

Mexico

# THE DANGERS OF INDUSTRIAL CORN AND ITS PROCESSED EDIBLE PRODUCTS



The universe of junk food has many brands and is sold everywhere. Snacks, fried flour toasts: oil, salt, glutamate, corn flour, chili powder.

In August 2017, a Mexican research team composed of members from the Universidad Nacional Autónoma de México (UNAM) and the Universidad Autónoma Metropolitana (UAM) published a study showing the presence of transgenes and the herbicide glyphosate in processed foods and tortillas made from industrial maize (corn) throughout Mexico.<sup>1</sup>

**A**t a press conference, the team stated: “The data are worrying, since maize is our basic food and we have lost our food sovereignty. Consumption of glyphosate-containing genetically modified corn can have serious health consequences.” They continued: “of 367 samples analyzed, 82% (301) contained at least one transgene. Of the tortillas analyzed, 90.4% contained transgene sequences.”

Furthermore, “glyphosate was detected in nearly one-third of the food samples that tested positive for the presence of the glyphosate-tolerance transgene.”

That which has been a concern of large numbers of individuals as well as scientists’, consumers’, and food and agriculture activists’ organizations since the discovery of transgenic contamination in maize from the Sierra Juárez of Oaxaca in 2001 has now taken centre stage with the emergence of new sources of evidence.<sup>2</sup>

The study sheds light on two key aspects relating to the progress of technoscience, spurred on by the actions of corporate agribusiness with the assistance of successive governments. The first is that transgenic contamination is widespread in processed foods (especially cereals, flour, and corn-based snack foods)<sup>3</sup> and tortillas

(the corn flatbread that is the basis of the Mexican diet). But the finding mainly concerns the industrial, machine-made tortillas that are distributed and marketed in small stores (*tortillerías*) throughout the country. In addition, “one-third of samples (27%)” from a wide array of products contained glyphosate contamination — the same samples that had already tested positive for transgenic events, which is highly significant.

The second aspect highlighted by the study is that samples of tortillas produced by hand from native maize showed almost no transgenic contamination. The UNAM-UAM team wrote: “Tortillas made in peasant communities solely from native maize (grown in those communities) contained almost NO transgenic proteins or glyphosate. Trace amounts of these proteins could potentially be present in native maize as a result of transgene contamination, but stewardship of native maize by Mexican communities has kept it overwhelmingly free of transgenes [since their appearance in Mexico].”<sup>4</sup>

By virtue of these findings, the study proves germane to a number of ongoing discussions

1. There are two different sets of processes, two metabolisms associated with maize in the agriculture and life of the countries where it has traditionally been a crucial grain.

On the one hand we find native maize, treasured and stewarded by communities for millennia as part of a co-evolutionary process, a series of conversations between

1. E. González-Ortega, A. Piñeyro-Nelson, E. Gómez-Hernández, E. Monterrubio-Vázquez, M. Arleo, J. Velderrain, C. Martínez-Debat, and E.R. Álvarez-Buylla, “Pervasive presence of transgenes and glyphosate in maize-derived food in Mexico,” *Agroecology and Sustainable Food Systems* 41(9-10), August 2017 <https://www.tandfonline.com/toc/wjsa21/41/9-10?nav=tocList>

2. See *El maíz no es una cosa: es un centro de origen* (Mexico: Casifop, GRAIN, and Itaca, 2012).

3. The study excluded beverages and emulsions, preserves, and other products containing high-fructose corn syrup.

4. UNAM-UAM team, “Preguntas y respuestas en torno a la presencia de secuencias transgénicas en alimentos elaborados con maíz en México.”



Hybrid corn, grown by Menonite farmers in Yucatan Peninsula in México, with enormous amounts of glyphosate.

the crop and its human stewards. It is grown in a polycultural system known as the *milpa* and for the most part treated by “nixtamalization” – a process whereby maize is cooked and soaked with lime or ash to break the lignin in the husk and fully release the nutrient potential.

On the other hand we find generic hybrid or genetically modified industrial corn, grown by large corporations in extensive monocultures with chemical inputs designed to boost yields. These crops are not intended for direct human consumption but as a raw material in all manner of animal feeds and forages, as well as for processing into edible products, including industrial tortillas. In addition, this corn is fractionated into ingredients used in (or as) fuels, paints, starches, sweeteners such as high-fructose syrup, “biodegradable” plastics, adhesives, cosmetics, textiles, paper, and many other classes of products.

The study gives considerable weight to the idea that transgenics are concentrated in industrial hybrid corn and its by-products (in this case, processed foods), while native maize is still holding out against contamination at

the most local levels. But it is not out of danger, and the combined forces in society that are devoted to taking care of and being nurtured by our maize have embarked on a process of reflection whose ultimate goal is to defend it.

