

## Homemade diets for pets: reasons, risks and rewards

*Zelfbereide diëten voor gezelschapsdieren: redenen, risico's en voordelen*

M. F. Menniti, C. Baptista da Silva, M.C. Hotatt, M. Hesta

Equine and Companion Animal Nutrition, Faculty of Veterinary Medicine,  
Ghent University, Salisburylaan 133, B-9820 Merelbeke, Belgium

myriam.hesta@ugent.be

### ABSTRACT

Requests for homemade diets are becoming more common in general practice. It is essential that general practice veterinarians understand the advantages, drawbacks and risks of these diets to facilitate evidence-based discussions in the consult room. In the veterinary literature, it has been shown that many clients are choosing to feed homemade diets without consulting a qualified veterinary nutritionist. This may put their pets at risk of nutrient deficiencies. Calcium, phosphorus and vitamin D deficiencies appear to be common as evidenced by selected case studies. In this article, an overview is given of current homemade diet use in general practice, answers to why clients are interested in using them and how to have better discussions with clients about their use.

### SAMENVATTING

Aanvragen voor zelfbereide diëten komen steeds vaker voor in de eerstelijnsdierenartspraktijk. Het is daarom noodzakelijk dat dierenartsen de voor- en nadelen en risico's van deze diëten kennen om "evidence-based"-gesprekken tijdens de consultatie te bevorderen. In de literatuur wordt beschreven dat veel cliënten kiezen voor zelfbereide diëten zonder dat ze een gekwalificeerde veterinaire voedingsdeskundige hebben geconsulteerd. Dit kan ervoor zorgen dat hun huisdier het risico loopt op voedingstekorten. Tekorten aan calcium, fosfor en vitamine D blijken vaak voor te komen in gevalstudies. In dit artikel wordt een overzicht gegeven van het gebruik van zelfbereide diëten in de eerstelijnsdierenartspraktijk en wordt beschreven waarom cliënten erin geïnteresseerd zijn en hoe dierenartsen hierover beter in gesprek kunnen gaan met hun cliënten.

### INTRODUCTION

Since their invention in the 1800s (Fraser-Miller et al., 2021), commercial pet foods have gained popularity as a convenient way to provide nutritious meals to domestic cats and dogs. These foods come in a wide variety of textures, flavors and compositions to match the preferences and nutritional needs of different pets. Generally, they contain all required nutrients in the correct proportions to maintain health and are ready-to-serve. They may also be formulated to support the treatment or prevention of illness. It has been reported that more than 85% of cats and dogs in many countries are fed commercial foods as the main dietary source (Courcier et al., 2010; Diez et al., 2015;

Laflamme et al., 2008; Robertson, 1999; Rohlf et al., 2010; Thomson et al., 2008).

Although commercial foods are currently the most popular type of diet for cats and dogs, a number of surveys in the literature have demonstrated a growing interest in home-cooked diets (Connolly et al., 2014; Dodd et al., 2020; Dodd et al., 2018). Anecdotally, the authors have noticed an increasing number of clients who are adamant about wanting a home-cooked diet for pets with a clinical illness, even when there are a number of suitable commercial options available.

The aim of this review is to give an overview of the reasons explaining the popularity of homemade diets and how veterinarians in general practice can navigate discussions regarding their use.

## Why pet owners are interested in feeding homemade diets

It is important for general practice veterinarians to understand the reasons why a client may want to feed a homemade diet. Practitioners are more likely to form trusting relationships if they are able to engage in discussion rather than dismissing their clients' requests (Hughes et al., 2018; Shaw et al., 2010).

### *Distrust in commercial pet foods*

Homemade diets are considered as part of a new class of pet diets which some veterinarians have labelled as "alternative" (Parr and Remillard, 2014). This is because they differ from the aforementioned widespread practice of feeding commercial diets. A 2004 survey of pet owners demonstrated that those who did not feed a commercial diet generally had a mistrustful attitude towards commercial pet foods and manufacturers (Michel et al., 2008). Compared to pet owners who fed commercial diets, those feeding non-commercial diets were more likely to disagree with statements such as: "I trust pet food manufacturers to provide nutritionally sound, quality products" and "most pet food companies place a high priority on pet health and well-being".

