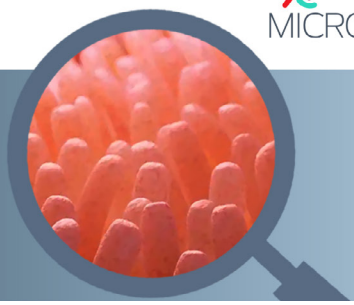
PURINA Institute
Advancing Science for Pet Health

MICROBIOME FORUM

Purina Institute Microbiome Forum Round Table 2024

CHANGING PARADIGMS IN DIARRHEA MANAGEMENT



A PANEL DISCUSSION

Acute gastroenteritis and gastroenteropathy are very common disorders. Affected dogs frequently present with diarrhea and are often prescribed antibiotics. However, paradigms are changing in how to manage these acute diarrhea cases.

In this discussion[1] moderated by Purina PetCare Endowed Chair in Microbiome Research and Professor and Associate Director of the Gastrointestinal Laboratory at Texas A&M University, Dr. Jan Suchodolski, veterinary gastroenterology experts, Dr. Kathrin Busch, Dr. Katie Tolbert, and Dr. Melanie Werner, and veterinary communication expert, Dr. Jason Coe, discuss new guidelines established by the European Network for Optimization of Veterinary Antimicrobial Treatment (ENOVAT) on the appropriate, very limited usage of antibiotics in acute diarrhea in dogs. Panelists discuss why the focus should be on avoiding antibiotics, what the research has shown, their clinical experiences in managing these cases, especially their use of diet, and how to effectively communicate these shifts in acute diarrhea management to pet owners and veterinary team members. The experts also touch on management of chronic diarrhea.

THE CASE AGAINST THE ROUTINE USE OF ANTIBIOTICS IN DOGS WITH ACUTE DIARRHEA

Jan S. Suchodolski, MedVet, DrMedVet, PhD, AGAF, DACVM (Chair/Moderator)

Dr. Jan Suchodolski: Why is the viewpoint evolving on the administration of antibiotics to dogs with diarrhea?

Dr. Melanie Werner: We know that the use of antibiotics can have important negative consequences. We have shown that there is a significant increase in antibiotic-resistant bacterial strains in the gut when you use any antibiotics. This is not only the case during the antibiotic treatment, but also afterwards. We see an increase of antibiotic-resistant bacterial strains weeks after we use the antibiotics.

Dr. Katie Tolbert: When you give antibiotics to both dogs and cats, you potentially reduce the gut population of *Clostridium hiranonis*, which is a bile acid-converting bacteria that is very important for gut health. You reduce microbial diversity, which is associated with a wide range of diseases, including, but not limited to, atopic disorders, and at least in people, enteropathies such as Crohn's disease. You may see the adverse consequences of antibiotic administration within a few weeks, or potentially not for months or even years later.

Dr. Werner: In addition, the research does not support their efficacy for the treatment of diarrhea. In six randomized controlled trials of over 200 dogs, diarrhea resolved on its own after 4½ days in most placebo-treated dogs. In the dogs that were treated with antibiotics (either amoxicillin-clavulanic acid or metronidazole), the duration of the diarrhea was only 0.28 days, or less than 7 hours, shorter. This period of time is not clinically relevant.

I am a member of the ENOVAT working group focused on formulating antibiotic treatment guidelines for several diseases including acute diarrhea in dogs. We have classified the severity of acute diarrhea, regardless of whether blood is present in the stool, as:

- Mild – Affected dogs are responsive, bright, and alert with normal body temperature. Dogs are stable with no clinical signs of dehydration and can be treated as outpatients. This group comprises the majority—84%—of dogs with acute diarrhea.
- Moderate – In these cases, dogs are mildly to moderately depressed and have clinically detectable dehydration but no fever. Dogs should be hospitalized for management. With adequate fluid therapy, their mental status improves and their cardiovascular system stabilizes. This group comprises 15% of dogs with acute diarrhea.
- Severe – Dogs with severe disease are moderately to severely depressed with clinically detectable dehydration and a fever. Dogs should be hospitalized. However, this subset of patients does not respond to appropriate fluid therapy alone. Only 1% of dogs with acute diarrhea are severely affected.

