Professional Certificate in Allergies in Pets

Nutrition And Allergies In Pets

Allergen – any substance that can provoke an immune response in a pet. Allergens may be proteins, lipids, carbohydrates, or small molecules that the animal's immune system recognises as foreign. In practice, a veterinarian may suspect a specific allergen when a dog develops pruritic skin lesions after eating a particular commercial diet, or when a cat's respiratory signs worsen after exposure to pollen. Understanding the nature of the allergen is the first step in diagnosing food-related versus environmental allergies.

Immunoglobulin E (IgE) – a class of antibody that mediates immediate-type hypersensitivity reactions. When a pet is sensitised to an allergen, IgE binds to mast cells and basophils. Upon re-exposure, cross-linking of IgE triggers the release of histamine, prostaglandins, and leukotrienes, leading to clinical signs such as itching, swelling, and erythema. Laboratory tests that measure serum IgE levels can help identify specific allergens, though false-positive results are common.

Food Allergy – an adverse immunologic reaction to a dietary protein or, less frequently, to a carbohydrate or lipid component. True food allergy involves IgE-mediated sensitisation, whereas food intolerance may involve non-immune mechanisms such as enzyme deficiencies. The classic presentation includes recurrent otitis externa, pruritus, and gastrointestinal upset. An elimination diet trial, followed by a controlled food challenge, is the gold-standard diagnostic approach.

Elimination Diet – a diet that removes all potential allergenic proteins, typically using a single novel protein source and a single carbohydrate source that the pet has never consumed before. For example, a hypoallergenic diet for a dog might contain duck meat and tapioca starch. The diet is fed for a minimum of eight weeks, after which the original diet is re-introduced to confirm the diagnosis. Nutritional adequacy must be maintained throughout the trial, often requiring a commercial therapeutic formula or a carefully balanced home-prepared diet.

Novel Protein – a protein source that the animal has not previously been exposed to, reducing the likelihood of pre-existing sensitisation. Common novel proteins include venison, rabbit, or kangaroo for dogs, and quail or salmon for cats. Selecting a novel protein is essential for an effective elimination diet, yet some pet owners may face difficulty sourcing these ingredients or may encounter cross-reactivity with related species.

Hydrolysed Protein – a protein that has been broken down into small peptide fragments, typically less than 10,000 Daltons, which are too small to be recognised by IgE antibodies. Hydrolysed diets are frequently recommended for pets with confirmed food allergies or for those that have failed a novel protein trial. Practical challenges include higher cost, limited palatability for some animals, and the need for rigorous quality control to ensure consistent hydrolysis.

Cross-reactivity – a phenomenon where antibodies generated against one allergen also recognise a structurally similar allergen, leading to unexpected reactions. For instance, a cat sensitised to beef may also react to lamb because of shared epitopic regions. Cross-reactivity complicates both diagnosis and dietary management, as it may require broader exclusion of related proteins.

Atopic Dermatitis – a chronic, inflammatory skin disease characterised by pruritus, erythema, and secondary infections. While atopic dermatitis is primarily driven by environmental inhalant allergens, secondary food allergies can exacerbate the condition. Management often involves a combination of allergen avoidance, topical therapy, and systemic immunomodulators.

Pruritus – the sensation that leads to scratching or rubbing. In pets, pruritus is a common clinical sign of allergic disease, and its intensity can be quantified using validated scoring systems such as the Canine Itch Scale. Understanding the underlying cause of pruritus (e.g., food-borne versus inhalant) guides therapeutic decisions.

Mast Cell – a type of immune cell that stores histamine, heparin, and other mediators. Upon activation by IgE cross-linking, mast cells degranulate, releasing substances that cause vasodilation, increased vascular permeability, and nerve stimulation. Mast cell stabilisers such as cromolyn sodium may be used as adjunctive therapy in allergic pets.

