

Day One, General Discussion

Kaplan-Meier Curves

Dr. Margie Scherk, Vancouver: This question is for Dr. Carolyn Cupp. With respect to the Kaplan-Meier curves that you showed from your study of the 90 cats, the curves for all three diets seem to come together around age 15 or 16 or so, and then they split apart again. I was wondering if you had an explanation for that? And also, did you notice any change in all causes of death across the three diet groups?

Dr. Carolyn Cupp, Nestlé Purina Research: Regarding the Kaplan-Meier data, I don't know that I have an explanation for why that happened. We presented preliminary data maybe three or four years ago on the pathology from the cats that had died, and I have started to look at the final data set. We appear to still see the same pattern. There did appear to be about half the number of cats on diet three, the supplemented diet with lymphocytic-plasmacytic inflammation of the GI tract and about half the number of hyperthyroid cats, compared to diet one cats. I don't know if it's significant because usually we see multiple diseases in each cat when they die. Some cats have renal and thyroid disease, and others have GI disease and cancer. So we just tabulated them. We're looking at that. Numerically there may be a reduction in renal disease as well.

Benefits of High-Protein Diets for Senior Dogs

Dr. Bill Milgram, CanCog: I was under the impression, before I came to this meeting, that senior dog food should have reduced protein. But coming from this meeting, I'm wondering whether it should be high protein. The question for discussion is should there be protein supplementation in food for senior animals?

Dr. Dottie Laflamme, Nestlé Purina Research: I will start since I've been a strong proponent for many years that restricting protein in senior dogs is the wrong approach. The evidence that strongly supports that senior dogs need more protein is limited. There's just not that much data, period. But what is out there? The Wannamacher study, the McCoy work, the work from the 1950s and 1960s that showed that senior dogs need about 50% more protein than young dogs in order to maintain protein turnover, in order to maintain lean body mass, in order to maintain normal immune function and response to stress. That work from the '50s and '60s was published and then tended to be ignored because of fear that protein causes kidney damage. Later, Dr. David Kronfeld was the big champion of increasing protein for dogs, and, of course, even though he was a strong proponent of it, he was not really successful in

convincing the world of it. There's a little bit of evidence published by Dr. Dick Kealy on changes in lean body mass with age in dogs. His work showed that dogs, like cats, lose lean body mass with age and that by providing higher protein, you can help to offset that. The other work that Dr. Kevin Miller presented today from, I believe it was an Auburn study feeding 16, 24 and 32% protein, showed some changes in protein turnover. Not necessarily changes in accretion. If we go back to the McCoy and Wannamacher work, protein turnover per se is important because that helps support immune function even if it's not changing the actual protein reserves. So the point I would say is that while there's not a whole lot of evidence that dogs need more protein, unless I've missed something, there's no evidence that they need less.

Dr. Steve Ettinger, California Animal Hospital: I'm old enough to remember David Kronfeld and those arguments. In fact, for many years in practice I always told clients they should supplement their dogs' food with cooked egg every day. Just because of David's argument. So there are two things that I would ask: One is how much of all this does just the lowered sodium have to do with the benefit of the aged or elderly type diet? Might reduced sodium itself be enough? Then the second question I would ask is: The one group that seems to have published papers suggesting that there was a benefit to protein restriction is the Minnesota group, so how does that fit into the overall picture?

Dr. Dottie Laflamme, Nestlé Purina Research: Just to clarify, are you saying that they published data that seems to suggest a benefit to protein restriction in dogs with renal failure or in otherwise healthy dogs? In renal failure, OK, now that's a different scenario. You are talking about dogs that have existing chronic renal failure and there is certainly evidence that phosphorous- and protein-restricted diets are beneficial, although Del Finco's work really raises the question whether it is protein at all or simply the fact that protein and phosphorous go hand in hand. For renal diets, protein may be restricted to achieve phosphorous restriction or to control uremia in dogs with damaged kidneys. As far as restricting protein in order to protect kidneys from damage, unless I'm mistaken, there's no evidence of that either.

Dr. Fran Kallfelz, Cornell University: I think Steve has sort of hit the nail on the head, and you have also, Dottie. Like you, I have been of the opinion that older dogs need more protein, not less. And I think the idea of lowering protein in the senior diets came from the idea that non-protein-losing renal failure

was of significant incidence in older dogs, and perhaps the completely erroneous position that high protein might cause it. But I think from some of the data that was presented here today, as well as other data that I've read, there's just no evidence that non-protein losing renal failure is a major cause of mortality in older dogs. So, I think we've all been kind of sucked into something here, for years and years that we're finally, thankfully, getting out from.

Dr. Julie Churchill, University of Minnesota: My PhD thesis work at the University of Minnesota was in nutritional effects of renal aging in geriatric dogs, using the uninephrectomy model. Dr. Del Finco (University of Georgia) did a similar study about the same time. Both of us were looking at what would have been similar to a "typical senior diet" at about 18% protein compared to 35% or 36% protein. In my study with uninephrectomized geriatric dogs, there was no clinical evidence of renal dysfunction during the study. The dogs were non-azotemic with normal urine concentrating ability. There was no difference, no beneficial effect at all from restricting protein. We did nitrogen balance studies that certainly could be criticized. Nitrogen balance in the low protein group was zero, with positive nitrogen in the higher protein group. We did histomorphometric analysis and, again, no difference in any of the histomorphometric measurements. No evidence of hypertension, any of those things.