With the advent of social media, misinformed individuals have been given a platform to spread myths about commercial pet food. Among these are the beliefs that these foods have little nutritive value and that the grains they contain are damaging to health (McKenzie, 2020; Tricario, 2021). Unfortunately, a large number of pet owners -reported to be up to 58%-turn primarily to the internet rather than their veterinarian, for pet nutrition information (Kogan et al., 2018; Laflamme et al., 2008; Schleicher et al., 2019).

Another reason for mistrust in commercial pet food products is the misunderstanding of their ingredient sources (Thompson, 2008) and additives (Morelli et al., 2021).

Animal by-products or animal derivatives, for example, are not understood to be the nutritious parts of farmed animals not typically consumed in western societies. These include liver, hearts, kidney and tripe (Thompson, 2008). They are thought to have sinister origins and push consumers away from choosing commercial pet foods (Carter et al., 2014). However, these ingredients are indeed sourced from ante- or post-mortem veterinary-inspected animals at slaughter or animals that are kept under veterinary care (Villaverde and Chandler, 2022).

Additives may be either synthetically-derived or naturally-derived and are added to confer nutritional, safety or quality-maintaining benefits to pet foods (Craig, 2021). These ingredients are subject to strict protocols when included in commercial pet diets (European Commission Directorate-General for Health Food Safety, 2020; Food and Drug Administration,

2022; Food Standards Agency, 2020).

The assumption that processed foods are unhealthy is another reason for which pet owners are opposed to choosing commercial foods (Michel et al., 2008). In reality, nutritional value is more closely tied to the nutritional components than the way in which a meal has been prepared (Derbyshire, 2019; Howard et al., 2012; Jones, 2019). A concern for the formation of harmful compounds in thermally-processed ingredients, such as the ones used in commercial pet foods, has been raised (Van Rooijen et al., 2013). One such compound is the advanced glycation end product (AGE) (Raditic, 2021). AGEs are hypothesized to have a negative impact on health because the ones that are produced endogenously contribute to the pathogenesis of certain chronic diseases, such as cardiovascular disease and diabetes mellitus (Luevano-Contreras and Chapman-Novakofski, 2010; Zhang et al., 2020). However, this research is still in its infancy with most studies using rodents and rodent tissue as models (Patel et al., 2012; Qu et al., 2017). No definitive links between consumption of dietary AGEs and ill health have yet been made (Luevano-Contreras and Chapman-Novakofski, 2010; Raditic, 2021; Zhang et al., 2020).

### *To treat their pets as a family member*

Many people view their pets as a member of the family (Avanzino, 1996; Dotson and Hyatt, 2008; Serpell, 2003). There is also evidence that dog owners tend to anthropomorphize their pet and treat them as they would towards another person (Boya et al., 2012). As such, there is an emergent desire to feed pets just as any other family member. The act of preparing a meal has long been seen as an act of caring and of love (Daniels et al., 2012; Moisisio et al., 2016). This is something that pet owners, presumably, would like to extend to their cats and dogs as well (Michel et al., 2008).

### *For palatability reasons*

There are no current studies which definitively demonstrate that homemade diets are more palatable than commercial diets. However, increased palatability is one stated reason for pet owners to prefer this type of feeding (Johnson et al., 2016). In the authors' experience, there are cases in which a pet may prefer a homemade diet, even when a variety of commercial diets have been offered. Certainly, when formulating a homemade diet, there is an opportunity to choose ingredients, which match the preferences of the pet in question (Villaverde and Chandler, 2022).

### *For ingredient choice*

Clients may prefer to feed their pets only ingredients that match their personal dietary choices or cultural beliefs. For example, in the case of vegetarian

or vegan clients who prefer to feed a plant-based diet (Dodd et al., 2019) or practicing Jews who follow kosher dietary rules (Regenstein et al., 2003).

