

CAS JAMAICA

FOOD SAFETY NEWSLETTER



Annaliese Legister/Lister Mair/Gilby School for the Deaf

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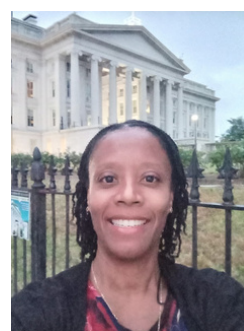
A letter from the editor

In December 2023 over 90 Quaker Oats Company products were recalled due to their possible contamination with Salmonella, a pathogenic bacteria. By mid-January an additional 40 products were recalled. The impacted products included granola bars and cereals. Salmonella is an environmental pathogen which thrives under various conditions. A vegetative bacterium, Salmonella is able to survive in both acidic and basic environments. It can grow under refrigerated temperatures as well as at elevated temperatures of 46 degrees celcius. As a facultative bacterium, it has the ability to grow under both aerobic and anaerobic conditions. The minimum water activity required for its growth is 0.94. The pathogen causes foodborne illness by infection and invades the body after the consumption of contaminated food. Symptoms of infection include nausea, vomiting, diarrhea, fever and headache. Possible sources of food contamination are humans, animals, water, soil, and equipment.

There are 3 types of recalls namely, Class 1, Class 2 and Class 3 with Class 1 being the most severe. Class 1 recalls indicate that the identified hazard is potentially life threatening. Recalls can be mandated by a governmental agency or is issued voluntarily by a company once a hazard has been identified. The recall issued by Quaker Oats Ltd was voluntary. Recalls while necessary can be quite costly. There is a loss in revenue, loss in consumer confidence and potential job loss. The branch of the Quaker Oats Company that was associated with the recall is located in Danville, Illinois. The company which has been in production for 65 years has announced that it will be closing its facilities. Environmental monitoring is very important especially for ready to eat products.

Another potential hazard in oats products is the presence of chemical hazards. Chlormequat chloride is a pesticide that acts as a plant growth regulator and prevents plants from bending during growth, by decreasing stem height, making harvesting easier. This pesticide which can lead to reproductive disorders has been found in oats-based cereals such as Cheerios and Quaker oats.

Glyphosate, a herbicide which kills weeds, has also been found in some cereals. It is the main ingredient present in the pesticide “Roundup”. It is important that the guidelines set by the Environmental Protection Agency regarding the application of these chemicals during crop production be properly adhered to so as to limit the presence of these chemicals in foods. Biological, chemical and physical hazards impact the foods that we eat. Food safety is everyone’s responsibility. Let’s be vigilant in creating a culture of food safety.



Dr Andrea Goldson-Barnaby
Senior Lecturer, The Department of Chemistry
The University of the West Indies, Jamaica.

Featured in this edition of our newsletter are articles contributed by students from Lister Mair/Gilby High School for the Deaf. Founded in 1966, Lister Mair/Gilby School for the Deaf was originally located at 48 Hagley Park Road. Currently the school has three units in Kingston, Clarendon and Portland, Jamaica.

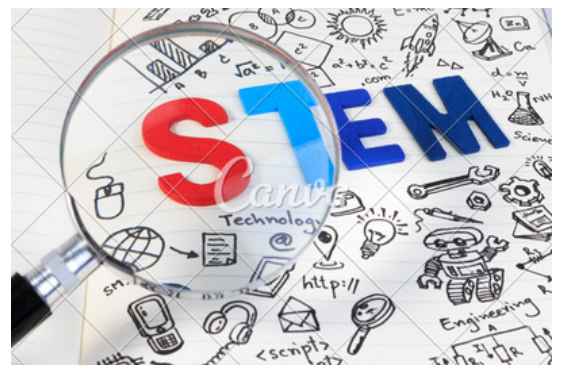
Implementation of a STEM Program in Schools for the Deaf in Jamaica

By *Kaleah Kelly*

I believe that the Science, Technology, Engineering and Mathematics (STEM) program if implemented in Jamaica would significantly benefit the deaf community. The deaf community is a minority within the workforce and has limited opportunities to get certain jobs. I believe implementing the STEM program is a move in the right direction that will create more diverse opportunities and equality for all involved. I learned of the challenges within the workforce for the deaf community firsthand when my dreams of becoming a flight attendant were shattered. Ever since I was much younger, seeing aeroplanes flying high in the sky always left me feeling excited. I learned that a job as a pilot or flight attendant would get me in that position. Those dreams were later shattered when I learned that due to my hearing impairment, I would not be able to pursue that goal.

