Effect of question design on dietary information solicited during veterinarian-client interactions in companion animal practice in Ontario, Canada

Clare MacMartin, PhD; Hannah C. Wheat, PhD; Jason B. Coe, DVM, PhD; Cindy L. Adams, MSW, PhD

Objective—To establish the types of initial questions used by veterinarians in companion animal practice to solicit nutritional history information from owners of dogs and cats, the dietary information elicited, and the relationship between initial question-answer sequences and later nutrition-related questions.

Design—Cross-sectional qualitative conversation analytic study.

Sample—98 appointments featuring 15 veterinarians drawn from an observational study of 284 videotaped veterinarian-client-patient visits involving 17 veterinarians in companion animal practices in eastern Ontario, Canada.

Procedures—Veterinarian and client talk related to patient nutrition was identified and transcribed; conversation analysis was then used to examine the orderly design and details of talk within and across turns. Nutrition-related discussions occurred in 172 visits, 98 of which contained veterinarian-initiated question-answer sequences about patient nutritional history (99 sequences in total, with 2 sequences in 1 visit).

Results—The predominant question format used by veterinarians was a *what*-prefaced question asking about the current content of the patient's diet (75/99). Overall, 63 appointments involved a single *what*-prefaced question in the first turn of nutrition talk by the veterinarian (64 sequences in total). Dietary information in client responses was typically restricted to the brand name, the subtype (eg, kitten), or the brand name and subtype of a single food item. When additional diet questions were subsequently posed, they typically sought only clarification about the food item previously mentioned by the client.

Conclusions and Clinical Relevance—Results suggested that question design can influence the accuracy and completeness of a nutritional history. These findings can potentially provide important evidence-based guidance for communication training in nutritional assessment techniques. (*J Am Vet Med Assoc* 2015;246:1203–1214)

In medicine, data gathering is essential to diagnosis and treatment.[1] By asking a series of questions, health-care providers gather information critical to the process of hypothesis testing that can facilitate diagnosis.[2] The practical functions of such questioning make the reported high prevalence of its use unsurprising in human medicine and make its study by medical communication researchers worthwhile.[3–5] The accuracy of a diagnosis and, therefore, the appropriateness of subsequent treatment recommendations have been found to depend on the effectiveness of physician questioning when gathering information from patients.[6–8]

From the Department of Family Relations and Applied Nutrition, College of Social and Applied Human Sciences (MacMartin), and the Department of Population Medicine, Ontario Veterinary College (Wheat, Coe), University of Guelph, Guelph, ON N1H 2W1, Canada; and the Department of Veterinary Clinical and Diagnostic Sciences, Faculty of Veterinary Medicine, University of Calgary, Calgary, AB T2N 1N4, Canada (Adams).

Supported by a grant from Royal Canin.

Presented at the Waltham International Sciences Symposium, Portland, Ore, October 2013; and the International Conference on Communication in Veterinary Medicine, St Louis, November 2013.

The authors thank Dr. Shannon Cunningham for research assistance.

Address correspondence to Dr. MacMartin (cmacmart@uoguelph.ca).

In veterinary medicine, research on clinician questioning practices is limited. Previous researchers adapted methods used in human medical communication[9] to analyze videotapes of veterinarian-client-patient interactions during clinic appointments and identify broad communication patterns[10] along with types of utterances, their proposed functions, and their relative frequencies.[11] For example, 1 study[11] examined the percentage of veterinarian-client communication spent gathering information and the types of questions veterinarians posed to clients in terms of open-endedness and grammatical form. However, such research designs require that veterinarians' questions be investigated in isolation from clients' answers; therefore, determining how effective questioning is in eliciting desired information is not possible.

A different approach, the qualitative methodology of conversation analysis, is better suited to such inquiry. Strongly empirical and inductive, conversation analysis can best be understood in relation to its theoretical assumptions and aims.[12–15] Focusing on the study of real-life conversations and the social actions it achieves, conversation analysis treats conversation as a deeply ordered and systematically and autonomously organized domain. Its foundation is the sequencing of different speakers' successive contributions to a conversation,

with analysis of turn-taking at its core. One object of study in conversation analysis is the question-answer sequence, consisting at a minimum of a first speaker's question turn and a second speaker's response turn. Through close inspection of the interactional details of turns during talk, conversation analysis aims to document what the participants are doing with their talk and how they understand each other, as these understandings are displayed in their talk. Analysis of the sequential environment, what precedes a certain turn (eg, a question preceding an answer) and what comes after that turn, is critical in illuminating these understandings and actions.[12–15]

One focus of applied research in conversation analysis involves human medical communication across a range of health-care settings and types of practitioners and patients, with physician-patient interactions in outpatient settings constituting a major strand of such investigations.[16] Research on physician-patient question-answer sequences has resulted in a burgeoning literature on the relationship between features of physician questions and those of patient answers.[5,17–20] For example, an interventional study[20] that used conversation analysis demonstrated how a single word difference ("something" vs "anything") in a physician's question could affect the solicitation of patient concerns. In that study, when patients were asked, "Is there something else you want to address in the visit today?" there were significantly fewer previsit patient concerns that remained unmet by the end of the visit, compared with the number of unmet concerns when patients were asked, "Is there anything else you want to address in the visit today?" This finding suggests that patient responses are often designed to meet the expectations set by physician questions and that patient answers can display sensitivity to the implications such questions inherently impose.[5] One study[19] found that physicians who asked "How are you?" questions did not index patient medical concerns in the same way that physicians who asked "How are you feeling?" questions did. Furthermore, it appears that question design is implicated not only in the effectiveness of information gathering but also in the management of the social relationship between physician and patient.[5] For example, physician questions during routine history taking are typically designed to elicit answers from patients that confirm optimistic states of affairs. For example, as part of family history taking, physicians ask questions such as "Is your father alive?" rather than "Is your father dead?"[17]

In veterinary medicine, one specific area of data gathering that could particularly benefit from research on clinician questioning practices concerns nutrition. Diet can reduce the risk of certain diseases, can be used to treat certain nutrition-sensitive disorders,[21–23] or can itself induce certain diseases[21–23] (eg, through nutritional deficiencies or excesses).[23,24] Nutrition thus can play an important role in the prevention of diet-related illnesses and the management of chronic diseases,[21,22] including diseases associated with obesity.[25,26] The American Animal Hospital Association has recommended that a nutritional assessment be performed during every veterinary appointment involving a dog or cat,[21] and the curricular focus on nutrition in veterinary education is growing.[27,28]

