool-season crop that is typically grown under conditions that are favourable to *E. coli* O157:H7.

Bacteria can adhere to the surfaces of the leaves of the Romaine lettuce, and it is very difficult to remove from the leaves thus washing is not an effective way of removing pathogenic *E. coli*. The freshly cut Romaine lettuce should be kept at a temperature below 5 °C. This will preserve the lettuce and cause the bacteria to be inactive. *E. coli* O157: H7 bacterial growth is temperature-dependent and will grow rapidly at temperatures close to 37 °C. Additionally, even though lettuce is generally eaten raw, if consumers choose to consume Romaine lettuce it can be cooked at a temperature 160°F or 71°C until it is wilted. This is effective as this temperature is enough to destroy *E. coli* (Hirsch, 2018).

**Conclusion**

Foodborne illnesses are prevalent and unavoidable. Being cognisant of the associated symptoms, causes, risks factors and precautions can help to control the spread of infection.

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# Listeria Outbreak linked to Enoki Mushrooms

*by Gardine Brooks & Gianwah Maragh*

**Mushrooms**

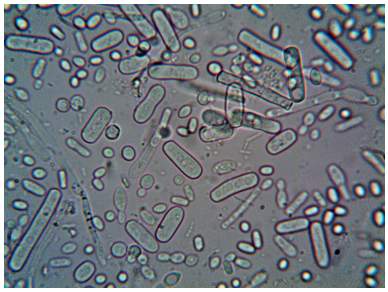
**Abstract**

This article provides an overview of the Listeria outbreak which occurred across multiples states in the United States of America due to the contamination of mushrooms. An overview of the pathogen *Listeria*, symptoms of listeriosis and how distributing bodies can control the spread of this foodborne pathogen or handle possible contamination are also provided.

**Introduction**

In this particular case of foodborne illness, Korean enoki mushrooms supplied to three companies had to be recalled due to the possibility of contamination with *Listeria monocytogenes*. According to the CDC, the products were past their shelf life and should not be sold. The three companies in question were H&C Food Inc. located in New York as well as Guan's Mushroom Co. and Sun Hong Foods, Inc. both found within the State of Carolina.

There was a total of 36 cases, that occurred in a distribution of 17 states, inclusive of deaths and hospitalizations (Gram et al., 2002). The cases also included those linked to several pregnancies which in some cases lead to loss of the foetus. Advice from the CDC is given on how to take extra precautions in avoiding infection by the bacterial species. This included proper refrigeration as *Listeria* can survive in chilled environments.



**Bacteria**

**Discussion**

Listeriosis is a food related illness caused by the pathogenic species of bacteria *Listeria monocytogenes* (Rogalla et al., 2021). Bacteria that are described as pathogenic usually cause diseases and the same is true for *Listeria* spp. *L. monocytogenes* are intracellular rod bacteria that can survive or be present in aquatic and soil environments as well as decaying vegetative sources (FDA). Additionally, they can survive in refrigerated environments.

Of those species within the Listeria family, 10 different species are usually attributed to causing infections in humans including meningitis in a variety of age groups (Rogalla et al., 2021). *L. monocytogenes* is an environmental pathogen that is usually transferred during food handling such as harvesting, preparation and packaging if the environment is contaminated with species from the Listeria family (Rogalla et al., 2021, FDA, CDC).

**Symptoms of Listeriosis/*Listeria* Infection**

Persons most at risk of listeriosis are those 65 years of age and older, have a weaken immune system, or foetuses (FDA). Persons usually experience flu-like symptoms such as fever, chills, muscle aches and diarrhoea or nausea (FDA). If the infection has spread to their nervous system, they will experience additional symptoms such as headaches, stiff neck, confusion, loss of balance, and convulsions (FDA). Pregnant women may experience flu-like or no symptoms, which could mean they have passed the infection onto in their foetus (FDA). Developing infections during pregnancy can result in the foetus or baby being miscarried, stillborn, premature, or developing a potentially fatal infection at birth.

