

Lead In Spices

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New York State

Department

of

Agriculture

&

Markets

Food Laboratory

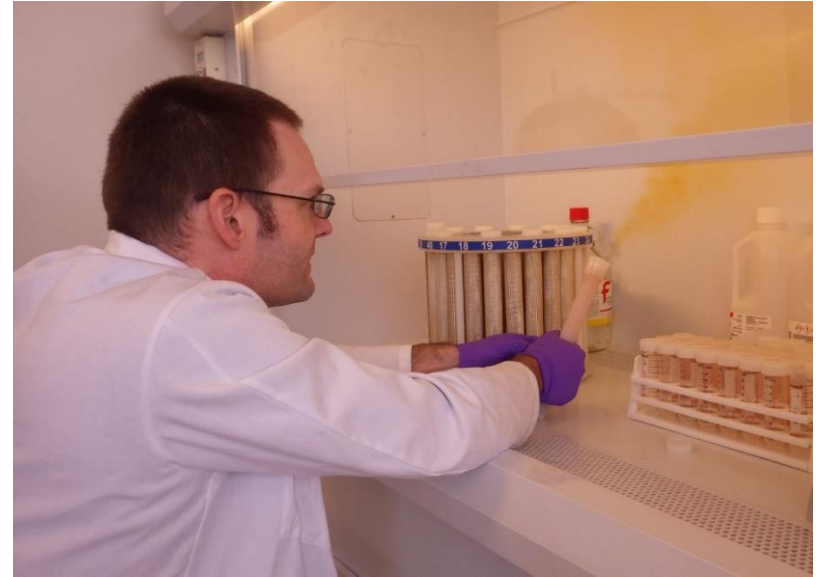


**NYS Food Lab
ISO 17025 accredited**

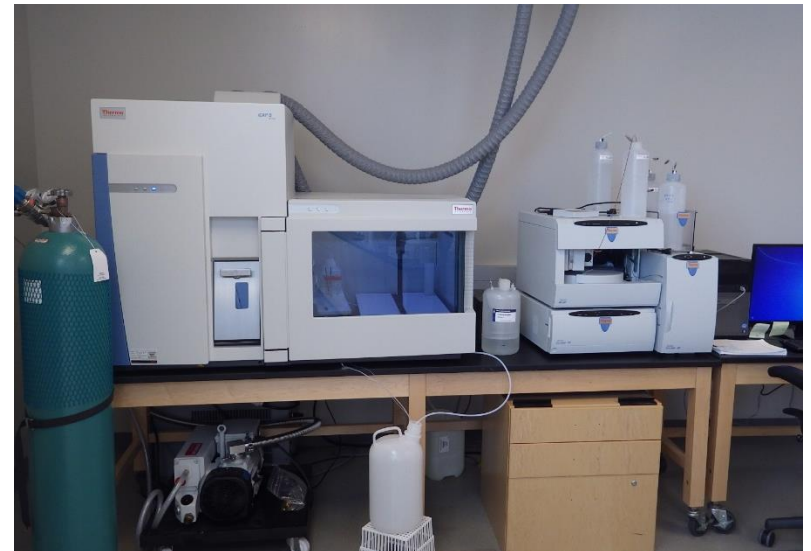
**Toxic Metal Analysis
in Food (Spices)
by Closed Vessel Microwave Digestion
and ICP-MS**

**Thermo ICAP-Q
ICP-MS**

Lead sensitivity ~ 19 ppb



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Andrew M. Cuomo, Governor

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Division of Food Safety & Inspection

Stephen Stich, Director

The enforcement of New York State Agriculture and Markets Laws and Regulations provides a vital service that is critical in maintaining the safety of the food supply from producer to the retailer. The Division of Food Safety and Inspection is the Department's largest Division, with a staff of approximately 200 full-time employees including about 115 food inspectors. The Division has jurisdiction over approximately 28,000 food handling establishments and conducts a variety of activities including:

Unannounced Sanitary Inspections of: Food Manufacturers

- Wholesale Bakeries
- Beverage Processors
- Food Warehouses
- Refrigerated Warehouses
- Retail Food Stores (Supermarket to Small Retailers)
- Slaughterhouses (not regulated by USDA)
- Fish Processors
- Rendering/Disposal Plant and Transportation Services
- Sampling of Food Products for analysis by New York State Agricultural Experiment Station
- Information Seminars for the Food Industry on Food Safety and Labeling
- Investigation of Consumer Complaints
- Licensing of Food Operators of Various Types of Establishments



The Coloring of Candies.

THE COLORING OF CANDIES.

BELOIT COLLEGE,
Chemical Laboratory,

OCTOBER 16, 1886.

Dr. J. T. REEVE, *Sec. State Board of Health:*

DEAR SIR:—In accordance with your request for information as to the results of analyses of samples of confectionery, made in this laboratory at different times, I take pleasure in laying before you such pertinent data concerning them as are at hand.

My attention has been repeatedly called during the last year or more to the nature of confectionery sold in this and other cities through the state, and particularly to the coloring matters used so freely in their manufacture. Extended analyses have not been made, however desirable they may appear; but many samples have been examined. As these examinations are stretched over a considerable period and were instituted for various reasons, only such records were entered in my laboratory note books as were deemed likely to prove of extraordinary interest. There were, however, three cases to which particular attention should be called. In each of these, highly colored candies were alleged to have produced serious consequences, and in each case a sample of the **candy** was sent here for chemical analysis by the physician in charge of the case.

In two of these cases Chrome Yellow [neutral **Chromate of Lead**] was the chief coloring matter, and in the third, Eosine.

The Coloring of Candies.

In the first of these cases the sample was a bar about two and one-half inches in length of a pasty consistency, coated heavily with chocolate (?) and showing on section a pale yellow color. It was a clear case of Chrome Yellow (Lead Chromate) coloring, as the following figures show. A section of the bar, about one-half inch in length was taken from near the center, and the lead was weighed as the sulphate.

Weight of candy taken.....	4.298 grammes.
Weight of Lead Sulphate.....	.0050 grammes.
Equivalent to Chromate of Lead0053 grammes.
i. e. One ounce would contain 0.54 grains Lead Chromate.	

The second sample referred to was bought for a good article of hoarhound **candy**, but was found to be highly colored with Eosine. (Sodium Tetra-brom-fluorescin.)

This sample had a fair appearance, but a practiced eye would immediately detect suspicious pleo-chlorism on viewing the sticks from different directions.

The third lot of samples, examined in February last, was made up of brilliantly colored bits of **candy**, the colors being as follows:

Red, from Cochineal.

Yellow, from Lead Chromate.

Green, from Lead Chromate and some blue pigment; (query, Prussian Blue?)

Blue; small quantity.

