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PRESIDENT'S CORNER



Angela Demaree, DVM, MPH
President
American Association of Food
Safety & Public Health
Veterinarians (AAFSPHV)
<http://www.aaphv.org/>

Greetings Colleagues,

This is the time of year when I meet my friends, colleagues, and classmates at the AVMA convention. Sometimes I hear the question being asked, "What are the benefits of being an AVMA member, are you going to pay your dues next year?"

Maybe you've wondered the same thing.

As an AAFSPHV member, I can share that a benefit of also having/keeping your AVMA membership up to date is that it allows the AAFSPHV to participate in the AVMA House of Delegates where Public Health and Food Safety issues are often discussed.

As an allied organization we also get a seat on the AVMA's Food Safety Advisory Committee, Legislative Advisory Committee weighing in on legislation before Congress, Committee on Antimicrobials, and help to plan the Food Safety Track content for the AVMA convention.

In other words, we get a seat at the table.

We have a voice.

It's a powerful way to share your collective professional experiences and opinions to ensure that national veterinary policy has input from public health and food safety experts like you.

Your dual membership in both AAFSPHV and AVMA allows us to have a seat at the table.

Whether you volunteer your time or your hard-earned dollars or both, THANK YOU!

It takes all of us collectively doing our small part to effect positive change and ensure our voices continue to be heard.

If you'd like to volunteer, please let us know!

Angela Demaree, DVM, MPH
President American Association of Food Safety & Public Health

From the Past President

Hello all!

Membership is critical to our organization. Our membership gives us the ability to crowdsource ideas and answers to food safety and public health issues. Please invite your colleagues to join us. You have the ability to post to our ListServ and get feedback and information. We also can share information about opportunities like jobs via our website now.

If you have a website, please link to our new website <https://aafsphv.org/> and share it with your fellow veterinarians in Public Health and Food Safety.

Please contact me if you have any questions.

Donna DeBonis, DVM, MSFS

drdebonis@gmail.com



FROM THE EVP

AAFSPHV members,

We submitted our membership list to AVMA and were notified that AAFSPHV has met the criteria and will be able to continue their representation in the AVMA House of Delegates.

Survey: Thanks to all members who filled out our member survey. Your exec council strategic planning group is compiling the results and we will be reaching out to those members who indicated an interest in mentoring, presenting to student organizations or an ACVPM partners webinar or serving on one of our committees.

We hope you will act as our ambassadors and reach out to others who may be interested in joining our organization. Please share the information below with prospective members.

Benefits of Membership:

- Free monthly online CE in public health via our partnership with the American College of Veterinary Preventive Medicine (ACVPM)
- Access to our The Quarterly, our newsletter with association and member news and a compendium of abstracts relating to veterinary public health and food safety. This is useful in studying for ACVPM boards and keeping up to date with publications in food safety and public health.
- Supporting an organization with representation on the AVMA House of Delegates, Food Safety Advisory and Legislative Advisory committees
- Access to our new website with a CE calendar, forums, and a jobs board
- Access to our YouTube and Podcast channels featuring interviews with veterinarians working in public practice, academia, and industry
- Access to our LinkedIn for job postings and discussions
- Networking with veterinarians across all sectors of public health and food safety
- Access to veterinarians for informational interviews and job or career advice
- Complimentary 1st year membership to recent DVM, MS in Food Safety, and MPH graduates
- Scholarships to help cover travel and expenses for student members to attend the AVMA Annual Meeting and other meetings
- NEW in 2023: Lafontaine Memorial scholarship fund for MPH or public health/food safety MS tuition for DVM students and graduate veterinarians

To join, visit our website: <http://aafsphv.org>

Katherine Waters
AAFSPHV Exec VP

aafsv.execvp@gmail.com

Editor's Corner

SEEKING ASSISTANT EDITOR FOR QUARTERLY NEWSLETTER

Hello all,

As I am sure it goes for all of you, life seems to be shooting past at a mile a minute! We are more than half way through 2023 and the fun continues. With all that goes on, and in an effort to make continuous improvements with the quarterly newsletter, I am seeking an assistant, or assistants, who would be willing to help keep the newsletter up to date. In particular, I would love input from people scanning journal articles to include the most relevant and up to date material for our members. If you have an interest in assisting with the newsletter, please reach out to editor@aafsphv.org.

The Quarter 3 edition for 2023 of the newsletter is rapidly approaching for October. Please continue to send in news, articles, and updates so we can showcase member activities!

All submissions for the October edition should be submitted to me by September 27th by 5pm CST. Any and all submissions can be submitted to editor@aafsphv.org

We love to hear from you! If you have any questions or suggestions, please don't hesitate to reach out!

Best,
Tori Novak, DVM, MPH
AAFSPHV Editor



Please Subscribe!

Be sure to subscribe to our [YouTube channel](#) and subscribe and listen wherever you get your podcast.



Committee Updates

Update from the Communications Committee

Hello Colleagues,

Here are all of our Social Media sites:



<https://www.linkedin.com/groups/4926618/>



<https://www.facebook.com/aafsphv>



<https://twitter.com/AAFSPHV>

I encourage everyone to join our LinkedIn and FaceBook Groups and Follow on Twitter.

If you enjoy posting on Social Media, please contact me. I would like help posting content on our Social Media sites. I can be reached at drdebonis@gmail.com .

Looking forward to hearing from you!

Donna DeBonis, DVM, MSFS

drdebonis@gmail.com

AVMA House of Delegates

Greetings AAFSPHV Members!

The 2023 AVMA House of Delegates (HOD) Summer Session was held July 13-14 in Denver, CO, in conjunction with the AVMA Convention. It was another productive and successful meeting!

As a reminder, the HOD is the principal body within the AVMA responsible for establishing policy and providing direction for matters relating to veterinary medicine. It is comprised of one delegate and one alternate delegate from each of the Principal Veterinary Organizations (including each state, the District of Columbia, and territories belonging to the U.S.) as well as select Constituent Allied Veterinary Organizations (including AAFSPHV), the Uniformed Services, and the Student AVMA. The HOD meets twice per year—once in January in conjunction with the AVMA Veterinary Leadership Conference and once during the summer in conjunction with the AVMA Convention.

As always, we want to thank all of you as AAFSPHV members for your valuable feedback in preparation of the HOD meeting - your expertise and knowledge make a difference! In order to maintain this vital representation in the AVMA HOD, a certain percentage of our AAFSPHV membership must also be AVMA members. Therefore, we encourage all of you to be AVMA members so that we can continue to bring this important voice to our profession.

Highlights from our 2023 HOD Summer Session include:

The HOD deliberated over one house manual change, nine resolutions, and two Veterinary Information Forum topics. You can read more details on these topics here:

<https://www.avma.org/about/house-delegates/hod-resolutions-and-proposed-bylaw-amendments>.

Resolutions and Results:

- Resolution 10—Safeguarding Care for Animals with Veterinarian-Led Teams: This resolution was adopted as amended.
- Resolution 11—Supersede Policy on Canine Devocalization: This resolution was adopted.
- Resolution 12—Revised Policy on Docking of Lambs' Tails: This resolution was adopted as amended.
- Resolution 13—Revised Policy on Tail Docking of Cattle: This resolution was adopted.
- Resolution 14—New Policy on Sheep and Goat Castration: This resolution was referred back to the Board of Directors for further consideration by the Animal Welfare Committee.
- Resolution 15—New Policy on Sheep and Goat Disbudding and Dehorning: This resolution was referred back to the Board of Directors for further consideration by the Animal Welfare Committee.
- Resolution 16—Revised Policy on Physical Restraint of Animals: This resolution was adopted as amended.
- Resolution 17—New Policy on Canine Hybrids: This resolution was adopted as amended.
- Resolution 18 - Statement to the Profession: This resolution was adopted as amended.

VIF Topics and Results:

VIF Topic—Spectrum of Care: The Why and Barriers to Implementation: This VIF topic was referred to the Board of Directors for consideration on the following actions: additional investigation, collaboration with stakeholders, coping potential research needs, consideration of development policy or position statements, and member resource development.

VIF Topic—Sustainability in Veterinary Medicine: The Greening of Veterinary Workplaces: This VIF topic was referred to the Board of Directors to develop a best practice list regarding sustainability, explore collaboration with other One Health stakeholders and academic institutions regarding sustainability, develop a Sustainable Practices Certificate, and to review internal processes and systems of AVMA to increase sustainability.

Elections:

- Vice President: No election, Jennifer Quamen enters 2nd year as VP
- President Elect: Sandra Faeh Butler was voted as AVMA next President Elect.
- House Advisory Committee: Juan Amierio, Lindy O’Neal, Theresa Killiher, and Doug McInnis ran for the HAC vacancies. All four candidates were voted into the HAC position.
- Council on Biologic and Therapeutic Agents - Microbiology: Melissa Bourgeois
- Council on Biologic and Therapeutic Agents - Private Clinical Practice Predominately Equine: Steven Dow
- Council on Public Health - Human Health: Sara McReynolds
- Council on Public Health - Animal Health: Sara Margrey, ONE VACANCY REMAINS
- Council on Research - Private Clinical Practice: Miles Theurer
- Council on Research - Veterinary Medical Research: Kathryn Shelton, Philippe Baneux, Charley Cull, Mila Kundu
- Council on Veterinary Service - Private Practice - Predominately Equine: Barbara Crabbe
- Council on Veterinary Service - Private Practice - Predominately Food Animal: Lacy Fahrmeier

Campaign Announcements:

- President Elect: Michael Bailey announced his candidacy for President Elect.
- Vice President: Elisabeth Boggier & Gary Marshal announced their candidacy for Vice President.

