Foreverest

Pet-Safe Botanical Ingredients for Household & Care Products

A structured safety assessment portfolio for formulations across companion animal environments

Foreverest Resources Ltd.

v20260831a
Foreverest Resources Ltd. | foreverest.net | 2026

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CHAPTER 1

Introduction & Background

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MARKET GROWTH CREATES A NEED FOR PET-SAFE INGREDIENT SCREENING

Pets are now an integral part of household life across the world. More than 900 million pets live in homes globally, with dogs and cats accounting for roughly 80 per cent of the market. In the United States, nearly 70 per cent of households keep pets. In Indonesia, more than 45 per cent of households keep cats, while in the Philippines, over 65 per cent keep dogs. Russia records the world's highest share of cat-owning households, at 59 per cent. Beyond dogs and cats, exotic companion animals — including ornamental fish, reptiles, rodents and birds — are also gaining popularity.

As the companion animal market continues to expand, product safety can no longer be assessed through a human-only lens. Household cleaning and care products increasingly rely on botanical ingredients, yet different pet species respond very differently to plant-derived substances. This creates a clear need for more rigorous ingredient screening in pet household applications.

At Foreverest, we work across five core application domains: disinfection, odour control, parasite control, scent design, and skin repair. In each of these areas, we support ingredient screening and application development tailored to the sensitive environments in which pets live.

WHEN "PET-SAFE" IS NOT ENOUGH

Many household cleaning and care products now contain natural ingredients, and most of these formulations were originally designed with human family use in mind. Yet different pet species do not respond to plant-derived substances in the same way as humans. An ingredient considered gentle in a human household may still present a toxicological risk to a companion animal, and in severe cases, that risk can be fatal.

A key part of this issue lies in **plant secondary metabolites** — chemical substances produced by plants through specific biosynthetic pathways during growth, not for primary life maintenance, but for defence and ecological interaction. These include terpenes, polyphenols, phenylpropanoids, salicylates and related constituents commonly found in essential oils, botanical extracts and plant-derived monomers. Precisely because these substances help plants deter herbivores and insects, they are also widely used in plant protection, household cleaning and hygiene formulations.

The problem is that “natural” is not a toxicological category, and “pet-safe” is often judged too loosely. In early 2026, a poisoning incident discussed widely on Chinese social media involved a pet owner who used a well-known household disinfectant exactly as instructed — dilution, mopping and ventilation included — yet five kittens in the home died the same night. Public discussion quickly focused on whether the cleaning was excessive, while the more important question was largely overlooked: how might pets be sensitised to plant secondary metabolites present in everyday household products?

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WHEN "PET-SAFE" IS NOT ENOUGH

1,8-Cineole is one of the principal constituents of eucalyptus volatile oil and a typical monoterpene secondary metabolite. Its natural antimicrobial profile has made it a common ingredient in antibacterial and household cleaning products. Yet a substance that appears comparatively mild in human use can present a very different risk profile in cats.

The toxicological concern is not simply the ingredient itself, but the way the animal processes it. Cats do not lack UDP-glucuronosyltransferases altogether; instead, they show a well-documented deficiency in specific UGT activities, most notably those responsible for glucuronidation of planar phenolic compounds. Because this metabolic capacity is limited, some plant-derived constituents cannot be cleared efficiently once they enter the feline body — whether through skin contact, inhalation, or subsequent oral intake during grooming. Accumulation can increase the risk of hepatic injury, neurological signs, and, in severe cases, death.

THIS IS WHY a safety claim based on human experience alone is not enough for pet household products. It is also why we invested in building a safety-graded botanical ingredient portfolio: a framework designed to distinguish between ingredients that are broadly compatible with pet environments and those that require strict concentration limits, restricted application scenarios, or complete exclusion.

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WHY CATS ARE DIFFERENT

Cats are among the most sensitive pets to certain plant secondary metabolites. The issue is not a complete absence of glucuronidation, but a marked limitation in specific UDP-glucuronosyltransferase activities, especially those involved in metabolising planar phenolic compounds. In domestic cats, UGT1A6 is recognised as a pseudogene, and the liver expresses a less diverse range of UGT1A isoforms than in many other mammals. This helps explain why compounds such as thymol, guaiacol and eugenol may present a disproportionate toxicological risk in cats, as these substances may be cleared less efficiently once absorbed.

Grooming further amplifies this risk. Residues deposited on the coat can be transferred from dermal exposure to oral intake, including microdroplets from fragrancing systems, airborne particles, and residues left on floors or household surfaces after cleaning.

Risk Factors Summary

- ☐ **Grooming and licking increase oral intake of deposited residues**
- ☐ **Diffusion, aerosols and airborne microdroplets raise inhalation exposure**
- ☐ **Floor and surface residues prolong indirect household contact**
- ☐ **Limited phenolic detoxification capacity amplifies cumulative risk**

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NOT JUST A CAT PROBLEM: HIGHER TOLERANCE, NOT IMMUNITY

Compared with cats, dogs have a more complete glucuronidation capacity and are generally larger in body size, which gives them a higher tolerance to some plant secondary metabolites. But higher tolerance does not mean immunity. Dogs remain vulnerable when exposure levels are too high, when contact is repeated, or when the molecule itself carries a higher toxicological burden.

This is particularly relevant for certain household ingredients and exposure scenarios. Products containing methyl salicylate can create a salicylate poisoning risk if absorbed or ingested by dogs. Essential oils containing eucalyptus constituents have also been associated with seizures in animals, while d-limonene-containing products may cause dermal irritation or dermatitis after topical exposure. In practice, dose, route of exposure, and chemical structure all matter.

Risk Factors Summary

- ☐ **Licking and paw-pad contact with residues**
- ☐ **Higher exposure pressure in smaller dogs**
- ☐ **Dermal absorption of specific actives**
- ☐ **Over-concentration in everyday products**

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WHY ESSENTIAL OILS AND BIRDS DO NOT MIX

Birds differ fundamentally from mammals in the way they breathe. Their respiratory system includes air sacs and a highly efficient airflow pattern, which means inhaled aerosols can penetrate deeply into the respiratory tract. In a household setting, this makes birds especially vulnerable to volatile botanical substances released through diffusers, sprays, and fragranced cleaning products.

Essential oils are highly volatile by nature, and birds have very limited tolerance for this kind of airborne exposure. The concern is not simply contact, but direct respiratory delivery: fine droplets and vapours may reach deep lung tissues and air sacs without the same protective buffering seen in larger mammals. For this reason, even low-level but continuous exposure in enclosed indoor environments may create a disproportionate pulmonary risk for pet birds.

