

# CAS JAMAICA

FOOD SAFETY NEWSLETTER



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## A letter from the Editor

*by Dr Andrea Goldson-Barnaby*

As we launch our very first Caribbean Academy of Sciences, Jamaica (CASJ) Food Safety Newsletter, we would like to remember Prof Tara Dasgupta. This newsletter is dedicated to him. Prof Tara Dasgupta was the president of the Caribbean Academy of Sciences, Jamaica. He made significant contributions to the Department of Chemistry, at The University of the West Indies, Mona, Jamaica. I first got the opportunity to work with Prof Dasgupta during the planning of the 21st General Meeting and Conference of The Caribbean Academy Sciences (CAS) held in November 2018 in Kingston. Thereafter, Prof Dasgupta gave me the opportunity to speak at a Food Safety Forum in April 2019. In November of last year, he asked me to serve as editor for the Food Safety Newsletter.

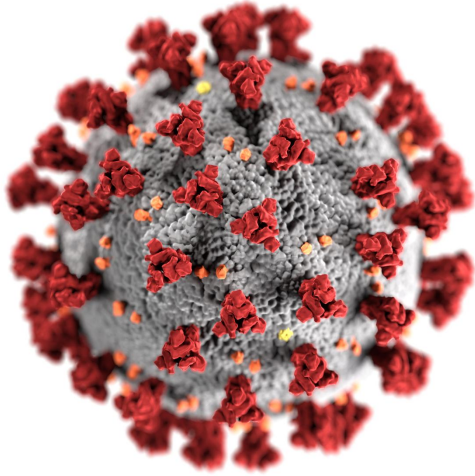
We were exchanging ideas about the newsletter just a few days before his sudden passing. Prof Dasgupta looked for potential in others and allowed them the opportunity to shine.

The year 2020 has brought us several challenges. The recent COVID-19 outbreak once again brings us back to the importance of food safety. From a market in Wuhan, China, emerged a virus that caused the world to stand still. Biological hazards can be in the form of microorganisms, prions or viruses and are the main cause of foodborne illnesses. Only 12 countries were reported as not having an outbreak of the virus. These include remote places in the smaller Pacific island nations such as the Solomon Islands, Vanuatu and Samoa, Lesotho and Comoros in Africa, North Korea and Turkmenistan. The Pacific islands, like Jamaica, are highly dependent on tourism. Remote Pacific countries such as Samoa are in no position to combat the virus due to limited health facilities and infrastructure. Communal living facilities in Samoa would lead to rapid spread of the virus. In many countries, a state of emergency was called due to the global coronavirus (COVID-19) pandemic. Entry into countries were curtailed to curb the spread of the virus. COVID-19 tests are currently ongoing with mandatory quarantine being required for those travelling internationally. Countries most affected by the virus include The United States of America, China, and Italy.

Globalization has no doubt contributed immensely to the spread of the virus. St. Lucia has become one of three countries in the world where all persons infected with COVID-19 have recovered.

Senegal in West Africa, which has experience in treating infectious disease such as Ebola, have developed COVID-19 testing kits at a cost of US\$1. These tests utilize saliva or blood. They are reported as having good recovery rates from the virus. 3D printing has also been utilized to make ventilators. These come at a cost of US\$60 versus US\$1785 for a medical ventilator. No doubt, COVID-19 will change our perspective on life which is fleeting and fragile. Some of our new habits will remain as we embrace this new state of normalcy with virtual meetings and more connectivity. Our outlook on food will possibly change. Issues such as animal welfare have been brought to the forefront. More time will more likely be spent at home preparing meals as we go back to the basics.