### The homemade diet consult and recipe creation

Clients who are interested in feeding a home-prepared diet to their pets should consult a qualified veterinary clinical nutritionist to create the recipe (Delaney, 2011; Remillard, 2008). A qualified veterinary clinical nutritionist is a diplomate of clinical nutrition who has been boarded either in Europe with the European College of Veterinary and Comparative Nutrition (ECVCN) or in North America with the American College of Veterinary Nutrition (AAVN) (Chandler et al., 2015).

During the consultation, the veterinarian will first assess the animal's bodyweight, body condition and muscle condition. Next, the medical and dietary history of the pet is reviewed (Fascetti and Delaney, 2011). In cases of suspicion of adverse food reaction, the dietary history will have to be extensive and cover every ingredient the pet has eaten during its lifetime (Verlinden et al., 2006). In every nutritional consult, all consumable products and ingredients must be disclosed. Because some pet owners might not consider supplements or dental products as a part of the diet (Abood, 2008; Chandler and Takashima, 2014). A combination of open-ended and close-ended questions should be used to ensure the dietary history gathered is reflective of reality (Cline et al., 2021). It may be useful to have the client fill out a diet history form at home, so he/she can easily reference products or ingredients in situ. A pet food diary is also helpful for the client to keep over the span of a few days to accurately record what is normally consumed (Michel, 2009).

Other relevant dietary information to collect during the consult includes at what times of the day the pet is fed, how meals are presented, how much of each meal is eaten, and which treats are given in-between meals (Eirmann, 2016). The consultation may also include the identification of specific ingredients that the client would like to use or avoid.

Nutritional guidelines have been published by the National Research Council (NRC, 2006), the European Pet Food Industry Federation (FEDIAF, 2021), and the Association of American Feed Control Officials (AAFCO, 2014). Diets should be formulated to meet established guidelines while targeting the individual nutrient requirements of the pet. In the case of a patient with illness, the targeted requirements are based on key nutritional factors of illness (Elliott, 2004). For example, a canine patient with a diagnosis of hyperlipidemia will require a diet that is restricted in its fat level (Xenoulis and Steiner, 2015). In the case of a homemade diet, the recipe will be formulated to target a fat level close to the minimum recommended intake for the patient while still meeting the guideline requirements.

Ingredients for the recipe are chosen to meet the key nutritional needs of the patient while taking into account the preferences of the client. Commonly, three ingredients are selected to start the process: one protein-rich, one carbohydrate-rich and one fat-rich, respectively. The full nutrient profile of each ingredient is then referenced from the scientific literature or from an ingredient database. Examples of databases include the Belgian Nubel Foodplanner (Vereniging Zonder Winstoogmerk, 2022) and the United States Department of Agriculture FoodData Central Database (USDA, 2022).

To create a recipe, the ingredients are combined in a way that most closely matches established nutrient requirements. Vitamin and mineral supplements are then selected to complement the mix and create a fully balanced meal. This can be accomplished manually, but some may find it more efficient to use software to perform the calculations. In some cases, it may not be possible to mix the chosen ingredients in a way that will match established nutrient requirements (Remillard and Crane, 2010). In this situation, either an additional ingredient will have to be added to the mix or an ingredient will need to be switched with one that is a better fit.

Recipes must be written out with exact specifications for pet owners. The recipe should specify the ingredients in details, the method of cooking (if any), and the weight of the ingredient to be used in the recipe after preparation (Stockman et al., 2013). For example, a beef ingredient that is used in a recipe may be listed as "beef, ground, 5% fat, 33 grams of broiled beef". Note that the cut of beef, percentage of fat in the beef preparation, cooking method, and mass of the ingredient after cooking is specified. Starch-rich ingredients will change in mass significantly after cooking, so it is particularly important that the recipe specifies how they are to be measured.

It must be emphasized that no ingredients, other than those specified in the recipe, are to be used- even for the purpose of cooking. Clients may unwittingly cook raw ingredients with the inclusion of cooking oils, just as they would with their own meals. It should also be clarified that only ingredients with a specified cooking method should be exposed to heat during the meal preparation process. Especially in the case of vitamin supplements, heat can cause degradation of nutrients and cause deficiencies or imbalances (Ottaway, 2010). Transition to a homemade diet should take place over the course of a few days to avoid gastrointestinal upset.