The gathering of accurate nutritional history information is integral to the determination of overall health and to the development of effective dietary recommendations.[29] If veterinarians do not have comprehensive, up-to-date information about the composition of their patients' diets as well as information about diet intake, activity levels, and feeding management, then their ability to prevent and treat nutrition-related illnesses will be compromised. For instance, effective nutritional history taking should seek information about noncommercial foods (eg, table scraps, raw foods, and home-prepared diets) in addition to the main diet.[30] Survey research on dog and cat owners' self-reported feeding practices showed that for > 17% of dogs and > 6% of cats, home-prepared foods were reported by clients to comprise ≥ 25% of these pets' diets.[30] Because this survey was completed before the 2007 mass recall of commercial pet foods, it has been argued that the proportion of noncommercial foods in the diets of cats and dogs is likely even higher today.[31] Furthermore, exclusive use of special or veterinary diets tailored for individual pets and client control of intake are effective ways of preventing or limiting disease and optimizing animal well-being.[21,22]

There is advice on how to obtain nutritional history information for cats and dogs regarding diet factors, feeding management, and environmental factors.[21,22] Recommended elements of a comprehensive nutritional history include information about the household, main diet, feeding practices, eating behavior, treats, supplements, and exercise.[29] Detailed advice is also available on how to communicate effectively with clients when taking a nutritional history, approaches for collecting diet information, nutritional history forms that can be filled out by the client, and the benefits of beginning the interview with open-ended questions.[32] However, this advice is typically not grounded in evidence-based findings. Although anecdotal information is provided about how routine simple nutritional history interviews are likely done,[32] systematic empirical evidence of actual nutritional history interviews in veterinary medicine has been lacking. In addition, given the time-consuming nature of recommended protocols for nutritional history collection,[32] widespread practitioner adoption of such protocols may not be easy to attain. It is in the best interests of the profession to investigate approaches to nutritional history taking in current use, in part to identify the strengths and weaknesses of typical interviewing practices in relation to the ideal versions that are recommended. The present study was designed to address these limitations by investigating recordings of diet discussions between veterinarians and clients, including nutritional history taking. Specifically, the purpose of the study reported here was to use conversation analysis to examine the relationship between the design of veterinarians' initial diet questions and the quality and quantity of dietary information provided by clients in clinical consultations.

Materials and Methods

The study protocol was reviewed and approved by the University of Guelph Research Ethics Board. Data

were obtained from a previously collected archive of videotaped veterinarian-client-patient visits. Videotapes were subjected to preliminary analysis to allow for selection of the final sample included in the study (**Figure 1**).

Data archive—The present study made use of an archive of 284 videotaped client appointments involving 17 veterinarians in companion animal practices in Ontario, Canada (Figure 1). Clients and veterinarians had consented to allow these appointments, which had previously been recorded for a quantitative study of veterinarian-client-patient communication,[33] to be used in subsequent secondary analyses, of which the present study is a part. The original data collection, which consisted of 350 appointments, took place in 2006 and involved 20 companion animal practitioners and their clients in 14 counties across Ontario, Canada; a detailed account of the overall study design has been published.[33]

Data preparation—The 284 videotaped appointments for which consent had been obtained for secondary analyses were screened for any instances of nutrition-related communication. One hundred seventy-two (61%) appointments were found to contain segments of nutrition-related communication, and these appointments were subjected to basic orthographic (word-for-word) transcription (Figure 1). Next, the written transcripts of the 172 appointments were used to identify those interactions during which the topic of nutrition was initiated by the veterinarian asking the client about the patient's diet. This occurred in 98 of the 172 (57%) appointments featuring 15 veterinarians; however, in 1 of the 98 appointments, separate questions were asked about each of 2 patients' diets. In total, therefore, 99 question-answer sequences were available for preliminary analysis. Given that the present study focused on a systematic analysis of the effectiveness of veterinarians' questions in eliciting important diet information from clients, appointments during which diet information was introduced in other ways were excluded (eg, the veterinarian offered advice about diet or the client asked a diet-related question or volunteered diet information before the veterinarian asked a question about diet).

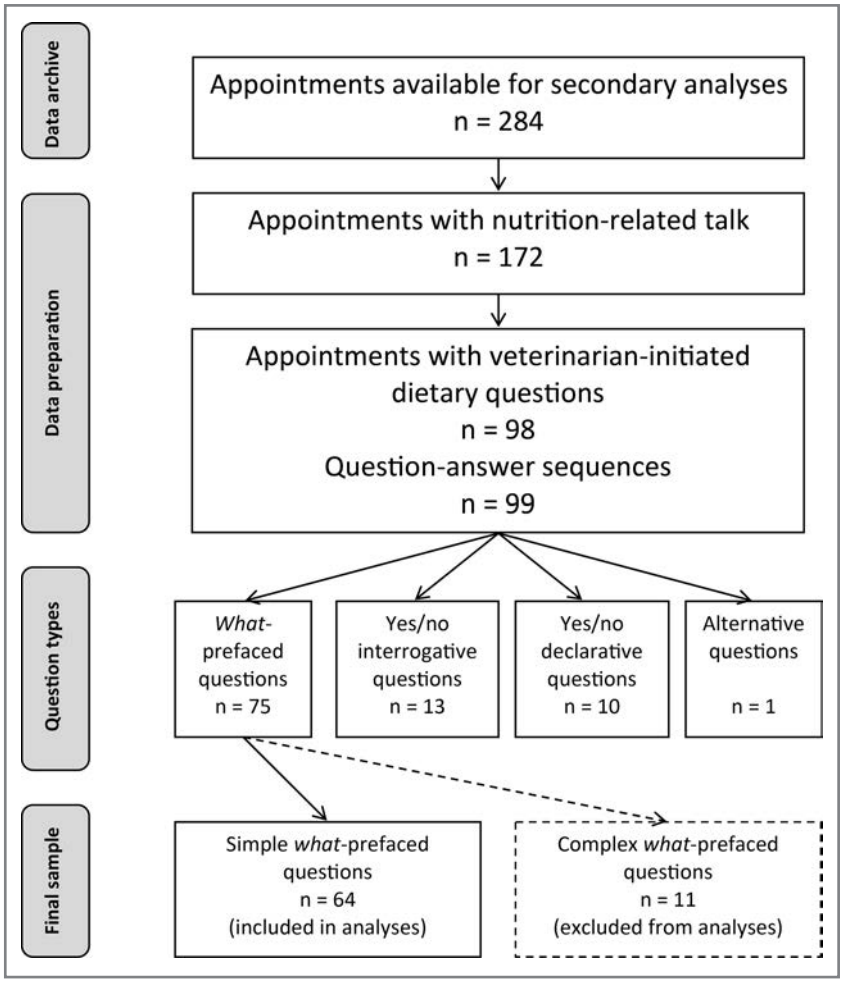

Figure 1—Flow diagram of data analysis in a study that used conversation analysis to examine the relationship between the design of veterinarians' initial diet questions and the quality and quantity of dietary information provided by clients during clinical appointments. The study drew on a previously collected archive of 284 videotaped veterinarian-client-patient appointments featuring 17 veterinarians in companion animal practices in eastern Ontario, Canada.