*Dr Andrea Goldson-Barnaby  
The Department of Chemistry,  
The University of the West Indies,  
Mona, Kingston 7, Jamaica.  
andrea.goldson03@uwimona.edu.jm*



# Coronavirus and food safety

By Ms Shantelle Henry

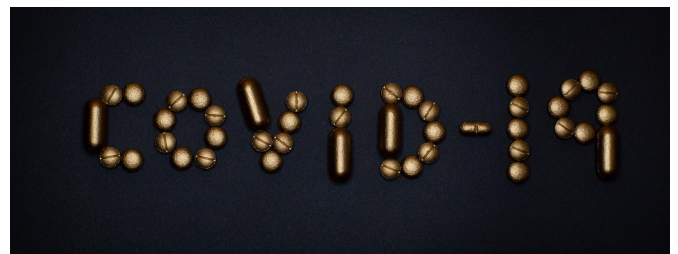
The world is currently facing a pandemic caused by the novel SARS-CoV-2 virus (referred to as the COVID-19 virus) which emerged in Wuhan, China, in late 2019. According to the World Health Organization, the primary mode of the coronavirus transmission is through person to person and through direct contact with respiratory droplets, which are produced when an infected individual sneeze, speak, or cough (1).

Due to the unprecedented threat from the novel COVID-19 virus, consumers were concerned about the spread and possible contamination of the food supply chain. This led to two pertinent questions:

1. Can the coronavirus be transmitted through food or food packaging?
2. Does cooking food kill the coronavirus?

Currently, there is no evidence supporting the transmission of the COVID-19 virus by food or food packaging. Unlike human enteric viruses such as Norovirus, Rotavirus, and Hepatovirus that are primarily transmitted by the faecal oral route, by the ingestion of contaminated food or water, the COVID-19 virus is not a foodborne disease. It may be possible that the COVID-19 virus can be transferred through indirect contact by touching an object or surface that a person has coughed or sneezed on then touch the mouth, the nose, or the eyes.

Recent research evaluated the ability of the COVID-19 virus to survive on various surfaces under laboratory conditions, with controlled temperature and relative humidity. The results showed that the COVID-19 virus remained viable for up to 72 hours on plastic and stainless steel, up to 24 hours on cardboards, up to 4 hours on copper, and up to 3 hours in aerosols (2). The more significant findings of the study was that the half-life—the time it takes for the concentration of virus to diminish by 50 % was 5.6 hours on stainless steel, 6.8 hours on plastic, 3 hours on cardboards, and 1.2 hours in aerosols (2). Therefore, due to the rapid deterioration of the virus particles on the surfaces, the existing viable particles may not be enough to infect an individual.



With the limited information currently available for the novel coronavirus, it is difficult to determine whether the virus is susceptible to normal cooking temperature. However, research conducted on the SARS-CoV-1 virus in 2004 showed the inactivation of the virus at 65 °C (3). Therefore, experts recommend cooking food to the same internal temperature required to kill foodborne pathogens. The safe internal cooking temperature is approximately 65 °C for whole meats and 70 – 75 °C for ground meats. It is always a good idea to follow good food hygiene practices – regardless of whether or not there is a pandemic. Wash fruits and vegetables using potable water, prevent cross-contamination by separating raw meat from other foods, and sanitise surfaces using alcohol-based sanitiser or bleach. The COVID-19 virus and foodborne illnesses share similar symptoms such as diarrhoea, vomiting, fever, nausea etc. Presently, a visit to the doctor caused by foodborne pathogens could take much longer, so always stay vigilant when handling food.

*Ms. Shantelle Henry, PhD Candidate – Food Safety and Quality  
Faculty of Food and Agriculture, The University of the West Indies  
St. Augustine Campus, Trinidad  
Email: henryshantelle@live.com*

# Impact of Climate Change on Agro-Processing in the Caribbean

By Kailesha Duffus, Kemar Williams, and Kimberly Grant

## Abstract

With recent changes in climate pattern stemming from man-made influences, it is of great concern whether agro-processing technology in the Caribbean is adequate to stand up to the constantly increasing demands. From the processor's standpoint, considerations must be made regarding the availability of raw produce to maintain production flow, market presence, food safety, and food quality. The unpredictable nature of the weather pattern has resulted in a variation in the quality and yield of produce at different times of the year, due to a lack of optimum conditions for growth. The effects of climate change are far-reaching because traditional practices are being used to tackle an inconsistent weather pattern. Therefore, an analysis of the elements of climate change in the Caribbean and its impact on agro-processing is critical to maintain food security.