It is recommended that a re-check consultation is scheduled one month after transitioning to a homemade diet (Cline, 2017). This appointment serves as an audit to ensure that the meals are indeed being prepared according to the recipe. It also gives an opportunity to the pet owner to discuss any questions he/she has after having followed the recipe protocol for a few weeks. A formal evaluation of any changes in the pet's

bodyweight, body condition and muscle condition can also be made at this time. Laboratory diagnostics including complete blood count, serum biochemistry and urinalysis is recommended to be performed six months after starting the new meal plan and on a yearly basis afterwards (Cline, 2017). This will allow for long-term monitoring of the health status of the pet and any necessary changes to the homemade diet can be made accordingly with any detected changes in the health status.

In Table 1, an example is given of a homemade diet formulated for a healthy four-year-old female, intact crossbreed dog. This recipe was created specifically for this patient and does not necessarily meet the needs of other dogs.

### Advantages of feeding homemade diets

#### *Specific ingredient selection*

General practice veterinarians have historically been prescribing simple homemade diets, consisting of a single novel protein and single carbohydrate source in cases of diagnostic evaluation of adverse food reactions (Gaschen and Merchant, 2011; Harvey, 1993; Roudebush and Cowell, 1992; Rutgers et al., 1995; Wills and Harvey, 1994). These two-ingredient diets are not complete and balanced (Hutchinson et al., 2012) but are intended to be fed only for the short period required for a dietary elimination trial (Favrot et al., 2020). This protocol should only be undertaken if the patient had been consuming a complete and balanced diet leading up to the dietary elimination trial. It is possible to formulate a complete and balanced homemade recipe using only novel ingredients, but will require a consultation with a qualified veterinary clinical nutritionist.

#### *Creation of a tailored nutrient profile*

Being able to tailor the nutrient profile of a diet is particularly beneficial when a pet has multiple conditions which require nutritional support. Most commercial clinical diets are formulated with one specific clinical condition target (Delaney, 2011).

Additionally, when formulating a diet for a specific patient, key nutrients can be provided based on the ideal bodyweight of the pet rather than at a specified concentration in the food. In this way, nutrients are fed to match a therapeutic dose specified in the literature or based on the clinical needs of the patient. Achieving a therapeutic dose of a key nutrient using certain commercial diets alone may not be possible, as the amount fed is limited by the energy density of the food.

#### *Catering to clients who are opposed to feeding commercial diets*

For clients who are opposed to feeding commercial diets (see above), a homemade diet formulated by a qualified individual can be recommended as a good alternative.

### Homemade diet disadvantages

A pet owner should be aware of the disadvantages of feeding a homemade diet before agreeing to attend a consultation with a clinical nutritionist.

#### *Higher cost than commercial diets*

Ingredients intended for direct human consumption are more costly than the by-products typically used in traditional pet foods. Depending on the formulation, specific ingredients may be available only in boutique shops or by importation from another country. Because of this, homemade diets tend to be more costly than dry commercial diets (Kratzer et al., 2022; Vendramini et al., 2020). Additionally, commercial diets can be energy dense. In most cases, a much higher volume of a home-prepared meal will be required to meet energy needs than a similar dry commercial counterpart. Still, efforts are being made to create digital algorithms which formulate cost-optimized complete and balanced homemade diets for dogs (Joban et al., 2020).