The decision to focus primarily on the first question-response sequence in each appointment was informed by previous research in human medical communication showing that the design of a physician's question is consequential in terms of patient engagement and the informational content that gets treated as relevant.[19,34–39] This also enabled standardization of the sample and hence systematic analysis of regularities and variations in the range and types of veterinarian questions and client responses.

Analytic method—Conversation analysis was used to examine the orderly details and design of veterinarians' initial dietary questions and clients' responses as well as any subsequent question-answer sequences about nutrition that occurred during the appointments. To determine the social actions people achieve through their talk, conversation analysts examine interactional details closely by listening to and, in the case of videotaped data, observing recordings of real life-interactions and by producing and studying highly detailed, specially notated transcriptions of those interactions.[40] To this end, the basic transcripts of the 99 question-answer sequences were further refined through the addition of conversation analytic transcript symbols to indicate features such as lengthy gaps in the conversation and changes in vocal pitch, volume, and speed. To ascertain the functions and consequentiality that each turn of talk

had in these conversations, we studied the interaction as a whole; each specific turn in terms of its design, delivery, and placement in the unfolding conversation; and the participants' reactions to each other's prior talk.

The basic unit of sequence construction used in these analytic procedures was the adjacency pair.[41] Adjacency pairs are made up of 2 ordered turns of talk by 2 speakers that are adjacently placed (ie, one after the other). The first turn of an adjacency pair is designated the first pair part, and the second turn, which responds to the action constituted by the first pair part, is designated the second pair part. Consider the following fictitious example:

1 V: What kind of food is he usually on?
2 C: Acme Adult Formula

In this example, the first pair part is the initial request from the veterinarian (V) for information about the patient's diet (line 1) and the second pair part is the answer (a brand name and subtype information; line 2) from the client (C).

Analysis—Preliminary analysis of the 99 question-answer sequences consisted of studying the forms and propositional content of the turns constituting veterinarians' initial dietary questions (Figure 1). Details were noted such as the type of question (eg, *what*-prefaced question), word categories used (eg, *food*), and presence of certain parts of speech (eg, adverbs such as *usually*) so that we could investigate the possible relationship between question design and the dietary information subsequently provided by clients.

To understand what information the initial question elicited, the client's response was identified and examined in 2 steps: first, by exploring what occurred in the client's turn of talk immediately following the diet question and, second, by exploring expanded multiunit turns of dietary information sharing whenever these occurred during the appointments.

The analysis sought to specify how the joint accomplishment of the question-answer sequences was achieved. It focused on the structure and propositional content of the dietary information provided by the client as well as subsequent contributions by the veterinarian and their impact. For example, veterinarians' reactions during expanded sequences could have involved brief utterances (eg, "Mm hm") that encouraged the client to keep talking.[42] The completion of each question-answer sequence was ascertained by identifying a new action in the form of a shift to a different topic or further questioning on new aspects of patient diet (eg, amount of food given or meal schedule).

Finally, attention was given to any nutrition-related questions asked later in the appointment, after the closing of the initial question-answer sequence. This allowed exploration of how a series of question-answer sequences functioned within the nutrition history discussion. Characteristics of the visits and frequencies of various categories of talk (eg, wording and word order in the formatting of the questions) were identified to help determine patterns in the data.

Results

Identification of dietary question types—Four types of veterinarian-initiated dietary questions were identified in the 98 appointments and 99 question-answer sequences (Figure 1). The most common type was *what*-prefaced questions (eg, "What kind of food is she on?"), which were identified during 75 of the 99 (76%) sequences (1 question starting with *which* was included in the *what*-prefaced question category because it elicited the same sort of information). Yes/no interrogative questions[43] (eg, "Any food change?" and questions of similar type that typically resulted in an affirmative or negative answer) were identified during 13 of the 99 (13%) sequences, and yes/no declarative questions[5] (eg, "You're still using [brand name]?" and other questions of similar type that typically resulted in an affirmative or negative answer) were identified during 10 (10%) sequences. The final question-answer sequence (1/99 [1%]) consisted of an alternative declarative question[44] (eg, "So now… she's on [brand name of dietary supplement[a]] or not?") that sought an answer endorsing 1 of 2 candidate responses provided in the question (ie, use of a dietary supplement with the main food vs no such use).

Although the yes/no and alternative question forms were of interest, they were assumed to presuppose prior knowledge on the part of the veterinarian about the patient's diet (eg, as information on file in the patient record). Given that the primary objective of the study was identifying questioning practices useful for gathering dietary information when little was known about the patient, these types of questions were eliminated from further analysis.

Among the 75 *what*-prefaced initial diet questions, there were 64 (85%) simple and 11 (15%) complex questions (Figure 1). A simple *what*-prefaced question was defined as a stand-alone single question asking about the content of the patient's diet (eg, "What are you feeding him?") followed by a client response. Instances when a yes/no interrogative was appended (eg, "Do you know?") were treated as simple questions because they occasioned client responses about diet content.

Complex *what*-prefaced questions took 1 of 2 forms. The first form consisted of 2 *what*-prefaced questions uttered by the veterinarian with no client response to the first question before the delivery of the second (eg, "What is the food? What are you feeding her?"). The second form consisted of an initial *what*-prefaced question connected by the conjunction *and* to a second question (eg, "What are you feeding her and how much are you feeding her?"), with both questions uttered during a single turn before the client responded. Such questions focused on the content of patient diet but also could solicit other aspects of the nutrition history.

Complex *what*-prefaced question-answer sequences were eliminated from further analysis owing to their low frequency, their idiosyncratic use by only 2 of the 15 veterinarians in the study, and the noncomparability of client answers in relation to those generated by simple *what*-prefaced questions (Figure 1).