## Introduction

The impact climate change has on the Caribbean region is evident through various environmental changes being experienced by different countries in the region. Environmental changes include rise in sea level, increased air and sea surface temperature, stronger and more frequent natural disasters, longer drought periods, and shorter, less frequent rainfall. Jamaica is one such island in the region that has been experiencing changes in its weather pattern. The climate of Jamaica is broadly characterized as having a dry winter and a wet summer.



In recent times, however, a shift in pattern has been observed as there is an increased occurrence of drought and the frequency and magnitude of extreme climate events. The period 2002 to 2008 bears witness to these extremities with the passing of Hurricane Charley and Ivan in 2004 and the prolonged seven-month drought period in the late 2004 and early 2005. Data analysis has shown that the number of very warm days and nights has been increasing not only in Jamaica, but also the region at large. According to the Food and Agriculture Organization of the United Nations, a warming in the Caribbean Sea has been detected. It is projected that this warming will be accompanied by increased intensity of hurricanes and sea level rise, impacting coastal zones of the different countries. These environmental changes can have devastating effects on the processing industry in the Caribbean. Climate change has undoubtedly affected agro-processing in Jamaica in recent times.

According to the Food and Agriculture Organization of the United Nations (Rome, 2013), two critical impacts of climate change in Jamaica are a reduced water availability for agricultural systems, and increased climatic events such as landslides, hurricanes, flooding, water stagnation, and saltwater intrusion.



These occurrences not only trends to lower harvest yields but also affects production flow and market value. One study estimated that the suitability of crops such as cabbage and carrots will likely decline by 2050. Water demand for agriculture is also expected to increase with time. Since high value produce have a relatively greater demand for water, they are extremely vulnerable to the effects of climate change. Practices including water harvesting are used as coping methods. However, due to inconsistencies in weather trends, traditional coping methods may not be as effective in the present day. Loss in crop yield, damage to livestock, infrastructure, aquatic systems, and irrigational issues have led to a reduction in the quality and availability of produce; subsequently, affecting the quality and safety of manufactured food. This, therefore, forces food manufacturers to employ more stringent procurement and testing practices.



Climate change may affect the overall productivity of the country and may necessitate importation as a means of maintaining market capacity. The establishment of mass harvesting and storage techniques, infrastructural upgrades and designs, and added technology, is important in ensuring consistent and quality supply of produce for agroprocessing. It is also vital that food manufacturers are educated on climate change and that different sectors work together to achieve effective planning, structure, and results.

Given the significant adverse effects of climate change on food security, and by extension, nutrition of Caribbean residents, there is an expected food reduction in the medium and long term future. Should the frequency and the intensity of the climatic events worsen, crop quantity and variety will decrease; hindering families from accessing adequate food. Food security is dependent on three main factors. These are: Food availability, food utilization (nutrition), and food stability. In addition to this, pre-production cycles are altered by soil quality (soil moisture, nutrient content) which affects seed development, while post-production cycles depend on harvest and storage conditions. Failure in either pre-production or post-production processes will compromise food security. Varied revenue in society can be partially or wholly affected by agriculture. In Jamaica, where agriculture affects labour and purchasing power of

the average household, price increases can be so volatile that food becomes extremely unavailable and inaccessible. If availability and accessibility of good quality foods reduces due to climate change, the utilization of these kinds of products will surely be curtailed. Proper nutrition will ultimately be denied to the average individual. Food safety can also be affected by reduced water availability as water is essential in food, equipment, and environmental sanitization.

### **Conclusion**

Climate change is a growing concern in the Caribbean. The effect of climate change is evident in the reduction in crop yield as a result of inconsistencies in rainfall pattern, frequency of drought, and frequency of natural disasters. In recent times, climatic events have been linked to a reduction in the quality of produce and, hence, a decline in yield and productivity, and also a struggle for food manufacturers to keep up with the market. In order to maintain a constant supply of quality produce, food manufacturers will have to develop strategies to mitigate the impact climate change has on the agricultural sector. The assessment of existing technology and infrastructure has to be done in order to combat these impacts and to promote adequate improvement. In addition, manufactures must be educated on climate change and its various effects on the quality, quantity, and availability of food. Also, food manufacturers must implement measures to combat the effects of climate change in order to ensure adequate food supply.