**Precautionary measures against *L. monocytogenes***

Retailers and food service operators who handled or store recalled or potentially contaminated food within their facilities for e.g., the enoki mushrooms contaminated with *Listeria*, should perform the following measures (FDA):

- Contact their local health department and warn their customers about the possibility of being infected with *L. monocytogenes*.
- Set the refrigerator to 4 ℃ (40 ℉) and the freezer to -18 ℃ (0 ℉), to impede the growth of *L. monocytogenes*.
- Wash all surfaces (walls, shelves, refrigerator, utensils, countertops, etc.) that have or may have encountered the contaminated foods; sanitize with a mixture of chlorine bleach and hot water; dry with a new clean cloth or paper towel.
- Wash hands and clothing with warm water and soap following the sanitization process.
- Sanitize areas that may encounter foods regularly to prevent or decrease the chance of cross-contamination.

**Proper hand washing techniques**

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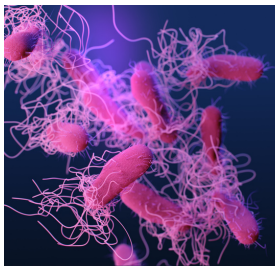
# Salmonellosis

*by Tiah Gayle & Anthonet Fowler*



**Abstract**

*Salmonella* is among the most important foodborne pathogens and the leading cause of food-borne bacterial illness in humans. *Salmonella* pathogens are commonly found in animals, hence animal-based foods are the main transmission route to humans (Alberto et al., 2012). Safety practices while preparing and handling foods are of utmost importance to mitigate and avoid the spread of foodborne illnesses.

**Introduction**

The Centers for Disease Control and Prevention (CDC) estimates *Salmonella* bacteria cause about 1.35 million infections, 26,500 hospitalizations, and 420 deaths in the United States every year (CDC, 2021). *Salmonella* is defined as a rod-shaped, Gram-negative microorganism that belongs to the Enterobacteriaceae family. *Salmonella* is a group of facultative anaerobe bacteria (Jemilehin et al., 2016). Food-borne illness from *Salmonella* can be spread by food services who do not practice proper kitchen hygiene and techniques, such as washing of hands and utensils used to avoid cross contamination. Some cases of *Salmonella* may become fatal. In fact, an estimated number of 450 patients in the United States die each year from salmonellosis (Centers for Disease Control and Prevention, 2021). Sources of *Salmonella* include raw or undercooked poultry and drinking water. Common symptoms of salmonellosis include diarrhea, fever, abdominal cramps. There are many preventive steps that can be taken to avoid having the illness. These include washing of hands, washing and sanitizing surfaces, cooking food thoroughly, etc. Diagnosis and treatment of salmonellosis involves a laboratory test. While most people may recover without specific treatment, for severe cases, antibiotics are needed (FDA, 2021). Salmonellosis is a common foodborne illness that is caused by food safety issues and practices that may need precautionary measures to reduce or avoid the health risks that are associated with this illness.

**Discussion**

Unsafe food creates a vicious cycle of disease and malnutrition, and therefore affects everyone who encounters it. Foodborne illnesses are usually infectious or toxic in nature and caused by bacteria, viruses, parasites, or chemical substances entering the body through contaminated food or water. The bacteria *Salmonella* causes salmonellosis (CDC, 2021).

Food safety and food security are intertwined. Examples of unsafe food include uncooked foods of animal origin, fruits and vegetables contaminated with feces, and raw shellfish containing marine biotoxins. Additionally other unhygienic practices while preparing food includes:

- Unsanitary cooking tools and utensils
- Poor hand hygiene
- Improper cooking, storage, and refrigeration
- Cross-contamination of raw and cooked items

*Salmonella* generally thrives in the intestines and exits the human or animal body in fecal matter (Alberto et al., 2012). If a random animal is infected with this illness, contamination may occur upon its death during butchering. During this process, the farmer/butcher may become infected if not following proper procedure and wearing the appropriate gear. Another means of infection depends on whether the meat of the animal is properly cleaned before being distributed to retailers. Fecal matter may reside on the uncleaned, dead flesh, which may contain *Salmonella* which could in turn infect the next person that decides to handle the product without proper gear (Alberto et al., 2012).

Oftentimes, people have the misconception that they do not need to take special precautions because "the person before must have done so". This results in ignoring the protocols put in place to protect our health and the inevitable consequence follows. Though human ignorance and lack of responsibility often increases the risk of exposure to the *Salmonella* infection, it may also be out of our control. An example would be if a man living downstream of a river fishes regularly for his daily meal suddenly became ill due to *Salmonella* infection. This man may have cleaned his shrimps and fish well, in an area suitable for such activities, washed his hands as often as necessary, and was still infected. The problem may be that somehow the water that this man was fishing in became contaminated by *Salmonella* somewhere upstream and completely out of his control, thereby infecting the man (Alberto et al., 2012).