Risk Factors Summary

- ☐ **Air-sac anatomy increases deep respiratory exposure**
- ☐ **Diffusers and sprays generate inhalable droplets**
- ☐ **Volatile compounds accumulate in enclosed indoor air**
- ☐ **Continuous low-level exposure may still be harmful**

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FISH AND REPTILES: TWO METABOLIC WEAK POINTS

Fish are highly vulnerable to dissolved chemical exposure because their external surfaces are designed for exchange with the surrounding water. The skin is thin and permeable, and the mucus-covered surface facilitates the movement of ions, gases and water. This same biological design also means that waterborne substances can enter the body rapidly, making dermal uptake a major route of exposure in ornamental fish.

A second constraint lies in metabolic capacity. Compared with mammals, fish generally have a narrower and less robust xenobiotic-detoxification buffer, which reduces their ability to process and clear foreign compounds under acute exposure. This is especially relevant for eugenol, a natural phenolic compound widely used in aquaculture as an anaesthetic and sedative. Its effects are strongly dose-dependent: at elevated concentrations or with prolonged exposure, eugenol may impair neural and respiratory function and can become lethal.

Risk Factors Summary

- ☐ **Semi-permeable skin allows rapid waterborne uptake**
- ☐ **Dissolved chemicals can enter through direct surface exposure**
- ☐ **Limited detoxification capacity reduces metabolic buffering**
- ☐ **Eugenol toxicity is dose- and time-dependent**

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FISH AND REPTILES: TWO METABOLIC WEAK POINTS

Reptilian pets face a different, but equally important, toxicological limitation. In several reptile species, the ability to detoxify certain xenobiotics appears to be highly restricted, particularly for some phenolic compounds. This means that substances tolerated more effectively in other animals may persist longer in the reptile body and create a greater risk of accumulation and oxidative injury.

This concern is illustrated by acetaminophen toxicity in snakes. Comparative studies have shown that some snake species lack functional phenol-type glucuronidation activity and are highly vulnerable to oxidant injury after exposure, with lethal methemoglobinemia documented as a key outcome. For pet reptiles, the practical implication is clear: compounds that depend on efficient phenolic detoxification should be approached with extreme caution, especially where exposure may be repeated or difficult to control.

Risk Factors Summary

- ☐ **Detoxification of certain phenolic xenobiotics may be limited**
- ☐ **Reduced clearance increases accumulation risk**
- ☐ **Oxidative injury can follow repeated or uncontrolled exposure**
- ☐ **Acetaminophen illustrates extreme reptilian sensitivity**

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CHAPTER 2

Framework & Use Guide

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THE PET-SAFE USE ASSESSMENT SYSTEM

Humans and pets differ fundamentally in metabolism, exposure routes, behaviour, and body-size ratio. These are not merely differences of degree, but differences of biological reality. Cats show major limitations in glucuronidation of certain phenolic compounds, birds are uniquely vulnerable to airborne aerosols because of their respiratory anatomy, and reptiles may have highly restricted detoxification capacity for specific xenobiotics. A safety model built for human use alone cannot fully account for these species-specific risks.

This framework was created to address that gap. The Pet-Safe Use Assessment System is a five-tier reference framework for evaluating botanical-origin ingredients in pet household and care product formulations. It was designed for one simple reason: pets are not small humans.

What is this?

A five-tier reference framework for assessing botanical-origin ingredients in pet household and care product formulations.

Why it was created?

Because pet safety cannot be judged by human exposure models alone..

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THE PET-SAFE USE ASSESSMENT SYSTEM

What is less visible is the compounding effect of exposure. Pets may face four overlapping pathways: **skin contact, inhalation, oral intake through grooming or licking, and indirect exposure from environmental residues**. Human safety assessments usually focus on the first two, but pet exposure often extends further and lasts longer within the same household setting.

Body size amplifies this gap. A 4 kg cat and a 70 kg human may share the same cleaned room, yet the cat's exposure per unit of body weight is approximately 17.5 times higher. Traditional safety models were not designed to account for this combination of multi-route exposure, grooming-related ingestion, and high body-weight-adjusted dose.

That is why pet safety requires its own assessment framework.

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GUIDANCE FOR FORMULATORS

Formulating genuinely pet-safe household products requires more than ingredient substitution. The S1–S5 framework provides a structured basis for ingredient selection by taking account of species-specific metabolism, grooming-related ingestion, and body-weight-adjusted exposure — factors that standard human-use safety models often overlook.

Build on S1 ingredients

Use S1-rated materials as the foundation of pet-safe formulations. These ingredients are considered the most broadly compatible across target species and should form the core of any product intended for routine pet household use.

Use S2 with strict limits

S2 ingredients may be used only within carefully controlled, species-specific concentration limits. In practice, this means a narrower safety margin for cats than for dogs, and therefore a more conservative formulation approach whenever feline exposure is possible.

Control High-Risk Tiers

S3 ingredients should be limited to non-contact environmental use, while S4 and S5 materials should be excluded from pet household formulations. At every stage, exposure assessment must include grooming-adjusted intake, especially for cats, because residues on fur can turn surface contact into oral exposure.

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THE S1-S5 FRAMEWORK COLOUR SYSTEM

S1 — Pet-Safe Tier

Free of phenolic hydroxyl groups (Ar–OH) and strongly reactive aldehyde groups (–CHO). Within this framework, such substances present the lowest structural toxicological concern for pet-household use. They are generally expected to be cleared through alternative pathways such as sulphation or oxidation under typical exposure conditions.

S2 — Low-Risk Tier

Free of major phenolic hydroxyl groups and strongly reactive aldehydes, but may still carry conditional risk factors such as higher volatility, partial metabolic burden, or species-specific sensitivity. These substances are considered suitable only under controlled, species-specific concentration limits.

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S3 — Moderate-Risk Tier

Shows phenolic character, higher volatility, or other properties associated with increased risk in sensitive pets, especially under cumulative, inhalation-prone, or direct-contact exposure. Use in pet products should be limited to tightly controlled or non-contact scenarios.

Scope:

This framework covers more than 190 botanical volatile oils, aroma compounds and related substances across the Foreverest portfolio. Each material is classified from S1 to S5 and annotated for suitability across six pet categories: dogs, cats, birds, reptiles, ornamental fish and rodents.

S4 — High-Risk Tier

Includes phenylpropanoid phenols or strongly reactive aldehydes that are associated with pronounced toxicological concern in sensitive pet species. These substances are generally unsuitable for routine pet-household formulations and should be avoided except under strictly isolated, pet-free conditions.

