**April 24, 2023**

**Environmental Working Group comments to the Environmental Protection Agency Docket ID: EPA-HQ-OPP-2021-0290; Petition To Establish U.S. Tolerances for Residues of Chlormequat Chloride in or on Wheat, Barley, and Oats and Secondary Residues in Meat, Milk, Poultry, and Eggs on the Document ID: EPA-HQ-OPP-2021-0290-0011; Receipt of a Pesticide Petition Filed for Residues of Pesticide Chemicals in or on Various Commodities February 2023**

The Environmental Working Group, a nonprofit research and policy organization with offices in Washington, D.C., Minneapolis, San Francisco and Sacramento, Calif., urges the Environmental Protection Agency not to approve the requested tolerances for chlormequat chloride and to revoke previously approved tolerances for chlormequat chloride in oats, wheat, barley, and animal products, and not allow new uses of chlormequat in the U.S.

In 2018, the Environmental Protection Agency allowed chlormequat chloride on imported oats, wheat, barley, and some animal products, with tolerances increased on some of these commodities in 2020. This decision paved the way, ultimately, for the introduction into the U.S. food supply of a new agricultural chemical, one with very concerning toxicity, as documented by recent EWG tests of oat-based products purchased in 2022.[1] The levels of chlormequat found in cereals and oat-based products are concerning for children's health because low doses of chlormequat have been shown to impact fertility, harm the reproductive system, and alter growth and development in animal studies.

EWG is recommending the EPA not approve the currently petitioned tolerances for chlormequat chloride, revoke the previously approved tolerances, and not allow new uses of chlormequat in the U.S. Our recommendations are based on the following:

1. Chlormequat chloride is a reproductive and developmental toxicant, which is not accounted for in the current EPA risk assessment.
2. The presence of chlormequat chloride in foods commonly consumed by children puts children's health at risk.
3. Chlormequat chloride is not necessary to produce oats and other grains.

Details and information that support EWG's recommendation not to approve chlormequat tolerances are listed below.

[1] Evans S, Temkin A, Naidenko O. EWG Investigation: Dangerous agricultural chemical chlormequat found in popular oat-based products. January 31, 2023. Environmental Working Group. https://www.ewg.org/research/ewg-investigation-dangerous-agricultural-chemical-chlormequat-found-popular-oat-based

**Chlormequat chloride is a reproductive and developmental toxicant, and exhibits neurotoxicity, which are not accounted for in the current EPA risk assessment.**

Since the 1980s there have been reports, summarized in the peer-reviewed literature, showing that exposure to chlormequat during pregnancy, at environmentally relevant concentrations through controlled dosing experiments or using chlormequat treated animal feed, can harm reproduction in both pigs and rodents.[2,3] Subsequent published studies, from 2016 to 2022, have also documented the harmful effects of chlormequat exposure, especially on the male reproductive system, the hormone system and on growth of the developing fetus in rodent models.[4,5,6,7] Importantly, the doses at which these effects occur in animal studies are in some cases lower than the current reference dose set by the EPA, at 0.05 mg/kg body weight per day. In early studies in pigs and mice, doses of 0.0023 and 0.024 mg/kg body weight per day, respectively, of chlormequat lowered fertility.[2,3] In another peer-reviewed study no NOAEL was available, yet the LOAEL of the study, 5 mg/kg body weight per day, was at the same dose as the point of departure used in EPA's assessment and cause altered growth and metabolism during development.[6] These two aspects indicate that in the human health risk assessment for chlormequat, EPA should apply a 10X FQPA safety factor for children's health, based on the developmental effects of chlormequat exposure, and another 10X for extrapolation of a LOAEL to a NOAEL. Furthermore, acute neurotoxic effects were observed in the registrant studies, yet no developmental neurotoxicity study was available, suggesting the database on chlormequat toxicity is not complete.