2. One aspect that deserves further study is the disruption caused by industry and government-promoted industrial corn imports, mainly from the United States. These imports continue at a time when domestic production (some 23–24 million tons) is sufficient to feed the whole population, since this quantity is 50% greater than the “possible annual digestible intake of 120 million Mexicans.”<sup>5</sup> Domestic corn production can be itemized as follows: over 60% (13.8 million tons) of it is peasant maize, of which 6.8 million tons (29.6%) is used for subsistence or self-sufficiency and 7 million tons goes to market. The rest amounts to some 10.6 million tons

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5. Antonio Turrent Fernández, “Maíz nativo mexicano: ¿propiedad privada multinacional?,” *La Jornada*, 3 November 2017.



Industrial production of *tortillas* made from generic hybrid or GMO corn.

of irrigated corn. Why then this insistence on importing 7-10 million tons of yellow corn?

For Antonio Turrent, a researcher with the Unión de Científicos Comprometidos con la Sociedad (UCCS), “We have more than enough standard white corn to supply the industrial tortilla manufacturers with all the flour that Mexicans could consume directly as food. Does this mean that the decision to mix domestic (non-transgenic) white corn with transgenic corn for the production of industrial corn flour is purely profit-driven? Isn’t this a foolish, even a cruelly mistaken decision in the long haul – the equivalent of shooting ourselves in the foot?”<sup>6</sup>

Ceccam, a very important peasant agriculture research centre in Mexico, has done in-depth research on the situation and it concurs: “Mexico imports 7 to 10 million of tons of yellow corn from the United States annually, mainly for cattle feed although it also goes into the human food chain. Genetically modified corn — until now only imported — is mixed with conventional corn in the production of animal feeds and corn products for human consumption: tortilla flour, cereals, oil, and atole [a hot cornmeal drink].”<sup>7</sup>

3. Processed edible products are today one of the main uses for industrial corn, a raw material consisting of yellow corn with perhaps some white corn. In all cases, the corn comes from hybrid or transgenic varieties grown in agrichemical-treated monocultures, which are expanded at the cost of land concentration,

6. Ibid.

7. Centro de Estudios para el Cambio en el Campo Mexicano (Ceccam), “Alerta Roja, maíz transgénico en México,” *El Surco* (Ceccam newsletter), no. 2, April 2013.

environmental devastation, and expulsion of peasants from the land.

Mexico is one of the world’s ten largest producers of processed foods; however, under NAFTA and the forty other trade, cooperation, and investment treaties that the country has signed, the word “Mexico” is really just a stand-in for the transnational corporations that operate out of our country because of the “comparative advantages” (read: conditions for the diversion of power) it offers.

According to *MexicoNow* editor Sergio L. Ornelas, Mexico has become the world’s eighth-largest producer of processed foods and the third-largest in the Americas, behind the United States and Brazil; this while the total value of the world’s production was USD \$4.9 trillion in 2014 and is expected to reach USD \$7.85 trillion in 2020 or thereabouts.<sup>8</sup>

In Mexico, processed food production was worth USD \$138 billion in 2014, but Mr. Ornelas, citing data from the consulting firm IHS, predicted that it would increase – and indeed, by 2017 its value had reached USD \$158 billion.<sup>9</sup> According to IHS data cited by the Mexican government agency ProMéxico in its sectoral analysis of processed foods, the country’s processed food industry netted USD \$35 billion in 2015. The Ministry of the Economy stated that in 2015 alone, Mexico received direct foreign investment of USD \$1 billion 304 million, while between 2005 and 2015 the cumulative investment for the processed foods industry was USD \$8 billion 264 million.

8. Sergio L. Ornelas, “Inside Mexico’s Processed Food Industry,” *Mexico Now*, no. 79, <http://www.mexico-now.com/main/index.php/20-magazine/editor-main-article/19-inside-mexico-s-processed-food-industry>.

9. Ibid.

Another significant fact brought to light by the UNAM-UAM research team<sup>10</sup> is that transgenic and glyphosate contamination currently affects at least 36.9% of processed foods in Mexico: namely, the 26.9% of these products corresponding to baked goods and tortillas, plus the 10% corresponding to grains and oilseeds.<sup>11</sup>

These foods include the ones produced by the snack food giant PepsiCo Mexico Foods. Its President, Paula Santilli, stated that “of the 200 countries where [PepsiCo, the parent corporation] operates, Mexico is its second-largest market, behind only the United States and nearly three times as large as that of countries like Brazil.”<sup>12</sup> PepsiCo Mexico has 17 plants “and annual revenues of over USD \$3.4 billion, according to its last annual report.”<sup>13</sup> Its brands include Sabritas, Quaker, and Doritos, among others examined by the UNAM-UAM team’s study.