My mother discovered my hearing loss at the age of 3 years old. I was told that at birth, I had to undergo a series of treatments. It is believed that as a result of this experience, I am now partially deaf and nearsighted. Job opportunities are limited within the scope of traditional occupations therefore lessening our earning capability. The job opportunities in the areas of Science, Technology, Engineering and Mathematics generally attract high income ranges. If the deaf community can be a part of the STEM program this will increase their income-earning ability and therefore improve our standard of living. The STEM program which focuses on four main areas of learning will allow us to be a part of improving the way we live in more areas than one. Studies in those areas can be used to improve the technology needed to repair or improve hearing loss and vision. Who better to be a part of this development than us the deaf community who live this experience daily.

Another benefit of including the deaf community in the STEM program is it will help us feel more integrated in society. Again, I have first-hand experience in feeling removed from society. I started out attending a traditional primary school and although partially deaf, my grades were average and even above most of the other students. However, the teacher said she was not trained to teach the deaf because I had to sit at the front of the class and try to read her lips. My mother explained the need for the transfer and that it would be better for me to attend a specialised school for the deaf. I could not understand why I had to move since my grades were not bad. I felt excluded from society and felt like I was being punished for being deaf. It is therefore extremely important to include the deaf community within the STEM program in order to get our creative input in society and help us to integrate in a global world



Food Safety, Health and Wellness

By Romain Benjamin

Health and Wellness

Food safety is important, because it keeps your body healthy and prevent you from harmful bacteria. Having access to safe and nutritious food is the key behind long life and good health. Proper handling, preparation, and storage of food can prevent foodborne illnesses such as harmful bacteria, viruses, parasites or chemical substances that can cause more than 200 different diseases, ranging from diarrhea to cancers. The globalization of food trade, an increasing world population, climate change and rapidly changing food systems have an impact on the safety of food. This essay will speak of the common challenges facing food safety and essential practices to ensure the food we consume is safe.

Common Challenges in Food Safety

There are several challenges that can prevent food safety. One significant challenge is the globalization of the food supply chain. Food products often travel long distances and pass through multiple hands before reaching consumers, increasing the risk of contamination. Also not to mention the varying food safety regulations and standards across countries can differ and making it challenging for enforcement and compliance. Another challenge is the growing incidence of antibiotic resistance. The misuse of antibiotics in animal farming can lead to the development of resistant bacteria, which can then be transmitted to humans through food. Additionally, climate change and environmental degradation contribute to the emergence of new pathogens and the spread of existing ones, further complicating food safety efforts.

Essential Food Safety Practices

Effective food safety practices are important at every stage of the food production and consumption process. These practices include proper hygiene, cooking, storage, and handling techniques to minimize the risk of contamination and illness.

1. **Personal Hygiene:** Making sure that food handlers maintain high standards of personal hygiene is important. This includes regular hand washing with soap and water, especially after using the bathroom, handling raw food, or touching garbage. Wearing clean clothing and using gloves, when necessary, also helps prevent contamination.

2. **Cooking and Preparation:** Cooking food at the right temperature kills harmful pathogens. Using a food thermometer can help ensure that meats, poultry, seafood, and eggs are cooked properly. Additionally, separating raw and cooked foods to avoid cross contamination is very important. For example, using separate cutting boards and utensils for raw meat and vegetables can prevent the spread of bacteria.

3. **Storage:** Proper storage of food helps maintain its safety and quality. Refrigerating perishable items promptly and keeping the refrigerator at the correct temperature are essential steps. It's also important to pay attention to expiration dates and practice the principle of "first in, first out" to ensure older items are used before newer ones.

