The

Connecticut

Agricultural

Experiment

Station,

New Haven

CAES
The Connecticut Agricultural Experiment Station
Putting Science to Work for Society since 1875

Technical

Bulletin 25

July 2021

Pesticide Residues and Arsenic Found in Human and Animal Food Sold in Connecticut in 2020:

MFRPS-LFFM ISO 17025:2017 Food Testing

Walter J. Krol, Ph.D., Brian D. Eitzer, Ph.D., Christina S. Robb, Ph.D., Christian O. Dimkpa, Ph.D., Michael Ammirata, Terri Arsenault, Craig Musante, Kitty Prapayotin-Riveros and Jason C. White, Ph.D.
Department of Analytical Chemistry

Pesticide Residues and Arsenic Found in Human and Animal Food Sold in Connecticut in 2020:

MFRPS-LFFM ISO 17025:2017 Food Testing

Walter J. Krol, Ph.D., Brian D. Eitzer, Ph.D., Christina S. Robb, Ph.D., Christian O. Dimkpa, Ph.D., Michael Ammirata, Terri Arsenault, Craig Musante, Kitty Prapayotin-Riveros and Jason C. White, Ph.D.
Department of Analytical Chemistry

ABSTRACT

The Connecticut Agricultural Experiment Station (CAES) published its first annual report on the adulteration of food entitled "Examination of Food Products Sold in Connecticut" in 1896 which contained data for the calendar year 1895[8]. CAES personnel have published an annual report on the adulteration of food sold within the State ever since.

Beginning with the inception of our market basket study in 1963, Connecticut is the only state in New England that has continuously monitored its food supply for pesticide residues in cooperation with the Connecticut Department of Consumer Protection (DCP).

Food commodities included in all these studies were not only grown in Connecticut, but also in other parts of the world. The results of the pesticide monitoring study have been published, at least in part, on an annual basis since 1963; and in a bulletin of the present form since 1988.

In December 2016 the CAES Department of Analytical Chemistry (DAC) obtained accreditation to the ISO 17025 standard for the analysis of pesticides and arsenic in food. The current report includes accredited findings from 2020 for both the pesticide and arsenic programs.

Introduction

The COVID-19 pandemic affected everyone in 2020. It likewise affected food sample analysis in the Department of Analytical Chemistry (DAC) at the Connecticut Agricultural Experiment Station (CAES). During the first quarter of the year (January – March), samples were routinely collected and tested. On March 20, 2020 the Food and Drug Administration (FDA) issued a stop work order for food sampling and testing. This, co-incidentally, was the same date that the Governor of Connecticut issued an Executive Order for residents to stay at home. The FDA order was rescinded on June 17, 2020. As a result, no food samples were collected or tested in the second quarter of 2020 (April – June). The DAC at the CAES maintained the ability to perform analysis during these months when required, even though most staff in the DAC were working remotely. Routine sampling and testing operations in the DAC resumed July 1, 2020.

The DAC at the CAES provides regulatory enforcement analysis of pesticide residues found in domestic and imported food sold within the state for the Connecticut Department of Consumer Protection (DCP). In 2020 the DAC began testing animal food for pesticide residues and arsenic through an agreement with the Connecticut Department of Agriculture (DoAg). This pesticide residue program ensures: 1) that pesticides on food products are used in accordance with their label and 2) that the public is protected from the deliberate or accidental misuse of pesticides. The DAC began testing for arsenic in select food samples for the DCP in 2016.

Violations of Federal law occur when pesticides are not used in accordance with label registration and are: 1) applied in excessive amounts (over tolerance) or 2) when pesticides are accidentally or deliberately applied to crops on which they are not permitted for use (no tolerance). A more complete overview of the agencies involved, their roles, and a discussion of tolerances is found in Krol *et al.* 2006[1]. Our past work predominantly focused on human food but in 2020 was expanded to include animal food. Tolerance levels for pesticide residues in food established by the FDA apply equally to both human and animal food. The FDA has likewise issued nonbinding action level recommendations for arsenic in bottled water[2], rice cereals for infants[4], and draft action levels for apple juice[3]. The results of the laboratory findings at the CAES are forwarded to the DCP or the DoAg for all samples submitted.

The Food Safety Modernization Act (FSMA)[5] mandated accreditation for regulatory testing laboratories. It is widely recognized that accreditation is a rigorous assessment, conducted by an independent science-based organization, which assures the capability and competency of a laboratory and its management systems. The DAC at the CAES gained initial accreditation for chemical testing to the International Organization for Standardization (ISO) / International Electrochemical Commission (IEC) ISO/IEC 17025:2005(E) standard on December 28, 2016 for pesticide and arsenic analysis in food. Subsequently, the laboratory gained accreditation to the updated ISO/IEC 17025:2017 standard and added the analysis of aflatoxins in February 28, 2019. During a bi-annual assessment in February 2021, three additional analysis were added to the scope of accreditation. The DAC is currently accredited by the American Association for Laboratory Accreditation (A2LA) for: 1) Pesticide Residues in Food, 2) Total Arsenic in Juice, and Solid and Semi-Solid Food Matrices, 3) Aflatoxin Analysis in Animal Food, 4) Percent Crude Fat Analysis in Animal Feed, 5) Percent Crude Protein in Animal Feed, and 6) Total Delta-9 tetrahydrocannabinol (THC) and Cannabidiol (CBD) Analysis in Hemp (Cannabis Sativa)[6].