Treasurer Report:

AVMA Treasurer, Arnie Goldman, is finishing his tenure as treasurer. Jon Pennell will take over as treasurer at the end of this meeting. Dr. Goldman offered a 6-year snapshot since he took office in 2017. Since that time, AVMA has experienced an increase in non-dues revenue, up 54% or \$7million dollars. In that same time, AVMA grew total revenue by 34% or 12.7million. Membership grew by 12% or nearly 11k members.

Governmental Relations Division Update:

Combating xylazine act: The AVMA supported the Combating Illicit Xylazine Act which would help combat the emergency threat posed by illicit xylazine while protecting veterinary access to this important animal sedative. The bill’s provisions would equip law enforcement with additional tools to stop xylazine trafficking while maintaining veterinary ability to legitimately use xylazine.

Federal advocacy overview:

- Rural Veterinary Workforce Act: VMLRP under a new name.
- Farm bill: Discussions are heating up surrounding this bill, specifically the reauthorization for animal health lab network, national animal defense preparedness response program, veterinary services grant program, and several research programs.
- Heathy Dog Importation Act: The goal will be to get this folded into the Farm Bill.
- Appropriations: AVMA has been successful for obtaining funds for programs and maintaining funding rather than taking cuts.
- AVMA Ambassador Program: A great way to encourage engagement. This program connects veterinarians directly with members of Congress, mobilizing local, individual leaders. Ambassadors visit with lawmakers in their home state, building and nurturing relationships and ensuring that legislators hear directly from constituent veterinarians about issues that are important to the profession.

The HOD also received an update on the Presidential Advisory Council on Combating Antibiotic Resistant Bacteria (PACCARB) from HHS.

As your AAFSPHV Delegate and Alternate Delegate to the HOD, we are here to serve you and to bring your valuable input on current and emerging topics in veterinary medicine to the forefront. We want to hear from you and truly value your input. You can find our contact information listed below. There is also a variety of AVMA volunteer opportunities available on the AVMA website. Please notify us if you're interested in having AAFSPHV support your interest in a position with a nomination. We look forward to talking with you!

Respectfully submitted,

Kristen Clark, DVM, MPH, DACVPM

AAFSHPV Delegate

Kristen.Clark@state.mn.us (NOTE new email address as of 8/16/23)

Katherine Waters, DVM, MPH, DACVPM, CPH

AAFSHPV Executive Vice President & Alternate Delegate

executivevp@aafsphv.org

Member News

❖ Dr. Renee Funk Retires as Director for Uniformed Services



AAFSPHV thanks you for your years of dedicated service to AAFSPHV and our profession. We wish you the best as you relocate to France to pursue a degree in International Development!

❖ AAFSPHV Announces New Director for Uniformed Services

We welcome Dr. Heather Brake as a new director.



CDR Heather Brake, MS DVM, DACVPM is a board-certified veterinarian with the US Public Health Service Commissioned Corps who has been assigned to work for the Centers for Disease Control and Prevention in Atlanta, GA. Since joining CDC in 2003, she has been

instrumental in the development of several programs to promote veterinarians in public health and to reduce the risk of zoonotic diseases. Most notably, Dr. Brake produced the website Healthy Pets Healthy People (www.cdc.gov/healthypets) and co-created the Day at CDC for Veterinary Students. In 2017, CDR Brake was assigned to the National Center for Environmental Health and the Agency for Toxic Substances and Disease Registry (CDC/ATSDR) where she currently works. Since joining Environmental Health, CDR Brake has worked on several critical issues such as lead, natural disasters, chemical spills, and per and polyfluoroalkyl substances (PFAS). Noting that her home state of Michigan had identified many areas of PFAS contamination, she decided to return to Michigan State University, College of Veterinary Medicine to pursue a PhD and conduct research on PFAS -- specifically how it impacts dogs and cats. Through her research project, PFAS in Pets, CDR Brake intends to complete an exposure assessment of per-and polyfluoroalkyl substances (PFAS) among dogs and cats living in West Michigan. The outcome of this study will allow veterinarians to better identify and provide recommendations for patients who have been exposed to high levels of PFAS and lay the foundation for the development of a surveillance system using dogs and cats as sentinels for human exposure. CDR Bair-Brake received her Bachelor of Science at Hope College, her Master of Veterinary Science from the University of Kentucky, her Aquatic medicine certificate from AQUAVET, and her veterinary degree from Michigan State University. She lives in Tucker, GA with her two boys, two cats, dog, and numerous fish.

AAFSPHV MEMBERS HONORED AT AVMA ANNUAL CONVENTION



Dr. Willie M. Reed, Dean of the College of Veterinary Medicine at Purdue University was named the inaugural recipient of the American Veterinary Medical Association's Frederick Douglass Patterson Lifetime Achievement Award for his distinguished leadership in promoting diversity, equity, and inclusion (DEI) in the veterinary profession.

Dr. Reed's selection was made by the AVMA Board of Directors and the award was presented at the organization's annual Convention, held this year in Denver.

After earning his Bachelor of Science and Doctor of Veterinary Medicine degrees at Tuskegee, Dr. Reed pursued a PhD in veterinary pathology at Purdue, which he received in 1982. He then joined the Purdue veterinary faculty, serving as associate professor of avian pathology and as chief of avian disease diagnostic services in the Animal Disease Diagnostic Laboratory. In 1990, he moved to Michigan State University to become a full professor and director of the Animal Health Diagnostic Laboratory (now called the Veterinary Diagnostic Laboratory). Later, he was named chairperson of the Department of Pathobiology and Diagnostic Investigation at MSU.

In 2007, Dr. Reed returned to Purdue as Dean of the College of Veterinary Medicine (CVM). Among his many achievements at Purdue, he modernized teaching, clinical and research facilities, expanded the class size by 20 percent, and significantly increased the diversity of the student body, while recruiting outstanding faculty in a wide range of disciplines from around the globe.

Under Dr. Reed's leadership, the CVM has received the national Health Professions Higher Education Excellence in Diversity (HEED) Award from INSIGHT Into Diversity magazine four times (2017, 2020, 2021, 2022). In 2021, the college was further honored with the Diversity Champion Award - the first time the publication named a veterinary college as a Diversity Champion, for demonstrating an outstanding commitment to diversity and inclusion. Diversity Champions are typically institutions known for visionary leadership, that serve as role models and set the standard for thousands of other college campuses striving for inclusive excellence. These institutions are recognized for exemplifying an unyielding commitment to diversity and inclusion throughout their campus communities, across academic programs, and at the highest administrative levels.



The American Veterinary Medical Association (AVMA) has named former AVMA President Dr. James Nave as the winner of the 2023 AVMA Advocacy Award.

Established in 2008, the AVMA Advocacy Award recognizes an individual for their contribution to advancing the AVMA's legislative agenda and advocating on behalf of the veterinary profession.

As a veterinary practice owner in Nevada, with additional interests in banking, hospitality and more, Dr. Nave has long recognized the importance of building relationships and engaging with lawmakers to influence policies that impact the veterinary profession. He has never hesitated to engage and advocate on behalf of the profession and the animals under veterinarians' care. His support, often quiet but highly impactful, highlights his dedication to the profession he loves.

Dr. Nave has also been instrumental in enhancing the AVMA's global advocacy efforts through ongoing dialogue between the AVMA Federation of Veterinarians of Europe, which has resulted in the development of multiple joint position statements on topics such as animal welfare, veterinary education, One Health and antimicrobial use and resistance.

Dr. Nave graduated in 1968 from the University of Missouri College of Veterinary Medicine. Before becoming a leader in the veterinary field, Dr. Nave served as a Captain in the U.S. Army, stationed in Vietnam. His outstanding service earned him the Bronze Star, demonstrating his long-standing commitment to duty and excellence, which has been a hallmark of his contributions to the field of veterinary medicine and advocacy.



The American Veterinary Medical Association named Dr. Phillip Nelson, professor of immunology and former dean at Western University College of Veterinary Medicine, as the winner of the 2023 AVMA Meritorious Service Award.

Established in 2001, the award recognizes a veterinarian who has brought honor and distinction to the veterinary profession through personal, professional or community service activities that are conducted outside the scope of organized veterinary medicine or research. The AVMA Board of Directors selects the recipient.

Dr. Nelson earned his DVM from Tuskegee Institute in 1979, completed a residency in internal medicine at Mississippi State University in 1983 and received his PhD in immunology and biotechnology from North Carolina State University in 1993. He served as acting head of the Department of Small Animal Medicine, Surgery and Radiology at Tuskegee University School of Veterinary Medicine, and associate dean, professor of academic and public affairs and interim dean at the Mississippi State University College of Veterinary Medicine, before joining Western University College of Veterinary Medicine, where he has held a series of leadership positions since 2005, including his service as dean and executive associate dean for preclinical programs. There he helped develop Western's problem-based curriculum and played a significant role in the establishment of a veterinary hospital on campus and the implementation of a distributive model for clinical training.