4. **Handling:** Safe handling practices, such as thoroughly washing fruits and vegetables under running water and avoiding the consumption of raw or undercooked foods known to carry high risks, like certain shellfish, can significantly reduce the risk of foodborne illness.

Conclusion Food safety is a critical aspect of public health that requires input from individuals, industries, and governments to ensure the food supply is free from contaminants. By understanding the challenges and following essential safety practices, we can all play our part in protecting ourselves, family and others from foodborne illnesses and promote a healthier society. With the increase in food production and maintaining rigorous food safety standards is more important than ever to safeguard our health and well-being.

Science in our Everyday Lives

By Dayanna Jackson

My name is Dayanna Jackson, I will be writing about Science in our Everyday Lives. So! science, what is science? Science means a system of knowledge that is concerned with the physical world and its phenomena. Also, science involves the observation identification, description, experiment, investigation and theoretical explanation of natural phenomena. Science aims to discover general truth or the operations of fundamental law. My favourite thing about science is that it can happen anywhere or time, for me science is something used to mesmerize me, because the way in which we get a lot of information out of little things that they research on. The most popular area in science now is in STEM as we have more interaction and knowledge in this area. STEM plays an important part of our science world as it teaches and helps us in many ways. STEM includes science, information technology, engineering and mathematics, STEM can help us in choosing our career paths, as we will become the future generations that look forward to becoming anything we choose to such as scientists, computer technologists, engineers and much more.

There are many ways science helps us in our lives, I would like to state a few of them that I have noticed science plays an important role in. Firstly, let's consider our morning routines. From the moment we wake up, science is at play. The alarm clocks that wake us, these are on our smart devices such as our phones or tablets, which rely on circuitry and programming, both products of scientific inquiry in electronics and computer science.

As we brush our teeth, we benefit from research in chemistry that have created effective and safe toothpaste, which prevents tooth decay and promotes oral hygiene through carefully formulated compounds.

The breakfast we consume is interesting to know it is all based on science. The process of pasteurization, discovered by Louis Pasteur, ensures that the milk we drink is free from harmful bacteria. Similarly, nutritional science informs us of the balanced diets that fuel our bodies throughout the day. The process of our bodies using the food to provide the energy we need to get us through our day. The vitamins, minerals, and other nutrients in our morning meals are understood and measured through biochemistry and health sciences, improving human health and preventing nutritional deficiencies.

Transportation we rely on to work, or school is another area where science plays a significant role. Whether we take a bus, drive a car, or ride a bicycle, each mode of transport is the result of centuries of scientific advancement through the hard work of dedicated scientists. The internal combustion engine that powers most vehicles was developed through principles and laws outlined in areas such as physics and engineering. Environmental science and innovations in science contribute to making these vehicles safer and more energy-efficient, reducing their environmental impact such as releasing harmful chemicals into the atmosphere. In our homes, electricity provides lighting, heating, cooling, and entertainment systems all facilitated by scientific understanding of scientific theories.

Even our leisure activities depend on science, how? from the engineering involved in constructing sports equipment to the technology used in video games and streaming services.

STEM has contributed to our understanding of AI (artificial intelligence) technology. How has it helped us? By knowing how to use this technology in the right way and making it easier to navigate our daily lives, especially for our children. It has helped us to learn how to continue to build new technologies and improve in developing new apps that can be used to create more businesses for the economic growth of our country. In conclusion, science is not merely a subject studied in schools; it is the foundation upon which our society we have today is built. Every aspect of our daily lives is touched by scientific knowledge and technology. As we continue to explore and understand the world of science may we embrace new discoveries which will continue to help us improve every area of our lives.