Orange, some organic coloring matter, probably an aniline.

Lead Chromate was the most objectionable substance present, and large pieces of **candy** colored thereby were prominent in the sample. It was therefore determined to examine quantitatively a portion of this particular yellow **candy**, and the following data are taken from my laboratory note book.

1886

Wisconsin
 State
 Board
 Of
 Health

Lead
 Chromate
 Found
 In
 Candy

Lead Poisoning in Gurkha Soldiers in Hong Kong

J. G. P. POWER,* D.P.H., D.I.H., D.T.M.&H. ; R. M. BARNES,† M.R.C.P.ED., M.C.PATH., D.T.M.&H.
W. N. C. NASH,‡ M.B., B.CH. ; J. D. ROBINSON,§ H.N.C., A.I.M.L.T.

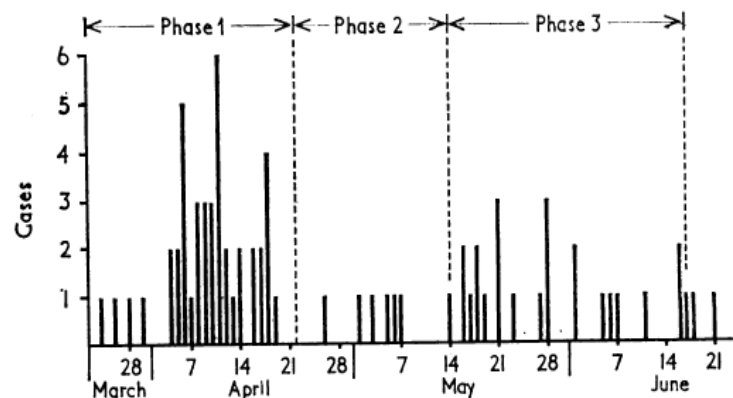
British Medical Journal, 1969, 3, 336-337

Summary: Investigation of an outbreak of lead-poisoning in 121 Gurkha soldiers showed that this was due to the contamination of chilli powder (cayenne pepper), a constituent of curry powder, with lead chromate. Comprehensive systems of food sampling are needed in developing communities.

Introduction

Lead-poisoning due to the ingestion of contaminated food or drink is less common than industrial intoxication resulting from inhaled lead dust or fume. Children have been poisoned through eating lead in paint, putty, or soil (Bartrop, 1968), whereas plumbism in adults is usually associated with drinking highly contaminated beer, cider, or water (Monier-Williams, 1949 ; Ministry of Food, 1954). Lead-contaminated food was the cause of the outbreak of plumbism in 121 Gurkha soldiers described in this paper.

in about 19% of patients. An unexpected finding was bilateral limitation of lateral gaze in 60% of patients. Anaemia was the most striking feature, 110 of the 121 patients showing haemoglobin levels of less than 11.4 g./100 ml. of blood, of whom 79 had less than 10.1 g./100 ml. Basophilic stippling of red cells was seen in 51% of all cases.



Incidence of new cases, by days, showing the three phases of the

The various spices used to prepare the curry powder were analysed (Table II) and the sample of chilli powder showed the astonishingly high lead level of 10,800 p.p.m. It is thought that whole chilli pods, imported from mainland China, were

1994

Hungary

**Paprika -
contaminated
with lead**



**Paprika peppers are air dried
for up to a year.**



Lead Oxide (Red Lead) Pb_3O_4

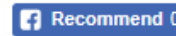


Paprika

Advertisement

Market Focus : Tainted Paprika Poisons Hungary's Culinary Pride : Fifty-nine people are arrested in the scandal, which sent 46 to the hospital. The health of the industry is also at stake.

October 11, 1994 | CAROL J. WILLIAMS | TIMES STAFF WRITER



BUDAPEST, Hungary — Greed was the motive. Housewives were the unwitting perpetrators. So far, nearly four dozen diners have become victims, stricken ill by paprika laced with lead-based paint.

The consequences of Europe's latest food-tampering scandal are likely to afflict not just the body but the soul of Hungary, as a nation proud of its culinary culture finds its food under suspicion, and cooks from Sopron to Szeged ponder how they will manage without their signature Hungarian spice.

Since 46 people were poisoned by tainted paprika last month, police have rounded up 60 suspects. Sacks and tins of paprika have been swept from every store shelf, and the government has banned all domestic sales of the spice.

Yet panic has mounted.

"A Hungarian woman simply can't cook without paprika," insisted Anna Horvath, a pensioner who traveled 40 miles by train from an outlying village to get her cache of the capsicum-based, pungent red powder tested for traces of the poisonous paint.

FROM THE ARCHIVES

Valley's Top 10 Range From Ethnic to Elegant : Favorites...

January 18, 1996

RESTAURANT REVIEW : A Hankering for Hungarian : Hearty...

April 14, 1995

Investigators believe that the perpetrators tried to save time and money by artificially drying ripe peppers instead of allowing them to naturally desiccate, which can take up to a year. Peppers dried too quickly produce a less brilliant red color when ground into spice, food experts say, which likely prompted the tamperers to add the paint agent to improve the looks of their product.

LEAD Action NEWS

LEAD Action News Vol 3 no 3 Winter 1995 ISSN 1324-6011

Incorporating Lead Aware Times (ISSN 1440-4966) and Lead Advisory Service News (ISSN 1440-0561)
The journal of The LEAD (Lead Education and Abatement Design) Group Inc.

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Adulteration of Paprika in Hungary

*The following article appeared in Analysis Europa in December 1994.
Thanks to Bill Stavropoulos of Amdel Limited for pointing out this article.*

The Hungarian Government is desperately trying to restore consumer confidence in one of the country's most famous products - ground paprika - after large quantities of the popular spice were found to be contaminated with lead oxide.

The scandal stunned all Hungarians and was quickly followed by the arrest of individuals believed to have Mafia links. Government officials believe that, with the help of food analysis, they have the problem fully under control. Professor Erno Pungor, of The Institute for General and Analytical Chemistry in Budapest, says "There has been much embarrassment over the issue."

"The Hungarian Ministry of Agriculture found that 5.8 per cent of a batch of 3,432 random samples had been adulterated with Pb3O4. Not only did it enhance the colour of the paprika but it also added to the weight, increasing the profit to unscrupulous dealers."

Unfortunately, the discovery came too late for some. Several people have died through consuming the contaminated paprika and dozens have been taken ill. Nevertheless professor Pungor praised the rapid response of his Government once it became clear there was a problem.

"The Government strictly controls the export of paprika and believes that no contaminated spice has been exported to EU countries or elsewhere." In recent weeks the same controls that apply to export have been applied internally and it is hoped that all contaminated supplies will be identified and destroyed.

Paprika has always been a much sought after spice - it is used generously in Hungarian goulash - but there is an unpleasant history of adulteration with red lead.