One goal of Dr. Nelson's efforts in developing a curriculum at Western has been to develop a diverse profession that better reflects the diversity of the community that it serves. A fervent advocate for DEI in the veterinary profession, Dr. Nelson has been at the forefront of state and national efforts to highlight opportunities within the profession and has worked to address the lack of representation of Black clinicians in the field, most notably as a past president of the American Association of Veterinary Medical Colleges (AAVMC) and a consultant and member of AAVMC's Multicultural Affairs Committee. He currently co-hosts a podcast, "Peter & Phil's 'Our Courageous Conversation,'" which provides a platform to discuss these important issues.

Through his leadership and with the support of the faculty and staff, Dr. Nelson has been instrumental in bringing veterinary services to underserved communities. His development of Western's Veterinary Ambulatory Community Service Program, and Shelter Medicine Program supporting Los Angeles and Upland shelters has increased access to critical veterinary care while also fostering a passion for service among the university's veterinary students. He also developed a working relationship with Los Angeles County Animal Control and set up a spay/neuter program at their Center East Valley facility, reflecting his determination to utilize his professional expertise for the betterment of the broader society.



The American Veterinary Medical Association today presented a special award to transformative leader, Dr. Ruby Perry, for "unwavering commitment" to advancing Diversity, Equity, and Inclusion (DEI) throughout the veterinary profession.

Dr. Perry, Dean of the Tuskegee University College of Veterinary Medicine and President and Board Chair of the American Association of Veterinary Medical Colleges, was recognized during the President's Reception at the AVMA's annual Convention, held this year in Denver.

"Their unwavering commitment and strong, visionary leadership have catalyzed change and will leave an indelible mark on our profession," said Dr. Lori Teller, President of the AVMA.

Dr. Perry co-chaired the landmark Commission for a Diverse, Equitable and Inclusive Veterinary Profession, formed by the AVMA and AAVMC in late 2020 to lay the groundwork for improving DEI throughout the veterinary profession.

AVMA CANDIDATES RESPOND TO CHALLENGES IN VETERINARY PUBLIC HEALTH

1) Public health issues and misinformation are rampant in the news and social media. As President of the AVMA, how do you intend to engage allied organizations in ensuring we speak with a unified voice and include the experts in our profession?

Dr Murtagh: *The veterinary profession is rich in expertise in many important areas of the One Health spectrum. In the domain of Public Health, veterinarians have and currently stand out in many areas of research, leadership, and public policy development. The AVMA is the voice and advocate for our profession and society on key issues such as Public Health. In matters of Public Health, I would work to ensure that our messaging was aligned and the messengers were right for the moment.*

Dr. Goldman: *Veterinarians are, and should be regarded as, authorities and central figures in public health. We accept, understand, and promote the concepts inherent in "One Health", especially the prevalence of zoonotic disease and environmental health as major factors in human health, here and across the globe.*

After 25 years in private, clinical, small animal practice I returned to school in 2011 (University of Minnesota) to earn a Master of Public Health degree, because I wanted to expand my professional repertoire, and to add credibility to my leadership of public health preparedness programming in Connecticut. My CV and brochure (also attached) reflect those efforts and accomplishments, and I won't repeat them here.

You may have noted during my VLC campaign speech, delivered in Chicago in January, my reference to public health crisis communication as a versatile tool with which to deliver messaging on many of the issues facing our profession, such that confidence in the message and messenger is maintained. That confidence in our expertise, and in our self-image as protectors of public health, is enhanced through the regular use of public health concepts and language when communicating to our many audiences, both internal and external to our profession.

While total unity on all issues facing our profession is unlikely, there are many things on which we agree, not least of which is reliance on data, and unbiased analysis of that data, when deciding what actions to take or not take on a given challenge. Engagement of our allied organizations then, whether public health focused or otherwise, is best accomplished through reliance on unbiased data and analysis, accurate and transparent communication, and facility with the language of public health. The questions: What happened? What are we doing about it?, When will we know more? and What can I do now to protect myself, my family, my patients, my practice and my community? are not idle ones, and in my view can be very broadly applied to many situations that an AVMA president-elect and president may be called upon to address.

Finally, to ensure we speak with a unified voice and include public health expertise in our communications, regular and open access to, and consultation with, the appropriate experts should be a feature of the "chief communicator's" role, as the AVMA presidents-elect and president's roles are properly understood. Indeed, these roles are frequently misunderstood as combining the roles of the AVMA Board of Director's chair and Executive Vice President, as well as a spokesperson. The AVMA president-elect and president do play a part

as a member of the AVMA Board of Directors, however their primary and most significant duty is to communicate, and to do it well.

The AVMA commonly takes advantage of many sources of specific expertise in developing its messaging, expertise often available on its Councils and Committees, or in consultation with our allied organizations, across the breadth of our profession. Informed, accurate communication by the chief spokespersons, the president-elect and president, can only serve our profession and the AVMA well, in promoting our unity through the shared understanding of unbiased data and data analysis, and judicious actions taken in response.

Finally, with all the challenges facing our profession, someone should take the lead in expressing optimism about our profession, and gratitude for the role we are privileged to play in society. In my view, the correct person to do that is our president-elect and president - our chief spokespersons. We are more than just our challenges and our obstacles. We are an essential profession that serves society, which is a key element of our identity and our self-esteem, and not coincidentally, is integral to our Oath. That duty informs the calling that brought each of us to veterinary medicine and we minimize it to our disadvantage.

As such I have emphasized values in my campaign: unity, in service of our advocacy; professionalism, in putting the immediate needs of our patients, clients and society ahead of our own; and as I mentioned above, our duty of service. Keeping these ideas alive within our overall messaging is also the role of the AVMA president-elect and president. I believe it's essential to us, and to those we hope will follow us, in every practice niche. We are still a great profession!

Dr. Faeh-Butler: *With my experience in organizations, I am keenly aware of the issues created by misinformation and lack of communication. As the spokesperson for the AVMA and ambassador for the profession, I intend to ensure that allied organizations and experts in the field are always at the table when working on issues and challenges. I intend to strengthen and enhance our collaboration and connection with these groups by attending their annual conferences, making connections with leadership in the organizations at all state and national meetings, and keep communications channels open as I attend council and committee meetings.*

Communication and collaboration are the keys to the success of any organizations. We are such a small profession, but extremely diverse among regions, practice types, and allied organizations. It is essential that your leaders not only listen and learn from each organization, but utilize their expertise.

2) One of our association objectives is to "Provide a unified voice to promote the interests and improve the image of veterinarians in the practice of Food Safety and Public Health. As the premier national association for veterinarians, AVMA often fields media requests; "What do you feel is AVMA's role in ensuring we are speaking with a unified voice, and in your opinion has AVMA done enough to engage experts in this area? (Many are members of the AAFSPHV.)"

Dr Murtagh: *Members of the AAFSPHV are on the front lines, performing vital duty every day for our profession and the society we all collectively serve. Those functions of AAFSPHV members need to be routinely highlighted and celebrated within the profession as well as to the public at large including to the audience of potential future veterinarians to be. The AVMA has the tools and resources to harness to be that promoter on behalf of the AAFSPHV and the other affiliated organizations represented in the House of Delegates. For the remainder of your query, I would point to my answer to the first question above.*

Dr. Goldman: *The AVMA president-elect and president's most significant roles are as the AVMA's chief communicators, spokespersons, cheerleaders, and ambassadors. Particularly when important issues that touch on human and environmental health are in play, the credibility of our profession relies upon a unified voice. Accomplishing that is dependent on offering accurate and transparent information to our audiences,*

information we all can stand behind. The AVMA's role in this then, is to seek, compile and transmit only the most accurate information known at the given time, and when there is doubt, to be open and transparent about what is still unknown. I refer again to the 4 crisis communication questions I mentioned above, as a framework with which to demonstrate transparency, accuracy, and the scientific basis under which our learned profession routinely operates.

Regarding whether the AVMA has "done enough" in engaging with food safety and public health resources and expertise, I must admit I'm not sure. I have yet to see first-hand, just how much of the presidents-elect and president's public health and food safety "talking points" are developed with the assistance of non-staff AVMA members or consultants. To date, I have always written my own materials and speeches, and if I am fortunate to be elected, I expect I will continue to do so, taking advantage of many sources of needed expertise for background. With that comes the freedom and creativity to incorporate broader ideas and themes into the AVMA's messaging that elevates our profession, including our food safety and public health professionals.

In closing, I am aware that the AVMA Council on Public Health and members of the AAFSPHV are frequently engaged on behalf of the Board of Directors and AVMA staff to support initiatives and messaging related to their charges. That said, and admittedly in a blatant opportunity of self-promotion, it would not be unhelpful in this regard for an AVMA president-elect and president to have a public health degree and a demonstrated interest in, and working knowledge of, these areas.

Dr. Faeh-Butler: *It is essential to provide a unified voice to promote our interests and improve our image. This is a primary responsibility of the AVMA and I believe they are doing an excellent job but more can always be done. AVMA's role is to continue to strengthen and enhance our collaboration and connections with the experts in our Allied organizations. As the umbrella organization, our role is to be a convenor and pull all perspectives, bring accurate and data driven information when working on solutions. The various committees and Councils of the AVMA, gives us a broad base for input on policy creation or adjustment.*

The public is very naive to our diversity and our skill sets, and they need to continually be informed about the important role our profession takes in public health and food safety.