#### *Requires considerable time commitment*

Putting together a homemade recipe can be labor-

**Table 1. Homemade diet, daily portion, formulated for a healthy four-year-old, female, intact, crossbreed dog of 19.2 kilograms.**

| Ingredients  | Amount    |
|--|-----------|
| (1) Rice, white, long-grain, cooked                      | 340 grams |
| (2) Courgette, with skin, boiled and drained             | 320 grams |
| (3) Pork, loin, lean meat, cooked                        | 220 grams |
| (4) Soybean oil  | 10 grams  |
| <b>The following supplements must also be added:</b>     |           |
| *Commercially-available vitamin and mineral mix, 8 grams |           |

\*The name of the manufacturer has been withdrawn

**Table 2. Summary of selected case studies from the literature in which a patient presented with clinical signs due to nutritional deficiency caused by an incomplete or imbalanced homemade diet.**

| Patient(s)                                       | Homemade diet ingredients   | Identified key nutrient deficiencies | Reference                      |
|--|---|--------------------------------------|--------------------------------|
| 7-month-old male-intact bulldog dog              | Meat, cooked cereal, vegetables   | Vitamin D                            | Hall et al., 2020              |
| 8-month-old male-intact Saint Bernard dog        | Ground beef, rice, apple, broccoli, commercial dog food, egg, dietary supplement                                | Calcium, phosphorus, vitamin D       | Hutchinson et al., 2012        |
| 6-month old female-intact giant schnauzer dog    | Ground beef, carrot, green beans, broccoli, sunflower oil, apple, egg, garlic, brown rice flour, oat bran       | Vitamin D                            | Tal et al., 2018               |
| 4-month old male-intact old English sheepdog dog | Selection of meats, selection of vegetables, egg, goat's milk, fish oil, commercial supplement                  | Calcium, phosphorus, Vitamin D       | Dodd et al., 2021              |
| Six cats of 3.5 month of age to 7 months of age  | (1) Meat<br>(2) Meat and rice<br>(3) Meat and rice<br>(4) Potatoes, rice and carrots<br>(5) Chicken<br>(6) Meat | Calcium, phosphorus, vitamin D       | Tomsa et al., 1999             |
| Two 3-month-old female-intact Abyssinian cats    | Meat, milk, yogurt  | Calcium                              | Dimopoulou et al., 2010        |
| 13-year old male-intact poodle dog               | Chicken, basmati rice, soup bouillon  | Calcium                              | Diquélou et al., 2005          |
| 6-year old female-spayed Rottweiler dog          | Meat, pasta, green beans  | Calcium and vitamin D                | De Fornel-Thibaud et al., 2007 |

intensive (Oliveira et al., 2014). In cases where an uncommon food item is selected as an ingredient, the client may have to travel to a boutique shop for purchase or order online. Also, not all ingredients may be available in the same location, so it can take some planning to gather each one. They also may have to be cooked separately, using multiple appliances in the kitchen. All ingredients will have to be mixed to create a homogenous meal. This is particularly important for pets that may pick out and consume only their favorite parts (Remillard and Crane, 2010).

There are, however, measures that can be taken to reduce overall labor. For example, a client can prepare large batches at one time and separate out daily portions to be stored in the refrigerator or freezer. It must be emphasized that food should be re-heated only to room temperature so as not to have impact on heat-labile nutrients. Some of the dietary components which do not have to be kept refrigerated or frozen, such as mineral and vitamin supplements, should be added right before serving and never exposed to heat (Lešková et al., 2006).

### *Requires ingredient storage space*

Especially in the case of large dogs, a sizable volume of home-cooked food will be required to meet daily energy requirements. In the authors' experience, a recipe formulated for a dog can include half a kilogram of a cooked carbohydrate-rich ingredient, such as white potato, per day. Hence, the pet owner will need enough storage to accommodate this daily amount. If large batches are cooked and stored, enough cold

**Table 3. Ingredients which have demonstrated toxicity in dogs and/or cats (Cortinovis and Caloni, 2016; FEDIAF, 2021).**

**Allium species (includes onion, garlic, leek, shallot and chives)**  
**Grapes and raisins**  
**Macadamia nuts**  
**Chocolate**  
**Coffee**  
**Xylitol**