Another outlet for industrial corn is Ingredion, a producer of corn flours, starches and high-fructose corn syrup among many other corn-based industrial products, which announced in January 2016 that it would invest USD \$30 million “to increase the production capacity of its San Juan del Río, Querétaro plant.”<sup>14</sup> Then there is Gruma, a world leader in corn flour production with 18 processing plants and research and food technology facilities for the production of corn flour and industrial tortillas, which netted 18 billion 819 million pesos (about USD \$1 billion at the current exchange rate) in 2016; and the Bimbo Group, another Mexican baked goods and snacks giant that saw consolidated revenue growth of 0.3% to an amount of “65 billion 390 million pesos [USD \$3 billion 534 million] with respect to the third quarter of 2016, and whose Mexico sales increased by 12.2%.”<sup>15</sup>

All this production is boosted by the enormous Latin American supermarket chains. Walmex (Walmart’s

Mexican subsidiary) stated in its second-quarter 2017 report to the Mexican stock exchange that its total sales grew by 9.1% to reach “135 billion 724 million pesos [approximately USD \$7.3 billion].”<sup>16</sup>

Also starting to appear on the mass media’s radar is the colossal growth of convenience stores, in particular Oxxo (part-owned by Mexican Coca-Cola subsidiary Femsá). A recent BBC Mundo story was titled: “A new store every 8 hours: how Oxxo became the biggest retailer in Latin America.”<sup>17</sup>

A 2015 report by GRAIN documented how these corner store-type operations are moving into different neighbourhoods in an attempt to take control over local food availability. These stores front-rack processed edible products – the same snack foods documented in the study by the UNAM-UAM research team – but sell little in the way of fresh produce.<sup>18</sup>

According to BBC Mundo, Oxxo has 16,000 stores, mainly in Mexico,<sup>19</sup> and has established a distribution network for industrial corn-based processed edible products. Its omnipresence makes it urgent to review the food safety criteria for this GM-contaminated corn, which has found its way into every Mexican city district and many villages as an ingredient in these products.

4. Another matter of concern is slow (or not so slow) poisoning of Mexicans with glyphosate – given that the study by the UNAM-UAM team (one of whose members is Dr. Elena Álvarez-Buylla, the laureate of the Mexican National Science Award for 2017), found that almost one-third of processed food samples, including industrial tortillas (likewise found in tortillerías in every neighbourhood), contain traces of this herbicide. The ETC Group’s Silvia Ribeiro writes: “The results are particularly dire because Mexico’s per-capita corn

10. E. González-Ortega et al., “Pervasive Presence...,” *op.cit.*

11. Unidad de Inteligencia de Negocios, ProMéxico, Government of Mexico, *Análisis Sectorial, Alimentos Procesados*, 19 February 2016, [https://www.gob.mx/cms/uploads/attachment/file/75326/04112015\\_DS\\_Alimentos\\_P.pdf](https://www.gob.mx/cms/uploads/attachment/file/75326/04112015_DS_Alimentos_P.pdf)

12. Francisco Hernández, “México es el segundo entre 200 países para PepsiCo,” *El Financiero*, 14 November 2017, <http://www.elfinanciero.com.mx/empresas/mexico-es-el-entre-200-paises-para-pepsico.html>.

13. *Ibid.*

14. Unidad de Inteligencia de Negocios, ProMéxico, *op.cit.*

15. Bolsa Mexicana de Valores, “Aumentan ganancias del Grupo Bimbo en el tercer trimestre de 2017,” 27 October 2017, <http://bol-samexicanadevalores.com.mx/ganancias-bimbo/>.

16. “Ventas de Walmex superan el crecimiento de la ANTAD,” *El Economista*, 27 August 2017, <https://www.economista.com.mx/mercados/Ventas-de-Walmex-superan-crecimiento-de-la-ANTAD-20170727-0037.html>.

17. Cecilia Barría, “Una nueva tienda cada 8 horas: cómo la mexicana Oxxo se convirtió en la mayor tienda minorista de América Latina,” *BBC Mundo*, 2 October 2017.

18. GRAIN, “Free Trade and Mexico’s Junk Food Epidemic,” 2 March 2015, <https://www.grain.org/article/entries/5170-free-trade-and-mexico-s-junk-food-epidemic>.

