

HYPOALLERGENIC HEALTHY LIVING

ALL LIFESTAGES RECIPE

A SCIENTIFIC
SUPPORT PAPER

**The Hypoallergenic
Healthy Living diet
provides a 75% reduction in
free radicals to support a
healthy immune system.**

University of Liège – 2024 Study.



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WHY ARE HEALTH AND WELL-BEING IMPORTANT?

Health and well-being are fundamental to a cat's quality of life, longevity and ability to perform normal physiological functions.

As obligate carnivores, cats have unique nutritional requirements that must be met throughout life to support growth, maintenance, reproduction and healthy ageing (FEDIAF, 2024). Providing complete and balanced nutrition is therefore essential for effective feline health management.

Advances in nutrition, veterinary care and preventive healthcare have contributed to increased life expectancy in domestic cats, resulting in a growing population of mature and senior pets. At the same time, pet owners are increasingly seeking nutritional solutions that support long-term health. Throughout life, cats may experience changing nutritional requirements and physiological challenges, including maintaining healthy body condition, digestive function, urinary health, mobility, and immune function. Nutrition therefore plays an important role in supporting health from growth through to healthy ageing (Laflamme, 2012; Vogt et al., 2023).

Nutrition is recognised as a key component of preventive healthcare and can play an important role in supporting overall well-being throughout all life stages. Diets formulated with highly digestible ingredients and functional nutrients can support key areas of concern e.g., promote skin and coat health. Consequently, there is increasing demand for multifunctional feline nutrition that delivers targeted health benefits while meeting the cat's essential nutritional requirements.

WHY ARE PETS LIVING LONGER?

On average, owned cats have a longer life expectancy than owned dogs and consequently spend a greater proportion of their lives as mature and senior animals, emphasising the importance of nutritional strategies that support health throughout every life stage. Recent UK data report an average life expectancy of approximately 11.7 years for owned cats, although longevity varies depending on genetics, lifestyle, nutrition and access to veterinary care (Teng et al., 2024).

Healthspan refers to the proportion of an animal's life spent in good physical and physiological health, free from significant disease or disability. Supporting optimal health throughout every life stage—from growth and adulthood through to senior years—is therefore fundamental to promoting longevity and maintaining quality of life (Adams et al., 2018; Teng et al., 2024).

WHAT IS AN ALL LIFE STAGES RECIPE?

An All Life Stages (ALS) recipe is formulated to provide complete and balanced nutrition for cats at every stage of life, from growth (kittens) throughout adulthood.

According to the FEDIAF Nutritional Guidelines, a diet that meets the nutritional requirements for growth also satisfies the nutrient requirements for healthy adult maintenance (FEDIAF, 2024).

To support the most nutritionally demanding life stages, All Life Stages recipes are typically more nutrient-dense than adult maintenance diets, providing appropriate levels of high-quality protein, metabolisable energy, essential amino acids, vitamins, minerals and essential fatty acids to support healthy growth, development and reproductive performance. As obligate carnivores, cats have specific nutritional requirements for nutrients such as taurine, arachidonic acid, vitamin A and arginine, making careful formulation essential to ensure nutritional adequacy throughout life.

Ageing is associated with progressive physiological and metabolic changes, including reduced lean body mass, altered immune function, increased oxidative stress and chronic low-grade inflammation, all of which may contribute to age-related health disorders (Laflamme, 2012; Vogt et al., 2023).



WHAT CONSTITUTES GOOD OVERALL HEALTH IN KITTENS AND ADULT CATS?

Good overall health in cats is characterised by the maintenance of optimal physiological function, including a healthy body condition, strong immune response, efficient digestion, normal metabolic function, and the ability to express natural behaviours.

Achieving and maintaining health throughout life is influenced by multiple factors, including genetics, environment, preventive healthcare, and most importantly, the provision of a complete and balanced diet formulated to meet the specific nutritional needs of cats at each life stage (FEDIAF, 2024).

During kitten development, nutrition plays a fundamental role in supporting rapid growth and maturation. Early life is a critical period where adequate intake of highly digestible protein, essential amino acids, fatty acids, vitamins, and minerals supports the development of lean muscle mass, skeletal structure, neurological function, and immune competence.