Histamine – a vasoactive amine released from mast cells and basophils. Histamine contributes to the classic signs of an allergic reaction, including redness, swelling, and itch. Antihistamines (e.g., cetirizine, diphenhydramine) can provide partial relief of pruritus but are often insufficient as sole therapy for severe food allergies.

Cytokine – signaling proteins released by immune cells that regulate inflammation. In allergic dermatitis, cytokines such as interleukin-4 (IL-4) and interleukin-31 (IL-31) play pivotal roles in the development of pruritus and skin barrier dysfunction. Emerging biologic therapies targeting IL-31 have shown promise in refractory cases.

Environmental Allergen – substances present in the pet's surroundings that can trigger an allergic response. Common examples include house dust mite (Dermatophagoides spp.), pollen, mold spores, and flea saliva. Environmental allergen testing (intracutaneous skin testing or serum IgE panels) assists in identifying sensitisation patterns, which may influence nutritional recommendations (e.g., avoidance of flea infestations to reduce secondary skin trauma).

Inhalant Allergen – a subset of environmental allergens that are inhaled, such as pollen or dust mite particles. Inhalant allergens primarily affect the respiratory tract but can also contribute to cutaneous signs through systemic sensitisation. Managing inhalant exposure may reduce the overall inflammatory load, thereby improving the response to dietary therapy.

Contact Allergy – an allergic reaction that occurs when the skin directly contacts an allergen, such as certain

cleaning agents, perfumes, or plastics. Contact allergies can mimic food-related dermatitis, leading to misdiagnosis if not carefully evaluated. Practical steps include reviewing the pet's grooming products and bedding materials.

Type I Hypersensitivity – the classic IgE-mediated allergic reaction that occurs within minutes of exposure to an allergen. Clinical manifestations include urticaria, angioedema, anaphylaxis, and immediate-type pruritus. In the context of nutrition, type I hypersensitivity underlies true food allergies.

Type IV Hypersensitivity – a delayed-type immune response mediated by T-cells, typically manifesting 24–72 hours after exposure. While less common in food allergies, type IV reactions can occur with certain food additives or preservatives, presenting as chronic dermatitis. Patch testing may help identify the offending agent.

Anaphylaxis – a severe, systemic allergic reaction that can be life-threatening. Rapid onset of airway obstruction, hypotension, and shock characterises anaphylaxis. In pets, anaphylaxis may be precipitated by an acute ingestion of a highly allergenic food, especially in previously sensitised animals. Immediate treatment includes intramuscular epinephrine, airway support, and fluid therapy.

Immunotherapy – also known as allergen-specific immunotherapy (ASIT), it involves the gradual administration of increasing doses of the identified allergen to induce tolerance. While primarily used for inhalant allergens, immunotherapy can complement dietary management in pets with mixed allergic profiles.

Desensitisation – the process by which repeated exposure to an allergen reduces the immune system's reactivity. Desensitisation is the therapeutic goal of immunotherapy. In nutritional practice, desensitisation may be considered when a pet has limited dietary options and requires exposure to a specific protein for nutritional reasons.

Skin Barrier Function – the protective role of the epidermis in preventing transepidermal water loss and entry of irritants. Allergic inflammation can compromise barrier integrity, leading to increased susceptibility to secondary infections. Nutritional strategies that support barrier function include supplementation with omega-3 fatty acids and ceramides.

Essential Fatty Acid (EFA) – fatty acids that cannot be synthesised by the body and must be obtained from the diet. The two primary EFAs for dogs and cats are linoleic acid (omega-6) and alpha-linolenic acid (omega-3). Adequate EFA intake helps maintain skin health, reduces inflammation, and may lessen the severity of allergic dermatitis.

Omega-3 Fatty Acid – a family of polyunsaturated fatty acids, including eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). Omega-3s possess anti-inflammatory properties and are frequently added to therapeutic diets for pets with allergic skin disease. Practical application involves prescribing a diet containing 1–2 % EPA/DHA on a caloric basis, or supplementing with fish oil capsules.