# Food Recalls: Are they increasing?

By Mrs Dellecia Roberts-King

Food recalls seem to be increasing in popularity these days; recently products containing ground beef, chicken, and even vegetables were recalled in the United States. Specific brands of beef and salad products were recently recalled due to possible *E. coli* O157:H7 contamination and chicken products due to possible foreign matter contamination (4). Food recalls mainly occur due to the presence of biological, physical, and chemical (allergen) hazards, improper labeling or product not meeting specifications (5).



You might be wondering why there are so many food recalls nowadays. Government agencies such as the Food and Drug Administration (FDA) and Centers for Disease Control and Prevention (CDC) are using improved technology to identify possible outbreaks so this can contribute to the increased number of reported product recall cases (5). The increase can also be attributed to employees not adhering to Good Manufacturing Practices (GMP) and Standard Operating Procedures (SOP), weaknesses in Hazard Analysis Critical Control Point (HACCP) and lack of proper traceability (6). Food recalls can tarnish a company's reputation, compromise customer loyalty, and result in financial loss for the company. Consumers may also become ill if recalled products are consumed before notifications are issued which can lead to lawsuits. It is, therefore, important to ensure that measures are implemented in the food manufacturing process to reduce the likelihood of food recalls. Checking the quality of raw materials from receipt at the facility and throughout the production process, improving traceability, establishing strong supplier relationships, and developing robust food safety systems are some of the ways that food recalls can be minimized. Food manufacturers can only take measures to reduce the occurrence of food recalls not eliminate them because after all, mistakes do happen.

*Mrs Dellecia Roberts-King is a graduate of the MSc in Food and Agro Processing Technology Programme at The University of the West Indies, Kingston, Jamaica.*

*She is currently pursuing further studies at Red River College, Winnipeg, Manitoba.*



# From a Fruit Vendor to Fruit Science Journal Author

By Mr Adrian Tulloch

Like yesterday, the images are still clear- of my brother and I racing to the bush where we had a big naseberry tree. We both had our own “lucky limb” on the tree- that was where we would find the ripest fruits. We would take the harvested fruits to Carron Hall Primary School, where we attended, and sold the ripe fruits for five or ten dollars each. We would then use the money collected to buy vegetable seeds; thereafter, it would be all about who could produce the “biggest and prettiest” vegetables for the market. I can also remember when I was in about first form my dad, while viewing my end of year school report asking, "what do you want to become when you grow up?" I was doing well in the Sciences. I liked to build things- just the joy of seeing things I made work. I loved agriculture and I also love the idea of being an entrepreneur but the summary answer I gave at the time was “I want to be a farmer”. Well, my answer was not quite receptive to my aunt who was listening to the conversation as the perception of farming was hardship- using a machete and fork to clear and till the land in the hot sun. Fast-forward through the years to the present, while in pursuit of a MSc. Food and Agro Processing Technology at the University of the West Indies, Mona (The UWI Mona), I was challenged to research a fruit. Guess what... The fruit was Naseberry!! I did not know the fruit I sold as a little boy had so much entrepreneurial potential and health benefits, nor did I know the fruit had much application in the medicinal and agroprocessing industry. All I knew then was that the fruit was sweet when eaten fresh. So, I am elated to share with you my very first journal article entitled “*Manilkara zapota* (Naseberry): Medicinal Properties and Food Applications”. Thanks to the other co-authors from The Department of Chemistry, The University of the West Indies, Kingston, Jamaica.

