

Lead in Candy: the case of Mexico

I. Introduction

Lead is everywhere: paint, soil, water pipes, pottery. It is one of the most used metals in the world and many industries have exploited its useful qualities, driving its consumption to exceptional levels. According to the International Lead Association, there were consumed globally 10,469,000 tons of lead in 2012 (International Lead Association, n.d.).

In the United States, there were consumed 1,499,000 tons of lead in 2012, accounting for 14.3 percent of total global consumption (International Lead Association, n.d.). This constitutes a problem because lead can get into a person's body, which can lead to harmful, sometimes fatal results. We can be exposed to lead poisoning through breathing, drinking and eating or even if lead particles get through the skin, which makes it a "nearly ubiquitous toxic in the environment" (Warren, 2001, p.2).

Children are known to be the most vulnerable sector related to lead poisoning (plumbism) since they can absorb between 50% and 100% of ingested lead (Tamayo-Ortiz, et.al, 2020) which affects physical and mental development (Warren, 2001). Decreased intelligence, impaired neurobehavioral development, stunted physical growth, hearing impairment and kidney problems are just some of the problems children may experience as a result of lead poisoning (Medlin, 2004). Therefore, childhood plumbism is an important environmental disease affecting millions of children around the world (Warren, 2001). However, many exposures are highly preventable.

Since the early 1990s, The United States Food and Drug Association (FDA), the California Department of Health Services, and independent laboratories have shown that certain candies from Mexico, the main commercial partner to the United States, contained high concentrations of lead particles. In 2006, as stated in the guidance document “Guidance for Industry: Lead in Candy Likely To Be Consumed Frequently by Small Children” FDA lowered the lead level FDA considers dangerous 0.5 ppm to 0.1ppm (particles per million) which they considered an amount that producers were able to achieve with the use of good manufacturing practices in the production of candy and its ingredients (FDA, 2006)

Additionally, in 2019 FDA issued an Import Alert 33-10 entitled “Detention Without Physical Examination of Candy Due to Lead” that announced the purpose of monitoring candy products from certain manufacturers and shippers on a “Red List” to determine if they contain lead at levels that are a health risk to consumers. The Alert notes that while incidents of lead contamination due to packaging materials have not occurred since the 1990s, elevated lead levels in candy products, mostly the ones containing chili powder and tamarind, an edible fruit that grows in tropical and sub-tropical weathers, are still occurring.

The present report is structured as follows: the first section addresses where the lead in candy is believed to be from. That is followed by a discussion of a 2018 study of the lead levels of samples of candies from Mexico. The concluding section notes which international companies from Canada and China, the other two main trade partners of the United States, have exported candy products exceeding lead levels to the United States.

II. Where is the lead coming from?

California authorities and FDA officials have found lead in a common ingredient in many Mexican candies: chili powder, the pulverized version of chili pepper. Other several potential contamination sources have also been identified: soil residue from fields, air-drying or storage where the chilies can accumulate dust, metal particles accumulated during the grinding process of the candy's ingredients, and drying the ingredients over open petrochemical fires (Medlin, 2004).

According to Tamayo-Ortiz et. al., (2020) the contamination of lead in traditional Mexican candy may also be attributed to the fact that candies, such as dried and candied fruits, caramelized amaranth and peanut bars are known to be prepared in a process where ceramic tableware, a non-metal material traditionally used in Mexico, is included (Tamayo-Ortiz et. al., 2020).

III. Previous analysis of lead levels in Mexican candy

In 2018, lead concentrations in candy were analyzed by the Lautenberg Environmental Health Sciences Laboratory at the Icahn School of Medicine at Mount Sinai. The study examined the arithmetic mean of 5 samples, each of 7 candy brands that were reported by the FDA in 2008 with higher lead concentration. As shown in Table 1, the study compared the lead levels these candies had 2008 and 2018. The Indy Marimbas, Ricaleta Chamoy and Ricaleta Diablo candies were starred because only one candy sample was analyzed in 2008.