Omega-6 Fatty Acid – another class of polyunsaturated fatty acids, essential for maintaining skin barrier integrity. Over-supplementation of omega-6 relative to omega-3 can exacerbate inflammation. Balancing the omega-6:omega-3 ratio (often targeted at 5:1 or lower) is a key nutritional consideration in allergic pets.

Prebiotic – a non-digestible food ingredient that selectively stimulates the growth or activity of beneficial gut bacteria. Common prebiotics include fructooligosaccharides (FOS) and inulin. In allergic animals, prebiotics may help modulate the gut microbiome, reducing systemic immune activation and improving skin outcomes.

Probiotic – live microorganisms that, when administered in adequate amounts, confer a health benefit. Strains such as Lactobacillus acidophilus and Bifidobacterium animalis are frequently incorporated into pet foods. Probiotic supplementation can aid in restoring microbial balance after antibiotic therapy, which is common in pets with secondary bacterial infections secondary to allergic dermatitis.

Metabolizable Energy (ME) – the portion of a food's gross energy that is available for the animal's metabolic processes after accounting for losses in feces, urine, and gases. Accurate calculation of ME is crucial when formulating therapeutic diets, especially for overweight allergic pets where caloric restriction must be balanced with nutritional adequacy.

Digestibility – the proportion of a nutrient that is absorbed from the gastrointestinal tract. Protein digestibility is a critical quality indicator; highly digestible proteins reduce the antigenic load presented to the immune system. The apparent digestibility coefficient (ADC) is often used to compare commercial diets.

Protein Quality – a measure of how well a protein source supplies essential amino acids in the correct proportions. High-quality proteins, such as animal-derived whey or egg protein, have a biological value (BV) approaching 100 %. In the context of food allergies, high protein quality ensures that even when a single protein source is eliminated, the pet receives sufficient essential amino acids.

Amino Acid Profile – the composition and relative amounts of individual amino acids in a protein source. For cats, the dietary requirement for taurine is non-negotiable; a deficiency can lead to retinal degeneration and cardiomyopathy. When constructing a novel-protein diet, the amino acid profile must be evaluated to avoid deficiencies.

Bioavailability – the proportion of a nutrient that is absorbed and utilised by the body. Minerals such as iron and zinc may have low bioavailability in plant-based diets due to phytate binding. Understanding bioavailability guides the inclusion of chelated mineral forms or the addition of enzyme preparations to enhance absorption.

Allergenic Protein – a protein that has the potential to trigger an IgE-mediated response. In dogs, common allergenic proteins include beef, chicken, dairy, and wheat gluten. In cats, fish and beef are frequent culprits. Identifying the specific allergenic protein is essential for designing appropriate elimination or hydrolysed diets.

Grain-Free Diet – a diet that excludes cereal grains such as corn, wheat, and barley. While grain-free diets are marketed as hypoallergenic, they often replace grains with other carbohydrate sources like peas or lentils, which can become new allergen sources. Recent research suggests a possible association between grain-free diets high in legumes and canine dilated cardiomyopathy, underscoring the need for careful formulation.

Low-Fat Diet – a dietary regimen that reduces total fat content, typically to less than 10 % of metabolizable energy. Low-fat diets may be prescribed for overweight allergic pets to aid weight loss, but excessive fat reduction can impair skin barrier function and reduce the intake of essential fatty acids. Balancing caloric restriction with adequate EFAs is a frequent challenge.

High-Protein Diet – a diet containing greater than 30 % of metabolizable energy from protein. High-protein diets are often employed in active working dogs or in cases of muscle loss due to chronic inflammation. However, in pets with food allergies, a high-protein diet may increase the risk of antigen exposure if the protein source is not truly novel or hydrolysed.

Caloric Density – the amount of energy per unit weight of food, expressed as kcal/kg. Foods with high caloric density can lead to over-consumption in small-mouth breeds, while low-density foods may be beneficial for weight management. Adjusting caloric density is a practical tool when tailoring diets for allergic pets with concurrent obesity.