Characteristics of initial simple *what*-prefaced diet questions—The final sample of 64 simple *what*-prefaced diet questions occurred during 63 ap-

pointments involving 15 veterinarians (during 1 appointment, there were 2 question-answer sequences). Of the 15 veterinarians, 11 were female and 4 were male. Median time in practice was 10 years (range, 2 to 25 years), and 13 of the veterinarians worked in clinics in which ≥ 2 veterinarians were employed. Of the 15 clinics in which the veterinarians practiced, 8 were located in urban areas, 4 were located in rural areas, and 3 were located in suburban areas. Of the 64 question-answer sequences, 29 (45%) involved dogs as patients and 35 (55%) involved cats. In terms of appointment type, 48 of the 63 (76%) appointments were wellness appointments and 15 (24%) were problem appointments.

There were regularities with some variations in the wording of the 64 simple *what*-prefaced questions. Eighteen (28%) contained *what* as a pronoun (eg, "What are you feeding him?," "What does she eat?," and "What is his regular diet?"), 4 (6%) contained *what* as an adjective modifying the single noun *food* (eg, "What food do you have her on?" and "What food are you feeding him right now?"), and 42 (66%) contained *what* as an adjective modifying a noun phrase beginning with *kind* or *type* (eg, "What kind of food are you giving them?" and "What type of diet is she eating right now?"). Noun modifiers were occasionally used with the noun *food*, specifying patient species (eg, "What kind of a cat food...?") or the particular life stage category of the species (eg, "What kind of a kitten food...?"). The adjective *regular* was used once to modify *diet* ("What's her regular diet?"). If patients were referenced in questions, this was always done with pronouns (eg, *he*, *his*, *they*, and *their*) rather than proper names.

Questions were constructed with various action verbs (eg, *eat*, *feed*, *give*, and *get*) in the active voice, with either the pet as agent (eg, "What's he eating?") or the client as agent (eg, "What are you feeding him?"). Action verb tenses typically were either the simple present tense (eg, "What do you feed her?") or the present progressive tense (eg, "What kind of food is he eating?"). State-of-being verbs were also typically conjugated in the present tense (eg, "What is her diet?"), although occasionally in the present perfect tense (eg, "What kind of food has she been on?"). Occurrence of a prepositional collocation formed by the verb *is* and the preposition *on* was most frequent in questions with *what* as an adjective modifying a noun phrase (eg, "What kind of food is he on?"). Occasionally, questions with state-of-being verbs in the main clause were constructed with the client as the agent in a subordinate clause containing an action verb (eg, "What is the food that you've started him on?" and "What's the food that you keep her on?").

Adverbs and adverbial phrases were sometimes used (eg, *usually* in "What kind of food is he usually on?"); most often, these were temporal (eg, *now, right now, these days,* or *at the moment*), indicating that only the current food was targeted by the question (eg, "What kind of food is she on now?").

Twenty-two of the 64 (34%) questions contained turn-initial conjunctions. Thirteen of these 22 (59%) questions used *and*, 4 (18%) used *now*, 4 (18%) used *so*, and 1 (5%) used *like*. These turn-initial conjunctions connected the turn they prefaced with a prior turn in the interaction.

Information contained in client responses—Despite the variation in question construction, clients responded in a robustly similar way during initial *what*-prefaced question-answer sequences. For 39 of the 64 (61%) simple *what*-prefaced question-answer sequences, the client reported only a single food item that the patient was currently consuming. In 37 of these 39 (95%) sequences, the answer consisted of a brand name only, sub-brand information only, or brand name plus further sub-brand information. Types of sub-brand information included food form (eg, wet or canned vs dry or kibble), life stage (eg, kitten), and targeted health area (eg, low calorie). There were 2 exceptions. In 1 instance, the child of the adult client replied "treats" to the veterinarian's *what*-prefaced question about the patient's favorite food; in another, the client reported a home-prepared diet. For the remaining 25 question-answer sequences, the client reported 2 food items (18/64 [28%]), 3 food items (4/64 [6%]), 4 food items (2/64 [3%]), or 5 food items (1/64 [2%]). As more items were mentioned, the emphasis on brand and sub-brand characteristics decreased and a focus on human foods increased.

Regarding categories of food items other than the main pet food that were mentioned by clients, treats were mentioned in 5 of the 64 (8%) sequences. Individual product brand names included both health-oriented[b] and non–health-oriented[c] treats. Human food was mentioned in 5 (8%) sequences, whereas pet food intended for a different species (eg, dog food consumed by a cat) was mentioned in 2 (3%). Previous food items no longer given were sometimes mentioned as part of the client response. Such answers sometimes also contained accounts as to why the food items were discontinued (eg, patient preference or cost).

Organizational features of *what*-prefaced question-answer sequences—For adjacency pairs, the first pair part does not predict the second pair part in a predetermined fashion,[41] and deviations from the standard pattern were found in our data. For example, clients sometimes displayed difficulty in remembering brand names. There were 3 main turn-taking patterns by which the 64 simple *what*-prefaced question-answer sequences were organized. A special notation system[40] (not shown) was used to analyze the interactions.

Adjacency pairs with and without a third turn—Client answers most frequently occurred immediately following the veterinarian's question (34/64 [53%]). Closure of these question-answer sequences happened as a result of the client's answer (10/34 [29%] cases) or the veterinarian's third-turn response to the client's answer (24/34 [71%]). This third turn involved a new question or other activity subsequently introduced by the veterinarian, as illustrated by the following extract, which occurred during a problem-based appointment:

1 V: What's the food that you keep her on?
2 C: [Brand Name][d]?
3 V: Yeah,'kay.
4 V: (It's over,) *[Talk not fully audible]*
5 V: Is that a lamb or a chicken,

The sequence began with an initial diet question (first pair part; line 1) after which the client indicated a brand name (second pair part; line 2). The veterinarian then responded (line 3) in a manner that suggested closure of the question-answer sequence. However, after speaking to the patient (line 4), the veterinarian sought sub-brand information about the main diet by asking the client a yes/no clarification question that proposed possible alternative candidate options (line 5).