S5 — Extreme-Danger Tier

Includes substances with severe toxicological profiles, such as carcinogenicity, irreversible organ injury, or no realistic pet-safe use scenario. Within this framework, these materials are fundamentally incompatible with pet household and care products.

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HOW IS THE FRAMEWORK DESIGNED?

Step 1. Screen Molecular Structure

The framework begins with molecular structure, and this is a deliberate choice rather than a shortcut. No public authoritative database currently evaluates ingredient toxicity in cats, dogs, birds, fish or reptiles. Published safety lists assess humans or the environment, while veterinary toxicology sources record confirmed poisons rather than confirmed safe substances. Structural screening is therefore the only systematic starting point available. The alert list behind this step comes from general organic chemistry, not from pet-specific toxicology: it is a screen for concern, not a verdict.

Each ingredient is first screened for structural features associated with higher concern in pet environments: free phenolic hydroxyl groups, reactive aldehyde groups, epoxides and conjugated ketones. Such features indicate greater reactivity, higher metabolic burden, or a greater likelihood of adverse effects in sensitive species. This review forms the first sorting layer of the S1–S5 system. It does not determine the final rating on its own, but it establishes the chemical basis for deciding which ingredients require closer control, restriction or exclusion.

4	S2	Sesquiterpene Hydr
4	S2	Sesquiterpene Al
4	S1	Sesquiterpene E
4	S2	Phenylpropanoid
4	S2	Phenylpropanoid (A
4	S1	C6 Alcoholic Alcohol (Gree
4	S2	C6 Alcoholic Alcohol (Gr
4	S2	Essential Oil (Monoter
4	S2	Monoterpene Mixture (
4	S1	Monoterpene Alcohol
4	S1	Monoterpene E
4	S2	Monoterpene Nitrile (
4	S2	Monoterpene Alcohol
4	S2	Lactone
4	S1	Lactone
4	S1	Lactone
4	S2	Sesquiterpene Alc
4	S2	Phenylpropanoid (
4	S2	Phenylpropanoid (Aldehyd
4	S2	Essential Oil (Citronel
4	S2	Monoterpene Mix
4	S2	Monoterpene Alcohol
4	S2	Monoterpene Ketone (
4	S2	Monoterpene Est
4	S1	Monoterpene Ketone (
4	S2	Essential Oil (Monoterpene
4	S2	Monoterpene Est
4	S1	Essential Oil (Monoterpene
4	S1	Monoterpene Este
4	S1	Monoterpene Este
4	S1	+

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HOW IS THE FRAMEWORK DESIGNED?

Step 2. Adjust for Metabolism and Exposure

Structural screening is only the starting point. The framework then adjusts this interpretation by considering how an ingredient is metabolised and cleared in pets, and how it may realistically enter the animal body during household use. A substance that appears acceptable at the structural level may still create concern if its clearance pressures sensitive metabolic pathways, or if its exposure profile favours inhalation, dermal contact, residue transfer, or grooming-related oral intake.

For this reason, the framework is not based on chemistry alone. It combines structural alerts with metabolic interpretation and route-of-exposure analysis, so that classification reflects how a substance behaves in real pet-use scenarios. Dogs retain roughly 60–70% of human glucuronidation capacity for certain phenolic substrates, whereas cats may retain only 10–20%. This gap explains why one ingredient can carry different boundaries for different species: dogs retain more clearance capacity, while cats require a correspondingly narrower margin. Finished-product certification standards, such as Ecocert ECOPETCARE, can serve only as reference points for natural origin and processing. They assess the product, not ingredient toxicology, and cannot replace metabolic reasoning.

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HOW IS THE FRAMEWORK DESIGNED?

Step 3. Interpret by Pet Species

Pet safety cannot be interpreted through one universal animal model. Dogs, cats, birds, reptiles, ornamental fish and rodents differ in physiology, behaviour, exposure pattern and metabolic sensitivity, so the same ingredient does not carry the same practical significance across all pet categories. A rating must be read through species-specific context rather than applied as a single, undifferentiated label.

Differences in grooming behaviour, respiratory anatomy, waterborne uptake, body-size ratio and detoxification capacity all change the outcome. One substance may therefore show different symbols across the six species columns, and this is intentional, not inconsistency. Where species-specific evidence is thin, the framework does not assume safety by default. Rodent data remains limited across much of the catalogue, so rodents are marked for caution unless a substance meets S1 criteria, even where a substance is well tolerated by dogs. The same logic applies to birds, whose respiratory anatomy makes airborne exposure a separate concern. The aim is not to rank species by importance, but to keep each rating traceable to the species it is meant to protect.

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HOW IS THE FRAMEWORK DESIGNED?

Step 4. Convert into S1–S5 Decisions

Once structure, metabolism, exposure route and species sensitivity have been considered, the framework converts them into an S1–S5 outcome. Each rating is then cross-checked against an independent assessment built for that purpose. It re-examines every ingredient along three separate axes: chemical reactivity, metabolic clearance route, and external regulatory or veterinary evidence. It deliberately uses none of the rules the framework itself applies. In practice the two passes overlapped on only a single ingredient, which is the point of running them separately.

Where the two passes diverge, the stricter reading is applied. A rating is not relaxed on uncertain grounds, and any tightening is taken to the stricter end of the indicated range. Across the current catalogue this shifted the distribution towards restriction: ingredients rated S1 or S2 fell from about four in five to just over seven in ten. The result is a formulation decision tool rather than a descriptive label. It separates preferred ingredients, conditionally usable ones, restricted materials and substances to be excluded from pet household and care products.

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TRANSPARENT DECLARATION

Five Things You Must Know Before Using This Framework

1. The role of this framework. This framework is a formulation-screening and reference tool, not a veterinary safety certification.

   This framework is designed to support the screening and selection of botanical-origin ingredients for pet household and care product formulations. Its role is to provide a structured reference for formulation decisions based on chemical classification, metabolic toxicology, species sensitivity and exposure characteristics. It should not be interpreted as an absolute safety guarantee across all conditions, nor as a substitute for veterinary diagnosis, treatment advice or clinical judgement.

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TRANSPARENT DECLARATION

Five Things You Must Know Before Using This Framework

2. Classification depends on use conditions. The practical meaning of each classification depends on concentration, exposure pattern and product-use conditions.

   Ingredient classification should always be interpreted in the context of actual formulation and use. Differences in concentration, dilution, ventilation, frequency of application, contact pathway and residue control may materially affect practical exposure. For this reason, a tier assignment within the framework should be understood as a use-dependent reference rather than a detached guarantee that applies uniformly across all scenarios.

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TRANSPARENT DECLARATION

Five Things You Must Know Before Using This Framework

3. Biological variability remains relevant. A shared classification does not imply identical tolerance across species, life stages or individual health conditions.

