

**PETITION TO THE
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

Office of Pesticide Programs (OPP)

**Petition to Add Capsaicin (CAS No. 404-86-4)
to the Minimum Risk Active Ingredient List**

40 CFR 152.25(f)(1), Table 1

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Executive Summary

This petition requests that EPA, under the Administrative Procedure Act (5 U.S.C. 553(e)) and FIFRA section 25(b), initiate notice-and-comment rulemaking to amend 40 CFR 152.25(f)(1), Table 1 (Active Ingredients Permitted in Minimum Risk Pesticide Products) to add Capsaicin (CAS No. 404-86-4).

Capsaicin is a naturally occurring constituent of *Capsicum* peppers with extensive history of dietary exposure. Capsaicin is also an EPA-registered biochemical pesticide active ingredient with a long regulatory history. Capsaicin is exempt from the requirement of a tolerance in or on food commodities under 40 CFR 180.1165 when used in accordance with approved label rates.

This petition does not minimize capsaicin's primary hazard: acute irritation, especially to eyes and mucous membranes. Rather, it presents a balanced risk profile and proposes that EPA evaluate whether the ingredient can appropriately be considered for the minimum risk program, taking into account aggregate exposure considerations and the intent of FIFRA 25(b).

Requested Action:

- Accept this petition under 5 U.S.C. 553(e).
- Initiate rulemaking to add “Capsaicin (CAS No. 404-86-4)” to 40 CFR 152.25(f)(1), Table 1.

I. Introduction and Summary of Request

The Petitioner respectfully requests that EPA initiate notice-and-comment rulemaking to amend the minimum risk pesticide exemption regulation at 40 CFR 152.25(f)(1) to add Capsaicin (CAS No. 404-86-4) to Table 1 as an eligible active ingredient. EPA has stated that stakeholders may petition the Agency to add or remove ingredients from the minimum risk active and inert lists under the Administrative Procedure Act, and that granting such a petition would proceed through notice-and-comment rulemaking.

II. Statutory and Regulatory Framework

Under 40 CFR 152.25(f), qualifying minimum risk pesticide products that meet all conditions of the exemption (including use of only eligible active and inert ingredients) are exempt from federal registration requirements under FIFRA. Table 1 of 40 CFR 152.25(f)(1) lists eligible active ingredients.

III. Requested Rulemaking (Proposed Regulatory Text)

The Petitioner requests that EPA amend 40 CFR 152.25(f)(1), Table 1 by adding the following entry:

Capsaicin — CAS No. 404-86-4

IV. Supporting Discussion

A. Ingredient Identity and Ability to Define/Specify

Capsaicin is a single, well-defined chemical entity with an established CAS Registry Number. Compared to complex botanical mixtures, capsaicin can be bounded with objective specifications (e.g., assay, impurity profile, heavy metals, residual solvents) to support consistent identity across manufacturers and products.

B. History of Exposure and Regulatory History

Capsaicin occurs naturally in *Capsicum* peppers and has extensive history of human dietary exposure through foods. Capsaicin has also been used as a pesticide active ingredient in the United States for decades and is treated by EPA as a biochemical pesticide.

C. Human Health Hazard Profile (Balanced Statement)

Capsaicin's primary hazard is acute irritation, particularly ocular and mucous membrane irritation. This petition does not argue that capsaicin is non-irritating. Instead, it asks EPA to evaluate whether, given capsaicin's long history of exposure and regulatory review, the ingredient can be considered for inclusion in the minimum risk program, which already includes other ingredients that are eye and skin irritants when misused or highly concentrated.

D. Residue Considerations and Tolerance Exemption

Capsaicin is exempt from the requirement of a tolerance in or on food commodities under 40 CFR 180.1165 when used in accordance with approved label rates and good agricultural practice. While the minimum risk program is primarily used for non-food uses, this tolerance exemption provides relevant context for EPA's prior residue-safety evaluation.