Adjacency pairs with inserted repair turns—In 4 of 64 (6%) sequences, the smooth production of question-answer adjacency pairs was disrupted by clients' struggles to produce the sought-after diet information. This resulted in additional turns during which the veterinarian and client worked to fix the trouble before the diet question-answer sequence was resumed (so-called repair sequences[14]). The source of the trouble usually was the second pair part and took the form of either the client misnaming the brand of food or displaying difficulty remembering it. When clients offered an incorrect brand name, veterinarians sometimes proffered an alternative name; when clients observably struggled with recall, veterinarians sometimes suggested a candidate name, as illustrated in the following extract, which occurred during a wellness appointment:

1 V: What kind of food is he on right now?
2 C: He's on thatta one that I don't know but
3 V: The [2 Brand-Relevant Initials][e] stuff?
4 C: Yeah the [1st Initial][e] 'n e the
5 both the the dry and the and the
6 V: The can
7 C: Canned stuff

After the veterinarian's initial question (line 1), the client displayed an apparent difficulty with memory retrieval when attempting to answer (line 2). The veterinarian initiated a repair by offering a possible brand-relevant name (line 3), describing the main diet as "stuff." The client accepted the suggestion (at the start of line 4) and then attempted to offer sub-brand information about the diet form, projecting the reporting of dry and wet versions (lines 4 and 5). However, before the client finished the turn, the veterinarian initiated a repair by offering a candidate description (line 6). This was taken up by the client (line 7) who echoed the veterinarian's use of "stuff." Attention to repair in the question-answer sequences indicated that clients and veterinarians treated brand and sub-brand information about the main food to be the appropriate answer sought by the initial diet question.

Elaborated informing sequences—In 22 of 64 (34%) sequences, more information about the previously mentioned dietary item or a new item was provided after completion of the client's initial answer. These expanded sequences happened in 2 ways. One involved veterinarians reacting briefly to clients' initial responses, which led to elaboration of dietary information. In 16 (25%) sequences, veterinarians used so-called other-repeats (repetition of clients' prior answers[43]) or minimal response tokens (eg, "Mm hm," "Okay," or "Yeah") uttered with continuing, rather than final (ie, falling), intonation. Such features invited clients to share more information, as illustrated by the following extract, which occurred during a wellness appointment:

1 V: What kinda cat food is she on at the moment
2 C: [Brand Name][f]
3 V: [Brand Name][f] *((while possibly taking notes))*
4 C: And dog food

In response to the veterinarian's question (line 1), the client provided a brand name answer (line 2). The veterinarian received this answer by repeating it briefly with continuing intonation (line 3). In this and other instances, veterinarians' repetition of clients' answers could have been part of medical notetaking during the dietary question-answer sequence, whereby the repetition marked the activity of writing and displayed what was being recorded,[45,46] although this possible nonverbal activity was off camera in the segment captured in this extract. The client then expanded the initial answer, using a turn-initial *and*, which tied the phrase that followed to the initial answer and disclosed a new diet category outside the single-species bounds set by the question (line 4).

This first pattern kept the action of the question-answer sequence going through topic extension. However, a second pattern was identified in 6 of 64 (10%) sequences during which clients reintroduced the topic of their pets' dietary content while the veterinarian was moving out of that particular questioning activity or was already engaged in a different activity. Veterinarians supported the return to the topic of the dietary content, realigning with the clients' expanded reports by making use of the same practices used in the first pattern. The following extract, which occurred during a wellness appointment, was the only instance during which > 4 food items were reported by a client:

1 V: And what kind of food do you usually
have him on
2 C: I've got him on [Brand Name][f] uh
3 (3.0)
4 C: I suppose that helps
5 V: Mm hm ((laughs)) Well he's definitely
an active adult
6 C: Yeah
7 V: Okay Pacer, ((Starts moving away
from door towards table
8 to begin examination))
9 C: An ah (1.1) I've been puttin' a bit of
ah (0.6) mm
10 the ah canned food [Brand Name][g]
11 V: Mm hm
12 C: It helps (0.5) It-It's just as ah (1.0)
13 as a flavouring for the rest of it ((smiling))
14 V: Yeah
15 C: Um I do a ah I do give him ah a little bit
16 like most of the time I give em like ah
some bread crusts

The veterinarian asked the diet question (line 1) which the client initially answered (line 2). Following a

3.0-second pause (line 3), the client added a comment that obliquely referenced a previous topic: the patient's mobility problems (line 4). The implicit linking of the patient's diet to his energy levels and implications for mobility occasioned the veterinarian's laughter and explicit assessment of the patient (line 5), with which the client agreed (line 6). The veterinarian then signaled a new activity in the appointment, the physical examination, speaking to the patient and moving toward the examination area (lines 7 and 8). The client, however, reopened the diet-informing sequence through an expansion that mentioned a new food item (lines 9 and 10). The veterinarian then used a continuer (line 11) encouraging further information sharing by the client (lines 12 and 13). This information was received by the veterinarian with another continuer (line 14), which was followed by disclosure of yet another food item by the client (lines 15 and 16).

Possible answer-shaping features of *what*-prefaced questions—Predominant design elements of *what*-prefaced questions may have encouraged restricted answers. First, the subject of these interrogative sentences was singular regardless of whether a noun (eg, *food*) or noun phrase (eg, *type of food*) was used, and no instances of a plural subject (eg, "What foods...?" or "What kinds of food…?" or "What types of food?") were identified. When considering variations in wording, one could argue that the noun *diet* (used infrequently, compared with *food*) could invite reporting of more than 1 food item, given that it typically references multiple foods when describing human consumption. However, in the few instances in which questions mentioned patient diet, clients oriented to it as referring to a single brand-based item that veterinarians treated as an adequate answer.

Second, restricted reporting might have been partly shaped by the common use of noun phrases containing the categorizing referents *kind* and, less often, *type* of food. The particularizing effect of these referents, in concert with the potential specifying action performed by the *what*-prefaced question generally, could have encouraged clients to provide an item of food that was recognizably an instance of a subgroup. Thus, a request for a *kind* of food could have raised an expectation that not only a brand name be provided but also possibly sub-brand information about form (eg, dry) or variety (eg, lamb and rice) or an individual product line name that by itself could sufficiently disambiguate the identity of the food item.

The power of *what*-prefaced questions to elicit reports of brand-based foods was demonstrated even in the version of the question that avoided explicit use of singular forms. Hypothetically, the pronoun *what* can reference plural objects; however, interrogatives containing it (eg, "What are you feeding her?") occasioned the same sort of restricted answers as did formats that used *what* as an adjective modifying singular nouns like *food* (eg, What food are you feeding her?") and singular noun phrases (eg, "What type of food...?").