Table 1

Comparison in Lead levels in Mexican Candy between 2008 and 2018

Candy Name	Arithmetic Mean (range) of 5 samples Lead Concentration (ppm)		Highest Lead Concentration (ppm) found in 1 candy piece	
	2008	2018	2008	2018
Gudupop Chile (lollipop)	0.096 (0.059–0.157)	0.018 (0.013–0.021)	0.16	0.02
Indy Marimbas (gummy)	0.219**	0.004 (0.002–0.006)	0.22	0.01
Miguelito (chili powder)	0.047 (0.040–0.058)	0.057 (0.031–0.096)	0.06	0.10
Ricaleta Chamoy (lollipop)	0.192**	0.006 (0.004–0.008)	0.19	0.01
Rockaleta Diablo (lollipop)	0.700**	0.011 (0.009–0.015)	0.70	0.01
Tutsi Pop (lollipop)	0.032 (0.005–0.129)	0.004 (0.003–0.004)	0.13	0.00
Pulparindo (Tamarind candy)	0.008 (0.006–0.010)	0.027 (0.020–0.047)	0.01	0.05
Bubbaloo Xtreme blueberry (lollipop)	Not analyzed	0.005 (0.002–0.011)	Not analyzed	0.01
Bubbaloo Xtreme strawberry (lollipop)	Not analyzed	0.006 (0.004–0.008)	Not analyzed	0.01
Rockaleta Junior (lollipop)	Not analyzed	0.030 (0.009–0.099)	Not analyzed	0.10

* Highlighted concentrations were ≥ 0.1 ppm, the US- FDA permissible lead limit.
 ** Only 1 candy sample analyzed in 2008.

Source: Tamayo-Ortiz et. al., 2020

The conclusion from the study was that lead concentrations in selected Mexican candies are typically low, and there was a noticeable decrease from prior levels. However, some lead levels in Mexican candy still exceed the recommended level, as it is presented in the Import Alert 33-10.

IV. Companies by country

The data collected in the present chapter was using FDA’s Import Alert 33-10, where there are the “Red List” companies that have had import refusals related to lead in candy, and FDA’s Data Dashboard¹ where import refusals by country and by company are categorized in graphics.

This section reviews the information concerning products and companies addressed in the Import Alert from the other two main trade partners of the United States, China and Canada. Candy without Chocolate, Candy Specialties and Gum (purple), Chocolate

¹For more information, visit <https://datadashboard.fda.gov/ora/cd/imprefusals.htm>

and Cocoa Products (blue) Spices, Flavors and Salt (yellow) and Snack Food Items (green).

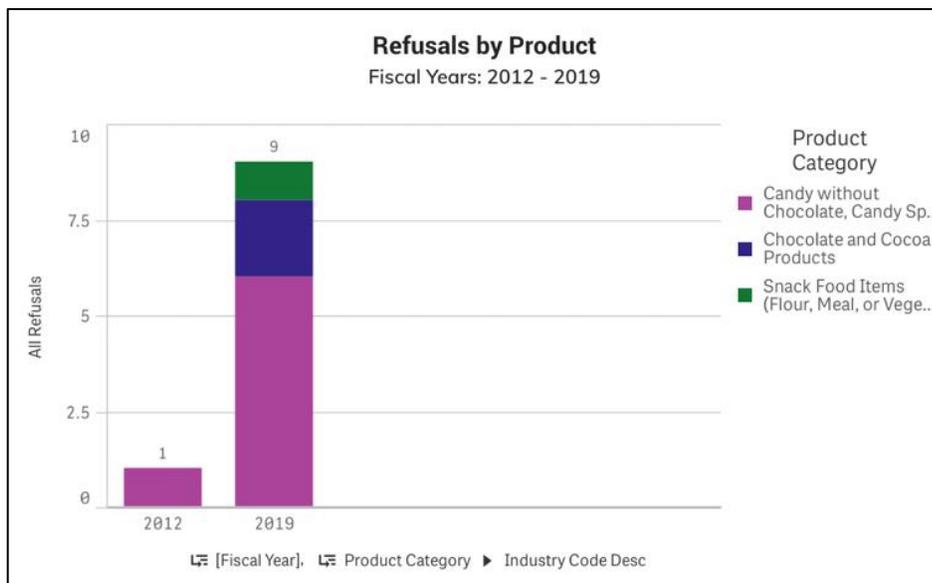
A. Canada

a. Tootsi Impex Inc

In the period from 2012 to 2019, imports from the Canadian company Tootsi Impex Inc have been refused 1 time in 2012 and nine times between May and September 2019. Most of the violations concerned Candy without Chocolate.