Based on disease severity, we have established guidelines for the use of antibiotics in dogs with acute diarrhea:

- Dogs with mild and moderate disease should not be treated with antibiotics.
- The only group that should potentially have antibiotics added to other supportive treatment strategies are the dogs with severe disease. Importantly for this group of dogs, the antibiotic is not given to stop or treat the diarrhea. Antibiotics in these severely diseased dogs are administered to treat any sepsis or bacterial translocation.

"We have shown that there is a significant increase in antibiotic-resistant bacterial strains in the gut when you use any antibiotics."
Melanie Werner, DrMedVet, Dipl. ECVIM-CA (Internal Medicine)

Dr. Kathrin Busch: We randomized dogs with acute hemorrhagic diarrhea syndrome (AHDS) into two groups, standard treatment and standard treatment with amoxicillin-clavulanic acid. We found no difference in outcome in mortality rate or in hospitalization duration. So, for these dogs with AHDS, there was no indication that you should give antibiotics prophylactically. Again, the only indication would be in dogs showing signs of sepsis. The other consideration is that AHDS is likely due to an overgrowth of NetF toxin encoding *Clostridium perfringens*. And even in human medicine, unless there is fever or otherwise very severe disease, antibiotics are not recommended. This is mostly based on the fact you do not want to suppress the competitive microbiome.

"You may see the adverse consequences of antibiotic administration within a few weeks, or potentially not for months or even years later."
Katie Tolbert, DVM, PhD, DACVIM (SAIM, SA Nutrition)

Dr. Suchodolski: Are there other pathogens we should be testing for or other diagnostics we should be performing?

Dr. Werner: The published trials indicate that there are no bacterial pathogens, such as *Salmonella* or *Campylobacter*, that we need to eliminate in these dogs. These bacteria do not really play a role. So, we usually do not do a bacterial culture or fecal PCR panels in dogs with acute diarrhea.

Dr. Busch: There are some specific cases, for example, if there is fever with a history of raw feeding, where we may test for a pathogen such as *Salmonella*, but those are very rare cases.

We did a study evaluating C-reactive protein (CRP) in dogs with AHDS. We expected that CRP would be high in severely affected dogs and perhaps that would correlate with the use of antibiotics. However, we found no association between CRP and disease severity, mortality, duration of hospitalization, or antibiotic treatment. Unfortunately, CRP does not appear to be a good marker for whether antibiotics are indicated.

"Dogs with mild and moderate disease should not be treated with antibiotics."
Dr. Werner

MANAGEMENT OF DIARRHEA

Dr. Suchodolski: If you are not routinely using antibiotics, how do you manage these cases?

Dr. Tolbert: I prefer to utilize dietary management either through a veterinary therapeutic diet that is formulated to manage clinical signs associated with gastrointestinal disease, or by supplementing fiber(s) if there is a reason I cannot change the diet. We know therapeutic gastrointestinal diets can also provide more than just dietary fiber. They contain quality well-sourced ingredients and may also be complete and balanced for the life-stage of the patient. Some are also highly digestible, while others may have a blend of fibers to help manage large bowel diarrhea. Some contain other functional ingredients such as enteroabsorbents, specific prebiotic fibers, colostrum – all of which can support a more rapid return to gastrointestinal health.

Dr. Suchodolski: Do you treat small bowel disease or small bowel diarrhea differently from large bowel diarrhea?

Dr. Tolbert: Generally speaking, if I have a patient that has large bowel diarrhea, I am focused more on a mixed fiber source, insoluble and soluble fibers, plus or minus changing the protein to a novel or hydrolyzed if I think they need it. But frequently they do not.

Small bowel diarrhea, I typically use a highly digestible diet. Again, perhaps some prebiotic fibers but less insoluble fiber in those cases. In these cases I also think about protein source. Hydrolyzed or novel proteins may be needed for some patients.