There are additional factors that can increase the risk of salmonellosis. These activities include:
• International travel - Developing countries with poor sanitation may pose a threat for *Salmonella*.
• Owning pets - Birds and reptiles are common pets that are capable of carrying *Salmonella* (Mayoclinic, 2021).

**Symptoms of salmonellosis**

"My fiancé was so weak and feverish, she could barely stand up," was the experience of a couple spending their honeymoon at a hotel in Jamaica (Fickenscher, 2021). Words such as, "nightmare" and "disaster" were used by the couple to explain their exposure to salmonellosis. Common symptoms of salmonellosis include:
• Diarrhea
• Fever
• Stomach cramps

Some people may also have nausea, vomiting, or a headache. Symptoms usually start within 6 hours–6 days after infection and last 4–7 days. People who have a Salmonella infection will shed the bacteria in their feces.

Those who have had diarrhea should not return to child care, school, or work until 24 hours have passed. As for food servicing workers, they should not return to work until 48 hours have passed without symptoms (CDC, 2021).

According to the CDC (2021), persons should call a doctor if exhibiting any of the following symptoms:
•Diarrhea and a fever higher than 102°F
•Diarrhea for more than 3 days that is not improving
•Bloody stools
•Prolonged vomiting that prevents you from keeping liquids down
•Signs of dehydration, such as:
  Making very little urine
  Dry mouth and throat
  Dizziness when standing up

*Salmonella* can also enter the bloodstream, which is referred to as as bacteraemia. This can pose an effect on tissues throughout the body including:
• The lining of your heart or valves (endocarditis)
• The tissues surrounding your brain and spinal cord (meningitis)
• The lining of blood vessels
• Your bones or bone marrow (osteomyelitis)
Persons who come in contact with *Salmonella* may also develop Reactive arthritis (Mayoclinic, 2021).

**Precautionary measures**

Precaution, it's not just about what you eat, it would also be wise to consider where you eat. While it may not be easy to know if a restaurant or food vendor follows proper food handling and hygienic practices such as properly cleaning cutting boards and utensils, regularly washing their hands, or correctly refrigerating food items, avoiding restaurants and food vendors that appear unclean can be beneficial (FDA, 2021).

Additionally, *Salmonella* infection can be prevented through proper food handling techniques, storing food in the refrigerator and freezer at correct temperatures, and cooking food to the correct internal temperature.

Other important practices include:

1. Wash hands with soap and water for 20 seconds before, during, and after preparing food and before eating.
2. Wash utensils, cutting boards, and countertops with hot, soapy water.
3. Boil water when you are unsure if it is clean.
4. Wash fruits and vegetables under clean running water.

There are precautionary measures that can be taken into consideration if anyone comes in contact with *Salmonella*. A simple test of a sample of your stool can be carried out, however by the time the results are back, most people have already recovered. Two forms of medication can be taken. These include antibiotics and anti-diarrheal.

**Conclusion**

Unsafe food poses global health threats, endangering everyone. *Salmonella* is caused by contaminated food as a result of improper preparation or mishandled food at home, in food service establishments or at markets. This may result in symptoms such as fever, dehydration and diarrhea which may require antibiotics and anti-diarrheal. To eliminate the spread of salmonellosis, both customers and business entities must adopt basic hygienic practices when buying, selling, and preparing food to protect their health and that of the wider community. In fact, everyone can contribute to making food safe by following the necessary safety precautions. Safe food, save people!

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*Tiah Gayle & Anthonet Fowler*
*Faculty of Science and Technology,*
*The University of the West Indies, Kingston, Jamaica*

# Food Safety Preventive Controls Alliance Preventive Controls Qualified Individual Food Safety Workshop

Do you wish to learn more about food safety? Register for one of our Food Safety Preventive Controls Alliance (FSPCA), Preventive Controls Qualified Individual (PCQI) three day course offered by The Department of Chemistry at The University of the West Indies. Our most recent PCQI session was held on July 5 - 7, 2022. At the end of the session participants were more knowledgeable about food safety issues.