   Even under similar formulation and use conditions, practical responses may differ across pet species and among individuals. Physiological characteristics, age, health status and sensitivity differences may all influence actual tolerance and risk outcome. Accordingly, the framework should be used as a screening-level reference, not as a universal prediction of uniform response across all pets.

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TRANSPARENT DECLARATION

Five Things You Must Know Before Using This Framework

4. The application boundary of this framework. This framework is intended for early-stage risk screening and formulation guidance, not for legal compliance, market-entry approval or verification replacement.

   The appropriate use of this framework is to support early-stage ingredient selection by identifying and excluding higher-risk substances and narrowing the formulation pool. Whether a product is legally compliant or suitable for market entry depends on the regulatory requirements of the target market, together with appropriate verification and professional review. Reliance on this framework alone should not be treated as sufficient support for bypassing regulatory assessment, laboratory verification or veterinary toxicological consultation.

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TRANSPARENT DECLARATION

Five Things You Must Know Before Using This Framework

5. Precaution applies where certainty is limited. Where direct evidence remains limited, this framework prioritises transparent disclosure and precautionary interpretation over optimistic assumption.

   For categories in which conclusive safety evidence remains limited, especially unconventional pets such as birds, reptiles and ornamental fish, the framework adopts a precaution-first and strict-over-lenient approach. This may leave certain boundary scenarios unresolved, but it also prevents uncertainty from being mistaken for safety. In this sense, transparent declaration of limitation is not a weakness of the framework, but part of its professional discipline.

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CHAPTER 3

Label Reference & Product Catalogue

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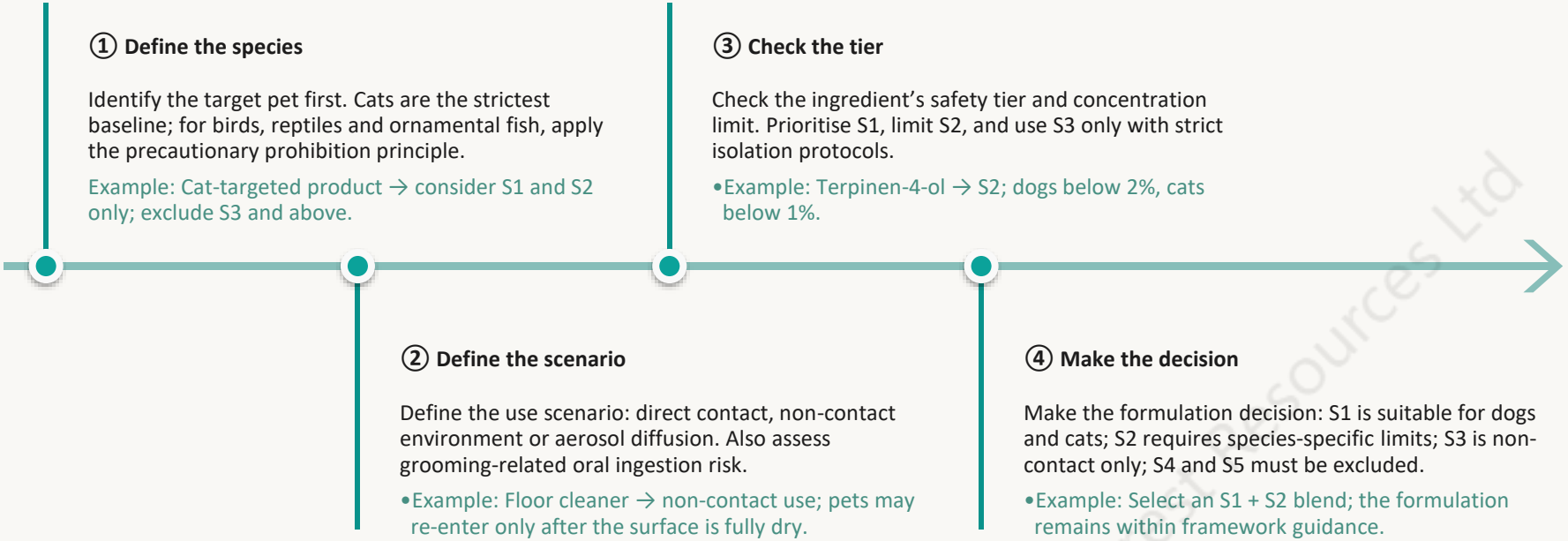
USING THE FRAMEWORK IN FOUR STEPS

If you are a downstream brand or formulator, follow these four steps:



① Define the species

Identify the target pet first. Cats are the strictest baseline; for birds, reptiles and ornamental fish, apply the precautionary prohibition principle.

Example: Cat-targeted product → consider S1 and S2 only; exclude S3 and above.

② Define the scenario

Define the use scenario: direct contact, non-contact environment or aerosol diffusion. Also assess grooming-related oral ingestion risk.

- Example: Floor cleaner → non-contact use; pets may re-enter only after the surface is fully dry.

③ Check the tier

Check the ingredient's safety tier and concentration limit. Prioritise S1, limit S2, and use S3 only with strict isolation protocols.

- Example: Terpinen-4-ol → S2; dogs below 2%, cats below 1%.

④ Make the decision

Make the formulation decision: S1 is suitable for dogs and cats; S2 requires species-specific limits; S3 is non-contact only; S4 and S5 must be excluded.

- Example: Select an S1 + S2 blend; the formulation remains within framework guidance.