"We found no association between CRP and disease severity, mortality, duration of hospitalization, or antibiotic treatment. CRP does not appear to be a good marker for whether antibiotics are indicated."
Kathrin Busch, DVM, DrMedVet, Dipl. ECVIM-CA

However, the most important thing we can tell pet owners about diet is it is trial and error, especially in the context of chronic diarrhea. If the first diet is not effective, then we try something else. These cases are all individuals.

Dr. Suchodolski: How do you use psyllium?

Dr. Tolbert: Psyllium is a soluble fiber. It's non fermentable. So, it is really nice especially for large bowel diseases, whether it be constipation where it can have a lubricant, a laxative, effect or large bowel diarrhea where it can serve as an absorbent due to its solubility. It is very helpful for large bowel diarrhea or mixed bowel diarrhea.

In the cases of small bowel diarrhea, I try to reach for psyllium plus other fibers that might be helpful, some rapidly fermentable fiber, things such as gums, beet pulp, etc. All of those again are in the gastrointestinal diets which I am typically reaching for.

Dr. Suchodolski: What are your thoughts on probiotics?

Dr. Werner: The ENOVAT panel does not recommend for or against the use of probiotics in dogs with acute diarrhea. However, if the probiotics are from a reputable company, e.g., one that does its due diligence in terms of quality control, they appear to be a safe and benign option to try.

Dr. Tolbert: Probiotics are one of my management options.

Dr. Suchodolski: If you have an acute diarrhea case you modulate with diets, how long would you recommend leaving the dog on the diet?

Dr. Tolbert: In the context of acute diarrhea, I generally think 5 to 7 days would be sufficient for most of the cases. Then you transition them back to their routine diet. This is assuming there is no history that leads you to believe that they may have a chronic disease state.

Dr. Suchodolski: When would you consider the diarrhea to be chronic?

Dr. Werner: We really do not have a consensus on that, especially in the dogs with intermittent acute flare-ups or episodes of diarrhea. Based on old literature, chronicity is defined as a diarrhea that lasts for at least 3 weeks. However, for me, when a dog has acute diarrhea 3 to 5 times a year, I think this is not normal and is also chronicity.

> "The most important thing we can tell pet owners about diet is it is trial and error. If the first diet is not effective, then we try something else."
> **Dr. Tolbert**

Dr. Busch: Now we also know that after a severe case of acute diarrhea, such as severe AHDS or parvovirus infection, dogs may be more prone to developing chronic diarrhea. So, perhaps even if they had only one episode of really severe acute diarrhea, there is a chance that they develop chronic diarrhea later in life.

Dr. Tolbert: I feel we need to do better about monitoring those patients that had severe acute disease. We could be more specific with our history taking on their annual examinations to pick up chronic GI signs earlier. We may miss cases of chronic diarrhea because of the way we ask pet owners about their pet's stool consistency. Pet owners may not understand normal stool versus diarrhea. Some owners believe only watery stool is diarrhea and may perceive chronic soft stool as "normal" for their pet; therefore, they may not proactively share this information with us.

Dr. Werner: It helps to show the owners the Purina fecal scoring chart so they can indicate what their pet's stool looks like.

Dr. Suchodolski: Would you ever reach for an antibiotic if the diarrhea becomes chronic?

Dr. Tolbert: I do reach for antibiotics at the end when I have tried everything else. No one on this panel is recommending against the use of antibiotics for every situation. But I consider whether there is an indication, and what will I use to monitor the response? I also consider how I can do it the safest way, such as using antibiotics that hopefully will not induce as much resistance, that are narrow in scope and spectrum. Choosing wisely is crucial.

COMMUNICATION WITH PET OWNERS

Dr. Suchodolski: How do we effectively communicate the changing paradigm in acute diarrhea management to clients? First, what are the different communication approaches?

