



FACTORY FARMS: ARSENIC

Chicken, pork, and turkey are among the most heavily consumed meats in America. From 1966 to 2000, annual chicken consumption rose 253 percent, from 32.1 to 81.2 pounds per person.¹ But did you know that chicken contains arsenic?

WHAT IS ARSENIC AND WHY IS IT IN MY CHICKEN?

Despite many risks, FDA approved arsenic-containing feed additives for animals in the 1940s, and they are still widely used in chicken, turkey and swine production² to promote weight gain, improve feed efficiency, change meat pigmentation, and for disease prevention and control.³

Why? Chicken production has changed significantly since the 1940s. The relentless drive to produce more animals in less time, with less space, and at lower cost lies behind the routine addition of antimicrobial drugs such as arsenicals to animal feed. Almost all chickens are now raised in broiler "houses", which typically hold 25,000 to 30,000 birds. A modern broiler "farm" generally has 2 to 6 such houses. Inside, animals compete for space, food, and water; breathe contaminated air; and live in their own waste. Overcrowding and poor sanitation significantly increase the chances of outbreaks of disease in these large chicken operations.

Arsenic exists in two forms: organic and inorganic. Inorganic arsenic is a known human carcinogen. It can contribute to cancers, heart disease, diabetes, birth defects, decline in intellectual function, and can decrease a body's virus response. Organic arsenic—the form in animal feed—was once considered safe at low levels, but recent studies show

that it can easily convert to inorganic arsenic and even low exposure levels currently found in contaminated food, drinking water, and the broader environment can cause cancers.⁴

HOW MUCH ARSENIC IS IN MY CHICKEN?

The truth is that FDA does not know. FDA has *approved* hundreds of kinds of arsenic use; yet it does not *monitor* the usage of these drugs in animal feed. Unfortunately, there is no public data to quantify the amount of arsenic given to poultry, yet an estimated 70 percent of broiler chickens are fed arsenic-containing compounds at some point in their lives.⁵

Until the Institute for Agriculture and Trade Policy (IATP) conducted its own tests in 2004 and 2005, FDA's Food Safety and Inspection Service (FSIS) rarely inspected chicken for arsenic. When it did, FSIS examined chicken livers, not muscle meat, which is what most people consume.⁶ IATP tested more than 150 supermarket packages of raw chicken and "fast food" chicken sandwiches and nuggets, and found that fully 55% of "raw chicken" products and 100% of "fast food" chicken product samples revealed detectable levels of total arsenic.⁷ These results strongly suggest the use of arsenic in poultry feed leads to arsenic in chicken.

ENVIRONMENTAL IMPACTS OF ARSENIC

Arsenic is an element and neither degrades nor disappears. Therefore, it can readily migrate through soils, underlying groundwater, and into the air.⁸

Arsenical use in poultry production has indirect human and environmental impacts. Billions of chickens raised in the U.S.

generate billions of pounds of waste, where arsenicals pass nearly unchanged. Waste can be used as fertilizer to croplands, but still contains arsenic which leaches into groundwater. Poultry litter containing arsenic is also fed to beef cattle.

New practices have developed to address the massive amounts of waste generated by factory farms. Arsenic-laden poultry litter is now converted into fertilizer pellets and used for crops, home landscaping, gardening and golf courses.⁹ It is also burned as a biofuel, releasing arsenic into the air. These practices open up entirely new avenues of arsenic exposure and public health concerns.

Routine arsenical use in animal feed likely adds to the already significant public health burden from arsenic-contaminated drinking water supplies, fertilizers, treated wood products, and arsenical pesticides used on crops.¹⁰

REGULATION ON ARSENIC IN ANIMAL FEED

Acknowledging the lack of science supporting health or safety standards for arsenic, the European Union has never approved its use in animal feed,¹¹ has warned children and consumers of the risks of arsenic in food, and recommended that dietary exposure to inorganic arsenic be reduced.¹²

Conversely, while federal agencies have demonstrated that they *can* act to curb arsenic uses, FDA has so far failed to do so. For

example, in 2009 EPA reached an agreement with organic arsenical pesticide manufacturers who then withdrew their products from the market and EPA withdrew its approval for these pesticides.¹³ In contrast, in June 2011, Alpharma (a division of Pfizer) announced it would voluntarily suspend sale of Roxarsone. At the time, FDA commented that Roxarsone raised concerns of a “completely avoidable exposure to a carcinogen,” yet still did not withdraw its approval.¹⁴

The most efficient solution is to simply ban the use of arsenic in the U.S. With such great health risks, making the well-being of their citizens a priority gives the U.S. plenty of reason to ban it. States like Maryland have already passed legislation limiting arsenic sale and use. There is no reason FDA cannot do the same thing for arsenic in animal feed as the agency did for arsenical pesticides.

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1 David A. Taylor, *Funky Chicken: Consumers Exposed to Arsenic in Poultry*, 112 *Env'tl. Health Persp.* A50 (2004) (reviewing Tamar Lasky et al., *Mean Total Arsenic Concentrations in Chicken 1989-2000 and Estimated Exposures for Consumers of Chicken*, 112 *Env'tl. Health Persp.* 18, 18-21 (2004)).

2 B.K. Anderson and T.N. Chamblee, *The Effect of Dietary 3-Nitro-4-Hydroxyphenylarsonic Acid (Roxarsone) on the Total Arsenic Level in Broiler Excreta and Broiler Litter*, 10 *J. Applied Poultry Res.* 323, 323-328 (2001); see also David Wallinga, *Inst. for Agric. and Trade Policy, Playing Chicken: Avoiding Arsenic in Your Meat* 11 (2006), available at <http://www.iatp.org/iatp/publications.cfm?accountID=421&refID=80529>.

