NUTRITION THAT GOES BEYOND SKIN DEEP

The most common causes of skin problems are attributed to parasites such as fleas, ticks, lice and mites; environmental allergies; and adverse food reactions. Targeted nutrition can play a key role in supporting cats and dogs with any of these issues, writes Clare Hemmings Cert CFVHNut, Royal Canin

Skin problems are among the most common reasons why cat and dog owners seek veterinary advice, accounting for around 20% of the average vet's consultations (Hill *et al*, 2006). This is perhaps because changes to the skin and coat and incessant pruritus are noticeable to owners (Mueller *et al*, 2017).

Once parasites and infections are under control or ruled out, the next step towards diagnosis is running a food elimination trial for at least eight weeks (Olivry *et al*, 2015). Importantly, Mueller & Unterer (2018) found that this was the only reliable method for diagnosing adverse food reactions (AFR), with blood, serum, saliva and hair testing all commonly giving false results.

ADVERSE FOOD REACTIONS

Signs of AFR can include erythema, lichinification, eosinophilic plaques, excoriations and pruritus as well as gastrointestinal signs, usually in the form of diarrhoea and/or vomiting.

Some animals can react concurrently to both food and environmental factors and can be harder to manage as a result. The goal, in this case, would be to firstly identify the food allergen and then for long-term feeding, ensure the appropriate diet contains high-quality, digestible protein to which the animal is not reactive and one which incorporates nutrients for additional nourishment for the skin, as explained later in this article.

Although there is a relatively low incidence of true food allergy, the most common dietary allergens are due to proteins with a molecular weight of between 15-40 kilodaltons (KDa), and these are often meat proteins (Cave, 2008). Beef, fish and chicken are the top three allergens in cats and beef, dairy and chicken in dogs. Additionally, studies using DNA analysis by Olivry & Mueller (2018) showed significant cross contamination in many pet foods sold as 'single protein source' with many being specifically labelled as ideal diets for food allergies.

Importantly, as Beynen (2017) explains, the word 'hypoallergenic' has no legal definition nor legal efficacy but frequent use of this marketing term results in approximately 5% of prepared pet foods being marketed as 'low allergy' to consumers. This increased consumer awareness of 'hypoallergenic' diets in turn fuels public perception that allergy to food is a much more common cause of skin issues and scratching than current figures show (1-2% of any diagnosis and 0-24% of those with skin diseases, Olivry & Mueller, 2017).

Blood testing is useful to identify ingredients to which a pet has not been exposed, in order to find something novel with which to run an elimination trial. However, in recent years, pet foods have contained such a wide variety of unusual protein sources, finding one to which the animal has not already been exposed to can be tricky. For this reason, the ideal diet would contain a hydrolysed protein source (Biourge *et al*, 2004).