**Table 4. Nutritional risk factors (Adapted from: World Small Animal Veterinary Association Nutritional Assessment Guidelines Task Force (2011)).**

|  |
|--|
| <p><b>History</b></p> <ul style="list-style-type: none"> <li>Altered gastrointestinal function (e.g., vomiting, diarrhea, nausea, flatulence, constipation)</li> <li>Previous or ongoing medical conditions/disease</li> <li>Currently receiving medications and/or dietary supplements</li> <li>Snacks, treats, table food &gt; 10% of total calories</li> <li>Inadequate or inappropriate housing</li> <li>Not yet reached adulthood bodyweight</li> <li>Currently in gestation or lactation</li> <li>Heavy activity or sporting activity</li> </ul> |
| <p><b>Physical Examination</b></p> <ul style="list-style-type: none"> <li>Body condition score, on a 9-point scale, of less than 4 or greater than 5</li> <li>Muscle condition score: Mild, moderate, or marked muscle wasting</li> <li>Unexplained weight change</li> <li>Dental abnormalities or disease</li> <li>Poor skin or hair coat</li> <li>New medical conditions/disease</li> </ul>  |

storage should be available to accommodate at least several days'-worth of meals.

#### *Lack of consistency and quality testing*

Unlike commercial diets, homemade diets do not undergo the quality control testing which is mandated by trustworthy manufacturers (Villaverde and Chandler, 2022). Commercial products do not differ with each batch produced, as manufacturers can evaluate the nutrient composition through the production chain and final product. Quality assurance can also include digestibility testing and long-term feeding studies; both of which are not possible to be practically carried out in case of a home-cooked diet recipe.

#### **Homemade diet risks**

##### *Deficiencies and imbalances*

Homemade diets which have not been formulated by a qualified veterinary clinical nutritionist, are not likely to meet nutritional requirements (Dodd et al., 2021; Heinze et al., 2012; Kawaguchi et al., 1993; Larsen et al., 2012; Pedrinelli et al., 2017; Pedrinelli et al., 2021; Streiff et al., 2002). These recipes may be found in books, online, or pet owners may come up with one of their own (Larsen et al., 2012; Morelli et al., 2021; Morris, 2021; Stockman et al., 2013). These recipes have been found to lack clarity when describing preparation, the ingredients, and how much of each ingredient is used (Larsen et al., 2012; Wilson et al., 2019). They will, therefore, yield a variable result depending on the individual interpretation of the instructions.

There is evidence from multiple case studies where feeding homemade diets led to severe deficiencies

which manifested with overt clinical signs. Homemade diet key nutrient deficiencies involving vitamin D, calcium and phosphorus are commonly documented in the literature (de Fornel-Thibaud et al., 2007; Dimopoulou et al., 2010; Diquélou et al., 2005; Dodd et al., 2021; Hall et al., 2020; Hutchinson et al., 2012; Tal et al., 2018; Tomsa et al., 1999) (Table 2).

##### *Extended feeding of prescribed homemade diets intended for short-term use*

Previously, it has been mentioned that veterinarians may prescribe a homemade diet consisting of two ingredients for diagnosis of adverse reactions to food (see above). The intention is that these will be fed for no longer than the length of the elimination trial of three months, plus a few additional weeks to diagnose individual adverse reactions to specific ingredients (Rosser Jr, 2013).

It is also common for veterinarians to recommend feeding 'bland' diets consisting of a single protein source and rice in case of acute gastrointestinal upset (Guilford and Matz, 2003; Rondeau, 2022; Zoran, 2008). This diet is to be fed only for a few days, or once the gastrointestinal symptoms resolve.

In the abovementioned cases, a client may very well see a decrease in the clinical symptoms of their pet after switching to the short-term-recommended homemade diet. These diets are sometimes then fed over a longer term without realizing that they are imbalanced and will not meet established nutritional needs. This has been seen in a published case study by Hutchinson et al. (2012), in which a puppy was fed a homemade diet consisting of ground beef and rice helped to resolve an episode of acute diarrhea but then was continued to be fed even after symptom resolution.

### Diet drift

One common concern that arises when recommending a homemade diet is the issue of diet drift. This is the phenomenon which occurs as a client becomes over-confident and no longer closely references the recipe while preparing it. Ingredients may end up mis-measured or missing from the final recipe (Johnson et al., 2016; Oliveira et al., 2014). This may lead to nutrient imbalances as well as toxicities or deficiencies. It is imperative that the ingredients for homemade diet recipes are weighed out each time the meal is prepared, using a gram scale (Boothby et al., 2022).