Particular attention is required for feline-specific nutrients such as taurine, arginine, and arachidonic acid, which are essential for normal growth and cannot be adequately synthesised by cats (MacDonald et al., 1984; Zoran, 2002).

For adult cats, maintaining a healthy body composition and supporting metabolic health are key indicators of overall well-being. Cats naturally require a high-protein diet to help maintain lean muscle mass, and preserving muscle becomes increasingly important as cats age due to the risk of age-related muscle loss. Maintaining an ideal body condition is also essential, as excess body weight can negatively impact mobility, metabolic health, and quality of life.

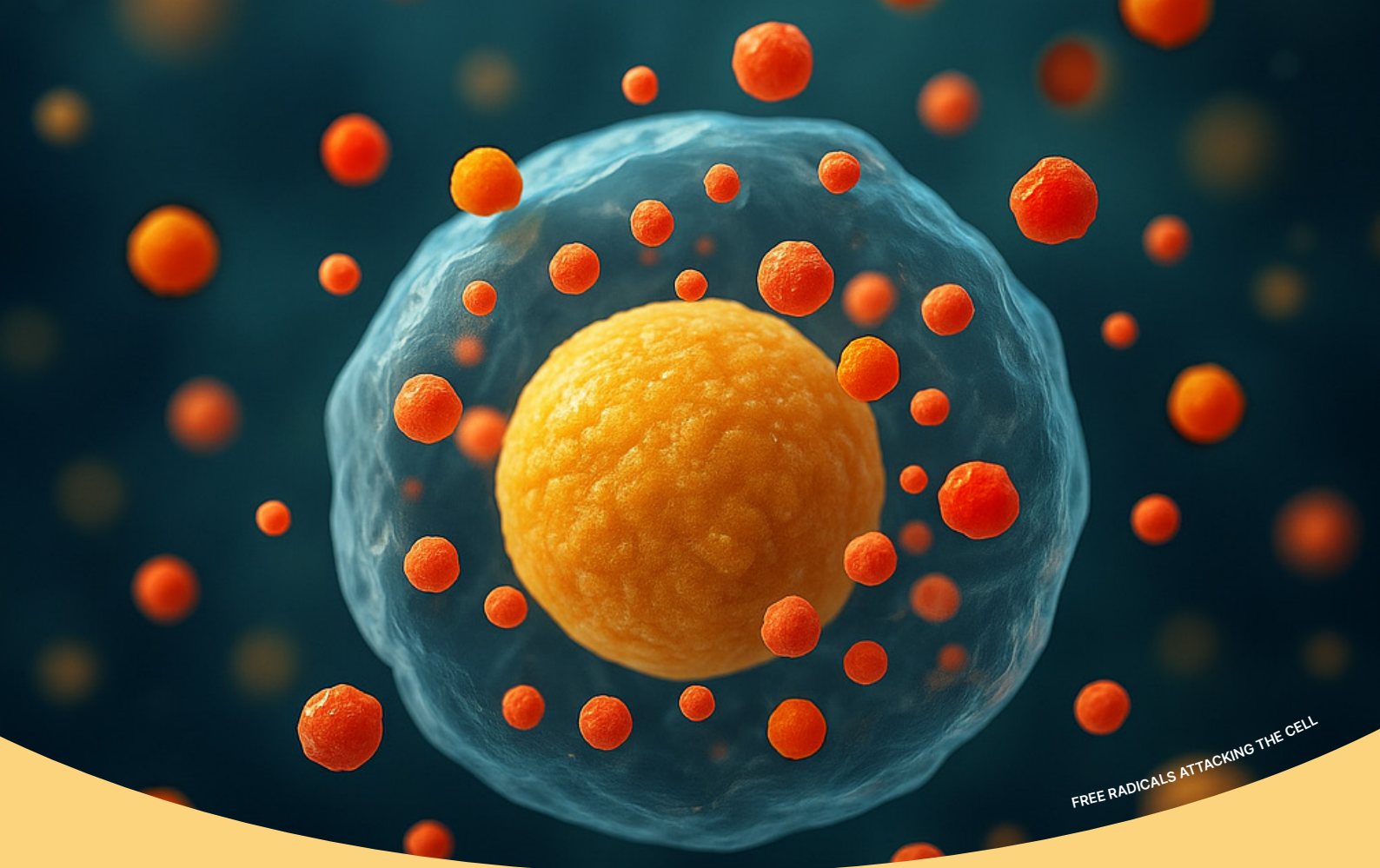
Preventive nutritional strategies that support appropriate energy intake and body condition can therefore contribute to long-term health outcomes (German, 2006).