Verb tenses used in the *what*-prefaced questions and certain adjectives and adverbs may have exerted further constraints. The simple present tense (eg, *does eat*) and the present progressive tense (eg, *is eating*) suggested that information about only the current diet (not past food items) was being sought. In addition, temporal adverbs or adverbial phrases narrowing the time frame of the questions (eg, *at the moment* or *right now*) emphasized that content of the present diet, not the past diet, was being sought. The specification of a temporal limit encouraged a report of only current or standard food items as a kind of update; a detailed historical (and possibly narrative) answer was simultaneously discouraged. Expectations about answers reporting only the habitual or main diet may have been conveyed through other details, such as the verb *keep* in "the food that you keep her on," the adjective *regular* in "regular diet," and the adverb *usually*.

The turn-initial design of some veterinarians' *what*-prefaced questions provided sensitizing clues about their possible functions within the larger sequential environments in which they appeared. Some questions began with *now* and *so*, terms which could have indicated that a new action was being launched or that a pending topic was being introduced with the question[47,48]; the most frequent turn-initial discourse marker, *and*, often signaled that this was 1 item in a series of multiple questions for which brief answers were sought.

Linkages between initial and subsequent diet questions—In analyzing possible sequential and topical relationships between the initial question-answer sequence and diet-related questions asked later during the consultations, queries seeking more specific identifying information about the content of a previously mentioned food item or about the amount of a previously mentioned food item fed to the patient were identified. However, given the tendency of the initial *what*-prefaced questions to occasion reports of a single food item, of particular interest was whether veterinarians pursued information about additional dietary items.

Three broad patterns of regularities and variations emerged with respect to diet-related questioning after the initial *what*-prefaced question-answer sequence. In 32 of 64 (50%) instances, veterinarians asked no further questions about the composition of the patient's diet during the appointment. In these instances, veterinarians switched either to a different line of diet history questioning (eg, asking about the amount of food given) or to a nondietary topic.

In 19 of 64 (30%) instances, veterinarians asked questions seeking clarification about the previously mentioned food item or items. Occurring singly or in combination immediately or shortly after initial *what*-prefaced question-answer sequences, these included yes/no declarative questions (eg, "And it's the puppy food you have?"), yes/no interrogative questions (eg, "Do you know what brand?"), alternative questions (eg, "Is that canned or dry?"), and single-word questions offering the candidate response (eg, "Dry?"). Once these follow-up question-answer sequences were completed, the trajectory of these 19 appointments took 3 forms. In 12 of 19 instances, the veterinarian asked no further questions about the content of the patient's diet; in 4, the veterinarian asked 1 or more further clarification questions about the same item; and in 3, the veterinarian asked 1 or more questions about other possible food items.

In 13 of 64 (20%) instances, veterinarians inquired about other dietary items immediately or shortly after the initial *what*-prefaced question-answer sequence. Typically in the form of yes/no interrogatives, these questions asked about other food items not previously disclosed or whether there had been any changes in the patient's diet. Thus, in only 16 of 64 (25%) instances (these 13 instances and the 3 other instances during which veterinarians inquired about other possible food items after their initial clarification-seeking questions) did veterinarians ask either explicitly or implicitly about other present or past food items in the patients' diets. That is, in 48 of 64 (75%) instances, veterinarians sought no further information about other possible food items in the patients' diets beyond the items revealed by the initial *what*-prefaced questions.

Discussion

The conversation analytic approach used in the present study enabled detailed exploration of practitioner-client communication during actual clinical appointments in companion animal practice. The particular focus was veterinarians' topic-initiating inquiries about patient diet. Other research[10] has examined veterinarians' questions (and other types of utterances) by coding and categorizing them apart from clients' responses and the larger sequences in which they occurred. In contrast, the present study systematically analyzed both the composition and position[41,49] of turns at talk to empirically assess the quality and quantity of dietary information solicited and the features of veterinarians' questions that may have shaped clients' answers.

In the present study, 61% (172/284) of the total number of videotaped appointments available for analysis contained nutrition-related discussions. In the remaining 112 (39%) visits, patient diet was not mentioned. Given the positive effects of appropriate nutrition on animal health, we believe the high percentage of visits during which diets was not mentioned is concerning. Since the time of the present study, the American Animal Hospital Association has published guidelines recommending that a nutritional assessment be performed during every veterinary appointment involving a dog or cat.[21,22] Given our study finding and these guidelines, the promotion of practitioners' engagement with patients and clients regarding nutritional health is an area of need and an important priority for the veterinary profession.

The predominant vehicle by which veterinarians in the present study initiated the topic of patient diet was a simple *what*-prefaced question. This finding deviates considerably from best-practices suggestions that nutrition history interviews begin with open-ended questions inviting a broad range of nutrition-relevant information from clients.[32] In the present study, both question design and sequential placement were seemingly implicated in the subsequent reporting of restricted diet information by clients. For 57 of 64 (89%) simple *what*-prefaced question-answer sequences, the initial diet question elicited the reporting of 1 or 2 food items, and only 5 of the 64 (8%) sequences included mention of either treats or human foods. Moreover, when the entire trajectories of simple *what*-prefaced questions across the veterinary visits were systematically examined, in 48 of 64 (75%) instances, veterinarians failed to subsequently solicit information about additional food items. Many follow-up questions oriented only to a possible change of diet since the last visit, with the presupposition of such questions maintaining a focus on only 1 food. More frequently, follow-up questions merely sought clarification about the identity of the 1 or 2 items previously mentioned.

Given the tendency in the present study for veterinarians to focus primarily on the main commercial food in patient diets, there may be important information relevant to the prevention or treatment of disease missing from patient diet histories. The low frequencies with which human foods (5/64 [8%]) and treats (5/64 [8%]) were mentioned in clients' responses are concerning in the context of previous empirical research. In a large survey study,[30] pet owners reported that 13.1% of cats and 30.6% of dogs were given noncommercial food (eg, homemade foods, leftovers, or table scraps) as part of their main diet and that 21.4% of cats and 41.2% of dogs were fed at least 1 commercial treat daily; bones or raw foods were fed as part the main meal of 9.6% of cats and 16.2% of dogs.[30] The American Animal Hospital Association nutritional assessment guidelines[21,22] emphasize that diet history taking during nutritional screening should gather information not only about commercial main diets but also about chew toys, medications and the foods used to administer them, nutritional supplements, snacks, table foods, treats, and unconventional diets, including homemade, raw, and vegetarian foods. An accurate diet history capturing information about all consumed foods is required to make effective dietary recommendations and optimize animal health.[29,30]

The underreporting of all foods that make up a patient's diet can have serious clinical implications. There are multiple negative health consequences associated with nutrient excesses, deficiencies, and imbalances.[24] Diet can affect the periodontal health of cats and dogs.[50,51] Being overweight or obese has been linked with a host of health risks in dogs and cats.[25,52–55] Previous research on dogs has found that, compared with owners of normal weight dogs, owners of overweight or obese dogs tend to feed them more kitchen scraps,[56] snacks,[56,57] and treats,[58] items that were infrequently reported in our study. With respect to life-stage–specific diets, there are special nutritional requirements associated with pediatric[59] and senior[60,61] patients. For example, overfeeding of large-breed puppies is implicated in a range of health risks, including developmental orthopedic disease and obesity.[62] Home-prepared and raw food diets may not be nutritionally balanced and complete,[63,64] with inadvertent contamination of raw diets posing further food safety concerns for pets and owners involved in food handling.[24,63] Results of the present study may prove helpful in articulating communication strategies to support comprehensive nutritional assessments in companion-animal practice.