E. Environmental Considerations

The Petitioner understands that EPA will consider persistence, bioaccumulation potential, and non-target effects in evaluating minimum risk eligibility. The Petitioner is prepared to provide supporting literature summaries and specifications that address environmental fate and ecological considerations as needed.

F. Aggregate Exposure and Product-Form Considerations

Because inclusion on the minimum risk list would allow broad downstream use by multiple formulators, EPA must consider aggregate exposure across product types. This petition highlights product-form considerations in the appendices, emphasizing that non-aerosolized forms (e.g., pastes, gels, seed treatments, granular carriers) may meaningfully reduce inhalation exposure potential compared to sprays or fine powders.

V. Precedent and Process

EPA's addition of chitosan to the minimum risk active ingredient list (87 FR 67364, Nov. 8, 2022) illustrates the petition-to-rulemaking pathway for adding ingredients to Table 1. The Petitioner submits this request in the same procedural posture: a formal petition asking EPA to consider and, if appropriate, initiate rulemaking.

VI. Requested Agency Action

1. Accept this petition under 5 U.S.C. 553(e) and confirm receipt.
2. Initiate notice-and-comment rulemaking to amend 40 CFR 152.25(f)(1), Table 1 to add Capsaicin (CAS No. 404-86-4), or alternatively provide written explanation if EPA declines.

VII. Submission and Contact Information

Email (minimum risk inquiries): pesticidequestions@epa.gov

Mail: Environmental Protection Agency, Office of Pesticide Programs, Mail Code 7506C, 1200 Pennsylvania Ave., NW, Washington, DC 20460

VIII. References

- 40 CFR 152.25(f) — Minimum risk pesticide exemption.

- 40 CFR 152.25(f)(1), Table 1 — Active ingredients permitted in minimum risk pesticide products.
- 40 CFR 180.1165 — Capsaicin; exemption from the requirement of a tolerance.
- 87 FR 67364 (Nov. 8, 2022) — Chitosan added to minimum risk active ingredient list.
- National Pesticide Information Center (NPIC) — Capsaicin Fact Sheet.

Appendix A: Identity and Specification Sheet

***Note:** This specification is intentionally conservative. EPA may refine or require different specifications if it elects to pursue rulemaking.*

Active ingredient proposed for Table 1: Capsaicin (CAS No. 404-86-4)

This specification is designed to minimize variability concerns that often arise with complex botanical mixtures. Capsaicin can be bounded with objective specifications including assay purity, impurity profile, heavy metals limits, and residual solvents to support consistent identity across manufacturers and products.

Appendix B: Hazard Summary

***Purpose:** Provide a balanced hazard summary that does not minimize irritation hazards and highlights exposure controls appropriate for minimum-risk products.*

Key Hazard Characteristics

- **Primary hazard:** Acute irritation of eyes and mucous membranes; capsaicin can severely irritate eyes and can cause tearing, photophobia, and temporary visual impairment after accidental ocular exposure.
- **Dermal contact:** Can cause burning sensation and skin irritation; susceptible individuals may experience stronger responses.
- **Inhalation:** Exposure can provoke coughing and bronchoconstriction; individuals with asthma or other respiratory disease may be more sensitive.

Systemic Toxicity Considerations

Risk discussion should distinguish between (i) acute sensory irritation at low exposure and (ii) systemic toxicity at much higher doses. Capsaicin has a long history of dietary exposure as a natural constituent of peppers; EPA has also historically regulated capsaicin as a biochemical pesticide.

Practical Risk Management

- Design products to avoid aerosol/dust exposure (e.g., closed-system dosing, pastes/gels, pre-wetted carriers, non-friable granules).
- Use child-resistant packaging and clear first-aid language for accidental eye exposure (flush with water; seek medical advice if symptoms persist).
- Prominent precautionary statements: avoid eye contact; wash hands after handling; do not use in ways that create airborne mist or dust.

Appendix C: Exposure-Limiting Product Forms

Purpose: Explain why the petitioner's intended real-world uses are low-airborne-exposure forms, and how such forms align with the intent of the minimum-risk exemption.

