



Addressing claims of herbicide in orange juice

By Kevin M. Folta

A number of websites recently made claims about detection of the herbicide glyphosate in orange juice from several leading brands¹⁻³. It is important to understand the claims, who is making them, and how to communicate the actual risk, which the science says approaches zero.

WHAT IS THE CLAIM?

Moms Across America (MAM) claims that it has identified traces of the herbicide glyphosate in major orange juice brands¹.

WHO IS THIS GROUP?

The MAM group was established by Zen Honeycutt, a mother who had unfortunate health issues appear in her children⁴. She blames modern agriculture, seed technologies and associated crop protection products. Her group has specifically targeted glyphosate, the active ingredient in the herbicide Roundup, and her website sells plenty of supplements to protect people from agricultural “toxins.”

IS IT POSSIBLE?

Glyphosate is used to control weeds in row middles, under and between trees⁵. It is a foliar herbicide, killing plants from leaf application⁶. It generally has poor uptake through the roots⁷. It is not sprayed on citrus trees, and would kill them if it was. The amount applied, and where it is applied, alone makes the claim unlikely.

SHOULD WE TRUST MAM?

No. MAM does not publish scientific research with validated methods, transparent tests, replicated trials or

¹http://www.momsacrossamerica.com/all_top_5_orange_juice_brands_positive_for_weedkiller

²<http://healthfreedomidaho.org/glyphosate-probable-cancer-causing-agent-found-in-all-5-major-orange-juice-brands>

³<https://www.march-against-monsanto.com/glyphosate-weedkiller-found-in-all-5-popular-orange-juice-brands/>

⁴http://www.momsacrossamerica.com/zen_s_story_and_speech

⁵Erickson C.G., Management of glyphosate-related citrus fruit drop. Proc Fla State Hort Soc 109: 40–42(1996).

⁶Duke, S.O. and Powles, S.B. (2008), Glyphosate: a once-in-a-century herbicide. Pest. Manag. Sci., 64: 319–325.

⁷Sprinkle, Paul, W.F. Meggitt, and Donald Penner. Rapid inactivation of glyphosate in the soil. Weed Science 23.3 (1975): 224–228.

use of independent laboratories. In March of 2013, MAM published a chart with falsified corn composition data⁸ that spread quickly throughout the web. The group claimed the results were from corn, but the results were not remotely from anything biological. When questioned, MAM simply attacked its critics.

The group also has claimed that glyphosate is present in vaccines⁹, breast milk¹⁰, urine (where it would be)¹⁰, and many foods and beverages. Orange juice is the latest target.

HOW DOES MAM TEST?

Most of its tests are performed using a commercial kit that is designed for use with water. The chemistry of the kit is incompatible with other products, so false positives are common, yet are willfully interpreted as real signals. For instance, MAM reports detection in breast milk, prompting breast milk composition experts to perform similar tests correctly. These properly performed, reviewed and published reports failed to confirm MAM's results¹¹,

While we should not trust unpublished, non-independently replicated results, it is important to note that if they were real, the amounts reported are inconsequential.

and matched the results from an independent commercial lab that also failed to detect the compound in breast milk samples.

The MAM tests on OJ were performed using a different method that could measure actual amounts. However, "no glyphosate" controls were not included. The nature of the test is such that it is impossible to tell an actual signal without a correct comparison to an equivalent control. Organic orange juice would have been an appropriate control. Furthermore, the test was performed by a lab in Fairfield, Iowa, whose founder is the "Food Purity Raja" in the Maharishi movement¹² and a committed opponent of modern agriculture.

WHAT DO THE RESULTS MEAN?

While we should not trust unpublished, non-independently replicated results, it is important to note that if they were real, the amounts reported are inconsequential. The claimed amounts of 4 to 26 parts per billion (by analogy, 4 to 26 seconds in 32 years) are hundreds of thousands of times lower than any edge of physiological relevance.

MAM stokes health concerns from non-replicated research in petri dishes and extrapolates the results to humans. MAM claims that the compound is a "probable carcinogen," which is a highly

controversial claim made by only one global agency that simply reviewed the literature, omitting many studies¹³. That conclusion was not reached by dozens of government, academic or industry evaluations, as there is no firm evidence of carcinogenicity mechanism, no negative trends in animals studied, and extremely limited evidence of glyphosate-related cancers in epidemiological assessments.

CONCLUSION

Be extremely skeptical when unpublished, seemingly-scientific results are offered on websites, especially those with a clear agenda. Those opposed to conventional farming claim detection of trace amounts of agricultural chemistry in food. They then imply risk with the intention of affecting consumer choice and limiting crop protection strategies for ag producers.

If asked about this topic, ag producers should emphasize that weeds must be controlled, and that glyphosate, used as directed, is a safe, effective and inexpensive way to do it. They should note that there is a movement afoot to limit access to all agricultural chemistries, even if such restrictions have negative impacts on farm families, force use of approaches with higher environmental impact, or drive higher prices that affect the poor. 🍊

Kevin M. Folta is a professor and chair of the Horticultural Sciences Department at the University of Florida in Gainesville.

⁸<http://kfolta.blogspot.com/2013/04/the-gullible-moms-across-america-post.html>

⁹http://www.momsacrossamerica.com/glyphosate_in_childhood_vaccines

¹⁰http://www.momsacrossamerica.com/glyphosate_testing_results

¹¹McGuire, M.K. et al. Glyphosate and aminomethylphosphonic acid are not detectable in human milk. *Am J Clin Nutr.* 2016 103(5):1285-90.

¹²<https://geneticliteracyproject.org/glp-facts/john-fagan-rajah-world-peace-maharishi-movement-behind-scenes-guru-anti-gmo-movement/>

¹³<https://www.reuters.com/investigates/special-report/who-iarc-glyphosate/>