Body Condition Score (BCS) – a visual assessment scale ranging from 1 (emaciated) to 9 (obese) that estimates the animal's adiposity. Accurate BCS evaluation is essential when monitoring the impact of dietary changes in allergic pets, as both under- and over-nutrition can exacerbate skin disease.

Obesity – a condition characterised by excess adipose tissue, often linked to chronic low-grade inflammation. Obese pets may experience worsened pruritus due to increased cytokine production. Weight loss protocols that incorporate high-protein, low-glycaemic diets can improve both metabolic health and allergic skin signs.

Weight Management – the systematic approach to achieving and maintaining an optimal body weight. Strategies include controlled caloric restriction, increased fibre to promote satiety, and regular exercise. In allergic animals, weight management must also consider the need for adequate EFAs and nutrient density to support skin health.

Nutrient Deficiency – a shortfall in essential nutrients that can impair physiological functions. For example, a deficiency in vitamin E can lead to oxidative stress and exacerbate dermatitis. When formulating elimination diets, it is critical to ensure that all vitamins and minerals meet the recommended levels, often by adding a premix.

Vitamin E – a fat-soluble antioxidant that protects cell membranes from oxidative damage. In allergic pets, vitamin E supplementation can reduce the severity of skin lesions by decreasing lipid peroxidation. Typical

therapeutic doses range from 5–10 IU/kg body weight per day.

Vitamin A – a fat-soluble vitamin essential for epithelial integrity and immune function. Deficiency can manifest as hyperkeratosis and impaired wound healing, while excess may cause skeletal abnormalities. Balancing vitamin A levels is particularly important in diets that rely heavily on liver or fish oils, which are rich sources.

Vitamin D – a secosteroid hormone that regulates calcium and phosphorus metabolism. In cats, vitamin D deficiency is rare but can occur in homemade diets lacking fortified ingredients. Adequate vitamin D status supports overall immune health, potentially reducing allergic inflammation.

Mineral – inorganic elements required for a variety of physiological processes, such as calcium for bone health and zinc for skin integrity. In allergic pets, zinc deficiency can lead to alopecia and poor coat quality. Supplementation must respect the upper tolerable limits to avoid toxicity.

Zinc – a trace mineral involved in enzymatic reactions, immune function, and skin health. Therapeutic zinc supplementation (e.g., zinc gluconate) may be prescribed at 1–2 mg/kg body weight per day for pets with refractory dermatitis.

Trace Elements – minerals required in minute amounts, including selenium, copper, manganese, and iodine. Selenium, as part of the selenoprotein glutathione peroxidase, protects cells from oxidative damage. In allergic animals, adequate trace element status supports antioxidant defenses.

Selenium – an essential trace element that functions as a cofactor for antioxidant enzymes. Dietary selenium is commonly provided as selenomethionine in pet foods. Over-supplementation can cause selenosis, so precise formulation is vital.

Antioxidant – a molecule that neutralises free radicals, preventing cellular damage. In the context of allergies, antioxidants such as vitamin C, vitamin E, and selenium can mitigate oxidative stress associated with chronic inflammation. Clinical studies have shown modest improvements in pruritus scores when antioxidants are added to therapeutic diets.

Calcium-Phosphorus Ratio – the proportion of calcium to phosphorus in the diet, ideally maintained between 1:1 and 1.3:1 for most adult dogs and cats. Imbalance can affect bone health and may indirectly influence immune function. When formulating hypoallergenic diets, attention to this ratio prevents iatrogenic skeletal disorders.

Fiber – indigestible carbohydrate that adds bulk to the diet and modulates gastrointestinal transit. Soluble fiber can be fermented by colonic bacteria to produce short-chain fatty acids, which have anti-inflammatory effects. In allergic pets, adding moderate amounts of beet pulp or psyllium can improve stool quality and may reduce systemic inflammation.

Soluble Fiber – a type of fiber that dissolves in water, forming a gel-like substance. It is fermentable and can

increase the production of beneficial short-chain fatty acids. Common sources include oat bran and pectin. Soluble fiber can aid in weight management by promoting satiety.