Other tricks include the use of white nanner curcuma barium sulphate and even brick powder

Post Harvesting

Turmeric : Processing of turmeric

Turmeric processing technology

Botanical name of turmeric is *curcutha longa L.* It is an important spice which is used for yellow colour and special flavour. Rhizomes of turmeric are often found in violet yellow colour. Central rhizomes are like tubers and small rhizomes like fingers coming out from the central one. It contains 1.8 to 5.4% curcumin due to this it has yellow colour. Some amount of starch and 2.5 to 7.2% oil is also obtained. It is used in the form of spices for colouration and flavour. In this very form it is used in medicine and cosmetic goods manufacturing. There are two types of turmeric produced in central India. One has solid and dark colour and the other long, soft and light colour.

Processing of turmeric by traditional method

In India, at various places different methods and equipments are used, but basic method is mentioned below in a process flow sheet.

Machine is also used for polishing. For this a drum having 0.9m diameter and 0.6m length is used. It is kept horizontally on a shaft and operated by a handle. Average capacity of this machine comes to 32kg per batch. Dry turmeric 32kg approx. is filled and polishing is done at least for 7 minutes. During this period water is also sprinkled which causes improvement in the colour of turmeric.

Colouring

Exporting turmeric is given special colour by mixing yellow so that powder and processed materials can give better look and quality. Cleaning is done by two methods. One is dry colouring and the other wet colouring. In the first process dry powder of yellow colour is sprayed on boiled turmeric and rightly mixed. Powder is known as middle crome. In the wet colouring process its solution is prepared in water which is sprayed on rhizomes and mechanically mixed. After colouring is complete for one week these are dried. Later on these rhizomes are kept in sacks and closed for exporting.

Grinding or Powder making

“Middle
Crome”

Added
To

Turmeric
Rhizomes



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» Practicals on Weed Managemet

» Crop Production - Rabi Season

» Weed Management

Current Category » [Crop Production - Rabi Season](#)

Curing of Turmeric

1. The cleaned finger rhizomes are cured by boiling them in an iron pan.
2. The rhizomes are cooked are cooked in water for 2.5 to 3 hours.
3. The rhizomes are boiled in water till a forth comes out and white fumes appear giving out a characteristic odour.
4. The rhizomes become soft and break easily when pressed between the fingers.
5. They are taken out of the pan and spread on a hard ground for sun drying for about one to two weeks.
6. They are stirred 3 to 4 times for uniform drying.
7. Fully dried rhizomes are again cleaned of roots if any and polished.
8. If produce is in small quantity the it is polished by rubbing with hand against the hard ground.
9. If produce is large in quantity polishing is done by using revolving drum.
10. Turmeric powder or 'middle chrome' (an artificial dye) is used for giving necessary color and polish to the rhozomes.

Current Category » [Crop Production - Rabi Season](#)

You are here: [home](#) > [Chrome Pigments](#) > [Medium Chrome Yellow](#) > [Middle Chrome Yellow Pigment Yellow 34 Lead Chromate Pigment for paints and coatings](#)



Middle Chrome Yellow Pigment Yellow 34 Lead Chromate Pigment for paints and coatings

Price: 2.75 USD

Payment Terms: T/T,L/C,D/P,WU,Paypal

Place of Origin: Zhejiang, China (Mainland)

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Company Info

Hangzhou Epsilon Chemical Co.,Ltd. [China (Mainland)]

Business Type: Manufacturer, Trading Company, Service

City: Hangzhou

Province/State: Zhejiang

Country/Region: China (Mainland)

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CIBA HORNIA CHROME
YELLOW GUH-35-SQ lead ...



[Middle Chrome Yellow Pigment Yellow 34
Lead Chromate Pigment for paints and
coatings](#)

Product Detail

Model No.:	MCY-104	Means of Transport:	Ocean,Land,Air
Production Capacity:	1000tons/month	Packing:	25kg bag with pallets
Delivery Date:	15days after PO	Type:	Chromium
Style:	Inorganic	Brand Name:	Epsilonchem
CAS No.:	1344-37-2	Purity:	99%
Appearance:	Reddish Yellow powder	C.I. No.:	77600
Characteristics:	excellent light fastness, d...	Color Index:	Pigment Yellow 34
H.S. Code:	32062000	Package:	25KG BAG
Q'ty/PLT:	1250kg	Q'ty/20GP:	25000kg
Chemical Class:	Lead Chromate	EINECS NO.:	215-693-7

1. Reddish Yellow powder
2. Recommended for paints and coatings
3. Excellent light fastness, durability, stability, performance and dispersibility

Chrome Yellow is lead chromate (PbCrO₄), it had been commonly produced by mixing solutions of lead nitrate and potassium chromate and filtering off the lead chromate precipitate.

Lead Chromate



Lead(II) chromate

From Wikipedia, the free encyclopedia

Lead(II) chromate (PbCrO_4) is a chemical compound, a chromate of lead. It has a vivid yellow color and is insoluble in water, and as a result, is used in paints under the name chrome yellow.

Applications

Approximately 37,000 tons were produced in 1996. The main applications are as a pigment in paints. It has also been used in the paint to color school buses.

**Lead
Chromate**



**Processed
Whole
Turmeric
Rhizomes**



Archer Farms Turmeric – April 2011

Archer Farms
Turmeric

Class I
Recall

“Excessive Lead levels”

Lead concentrations
not given

U.S. Department of Health & Human Services

FDA U.S. FOOD & DRUG ADMINISTRATION

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- 2013

PHOTO – B&M, Inc. Conducts Voluntary Nationwide Recall Of 6 Lot Numbers Of Archer Farms Ground Turmeric Due To Excessive Lead Levels.

B&M, Inc. Conducts Voluntary Nationwide Recall Of 6 Lot Numbers Of Archer Farms Ground Turmeric Due To Excessive Lead Levels.
Photo



Return to Firm Press

Indian Standard
SPICES AND CONDIMENTS—TURMERIC, WHOLE AND
GROUND—SPECIFICATION

(Third Revision)

ICS 67.220.10

© BIS 2010

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

2

ANNEX A
CHROMATE TEST

[Table 1, Sl No. (vi), Col 6]

A-1 REAGENT

A-1.1

Dilute Sulphuric Acid—1 : 7 (v/v).

A-1.2

Diphenyl Carbazide Solution—0.2 percent (m/v) in ethyl alcohol [95 percent (v/v)].

A-2 PROCEDURE

Ash about 2 g of the material. Dissolve the ash in 4 to 5 ml of dilute sulphuric acid in a test-tube and add 1 ml of diphenyl carbazide solution. The presence of chromate is indicated by the production of violet colour.