**The presence of chlormequat chloride in foods commonly consumed by children puts children's health at risk.**

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[2] Sorensen MT, Danielsen V. Effects of the plant growth regulator, chlormequat, on mammalian fertility. Int J Androl. 2006;29(1):129-33.
[3] Torner H, Blottner S, Kuhla S, Langhammer M, Alm H, Tuchscherer A. Influence of chlorocholinechloride-treated wheat on selected in vitro fertility parameters in male mice. Reprod Toxicol. 1999;13(5):399-404.
[4] Huang D, Wu S, Pan Y, Meng Q, Chu H, Jiang J, Shang L, Hao W. The effects of chlormequat chloride on the development of pubertal male rats. Environ Toxicol Pharmacol. 2016 Oct;47:92-99. doi: 10.1016/j.etap.2016.09.002. Epub 2016 Sep 4. PMID: 27653211.
[5] Hou X, Huang D, Meng Q, Zhang Q, Jia L, Wang S, Cheng Z, Wu S, Shang L, Jiang J, Hao W. Pubertal chlorocholine chloride exposure inhibits testicular testosterone synthesis by down-regulating steroidogenic enzymes in adult rats. Toxicol Lett. 2018 May 15;288:17-24. doi: 10.1016/j.toxlet.2018.02.015. Epub 2018 Feb 12. PMID: 29447956.
[6] Xiagedeer B, Hou X, Zhang Q, Hu H, Kang C, Xiao Q, Hao W. Maternal chlormequat chloride exposure disrupts embryonic growth and produces postnatal adverse effects. Toxicology. 2020 Sep;442:152534. doi: 10.1016/j.tox.2020.152534. Epub 2020 Jul 2. PMID: 32622971.
[7] Xiao Q, Hou X, Kang C, Xiagedeer B, Hu H, Meng Q, Jiang J, Hao W. Effects of prenatal chlorocholine chloride exposure on pubertal development and reproduction of male offspring in rats. Toxicol Lett. 2021 Oct 15;351:28-36. doi: 10.1016/j.toxlet.2021.08.005. Epub 2021 Aug 16. PMID: 34411681.

EWG has researched the presence of pesticides, particularly glyphosate, in oat-based products since 2018. Our results found glyphosate in nearly all conventional oat-based products, with most exceeding safety thresholds recommended by EWG scientists.[8] Upon learning of EPA's recent approval of tolerances for chlormequat in imported oats, EWG continued testing oat-based products, this time in 2022 for the presence of chlormequat. In our tests, we found chlormequat in all but one of 13 conventional oat-based products, with the highest levels detected in popular Quaker products as well as General Mills Cheerios.[1] These levels did not exceed EPA tolerances. But given the faults of the risk assessment highlighted in the previous section, the safety thresholds set by EPA do not adequately protect children's health.

Additionally, in Sweden and the U.K., chlormequat can be detected in 100 percent of the individuals sampled and at concentrations higher than other pesticides with known health effects in human populations, including chlorpyrifos.[9,10] Shockingly, despite widespread exposure in the human population and harmful effects at low doses in animal studies, no epidemiological studies exist investigating the potential adverse health effects in humans. This large data gap prevents a full understanding of chlormequat toxicity.

**Chlormequat chloride is not necessary to produce oats and other grains.**

The use of chlormequat and introduction of chlormequat into the food supply in not just the U.S. but also Canada is a relatively new phenomenon. Oats and grains have been grown in North America for decades without the use of chlormequat. Further still, in EWG tests of conventional oat-based infant food, chlormequat was rarely detected. Furthermore, one study that investigated switching from a conventional to an organic diet, found the levels of chlormequat dropped rapidly and significantly in human urine samples.[11]

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[8] Environmental Working Group. Complete Results of EWG's 2018 Glyphosate Tests in Oat Cereals and Snacks. 2018. https://www.ewg.org/sites/default/files/u352/EWG_Glyphosate-2_Table_Full_C02.pdf

[9] Galea KS, MacCalman L, Jones K, Cocker J, Teedon P, Cherrie JW, van Tongeren M. Urinary biomarker concentrations of captan, chlormequat, chlorpyrifos and cypermethrin in UK adults and children living near agricultural land. J Expo Sci Environ Epidemiol. 2015 Nov-Dec;25(6):623-31. doi: 10.1038/jes.2015.54. Epub 2015 Sep 16. PMID: 26374656; PMCID: PMC4611359.

[10] Norén E, Lindh C, Rylander L, Glynn A, Axelsson J, Littorin M, Faniband M, Larsson E, Nielsen C. Concentrations and temporal trends in pesticide biomarkers in urine of Swedish adolescents, 2000-2017. J Expo Sci Environ Epidemiol. 2020 Jul;30(4):756-767. doi: 10.1038/s41370-020-0212-8. Epub 2020 Feb 24. PMID: 32094458; PMCID: PMC8075908.

[11] Rempelos L, Wang J, Barański M, Watson A, Volakakis N, Hoppe HW, Kühn-Velten WN, Hadall C, Hasanaliyeva G, Chatzidimitriou E, Magistrali A, Davis H, Vigar V, Średnicka-Tober D, Rushton S, Iversen PO, Seal CJ, Leifert C. Diet and food type affect urinary pesticide residue excretion profiles in healthy individuals: results of a randomized controlled dietary intervention trial. Am J Clin Nutr. 2022 Feb 9;115(2):364-377. doi: 10.1093/ajcn/nqab308. PMID: 34718382.

In conclusion, given the large data gaps that prevent a full understanding of the toxicity of chlormequat, the available studies that indicate low dose exposure to chlormequat can harm reproduction and development, and the presence of chlormequat in children's food and foods eaten by pregnant people, we believe strongly that the EPA should not approve the petitioned tolerances, should revoke previously approved tolerances and should not allow new uses of chlormequat in the U.S.

We appreciate the opportunity to comment.

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