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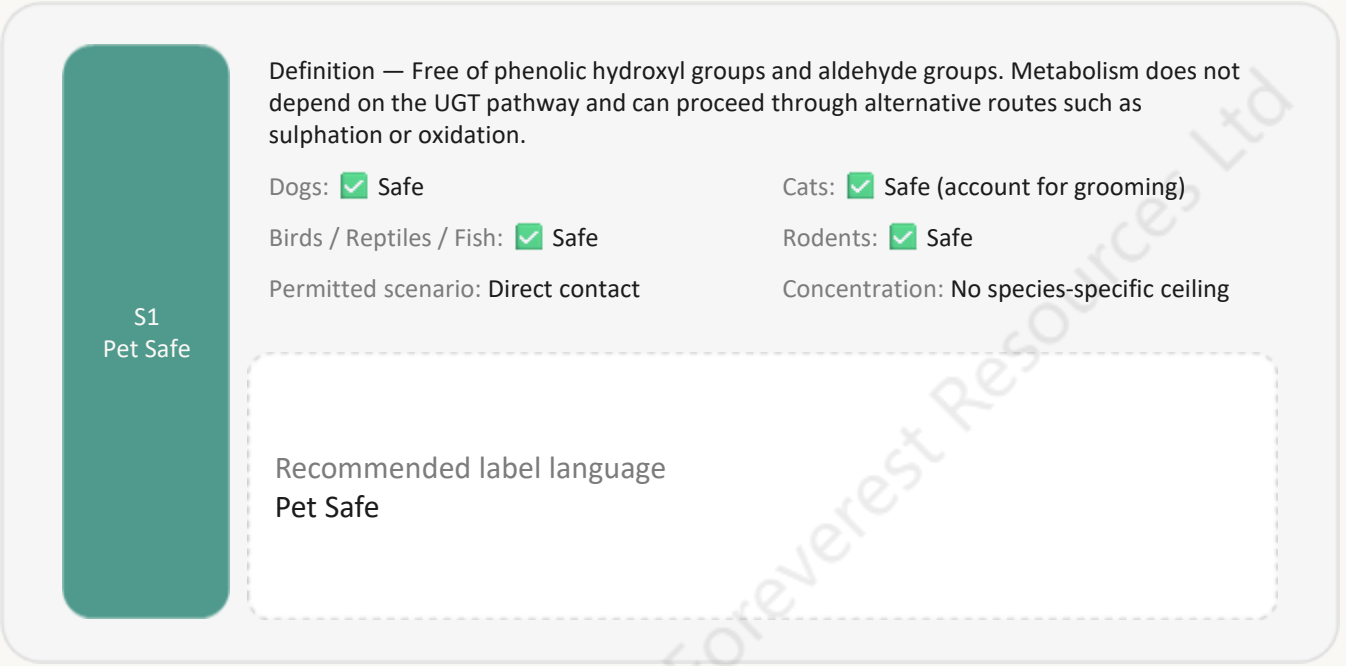
S1 - LABEL REFERENCE

The label language below reflects each tier's definition within the Pet Safety Assessment Framework. For S2, label language should indicate that species-specific usage boundaries apply, and be confirmed for each substance. S4 and S5 share the same primary exclusion label, "Not for Pet Use", but differ in the hazard qualifier: S4 indicates phenolic/aldehyde toxicity, whereas S5 indicates carcinogenicity or irreversible harm.

Note: The label language reflects the unrestricted-safe definition of the S1 tier.



S2 - LABEL REFERENCE

Note: Specific concentration ceilings must be determined per substance and confirmed against the framework.

See Chapter 2, Step 2 for the metabolic and exposure basis.

S2
Low Risk

Definition — Free of phenolic hydroxyl groups. Metabolism may partially depend on the UGT pathway, but alternative clearance routes remain available. Use only within species-specific formulation limits.

Dogs: ✅ Permitted, subject to species-specific limits

Cats: ⚠️ Use with caution; restricted concentration

Birds / Reptiles / Fish: ❌ Not recommended for diffusion

Rodents: ⚠️ Permitted under the same limits as dogs

Permitted scenario: Direct contact with controlled formulation

Concentration: Subject to species-specific concentration limits

Recommended label language

Pet safe at controlled concentrations / Species-specific limits apply

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S3 - LABEL REFERENCE

Note: S3 label language indicates restricted use and does not imply suitability for direct-contact pet products.

S3
Moderate
Risk

Definition — Contains minor phenolic hydroxyl groups or is a highly volatile terpene. In cats, UGT deficiency may create cumulative toxicity risk even at low exposure levels.

Dogs: ⚠️ Limited, non-routine use only

Cats: ❌ Not for direct contact

Birds / Reptiles / Fish: ❌ Prohibited

Rodents: ❌ Prohibited

Permitted scenario: Non-contact or indirect environmental cleaning only

Concentration: Restricted; no direct-contact use for sensitive species

Recommended label language

Dog Only / Non-contact cleaning / Cat Prohibited

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S4 - LABEL REFERENCE

Note: S4 uses the primary exclusion label "Not for Pet Use" with a phenolic/aldehyde hazard qualifier.

S4
High Risk

Definition — Contains a definitive phenolic hydroxyl group or a strongly reactive aldehyde group. Highly toxic to cats, birds, reptiles, ornamental fish and rodents, with a defined phenolic or aldehyde hazard basis.

Dogs: ⚠️ Exceptional use only, under professional guidance

Cats: ❌ Prohibited

Birds / Reptiles / Fish: ❌ Prohibited

Rodents: ❌ Prohibited

Permitted scenario: Pet-free zones only

Concentration: Exceptional-use only; avoid all direct pet contact

Recommended label language

Not for Pet Use / Phenolic or aldehyde hazard

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S5 - LABEL REFERENCE

Note: S5 uses the same primary exclusion label, but with a carcinogenicity/irreversible-harm qualifier.

S5
Extreme
Danger

Definition — Highly toxic across all common pet species. Usage is entirely incompatible with pet environments, and the hazard mechanism involves irreversible organ damage, carcinogenicity or persistent mutagenic risk.

Dogs: ❌ Prohibited

Cats: ❌ Prohibited

Birds / Reptiles / Fish: ❌ Prohibited

Rodents: ❌ Prohibited

Permitted scenario: Not applicable

Concentration: None

Recommended label language

Not for Pet Use / Carcinogenic / Irreversible harm

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RESTATEMENT

All products listed in this catalogue are derived from data compiled within the company's product library. Accordingly, this pet care safety ingredient screening mechanism is built upon our product library and does not guarantee comparable efficacy to any other similar screening system available on the market. This catalogue is designed to assist you in quickly identifying potential product targets; such assistance does not constitute a recommendation of, or substitute for, any experimental or testing results. If you have limited experience in pet care product development, please ensure you proceed under the guidance of an authoritative certification scheme (such as Ecopetcare).

IF YOU CONTINUE READING, IT IS DEEMED THAT YOU HAVE READ, UNDERSTOOD, AND AGREED TO THE ABOVE STATEMENT.

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PRODUCT CATALOGUE

Reference Sheet — S1-S5 Botanical Ingredient Safety Ratings

SAFETY TIER LEGEND

	S1	Safe for all six pet types; no known metabolic concern.
	S2	Conditionally safe within species-specific concentration limits; low metabolic concern.
	S3	Restricted to limited use; direct-contact use excluded for sensitive species apply for sensitive species.
	S4	High-risk tier; excluded from normal pet-use formulations due to significant toxicity concern.
	S5	Absolute exclusion tier; not suitable for any pet household product application.