Digestive health is another important component of feline well-being. A healthy gastrointestinal system supports efficient nutrient digestion and absorption while also contributing to immune function through the gut-associated immune system. Highly digestible ingredients, appropriate fibre sources, and targeted nutritional support can help maintain gastrointestinal function and promote consistent stool quality.

Skin and coat condition is also recognised as an indicator of feline health and nutritional status. The skin acts as an essential protective barrier, while the availability of key nutrients including high-quality protein, essential fatty acids, zinc, and selected vitamins influences coat quality.

Supporting skin barrier function and coat condition can therefore contribute to maintaining overall health and external indicators of well-being.

Ultimately, good feline health is not defined by the absence of disease alone but by supporting optimal function throughout life. A proactive approach to nutrition, incorporating highly digestible ingredients and functional nutrients, can support a cat from kittenhood through to senior years.



FREE RADICALS ATTACKING THE CELL

WHAT IS OXIDATIVE STRESS?

Oxidative stress occurs when there is an imbalance between the production of reactive oxygen species (ROS), also known as free radicals, and the body's ability to neutralise these compounds through antioxidant defence systems.

Free radicals are highly reactive molecules containing one or more unpaired electrons, which enables them to interact with cellular components including lipids, proteins, and DNA (Halliwell & Gutteridge, 2015).

Under normal physiological conditions, cats naturally produce ROS as part of essential biological processes, including cellular energy metabolism and immune function. These reactive molecules are regulated by endogenous antioxidant defence systems that help maintain cellular balance.

However, when ROS production exceeds the capacity of these protective mechanisms, oxidative stress occurs, resulting in damage to cellular structures and disruption of normal biological function (Halliwell & Gutteridge, 2015).

Cell membranes are particularly susceptible to oxidative damage, as ROS can initiate lipid peroxidation, resulting in structural changes and the formation of oxidative by-products such as malondialdehyde (MDA).

Oxidative stress can also affect proteins and genetic material, potentially altering cellular function and contributing to age-related physiological changes (Halliwell & Gutteridge, 2015).

Oxidative stress is therefore considered an important factor in maintaining health throughout life, particularly as antioxidant

defence mechanisms may become less efficient with advancing age. Supporting antioxidant capacity through nutrition may help protect cells from oxidative damage and contribute to healthy ageing in cats.

WHAT ARE ANTIOXIDANTS?

Antioxidants are compounds that help protect cells from oxidative damage by neutralising ROS and reducing oxidation of essential biological molecules, including nucleic acids, proteins, lipids, and carbohydrates

During this process, antioxidants donate electrons to unstable free radicals, converting them into more stable compounds and helping to maintain cellular redox balance (Halliwell & Gutteridge, 2015).

Cats rely on a combination of endogenous antioxidant defence systems and dietary antioxidants to regulate oxidative processes. Enzymatic antioxidants, including glutathione peroxidase, superoxide dismutase and catalase, work alongside dietary antioxidants such as vitamin E, selenium, vitamin C, and carotenoids to help protect cells from oxidative damage.

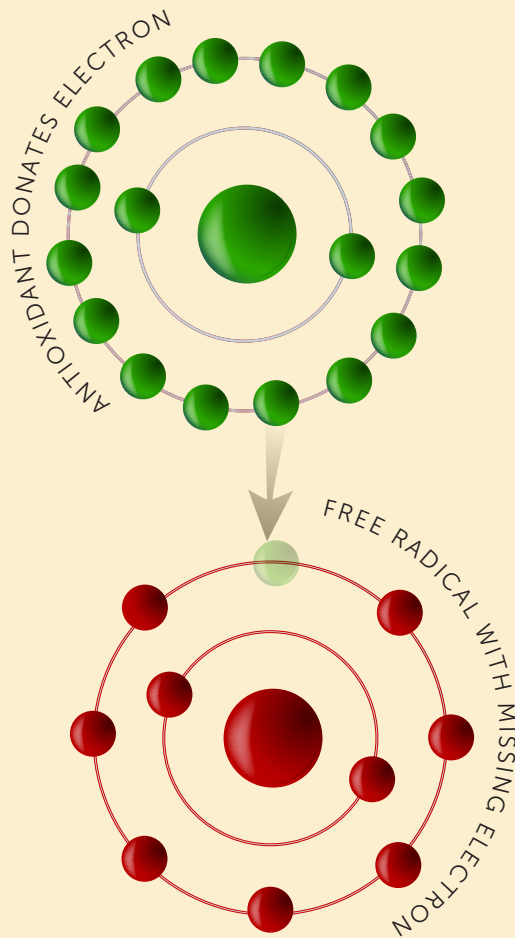
Maintaining antioxidant balance is particularly important for immune function. ROS are naturally generated during immune responses and contribute to normal defence mechanisms; however, excessive ROS production can damage immune cells and disrupt normal immune signalling, potentially reducing the effectiveness of the immune response (Dröge, 2002).

