GMW: Now glyphosate found in people's urine

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According to an article in German in the Ithaca journal, a German university study has found significant concentrations of glyphosate in the urine samples of city dwellers. The analysis of the urine samples apparently found that all had concentrations of glyphosate at 5 to 20-fold the limit for drinking water. As well as being used increasingly widely in food production, glyphosate-based weedkillers often also get sprayed onto railway lines, urban pavements and roadsides.
http://www.ithaka-journal.net/herbizide-im-urin

Disturbingly, the Ithaca journal reports (in our translation), "The address of the university labs, which did the research, the data and the evaluation of the research method is known to the editors. Because of significant pressure by agrochemical representatives and the fear that the work of the lab could be influenced, the complete analytical data will only be published in the course of this year."
http://www.ithaka-journal.net/herbizide-im-urin

News of this study comes not long after the publication of a study confirming glyphosate was contaminating groundwater. Last year also saw the publication of two US Geological Survey studies which consistently found glyphosate in streams, rain and even air in agricultural areas of the US.
http://www.gmwatch.org/latest-listing/1-news-items/13549

Other recent studies - see the abstracts of the 4 below - indicate that people may not only be absorbing glyphosate from multiple sources but that it can circulate in the blood and can even cross the placental barrier and so reach the developing fetus.

Aris, A. and S. Leblanc (2011). "Maternal and fetal exposure to pesticides associated to genetically modified foods in EasternTownships of Quebec, Canada."
ReproductiveToxicology 31(4).

Pesticides associated to genetically modified foods (PAGMF), are engineered to tolerate herbicides such as glyphosate (GLYP) and gluphosinate (GLUF) or insecticides such as the bacterial toxin bacillus thuringiensis (Bt). The aim of this study was to evaluate the correlation between maternal and fetal exposure, and to determine exposure levels of GLYPandits metabolite aminomethylphosphoricacid (AMPA), GLUF and its metabolite 3-methylphosphinicopropionicacid (3-MPPA) and Cry1Ab protein (a Bt toxin) in Eastern Townships of Quebec, Canada. Blood of thirty pregnant women (PW) and thirty-nine nonpregnant women (NPW)were studied. Serum GLYPand GLUF were detected in NPW and not detected in PW. Serum 3-MPPA and CryAb1toxin were detected in PW,their fetuses and NPW. This is the first study to reveal the presence of circulating PAGMF in women with and without pregnancy, paving the way for a new field in reproductive toxicology including nutrition and utero-placental toxicities.

Chang, F. C., M. F. Simcik, et al. (2011). "Occurrence and fate of the herbicide glyphosate and its degradate aminomethylphosphonic acid in the atmosphere."
Environ Toxicol Chem 30(3): 548–555.

This is the first report on the ambient levels of glyphosate, the most widely used herbicide in the United States, and its major degradation product, aminomethylphosphonic acid (AMPA), in air and rain. Concurrent, weekly integrated air particle and rain samples were collected during two growing seasons in agricultural areas in Mississippi and Iowa. Rain was also collected in Indiana in a preliminary phase of the study. The frequency of glyphosate detection ranged from 60 to 100% in both air and rain. The concentrations of glyphosate ranged from <0.01 to 9.1 ng/m(3) and from <0.1 to 2.5 microg/L in air and rain samples, respectively. The frequency of detection and median and maximum concentrations of glyphosate in air were similar or greater to those of the other high-use herbicides observed in the Mississippi River basin, whereas its concentration in rain was greater than the other herbicides. It is not known what percentage of the applied glyphosate is introduced into the air, but it was estimated that up to 0.7% of application is removed from the air in rainfall. Glyphosate is efficiently removed from the air; it is estimated that an average of 97% of the glyphosate in the air is removed by a weekly rainfall >/= 30 mm.

Coupe, R. H., S. J. Kalkhoff, et al. (2011). "Fate and transport of glyphosate and aminomethylphosphonic acid in surface waters of agricultural basins."
Pest Manag Sci.

BACKGROUND: Glyphosate [N-(phosphonomethyl)glycine] is a herbicide used widely throughout the world in the production of many crops and is heavily used on soybeans, corn and cotton. Glyphosate is used in almost all agricultural areas of the United States, and the agricultural use of glyphosate has increased from less than 10 000 Mg in 1992 to more than 80 000 Mg in 2007. The greatest intensity of glyphosate use is in the midwestern United States, where applications are predominantly to genetically modified corn and soybeans. In spite of the increase in usage across the United States, the characterization of the transport of glyphosate and its degradate aminomethylphosphonic acid (AMPA) on a watershed scale is lacking. RESULTS: Glyphosate and AMPA were frequently detected in the surface waters of four agricultural basins. The frequency and magnitude of detections varied across basins, and the load, as a percentage of use, ranged from 0.009 to 0.86% and could be related to three general characteristics: source strength, rainfall runoff and flow route. CONCLUSIONS: Glyphosate use in a watershed results in some occurrence in surface water; however, the watersheds most at risk for the offsite transport of glyphosate are those with high application rates, rainfall that results in overland runoff and a flow route that does not include transport through the soil. Copyright (c) 2011 Society of Chemical Industry.

Poulsen, M. S., E. Rytting, et al. (2009). "Modeling placental transport: Correlation of in vitro BeWo cell permeability and ex vivo human placental perfusion."
Toxicol In Vitro 23: 1380–1386.

The placental passage of three compounds with different physicochemical properties was recently

investigated in ex vivo human placental perfusion experiments (caffeine, benzoic acid, and glyphosate) [Mose, T., Kjaerstad, M.B., Mathiesen, L., Nielsen, J.B., Edelfors, S., Knudsen, L.E., 2008. Placental passage of benzoic acid, caffeine, and glyphosate in an ex vivo human perfusion system. J. Toxicol. Environ. Health, Part A 71, 984-991]. In this work, the transport of these same three compounds, plus the reference compound antipyrine, was investigated using BeWo (b30) cell monolayers. Transport across the BeWo cells was observed in the rank order of caffeine>antipyrine>benzoic acid>glyphosate in terms of both the apparent permeability coefficient and the initial slope, defined as the linear rate of substance transferred to the fetal compartment as percent per time, a parameter used to compare the two experimental models. The results from the in vitro studies were in excellent a greement with the ex vivo results (caffeine approximately antipyrine>benzoic acid>glyphosate). However the transfer rate was much slower in the BeWo cells compared to the perfusion system. The advantages and limitations of each model are discussed in order to assist in the preparation, prediction, and performance of future studies of maternal-fetal transfer.