Insoluble Fiber – a fiber type that does not dissolve in water and adds bulk to the stool, promoting regular bowel movements. Examples include cellulose and wheat bran. While insoluble fiber is less fermentable, it can be useful for managing constipation in pets receiving low-fat diets.

Short-Chain Fatty Acids (SCFA) – metabolites produced by bacterial fermentation of soluble fiber, including acetate, propionate, and butyrate. SCFAs serve as an energy source for colonocytes and have systemic anti-inflammatory properties. Enhancing SCFA production through dietary fiber may help modulate allergic responses.

Prebiotic-Fiber Blend – a combination of soluble and insoluble fibers designed to optimise gut health. Formulations often include chicory root (inulin) and beet pulp. When introduced gradually, this blend can improve stool consistency and support a balanced microbiome in allergic pets.

Digestive Enzyme Supplement – products containing proteases, amylases, and lipases that aid in the breakdown of macronutrients. In pets with compromised digestion due to chronic inflammation, enzyme supplementation can improve nutrient absorption and reduce antigenic peptide load.

Metabolic Energy Requirement (MER) – the amount of energy needed to maintain basic physiological functions at rest. MER is calculated based on body weight and activity level, and serves as a baseline for diet formulation. Adjusting MER for allergic pets may involve reducing caloric intake while ensuring sufficient nutrient density.

Resting Energy Requirement (RER) – a specific calculation of energy needs for a resting animal, typically expressed as 70 × body weight (kg)^0.75. RER is used as a starting point for determining daily caloric needs, especially when formulating therapeutic diets for pets with limited activity due to skin discomfort.

Therapeutic Diet – a specially formulated food designed to manage a specific health condition, such as food allergy, dermatologic disease, or renal insufficiency. Therapeutic diets for allergic pets often contain hydrolysed proteins, limited ingredient lists, and added omega-3 fatty acids. Commercial options must meet AAFCO or NRC nutrient profiles.

AAFCO – the Association of American Feed Control Officials, which sets nutrient standards for pet foods in the United States. AAFCO nutrient profiles provide minimum and maximum levels for essential nutrients, ensuring that therapeutic diets meet safety and efficacy criteria.

NRC – the National Research Council, which publishes comprehensive nutrient requirement guidelines for dogs and cats. The NRC guidelines are used internationally as a reference for formulating balanced diets, especially when creating home-prepared recipes for allergic pets.

Home-Prepared Diet – a diet cooked and assembled by the pet owner, often using fresh ingredients. While

home-prepared diets can be tailored to avoid specific allergens, they require meticulous formulation to avoid deficiencies. Nutrient analysis software and consultation with a veterinary nutritionist are essential for success.

Commercial Therapeutic Food – a pet food manufactured under strict quality controls, designed to meet specific health needs. Commercial options provide convenience and consistent nutrient composition, but may be limited in flavour variety, leading to compliance issues in some allergic pets.

Palatability – the degree to which a food is acceptable to the animal's taste and smell preferences. Palatability challenges are common with hydrolysed or novel protein diets, as the breakdown of proteins can reduce aromatic compounds. Enhancing palatability may involve adding low-level flavour enhancers or warm feeding temperatures.

Compliance – the extent to which pet owners follow prescribed dietary protocols. High compliance is critical for accurate diagnosis during an elimination diet trial. Strategies to improve compliance include clear written instructions, feeding schedules, and regular follow-up appointments.

Secondary Infection – an opportunistic bacterial or fungal infection that occurs due to compromised skin barrier from allergic inflammation. Common secondary infections include Staphylococcus pseudintermedius in dogs and Malassezia pachydermatis in cats. Effective management of the primary allergy often reduces the frequency and severity of secondary infections.

Antibiotic Stewardship – the judicious use of antibiotics to minimise resistance development. In allergic pets with secondary bacterial infections, culture-guided therapy is preferred over empirical treatment. Reducing unnecessary antibiotic use also preserves the gut microbiome, which influences immune regulation.