Both veterinarians and clients in the present study frequently oriented to *what*-prefaced question as one instance in a routine checklist of questions for which

only brief responses were sought. This is interesting to consider in light of Abood's[32] anecdotal example of the simple diet history interview she describes as routinely used in companion animal practice: "What's being fed? How much? How often?" The design of such checklist questions conveys their routine character and associated expectations of brief responses.[5] Thus, restricted responses could be understood not only in relation to the turn design and propositional content of diet questions but also to their position[41,49] within the overall structural organization[65] of the medical activity of gathering information, of which routine checklist questioning was a part. This suggestion is supported by our finding that the client's answer to the *what*-prefaced question about the content of the patient's diet was completed in the next turn in 53% (34/64) of cases. Veterinarians thus treated client answers as sufficiently informative by closing off the topic of diet content and moving to either a different history-taking question or to a new activity altogether.

Even in the minority of cases in which clients provided more expanded answers, these answers did not typically lead to more sustained dialogue about nutrition. The role of question design in maximizing information sharing is bound up with discussions in the communication literature about the definitions of, and distinctions between, open-ended and closed-ended questions. Open-ended questions have been defined in the field of medical communication as those that set a topic while encouraging expansion by allowing the recipient considerable freedom as to how to answer.[66] In contrast, closed-ended questions are more directive and restrictive of how the recipient should answer.[66] In human medicine, the recommendation that open-ended questions be used with patients as a precursor to closed-ended questions has been strongly promoted and is increasingly reflected in clinical communication training.[66] Supportive findings come from a recent quantitative study[67] that coded veterinarians' solicitations of client concerns at the beginning of an appointment and measured the length of clients' responses in videotaped appointments taken from the larger database from which data used in the present study were drawn. Veterinarians' use of closed-ended questions to solicit clients' concerns resulted in significantly fewer concerns being elicited and reduced the length of time clients spent sharing such information.[67]

In addition to *what*, words such as *who*, *where*, and *when* can be used to preface questions (so-called *wh*-questions). Although such questions have sometimes been considered open-ended questions by virtue of their prefacing with a question word, a recent conversation analytic study[68] showed that format alone is not enough to determine the open-endedness of a question. Analysis of responses to such questions in everyday conversations suggests that finer distinctions are needed to determine whether a particular question operates as a specifying question or a telling question: telling questions are more open than specifying questions in terms of the degree of expansion they invite in recipient responses.[68] An example might be the following: "What has been happening with [pet name]'s diet since we last met?" In contrast, the simple *what*-prefaced questions in the present study constituted specifying questions that requested specific, concise bits of information, as in "What food are you feeding [pet name] right now?" The finding in the present study that these occasioned restricted reporting of food items was, therefore, not surprising.

A study[69] on human diet history taking investigated the efficacy of nutritionists' questions that solicited narratives of a habitual sort by asking patients to describe in their own words what they ate throughout the day. Such telling questions inviting uninterrupted accounts elicited multiple food items and aided memory recollection, likely because cues enabled by patient narratives assisted in the reconstruction of specific contexts of consumption.[69] The range of food items a pet consumes is likely to be far smaller than a human's; however, narrative accounts may supply details about an assortment of foods and indirectly invite information about patient exercise, feeding management, and the number and range of household members engaged in the daily care and feeding of the pet. One suggestion, therefore, would be for practitioners to use telling questions seeking narrative accounts as in "Tell me about everything [pet name] eats throughout a day, starting first thing in the morning right through to the end of the day." The topic of patient diet could thus be initiated in a manner that engages clients; invites disclosure of experiences, priorities, and concerns; and maximizes information gathering, including important details about the patient.

This is in line with current recommendations regarding clinical education and professional development in veterinary medicine. One alternative approach to diet history taking, drawing on the Calgary-Cambridge Observation Guide,[70] advocates co-creation of a patient's history through a funnel approach: the practitioner asks the client questions of different designs, in a serial fashion, moving from more open-ended requests for information (ie, telling questions) to closed-ended questions seeking particular bits of information (ie, specifying questions).[71] This approach facilitates engagement of the client's perspective from the beginning of the history-taking activity and can gather, in a stepwise fashion, critical information to guide investigation and treatment. This can include social lifestyle-related information. Hunter and Shaw[71] offer examples of the funnel approach to history taking: With a patient presenting with poor appetite, a veterinarian might start by inviting the client, "Tell me about a day in the life of you and [pet name]," move on to ask, "Would you tell me about [pet name]'s normal eating habits?," and then use more detailed questions to solicit specific information about more recent problematic eating habits, such as "Describe [pet name]'s eating habits over the past three days." Such questions expect expanded responses (ie, asking about "a day in the life" particularly encourages expansion in the form of a narrative answer).[71]

In 16 of 64 (25%) question-answer sequences in the present study, clients expanded their initial answers. Veterinarians displayed receptivity through acknowledgment tokens such as continuers (eg, "Mm hm"), by collaborating with clients to help in the recall of dietary information, or by remaining silent and postponing

further questions or different activities to give clients time to respond. These findings dovetailed with previous recommendations that veterinarians support client information sharing by pausing, avoiding intervening in or interrupting clients' answers, and using eye gaze, head nodding, and minimal prompts (eg, "Uh huh" or "Go on") to encourage clients to keep talking.[72] A separate line of empirical research that uses conversation analysis of everyday talk has identified these as signals that the listener is a cooperative recipient of the speaker's contributions.[49,72,73] Empirical support also comes indirectly from quantitative analysis of veterinarians' solicitations of clients' concerns.[58] The most frequent barriers to clients' successful completion of their initial responses to these solicitations involved veterinarians issuing follow-up, closed-ended questions and noninterrogative statements.[67]