### Inclusion of toxic ingredients

Some clients have been found to create their own homemade diet recipe using ingredients which they believe to be suitable. There are reports of pet owners who include toxic ingredients such as garlic and on-

ions as ingredients in homemade recipes (Stockman et al., 2013; Tal et al., 2018). In Table 3, a summary of ingredients which have demonstrated toxicity in dogs and/or cats is shown.

### Ingredient variability

Even when recipes are formulated by a veterinary nutrition diplomat, the nutrient levels of a chosen ingredient may differ from what has been included in the ingredient database. In a study by Stockman et al. (2013), significant differences in concentrations of fat, copper and choline have been demonstrated when homemade recipes were analyzed quantitatively using computer software versus when they were analyzed in a laboratory (Stockman et al., 2013). Nutrient levels in raw materials can differ based on factors such as seasonality (Birnin-Yauri et al., 2011; Kim et al., 2007; Pérez-Serrano et al., 2020; Phillips et al., 2018; Wills et al., 1984; Wunderlich et al., 2008), cultivar (Assirey, 2018; Baranski et al., 2012; Dris et al., 1998;

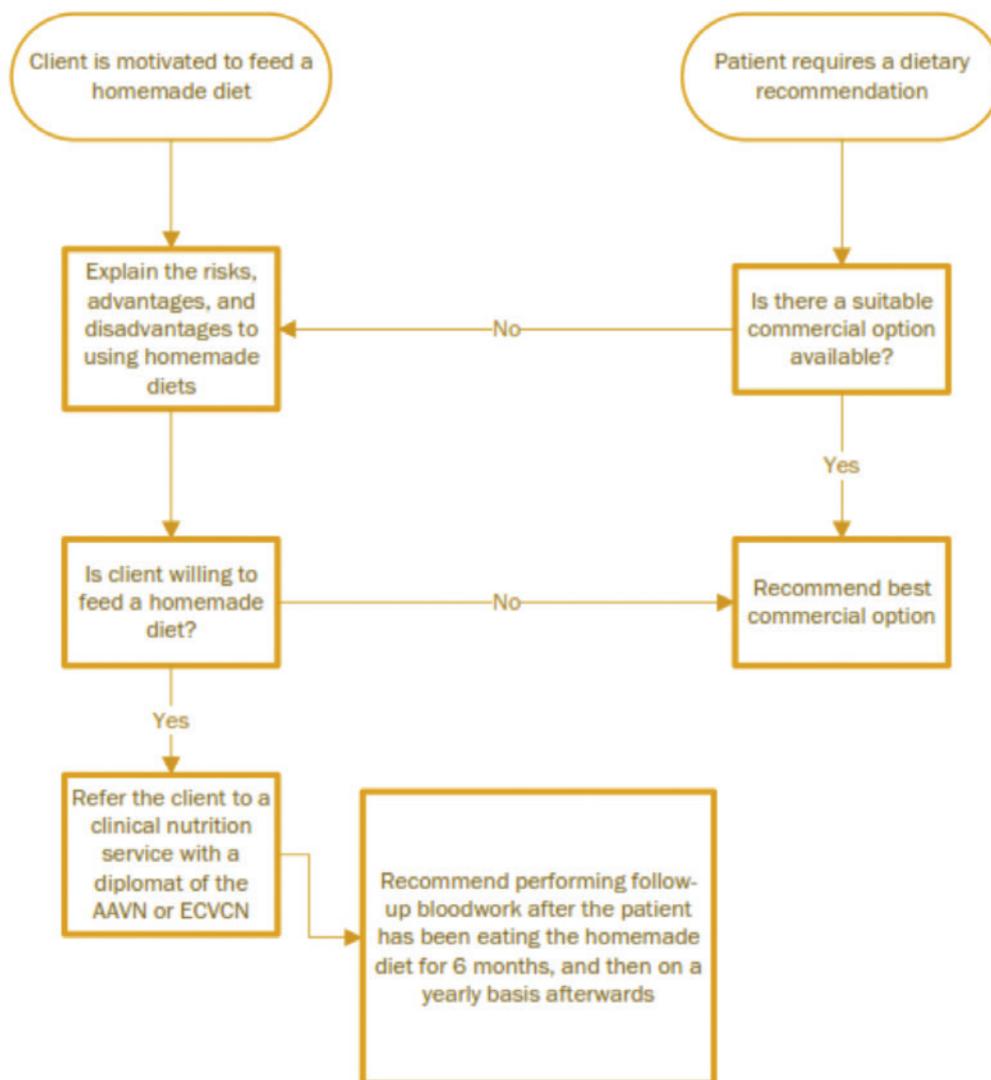


Figure 1. Flowchart demonstrating the path for a general practitioner to recommend a homemade diet to a client.

Simmonds and Preedy, 2015), and length of storage (Fennema et al., 2007; Severi et al., 1997).

Ingredients with even small variations in nutrient composition can be problematic when being used in recipes in which key nutrients have to be exact. For example, recipes for growing animals in which calcium and phosphorus levels have to meet nutritional requirements and be in balance with each other. Voorhout and Hazewinkel (1987) have demonstrated a disturbance in the secondary ossification centers of the long bone with levels of calcium in the diet that are below or above the established recommendation for puppies. An imbalance in the calcium to phosphorus ratio can cause long-lasting bone deformities in growing dogs (Schoenmakers et al., 2000).

### Incorporating homemade diets into general practice

The nutritional assessment has been established as the fifth vital sign and must be performed at every consultation (WSAVA Nutritional Assessment Guidelines Task Force Members, 2011). It is therefore important that all veterinarians are confident when discussing the option of homemade diets with their clients and know when to use a referral service. As was mentioned previously, a large percentage of pet owners are turning to unreliable sources when making decisions about feeding (see above). By understanding the basic process of creating homemade diets as well as the advantages and disadvantages, veterinarians can help clients make an informed decision. This approach provides more value to the general practice consultation as a whole and is likely to improve client compliance (Coe et al., 2008).