Your organization and members have been very valuable being subject matter experts when it comes to food safety when there is an animal disease outbreak or prevention. We saw how valuable the public health veterinarians were with the COVID response. There is always room to improve, but that partnership makes the public safer.

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ENVIRONMENTAL HEALTH AND TOXICOLOGY

Health Research in the Wake of Disasters: Challenges and Opportunities for Sensor Science

Disaster events adversely affect the health of millions of individuals each year. They create exposure to physical, chemical, biological, and psychosocial hazards while simultaneously exploiting community and individual-level vulnerabilities that allow such exposures to exert harm. Since 2013, the National Institute of Environmental Health Sciences (NIEHS) has led the development of the Disaster Research Response (DR2) program and infrastructure; however, research exploring the nature and effects of disasters on human health is lacking. One reason for this research gap is the challenge of developing and deploying cost-effective sensors for exposure assessment during disaster events.

The objective of this commentary is to synergize the consensus findings and recommendations from a panel of experts on sensor science in support of DR2. The NIEHS convened the workshop, "Getting Smart about Sensors for Disaster Response Research" on 28 and 29 July 2021 to discuss current gaps and recommendations for moving the field forward. The workshop invited full discussion from multiple viewpoints, with the goal of identifying recommendations and opportunities for further development of this area of research. The panel of experts included leaders in engineering, epidemiology, social and physical sciences, and community engagement, many of whom had firsthand experience with DR2.

The primary finding of this workshop is that exposure science in support of DR2 is severely lacking. We highlight unique barriers to DR2, such as the need for time-sensitive exposure data, the chaos and logistical challenges that ensue from a disaster event, and the lack of a robust market for sensor technologies in support of environmental health science. We highlight a need for sensor technologies that are more scalable, reliable, and versatile than those currently available to the research community. We also recommend that the environmental health community renew efforts in support of DR2 facilitation, collaboration, and preparedness.

Authors: John Volckens, Erin N. Haynes, Sharon P. Croisant, Yuxia Cui, Nicole A. Errett, Heather F. Henry, Jennifer A. Horney, Richard K. Kwok, Sheryl Magzamen, Ana G. Rappold, Lingamanaidu Ravichandran, Les Reinlib, Patrick H. Ryan, and Daniel T. Shaughnessy

Source: (2023). *Environmental Health Perspectives* 131:6 CID: 065002 <https://doi.org/10.1289/EHP12270>

Relationship between Climate Variables and Dengue Incidence in Argentina

Climate change is an important driver of the increased spread of dengue from tropical and subtropical regions

to temperate areas around the world. Climate variables such as temperature and precipitation influence the dengue vector's biology, physiology, abundance, and life cycle. Thus, an analysis is needed of changes in climate change and their possible relationships with dengue incidence and the growing occurrence of epidemics recorded in recent decades.

This study aimed to assess the increasing incidence of dengue driven by climate change at the southern limits of dengue virus transmission in South America. We analyzed the evolution of climatological, epidemiological, and biological variables by comparing a period of time without the presence of dengue cases (1976-1997) to a more recent period of time in which dengue cases and important outbreaks occurred (1998-2020). In our analysis, we consider climate variables associated with temperature and precipitation, epidemiological variables such as the number of reported dengue cases and incidence of dengue, and biological variables such as the optimal temperature ranges for transmission of dengue vector.

The presence of dengue cases and epidemic outbreaks are observed to be consistent with positive trends in temperature and anomalies from long-term means. Dengue cases do not seem to be associated with precipitation trends and anomalies. The number of days with optimal temperatures for dengue transmission increased from the period without dengue cases to the period with occurrences of dengue cases. The number of months with optimal transmission temperatures also increased between periods but to a lesser extent. The higher incidence of dengue virus and its expansion to different regions of Argentina seem to be associated with temperature increases in the country during the past two decades. The active surveillance of both the vector and associated arboviruses, together with continued meteorological data collection, will facilitate the assessment and prediction of future epidemics that use trends in the accelerated changes in climate. Such surveillance should go hand in hand with efforts to improve the understanding of the mechanisms driving the geographic expansion of dengue and other arboviruses beyond the current limits.

Authors: María S. López, Andre A. Gómez, Gabriela V. Müller, Elisabet Walker, Michael A. Robert, and Elizabet L. Estallo

Source: (2023). *Environmental Health Perspectives* 131:5 CID: 057008 <https://doi.org/10.1289/EHP11616>

Levels of Arsenic, Cadmium, and Mercury in Urine of Indigenous People Living Close to Oil Extraction Areas in the Peruvian Amazon

Oil extraction can lead to long-term harm to the environment and human communities.¹ In the 1970's, oil extraction started in the northern Peruvian Amazon, in the Corrientes, Pastaza, and Tigre river basins, all major tributaries of the Marañón River, leading to high levels of environmental contamination in these four river basins.

The oil concessions of this area, which are currently among of the most contaminated areas of the country [see reports on oil Blocks 8 and 192 (formerly 1AB)], overlap with the territories of the Achuar, Quechua, Kichwa, and Kukama Peoples. These Indigenous groups belong to the Jivaro, Quechua, and Tupi linguistic families, respectively. They live in the northern Amazon, on the border between Peru and Ecuador. According to the 2017 Peruvian National Census (indigenous communities module), it is estimated that approximately 7,944~7,944 Achuar, 11,347 Quechua, 4,742 Kichwa, and 9,532 Kukama Peoples live in these four river basins.² These groups were mostly nomadic-hunter gatherers until the 1960s when they settled in small communities. Nowadays, they continue to rely on subsistence agriculture and on hunting and fishing for their daily protein intake. Since the arrival of the oil companies to the area, the inhabitants of the area have shown concerns about the potential health effects of the environmental contamination caused in the area. High blood lead levels (greater than 5 micrograms per deciliter >5µg/dL in 49% of children and in 60% of adults) were reported among the population of these river basins,³ but there is no information on other metals. The primary aim of this study was to estimate concentrations of metals in urine of Indigenous People residing in four major river basins in oil concessions areas in Peru. Associations were then explored between previously reported urinary metal concentrations and sociodemographic, environmental, occupational, and lifestyle factors.

Authors: Cristina O'Callaghan-Gordo, Jaime Rosales, Pilar Lizárraga, Frederica Barclay, Tami Okamoto, Diana M. Papoulias, Ana Espinosa, Martí Orta-Martínez, Manolis Kogevinas, and John Astete

Source: (2023). *Environmental Health Perspectives* 131:5 CID: 057701 <https://doi.org/10.1289/EHP11932>

Investigating the Links between Climate Injustice and Ableism: A Measurement of Green Space Access Inequalities within Disability Subgroups

In the United States, a 2020 study found that approximately 5,600~5,600 annual excess deaths across the country were attributable to heat, which is substantially higher than previously reported. Marginalized populations, such as those with disabilities, are particularly at risk of experiencing negative health outcomes related to heat. Disabled status is a complex classification, with numerous subgroups ranging from physical to cognitive disabilities. Research evaluating the disproportionate risks associated with extreme heat for people with disabilities is limited and often regards disability as a single category, therefore potentially obscuring unique risks for subgroups within the disabled population. Further, through compounding social and economic risk factors, structural ableism may exacerbate preexisting health vulnerabilities for some people with

disabilities during heat extremes, increasing the number of emergency department visits for individuals with cognitive or physical disabilities. By omitting the multitude of disability types in adaptation planning, cities are not adequately prepared for the inevitable future of additional extreme heat days and more people living with different disabilities.

It is well established that public parks are beneficial to human health through various mechanisms, such as reducing local ambient air temperatures through shading, enhancing wind patterns, and evapotranspiration.⁷ To the best of our knowledge, evidence regarding potential disparities in access to parks across disability subgroups has not been investigated. Determining disparities of access to parks by disability type can help cities effectively refine extreme heat adaptation policies to enhance equity toward ableism.

In this study, we defined access as the percentage of residents living within a proximity of 0.5 mi (0.8 km) to a park, beach, open space, or coastline within each urban census tract in San Diego County. The aim of this study, which we believe to be the first of its kind, was to quantify the extent to which access to public parks varies by overall disability and two broad categories of disability type (physical and cognitive) in San Diego. Determining differences in park access by disability type will help inform how lack of access to such environmental amenities negatively impacts historically marginalized disabled persons.

Authors: Emma Lasky, Chen Chen, Sheri D. Weiser, and Tarik Benmarhnia

Source: (2023). *Environmental Health Perspectives* 131:5 CID: 057702 <https://doi.org/10.1289/EHP12319>

Shellfish-algal systems as important components of fisheries carbon sinks: Their contribution and response to climate change

In the context of global climate change, ocean acidification and warming are becoming increasingly serious. Adding carbon sinks in the ocean is an important part of efforts to mitigate climate change. Many researchers have proposed the concept of a fisheries carbon sink. Shellfish-algal systems are among the most important components of fisheries carbon sinks, but there has been limited research on the impact of climate change on shellfish-algal carbon sequestration systems. This review assesses the impact of global climate change on shellfish-algal carbon sequestration systems and provides a rough estimate of the global shellfish-algal carbon sink capacity. This review evaluates the impact of global climate change on shellfish-algal carbon sequestration systems. We review relevant studies that have examined the effects of climate change on such systems from multiple levels, perspectives, and species. There is an urgent need for more realistic and comprehensive studies given expectations about the

future climate. Such studies should provide a better understanding of the mechanisms by which the carbon cycle function of marine biological carbon pumps may be affected in realistic future environmental conditions and the patterns of interaction between climate change and ocean carbon sinks.