3 See 21 C.F.R. §§ 558.530, 558.62, 558.120, 558.369, 558.530.

4 See A.J. Bednar et al., *Photodegradation of Roxarsone in Poultry Litter Leachates*, 302 *Sci. Total Env't* 237, 237-245 (2002); J.R. Garbarino et al., *Environmental fate of roxarsone in poultry litter. I. Degradation of roxarsone during composting*, 37 *Env'tl. Sci. & Tech.* 1509, 1509-14 (2003); John F. Stolz et al., *Biotransformation of 3-Nitro-4-Hydroxybenzene Arsonic Acid and Release of Inorganic Arsenic by Clostridium Species*, 41 *Env'tl. Sci. & Tech.* 818, 818-23 (2007).

5 See 21 C.F.R. §§ 558.35-558.680; H.D. Chapman, Z.B. Johnson, *Use of Antibiotics and Roxarsone in Broiler Chickens in the USA: Analysis for the Years 1995 to 2000*, 81 *Poultry Sci.* 356, 356-64 (2002).

6 USDA, FSIS, 2001 FSIS National Residue Program Data, available at http://www.fsis.usda.gov/OPHS/red_book_2001/2001_Residue_Program_Data_Sections1-7.pdf.

7 David Wallinga, see above note 2 at pages 6-7.

8 B.P. Jackson et al., *Trace Element Speciation in Poultry Litter*, 32 *J. Env'tl. Quality* 535, 535-40 (2003); see also above note 4.

9 Keeve E. Nachman et al., *Arsenic: A Roadblock to Potential Animal Waste Management Solutions*, 113 *Env'tl. Health Persp.* 1123, 1123-24 (2005).

10 See, e.g., U.S. Food and Drug Admin., *Bottled Water: Arsenic Guidance for Industry Bottled Water: Arsenic Small Entity Compliance Guide* (Apr. 2009), available at <http://www.fda.gov/Food/GuidanceComplianceRegulatoryInformation/GuidanceDocuments/ChemicalContaminantsandPesticides/ucm151384.htm>; U.S. Beverages: Bottled Water Final Rule, 70 *Fed. Reg.* 33,694 (June 9, 2005) (to be codified at 21 C.F.R. § 165.110(b)(4)(iii)), available at <http://www.fda.gov/Food/FoodSafety/Product-SpecificInformation/BottledWaterCarbonatedSoftDrinks/ucm077148.htm>; press release, U.S. Food and Drug Admin., *FDA Warns Again About Arsenic in Mineral Water* (Mar. 24, 2007), available at <http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/2007/ucm108875.htm> (recognizing arsenic contamination of drinking water); Miguel L. Cabrera & J. Thomas Sims, *Beneficial Use of Poultry By-Products: Challenges and Opportunities, in Land Application of Agricultural, Industrial, and Municipal By-Products* (James F. Power & Warren A. Dick eds., Soil Science Society of America 2000) (2000); D.W. Rutherford et al., *Environmental Fate of Roxarsone in Poultry Litter. Part II. Mobility of Arsenic in Soils Amended with Poultry Litter*, 37 *Env'tl. Sci. & Tech.* 1515, 1515-20 (2003); R.L. Wershaw et al., *Roxarsone in Natural Water Systems*, available at <http://water.usgs.gov/owq/AFO/proceedings/afo/pdf/Wershaw.pdf>. (poultry litter containing arsenic as fertilizer); Jennar R. Jambeck et al., *Landfill Disposal of CCA-Treated Wood with Construction and Demolition (C&D) Debris: Arsenic, Chromium, and Copper Concentrations in Leachate*, 42 *Env'tl. Sci. & Tech.* 5740, 5740-5745 (2008) (arsenic-treated wood products); P.N. Williams, et al., *Market Basket Survey Shows Elevated Levels of Arsenic in South Central U.S. Processed Rice Compared to California: Consequences For Human Dietary Exposure*, 41 *Env'tl. Sci. & Tech.* 2178, 2178-83 (2007) (arsenical pesticide use on crops).

11 Council Regulation 2377/90, 1990 O.J. (L 224) (EC) (repealed 2009 by Council Regulation 470/2009, 2009 O.J. (L 152) (EC))(Under Council Regulation 470/2009, Council Regulation 2377/90 remains in effect until new regulation classifying maximum residue limits of pharmacologically active substances come into force); European Medicines Agency, Summary Opinion of the Committee for Veterinary Medicinal Production the Establishment of Maximum Residue Limits: Roxarsone of 14 January 2004, available at <http://www.emea.europa.eu/pdfs/vet/mrls/mrlopinions/008304en.pdf>; David Wallinga, see above note 2, pages 7-8.

12 European Food Safety Auth. Panel on Contaminants in the Food Chain, European Food Safety Auth., *Scientific Opinion on Arsenic in Food*, 7 *EFSA Journal* 1351, Summary at 2 (2009).

13 Letter from Richard Keigwin, Dir. of Special Review & Reregistration Div., U.S. Env'tl. Prot. Agency, to Pesticide Registrants, Re: Amendment to Organic Arsenicals RED (Apr. 22, 2009), available at <http://www.regulations.gov/search/Regs/home.html#documentDetail?R=090000648096e574>.

14 Press Release, FDA, FDA: Pfizer will voluntarily suspend sale of animal drug 3-Nitro (June 8, 2011), available at <http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm258342.htm>.