Dr. Jason Coe: We can characterize communication between a veterinarian and a client as fitting into two general patterns:

- The first is a veterinarian-centered approach. It is taking our knowledge, developing it into a very well-conceived message, and delivering that message to our client.
- The second is a relationship-centered approach. It is recognizing that in any interaction, there are at least two individuals involved. Through a process of sharing our understanding back and forth, we can identify common ground so that we can create a plan where both parties are ultimately invested and committed.

In our research we have shown that when veterinarians use a relationship-centered approach with their clients, clients are significantly more satisfied at the end of the appointments. Clients are also more likely to adhere to veterinary recommendations. How we engage with clients impacts important outcomes to us in veterinary practice every day.

> "Now we also know that after a severe case of acute diarrhea, such as severe AHDS or parvovirus infection, dogs may be more prone to developing chronic diarrhea."
> **Dr. Busch**

Dr. Suchodolski: How do we approach clients who have asked for or are expecting to receive antibiotics to manage their pet's acute diarrhea? How do we help them understand and accept that antibiotics are generally not indicated?

Dr. Coe: If we perceive that our client is giving us resistance to our recommendation not to use antibiotics to manage acute diarrhea, we need to be curious and understand the client's perspective, which requires us to get a comprehensive history from our client.

We want to understand the animal, their environment, and who is involved in their care. In veterinary colleges and technician or nursing schools, we teach primarily to focus on gathering information about the animal and the environment, because that is the information we need to make a diagnosis in order to manage the patient. Yet over time, I have come to recognize how important the human factor is. The human element really influences what a client does when they leave our examination room.

"When veterinarians use a relationship-centered approach with their clients, clients are significantly more satisfied at the end of the appointments."
Jason Coe, DVM, PhD

Dr. Suchodolski: How do we explore the client's perspective?

Dr. Coe: We start by using open-ended inquiry. We can use stems such as "Walk me through" or "Tell me," or start questions with words such as "What" to engage clients so that they will start sharing their story with us.

We might use statements such as "Walk me through what has happened since his diarrhea started," or "Tell me what has happened since the stool started becoming soft." What this allows us to do is get a more detailed history, for example, is this really an acute episode, and how severe is it. The pet owner also might provide information that points at extraintestinal causes that we should explore further.

We also want to ask the pet owner directly what their goals are for their pet. In the context of a dog with acute diarrhea, the pet owner often wants to resolve the diarrhea as quickly as possible.

Dr. Suchodolski: How do we work with the pet owner to come up with a management plan for the pet?

Dr. Coe: We start by using "team talk," where we convey an idea of working together to come up with a solution that is going to be best for everyone involved—practitioner, client, and pet. For example, "Let us go through the available options and discuss them together. Then we will identify a plan for moving forward that we are both comfortable with."

It is also important to think about empathy, which is one of the most powerful relationship-building tools that we have from a communication standpoint. We use empathy to set a foundation of acknowledging what is happening for that client so that we can further our conversation about the available options. We might say, "I can see you have questions about not using antibiotics this time to address the diarrhea."

We then use a permission statement, such as, "Would you mind if I take a few minutes to share concerns that I have with using antibiotics?" If the client says no, at that point in time, we do not want to force the conversation because we can potentially harm the relationship. We come back to the conversation at another opportunity. The reality is, though, when we ask for a client's permission, the majority will say yes. Once we have their permission, they will be much more open and receptive to having that conversation.

Example of value matrix. This will vary based on the individual client's unique perspective.

Options: Acute Diarrhea

Option Talk Discuss alternatives, present the pros and cons, introduce cost	RESOLVE DIARRHEA	POSITIVE EFFECT ON GUT HEALTH	BENEFIT TO PET HEALTH LONG TERM	REDUCE RISK ANTIMICROBIAL RESISTANCE	CLIENT PERSPECTIVE
1. DO NOTHING	✓	?	?	✓	✗
2. DIET CHANGE	✓	✓	✓	✓	?
3. ANTIBIOTICS	✓	✗	✗	✗	?