**Comments from participants**:

- I feel empowered
- It is a great course!
- I would recommend this course to others
- The overall course was a great experience and delivery was exceptional
- Every section of the course was valuable as there was something to take away from each chapter and each chapter was vital to the other.

**PCQI Training Sessions hosted at The University of the West Indies, Jamaica**

Lead Instructor, L Hope Kerr (Front row, far left) & Andrea Goldson-Barnaby (Front row, far right)


Lead Instructor, Lisamarie Lecesne

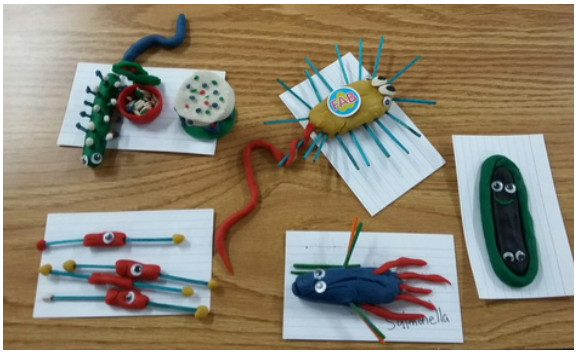
Lead instructor, Dr Andrea Goldson-Barnaby, Centre

# Food Safety Hazards

We recently heard about the recall of Haagen Daz vanilla ice cream due to the presence of pesticide residue. This is an example of a chemical hazard. Below are creative illustrations of other food safety hazards made by participants from our Preventive Controls Qualified Individual Training Workshops. Some people exhibit allergic reactions to milk, soy, tree nuts, peanuts, wheat, fish, eggs and shellfish.







# Food and Agro Processing Technology Programme
# The University of the West Indies
# The Department of Chemistry
# 10 Year Anniversary

In September 2012, the MSc in Food and Agro Processing Technology (FAPT) programme welcomed its first cohort of students. This year we celebrate 10 years. We thank all those who have played an integral role in the successes we have achieved thus far. The FAPT programme is offered at the Department of Chemistry, The University of the West Indies, Mona, Jamaica and attracts working professionals in the field and aspiring Food Scientists. We offer Masters, Post Graduate Diploma and Post Graduate Certificate programmes. Our graduates can be found internationally, working in areas such as quality assurance, food safety, product development, research and academia.

## Meet our Students

Food & Agro Processing
The Scientific Research Council

Zoie Aimey & Shaneque Gallimore

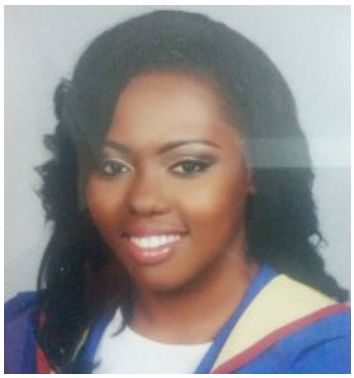

Field trip, Salada foods

Jacquél Johnson

Debbie Ann Phillips

# M Sc Graduates

Kimberley Cole
Quality Assurance Analyst
Jamaica Broilers Group Limited



Dellecia Roberts-King
HACCP Specialist, Maple Leaf Foods Inc,
Canada

Kimone Campbell
Food Safety & Sanitation Coordinator
Jamaica Flour Mills Ltd

Ereca Peart
Adjunct Lecturer,
The University of the West Indies, Jamaica

David Chung
QA Coordinator (SQF Practitioner)
Loblaws Company Limited, Canada

Marielle Coley
Quality Assurance Manager
International Biscuits Limited

Samantha Joseph
Lecturer, University of Guyana·

Janhoi Kelly
Associate Supplier Quality Manager
Tate & Lyle Sugars, United Kingdom

Kelly Simon-Brown
New Product Development &
R&D Coordinator, Organic Traditions, Canada

Ronamae Bradford
Product Development Consultant

Jesse James Clarke
Lecturer, Univ. of Technology

Toni-Moy Stewart
Business & Product Development Specialis
PA Benjamin Manufacturing Company Ltd