Figure 1

Tootsi Impex Inc Import Refusals (2012-2019)



Source: FDA Data Dashboard

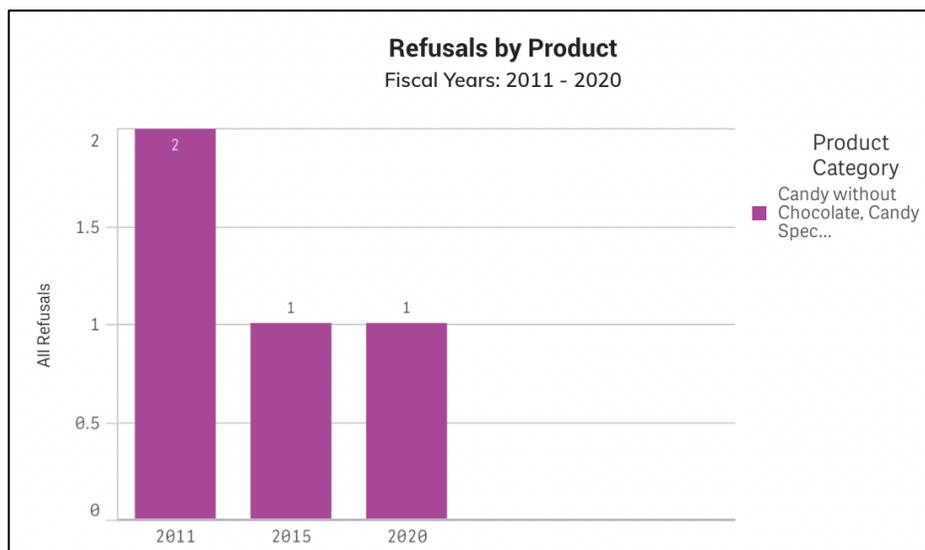
B. China

a. Zi Jing Yuk Hin Enterprise Co., Ltd

In the period of 2019-2020, imports from the Chinese company *Zi Jing Yuk Hin Enterprise Co., Ltd* have been refused four times: Four times in 2019 and one time in 2020. All the violations concerned Candy without Chocolate.

Figure 2

Zi Jing Yuk Hin Enterprise Co., Ltd Import Refusals (2011-2020)



Source: FDA Data Dashboard

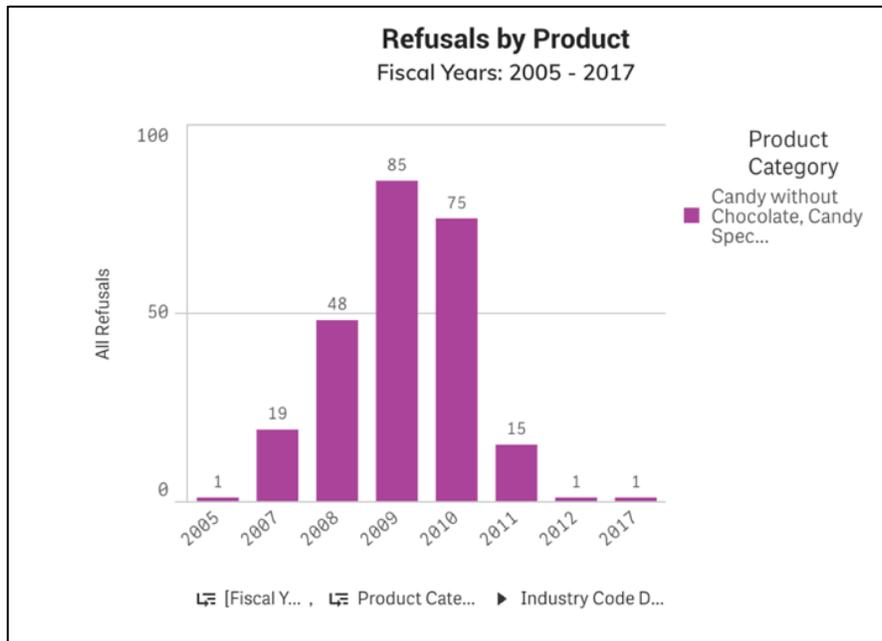
C. Mexico

a. Dulces Vero

In the period of 2015-2017, imports from the Mexican company *Dulces Vero* have been refused 230 times between 2005-2017.