Dr. Steve Ettinger, California Animal Hospital: So now, you're coming into my field of cardiology. If we believe that once renal failure develops then protein becomes "poisonous," then the question is where in that spectrum of the normal dog that is becoming an aging mammal that is moving toward renal failure do we look for protein restriction to make the difference? I made the comment about cardiology because, you know, one of my interests is biomarkers as they relate to identifying when things are occurring in the heart, before the damage occurs, before the modeling occurs. So, if indeed there really is this protein effect on the kidneys, then at what point would you want to not administer additional protein because you may be causing a toxic effect?

Dr. Julie Churchill, University of Minnesota: Well, I can tell you that my dogs were very old at the time of death. They were 14 and 15 years old, so I think that in a normal, aging healthy dog, the kidneys outlive the dog. Also, I asked Dr. Liz Lund who was working with Jane Armstrong in the National Companion Animal Study, and she helped me pull from the data the prevalence of kidney disease in geriatric dogs. For all causes of renal disease, the prevalence rate was less than 2.7%. So, again, I just don't think it's a disease of commonality.

Dr. Steve Ettinger, California Animal Hospital: This is just an interesting comment. Our hospital was actually involved

in the original work with (Purina Veterinary Diets) EN, CV and NE. And the study director, Dr. Morris Cover, wanted to know when and why we couldn't get these dogs that are going into kidney disease and find them and treat them for a year or so? And my comment was, I don't believe in practice that you see those dogs. And yet everybody talks about all these dogs that are going into renal failure. But in clinical practice, you don't see them. You see normal dogs and then one day they come in with vomiting and polyuria or polydipsia, and they go into renal failure.

Dr. Joe Wakshlag, Cornell University: Being fairly fresh out of private practice, I think it's almost an overdiagnosis. I've got so many records that say old dog in renal failure because the BUN was 50 and that dog ate a steak that morning. And so, I think as you say, it's prevalent, but I think it's busy veterinarians saying, "Oh well, it might be renal failure," so bang, you've got to put him on something low protein, when really that dog's a little dehydrated and kidney disease is overdiagnosed.

Dr. Dennis Chew, The Ohio State University: I want to address something. You said that veterinarians don't see these kinds of dogs. You see them every day. You don't diagnose them because you don't look at urine, and you don't look for diseases that are emerging. This is happening in every practice, in everybody's visits when they're coming in. You should look at urine. You look at urine proteins. You do specific tests to look for declining kidney function. It's a very rampant thing. I'd also like to add in, I agree that protein restriction is extremely overrated in dogs that have chronic kidney disease. There is almost no information to suggest that the protein restriction does anything for you. If the patient is severely azotemic, it might reduce some of the morbidity, but it doesn't do anything to save the kidney. And there's been some very elegant work that has separated the effects of phosphorous restriction from protein restriction. And it's the phosphorous restriction that saves the kidney and saves the animal's body; it's not the protein restriction. And there is some evidence in dogs, the Bovee work from many years ago, showing that really high-protein supplementation doesn't do anything to harm the patient that has significant underlying chronic kidney disease.

High-Protein Diets for Senior Cats

Dr. Esther Plantinga, Utrecht University: We have been only talking about dogs, and I was curious what your opinion is about high-protein diets for geriatric cats.

Dr. Claudia Kirk, University of Tennessee: I'll make two comments just because some people kind of know from whence I hail, and that is I personally think that dogs and cats do better on a high-protein diet. Certainly cats have a much higher

proportion of renal failure, but so as long as you're screening the animal appropriately, I think that it's not a problem to feed high-protein diets, and cats usually have better appetites and better lean body mass. My concern is I don't like the Wannamacher study. I think it is a poor study because it's basically using deficient proteins once you get down to the lower levels. So that's a personal bias. As we agreed, there are no other studies out there. I just don't like any study overinterpreted. So you can hear my bias and my questions on that study. In cats that we've looked at with DEXA, and I think some of the studies that Margarethe Hoenig and others have done, looking at low-carbohydrate, high-protein diets, lean body mass tends to be higher with animals fed high-protein diets. So if it's lean body mass that's important for longevity and better quality of life, then it would certainly support a much higher protein intake in the aging cats.

Aging Feline Study

Dr. Bob Backus, University of Missouri: I just want to ask Dr. Cupp a question about the feline aging study. Was the protein energy ratio the same in diet three? And was the energy and protein intake the same across the diets? The reason that I'm asking this is because we know that in most species, energy restriction prolongs life. Was there any indication that those cats in diet three ate less protein and less energy?

Dr. Carolyn Cupp, Nestlé Purina Research: Diet three, with chicory, had a little more fat added, but all diets were similar in energy and protein content. The cats were offered the same

amount of calories across the groups, and actual intake did not differ between groups.

Optimal Body Condition Scores

Dr. Kathy Michel, University of Pennsylvania: My question is for Dottie Laflamme. Dottie, I need you to clarify something. I'm a little confused on some of the data both Carolyn and Dr. Perez-Camargo presented, because I'm remembering back to the study that you did using DEXA and body composition to validate the body conditioning systems. I thought that the optimal body condition scores, four to five in the dog and five in the cat, were in the 20% body fat ranges. And the cats in these studies seem to have a lot less fat.

Dr. Dottie Laflamme, Nestlé Purina Research: I think Carolyn made a good point in introducing her study that none of her cats were obese. And some of the conclusions from her study, that increasing body fat or maintaining body fat was beneficial, were because she was working almost exclusively on the left-hand side of that U-shaped curve with cats on the normal to low side. The studies were not dealing with the right-hand side where the obese animals are, where increasing body fat can be detrimental. That was a very good pickup on your part, Kathy, that she was looking at body fat percentages in the 20 to 25% or less, with body condition scores in the 3, 4 and 5 range, maybe pushing 6, but not the 7, 8, 9 like you would see in middle-aged cats in practice. This is the geriatric, skinny cat that we're dealing with.