Results of the present study and previous research suggest that telling questions used not only to solicit client concerns generally but also to initiate the topic of diet may generate rich information relevant to history taking and nutritional assessment in veterinary medicine. Nevertheless, there is still a role for specifying questions in diet history taking, either after the initial solicitation of the patient's diet through a telling question, as later questions in a funnel question series,[71] or as follow-ups to routine checklist questions. Specifying questions pursuing more information about key dietary items and feeding management may be necessary because of memory issues or because of the sometimes delicate nature of certain discussions about food. In a study[69] of human diet history taking, it was suggested that patients may omit from meal descriptions food items they feel sensitive about, which may need to be solicited through further questions. This may also be necessary in veterinary dietary questioning for some clients. In the 172 appointments evaluated for the present study during which patient diet was discussed, there was interactional evidence (demonstrated in the content and style of delivery of talk) that patient weight, dental problems, the timing of transition from one life stage diet to another, certain treat categories, wet versus dry foods, quality of the main commercial food, and use of human food were subjects that clients, veterinarians, or both would sometimes orient to as sensitive. For example, in the extract in which > 4 food items were mentioned, the client's answer about giving his dog canned food contained some verbal disfluencies and a notable pause in midresponse ("a bit of ah [0.6-second pause] mm the ah canned food"); the client minimized the amount ("a bit") and then provided an account (delivered in a similarly hesitant fashion), explaining its intended use to merely increase the palatability of the dry food ("It helps… [0.5-second pause] It-It's just as ah [1.0-second pause], as a flavoring for the rest of it"). Similar dysfluencies and minimization of food amounts characterize the client's subsequent disclosure that he also feeds his pet human food: "Um I do a ah I do give him ah a little bit like most of the time I give em like ah some bread crusts."

A main finding of the present study concerned the possibly restrictive effects of recurrent lexical features in the design of *what*-prefaced diet questions. These features included singular references to food and even more frequent singular noun phrases involving *kind* or *type* (eg, "kind of food") that referenced a particular category of food. These often co-occurred with adjectives (eg, *regular*, *cat*, or *kitten*) that modified *food* or *diet*, action words and verb tense (eg, "[What food] do you keep her on?"), and adverbials (eg, *usually*, *normally*, or *right now*). Together, these appeared to expect a report of the current main commercial food only. In most instances in this study, clients provided only 1 or 2 main food items with a focus on brand and sub-brand descriptions of commercial pet foods. A simple recommendation would be to minimize the specificity of the question scope by use of the plural *foods* rather than the singular *food* or the term *diet*, avoiding use of *kind* or *type*, and avoiding delimiting adjectives and temporal tags. The redesigned question could be "What foods is [pet name] eating?" or "What foods is [pet name] being fed?" This question also avoids use of the second person *you* (as in "What foods are you giving [pet name]?"), removing the ambiguity inherent in the English word *you* as to whether it indexes the singular or plural second person. Omission of the person reference discourages a possible interpretation that the question focuses exclusively on the recipient of the question and invites reports of food items given by other (perhaps nonpresent) family members who participate in feeding the pet. Lastly, follow-up questions can pursue categories of unmentioned food items in sequence, as in, "What treats is [pet name] being fed?" This is in accord with funnel questioning[71] and the conversation analytic idea that context is potentially renewable in subsequent turns.[12] In other words, if the first question does not elicit the information sought, other questions can be attempted.

There were certain limitations associated with the present study. The study participants represented a small sample of veterinarians and their clients in companion animal practices located in a relatively small geographic area in eastern Ontario, Canada. Diet-related conversations between clients and staff outside of the consultation room (eg, in the reception area) were not recorded. Also, analyses of other types of question-answer sequences were not reported. The final sample of 64 simple *what*-prefaced question-answer sequences (63 visits in total) represents 65% of the total 99 veterinarian-initiated dietary question-answer sequences (98 visits in total) in the larger data set. Furthermore, in analyzing archival data in which there was invariant use of the singular (eg, "What is…," "What food…," or "What type of diet…") in *what*-prefaced questions, we could not investigate the effect of questions that use plural categories (ie, *foods* or *kinds* [or *types*] *of food* [or *foods*]) as would be possible in an interventional study. In addition, there was no demonstrable evidence that there were food items of nutritional consequence that remained undisclosed owing to the failure of veterinarians to solicit further information. Restricted answers may factually reflect that the dogs and cats in this sample had diets consisting of a single food. Because of the absence of a separate, independent measure (eg, a post-consultation client survey) of the identity and range of food items in patient diets outside of those disclosed

during the consultations, it remains unclear whether the low number of items mentioned was due to the restricted diets of patients or the restricting design of the diet questions. Finally, the cross-sectional nature of the study means there were no supplemental data, such as subsequent health records, to investigate the possible effects of these approaches to history taking on clinical outcomes.

Future research is needed on the remaining diet question types in our data set as well as on the entire scope of diet-related questions following the initial diet questions. Such research would articulate the range and sequential organization of diet-related questions and the comprehensiveness of dietary information generated. The relationship between dietary questions and recommendations also requires investigation. Other analyses of the same conversations suggest that early failure to elicit client perspectives may result in clients challenging veterinarians' long-term dietary recommendations for patients.[h] In summary, the present study and these prospects for further research demonstrate how the evidence-based approach of conversation analysis can contribute to the fields of veterinary communication research and education, helping practitioners and educators to refine communication practices to meet the often complex goals and exigencies of companion animal practice.

a. "Epakitin." Epakitin, Vetoquinol, Magny-Vernois, France.
b. "Dentabone." Pedigree Dentabone, Mars Petcare Inc, Brussels, Belgium.
c. "Temptations." Pedigree Temptations, Mars Petcare Inc, Brussels, Belgium.
d. "Eukanuba." Eukanuba, P&G Pet Care, Cincinnati, Ohio.
e. "g/d." Prescription Diet g/d Early Cardiac-Healthy Aging, Hill's Pet Nutrition Inc, Topeka, Kan.
f. "Iams." Iams, P&G Pet Care, Cincinnati, Ohio.
g. "Pedigree." Pedigree, Mars Petcare Inc, Brussels, Belgium.
h. Wheat HC, MacMartin C, Coe JB. Veterinarian-initiated long-term dietary recommendations: practitioners' management of clients' responses (poster presentation). Waltham International Nutr Sci Symp, Portland, Ore, Oct 2013.

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