By supporting redox balance, antioxidants help maintain appropriate immune activation while limiting oxidative damage.

In addition, antioxidants contribute to the maintenance of important physical barriers, including the gastrointestinal tract and skin. The intestinal barrier plays a key role in feline immune defence by regulating interactions between the gut environment and the immune system, while the skin barrier protects against external stressors.

Supporting cellular protection and barrier integrity can therefore contribute to overall feline health and resilience.

Consequently, maintaining an appropriate antioxidant balance through nutrition is an important component of lifelong feline health, helping to protect cells, support immune function, and promote healthy ageing.



THE IMPORTANCE OF BIOAVAILABLE AND BIOACTIVE PEPTIDES TO SUPPORT HEALTH IN CATS DURING ALL LIFE STAGES

Proteins are essential macronutrients composed of smaller building blocks called amino acids, which are required by cats throughout all life stages.

As obligate carnivores, cats have a high dietary requirement for protein to support essential physiological functions, including maintenance of lean muscle mass, tissue repair, immune function, and skin and coat health. Dietary proteins also provide essential amino acids, such as taurine, arginine, methionine, and cysteine, which cats require to maintain normal metabolism and overall health.

Following ingestion, dietary proteins undergo enzymatic digestion within the gastrointestinal tract, where they are broken down into smaller peptides and free amino acids. These components are absorbed and utilised by the body for the synthesis of new proteins, including structural proteins such as muscle and skin, as well as functional proteins including enzymes, hormones, and antibodies.

Protein absorption does not occur solely as individual amino acids. Research has demonstrated that a significant proportion of dietary protein is absorbed in the form of small peptides, particularly di- and tripeptides, through specialised intestinal peptide transport systems such as PepT1 (Fei et al., 1994).

Dipeptides and tripeptides are most abundant in the molecular weight range of 0.2–0.25 kDa and 0.3–0.4 kDa, respectively. These smaller peptide structures provide an efficient source of amino acids for utilisation within the body.

Hydrolysed proteins are produced through enzymatic processing, which

breaks larger intact proteins into smaller peptide fragments. This reduction in protein size can improve digestibility and reduce the likelihood of immune recognition of larger protein structures, making hydrolysed proteins a valuable ingredient choice in diets formulated for cats with food sensitivities.

Hydrolysed salmon protein provides a highly digestible source of marine-derived amino acids and peptides, supporting nutrient availability while contributing to palatability and nutritional quality.

In addition to providing essential amino acids, salmon-derived proteins naturally contain bioactive peptides, which have been investigated for potential antioxidant and antimicrobial properties (Chalamaiah et al., 2012).

These properties may contribute to supporting cellular health and overall well-being when included as part of a complete and balanced feline diet.

Therefore, the inclusion of hydrolysed fresh and dried salmon provides a highly digestible protein source that supports optimal nutrient utilisation, helps maintain essential physiological functions, and is particularly suitable for formulations designed to support cats with sensitive digestive or nutritional needs.

Marine-derived protein hydrolysates have been extensively investigated for their biological properties. Studies have demonstrated that peptides derived from salmon proteins possess antioxidant activity through their ability to scavenge reactive oxygen species (ROS) and reduce oxidative damage *in vitro* (Wang et al., 2008).