*Mr Adrian Tulloch is a student of the MSc in Food and Agro Processing Technology Programme at The University of the West Indies, Kingston, Jamaica.*

*He is a Research and Development Officer for the Best Dressed Chicken Division*

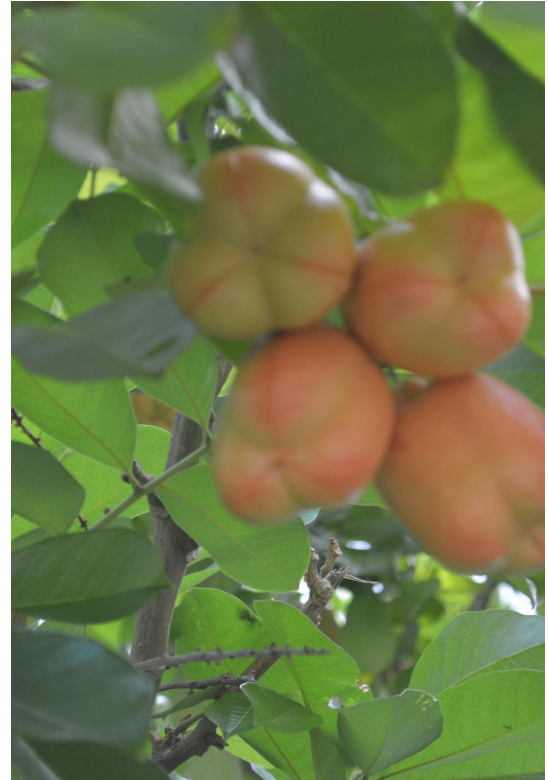




# The Ackee Fruit

By Ms Sherone McNeil

Ackee (*Blighia sapida*), is a beautiful tropical fruit of a West African evergreen tree belonging to the Sapindaceae family, which traversed the Atlantic Ocean sometime around the eighteenth century making Jamaica and the Caribbean its home (7). The ackee fruit is the national fruit, national dish constituent (ackee and salt fish), and a major food crop in Jamaica (8). Known for its high fat contents, and smooth texture, the ackee fruit remains an integral part of many Jamaican diets due to its vibrant colour and ability to blend with various dishes (9, 10). Over US \$13 million is earned annually due to the export of processed canned ackee fruit in brine. The unripe ackee has been a cause of widespread epidemic both in Jamaica and West Africa since the 19th century. However, the actual causative factor of its toxicity was not elucidated until 1955. The fruit is divided into three major segments: The pod, the seeds, and the arilli (edible portion).



Ackee should only be eaten when the fruit ripens and open naturally on the tree. The ingestion of unripe ackee for the purpose of medical or nutritional purposes (via forcibly opened ackees) can give rise to acute poisoning called "Jamaican vomiting sickness" or Toxic Hypoglycemic Syndrome (THS). The reuse of the water in which unripe ackee has been cooked is also a harmful practice. Symptoms of the sickness is characterized by a sudden onset of vomiting, as well as 2 – 6 hours of epigastric discomfort after the consumption of a meal containing unripe ackee. Convulsion or seizures may occur (11-14). Adverse effects include loss of muscle tone, increased sweating, increased heart rate and pulse rate, coma, and then, death. Most death cases occur in small children from 2 – 6 years old, after unintentional poisoning with unripe ackee. Under nutrition of the individuals is also thought to be directly associated with both susceptibility and severity of the illness (15). The major complication associated with this illness is that of hypoglycaemia, which is induced by the water- soluble toxin, hypoglycin A. Hypoglycaemia interferes with fatty acid metabolism, thus utilizing the glycogen stores from the liver, resulting in fatty degeneration of the liver.

The unripe fruit contains an elevated amount of the toxin, hypoglycin A, in comparison to the ripe fruit. The concentration of the toxin is highest in the seeds. The epidemiology of ackee poisoning is not well characterized, hence, the true incident and mortality rate of ackee poisoning is under-reported in Jamaica. However, with the introduction of various modes of treatment, the mortality rate has been reduced considerably. Due to the toxicity of unripe ackee, it is important to educate people about the dangers associated with its consumption.

*Ms Sherone McNeil is a graduate of The University of the West Indies, Kingston, Jamaica where she pursued a MSc. in Food and Agro Processing Technology. She currently serves as Quality Assurance Manager at Shavuot International Holdings Company Limited*

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