LR: Annaleise Legister, Tainia Taylor, Dayanna Jackson

Meet the winning students from our essay and poster competition



LR: Joyann Marks, Romaine Benjamin, Kaleah Kelly, Ainka Brown, Dayanna Jackson, Annaleise Legister, Andrea Goldson-Barnaby, Tainia Taylor

Frankincense and Myrrh

By Daina Barrett

The word frankincense is derived from an old French word “Franc Encens” which means “pure incense or pure noble quality incense”(Almeida-da-Silva et al., 2022). Frankincense which is also known as Olibanum is an aromatic resin that comes from the Boswellia tree, which is native to Africa, India, and the Middle East. Frankincense is composed of Olibanum and is used in religious ceremonies and was used in the past as one of the gifts taken to baby Jesus by the wise men. The main component of frankincense is oil (60 %). Research shows that “frankincense contains mono- (13 %) and diterpenes (40 %) as well as ethyl acetate (21.4%), octyl acetate (13.4%) and methylanisole (7.6%)” (Al-Yasiry and Kiczorowska, 2016).

Frankincense is utilized to make oil that soothes pain, enhances mood, combats stress and anxiety and also helps with nourishing the skin. The oil also detoxifies pores, reduces aging of skin and is a relief for itchiness caused by dry skin. Frankincense is also used as seasons in many dishes and also to make shaving soaps. Today the blue, green and yellow resins of frankincense are used to make tea. Frankincense is usually used with myrrh.

“Myrrh is a sap-like substance (resin) that comes out of cuts in the bark of trees that are members of the Commiphora species.” Myrrh originated from Arabia. Commiphora is from the family of Burseraceae. It is said to have more than 150 species of plant spread across subtropical and tropical regions, particularly north-east Africa, South Arabia and India”(Batina et al., 2022). Studies have revealed that it contains water soluble gum (30-60 %), alcohol soluble resins (25-40 %) and essential oil (3-8 %).

The essential oil of Myrrh consists of sesquiterpenes, monoterpenes and aromatic compounds. Myrrh is used for colds, coughs, asthma, cancer, pain, arthritis, and lung congestion.

Myrrh is also used as a stimulant and to increase menstrual flow (Hamond et al., 2017). Myrrh can be applied to the mouth for soreness, and swelling. It also helps with inflamed gums (gingivitis), bedsores, wounds, abrasion and boils. Myrrh is used as an antiseptic in mouthwashes, toothpaste and gargles. In foods and some beverages the sap like resin is used to enhance flavor. The resin is also known for its use in fixatives in cosmetics. In addition to this, it is used in embalming.

Frankincense is usually burned as an incense while myrrh is made into medicine or perfume. The world’s largest market of Frankincense and Myrrh is China. In traditional Chinese medicine both resins are combined as drug pairs for years and are more effective when used together. Natural herbs like frankincense and myrrh have many health benefits. Benefits of both include medicinal treatment such as: blood circulation, blood stasis, and chronic diseases. Frankincense and Myrrh are also used to treat wounds, skin ulcers and oral ulcers. Today both resins are used in prescribed drugs and are clinically proven. The benefits of these resins are remarkable. No wonder why Jesus was given Frankincense and Myrrh as one of the three gifts brought by the wise men.



Congratulations to Ms Daina Barrett
2024 recipient of An Intra-Caribbean Academic Mobility
Programme (ICAMP) Scholarship

References

- Almeida-da-Silva, C.L.C; Sivakuma, N.; Asadi, H. et al. Effects of Frankincense Compounds on Infection Inflammation and Oral Health. NIH 2022, 27(13):4174.<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9268443/>. (Accessed 2024/03/17).
- Al-Yasiry, A.R.M; Kiczorowska, B. Frankincense–therapeutic properties. NIH [online] 2016. <https://pubmed.ncbi.nlm.nih.gov/>. (Accessed 2024/03/27).
- Batina, G.A.; Wasef, L.; Teibo, J.O. et al. Commiphora Myrrh: A Phytochemical and Pharmacological Update. NIH 2022,396(3):405–420.<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9672555/>. (Accessed 2024/03/27).
- Hamond, G.M; Taha, T.H.; Alsherhri, N.M. Myrrh as a Functional Food with Therapeutic Properties Against Colon Cancer in Traditional Meals. JFPP [online] 2017, Issue 1,e12963. <https://ifst.onlinelibrary.wiley.com/doi/10.1111/jfpp.12963>. (Accessed 2024/04/01).