SYMBOL KEY

- ✅ Safe; no species-specific restriction
- ⚠️ Use with caution; concentration limits apply
- ❌ Not recommended; significant safety concern

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PRODUCT CATALOGUE

Reference Sheet S1-S5 Botanical Ingredient Safety Ratings

S	Product Name	Dogs	Cats	Birds	Reptiles	Ornamental Fish	Rodents
S2	(R)-(+)-Campholenic Aldehyde	✅	⚠️	❌	❌	❌	⚠️
S2	(S)-Campholenaldehyde	✅	⚠️	❌	❌	❌	⚠️
S2	1,4-Cineole	✅	⚠️	❌	❌	❌	⚠️
S2	3-Carene	✅	⚠️	❌	❌	❌	⚠️
S5	Pine Oil	❌	❌	❌	❌	❌	❌
S2	alpha-Longipinene	✅	⚠️	❌	❌	❌	⚠️
S4	Alpha Pinene Oxide	⚠️	❌	❌	❌	❌	❌
S4	Perilla Aldehyde (Synthetic)	⚠️	❌	❌	❌	❌	❌
S1	Pinane	✅	✅	✅	✅	✅	✅
S2	Pinocarveol	✅	⚠️	❌	❌	❌	⚠️

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PRODUCT CATALOGUE

Reference Sheet S1-S5 Botanical Ingredient Safety Ratings

S	Product Name	Dogs	Cats	Birds	Reptiles	Ornamental Fish	Rodents
S3	Synthetic Camphor	⚠	✗	✗	✗	✗	✗
S2	Terpineol	✓	⚠	✗	✗	✗	⚠
S2	Terpineol Mu	✓	⚠	✗	✗	✗	⚠
S2	Terpineol (Natural)	✓	⚠	✗	✗	✗	⚠
S2	Terpineol P (Perfumery)	✓	⚠	✗	✗	✗	⚠
S2	Terpinolene	✓	⚠	✗	✗	✗	⚠
S1	Terpinyl Acetate	✓	✓	✓	✓	✓	✓
S4	Turpentine	⚠	✗	✗	✗	✗	✗
S1	alpha-Terpinyl Acetate	✓	✓	✓	✓	✓	✓

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PRODUCT CATALOGUE

Reference Sheet S1-S5 Botanical Ingredient Safety Ratings

S	Product Name	Dogs	Cats	Birds	Reptiles	Ornamental Fish	Rodents
S3	1,8-Cineole	⚠	✗	✗	✗	✗	✗
S2	Acetophenone	✓	⚠	✗	✗	✗	⚠
S2	alpha-Pinene	✓	⚠	✗	✗	✗	⚠
S2	beta-Pinene	✓	⚠	✗	✗	✗	⚠
S2	Camphene	✓	⚠	✗	✗	✗	⚠
S2	Dipentene (Limonene)	✓	⚠	✗	✗	✗	⚠
S2	gamma-Terpinene	✓	⚠	✗	✗	✗	⚠
S2	Limonene	✓	⚠	✗	✗	✗	⚠
S2	Myrcene	✓	⚠	✗	✗	✗	⚠
S2	Ocimene	✓	⚠	✗	✗	✗	⚠

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Reference Sheet S1-S5 Botanical Ingredient Safety Ratings

S	Product Name	Dogs	Cats	Birds	Reptiles	Ornamental Fish	Rodents
S2	para Cymene	✅	⚠️	❌	❌	❌	⚠️
S2	Linalool	✅	⚠️	❌	❌	❌	⚠️
S2	alpha-Terpineol	✅	⚠️	❌	❌	❌	⚠️
S2	delta-Terpineol	✅	⚠️	❌	❌	❌	⚠️
S2	Terpinen-4-ol	✅	⚠️	❌	❌	❌	⚠️
S1	Dihydromyrcenol	✅	✅	✅	✅	✅	✅
S1	Bornyl Acetate	✅	✅	✅	✅	✅	✅
S3	Fenchone	⚠️	❌	❌	❌	❌	❌
S1	Isobornyl Acetate	✅	✅	✅	✅	✅	✅
S2	Menthol	✅	⚠️	❌	❌	❌	⚠️

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Reference Sheet S1-S5 Botanical Ingredient Safety Ratings

S	Product Name	Dogs	Cats	Birds	Reptiles	Ornamental Fish	Rodents
S2	Menthone	✅	⚠️	❌	❌	❌	⚠️
S2	Dihydrocarvone	✅	⚠️	❌	❌	❌	⚠️
S2	Piperitone	✅	⚠️	❌	❌	❌	⚠️
S2	l-Carvone	✅	⚠️	❌	❌	❌	⚠️
S2	Fenchol	✅	⚠️	❌	❌	❌	⚠️
S2	Nerol	✅	⚠️	❌	❌	❌	⚠️
S2	Geraniol	✅	⚠️	❌	❌	❌	⚠️
S1	Neryl Acetate	✅	✅	✅	✅	✅	✅
S1	Geranyl Acetate	✅	✅	✅	✅	✅	✅
S3	Citral (Geranial + Neral)	⚠️	❌	❌	❌	❌	❌

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PRODUCT CATALOGUE

Reference Sheet S1-S5 Botanical Ingredient Safety Ratings

S	Product Name	Dogs	Cats	Birds	Reptiles	Ornamental Fish	Rodents
S1	Sclareol	✅	✅	✅	✅	✅	✅
S2	p-Menthane-3,8-diol	✅	⚠️	❌	❌	❌	⚠️
S4	2-Methoxycinnamaldehyde	⚠️	❌	❌	❌	❌	❌
S1	2-Methylvaleric Acid	✅	✅	✅	✅	✅	✅
S3	4-Ethylguaiacol	⚠️	❌	❌	❌	❌	❌
S3	4-Ketoisophorone	⚠️	❌	❌	❌	❌	❌
S3	4-Methyl Guaiacol	⚠️	❌	❌	❌	❌	❌
S3	4-Vinyl Guaiacol	⚠️	❌	❌	❌	❌	❌
S2	Acetyl Cedrene	✅	⚠️	❌	❌	❌	⚠️
S2	alpha-Cedrene	✅	⚠️	❌	❌	❌	⚠️

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Reference Sheet S1-S5 Botanical Ingredient Safety Ratings

S	Product Name	Dogs	Cats	Birds	Reptiles	Ornamental Fish	Rodents
S2	alpha-Ionone	✅	⚠️	❌	❌	❌	⚠️
S3	alpha-Thujene	⚠️	❌	❌	❌	❌	❌
S2	alpha-Irone	✅	⚠️	❌	❌	❌	⚠️
S4	alpha-Methylcinnamaldehyde	⚠️	❌	❌	❌	❌	❌
S4	Amyl Salicylate	⚠️	❌	❌	❌	❌	❌
S4	Amylcinnamaldehyde	⚠️	❌	❌	❌	❌	❌
S3	Anethole	⚠️	❌	❌	❌	❌	❌
S2	Anisyl Acetate	✅	⚠️	❌	❌	❌	⚠️
S2	Anisyl Alcohol	✅	⚠️	❌	❌	❌	⚠️
S2	Anisylacetone	✅	⚠️	❌	❌	❌	⚠️