PRAN Brand Spice Powder Turmeric **Class I Recall** - Elevated Levels of Lead



<u>Recall Date</u>	<u>Distributor</u>	<u>Lead</u>
October 3, 2013	OnTime Distribution Inc.	28 – 42 ppm
October 8, 2013	Asia Cash & Carry Inc.	28 ppm
October 15, 2013	Best Value, Inc.	53 ppm
October 17, 2013	Fahman Enterprises Inc.	48 ppm



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Safety

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Recall -- Firm Press Release

FDA posts press releases and other notices of recalls and market withdrawals from the firms involved as a service to consumers, the media, and other interested parties. FDA does not endorse either the product or the company.

OnTime Distribution Inc. Recalls PRAN brand Spice Powder TURMERIC Due To Excessive Levels of Lead

Contact:

Consumer:
1-718-417-1100

FOR IMMEDIATE RELEASE - October 3, 2013 - OnTime Distribution Inc. of Brooklyn, NY, is voluntarily recalling PRAN brand Spice Powder TURMERIC because it was found to contain high levels of lead that could cause health problems to consumers, particularly infants, small children, and pregnant women if consumed. Recent analysis of the product found that it contained lead

One illness complaint has been received to date.

The recall was initiated after it was discovered that product contained high levels of lead based on sampling by New York State Health Department and private laboratory testing.

Consumers who have purchased PRAN brand Spice Powder TURMERIC are urged not to consume the product and should return it to the place of purchase for a full refund. Consumers with questions may contact the company at 1-718-417-1100, Monday – Friday, 9 am – 5 pm ET.

ADVERTISEMENT

FDA Cracks Down on Imported Spices After Turmeric Tests Positive for Lead

October 23, 2013

By ABC NEWS via GOOD MORNING AMERICA

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FDA Cracks Down on Imported Spices

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93-Year-Old Wheelchair-Bound Woman Robbed In East Harlem Store

AUTO START: ON OFF

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- 3  Echoes of Trump's Central Park Jogger Letter Linger in...
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- 5  Teen Captured Giving Away Shoes to Homeless Man in...

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Class I recall: a situation in which there is a reasonable probability that the use of or exposure to a violative product **will cause serious adverse health consequences or death.**

Class II recall: a situation in which use of or exposure to a violative product may cause temporary or medically reversible adverse health consequences or where the probability of serious adverse health consequences is remote.

<http://www.fda.gov/Safety/Recalls/ucm165546.htm>

Turmeric Powder

Retail market
Albany, New York

Received at Lab: March 14, 2014

Completed by lab: March 31, 2014

Origin: Bangladesh

(FBD Distributors)

Contains:

Lead = 52.8 ppm

Chromium = 10.3 ppm

Chromate Test = positive

(Indian Standard 3576 : 2010)

(Therefore contains Lead Chromate)



Turmeric Powder

Retail market
Albany, New York

Received at Lab: March 14, 2014

Completed by lab: March 31, 2014

Origin: Bangladesh

(Southern Foods USA Inc.)

Contains:

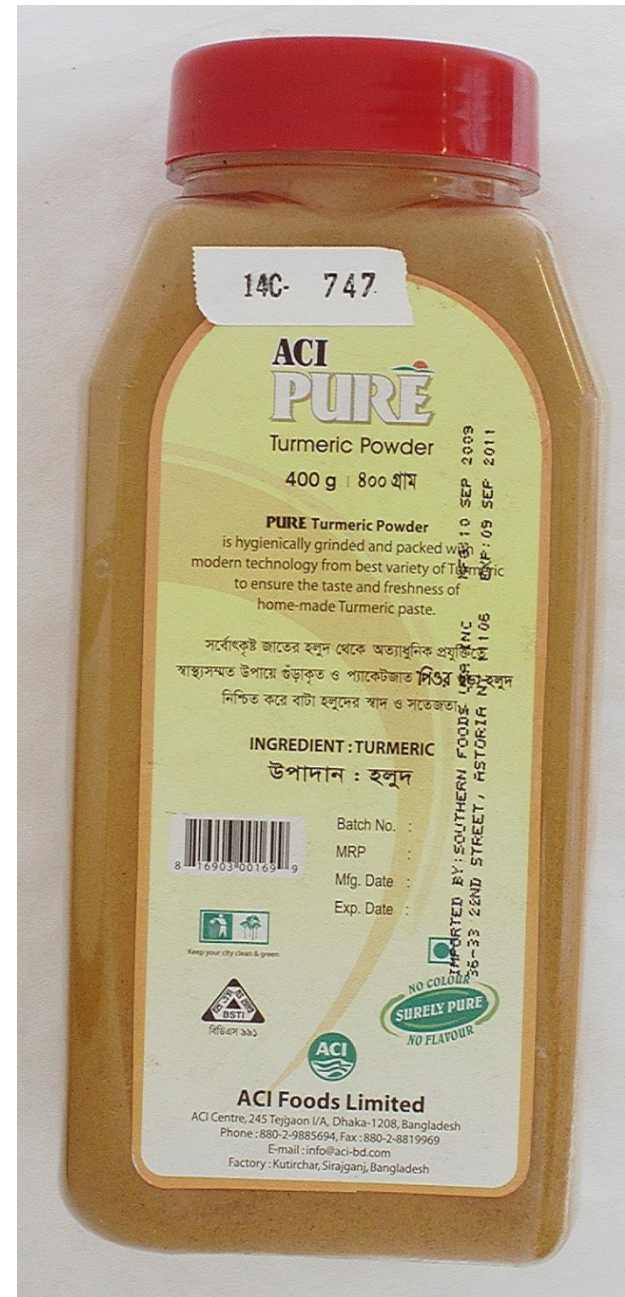
Lead = 146.0 ppm

Chromium = 30.0 ppm

Chromate Test = positive

(Indian Standard 3576 : 2010)

(Therefore contains Lead Chromate)



Population Effects of Turmeric Consumption on Pediatric Blood Lead Levels

Whitney Cowell¹, Donna Vorhees¹, Thomas Ireland², Wendy Heiger-Bernays¹

¹Department of Environmental Health, Boston University School of Public Health, ²Boston University School of Arts & Sciences

Prior Evidence

- Identification of Pb chromate, a potential adulterant, at turmeric manufacturing plants in India (source of 97% of US turmeric)
- Recalls of 4 US turmeric brands due to “excessive” Pb levels (Spice Hunter, Archer Farms, Pran, Dr. Clark Supplement)
- Reports of Pb poisoning following spice consumption from 4 health depts. across the US (AZ, CO, CT, CA)
- Identification of spices as the source of Pb exposure in case reports of clinical lead poisoning among children, adults and pregnant women.