19. Cecilia Barría, *op. cit.* Eréndira Espinoza, “Cuántas tiendas Oxxo hay en México,” *Dinero en Imagen*, 30 October 2017: “At the close of the third quarter of 2017, the chain was operating 15,999 outlets, and given its pace of new store openings, that figure has certainly surpassed 16,000 by now”; <http://www.dineroenimagen.com/2017-10-30/92472>.



Artisan tortillas hand made from native maize, free of GMO, grown by communities of the South of Jalisco, Mexico.

consumption is the highest in the world. Even though in 2015, the World Health Organization declared glyphosate a carcinogen in animals and a probable carcinogen in humans, and even though glyphosate-tolerant GM corn carries a high burden of glyphosate residues, COFEPRIS — the government body in charge of assessing the safety of foods intended for human consumption — had no qualms about approving this corn.”<sup>20</sup>

It is frankly shocking that this genetically modified corn should have been allowed into a people’s food supply when there is no certainty as to its safety.

5. It is worth briefly dwelling on the response to the UNAM-UAM study from researchers who are GMO proponents. They basically repeated the long-standing talking point of government, industry, and some scientists, which is that GMOs are safe, compliant with domestic and international regulations, and “substantially equivalent” to conventional plant varieties. For a representative quote: “In over 20 years of continuous use and consumption by over 1.2 billion human beings and 100 billion animals, no scientific evidence has been found that their consumption can be harmful. The

20. Silvia Ribeiro, “Tortillas envenenadas,” *La Jornada*, 28 October 2017, <http://www.jornada.unam.mx/2017/10/28/opinion/023a1eco>.

alleged harm reported in a few papers (Seralini et al., 2012 and 2014) has no relevant scientific basis.”<sup>21</sup>

Elena Álvarez-Buylla, Cristina Barros, Emmanuel González Ortega, Alma Piñeyro-Nelson, Alejandro Espinosa, and Antonio Turrent of the UCCS replied to the critics as follows:

*“Substantial equivalence” favours the genetically modified food corporations and the food industry players who make money processing their products for human consumption, running roughshod over the public interest. It is ethically wrong and scientifically unsound for regulators to take “no-evidence-of-harm” — a result of the absence of proper testing and monitoring protocols — as evidence of the safety of genetically modified food. There is an urgent need for strict dose-response protocols making it possible to directly test the hypothesis that these foods may have adverse impacts on human and animal health. The burden of proof should be on the companies, not the people...*

21. Francisco Bolívar Zapata, Jorge Herrera Estrella, and Agustín López-Munguía Canales, “Presencia de maíz transgénico de importación en México: 20 años de inocuidad en productos derivados para consumo humano y animal,” *Gaceta UNAM*, no. 4917, 6 November 2017.



Picking corn cobs for preparing *tamales* made from native maize free of GMO, in San Isidro, Jalisco, Mexico.

*There may be many papers that have found no data to support the hypothesis that substantial equivalence is unwarranted or that there is an absence of harm, but even one paper finding a significant correlation should be sufficient to reject this concept and regulate accordingly to prevent harm.... The study by Séralini et al., although rejected by these authors, was republished with additional supporting data. Moreover, many of the studies that found no negative impacts, ostensibly suggesting the safety of GMOs, were done by researchers with conflicts of interest. Experimental studies show that glyphosate is teratogenic in vertebrates and carcinogenic in lab animals.<sup>22</sup>*

## Conclusions

It is highly irresponsible that food safety regulators have done nothing to stop the distribution of processed edible products containing transgenic corn and traces of toxins as powerful as glyphosate, rated as a carcinogen by the WHO.

The trend towards a form of agriculture designed to produce raw materials for industry portends that city

dwellers and others will be eating ever more unsafe industrial products.

The corn used to make industrial tortillas, which are on sale in shops throughout Mexico, should be free of GMOs and agROTOXINS. This is so because the production of this generic corn is taking direct aim at and supplanting small- and medium-scale domestic production of non-GMO corn, and because the promotion of the industrialized edible products industry favours the production and/or import of agROTOXIN-laced GM corn, which is implicated in worsening health crises such as obesity, diabetes, cancer, and teratogenesis.

More research needs to be done on these health crises and on the forces working to control food availability. These interests are particularly targeting the poorer segments of society – a captive market that is very profitable for the manufacturers of junk food and industrial tortillas.

The campaign to defend our native maize must bolster and step up its arguments, evidence base, narrative, and efforts in favour of food sovereignty.

22. "Presencia de maíz transgénico y glifosato en nuestro alimento: sin evidencia científica de no toxicidad," *Gaceta UNAM*, no. 4924, 30 November 2017.



GRAIN is a small international non-profit organisation that works to support small farmers and social movements in their struggles for community-controlled and biodiversity-based food systems.

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