Figure 3

Dulces Vero Import Refusals (2005-2017)



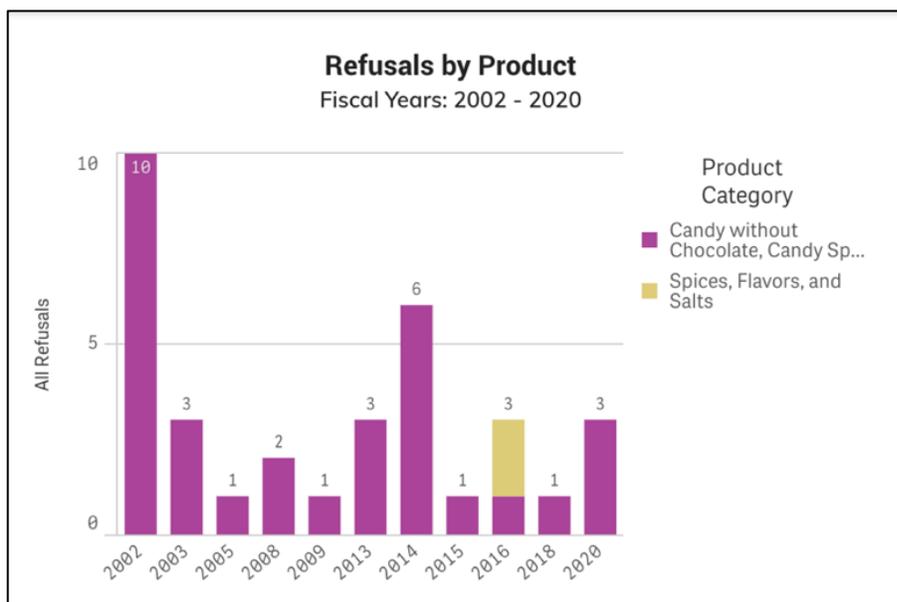
Source: FDA Data Dashboard

b. Industria de Alimentos Diana

In the period of 2019-2020, imports from the Mexican company *Industria de Alimentos Diana* have been refused 34 times between 2002-2020.

Figure 4

Industria de Alimentos Diana Import Refusals (2002-2020)



V. Lead regulations in Mexico

Based on the results gathered from the FDA Data Dashboard, Mexico has much higher numbers of import refusals related to lead contamination in candy, compared to Canada and China, the two other main trade partner of the United States, even though they have been decreasing significantly since the mid 2000s.

The reason for the drop in lead levels in Mexican candy is attributed to the huge media coverage that resulted in Mexico after FDA and California authorities issued their concerns about lead levels in candy imported to the United States (Tamayo-Ortiz et. al., 2020). As a result, the federal health authorities implemented a surveillance program for lead in food, water and consumer products and developed, at the same time, a blood lead monitoring program, particularly in children younger than 5 years of age and pregnant women (Tamayo-Ortiz et. al., 2020).

Additionally, the regulation (NOM-131-SSA1-2012), issued in 2012 by the Secretary of Governance (SEGOB), specifies that there should be a limit for lead in consumer products of 0.2 ppm (SEGOB, 2012). However, even though The Federal Commission for Protection of Sanitary Risks (COFEPRIS) is tasked with monitoring lead in consumer products, there is no program that provides public information about the results and analysis COFREPRIS generates (Tamayo-Ortiz et. al., 2020).

Finally, in order to get more information about the measures the Mexican government has carried out to control companies and/or the candy products, we tried to contact governmental Mexican institutions as The National Institute for Public Health,

The National Center for Child and Adolescent Health and The Secretary of Health and non-governmental organizations as The Institution for the Protection of Children. We did not get response from any of the Mexican institutions.

On the other side, we contacted FDA in order to get more information about how they controlled the “Red List” companies. FDA replied that they do not corroborate with the manufacturers they regulate, instead, FDA relies on scientific testing to determine the safety of foods and that they consider that any detectable levels of lead is violative.

References:

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