Authors: Ruolan Jia, Ping Li, Chengzhuang Chen, Ling Liu, Zhi-Hua Li

Source: (2023). *Environmental Research*, Volume 224, 2023, 115511, ISSN 0013-9351, <https://doi.org/10.1016/j.envres.2023.115511>

EPIDEMIOLOGY AND BIostatISTICS

Use of High-Resolution Geospatial and Genomic Data to Characterize Recent Tuberculosis Transmission, Botswana

Combining genomic and geospatial data can be useful for understanding *Mycobacterium tuberculosis* transmission in high-burden tuberculosis (TB) settings. We performed whole-genome sequencing on *M. tuberculosis* DNA extracted from sputum cultures from a population-based TB study conducted in Gaborone, Botswana, during 2012-2016. We determined spatial distribution of cases on the basis of shared genotypes among isolates. We considered clusters of isolates with ≤ 5 single-nucleotide polymorphisms identified by whole-genome sequencing to indicate recent transmission and clusters of ≥ 10 persons to be outbreaks. We obtained both molecular and geospatial data for 946/1,449 (65%) participants with culture-confirmed TB; 62 persons belonged to 5 outbreaks of 10-19 persons each. We detected geospatial clustering in just 2 of those 5 outbreaks, suggesting heterogeneous spatial patterns. Our findings indicate that targeted interventions applied in smaller geographic areas of high-burden TB identified using integrated genomic and geospatial data might help interrupt TB transmission during outbreaks.

Authors: Chelsea R. Baker, Ivan Barilar, Leonardo S. de Araujo, Anne W. Rimoin, Daniel M. Parker, Rosanna Boyd, James L. Tobias, Patrick K. Moonan, Eleanor S. Click, Alyssa Finlay, John E. Oeltmann, Vladimir N. Minin, Chawangwa Modongo, Nicola M. Zetola², Stefan Niemann², and Sanghyuk S. Shin

Source: (2023). *Emerging Infectious Diseases*, 29(5), 977-987. <https://doi.org/10.3201/eid2905.220796>

Assessing mammal fence crossing and local fence management in relation to classical swine fever spread in Japan

Infectious diseases at the wildlife-livestock-human interface have become a crucial issue, and evidence-based measures are growing increasingly important.

One countermeasure against animal diseases in wildlife is using fencing to contain and reduce disease spread and transmission rates between wild populations; however, quantitative assessments on fencing are rare. Moreover, existing research on fencing has highlighted knowledge gaps on the social and ecological aspects relevant to the use and design of fences. To control the spread of classical swine fever, fences were installed from the east to west in Gifu Prefecture, Japan, by March 2019, with the aim of restricting wild boar movement. To clarify the process of installation and maintenance of the fences, we conducted semi-structured interviews with prefectural government officers in Gifu Prefecture. Additionally, we installed infrared-triggered cameras at fence locations with and without gaps to evaluate the fence permeability of mammals. We used a generalized linear mixed model to evaluate the relationship between the presence of gaps and the relative abundance and permeability of each mammal. Our findings showed that the occurrence of gaps was inevitable during the installation and management of wide-area perimeter fence in Japan, partly because of social factors. For example, fences could not be installed on roads that were frequently used by residents and were not adequately maintained owing to budgetary reasons in some cases. Analysis of footage from the infrared-triggered cameras revealed that several mammal species crossed the fence at gaps and even had the ability to cross the gapless parts of the fences. Wild boars crossed through the gaps regularly. It is possible that Sika deer, Japanese serows, raccoons, Japanese badgers, raccoon dogs, Japanese macaques, and feral cats crossed through fence gaps because their relative abundance was high at gap locations. In contrast, Japanese hares slipped through the fence mesh rather than crossing through the gaps. In conclusion, we suggest that coordination and collaboration among related parties, a sufficient supply of fence materials, and securing a budget for fence maintenance are important for fence installation and maintenance. Furthermore, as fence gaps are inevitable, technical development of countermeasures for these gaps could be effective.

Authors: Takaaki Suzuki, Takashi Ikeda, Daishi Higashide, Tsugumi Nose, Tomoya Shichijo, Masatsugu Suzuki

Source: (2023). *Preventive Veterinary Medicine*, Volume 218, 105980, ISSN 0167-5877, <https://doi.org/10.1016/j.prevetmed.2023.105980>

A quantitative risk assessment for the incursion of lumpy skin disease virus into Australia via long-distance windborne dispersal of arthropod vectors

Lumpy skin disease (LSD) is an infectious disease of cattle and water buffalo caused by lumpy skin disease virus (LSDV). It is primarily transmitted mechanically by biting insects. LSDV has spread from Africa to the Middle-East, the Balkans, Caucasus, Russia,

Kazakhstan, China, Asia and India, suggesting that a wide variety of arthropod vectors are capable of mechanical transmission. In 2022, LSD was detected in Indonesia, heightening awareness for Australia's livestock industries. To better understand the risk of LSDV incursion to Australia we undertook a quantitative risk assessment (QRA) looking at windborne dispersal of arthropod vectors, assuming a hypothetical situation where LSD is endemic in south-east Asia and Papua New Guinea. We estimated the risk of LSDV incursion to be low, with a median incursion rate of one incursion every 403 years, based on a model where several infectious insects (i.e. a 'small batch' of 3-5) must bite a single bovine to transmit infection. The incursion risk increases substantially to one incursion every 7-8 years if a bite from a single insect is sufficient for transmission. The risk becomes negligible (one incursion every 20,706 years) if bites from many insects (i.e. a 'large batch' of 30-50 insects) are necessary. Critically, several of our parameter estimates were highly uncertain during sensitivity analyses. Thus, a key outcome of this QRA was to better prioritise surveillance activities and to understand the key research gaps associated with LSDV in the Australasian context. The current literature shows that multiple vectors are required for successful bovine-to-vector transmission of LSDV, suggesting that our estimate of one outbreak every 403 years more accurately represents the risk to Australia; however, the role of single insects in transmission has not yet been evaluated. Similarly, attempts to transmit LSDV between bovines by *Culicoides* have not been successful, although midges were the highest risk vector category in our model due to the high vector-to-host ratio for midges compared to other vector categories. Our findings provide further insight into the risk of LSD to Australian cattle industries and identify the Tiwi Islands and areas east of Darwin as priority regions for LSDV surveillance, especially between December and March.

Authors: Robyn N. Hall, James R. Torpy, Rachel Nye, Emma Zalcman, Brendan D. Cowled

Source: (2023). Preventive Veterinary Medicine, Volume 218, 105990, ISSN 0167-5877, <https://doi.org/10.1016/j.prevetmed.2023.105990>

Modeled impacts of rapid and accurate cattle tracing in a Foot-and-Mouth Disease outbreak in the US

The purpose of this study was to estimate the impacts of rapid and accurate tracing of cattle movements during a Foot-and-Mouth Disease (FMD) outbreak in the United States (US). To simulate introduction and spread of FMD we utilized InterSpread Plus, a spatially explicit disease transmission model, and a national livestock population file. The simulations began in one of four regions of the US via beef or dairy cattle as the index infected premises (IP). The first IP was detected 8, 14, or 21 days after introduction. The tracing levels were defined by the

probability of a successful trace and the time to trace completion. We evaluated three tracing performance levels, a baseline that represents a mix of paper and electronic interstate shipment records, an estimated partial implementation of electronic identification (EID) tracing, and an estimated full implementation of EID tracing. To evaluate the potential to decrease the size of control areas and surveillance zones with full EID use, we compared the standard size for each to a reduced geographical area for each. The total number of IPs in an outbreak varied with the location of the index farms. Within index farm locations and across tracing performance levels, early detection (day 8) resulted in fewer IPs and a shorter duration of the outbreak. The impact of improving tracing was most evident within introduction region when detection was delayed (day 14 or 21). Full EID use decreased the 95th percentile but had a smaller impact on the median number of IPs. Improved tracing also decreased the number of farms impacted by control efforts in control areas (0-10 km) and surveillance zones (10-20 km) by decreasing outbreak size (total IPs). Decreasing the control area (0-7 km) and surveillance zone (7-14 km) sizes while using full EID tracing further decreased the number of farms under surveillance but increased the number of IPs slightly. Consistent with previous results, this supports the potential value of early detection and improved traceability to control FMD outbreaks. Further development of the EID system in the US is necessary to achieve the modeled results. Further research into the economic impacts of enhanced tracing and decreased zone sizes are needed to determine the full impact of these results.