These peptides may therefore help support the body's natural antioxidant defence mechanisms and contribute to the maintenance of cellular health. Further research has identified numerous low-molecular-weight

peptides (<10 kDa) isolated from salmon by-products, including skin and other protein-rich tissues, with demonstrated antioxidant and immunomodulatory activities. Salmon-derived peptide fractions exhibited greater antioxidant capacity than comparable cod-derived fractions in both hydroxyl radical scavenging and ABTS radical scavenging assays, suggesting that salmon is a valuable source of naturally occurring bioactive peptides (Pampanin et al., 2016).

Although many of these findings have been generated using *in vitro* models, they highlight the potential of hydrolysed salmon as a functional ingredient that may provide benefits beyond basic nutrition. In addition to supplying highly digestible protein, **hydrolysed salmon may contribute bioactive peptides that support antioxidant defence mechanisms and help protect cells from oxidative damage associated with normal metabolism and healthy ageing.**

The inclusion of hydrolysed fresh and dried salmon within the Hypoallergenic Healthy Living All Life Stages Cat recipe therefore provides both a highly digestible source of essential amino acids and a source of naturally occurring bioactive peptides with demonstrated antioxidant potential, supporting overall feline health and well-being.



COLLAGEN PEPTIDES

Collagen is the most abundant structural protein in the animal body and is found primarily in the skin, bones, cartilage, tendons, ligaments, and other connective tissues. It provides tensile strength and structural integrity to tissues while supporting normal joint function, mobility, and skeletal health throughout life.

Type I collagen is the predominant form found in skin, bone, tendons, and ligaments, where it provides structural support and resistance to mechanical stress.

Type II collagen is the principal collagen within articular cartilage, contributing to the resilience and elasticity required for smooth joint movement and shock absorption. Together, these collagen types play an essential role in maintaining the integrity of the musculoskeletal system.

Although cats are adept at concealing discomfort, degenerative joint disease and osteoarthritis are common, particularly in mature and senior individuals. Progressive changes to articular cartilage and connective tissues can reduce mobility and impact quality of life.

Maintaining healthy cartilage metabolism and connective tissue integrity is therefore an important component of supporting healthy ageing in cats (Lascelles et al., 2010).

Collagen-derived peptides generated through enzymatic hydrolysis have attracted increasing interest because of their potential to support connective tissue metabolism. Experimental studies suggest that low-molecular-weight collagen peptides may stimulate extracellular matrix synthesis and contribute to the maintenance of cartilage structure (Gupta et al., 2012; Bello & Oesser, 2006).

Hydrolysed fresh and dried salmon may provide naturally occurring collagen-derived peptides in addition to highly digestible protein and essential amino acids.

Consequently, the inclusion of hydrolysed salmon within the Hypoallergenic Healthy Living All Life Stages Cat recipe may help support normal connective tissue function, joint health, and mobility as part of a complete and balanced diet throughout life.



WHAT MAKES THE HYPOALLERGENIC HEALTHY LIVING DIET SO UNIQUE?

The development and formulation of the Hypoallergenic Healthy Living recipe has centred around the 'Power of Peptides' using the latest Freshtrusion HDP® technology.

Freshtrusion HDP® (Highly Digestible Protein) is the unique process of cooking fresh meat and fish ingredients in the presence of a natural enzyme, which digests (hydrolyses) the protein into a mixture of peptides and free amino acids.

This increases the digestibility and bioavailability of the protein and improves palatability, through what we like to refer to as the Goldilocks Principle:



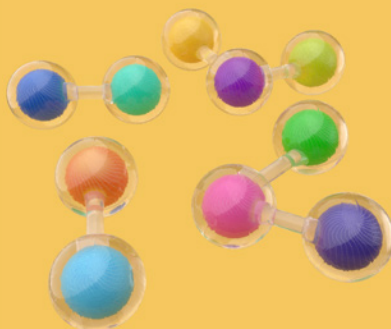
THE GOLDILOCKS PRINCIPLE

Instinctively, it might be assumed that intact protein would be the most suitable form for a cat to digest, as it contains all of the nutritional components within the complete protein structure. Conversely, individual amino acids, broken down into their smallest form, may appear to be the easiest to absorb. However, research has demonstrated that optimal digestibility and absorption occur with small-chain peptides (≤ 3 kDa).

We refer to this concept as the 'Goldilocks Principle', whereby peptides are neither too large nor too small, but are of an optimal size to support efficient digestion and absorption.