We then move into "option talk" where we discuss the different management options and their benefits and possible risks. I have a tool that I call a "value matrix," which becomes a decision aid that we can use to facilitate our conversation around these different options. Of options for managing acute diarrhea, doing nothing is possible, but many times that would bring uncertainty in terms of outcomes. We have many potential positives associated with diet change. With antibiotics, we have some concerns. This value matrix becomes an aid to help support a conversation to raise a client's awareness of the potential impacts of antibiotics on gut health, how it could potentially impact their pet's health long term.

Once we have presented the options, next is a check-in: "Tell me what your thoughts are," or "What questions do you have?" This enables us to manage any of the challenges that a client might be perceiving before they even leave that examination room.

Then I would suggest we leave the client with a safety net. So, if the diarrhea is worsening or not improving, or the client has concerns, we give them some empowerment to call us at the clinic so we can revisit our plan sooner than later.

Dr. Werner: I check in with pet owners in 2 to 3 days. It is important to keep in touch with the owner until the pet's diarrhea resolves.

Dr. Suchodolski: Any tips how you can make this a very concise conversation that fits into a 15- or 30-minute appointment?

Dr. Tolbert: We use a lot of automated forms. Utilizing dietary history forms allows us to tailor in and develop some of our open-ended questions. That is one way when we really have time constraints that we have been able to be more efficient in the clinic.

Dr. Suchodolski: I know the Purina Institute has some resources for asking dietary questions – such as questionnaires.[2] The World Small Animal Veterinary Association (WSAVA) also has resources.[3] Do you have any other suggestions?

Dr. Tolbert: Most universities that have a board-certified veterinary nutritionist have their own diet history form, and frequently these forms are online. Some practices have online and automated forms.

Dr. Coe: I think it is a common perception that time is going to be the barrier to having these conversations.

However, our research has shown that using open-ended inquiry provides significantly more information and does not typically take much more time. In one study, for a closed-ended question, a client response took 5 seconds and open-ended took 13, only 8 seconds longer. We also have done research with the "Tell me everything they eat throughout the day from when they wake in the morning through to the end of the day" inquiry, where we found that there was a difference of 28 seconds, but again, that approach provided significantly more information. While some interactions take longer, it tends to be a difference of only a couple minutes.

So, I would be amiss if I did not acknowledge that yes, time is always of the essence in veterinary practice. It is probably the number one challenge we hear around communication. As we hone these skills, I do think there are opportunities to upfront spend a little bit more time, but it hopefully will reduce the resistance from the client and ultimately save time.

> "Our research has shown that using open-ended inquiry provides significantly more information and does not typically take much more time."
> **Dr. Coe**

COMMUNICATION AND THE VETERINARY TEAM

Dr. Suchodolski: How important is a veterinary team-based approach to communication with the pet owner?

Dr. Coe: We did a study looking at shared decision-making, which is about taking a relationship-centered approach around the decision-making process with a client. In the study, we had some decisions where only the technician was involved in the conversation with the client, and we had other decisions where only the veterinarian was involved in the conversation with the client. When only one was involved in decision-making with a client, there was no statistically significant difference in the veterinarian's or technician's use of shared decision-making.

Whereas, when we had interactions where both the veterinarian and technician were involved in the decision-making process, we actually saw significantly greater shared decision-making than when the technician alone or the veterinarian alone was involved in decision-making. When moving to a team-based approach, the first step is getting everyone on board with the same message – so there is consistency in the message that we are sharing with our clients.

Dr. Suchodolski: How do we successfully get the rest of the veterinary team on board with the message?

Dr. Coe: Take some time to work with your team by discussing a case of acute diarrhea and having team members work through the different options using the value matrix tool – listing the potential benefits and risks associated with the various options. Then compare.

This creates a discussion within the clinic as to what is behind the preference that some team members have, for example, a preference for treating these cases with antibiotics. Then you can start educating each other through a relationship-centered approach. We are not telling our staff what they need to do, but we are educating them through an engaged process of communication.