Flea Allergy Dermatitis (FAD) – an allergic reaction to flea saliva, one of the most common skin conditions in dogs and cats. FAD can mask or exacerbate food-related pruritus, making diagnosis challenging. Effective flea control is a prerequisite for accurate assessment of food allergies.

Flea Control – strategies to prevent flea infestation, including topical spot-on products, oral systemic agents, and environmental treatments. Consistent flea control reduces the antigenic load from flea saliva, thereby decreasing the overall inflammatory burden in allergic pets.

Dermatophagoides spp. – a genus of house dust mites commonly implicated in inhalant allergies. Dust mite allergens can be present in bedding, carpets, and upholstery. Reducing dust mite exposure may involve washing pet bedding in hot water, using allergen-impermeable covers, and regular vacuuming with HEPA filters.

Allergen Immunotherapy (AIT) – the administration of gradually increasing doses of an identified allergen to induce immune tolerance. AIT can be administered subcutaneously (SCIT) or sublingually (SLIT). In practice, AIT is most effective for inhalant allergens, but may complement dietary therapy for pets with mixed allergic

profiles.

Patch Testing – a diagnostic method in which small amounts of potential allergens are applied to the skin under occlusive patches. The skin is examined after 48–72 hours for signs of localized inflammation. Patch testing can identify contact allergens that may contribute to dermatitis in pets with food allergies.

Serum IgG Test – a blood test that measures IgG antibodies against specific food proteins. While IgG testing is widely marketed, its clinical relevance is controversial because IgG antibodies can be present in normal, non-allergic animals. Reliance on IgG testing alone can lead to unnecessary dietary restrictions.

Serum IgE Test – a blood assay that detects IgE antibodies specific to particular allergens. Positive results may guide the selection of ingredients for elimination diets, but false positives are common. A positive IgE result should be interpreted alongside clinical history and trial outcomes.

Skin Scraping – a diagnostic technique used to collect superficial skin cells for microscopic examination. Skin scrapes can reveal the presence of mites (e.g., Demodex spp.) that may mimic allergic dermatitis. Identifying co-existing parasitic infestations is essential for comprehensive management.

Skin Cytology – microscopic evaluation of a skin sample to identify inflammatory cells, bacteria, or yeast. In allergic pets, cytology often shows a predominance of eosinophils, indicating an allergic component. Cytology also assists in detecting secondary Malassezia overgrowth.

Eosinophil – a type of white blood cell involved in allergic and parasitic responses. Elevated eosinophil counts in blood or skin cytology suggest an underlying hypersensitivity. Monitoring eosinophil levels can help assess response to dietary therapy.

Canine Atopic Dermatitis (CAD) – a chronic, hereditary skin disease in dogs characterised by pruritus, erythema, and lichenification. CAD is primarily driven by environmental allergens, but food allergies may act as secondary triggers. Managing CAD often requires a multi-modal approach that includes diet, topical therapy, and immunomodulation.

Feline Allergic Dermatitis (FAD) – an umbrella term for allergic skin disease in cats, encompassing flea allergy, food allergy, and atopic dermatitis. Cats often present with self-induced alopecia, miliary dermatitis, and eosinophilic granuloma complex. Dietary trials are a cornerstone of diagnosis, given the high prevalence of food-related reactions.

Self-Induced Alopecia – hair loss caused by excessive licking, biting, or scratching. In allergic pets, self-induced alopecia may be a visible indicator of chronic pruritus. Addressing the underlying allergy typically reduces the behaviour and promotes hair regrowth.

Secondary Malassezia Overgrowth – an opportunistic yeast infection that thrives in moist, oily skin environments. Malassezia dermatitis often co-exists with allergic skin disease, creating a vicious cycle of inflammation and infection. Antifungal therapy, combined with dietary allergen control, is required for

effective resolution.

