

Viral and Parasitic Foodborne Diseases

Names of Attendees: Kristen Gibson (Chair), Sonia Almeria (Vice-Chair), Grace Akumu, Courtney Aminirad, Mariem Amri, Akshaya Balaji, Patrick Bird, Preetha Biswas, Brittany Cooksey, Brenna DeRocili, Doris D'Souza, Monica Santin-Duran, Mauricio Durigan, Mathilde Trudel-Ferland, Donna Garren, Rocelle Grabarek, Yuan Guo, Fabienne Hamon, Ruth Harper, Sunee Himathongkham, Julie Jean, Hyo jung Kim, David Kingsley, Sanjay Kumar, Susan Leonard, Dan Li, Jinxin Liu, Yuxiao Lu, Jenny Maloney, Kyle McCaughan, Naim Montazeri, Angela Nguyen, Redd Ochoa, Sophie Pierre, Breanna Polen, Brooke Schwartz, Alexandre da Silva, Daniele Sohier, Yesutor Soku, Mitra Soni, Matthew Stasiewicz, Irshad Sulaiman, Lori Tansey, Tom Tansey, Susan Teegardin, Socrates Trujillo, Grace Tung, Chun Wang, Terri Wasmoen, Beth Wittenauer, Jacqueline Woods, Zhihui Yang, Linghuan Yang, Caroline Yates.

Board/Staff Present: Timothy Jackson.

Total Number of Attendees: 54.

Meeting Called to Order: Sunday, 9:00 a.m. Eastern Time, July 16, 2023.

Minutes Recording Secretary: Caroline Yates.

Old Business: The minutes from IAFP 2022 PDG meeting were approved with no modifications.

New Business: Four main topics were on the agenda: *IAFP Announcements:* Updates from the IAFP Executive Board were provided by Tim Jackson. Updates from the Student PDG were provided by Caroline Yates. Additional safety announcements were provided by Kristen Gibson. These updates and announcements included the following:

Notices from the Executive Board – Download the meeting app as this will be the best way to track what is happening. Make sure to synchronize the app to reflect real time changes. The DEI council video is now also available through the app. Webinars were free this year in June for Food Safety month with a record number of views and are a good platform for PDGs to consider. Those looking to join a committee can show interest with through their member profiles on IAFP website. The website is also a great source to get notifications for the new journal articles and issues. *IAFP Connect* is the best option to communicate within and across PDGs. You can also indicate interest in the IAFP mentor and mentee program via the website. Advice for those new to IAFP: go up and introduce yourself to those here.

Updates from the Student PDG – Ways to get involved with students include 1) meet your favorite scientist; 2) 3-Minute Thesis Competition; and 3) joint symposia, roundtable, or workshop proposal submissions. Please reach out to Ellen Mendez (ellenandrea@ksu.edu) if you are interested and for more details.

Highlights from the IAFP 2022 program relevant to the PDG:

Kristen reviewed accepted sponsored or co-sponsored proposals including symposia and roundtables. There was also a note about numerous posters and technical sessions that will be presented and are relevant to the Viral and Parasitic Foodborne Diseases PDG.

Update on foodborne parasitic diseases:

Dr. Monica Santin – Discussed the One health approach to their work and emphasized that parasites can infect animals and humans, and the environment plays a role in this through contamination of the food and water supply. Transmission of *Cryptosporidium* and *Giardia* is fecal-oral and is immediately infectious following excretion which differs from *Cyclospora* and *T. gondii*. *Cryptosporidium* has 44 valid species but not all infect humans, and there is a need to be able to distinguish between them. *Giardia* has 9 valid species and only 1 infects humans. Older detection methods use microscopy, but species cannot be distinguished only using morphology. Traditional molecular methods such as Sanger sequencing are limited due to difficulty with complex samples. Next Generation Sequencing (NGS) can be used to identify species composition within a sample, and NGS has a higher sensitivity detecting mixed assemblages.

Overall, molecular characterization is needed to determine risk. For example, a study on *Cryptosporidium* in cattle revealed 4 species, where only 1 can infect humans. This zoonotic species is found predominantly in pre-weaned calves and thus this is where interventions should focus.

Dr. Sonia Almeria – Improved methods for detection of *C. cayetanensis* by real time PCR in produce were discussed. Traditionally, 18S ribosomal RNA gene target is used, but a method based on a different target was developed. This method is referred to as Mit1C qPCR, and conditions had to be optimized for this method. Evaluated new method for exclusivity (using a panel of protozoa) and inclusivity. Also, determined sensitivity by spiking raspberries, lettuce, and cilantro samples.

Update on viral foodborne viruses:

Dr. Dan Li – A preview of the symposium of human norovirus infectivity assays was provided. Availability of ISO methods is a great step forward but there are many uncertainties as these methods are based on molecular detection via RT-qPCR. In a study at produce markets in Singapore, noninfectious norovirus was detected on berry products highlighting the need to apply a routine infectivity assay. The symposium will include updates on the human intestinal enteroid model to study human norovirus infectivity, the zebrafish model to study human norovirus infectivity, and inactivation of foodborne viruses and the use of surrogates in industry research.

In preparation for IAFP 2024 in Long Beach, CA, July 14 to July 18, 2023, roundtable and symposia topics were suggested and discussed:

PDG participated in breakout groups to consider important questions and areas of research related to viral and parasitic foodborne diseases that would be good symposium topics for IAFP 2024. Ideas have been listed based on group sharing.

Topic 1 – The impact of large outbreaks on food safety and public health...what will the next 5- 10 years bring to close gaps on large outbreak occurrence? What research will be needed?

What of pressure are we under? For example, *Cyclospora* outbreak in 2013 brought a lot of new developments.

Topic 2 – The “berry situation”...Hepatitis A virus and frozen berries from same farm over multiple years. HAV in berries has triggered a lot of investigations, but what did we have in the end? A lot of obvious gaps, so what should be done to prevent these outbreaks in the future? Once we have an outbreak like this, what are the chances it will happen again? This would be a good opportunity to discuss the preventive guidance that FDA is releasing and to look at ways to have real time, on farm risk evaluation. *Possible Roundtable*

Topic 3 – Mitigation and intervention strategies for both viruses and parasites in frozen berries. Maybe use the work Fresh Express has done on *Cyclospora* interventions with the growers?

Some promising interventions include HPP and advanced oxidation processes.

Topic 4 – Concerns about molecular testing and high Ct values, e.g., what is the value of a Ct value of 40 and is it valid? Should be a confirmatory test for a molecular “yes.” However, if detect virus/protozoa genomic material, then fecal contamination is more likely to be present so how do we address the risk of these high Ct values to our most vulnerable populations? This brings back the need for fecal indicators for viruses...fecal indicators specific to humans.

Topic 5 – Wastewater surveillance from a non-pandemic standpoint. How can we utilize this type of surveillance for enhancing safety of the food supply?

Topic 6 – Veterinarians have a lot of knowledge about parasites and we should engage with them to come up with a more holistic approach.

Topic 7 – Recovery of viruses from samples to maintain viability in order to utilize new infectivity models. Previous methods have been destructive in nature or have not worried about maintaining virus integrity.

Topic 8 – Next-generation sequencing for epidemiological tracing.

Recommendations to the Executive Board:

1. Sonia Almeria was elected Vice-Chair of the Viral and Parasitic Foodborne Disease PDG on April 19, 2023. We recommend that this is approved by the Executive Board.

Next Meeting Date: July 14, 2024, Long Beach, California.

Meeting Adjourned: 10:55 a.m. Eastern Time.

Chairperson: Kristen Gibson.