Authors: MaRyka R. Smith, Michael W. Sanderson

Source: (2023). Preventive Veterinary Medicine, Volume 215, 105911, ISSN 0167-5877, <https://doi.org/10.1016/j.prevetmed.2023.105911>

FOOD SAFETY

Symptomatic and Asymptomatic Campylobacter Infections and Child Growth in South Asia: Analyzing Data from the Global Enteric Multicenter Study

Campylobacter is widely regarded as a leading causative agent for bacterial food-borne gastrointestinal illness worldwide.1-3 This enteric pathogen is significantly associated with moderate-to-severe diarrhea (MSD) among children aged 0-11 months in Bangladesh and Pakistan; and 24- to 59-month-old children in India and Pakistan.2 Campylobacter enteritis is an acute, self-limiting infection, and clinical manifestation ranges from watery diarrhea to dysenteric illnesses.4,5 This enteric infection damages gut mucosa, disrupts widespread gut commensal flora, and may even cause prolongation of the diarrheal episode.6 Long-term health sequelae

include near-fatal Guillain-Barré syndrome, reactive arthritis, or Reiter's syndrome.⁷ Postinfectious irritable bowel syndrome and inflammatory bowel disease are also linked with *Campylobacter* infection.⁸

Several studies have reported the isolation of *Campylobacter* as asymptomatic infections, which are common in older children.⁹⁻¹¹ A study conducted in Peru reported that younger age, a recent history of diarrheal illness, and lower maternal education were linked to both asymptomatic and symptomatic *Campylobacter* infections. Some environmental factors in low- and middle-income countries (LMICs) pose a high risk of *Campylobacter* infections in humans, including poor sanitation, close contact with animals, and consumption of poultry meats and other poultry products.¹²⁻¹⁴ The isolation of this pathogen in nondiarrheal children could be explained by poor sanitation and early contact with animals.¹³ Moreover, excretion of *Campylobacter* by diarrheal infants has been reported in 75% of cases less than 7 days after diarrhea onset. However, such excretion may be prolonged, as high as 15 days and more among infants with both symptomatic infections (18%) and comparable asymptomatic colonization (11%) after diarrhea onset.¹⁵ Recent reports from the Etiology, Risk Factors, and Interactions of Enteric Infections and Malnutrition and the Consequences for Child Health and Development Project (MAL-ED) study have shown that the burden of asymptomatic infection by *Campylobacter* is associated with increased enteric inflammation.¹⁶ Previously, Chen et al. hypothesized that infections by certain species of the *Campylobacter* genus cause interruption of the gut mucosal barrier by targeting tight junctions and inducing a proinflammatory response in colonic epithelial cells, thereby leading to gastroenteritis.¹⁷ Recent studies have indicated that *Campylobacter* can use sufficient nutrients from the gut luminal environment for survival and growth.¹⁸ Asymptomatic malnourished children are more likely to carry *Campylobacter* in developing countries.¹² This has led to the hypothesis that, it is an opportunistic infection in this setting, maybe linked to immunosuppression caused by malnutrition.^{12,19} A study of Peruvian Amazonian children observed reduced weight gain and marginally compromised linear growth over a 3- and 9-month period, respectively, in cases of both symptomatic and asymptomatic *Campylobacter* infections. Such observations were more pronounced in the case of more severe *Campylobacter* infections.¹² Another study conducted in eight LMICs found *Campylobacter jejuni/coli* infections were associated with poor growth performance.¹⁶

However, information regarding the impact of *Campylobacter* infections on childhood growth in LMICs is lacking, especially in South Asia, where *Campylobacter* infection is a leading cause of MSD (moderate-to-severe diarrhea) episodes.^{1,2} In this study, our objectives were to evaluate potential associations of symptomatic and asymptomatic *Campylobacter*

infections with child growth in three distinct countries in South Asia.

Authors: Md. Iqbal Hossain, Sabiha Nasrin, Rina Das, Parag Palit, Al-Afroza Sultana, Rukaeya Amin Sobi, Soroar Hossain Khan, Sampa Dash, Mohammad Jobayer Chisti, Tahmeed Ahmed, and Abu Syed Golam Faruque

Source: (2023). The American Journal of Tropical Medicine and Hygiene. 108(6):1204-1211.

[doi:10.4269/ajtmh.22-0347](https://doi.org/10.4269/ajtmh.22-0347)

The use of omics in monitoring food gut microbiota interaction outcomes: a review of novel trends and technologies

Food-gut microbiome interaction is increasingly recognized for its impact on human nutritional status from early childhood. Increasing studies confirmed that a favored gut microbiome is directly related to the type of consumed diet leading to gut homeostasis. The disruption of such gut-microbiome symbiosis has also been involved in several degenerative health diseases. The monitoring of such complex functional interaction warrants the development of accurate and sensitive analytical tools to monitor such biotransformation capacity of the gut microbiome, especially being various among individuals. Metabolomics fits the requirements as a universal and sensitive analytical tool suited for the detection of 100-1000 metabolites in both targeted and untargeted manner. Our review aims to present a more advanced overview of food-gut microbiome interaction from several perspectives including 1) Recent advances in metabolomics technologies towards food analysis. 2) The monitoring of food-microbiome interaction in biological samples and metabolite recovery. 3) Applications of food-gut interaction towards maximizing its health benefits.

Authors: Mohamed A Farag, Mostafa H Baky, Martin von Bergen, Nesrine M Hegazi

Source: (2023). Current Opinion in Food Science, Volume 52, 101064, ISSN 2214-7993,

<https://doi.org/10.1016/j.cofs.2023.101064>

The efficacy of preharvest application of electrolyzed water and chemical sanitizers against foodborne pathogen surrogates on leafy green vegetables

Preharvest control strategies, to reduce or eliminate pathogenic bacteria in leafy vegetables that may be consumed raw, may provide additional food safety protection and shelf life quality extension beyond what is possible to achieve with postharvest sanitation alone. The aim of this study was to characterize the efficacy and effect of contact time of electrolyzed water (e-water), 1-bromo-3-chloro-5-dimethylhydantoin (BCDMH), and

peracetic acid (PAA) at 80 and 150 ppm against pathogen surrogates *Escherichia coli* M23 (*E. coli* M23) and *Listeria innocua* ATCC 33090 (*L. innocua*), and a representative spoilage microorganism *Pseudomonas fluorescens* (*P. fluorescens*) on leafy green vegetables (LGV) mizuna, rocket (arugula), and red chard. Each of the leafy vegetables has a distinctly different leaf architectures that could alter the effectiveness of preharvest sanitation treatments. e-Water, BCDMH and PAA were equally effective in inactivating plant total viable count, *E. coli* M23, *L. innocua* and *P. fluorescens* (reduction compared to water control—0.5–4.0 log CFU/g). On average an additional 0.8 (0.4–1.1) log CFU/g inactivation was obtained by increasing sanitizer contact time from 30 min to 2 h, whereas increasing sanitizer concentrations produced, at maximum, an extra 0.5 log CFU/g inactivation. These findings suggest that e-water, BCDMH, and PAA are all useful for in-field preharvest application on a wide range of plants and increasing contact time rather than concentration improves sanitation efficacy.

Authors: Hongshan Shang, Linxi Huang, Roger Stanley, Rosalind Deaker, John P. Bowman

Source: (2023). *Journal of Food Safety*, 43(4), e13051. <https://doi.org/10.1111/jfs.13051>

Contribution of MALDI-TOF-MS-based principal component analysis for distinguishing foodborne pathogens

Foodborne diseases are important to determine bacteria in strain level, which are analyzed by library-based devices and bioinformatics-enabled. The aim of this study was to investigate the contribution of principal component analysis (PCA) with matrix-assisted laser desorption ionization time-of-flight mass spectrometry (MALDI-TOF-MS) to distinguish according to the differences of bacterial strains as rapidly screening of foodborne bacteria. The MALDI-TOF-MS-based PCA analysis was used for differentiating bacterial strains isolated from ready-to-eat foods. According to the results of PCA analysis, the percentages of distance and proximity between species were evaluated by composite correlation indexes (CCI). *Bacillus cereus* were detected in burghul salad (BC1) and macaroni salad (BC2) taken from the SB2-snack bar, and the similarity rate was determined as 97%. Three other *B. cereus* bacteria (BC3, BC4, and BC5) in the same cluster were also isolated from salads collected from SB4-snack bar. The similarity of *Klebsiella pneumoniae* bacteria, which have the codes KP1 and KP2, isolated from macaroni salad and burghul salad taken from the SB2 snack bar respectively were 96%. Additionally, the CCI values of two *E. coli* strains in burghul (EC1) salad and Russian salad (EC2) in the same sampling point (SB1) were determined as 97%. In conclusion, this analysis with MALDI-TOF-MS based PCA has revealed the relationships between bacteria genera and species,

beyond just the identification of bacteria and the rapid screening of bacteria in perishable foodstuffs. Similarities between bacterial strains identified for different samples from the same sampling point suggested that there were not adequate hygiene rules and storage requirements were not followed.