Objectives

1. Quantify Pb concentration in turmeric samples purchased in greater Boston
2. Characterize the contribution of turmeric to children’s blood lead levels (BLLs)

Methods

Sample Collection: We purchased 64 unique brands of turmeric from 48 stores in the Boston metropolitan area and randomly selected 50% for Pb analysis (n=32).

Chemical Analysis: We analyzed all samples for Pb using ICP-MS and determined *in vitro* Pb bioaccessibility (IVBA) and Pb relative bioavailability (RBA) for a randomly selected subsample (n=10) using a simple bioaccessibility extraction test (SBET).

Exposure Assessment: We estimated a range of Pb intake from turmeric consumption by searching the web for “turmeric recipes” and recording the volume used per serving. We halved the serving size for children 1-4 years.

Exposure Model: We used @Risk6.0 to fit empirical distribution functions (EDFs) for our Pb (µg/g) & turmeric (g) ingestion data and conducted a one-dimensional Monte Carlo analysis to describe the population distribution of Pb exposure from turmeric consumption.

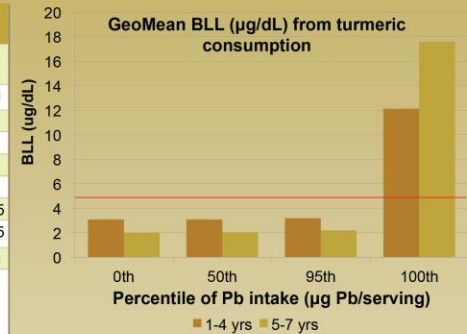
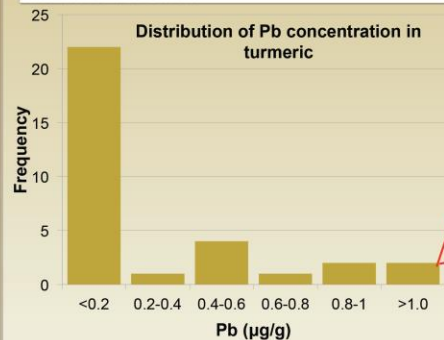
Risk Characterization: We input percentiles of Pb intake estimated from our exposure model into the EPA’s Integrated Exposure Uptake Biokinetic Model (IEUBK) to predict changes in children’s BLLs. We modified the default bioavailability to reflect our data from the SBET test.

Results

Summary Statistics for Lead Concentration, Turmeric Consumption, and Bioaccessibility Data

	N	Mean (SD)	50 th %ile	95 th %ile	100 th %ile
Pb Conc. (µg/g)	32	4.42 (18.39)	0.12	34.78	99.50
Turmeric Intake (g/serv)					
1-4 yrs	100	0.33 (0.33)	0.22	0.98	1.95
5-7 yrs	100	0.66 (0.67)	0.43	1.95	3.90
Pb Intake (µg/serv)*					
1-4 yrs		0.81 (5.18)	0.03	1.18	122.45
5-7 yrs		1.59 (10.42)	0.05	2.52	349.65
IVBA (%)**					
	10	69.97 (15.06)	65.75	99.80	99.80

*50,000 iterations was sufficient to achieve model stability.
 **To estimate RBA we used the following model:
 RBA=0.878*IVBA-0.028. To estimate absolute bioavailability (ABA) from RBA we assumed 50% of soluble lead is absorbed in food and water from the child’s GI tract



We found two samples with extremely elevated concentrations:
1. ACI Pure: 99.5 µg/g
2. Pran: 34.8 µg/g
 Both were imported from Bangladesh where the permissible level is 2.3 ppm. Using our mean intake, we estimate that a single 400g bag of ACI Pure would last for 2 years when consumed by a child on a daily basis.

Conclusion

Use of turmeric for food preparation is unlikely to substantially increase BLLs, however, intentional adulteration of spice samples with high concentrations of Pb warrants further investigation.

Next Steps

Our next steps include investigation of additional pathways of turmeric consumption, such as supplements and beverages, which we have found to contain up to 18.3 g of turmeric.

“Using our mean intake, we estimate that a single 400 g. bag of Aci pure (turmeric) will last 2 years when consumed by a child on a daily basis.”

400 grams ÷ 730 days = about ½ gram per day

In the Code of Federal Regulations (CFR) Title 21, the serving size per meal for spice is referenced as ½ gram.

<http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcr/cfrsearch.cfm?fr=101.12>

However....

New York Science Journal, 2009, 2(5), ISSN 1554-0200

<http://www.sciencepub.net/newyork>, sciencepub@gmail.com

Investigations Of Heavy Metals In Commercial Spices Brands

Hifsa Mubeen, Ismat Naeem*, Abida Taskeen and Zeb Saddiqe.

Lahore College for Women University, Lahore

Jail Road Lahore, Pakistan.

Tel: 92-42-9203801-9/245

Email: ismat4_naeem@yahoo.co.in

Abstract: In present study concentrations of some heavy metals such as iron(Fe), copper(Cu), chromium(Cr), lead (Pb), cadmium(Cd) and cobalt (Co) present in common spices of two brands widely used in Pakistan coded as A & B were determined using atomic absorption spectroscopy. The studies showed differences in metal concentrations in different spices samples. The concentration of Fe ranged from 144.5 to 1260 mgkg⁻¹ on dry weight basis, where as that of Cu was ranged from 9 to 44 mgkg⁻¹ to 3.05 mg kg⁻¹. The concentration level of Cr was from 115 to 368 mg kg⁻¹. Concentration of Co and Cd

blanks were also introduced. Results reported are average of duplicates.

The daily intake (mgkg⁻¹day⁻¹) was calculated based on these suppose

1) The human weight is 50 kg and

2) The human intake from spices per day is 20 g.

The daily intake (mgkg⁻¹day⁻¹) = metal concentration in spice × 20/1000 /50 (Eq.1)

Results and Discussion:

“Using our mean intake, we estimate that a single 400 g. bag of turmeric will last 2 years when consumed by a child on a daily basis.”