INTACT PROTEIN



DI AND TRIPEPTIDES



SINGULAR AMINO ACIDS



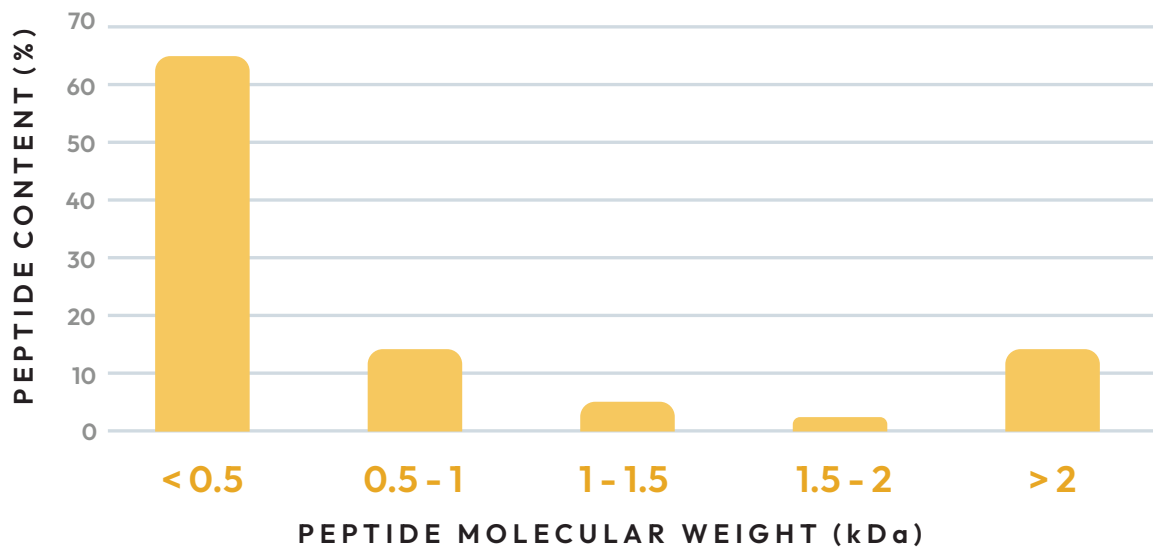
TOO BIG

JUST RIGHT

TOO LITTLE



HYPOALLERGENIC HEALTHY LIVING : PEPTIDE CONTENT (%)



A minimum of 66% of the peptides in this recipe are < 0.5 kDa, with just 13% of the peptides > 2 kDa.

These results show the majority of peptides in the finished kibble fall into the < 0.5 kDa category, which includes the highly digestible and nutritionally beneficial dipeptides and tripeptides, achieving the Goldilocks Principle.

THE POWER OF THE PEPTIDES FOR HEALTHY LIVING

- ✓ Increases the digestibility and bioavailability of the protein
- ✓ Improves the palatability of the recipe
- ✓ Ensures an ideal supply of amino acid building blocks required for the renewal and synthesis of key antioxidant proteins and structural proteins such as collagen
- ✓ Provides bioactive peptides with antioxidant potential to help support the body's natural antioxidant defence mechanisms and maintain cellular health
- ✓ Helps to support and maintain healthy joints and regain mobility

WHAT OTHER INGREDIENTS ARE BENEFICIAL IN MAINTAINING GOOD HEALTH AND WELL-BEING?

In addition to the inclusion of hydrolysed salmon protein, the Hypoallergenic Healthy Living recipe has been formulated with a range of carefully selected ingredients to support overall feline health and well-being.

These include cellulose, L-carnitine, and the unique **Feline Wellness Blend™**, which combines cranberry, seaweed, algae oil (*Schizochytrium* sp.), blueberry, chamomile, turmeric, and prebiotic fibres: fructooligosaccharides (FOS) and mannanoligosaccharides (MOS).

Together, these ingredients provide targeted nutritional support for key areas of feline health, including digestive function, antioxidant defence, skin and coat health, and overall well-being.



L-carnitine

L-carnitine is a naturally occurring nutrient that plays an essential role in energy metabolism by facilitating the transport of long-chain fatty acids into mitochondria, where they undergo β -oxidation to produce energy. Through this mechanism, L-carnitine supports efficient fat utilisation and helps maintain normal cellular energy production.