Authors: Yasemin Numanoğlu Çevik, Pınar Kaynar Mursaloğlu

Source: (2023). *Journal of Food Safety*, 43(4), e13053. <https://doi.org/10.1111/jfs.13053>

INFECTIOUS AND PARASITIC DISEASES

Generation and Functional Analysis of Defective Viral Genomes during SARS-CoV-2 Infection

Defective viral genomes (DVGs) have been identified in many RNA viruses as a major factor influencing antiviral immune response and viral pathogenesis. However, the generation and function of DVGs in SARS-CoV-2 infection are less known. In this study, we elucidated DVG generation in SARS-CoV-2 and its relationship with host antiviral immune response. We observed DVGs ubiquitously from transcriptome sequencing (RNA-seq) data sets of in vitro infections and autopsy lung tissues of COVID-19 patients. Four genomic hot spots were identified for DVG recombination, and RNA secondary structures were suggested to mediate DVG formation. Functionally, bulk and single-cell RNA-seq analysis indicated the interferon (IFN) stimulation of SARS-CoV-2 DVGs. We further applied our criteria to the next-generation sequencing (NGS) data set from a published cohort study and observed a significantly higher amount and frequency of DVG in symptomatic patients than those in asymptomatic patients. Finally, we observed exceptionally diverse DVG populations in one immunosuppressive patient up to 140 days after the first positive test of COVID-19, suggesting for the first time an association between DVGs and persistent viral infections in SARS-CoV-2. Together, our findings strongly suggest a critical role of DVGs in modulating host IFN responses and symptom development, calling for further inquiry into the mechanisms of DVG generation and into how DVGs modulate host responses and infection outcome during SARS-CoV-2 infection.

IMPORTANCE Defective viral genomes (DVGs) are generated ubiquitously in many RNA viruses, including SARS-CoV-2. Their interference activity to full-length viruses and IFN stimulation provide the potential for them to be used in novel antiviral therapies and vaccine development. SARS-CoV-2 DVGs are generated through the recombination of two discontinuous genomic fragments by viral polymerase complex, and this recombination is also one of the major mechanisms for the emergence of new coronaviruses. Focusing on the generation and function of SARS-CoV-2 DVGs, these

studies identify new hot spots for nonhomologous recombination and strongly suggest that the secondary structures within viral genomes mediate the recombination. Furthermore, these studies provide the first evidence for IFN stimulation activity of de novo DVGs during natural SARS-CoV-2 infection. These findings set up the foundation for further mechanism studies of SARS-CoV-2 recombination and provide evidence to harness the immunostimulatory potential of DVGs in the development of a vaccine and antivirals for SARS-CoV-2.

Authors: Terry Zhou, Nora J. Gilliam, Sizhen Li, Simone Spandau, Raven M. Osborn, Sarah Connor, Christopher S. Anderson, Thomas J. Mariani, Juilee Thakar, Stephen Dewhurst, David H. Mathews, Liang Huang, and Yan Sun

Source: (2023). mBio, e00250-23, 14, 3, <https://doi.org/10.1128/mbio.00250-23>

Imprinted Anti-Hemagglutinin and Anti-Neuraminidase Antibody Responses after Childhood Infections of A(H1N1) and A(H1N1)pdm09 Influenza Viruses

Immune imprinting is a driver known to shape the anti-hemagglutinin (HA) antibody landscape of individuals born within the same birth cohort. With the HA and neuraminidase (NA) proteins evolving at different rates under immune selection pressures, anti-HA and anti-NA antibody responses since childhood influenza virus infections have not been evaluated in parallel at the individual level. This is partly due to the limited knowledge of changes in NA antigenicity, as seasonal influenza vaccines have focused on generating neutralizing anti-HA antibodies against HA antigenic variants. Here, we systematically characterized the NA antigenic variants of seasonal A(H1N1) viruses from 1977 to 1991 and completed the antigenic profile of N1 NAs from 1977 to 2015. We identified that NA proteins of A/USSR/90/77, A/Singapore/06/86, and A/Texas/36/91 were antigenically distinct and mapped N386K as a key determinant of the NA antigenic change from A/USSR/90/77 to A/Singapore/06/86. With comprehensive panels of HA and NA antigenic variants of A(H1N1) and A(H1N1)pdm09 viruses, we determined hemagglutinin inhibition (HI) and neuraminidase inhibition (NI) antibodies from 130 subjects born between 1950 and 2015. Age-dependent imprinting was observed for both anti-HA and anti-NA antibodies, with the peak HI and NI titers predominantly detected from subjects at 4 to 12 years old during the year of initial virus isolation, except the age-independent anti-HA antibody response against A(H1N1)pdm09 viruses. More participants possessed antibodies that reacted to multiple antigenically distinct NA proteins than those with antibodies that reacted to multiple antigenically distinct HA proteins. Our results support the need to include NA proteins in seasonal influenza vaccine preparations.

Authors: Pavithra Daulagala, Brian R Mann, Kathy Leung, Eric H Y Lau, Louise Yung, Ruipeng Lei, Sarea I N Nizami, Joseph T Wu, Susan S Chiu, Rodney S Daniels, Nicholas C Wu, David Wentworth, Malik Peiris, Hui-Ling Yen

Source: (2023). mBio. 2023 Jun 27;14(3):e0008423. [doi: 10.1128/mbio.00084-23](https://doi.org/10.1128/mbio.00084-23)

Aging-Associated Augmentation of Gut Microbiome Virulence Capability Drives Sepsis Severity

Prior research has focused on host factors as mediators of exaggerated sepsis-associated morbidity and mortality in older adults. This focus on the host, however, has failed to identify therapies that improve sepsis outcomes in the elderly. We hypothesized that the increased susceptibility of the aging population to sepsis is not only a function of the host but also reflects longevity-associated changes in the virulence of gut pathobionts. We utilized two complementary models of gut microbiota-induced experimental sepsis to establish the aged gut microbiome as a key pathophysiologic driver of heightened disease severity. Further murine and human investigations into these polymicrobial bacterial communities demonstrated that age was associated with only subtle shifts in ecological composition but also an overabundance of genomic virulence factors that have functional consequence on host immune evasion.

Authors: James F. Colbert, Joshua M. Kirsch, Christopher L. Erzen, Christophe J. Langouët-Astrié, Grace E. Thompson, Sarah A. McMurtry, Jennifer M. Kofonow, Charles E. Robertson, Elizabeth J. Kovacs, Ryan C. Sullivan, Joseph A. Hippensteel, Namrata V. Sawant, Nicole J. De Nisco, Bruce D. McCollister, Robert S. Schwartz, Alexander R. Horswill, Daniel N. Frank, Breck A. Duerkop, Eric P. Schmidt

Source: (2023). mBio, e00052-23, 14, 3, <https://journals.asm.org/doi/abs/10.1128/mbio.00052-23>

Novel Highly Pathogenic Avian Influenza A(H5N1) Clade 2.3.4.4b Virus in Wild Birds, South Korea

We isolated 5 highly pathogenic avian influenza A(H5N1) clade 2.3.4.4.b viruses from wild waterfowl feces in South Korea during November 2022. Whole-genome sequencing and phylogenetic analysis revealed novel genotypes produced by reassortment with Eurasian low pathogenicity avian influenza viruses. Enhanced surveillance will be required to improve prevention and control strategies.

Authors: Sun-hak Lee, Andrew Y. Cho, Tae-hyeon Kim, Seo-jeong Ahn, Ju Ho Song, Heesu Lee, Yun-Jeong Choi, Nyamsuren Otgontogtokh, Jung-Hoon Kwon, Chang-Seon Song, and Dong-Hun Lee

Source: (2023). *Emerging Infectious Diseases*, 29(7), 1475-1478. <https://doi.org/10.3201/eid2907.221893>

Low Susceptibility of Pigs against Experimental Infection with HPAI Virus H5N1 Clade 2.3.4.4b

We found that nasal and alimentary experimental exposure of pigs to highly pathogenic avian influenza virus H5N1 clade 2.3.4.4b was associated with marginal viral replication, without inducing any clinical manifestation or pathological changes. Only 1 of 8 pigs seroconverted, pointing to high resistance of pigs to clade 2.3.4.4b infection.

Authors: Annika Graaf, Ronja Piesche, Julia Sehl-Ewert, Christian Grund, Anne Pohlmann, Martin Beer, and Timm Harder

Source: (2023). *Emerging Infectious Diseases*, 29(7), 1492-1495. <https://doi.org/10.3201/eid2907.230296>

Mycobacterium marinum Infection after Iguana Bite in Costa Rica

Infections after reptile bites are uncommon, and microbial etiologies are not well defined. We describe a case of *Mycobacterium marinum* soft-tissue infection after an iguana bite in Costa Rica that was diagnosed through 16S rRNA sequencing and mycobacterial culture. This case informs providers of potential etiologies of infection after iguana bites.

Authors: Jordan Mah, Kyle Walding, Brooke Liang, Laurence Rinsky, Roshni Mathew, Indre Budvytiene, and Niaz Banaei

Source: (2023). *Emerging Infectious Diseases*, 29(6), 1278-1280. <https://doi.org/10.3201/eid2906.230062>

PUBLIC HEALTH TOPICS

Engaging the Poultry Industry to Vaccinate Vulnerable Populations, Arkansas, 2021-2022

The poultry and meatpacking industry is one of the largest in Arkansas and was associated with several COVID-19 outbreaks at the start of the pandemic. Marshallese and Hispanic workers account for much of the poultry and meatpacking workforce and were disproportionately affected. The Arkansas Department of Health held worksite vaccination clinics and administered 1794 doses. Of those doses, 1219 (67.9%) and 391 (21.8%) were administered to Hispanic and Marshallese workers, respectively. Vaccination efforts must target populations that have been disproportionately affected by the pandemic.