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Reference Sheet S1-S5 Botanical Ingredient Safety Ratings

S	Product Name	Dogs	Cats	Birds	Reptiles	Ornamental Fish	Rodents
S1	Asiatic Acid	✅	✅	✅	✅	✅	✅
S1	Asiaticoside	✅	✅	✅	✅	✅	✅
S2	Benzaldehyde	✅	⚠️	❌	❌	❌	⚠️
S2	Benzyl Acetate	✅	⚠️	❌	❌	❌	⚠️
S2	beta-Caryophyllene	✅	⚠️	❌	❌	❌	⚠️
S2	beta-Eudesmol	✅	⚠️	❌	❌	❌	⚠️
S2	beta-Ionone	✅	⚠️	❌	❌	❌	⚠️
S3	Cajeput Oil	⚠️	❌	❌	❌	❌	❌
S1	Camellia Oleifera Oil (Cosmetic)	✅	✅	✅	✅	✅	✅
S1	Camellia Oleifera Oil (Refined)	✅	✅	✅	✅	✅	✅

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Reference Sheet S1-S5 Botanical Ingredient Safety Ratings

S	Product Name	Dogs	Cats	Birds	Reptiles	Ornamental Fish	Rodents
S3	Carnosic Acid	⚠	✗	✗	✗	✗	✗
S4	Carvacrol	⚠	✗	✗	✗	✗	✗
S1	Castor Oil	✓	✓	✓	✓	✓	✓
S3	Cedar Oil	⚠	✗	✗	✗	✗	✗
S2	Cedramber	✓	⚠	✗	✗	✗	⚠
S2	Cedrene	✓	⚠	✗	✗	✗	⚠
S2	Cedrol	✓	⚠	✗	✗	✗	⚠
S1	Cedryl Acetate	✓	✓	✓	✓	✓	✓
S4	Cinnamaldehyde	⚠	✗	✗	✗	✗	✗
S4	Cinnamaldehyde (Natural)	⚠	✗	✗	✗	✗	✗

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PRODUCT CATALOGUE

Reference Sheet S1-S5 Botanical Ingredient Safety Ratings

S	Product Name	Dogs	Cats	Birds	Reptiles	Ornamental Fish	Rodents
S4	Cinnamon Oil	⚠	✗	✗	✗	✗	✗
S2	Cinnamyl Acetate	✓	⚠	✗	✗	✗	⚠
S2	Cinnamyl Alcohol	✓	⚠	✗	✗	✗	⚠
S1	cis-3-Hexenol (Leaf Aldehyde)	✓	✓	✓	✓	✓	✓
S3	Citral	⚠	✗	✗	✗	✗	✗
S3	Citronella Oil	⚠	✗	✗	✗	✗	✗
S2	Citronella Terpene	✓	⚠	✗	✗	✗	⚠
S3	Citronellal	⚠	✗	✗	✗	✗	✗
S2	Citronellol	✓	⚠	✗	✗	✗	⚠
S1	Citronellyl Acetate	✓	✓	✓	✓	✓	✓

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Reference Sheet S1-S5 Botanical Ingredient Safety Ratings

S	Product Name	Dogs	Cats	Birds	Reptiles	Ornamental Fish	Rodents
S1	Citronellyl Formate	✅	✅	✅	✅	✅	✅
S2	Citronellyl Nitrile	✅	⚠️	❌	❌	❌	⚠️
S3	Coumarin	⚠️	❌	❌	❌	❌	❌
S3	Creosol	⚠️	❌	❌	❌	❌	❌
S2	D-Linalool	✅	⚠️	❌	❌	❌	⚠️
S1	Delta-Decalactone	✅	✅	✅	✅	✅	✅
S1	delta-Dodecalactone	✅	✅	✅	✅	✅	✅
S2	Dihydro-Anethole	✅	⚠️	❌	❌	❌	⚠️
S1	Dihydrocarveol	✅	✅	✅	✅	✅	✅
S2	Elemol	✅	⚠️	❌	❌	❌	⚠️

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Reference Sheet S1-S5 Botanical Ingredient Safety Ratings

S	Product Name	Dogs	Cats	Birds	Reptiles	Ornamental Fish	Rodents
S2	Ethyl Cinnamate	✅	⚠️	❌	❌	❌	⚠️
S2	Ethylvanillin	✅	⚠️	❌	❌	❌	⚠️
S3	Eucalyptus Citriodora Oil	⚠️	❌	❌	❌	❌	❌
S3	Eucalyptus Terpenes	⚠️	❌	❌	❌	❌	❌
S4	Eugenol	⚠️	❌	❌	❌	❌	❌
S1	Fenchyl Acetate	✅	✅	✅	✅	✅	✅
S2	Geranium Oil	✅	⚠️	❌	❌	❌	⚠️
S2	Geranyl Acetone	✅	⚠️	❌	❌	❌	⚠️
S1	Geranyl Butyrate	✅	✅	✅	✅	✅	✅
S1	Geranyl Formate	✅	✅	✅	✅	✅	✅

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Reference Sheet S1-S5 Botanical Ingredient Safety Ratings

S	Product Name	Dogs	Cats	Birds	Reptiles	Ornamental Fish	Rodents
S3	Guaiacol	⚠	✗	✗	✗	✗	✗
S1	Guaiazulene	✓	✓	✓	✓	✓	✓
S2	Helional	✓	⚠	✗	✗	✗	⚠
S2	Heliotropin	✓	⚠	✗	✗	✗	⚠
S4	Hexyl Cinnamic Aldehyde	⚠	✗	✗	✗	✗	✗
S3	Hydroxycitronellal	⚠	✗	✗	✗	✗	✗
S4	Isoeugenol	⚠	✗	✗	✗	✗	✗
S2	Isomethyl Ionone	✓	⚠	✗	✗	✗	⚠
S1	Isostearic Acid	✓	✓	✓	✓	✓	✓
S2	L-Borneol	✓	⚠	✗	✗	✗	⚠