400 grams ÷ 730 days = about ½ gram per day

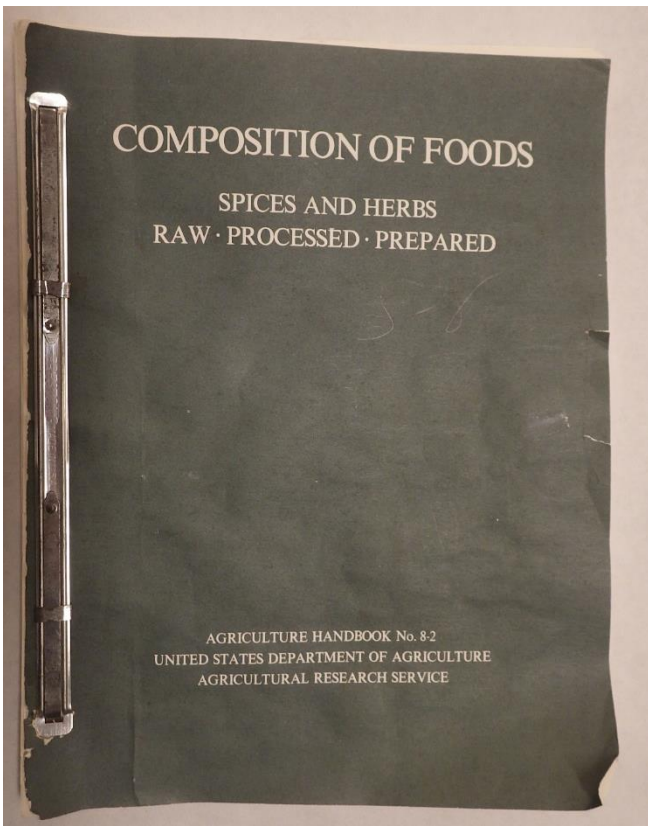
According to the reference from the Pakistani study...

“The daily intake ... was calculated based on these suppose

The human weight is 50 kg (110 lb.) and

The human intake from spices per day 20 g.”

So therefore, a 55 lb. child could consume **10 g. per day of spices.**



Goya Jamaican Curry powder



Curry powder:			
Coriander seed	36	was a	
Turmeric	28	cent	
Cumin	10	per, t	
Fenugreek seed	10	Fe	
White pepper	5	accor	
Allspice	4	than	
Yellow mustard	3	simil	
Red pepper	2	10 p	
Ginger	2	lated	
		(5).	
	<u>100</u> ³		

10 g. per day of spices =

3 to 4 grams per day of turmeric.

Lead exposure

About 310,000 U.S. children ages 1 to 5 have elevated blood lead levels, which can accumulate over months and years and cause serious health problems.

Effects on children

- Kids absorb up to 70 percent of lead, adults about 20 percent
- Often undetected; no obvious symptoms
- Can lead to learning disabilities, behavioral problems, malformed bones, slow growth
- Very high levels can cause seizures, coma, death

Sources

- Lead-based paint, contaminated dust in homes built before 1978
- Drinking water from lead pipes
- Contaminated food
- Soil (lead does not biodegrade, decay)
- Toys*



What parents can do

- Have child screened if there is concern of lead exposure
- Frequently wash child's hands, toys, pacifiers
- Only use cold tap water for drinking, cooking
- Test paint, dust in home if it was built before 1978

*Old toys with lead paint a known risk, but new toys from China now have come under scrutiny

Source: U.S. Centers for Disease Control and Prevention,
U.S. Department of Health and Human Services

© 2007 MCT

Lead in Spices

Colorado Environmental Health Association
September 28, 2011

Michele Kinshella, M.S., CIH

Tom Butts, MSc, REHS, RHSP



Interpretation of Lead Levels in Children and Recommended Actions

Venous Confirmed BLL ($\mu\text{g}/\text{dL}$)	Interpretation for Children Under Age 6	Action
Below 10	Not lead poisoned	No action
10-14	Some exposure to lead	Community intervention activities
15-19	Elevated blood lead level	Confirm with 2 nd BLL test. Case management, including nutritional and educational intervention; more frequent screenings. If level persists, environmental inspection and remediation.
20-44	Lead poisoned	Environmental investigation and remediation Medical check-up
Above 45	Seriously lead poisoned	Medical check-up and treatment

Case 1

- January 2010, received notice of 20-month old
 - BLL = 15.3 $\mu\text{g}/\text{dL}$ on 10/13/09
 - BLL = 25.2 $\mu\text{g}/\text{dL}$ on 11/20/09 → **Lead Poisoned**
- Family lived in Aurora apartment for previous 7 months
- Prior to living in Aurora, family lived in Nepal refugee camp
- Mother speaks Nepali; father speaks some English
- 1/4/10 conducted environmental assessment of apartment

Case 1 Sources Found

- White pitcher



- Ceramic tile

Case 1 Follow-up

- 6/11/10 — Received call from case's doctor at Lowry Refugee Clinic
- Case's BLL rose from 21 $\mu\text{g}/\text{dL}$ to 31 $\mu\text{g}/\text{dL}$
- Doctor requested TCHD re-visit home to look for additional sources

Curry Spice

- Case's mother ground various dried plants purchased from nearby ethnic grocery store to make curry powder
- Curry measured 29.2 ppm lead
- Lead standard for curry?
 - FDA maximum recommended standard of 0.1 ppm lead in candy

Case 2

- August 2010, received notice of 15-month old
 - BLL = 10.1 $\mu\text{g}/\text{dL}$ on 8/4/10
 - BLL = 24 $\mu\text{g}/\text{dL}$ on 11/3/10
 - Child born in U.S.
 - Educated parents; father worked in IT, both spoke English well
 - Family had recently been in India for 2.5 months
 - 11/15/10 conducted environmental assessment of apartment
 - Parents had elevated lead levels
- Lead Poisoned

Case 2 Sources Found

- Various spices
 - Chile powder—368.8 ppm
 - Turmeric—211.2 ppm
 - Coriander powder—2.4 ppm
 - Garam masala —1.4 ppm
- Red vase



Grocery Store Sampling

- Using XRF, screened TCHD staff spices for lead
- Screening levels ranged from 44 to 50 +/- 8 ppm lead in San Francisco Herb & Natural Food Co. turmeric
- Elevated lead levels confirmed by lab



Epidemiologic Characteristics of Children with Blood Lead Levels $\geq 45\mu\text{g}/\text{dL}$



**Brett Keller, Andrew Faciano MPH,
Adey Tsega MPH, Jacqueline Ehrlich, MD, MPH**
Healthy Homes Program /Lead Poisoning Prevention
New York City Department of Health
and Mental Hygiene





Of 96 products tested, 12 had \geq 10ppm lead

- 3 surma samples all had high lead levels (1.4%, 22%, and 25%)
- Cough remedy powder purchased in Russia (750,000ppm or 75%)
- Abdominal discomfort remedy made in South Korea (8,075ppm)
- Chapulinas (dried, spiced grasshoppers) from Mexico (2,900ppm)
- 2 turmeric samples from Bangladesh (1,424 & 2,000ppm)
- Cassava grain from Nigeria (38ppm)
- Ingested incense ash from Gambia (31ppm)
- Yellow metal toy car from China which a child mouthed (19ppm)
- Chili powder from Bangladesh (12ppm)

16C-2781
Jamaican Curry Powder

Origin Unknown

**Sampled at a retail market
in Brooklyn, New York**

**Received at Lab
July 5, 2016**

Lead = 35.0 ppm
Chromium = 9.76 ppm

Chromate Test
(Indian Standard 3576:2010)
POSITIVE

**Therefore, high lead is a result of use of lead
chromate (PbCrO_4), a yellow pigment.**

**Lead chromate contains hexavalent chromium
which is the more toxic form of chromium.**



Consumer Information

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State Fair

Food Safety Alert

July 22, 2016

[Jola Szubielski](#) 518-457-0752

[Dave Bullard](#) 315-487-7711 x 1377

Consumer Alert: Elevated Lead Levels in “Jamaican Curry Powder”

New York State Department of Agriculture and Markets Commissioner Richard A. Ball today alerted consumers to a concern for elevated levels of lead in Blue Mountain brand “Jamaican Curry Powder,” packaged and distributed by Eve Sales Corporation located at 945 Close Ave, Bronx, New York. No illnesses have been reported to date in connection with this product.