Intended Product Categories

- **Seed-treatment/seed-coating concentrates:** Intended to be applied to seed in a container (shake-coat) or tumbler, then allowed to dry prior to planting.
- **Pastes/gels:** Applied with glove/brush or as a non-spray smear/dip to reduce aerosolization.
- **Granular/non-friable carriers:** Where the active is bound/adsorbed to minimize dust release.

Why Non-Aerosol Forms Matter

Capsaicin's sensory irritation hazard is driven by accidental contact with eyes/mucous membranes and by inhalation of airborne droplets/particles. Non-aerosol, low-dust physical forms reduce the primary exposure routes that drive acute complaints (eye and inhalation).

Suggested EPA Considerations

If EPA considers adding capsaicin to Table 1, the Agency could evaluate whether additional specification clarity (identity/purity) is warranted to keep products within a predictable hazard envelope. EPA could also consider whether program communications should discourage aerosol product forms for any minimum-risk products containing capsaicin, given the known sensory irritation profile.

Appendix D: Comparator Analysis — Irritant Ingredients Already in Table 1

Purpose: Illustrate that Table 1 already includes ingredients that can cause significant eye irritation if mishandled, and that EPA has managed this category through identity/specification and use constraints within the minimum-risk framework.

Examples of Table 1 Ingredients with Known Irritation Potential

- **Lauryl sulfate / Sodium lauryl sulfate:** Surfactants known to irritate eyes at sufficient concentration.
- **Citric acid / Malic acid:** Organic acids that can cause eye irritation, especially as powders or concentrated solutions.
- **Cinnamon, clove, thyme, peppermint oils:** Essential oils that can be strong irritants and cause substantial stinging in eyes.
- **White pepper:** Pepper-derived active; illustrates Table 1 can include pungent botanicals.

Key Distinction

This petition is NOT claiming capsaicin is non-irritating; it explicitly acknowledges ocular and inhalation irritation hazards.

This petition IS asserting that: (i) capsaicin has extensive existing regulatory and exposure history, (ii) it can be identity-controlled with a clear CAS-based specification, and (iii) the minimum-risk program already includes ingredients with meaningful eye irritation potential that are managed through conditions, labeling, and practical formulation choices.

Appendix E: Detailed References

U.S. EPA. Contact Us About Minimum Risk Pesticides (updated Nov 5, 2025).

<https://www.epa.gov/minimum-risk-pesticides/forms/contact-us-about-minimum-risk-pesticides>

U.S. EPA. Conditions for Minimum Risk Pesticides. <https://www.epa.gov/minimum-risk-pesticides/conditions-minimum-risk-pesticides>

U.S. EPA. Minimum Risk Pesticides - Inert Ingredient and Active Ingredient Eligibility under 40 CFR 152.25(f). <https://www.epa.gov/minimum-risk-pesticides/minimum-risk-pesticides-inert-ingredient-and-active-ingredient-eligibility>

U.S. EPA. Active Ingredients Allowed in Minimum Risk Pesticide Products.

<https://www.epa.gov/minimum-risk-pesticides/active-ingredients-allowed-minimum-risk-pesticide-products>

Legal Information Institute (Cornell). 40 CFR 152.25.

<https://www.law.cornell.edu/cfr/text/40/152.25>

Legal Information Institute (Cornell). 40 CFR 180.1165.

<https://www.law.cornell.edu/cfr/text/40/180.1165>

NPIC (Oregon State University). Capsaicin Fact Sheet.

<https://npic.orst.edu/factsheets/capgen.html>

NPIC (Oregon State University). Capsaicin Technical Fact Sheet (archived).

<https://npic.orst.edu/factsheets/archive/Capsaicintech.html>

OSHA. Chemical Database: Capsaicin (CAS 404-86-4).

<https://www.osha.gov/chemicaldata/1014>

U.S. EPA. Non-Animal Testing Approach to EPA Labeling for Eye Irritation.

<https://www.epa.gov/pesticide-registration/non-animal-testing-approach-epa-labeling-eye-irritation>