Maintaining a healthy body composition is an important component of lifelong feline health. Cats, particularly neutered and indoor cats, can be predisposed to weight gain due to reduced energy expenditure and changes in metabolism. Dietary supplementation with L-carnitine has been shown to support fat oxidation and promote the maintenance of lean body mass in cats. In overweight neutered cats, L-carnitine supplementation increased resting energy expenditure relative to lean body mass and enhanced fatty acid utilisation compared with unsupplemented cats (Center et al., 2012).

Similarly, studies investigating weight reduction in obese cats have demonstrated that L-carnitine supplementation can support the loss of body fat while helping preserve lean tissue (Biourge et al., 2001). Additional research has shown that cats receiving higher dietary concentrations of L-carnitine accumulated less adipose tissue under positive energy balance conditions, highlighting its role in supporting healthy body composition (Jewell et al., 2016).

Therefore, the inclusion of L-carnitine within the Hypoallergenic Healthy Living All Life Stages Cat recipe supports normal energy metabolism, efficient fat utilisation, and the maintenance of lean body mass, contributing to overall feline health throughout life.





Cellulose

Cats are meticulous groomers, spending a significant proportion of their time licking and cleaning their coat.

During grooming, loose and shed hairs are inevitably ingested and pass through the gastrointestinal tract. While the majority of swallowed hair is naturally eliminated through faeces, some ingested hairs may accumulate within the stomach and form compacted masses known as hairballs, or trichobezoars.

Dietary fibre sources, such as cellulose, can play an important role in supporting the natural passage of ingested hair through the digestive tract. As an insoluble fibre, cellulose contributes to intestinal bulk and can help promote normal gastrointestinal transit, supporting the movement of swallowed hair through the digestive system and reducing the likelihood of accumulation within the stomach.

A controlled double-blind study investigating the effects of dietary cellulose supplementation in cats demonstrated a reduction in owner-reported hairball-related clinical signs.

Over a four-week period, cats fed a diet supplemented with 4% cellulose showed decreases in vomiting, retching, and coughing associated with hairballs compared with control cats. The proposed mechanism was that cellulose helped delay gastric emptying, allowing ingested hairs to become incorporated with food material, facilitating their movement into the intestine and subsequent faecal excretion (Beynen et al., 2011).

Therefore, the inclusion of cellulose within the Hypoallergenic Healthy Living recipe helps support normal gastrointestinal function and the natural elimination of swallowed hair, contributing to digestive comfort and overall feline well-being.

Cranberry

Cranberries are a natural source of bioactive plant compounds, including polyphenols and A-type proanthocyanidins (PACs), which have demonstrated antioxidant properties. These compounds can help neutralise reactive oxygen species and support the body's natural antioxidant defence mechanisms.

Cranberry-derived proanthocyanidins have also been investigated for their role in supporting urinary tract health.

A key mechanism associated with cranberry supplementation is the ability of A-type PACs to reduce the adhesion of certain uropathogenic *Escherichia coli* (UPEC) bacteria to urinary tract epithelial cells, which may help maintain a healthy urinary environment (Howell et al., 2010).

Evidence supporting this mechanism has also been demonstrated in cats. A blinded randomised crossover feeding study evaluated the effect of dietary cranberry supplementation in neutered adult cats and found that cranberry inclusion reduced *E. coli* adhesion to feline urinary epithelial cells in an *ex vivo* model, supporting its potential role as a nutritional approach for urinary tract support (Carvajal-Campos et al., 2024).



Seaweed

Ascophyllum nodosum is a marine-derived ingredient naturally rich in bioactive compounds, including polyphenols, minerals, and polysaccharides. Seaweed-derived compounds have demonstrated antioxidant activity and may contribute to supporting cellular protection against oxidative stress.

In addition, *Ascophyllum nodosum* has been investigated in companion animal nutrition for its potential role in supporting oral health.

Studies in dogs have suggested that supplementation may influence salivary composition and reduce factors associated with plaque and calculus formation; however, further feline-specific research is required to fully characterise these effects in cats (Gawor et al., 2021).

Algal Oil

Algal oil derived from *Schizochytrium* sp. is a sustainable source of the omega-3 fatty acid docosahexaenoic acid (DHA). DHA is an essential component of cell membranes and plays important roles in maintaining normal cellular function, particularly within the brain, eyes, immune system, and skin.