Topical Therapy – the application of medicated shampoos, sprays, or creams directly to the skin. Topical corticosteroids, calcineurin inhibitors, and essential oil blends can provide symptomatic relief while the underlying allergy is being addressed through diet.

Systemic Immunomodulator – oral or injectable drugs that modify the immune response, such as cyclosporine, oclacitinib, or glucocorticoids. These agents can control severe pruritus but are not curative; they are typically used while the pet undergoes an elimination diet trial to manage acute flare-ups.

Cyclosporine – a calcineurin inhibitor that suppresses T-cell activation. In dogs and cats, cyclosporine can reduce pruritus and inflammation, often allowing a smoother transition to a new diet. Monitoring for renal effects and drug interactions is essential.

Oclacitinib – a Janus kinase (JAK) inhibitor that blocks cytokine signalling involved in pruritus. Oclacitinib provides rapid itch relief and is commonly used as a bridge therapy during dietary trials. Long-term safety data are still emerging, requiring periodic blood work.

Glucocorticoid – a class of steroid hormones that suppress inflammation. Systemic glucocorticoids are effective for acute allergic flare-ups but carry risks such as polyuria, polydipsia, and immunosuppression. Short-term use is recommended while dietary changes take effect.

Dermatologic Scoring System – a standardized tool for quantifying the severity of skin lesions. Scores may include parameters such as extent of erythema, crusting, and alopecia. Consistent scoring before and after dietary intervention provides objective evidence of treatment efficacy.

Adverse Food Reaction (AFR) – a broader term encompassing both immune-mediated food allergies and non-immune food intolerances. Distinguishing AFR from true IgE-mediated allergy requires careful diagnostic work-up, including elimination diets and, when appropriate, oral food challenges.

Oral Food Challenge – the reintroduction of the suspected allergenic ingredient after an elimination diet, used to confirm the diagnosis. The challenge must be performed under veterinary supervision, with close monitoring for recurrence of clinical signs. A positive challenge confirms the allergen, guiding long-term dietary management.

Food Sensitisation – the immunologic process in which the pet's immune system recognises a specific dietary protein as foreign, leading to the production of IgE antibodies. Sensitisation may be subclinical for months before overt allergy manifests. Early identification through dietary history can prevent chronic disease progression.

Protein Hydrolysis – the enzymatic breakdown of proteins into smaller peptides. Complete hydrolysis reduces the allergenic potential of the protein, while partial hydrolysis may still contain epitopes capable of triggering an immune response. Commercial hydrolysed diets vary in degree of hydrolysis, influencing

efficacy.

Peptide Size – the length of amino acid chains resulting from protein hydrolysis. Peptides smaller than 10 kDa are generally considered non-allergenic. Analytical techniques such as mass spectrometry are used by manufacturers to verify peptide size distribution.

Food Matrix – the complex physical and chemical environment of a food, including its macronutrient composition, moisture content, and processing methods. The matrix can affect antigenicity; for example, heat-treated proteins may become more or less allergenic depending on denaturation patterns.

Processing Methods – techniques such as extrusion, canning, freeze-drying, or baking that alter the physical structure of pet foods. Processing can influence protein denaturation, lipid oxidation, and the formation of Maillard reaction products, all of which may affect allergenicity and palatability.

Maillard Reaction – a chemical reaction between reducing sugars and amino acids that occurs during heating, producing browned colour and distinct flavours. While the Maillard reaction enhances palatability, it can also create new antigenic determinants, potentially increasing allergenic risk in some pets.

Oxidative Stability – the resistance of dietary fats to oxidation, which can generate rancid flavours and harmful lipid peroxides. Oxidised fats may irritate the gastrointestinal tract and exacerbate skin inflammation. Antioxidant additives such as vitamin E and rosemary extract improve oxidative stability.

Palmitic Acid – a saturated fatty acid commonly found in animal fats. While not directly allergenic, excessive palmitic acid can influence the overall fatty acid profile, potentially diminishing the anti-inflammatory benefits of omega-3 supplementation.