The recalled “Jamaican Curry Powder” is packaged in a 6 ounce glass jar. It has a code of B/B 06/03/19 OPC LOT #060116 on the bottom of the container. The package also has a UPC code of 09349-19906. The product was distributed throughout the United States.

Routine sampling by New York State Department of Agriculture and Markets’ food inspectors and subsequent analysis of the product by the New York State Food Laboratory revealed the elevated level of lead.

Lead at elevated levels, if consumed, may cause health problems to consumers, particularly infants, small children, pregnant women, and those with underlying kidney disorders. If a child or a pregnant woman is exposed to lead for a prolonged period of time, permanent damage to the central nervous system, learning disorders, developmental defects, and other long-term health problems can occur. Pregnant women, children and patients with underlying kidney problems who may have consumed any of the above products should consult with their physician or health care provider.

Consumers who have purchased “Jamaican Curry Powder” should discard the product. Consumers with questions about the recalled product may contact Stewart Gayle at (718) 589-

Further testing: early August 2016



Lab #	16C-3166	16C-3167	16C-3168	16C-3169
Chromate:	Positive	Positive	Negative	Positive
Lead:	18.6 ppm	22.6 ppm	49.1 ppb	21.5 ppm
Chromium:	4.95 ppm	6.20 ppm	None found	6.10 ppm

Safety

Home > Safety > Recalls, Market Withdrawals, & Safety Alerts

Company Announcement

When a company announces a recall, market withdrawal, or safety alert, the FDA posts the company's announcement as a public service. FDA does not endorse either the product or the company.

Follow FDA

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- Recent Recalled Product Photos on FDA's Flickr Photostream

Oriental Packing Co., Inc. Issues Alert on Lead in Curry Powder

SHARE TWEET LINKEDIN @TWITTER EMAIL PRINT

For Immediate Release August 12, 2016

Contact **Consumers**
 Oriental Packing Company
 800-809-9793

...recalling approximately 377,000 lbs. of ...



Announcement Oriental Packing Co., Inc., Miami, Florida is recalling approximately 377,000 lbs. of the following blended seasoning curry products because it is contaminated with lead. Lead can accumulate in the body over time and can cause serious and sometimes permanent adverse health consequences.

- Blue Mountain Brand
- Blue Mountain Country Mild Curry Powder
 - Blue Mountain Country Hot Curry Powder
 - Blue Mountain Country Hot Jamaican Jerk Curry Seasoning
- Jamaica Choice Brand
- Jamaica Choice Mild

Turmeric powder

Received at Lab
December 2015

Retail market
Rome, New York

Origin: Unknown

Contains:

Lead = 3.33 ppm

by
ICP-MS



16C-2916
Ground Turmeric

Origin Unknown

**Sampled at a retail market
in Hudson, New York**

Received at Lab on July 14, 2016

Lead = 54.1 ppm
Chromium = 16.9 ppm

Chromate Test
(Indian Standard 3576:2010)

POSITIVE

**Therefore, high lead is a result of use of lead
chromate (PbCrO_4), a yellow pigment.**

**Lead chromate contains hexavalent chromium
which is the more toxic form of chromium.**



Consumer Information

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State Fair

Food Safety Alert

July 27, 2016

[Jola Szubielski](#) 518-457-0752

[Dave Bullard](#) 315-487-7711 x 1377

Gel Spice, Inc. Issues Alert on Elevated Lead Levels in One Lot of Fresh Finds Ground Turmeric Powder

Gel Spice, Inc. is recalling one lot of Fresh Finds Ground Turmeric Powder because the product contains elevated lead levels.

The recalled "Fresh Finds Ground Turmeric" is packaged in 3.75 oz. PET jars. It has a code of B/B 03/08/19 and B/B 05/18/19 on the neck of the container. The package also has a UPC code of 81026-01230. The product was distributed at Big Lots Stores throughout the United States.

Routine sampling by New York State Department of Agriculture and Markets' food inspectors and subsequent analysis of the product by the New York State Food Laboratory revealed the elevated level of lead.

No illnesses have been reported to date in connection with this problem.

Lead can accumulate in the body over time. Too much can cause health problems, including delayed mental and physical development and learning deficiencies. Pregnant women, infants and young children especially should avoid exposure to lead. People concerned about blood lead levels should contact their physician or health clinic to ask about testing.

Consumers who have purchased "Fresh Finds Ground Turmeric" should discard the product. Consumers with questions about the recalled product may call (201)564-0435.

[Photo](#)



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- Radiation-Emitting Products
- Vaccines, Blood & Biologics
- Animal & Veterinary
- Cosmetics
- Tobacco Products

Safety

Home > Safety > Recalls, Market Withdrawals, & Safety Alerts

Company Announcement

When a company announces a recall, market withdrawal, or safety alert, the FDA posts the company's announcement as a public service. FDA does not endorse either the product or the company.

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Update: Gel Spice, Inc. Issues Expanded Recall of Ground Turmeric Powder Due to Elevated Lead Levels

- SHARE
- TWEET
- LINKEDIN
- PIN IT
- EMAIL
- PRINT

For Immediate Release

August 5, 2016

Contact

Consumers

(201) 564-0435

Announcement

Gel Spice, Inc. is expanding its recall of ground turmeric powder to include additional

FDA Enforcement Report - Week of March 22, 2017

Recalling Firm: Gel Spice Co, Inc.
48 Hook Rd
Bayonne, NJ 07002-5007
United States