Did you know that the yellow colour of ackees is due to the presence of beta carotene?



***Blighia sapida* (ackee)**

Beta-carotene is a primary component of the organoleptic quality of food, not just because of its colour, but also because of the precursor aroma compounds that it produces during fruit ripening. It is also an antioxidant that is effective at scavenging free-radical and reactive oxygen species protecting against cellular damage.



***Annona muricata* (soursop)**

Annona muricata (soursop) belongs to the family Annonaceae. It is rich in phytochemicals and is utilized in traditional medicine to treat various maladies.

ACS Jamaica Student Chapter Highlights



Mona Symposium, The UWI
January 3, 2024



ACS Spring Conference, New Orleans
March 18, 2024



UWI Panoridim Steel Orchestra Concert
March 14, 2024



Worthy Park Sugar Estate
April 6th. 2024



Lister Mair Gilby School for the Deaf
November 21, 2023



St Thomas Technical High School,
May 29, 2024

*ACS Visits
St Thomas Technical High School
MAY 29, 2024*



Testing the skin of water



Flame test



Red cabbage indicator



Water, you just need to stir



Perforated balloons



Interlacing a polymer

ACS, Chemistry for Life

**Meet our high achievers
Third Form Students
St Thomas Technical High School**



LR: Joshua Broderick, Shelice Johnson, Daina Barrett, Bhiyanka Myrie
Top performing students in their final chemistry examination

ACS Jamaica Chapter Cultural Exposé

In our Cultural Exposé, ACS Jamaica student members were exposed to aspects of the rich cultural history of Trinidad and Jamaica. On March 14th they visited the Phillip Sherlock Center for the Creative Arts where they enjoyed a Panoridim Steel Band Concert. The steel pan originated in Trinidad and was initially made from barrels which were used to store and transport crude oil. The music produced by these instruments is extraordinary, rhythmic and pulsating. It is one of the newest instruments in the Western Hemisphere.

On April 6th, 2024, The ACS Jamaica Student Chapter visited the Worthy Park Sugar Estate. The estate has been in existence for over 250 years and has been owned by The Clarke Family since 1918. En route to the location we were able to see lush fields of sugarcane. Coupled to that was the scenic drive from Kingston, Jamaica to inner St Catherine. The estate is located 10 km from Ewarton, St Catherine. Worthy Park is Jamaica's largest producer of sugar locally and also produces rum. The students were given the opportunity to learn more about the intricacies of the rum distillation process.

It was nothing short of amazing, truly an incredible experience filled with passion and entertainment. The Steel Band concert was a beautiful experience. It was my very first time listening to a steel band, and I had a wonderful time. The pieces were melodious, and the transitions between each piece were pretty smooth. I absolutely loved it.

Chamique McFarlane

The Worthy Park Estate tour was an amazing experience. I indeed learned a lot about the sugar as well as the rum production here in Jamaica. I appreciated the history of the estate and knowing that it is still 100% Jamaican owned after all the years. I was most fascinated by the aging of the rum and the colour it obtained after being stored for a number of years. This tour definitely sparked my interest in the rum production industry.

Chamique McFarlane

Meet our incoming ACS Jamaica Chapter President

AMERICAN CHEMICAL SOCIETY:
The University of the West
Indies, Mona Local Chapter.



KURT MCBAYNE

PROFILE:

Fellow ACS members, my name is Kurt McBayne and I am currently pursuing a BSc in Molecular Biology & General Chemistry at the UWI Mona. I am deeply passionate about research, and hope to one day incorporate the principles of genomics and synthetic organic chemistry into my own. I firmly believe in the crucial role of STEM education in Jamaica's development and the impact our local ACS chapter can have in this regard. To support this cause, I actively participate in voluntary activities such as tutoring at the secondary level and engaging in undergraduate research projects. The American Chemical Society is dedicated to advancing scientific exploration for the betterment of our planet and all its inhabitants. I look forward to upholding these values in the 2024-25 academic year through our outreach initiatives and research pursuits.