Again, that is a first step. There are no easy solutions to communication. You will probably still have team members that may be skeptical. But as they see it actually starting to take effect and as you bring more on board, you will likely start to see a wave of change within your practice. This will bring a consistency of message to your clients and the care that your patients are receiving.

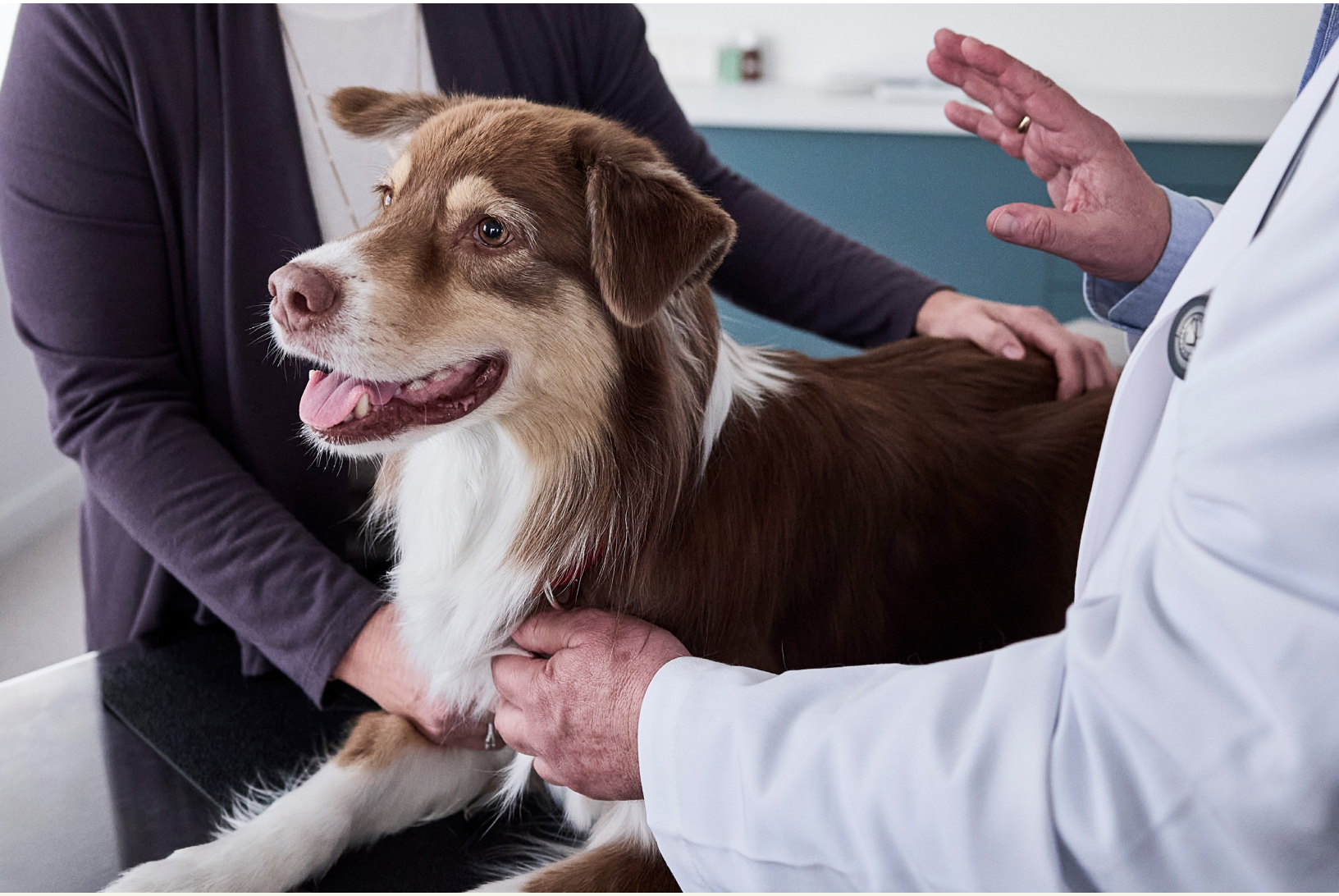
PANELISTS

Kathrin Busch, DVM, DrMedVet, Dipl. ECVIM-CA is Head of the Department of Gastroenterology at the Clinic of Small Animal Medicine of the Ludwig-Maximilians University in Munich, Germany.