According to the Poultry Federation, the state of Arkansas ranks third in the nation for poultry production, with more than 7.4 billion pounds of poultry produced in 2021.¹ Poultry production is the largest agriculture commodity in the state; with revenue of \$5.1 billion, it accounts for approximately half of the state's total agriculture cash receipts.^{1,2} Approximately 19 poultry and meatpacking companies are located in the state; employees are disproportionately Marshallese and Hispanic and may have limited access to health care.^{3,4} Arkansas, with more than 15 000 Marshallese residents, has one of the largest Marshallese populations in the United States.⁵ Marshall Islanders are free to migrate to the United States under a Compact of Free Association because the United States detonated more than 60 nuclear bombs that contaminated the Marshall Islands with radioactive pollution.^{5,6}

During the Trump administration, an executive order was issued during the pandemic that declared the poultry and meatpacking industry to be critical infrastructure, which exempted the state from closing these plants.⁷ In the early phase of the COVID-19 pandemic, employees of the poultry and meatpacking industry were among the first to experience notable outbreaks. Within six months of the pandemic, more than 3400 poultry and meatpacking employees in the state were infected with COVID-19.³ Through fear of losing their jobs, poultry and meatpacking workers would often come to work while experiencing COVID-19-like symptoms, thus increasing the risk of spreading the virus to other workers and their family members.³ Surveillance data showed that counties with poultry and meatpacking plants had higher rates of COVID-19 than counties without these plants.⁸ Despite calls for a minimum two-week shutdown, poultry and meatpacking plants remained open in the state during the pandemic. Several plants made significant attempts to protect workers; these included the creation of health check-in stations and work station dividers, testing, leave time, and shifting of lines when necessary.

The Arkansas Department of Health (ADH) had worked with the poultry and meatpacking industry in previous years to offer worksite influenza and hepatitis A vaccines and tuberculosis tests for employees. When the COVID-19 vaccine became available, it was imperative to collaborate with poultry plants to vaccinate poultry and meatpacking workers at their workplace. The COVID-19 vaccine has been shown to significantly reduce the risk for severe illness that could result in hospitalization or death.

Authors: Austin Porter, Pansy James, and Cassie Cochran

Source: (2023). *American Journal of Public Health* 113, 500_503, <https://doi.org/10.2105/AJPH.2023.307226>

Mpox Vaccine Interest Survey Prioritization and Data Flow: Maricopa County, Arizona, July-August 2022

With increasing mpox cases in Maricopa County, Arizona, the county's health department launched a survey on July 11, 2022, to gather eligibility and contact data and provide clinic information to those interested in JYNNEOS as postexposure prophylaxis (PEP) or expanded postexposure prophylaxis (PEP++). Survey data were matched to case and vaccination data. Overall, 343 of the 513 respondents (66.9%) who reported close contact with an mpox case patient received PEP and 1712 of the 3379 respondents (50.7%) who were unsure of their contact status received PEP++. This outreach intervention connected potential close contacts unknown to MCDPH with PEP or PEP++.

Authors: Brandon J. Howard, Jennifer E. Collin, R. Nicholas Staa, Sonia Singh, Erika Lara, Melissa Kretschmer, Lori Rehder, Anne Dellos, Jessica R. White, and Ariella P. Dale

Source: (2023). American Journal of Public Health 113, 504_508, <https://doi.org/10.2105/AJPH.2023.307224>

The Fitness of Beta-Lactamase Mutants Depends Nonlinearly on Resistance Level at Sublethal Antibiotic Concentrations

Adaptive evolutionary processes are constrained by the availability of mutations which cause a fitness benefit and together make up the fitness landscape, which maps genotype space onto fitness under specified conditions. Experimentally derived fitness landscapes have demonstrated a predictability to evolution by identifying limited "mutational routes" that evolution by natural selection may take between low and high-fitness genotypes. However, such studies often utilize indirect measures to determine fitness. We estimated the competitive fitness of mutants relative to all single-mutation neighbors to describe the fitness landscape of three mutations in a β -lactamase enzyme. Fitness assays were performed at sublethal concentrations of the antibiotic cefotaxime in a structured and unstructured environment. In the unstructured environment, the antibiotic selected for higher-resistance types—but with an equivalent fitness for a subset of mutants, despite substantial variation in resistance—resulting in a stratified fitness landscape. In contrast, in a structured environment with a low antibiotic concentration, antibiotic-susceptible genotypes had a relative fitness advantage, which was associated with antibiotic-induced filamentation. These results cast doubt that highly resistant genotypes have a unique selective advantage in environments with subinhibitory concentrations of antibiotics and demonstrate that direct fitness measures are required for meaningful predictions of the accessibility of evolutionary routes.

Authors: Andrew D. Farr, Diego Pesce, Suman G. Das, Mark P. Zwart, J. Arjan G. M. de Visser

Source: (2023). mBio, e00098-23, 14, 3, <https://journals.asm.org/doi/abs/10.1128/mbio.00098-23>

The use of theories, models, and frameworks to inform the uptake of evidence-based practices in veterinary medicine - a scoping review

Evidence-based practices (EBPs) provide strategies to improve the health, welfare and productivity of animal species. However, ensuring implementation and uptake into routine practice of these EBPs is often challenging. In human health research, one approach used to improve uptake of EBPs is the use of theories, models and/or frameworks (TMFs), however the extent of the use of this approach in veterinary medicine is unknown. The aim of this scoping review was to identify existing veterinary uses of TMFs to inform the uptake of EBPs, and to understand the focus of these applications. Searches were conducted in CAB Abstracts, MEDLINE, Embase and Scopus, alongside grey literature, and ProQuest Dissertations & Theses. The search strategy consisted of a list of known existing TMFs that have been used to improve uptake of EBPs in human health, alongside more generic terminology for implementation and terminology relevant to veterinary medicine. Peer reviewed journal articles and grey literature detailing the use of a TMF to inform uptake of EBP(s) in a veterinary context were included. The search identified 68 studies that met the eligibility criteria. Included studies represented a diverse spread of countries, areas of veterinary concern and EBP. A range of 28 different TMFs were used, although the Theory of Planned Behaviour (TPB) predominated, featuring in 46% of included studies (n = 31). The majority of studies (n = 65, 96%) utilised a TMF with the aim to understand and/or explain what influences implementation outcomes. Only 8 studies (12%) reported the use of a TMF alongside/in conjunction with the actual implementation of an intervention. It is clear there has been some use to date of TMFs to inform uptake of EBPs in veterinary medicine, however it has been sporadic. There has been a heavy reliance on usage of the TPB and other similar classic theories. This has typically been to inform the understanding of factors, such as barriers and facilitators, that may influence the outcome of an implementation effort without then applying this knowledge to the actual implementation of an intervention. Furthermore, there has been a lack of acknowledgement of wider contextual factors and consideration of sustainability of interventions. There is clear potential to increase and expand the usage of TMFs to improve uptake of EBPs in veterinary medicine, including utilising a wider range of TMFs and developing interdisciplinary collaborations with human implementation experts.

Authors: Rosemary A. Reyneke, Imogen F. Richens, Heather Buchanan, E. Bethan Davies, Caitlin Sorrell, Alison Ashmore, Marnie L. Brennan

Source: (2023). Preventive Veterinary Medicine, Volume 216, 105928, ISSN 0167-5877, <https://doi.org/10.1016/j.prevetmed.2023.105928>

Immunocompromised Children and Young Patients Living with Pets: Gaps in Knowledge to Avoid Zoonosis

Although pets are known to be beneficial for children, they could also imply risks for immunocompromised ones. We report the prevalence of children and young patients living with pets in a cohort of immunosuppressed pediatric patients and describe risk behaviors for acquiring zoonosis and compliance with veterinary recommendations. Methods. A cross-sectional, observational study was performed in a large tertiary hospital in Madrid, including immunosuppressed patients from different regions of Spain. The participants were asked to complete an online questionnaire. Results. Two hundred and eighty-four responses were received: 62.3% solid organ transplantation (177/284), 22.8% hematopoietic stem cell transplantation (65/284), and 14.8% inborn errors of immunity (42/284). The median age was 11 years (interquartile range 5.9-15.4), and 55% were boys (156/284). Up to 45% (130/284) of the respondents lived with 201 pets (74% of them dogs and cats). Half of the patients owning dogs or cats did not comply with at least one of the recommendations regarding vaccination, deworming, feeding, and/or veterinarian recommended controls. The poorest findings were related to deworming regimens. Only 42.8% (117/273) of the participants received specific recommendations from their healthcare professionals about companion animals. However, up to 97% of the families considering acquiring a pet did so when the professional did not contraindicate it (31/32), while 72% of the families having pets got rid of their pets when they were advised against animals (8/11). Conclusions. Pet ownership is frequent among immunocompromised children. They presented risky exposures for acquiring zoonoses, and basic veterinary recommendations were not frequently followed. The opinion of professionals significantly influenced the decision to acquire pets, but less than half of the families received recommendations in this regard.

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Source: (2023). Transboundary and Emerging Diseases. 2151761, 1865-1674, <https://doi.org/10.1155/2023/2151761>