Omega-3 fatty acids have recognised anti-inflammatory properties and may help support skin barrier function, coat condition, immune regulation, and healthy ageing in cats. As cats have limited conversion capacity of plant-derived alpha-linolenic acid (ALA) into longer-chain omega-3 fatty acids, direct dietary sources of DHA are particularly valuable (Bauer, 2011).



Blueberry

Blueberries are naturally rich in polyphenolic compounds, particularly anthocyanins, which possess antioxidant activity. These compounds can help neutralise reactive oxygen species and support the body's natural antioxidant defence systems, contributing to cellular protection against oxidative stress.

Dietary polyphenols have been increasingly investigated for their potential role in supporting healthy ageing due to their ability to modulate oxidative balance and inflammatory pathways. In companion animals, antioxidant-rich botanical ingredients may contribute to maintaining cellular health and overall wellbeing throughout life (Pérez-Jiménez et al., 2010).



Chamomile

Chamomile contains naturally occurring bioactive compounds, including flavonoids and essential oils, which have been investigated for their antioxidant and anti-inflammatory properties.

Traditionally, chamomile has been used as a botanical ingredient to support relaxation and gastrointestinal comfort. While evidence in cats remains limited, its inclusion provides a source of naturally occurring plant compounds that may contribute to overall wellbeing when included as part of a balanced diet (Ağan et al., 2022).



Turmeric

Turmeric contains curcumin, a bioactive polyphenolic compound that has been widely studied for its antioxidant and anti-inflammatory properties. Curcumin has demonstrated the ability to modulate oxidative stress pathways and inflammatory responses, which are important processes involved in maintaining cellular health.

Nutritional strategies that support antioxidant balance and healthy inflammatory responses may be particularly beneficial throughout ageing, helping to maintain overall health and wellbeing (Kumar et al., 2018).



Fructooligosaccharides (FOS) and Mannanligosaccharides (MOS)

Prebiotics, such as mannanligosaccharides (MOS) and fructooligosaccharides (FOS), are non-digestible dietary fibres that selectively influence the composition and activity of the intestinal microbiota.

In cats, these prebiotic fibres support digestive health by providing a substrate for beneficial gut bacteria, helping to maintain a balanced and resilient intestinal microbial population (Gibson et al., 2017).

FOS can be fermented by beneficial bacteria within the colon, producing short-chain fatty acids (SCFAs). These metabolites provide an energy source for intestinal cells, support mucosal barrier integrity, and contribute to maintaining a favourable intestinal environment by lowering luminal pH (Swanson et al., 2002).

MOS functions through a different mechanism, with yeast-derived MOS able to bind to certain undesirable bacteria, including *Escherichia coli* and *Salmonella*, reducing their ability to attach to intestinal surfaces and supporting a balanced gut environment (Spring et al., 2000).

By supporting beneficial microbial populations and intestinal barrier function, MOS and FOS may contribute to normal digestive function, immune support, and maintenance of healthy stool quality.

The inclusion of prebiotic fibres within the Hypoallergenic Healthy Living All Life Stages Cat recipe helps support a healthy gastrointestinal system, contributing to overall feline health and well-being throughout life.

What are the results?

As part of the development of the Hypoallergenic Healthy Living recipe, an independent study was conducted by the University of Liège in Belgium.

This study aimed to investigate the bioactive and beneficial properties of fresh hydrolysed salmon, which is included within the Hypoallergenic Healthy Living recipe. In particular, the study evaluated the potential anti-radical and antioxidant properties of salmon-derived peptides.

To assess antioxidant potential, free radicals were generated by mixing a sodium persulfate aqueous solution with 2,2'-azino-bis(3-ethylbenzothiazoline)-6-sulfonic acid (ABTS), followed by overnight incubation in the dark to produce a dark-coloured solution. Aqueous test samples were then added, during which the blue-green ABTS radical cation was converted back into its colourless neutral form in the presence of potential antioxidant compounds.

The results demonstrated that hydrolysed fresh salmon exhibited strong antioxidant potential by reducing free radical activity, with hydrolysed fresh salmon neutralising 75% of free radicals compared with the control.

This antioxidant activity may support immune health by helping to reduce oxidative stress, protect cells from oxidative damage, and maintain normal cellular function.

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