Reason for Recall: **Ground Turmeric may contain excess levels of lead.**

Classification: **Class I**

- 1) Ground Turmeric item #73535 Net Wt 50 lbs Distributed by Gel Spice Co., Inc 48 Hook Road, Bayonne, NJ 07002
- 2) Spice Supreme Ground Turmeric Net Wt 2 oz. (56 g) Packed in the USA by Gel Spice Co., Inc. Bayonne, NJ 07002 UPC 076114364628
- 3) Clear Value Ground Turmeric Net Wt..75 oz (21 g) Distributed by TopCo Associates LLC Elk Grove Village, IL 60007, UPC 036800354920
- 4) Market Pantry Ground Turmeric, Net Wt. 0.95 oz. Distributed by Target Corporation Minneapolis, MN 55403 Product of India UPC 085239211038
- 5) Spice Select Ground Turmeric, Net Wt 8 oz.(227g), Distributed By: GelSpice, Co., Inc., Bayonne, NJ 07002, UPC 076114007730
- 6) Lieber's Turmeric, Net Wt. 2 oz (56g), Dist by Lieber's Chocolate & Food Products Co, Maspeth, New York 11378, UPC 04342700626
- 7) Gel brand Ground Turmeric, Net Wt. 15 oz., (425g) Plastic Bottle, Packed by Gel Spice Co., Inc., Bayonne, NJ 07002, UPC 076114800867
- 8) b'gan seasonings Ground Turmeric NET WT. 16 oz 1 LB (454 g) Dist. by S. Bertram. Inc, Linden, NJ 07036 UPC
- 9) Freshly Ground Turmeric Net Weight 2.8oz (79g) Orient Provision & Trading Co. LTD UPC 6281063884002
- 10) Spice Supreme Ground Turmeric Net Wt 2 oz. (56 g) Gel Spice Co., Inc. Bayonne, NJ 07002 UPC 07611436462
- 11) Fresh Finds Ground Turmeric Net Wt. 3.75 oz (106g) Distributed by: Big Lots Stores, Inc. PO Box 28523 Columbus OH 43228-0523 UPC 08102601230

Product Quantity: **34,712 pounds total for all recalled products**

16C-3600
Turmeric Powder

Origin Unknown

**Sampled at a retail market
in Brooklyn, New York**

Received at Lab on August 24, 1016

Lead = 15.8 ppm
Chromium = 5.02 ppm

Chromate Test
(Indian Standard 3576:2010)
POSITIVE

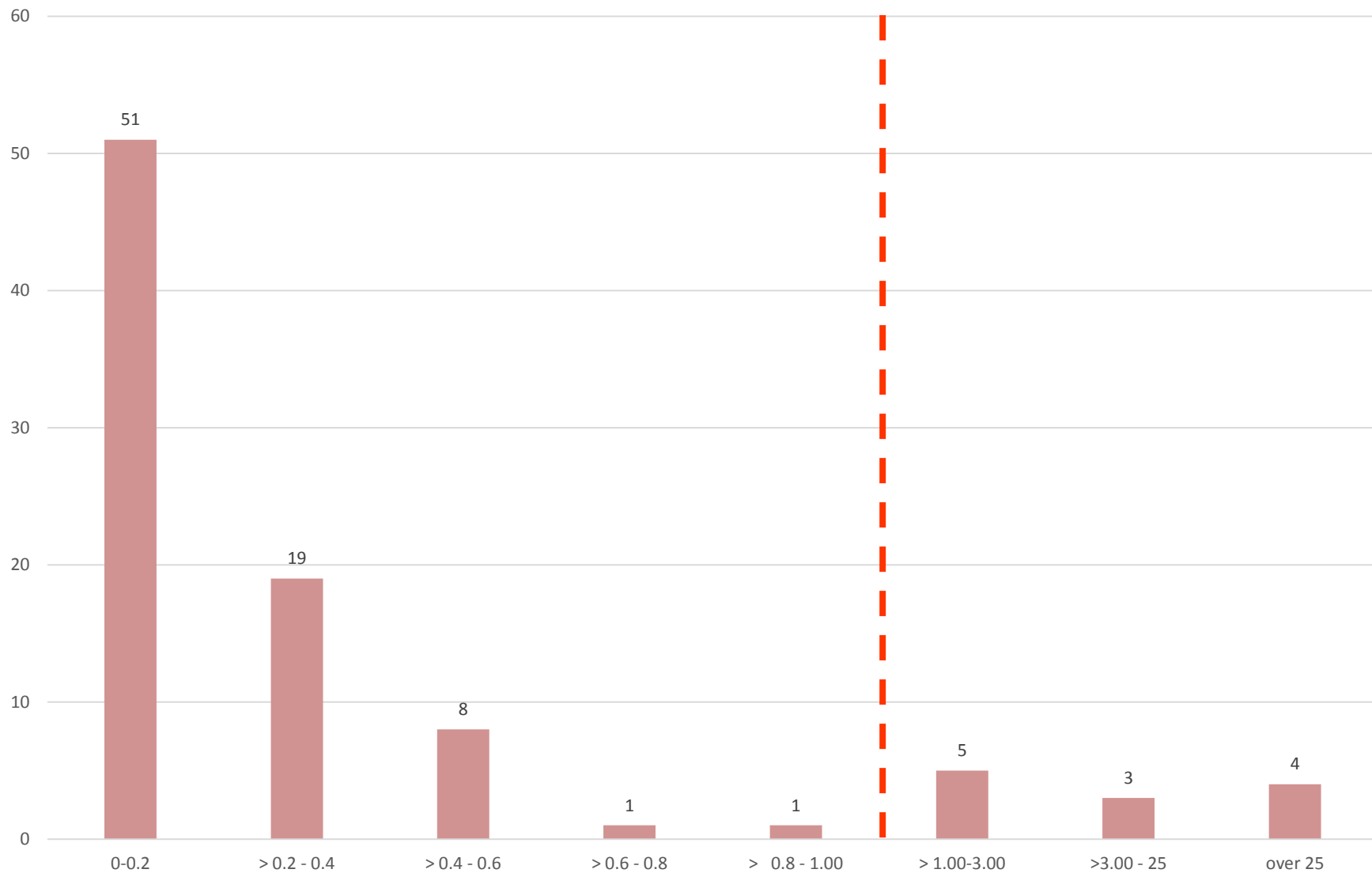
**Therefore, high lead is a result of use of lead
chromate (PbCrO_4), a yellow pigment.**

**Lead chromate contains hexavalent chromium
which is the more toxic form of chromium.**



92 turmeric samples, 2013 to present

Lead in ppm



March 17, 2017

US FDA Class 1 Recall
(State of Illinois)

Za'atar

Nabelsi brand "Thyme"

Ingredients:

Thyme, Sumac, Roasted Sesame Seeds,
Oregano, Cumin, Caraway seeds and Coriander

"...two cases of high blood levels of lead..."

"...product contained high levels of lead

(422 PPM)..."



Special Thanks to:

**NYS Agriculture & Markets
Division of Food Safety & Inspection**

**Michele Kinshella
Tri-County Health Denver**

**New York City
Department of Health
And Mental Hygiene**