Shere-Dean Reid
Food Safety Officer,
Caribbean Products Company Ltd

Dillon Williamson
Dairy Industries (Jamaica) Ltd

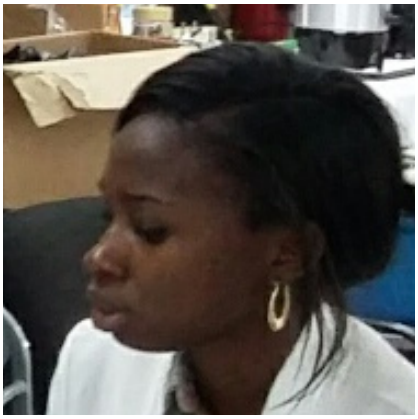
Tanzena Cunnigham
Production Supervisor, Saputo Inc,
Canada

Denise Campbell
QHSE Compliance Specialist
Campari Group

Sherone McNeil
Quality and Food Safety Professional,
Quality & Systems Manager,
Shavuot International Holdings

Terri-Lee Patterson
Quality Assurance
Dairy Industries (Jamaica) Ltd

Michael Malcolm
Director, Research & Quality Assurance
Hazardous Substances Regulatory Authority

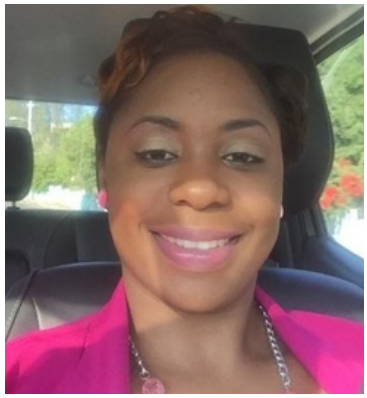


Avalon Gilpin
Scientific Research Council

Sabrina Palomino
Nutritionist, SERHA

Trishana Chevannes
PriceSmart, Country Safety Manager

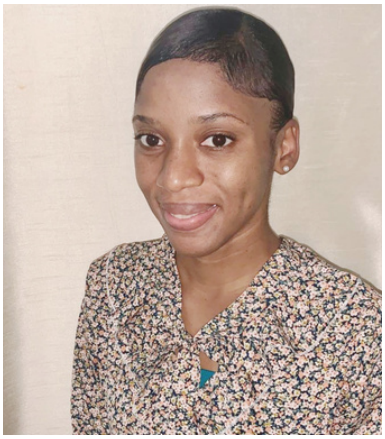
Kimberley Blissett
Food & Agricultural Systems Consultant, France



Gayann McLeod-Graham
RJ Rums & Spirits Ltd/Brewery

Vanessa Ranger
Process Engineer
UC Rusal Windalco

Monique Ellis nee Jackson
Senior Technical Officer
Grace Kennedy Limited



Hensleisha Virgo
Good Manufacturing Practices'
(G.M.P.) Officer.
Musson International Dairies Ltd/
Trading as Serge Dairies Ltd

Carol Andrade
Group Quality & Innovation Manager
Seprod Group of Companies

Kaytana Morgan

Janique McKenzie
Caribbean Flavours and Fragrances
Business Development Officer

## Post graduate Certificate

Kia Smith
Product Development Officer
Dairy Industries (Jamaica) Limited

# Thank you for your years of service to the students of the Food & Agro Processing Technology Programme

**Programme Coordinators**
Ian Thompson
Andrea Goldson-Barnaby

**Laboratory Technician**
Winston Chambers

**Administrative Assistants**
Simone Williams
Charles Grizzelle
Grace Morgan-Hosang

**Laboratory Demonstrators**
Ruth Williams Miguel Thaxter
Chevanese Morgan Zoie Aimey
Dellecia Roberts Tavia Riggon

**Past & Current Lecturers**

Gail Baccus-Taylor
Dennis Bailey
Neela Badrie
Robert Bates
Noureddine Benkeblia
Camille Bowen-Forbes
Paul Brown
Maxine Campbell
Michael Coley
Murie Edwards
Petrea Facey
Hortense Fraser
Andrea Goldson-Barnaby
Vivette Gooden
Lawrence Goodridge
Maxine Hoffman
Fatemeh Maleky
Madeen Miller
Peter Nelson
Melvin Pascall
Ereca Peart
Loron Pinnock Brown
Raymond Reid
Nicola Satchell
Subramaniam Sathivel
Henroy Scarlett
Pete Scott
Oswald Thomas
Ian Thompson
Kisan Ramji Vaidya
Niven Walker
Everton Younger

**10 years of Continuous Service**

Noureddine Benkeblia
Paul Brown
Maxine Campbell
Andrea Goldson-Barnaby
Raymond Reid
Melvin Pascall
Everton Younger
Niven Walker