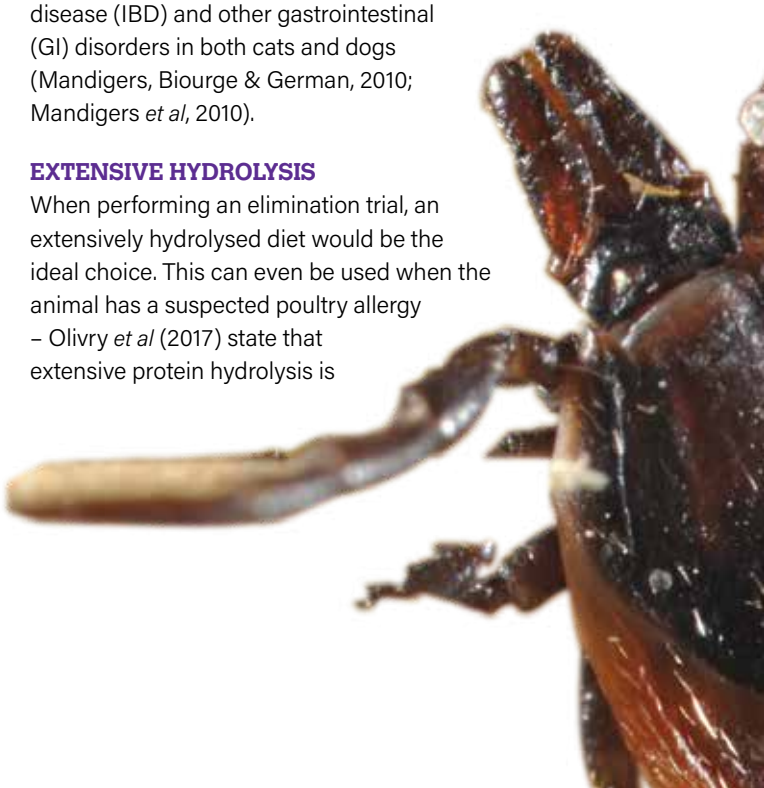
HYDROLYSIS

Hydrolysis, put simply, is a process by which a protein source is broken down at a molecular level before it is used in a diet. This means that, although the pet will be receiving essential and adequate amino acids from its food, the body can't recognise the protein structure and, therefore, the risk of a reaction is greatly reduced. Although using a hydrolysed soya or hydrolysed poultry diet for an elimination trial is highly successful (Cave, 2006), it is not 100%. One potential pitfall that is sometimes seen with hydrolysed diets is that the lower the molecular weight of the protein, the more bitter the taste. This could be problematic since a pet must eat it to the exclusion of anything else for significant period of time.

To combat this, the ideal hydrolysed diet should be highly palatable as well as balanced and digestible. Soya isolate, incidentally, is the protein often used for human babies with dairy intolerances. Some hydrolysed diets are also available to suit the lifestyle and size of the pet. A hydrolysed diet manufactured with soya-protein isolate has also been clinically proven to improve the signs of inflammatory bowel disease (IBD) and other gastrointestinal (GI) disorders in both cats and dogs (Mandigers, Biourge & German, 2010; Mandigers *et al*, 2010).

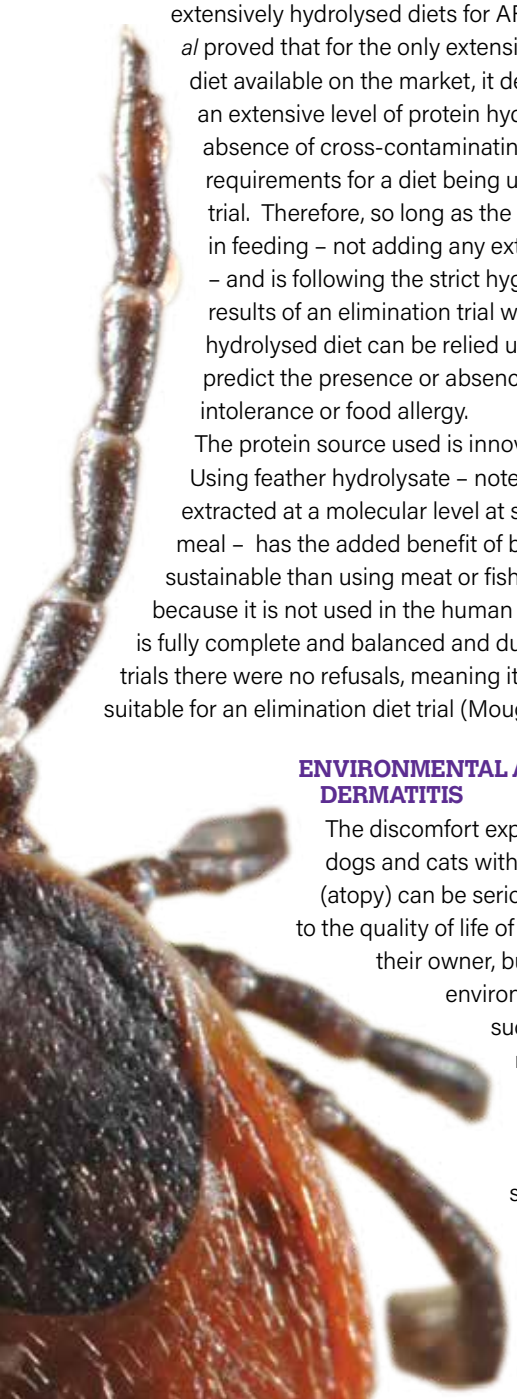
EXTENSIVE HYDROLYSIS

When performing an elimination trial, an extensively hydrolysed diet would be the ideal choice. This can even be used when the animal has a suspected poultry allergy – Olivry *et al* (2017) state that extensive protein hydrolysis is