### How to evaluate a homemade diet

Homemade diets can be quickly screened to determine if they are cause of immediate nutritional concern. It is important that diets which have not been formulated by a qualified nutritionist (see above) are properly audited to determine suitability for long-term feeding.

A homemade diet should include a source of protein, fat, minerals and vitamins (Cline, 2017; Weeth, 2012). A carbohydrate source isn't strictly necessary to meet nutritional requirements (National Research Council, 2006) but is often included as a concentrated source of energy and dietary fiber, which is benefi-

cial to intestinal health (Moreno et al., 2022; Pilla and Suchodolski, 2021).

In the case of a patient with a nutritional risk factor (Table 4) who is consuming a homemade diet that has not been formulated by a qualified individual, a referral should be made for a nutritional consult or the patient should be switched to a suitable commercial diet option.

### Homemade diet referrals

The primary reasons that referrals are made for homemade diet formulation is because the pet owner is especially motivated or there are no suitable commercial options available. Clients who are referred should be informed about the drawbacks and risks of a homemade diet, and must ensure it is a good fit for them and their pet (Figure 1). Clinical veterinary nutritionists often work closely with referring veterinarians to match the nutrient profile of the homemade diet to any changing nutritional requirements in light of ongoing diagnostics and treatment.

### CONCLUSION

With homemade diets becoming more common among pet owners, general practitioners must be well-versed in their advantages, drawbacks and risks. Not only do pet owners have to source their recipes from a qualified individual but they must be aware of the long-term commitment that is needed when feeding a homecooked meal. The understanding of how homemade diets can fit into general practice further opens up possibilities for partnerships between general practitioners and clinical nutritionists. Ultimately, both parties should work together for mutual benefit to create the best possible treatment plan for their patients.

### REFERENCES

For a complete reference list, contact the authors.



© 2022 by the authors. Licensee Vlaams Diergeneeskundig Tijdschrift, Ghent University, Belgium. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).