

Chitosan and Minimum Residual Limits

The question often arises from growers on what is the minimum residual limit (MRL) or is there a MRL for Chitosan.

The short answer is yes, but in practice, there is effectively no numerical minimum or maximum residue limit (MRL) required for Chitosan in most regulatory contexts because it is exempt from tolerance requirements. Different countries and governments view Chitosan differently. The information below is a brief summary with web links for the reader to investigate further.

United States (EPA)

Chitosan (poly-D-glucosamine) is exempt from the requirement of a tolerance for residues when used as a pesticide, plant growth regulator, or in related agricultural applications.

<https://www.ecfr.gov/current/title-40/chapter-I/subchapter-E/part-180/subpart-D/section-180.1072>

This exemption (40 CFR 180.1072) applies to seed treatments and general use on raw agricultural commodities.

Chitosan is also listed as a minimum-risk pesticide ingredient (exempt from full EPA registration under FIFRA Section 25(b)).

<https://www.epa.gov/pesticides/epa-adds-chitosan-list-active-ingredients-eligible-minimum-risk-pesticide-exemption>

In this same document, there is an official EPA statement on the low/ minimum risk for Chitosan:

“The Agency’s analysis of the available data suggests that chitosan and chitosan salts are of low toxicity to humans and no environmental risks of concern have been identified.”

The main reason for this is Chitosan has been long recognized as being low toxicity, naturally occurring, and abundant in the environment and naturally biodegradable. No specific residue limit is enforced because it poses negligible risk.

<https://www.ams.usda.gov/sites/default/files/media/Chitosan%20TR.pdf>

European Union

Chitosan is classified as a basic substance (or low-risk substance).

In October 2024, the EU added it to Annex IV of the MRL regulation (Regulation (EU) 2024/2612), meaning no specific MRL is required due to its minimal risk profile.

<https://agrinfo.eu/book-of-reports/maximum-residue-levels-for-chitosan-fat-distillation-residues-hydrolysed-proteins-and-lavandulyl-senecioate/>

<https://www.useforesight.io/news/eu-introduces-new-maximum-residue-levels-for-pesticides-and-low-risk-substances>

A general default MRL of 0.01 mg/kg may apply in some cases where not explicitly exempted, but for approved uses of Chitosan, residues are not regulated with numerical limits.

Other Contexts (Codex, International)

No specific Codex Alimentarius MRLs are typically set for Chitosan due to its safety profile and exemption status in major jurisdictions.

In food, feed, or supplement contexts, it is often treated as a natural substance with GRAS-like or low-concern status.

Summary

There is no practical minimum residue limit (nor a restrictive maximum) for Chitosan in agriculture/pesticide use. Regulatory bodies consider it safe enough that residues do not require monitoring or enforcement against a numerical threshold, provided it is used according to label or approved conditions.

For specific crops, export markets, or non-pesticide uses (e.g., food processing, animal feed), always check the destination country's import requirements or consult a regulatory expert, as rules can vary slightly. If this relates to a particular application (e.g., as a biopesticide or soil amendment), further inquiry may be necessary.