**Capacity building workshops**

Food Packaging with Prof Melvin Pascal
Sensory Analysis with Dr Margaret Hinds
Food Microbiology with Dr Lawrence Goodridge
Produce Safety with Dr Andrea Goldson-Barnaby and Mr Fitzroy White

**Graduates of the Food & Agro Processing Technology Programme**

Carol Andrade
Monique Ellis nee Jackson
Vanessa Ranger
Kelly Simon-Brown
Ereca Peart
Shere Dean Reid
Dillon Williamson
Avalon Gilpin
Tanzena Cunningham
Janhoi Kelly
Dellecia Roberts-King
Sherone McNeil
Ronamae Bradford
David Chung
Toni Moy Stewart
Janique McKenzie
Samantha Joseph
Jesse Clarke
Michael Malcolm
Kimberly Blissett
Kimone Campbell
Denise Campbell
Marielle Coley
Kaytana Morgan
Trishana Chevannes
Terri-Lee Patterson
Hensleisha Virgo
Kimberley Cole
Sabrina Palomino
Gayann McCleod-Graham
Kia Smith

# American Chemical Society
# Student Engagement Initiatives

On February 23, 2022, student members of the American Chemical Society Jamaica International Student Chapter visited the Port Royal Marine Lab for a Mangrove and Pollution Tour. During the tour we learned about various restorative projects being conducted by the team to improve our environment such as the removal of 9000 bags of garbage from Refuge Island. The island serves as a bird sanctuary. The students enjoyed the visit and found it very informative. During the visit they learned how pollution is directly affecting the mangroves and our ecosystem. They enjoyed seeing the ecosystems and the beautiful forest.

Refuge Cay

Mangroves with Prop Roots

## Students Visit the Port Royal Marine Laboratory

Chauntelle Green

Alexandra Söderholm, Alexander Kyriakidis, Zoe Garwood, Nadesha Pinnock, Dane Warren, Chamique McFarlane

Alexandra Söderholm, Chauntelle Green, Nadesha Pinnock, Sashauna Staple, Zoe Garwood

# Dairy Chemistry Workshop
# March 19, 2022

Mrs Sonal Gupte

Students learn about cheesemaking from Dairy Technologist Mrs Sonal Gupte

Milk curds

Tobian Burke

Sashana Staple, Tobian Burke,
Andrea Goldson-Barnaby
Zoe Garword, Nadesha Pinnock

Zoe Garwood

# OUR VISIT TO TYWMAN'S COFFEE FARM

Students enjoying the beautiful vista of the Blue Mountain and John Crow Mountains.

*Coffea arabica*

Pamsy sorting through dried coffee beans. There are different types of beans. Pea berry is the most expensive. Most of our roasted coffee is exported to Japan

Our tour guide, Laney

Also accompanying us on the trip was Fulbright Scholar Dr Patrick Gordon.

# Student testimonials

**My Holywell Coffee Farm Tour Experience**

On Wednesday, April 13, 2022,
I went on a field trip to the Holywell Coffee Farm Tour. The tour began and ended at Twyman's Old Tavern Coffee Estate and was both beautiful and informative. I was able to see how coffee is grown, including the coffee fruit and the coffee beans after they had dried, and the shell was removed. As a coffee enthusiast, I was delighted to be able to observe and learn more about the growth and production of coffee beans. One important thing I learnt was that there are various types of coffee beans that are classified based on their appearance. There are two types of coffee beans: peaberry coffee beans, which are rare, whole, and round, and number one coffee beans (or regular coffee beans), which are roughly half the size of peaberry coffee beans. Surprisingly, both types of coffee beans can be derived from the same tree and fruit. Other types of coffee beans are also available, but they are less common.

We were able to take a tour of the coffee plantation, which grows not only coffee but also vegetables and fruits. I was also shown the eucalyptus tree that grew along the path of the coffee plantation, as well as the castor oil tree and fruit, both of which I had never seen before.

Our tour guide and other workers at the coffee estate shared so many interesting things with us, not only coffee-related, but also important life tips that will greatly benefit us as young people as we navigate this journey called life. The coffee estate workers were incredibly welcoming and served us coffee with buns and cheese.