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PRODUCT CATALOGUE

Reference Sheet S1-S5 Botanical Ingredient Safety Ratings

S	Product Name	Dogs	Cats	Birds	Reptiles	Ornamental Fish	Rodents
S1	l-Bornyl Acetate	✅	✅	✅	✅	✅	✅
S2	l-Citronellol	✅	⚠️	❌	❌	❌	⚠️
S2	l-Limonene	✅	⚠️	❌	❌	❌	⚠️
S1	L-Theanine	✅	✅	✅	✅	✅	✅
S2	Lavandulol	✅	⚠️	❌	❌	❌	⚠️
S2	Lemairamin	✅	⚠️	❌	❌	❌	⚠️
S2	Lemon Terpenes	✅	⚠️	❌	❌	❌	⚠️
S2	Ligustral	✅	⚠️	❌	❌	❌	⚠️
S1	Linalyl Acetate	✅	✅	✅	✅	✅	✅
S5	Lyral	❌	❌	❌	❌	❌	❌

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Reference Sheet S1-S5 Botanical Ingredient Safety Ratings

S	Product Name	Dogs	Cats	Birds	Reptiles	Ornamental Fish	Rodents
S1	Madecassic Acid	✅	✅	✅	✅	✅	✅
S1	Madecassoside	✅	✅	✅	✅	✅	✅
S2	Menthol (Natural)	✅	⚠️	❌	❌	❌	⚠️
S2	Methyl Anthranilate	✅	⚠️	❌	❌	❌	⚠️
S2	Methyl Cedryl Ether	✅	⚠️	❌	❌	❌	⚠️
S2	Methyl Cedryl Ketone	✅	⚠️	❌	❌	❌	⚠️
S2	Methyl Cinnamate	✅	⚠️	❌	❌	❌	⚠️
S1	Methyl Dihydrojasmonate	✅	✅	✅	✅	✅	✅
S5	Methyl Eugenol	❌	❌	❌	❌	❌	❌
S4	Methyl Isoeugenol	⚠️	❌	❌	❌	❌	❌

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Reference Sheet S1-S5 Botanical Ingredient Safety Ratings

S	Product Name	Dogs	Cats	Birds	Reptiles	Ornamental Fish	Rodents
S4	Methyl Salicylate	⚠	✗	✗	✗	✗	✗
S2	Methylcyclopentenolone	✓	⚠	✗	✗	✗	⚠
S2	Methylheptenone	✓	⚠	✗	✗	✗	⚠
S2	Methylionone	✓	⚠	✗	✗	✗	⚠
S5	Musk Ketone	✗	✗	✗	✗	✗	✗
S1	Ambroxene (Natural)	✓	✓	✓	✓	✓	✓
S3	Natural Camphor Powder	⚠	✗	✗	✗	✗	✗
S3	Natural Sabinene	⚠	✗	✗	✗	✗	✗
S2	Viridiflorol	✓	⚠	✗	✗	✗	⚠
S2	Nerolidol	✓	⚠	✗	✗	✗	⚠

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Reference Sheet S1-S5 Botanical Ingredient Safety Ratings

S	Product Name	Dogs	Cats	Birds	Reptiles	Ornamental Fish	Rodents
S2	p-Anisaldehyde	✅	⚠️	❌	❌	❌	⚠️
S2	p-Anisic Acid	✅	⚠️	❌	❌	❌	⚠️
S2	Patchouli Oil	✅	⚠️	❌	❌	❌	⚠️
S2	Phenylethyl Alcohol	✅	⚠️	❌	❌	❌	⚠️
S5	Pine Tar	❌	❌	❌	❌	❌	❌
S1	Quercetin	✅	✅	✅	✅	✅	✅
S3	Raspberry Ketone	⚠️	❌	❌	❌	❌	❌
S2	Rhodinol	✅	⚠️	❌	❌	❌	⚠️
S2	Rose Oxide	✅	⚠️	❌	❌	❌	⚠️
S1	Rosmarinic Acid	✅	✅	✅	✅	✅	✅

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Reference Sheet S1-S5 Botanical Ingredient Safety Ratings

S	Product Name	Dogs	Cats	Birds	Reptiles	Ornamental Fish	Rodents
S1	Sclareolide	✅	✅	✅	✅	✅	✅
S3	Star Anise Oil	⚠️	❌	❌	❌	❌	❌
S2	Styralyl Acetate	✅	⚠️	❌	❌	❌	⚠️
S1	Tea Polyphenol	✅	✅	✅	✅	✅	✅
S3	Tea Tree Oil	⚠️	❌	❌	❌	❌	❌
S2	Terpenic Oil	✅	⚠️	❌	❌	❌	⚠️
S1	Tetrahydrolinalool	✅	✅	✅	✅	✅	✅
S3	Thujene	⚠️	❌	❌	❌	❌	❌
S4	Thymol	⚠️	❌	❌	❌	❌	❌
S3	Tung Oil	⚠️	❌	❌	❌	❌	❌

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Reference Sheet S1-S5 Botanical Ingredient Safety Ratings

S	Product Name	Dogs	Cats	Birds	Reptiles	Ornamental Fish	Rodents
S2	Vanillin	✅	⚠️	❌	❌	❌	⚠️
S2	Veratraldehyde	✅	⚠️	❌	❌	❌	⚠️
S2	Verbenol	✅	⚠️	❌	❌	❌	⚠️
S1	Watermelone Ketone	✅	✅	✅	✅	✅	✅
S5	Wood Creosote Oil	❌	❌	❌	❌	❌	❌
S5	Wood Tar Oil	❌	❌	❌	❌	❌	❌
S2	2-Methylundecanal	✅	⚠️	❌	❌	❌	⚠️
S2	Benzyl Alcohol	✅	⚠️	❌	❌	❌	⚠️
S2	Floralozone	✅	⚠️	❌	❌	❌	⚠️
S1	Furanone	✅	✅	✅	✅	✅	✅

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Reference Sheet S1-S5 Botanical Ingredient Safety Ratings

S	Product Name	Dogs	Cats	Birds	Reptiles	Ornamental Fish	Rodents
S2	Menthone Glycerin Acetal	✅	⚠️	❌	❌	❌	⚠️
S2	Perillartine	✅	⚠️	❌	❌	❌	⚠️
S2	Perillyl Alcohol	✅	⚠️	❌	❌	❌	⚠️

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CLOSING THE SAFETY GAP IN PET HOUSEHOLD PRODUCTS

Pets are not exposed like humans, and botanical safety cannot simply be inferred from human-use models. Yet for multi-pet households, the market still lacks a widely adopted safety grading language for botanical ingredients. This framework and product catalogue were developed to help formulators and procurement teams assess ingredients more clearly and make safer product decisions.

Build the pet-safe category.

Contact our sales team.

info@foreverest.net

foreverest.net/solution/cleaning-and-hygiene/safe-pet-care

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THANK YOU

for your time

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