Jason Coe, DVM, PhD is a Professor at the Ontario Veterinary College in Guelph, Ontario, Canada. He currently holds the VCA Canada Chair in Relationship-Centred Veterinary Medicine (2021-2026), at the Ontario Veterinary College, dedicated to research and education in communication and relationship-building to improve the outcomes of veterinary care.

Katie Tolbert, DVM, PhD, DACVIM (SAIM, SA Nutrition) is a Clinical Associate Professor in the Gastrointestinal Laboratory at Texas A&M University and is a member of the Dog Aging Project consortium. She also holds a position as a Clinical Veterinary Instructor at North Carolina State University and has completed an alternate-track residency in small animal nutrition at the University of Tennessee.

Melanie Werner, DrMedVet, Dipl. ECVIM-CA (Internal Medicine) is an Internal Medicine Specialist, focusing on gastroenterology, at the Small Animal Hospital of the University of Zurich, Switzerland and, since September 2023, is an Internal Medicine Specialist in a privately owned clinic near Zurich.



FOOTNOTES

[1] Adapted from the live broadcast of the Purina Institute Microbiome Forum Round Table 2024, Changing Paradigms in Diarrhea Management, which is available on demand at purinainstitute.com/events/microbiome-forum-lectures.

[2] A diet history form from the Purina Institute is available at screening-evaluation.pdf (purinainstitute.com).

[3] The WSAVA Short Diet History Form can be found at Diet-History-Form.pdf (wsava.org). WSAVA has additional nutrition resources available in multiple languages at Global Nutrition Guidelines (wsava.org).

PURINA FECAL SCORING CHART

Fecal consistency is primarily a function of moisture in stool and can be used to identify changes in colon health and other problems. In a healthy dog or cat, stools ideally should be firm but not hard, pliable, segmented and easy to pick up (Score 2).

Score	Specimen	Characteristics
1		■ Very hard and dry ■ Often expelled as individual pellets ■ Requires much effort to expel from the body ■ Leaves no surface residue when picked up
2		■ Firm, but not hard; pliable ■ Segmented appearance ■ Leaves little or no surface residue when picked up
3		■ Log shaped; moist surface ■ Little or no visible segmentation ■ Leaves surface residue, but holds form when picked up
4		■ Very moist and soggy ■ Log shaped ■ Leaves surface residue and loses form when picked up
5		■ Very moist, but has a distinct shape ■ Present in piles rather than logs ■ Leaves surface residue and loses form when picked up
6		■ Has texture, but no defined shape ■ Present as piles or spots ■ Leaves surface residue when picked up
7		■ Watery ■ No texture ■ Present in flat puddles

PURINA Institute

Advancing Science for Pet Health

GET TO KNOW THE PURINA INSTITUTE

Advancing Science for Pet Health

At the Purina Institute, we believe science is more powerful when it's shared. That's why we're on a mission to unlock the power of nutrition to help pets live better, longer lives. A global professional organization, the Purina Institute shares Purina's leading-edge research, as well as evidence-based information from the wider scientific community, in an accessible, actionable way so veterinary professionals are empowered to put nutrition at the forefront of pet health discussions to further improve and extend the healthy lives of pets through nutrition.

For more information and a wealth of pet nutrition resources,
visit PurinaInstitute.com and sign up for scientific communications.
By signing up, you'll receive updates on discoveries in nutritional science, free resources to support you in your nutrition conversations with clients, invitations to events, newsletters, and much more from the Purina Institute.

PurinaInstitute.com/Sign-Up

Learn more at
PurinaInstitute.com