I loved the coffee; it was amazing and delicious. The overall experience was fantastic, and I am grateful that such an opportunity was presented to us college students and that I was able to participate in it. I believe that such an experience would be beneficial to everyone.

*Chamique McFarlane*

**Coffee Farm Experience**

Getting the opportunity to visit a coffee farm would not be fascinating for many. But, as an aspiring food chemist, this is now a core new memory for me. Getting the opportunity to visit Old Tavern Coffee Farm through the American Chemical Society is one that I am grateful for. Even though I understood that the food value chain did not start within the factories with the chemists, this field trip provided a first-hand experience of all the processes along the food value chain.

In caring for the coffee plant, a borer trap is used as an insecticide. After the tree reaches a specific height/age, new leaves are continually removed. This will allow for sufficient nutrients to be available for the coffee berries. The berries are harvested once per year, then the layers that surround the coffee beans are removed and the beans are allowed to dry for approximately six weeks. Once the beans are dried, sorting is done. Seeing that there are different types of coffee, sold at different prices, many, including myself, would believe that there are different species of the coffee plant.

I now know, that one species bears different types of coffee, just by random selection. There is the 'round', 'ones', and 'twos.' The 'rounds' are the more expensive coffees that provide the smoothest beverage and are mainly exported.
Coffee beans are roasted to a light, medium, or dark roast. The timeframe is dependent on the desired color. After roasting, the coffee beans are ground and packaged for distribution.

*Dannielle Watt*

**Sponsorship for these initiatives was provided by the American Chemical Society**

# Fulbright Scholar, Dr Patrick Gordon

During the past six months we were blessed to have Fulbright Scholar, Dr Patrick Gordon visiting with us from Boston, USA. Dr Gordon has participated and assisted us in the execution of various ACS student engagement activities. He has been instrumental in assisting students from our local chapter to grow professionally. We have collaborated on various initiatives. Dr Gordon is the recipient of an ACS 2022 Senior Chemist Diversity, Equity, Inclusion and Respect Grant which will be utilized to strengthen the leadership skills of our students. Thanks Dr Gordon. Bon voyage and best wishes as you return to the USA.

ACS student social


Michelle Nichols, Patrick Gordon, Eneth Noble, Andrea Goldson-Barnaby


Appleton Estate Tour, St Elizabeth

# VERY AMAZING PRODUCTS (VAP) LTD

The Department of Chemistry at The University of the West Indies wishes to thank all the companies that supported our students during the pandemic by allowing them the opportunity to visit their facilities which is an integral component of learning.

Very Amazing Products (VAP) Ltd has supported both our undergraduate and graduate students. A special thanks to Mrs Kailesha Duffus and Ms Bailey for the role they have played in organizing the tour of their facilities for our students. VAP Ltd located at Twickenham Park Industrial Estate, Spanish Town, St Catherine has over forty years of experience in the food processing and manufacturing business. The company is family owned and was founded by Mr Victor Chin.

Trading under the Pure and Mandingo brands, VAP Ltd manufactures beverages, concentrates, syrups, vinegar, tomato ketchup, vegetable oil, bulk and tonic wines. The company has Safe Quality Food (SQF) certification and exports to the Caribbean, Canada, the United States and the United Kingdom.

*Thank you*

Thank you for your role in nation building and for supporting our students throughout the pandemic.

# Scholarship Opportunity

https://cwsimons.com/food-science-scholarship/

Apply for a $200 USD scholarship!
Eligibility: Student pursuing a degree in food science or food chemistry at the University of the West Indies, Mona, Jamaica.
Requirement: Write an original essay of at least 1000 words, explaining a concept in food science. The article must be informational but engaging for the general public to understand. Credible citations must be included, and are not part of the 1000 words.
The winner's essay will be published on this website.
Deadline to apply: August 15, 2022

# Science & Back to School Fair

# Microbiological Hazards

| C | N | Y | Y | N | T | C | C | O | I | X | S | O | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | P | S | E | O | E | X | O | I | C | P | U | F | T |
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| R | R | M | B | S | T | O | O | R | C | C | S | S | S |

INTOXICATION
HEPATITIS
STAPHYLOCOCCUS
YEAST
SPORES
NOROVIRUS
PRION
BOTULISM
TOXIN
CAMPHYLOBACTER
BACTERIA
MOULD
PARASITES
COLIFORMS
LISTERIA
BACILLUS
INFECTION

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