Stearic Acid – another saturated fatty acid that is relatively inert in terms of inflammation. Inclusion of stearic acid-rich sources (e.g., cocoa butter) is generally neutral for allergic pets, but may affect texture and melt properties of kibble.

Lauric Acid – a medium-chain saturated fatty acid with antimicrobial properties. Lauric acid, abundant in coconut oil, can be incorporated in therapeutic diets for its potential to reduce skin colonisation by bacteria, though its impact on allergy modulation remains under investigation.

Medium-Chain Triglycerides (MCT) – fatty acids with chain lengths of 6–12 carbon atoms, readily absorbed and metabolised for energy. MCTs can provide an alternative energy source for pets with malabsorption, but excessive inclusion may lead to gastrointestinal upset.

Protein-to-Energy Ratio – the proportion of dietary protein relative to total caloric content. A higher ratio supports lean tissue maintenance during weight loss, which is important for allergic pets that are prone to muscle wasting due to chronic inflammation.

Calcium-to-Phosphorus Ratio – a critical balance for skeletal health. In therapeutic diets, especially those

low in animal protein, calcium may be supplemented using calcium carbonate or bone meal, while phosphorus is maintained through meat-based ingredients. Improper ratios can lead to skeletal deformities, particularly in growing puppies and kittens.

Vitamin D Metabolites – active forms of vitamin D, such as 1,25-dihydroxyvitamin D, which regulate calcium homeostasis and immune function. Monitoring serum vitamin D levels may be advisable in pets with chronic skin disease, as deficiency can impair barrier repair.

Vitamin K – a fat-soluble vitamin essential for blood coagulation. While not directly linked to allergic pathways, vitamin K deficiency may arise in pets with severe malabsorption, highlighting the need for comprehensive nutrient assessment in elimination diets.

Vitamin B12 (Cobalamin) – a water-soluble vitamin important for neurologic function and red blood cell formation. Gastrointestinal disease associated with chronic allergic enteropathy can impair cobalamin absorption, necessitating supplementation.

Fecal Score – a visual assessment of stool consistency, ranging from hard pellets to watery diarrhea. Monitoring fecal score during dietary trials helps detect gastrointestinal side effects of novel or hydrolysed proteins, enabling timely adjustments.

Gastrointestinal Signs – clinical manifestations such as vomiting, diarrhea, flatulence, or constipation that may accompany food allergies. While skin signs dominate, gastrointestinal signs can be the primary presentation in some cats, especially those with a food protein-induced enteropathy.

Enteropathy – disease of the small intestine, often presenting with malabsorption, protein loss, and chronic diarrhea. Food-induced enteropathy may coexist with dermatitis, creating a complex clinical picture that requires integrated nutritional management.

Protein-Losing Enteropathy (PLE) – a severe form of enteropathy where large amounts of protein are lost into the intestinal lumen, leading to hypoalbuminemia and edema. In rare cases, certain food allergens can trigger PLE, emphasizing the importance of thorough dietary assessment.

Hypoallergenic Diet – a diet formulated to minimise the risk of allergic reactions, typically containing hydrolysed proteins, limited ingredients, or novel protein sources. Hypoallergenic diets are central to diagnostic elimination trials and long-term management of food-allergic pets.

Limited Ingredient Diet (LID) – a commercial diet that contains a minimal number of protein and carbohydrate sources, often two or three ingredients total. LIDs aim to reduce the exposure to multiple potential allergens while maintaining nutritional completeness. Owners may prefer LIDs for convenience, but they still require careful ingredient verification.

Allergen Avoidance – the practice of eliminating known allergens from the pet's environment and diet. Complete avoidance may be impractical for ubiquitous allergens (e.g., dust mites), so reduction strategies

such as regular cleaning, air filtration, and use of low-allergen bedding are employed.

Environmental Control – measures taken to reduce the presence of airborne and contact allergens. Techniques include frequent vacuuming, humidity control, and the use of allergen-impermeable covers for pet bedding. Environmental control