indispensable for success. Extensively hydrolysed proteins are those which have been broken down to below 1kDa in molecular weight. Proteins of this size are very unlikely to be recognised as the original protein source and, therefore, can confidently be used regardless of the protein to which the pet is sensitised. Studies using DNA and protein analysis by Lesponne *et al* (2018) support the clinical reliability of extensively hydrolysed diets for AFR. Lesponne *et al* proved that for the only extensively hydrolysed diet available on the market, it demonstrated an extensive level of protein hydrolysis and the absence of cross-contaminating protein – both key requirements for a diet being used in an elimination trial. Therefore, so long as the owner is compliant in feeding – not adding any extras or feeding treats – and is following the strict hygiene guidelines, the results of an elimination trial with an extensively hydrolysed diet can be relied upon to effectively predict the presence or absence of a nutrient intolerance or food allergy.

The protein source used is innovative and unusual. Using feather hydrolysate – note this is protein extracted at a molecular level at source, not feather meal – has the added benefit of being much more sustainable than using meat or fish protein sources because it is not used in the human food chain. The diet is fully complete and balanced and during the feeding trials there were no refusals, meaning its palatability is suitable for an elimination diet trial (Mougeot *et al*, 2013).



ENVIRONMENTAL ALLERGY – ATOPIC DERMATITIS

The discomfort experienced by dogs and cats with atopic dermatitis (atopy) can be seriously detrimental to the quality of life of both the pet and their owner, but exposure to environmental allergens, such as pollen, dust mites, feathers and grass, is very difficult to control. Although the symptoms of atopy in cats are similar to those seen in the condition in dogs, the function and reaction of the allergen-specific immunoglobulin E (IgE) receptors in cats is not wholly understood and, therefore, it is recommended that the condition be referred to as 'feline atopy-like dermatitis' (Gedon & Mueller, 2018). Interestingly, a 2018 study of around 5,700 dogs by Hakenen *et al*, found that owners showing allergic symptoms were more likely to own atopic dogs, and were also more likely to live in urban areas.

Often a contact dermatitis is seen that only affects the abdomen and paws, but the whole of the skin can be affected (Gedon & Mueller, 2018). There is a genetic predisposition for atopy in some breeds, including Labradors, Golden Retrievers and West Highland White Terriers, but it can affect any breed. In cats, there is speculation as to a genetic predisposition as noted in 2001 by Moriello when atopy was diagnosed in three littermates. However, there are few genetic studies of this condition in cats.

The primary goal when selecting a diet to support atopic patients is to select one which can help reduce the signs and help minimise discomfort. Van Bleek *et al* (2015) and Watson *et al* (2006) demonstrated the benefits of including nutrients specifically chosen to support the barrier function of the skin and other nutrients such as Ω3 fatty acids from fish oil, linolenic acid and borage oil.

SUMMARY

Conditions of the skin and coat are distressing for both pet and owner and seriously impact the quality of life of all concerned.

While allergies to food or to environmental factors cannot be cured, the signs can be improved when careful consideration is made in choosing nutritional support.

This is true not only during the initial phase, but also when considering what to feed in the long term. Two factors need to be considered when selecting a diet for patients with skin disease:

1. The nutritional composition of the diet, which should include nutrients to support the barrier effect of the skin; and
2. Due to the potential for cross-contamination, the quality and integrity of the manufacturing process should be exemplary. Feeding the right diet is invaluable in supporting patients with AFR