The current work reports upon the 92 human food and 20 animal feed samples tested in the 2020 calendar year for pesticide residues. The results of concurrent ICP/MS testing for arsenic in 40 processed food samples are also included. All samples were submitted by the CT DCP or the CT DoAg as part of the manufactured food regulatory program standard (MFRPS) and the laboratory flexible funding model (LFFM) cooperative agreement testing programs and were tested in accordance with the ISO/IEC 17025:2017 standard. Samples are collected by the CT DCP and DoAg and delivered to the CAES without prior knowledge of pesticide application.

Methods

Samples for Pesticide Residues:

The sample extraction and cleanup procedure is based on quick, easy, cheap, effective, rugged, and safe (QuEChERS) chemistry. Following homogenization and extraction, samples are analyzed by LC/HRMS and GC/MS/MS. Findings are reported to the DCP or DoAg as mg/Kg (ppm). Based on past FDA enforcement and the enforcement levels in use in the European Union (EU), the CAES defines its Limit of Reporting (LOR) at 0.010 mg/Kg (ppm). Limits of Detection (LOD) levels

and measurement uncertainty have been established for all pesticides reported.

Samples for Total Arsenic:

Samples are digested with acid and analyzed by ICP/MS. Findings are reported to the DCP as µg/kg (ppb). In 2005, The FDA issued an action level for arsenic in bottled water at 10 µg/L (ppb)[2]. A draft guidance action level for inorganic arsenic in apple juice at 10 µg/kg (ppb) was proposed by the FDA in 2013[3]. An action level for inorganic arsenic in rice cereals for infants of 100 µg/kg (ppb) was established by the FDA in 2020[4]. The CAES does not report arsenic levels lower than10 µg/kg (ppb). If no arsenic or trace levels are found, the CAES reports < 10 µg/kg (ppb). The CAES does not currently perform speciation to determine organic/inorganic arsenic.

Quality Assurance and Reproducibility

Calibration standards are prepared from reference materials that are traceable to the point of manufacture. Analyte spike-recoveries are evaluated with each batch of samples tested. All systems used for analysis are verified prior to use. Balances are calibrated annually and verified when used to ensure accuracy. Verification weights are National Institute of Standards and Technology (NIST) traceable through the Standard International (SI) system of units. Trends in the data produced are reviewed and analyzed. Overall method uncertainty (MU) has been established and is documented. Batch acceptability is determined using various quality control samples (QCS).

Results and Discussion

Pesticide Residue Program

Abbreviations are used in Tables 1 and 2 for pesticides and for the sample source. Table 3 contains a list of the 36 different pesticides found in 2020, the corresponding analyte abbreviations used in Tables 1 and 2, and the number of times each pesticide was found. No residues were found which were in violation of Federal Tolerance Levels[7]. The sample source column lists the State in which the sample originated by its two-letter abbreviation. For those samples originating outside of the US, a three-letter code is used. Table 4 correlates the three-letter abbreviation with the country. It also provides the frequency of sampling for that country individually for the pesticide work and the arsenic work.

The 2020 findings for human food provided by the DCP are summarized in Table 1. Of the 92 samples tested, 32 (35%) were found to contain at least one pesticide residue greater than the 0.010 mg/Kg (ppm) reporting limit. There were no residues reported in the remaining 60 (65%) samples. Of the 32 found to contain residues, no residues that were illegal were found. There were 18 (20% of total) samples of organic food tested. Pesticide residues were found in one (6%) of the organic food tested. There were 8 (9% of total) samples of baby food tested. Pesticide residues were found in one (13%) of the baby food samples tested. Of the 92 total samples, 38 (41%) were produced outside of the US; 53 (58%) were from the United States; and one was of unknown origin. Only two (2%) samples were grown in Connecticut. Samples were collected from 15 towns and cities throughout the State.

The 2020 findings for animal food provided by the DoAg are summarized in Table 2. Of the 20 samples tested in 2020, 5 (25%) were found to contain at least one pesticide residue. There were no residues reported in the remaining 15 (75%) samples. Of the 5 found to contain residues, no residues that were illegal were found. There were no samples of organic animal food tested. All 20 samples were produced in the US. A total of 2 (10%) of the samples were produced in Connecticut. Samples were collected from 2 towns and cities in Connecticut.

The results of all analysis performed at the CAES are reported to the DCP or the DoAg. All regulatory enforcement of illegal residues where CT is the source are performed by the CT DCP or the DoAg. In those cases where illegal residues are reported on samples whose source is outside of CT, the DCP will forward the results of the CAES to the FDA or the United States Department of Agriculture (USDA) for enforcement. The Enforcement actions (or lack thereof) taken by the DCP. DoAg, FDA or the USDA are not always communicated back to the CAES.

Arsenic Testing Program

Arsenic is a naturally occurring element widely found in nature and may be present in foods, depending on the particular environment. The FDA has issued nonbinding action level recommendations for arsenic in bottled water[2] and rice cereals for infants[4], and draft action levels for apple juice[3].

There were 40 samples tested in 2020 as part of the CAES contract with the DCP. Of these, 27 (68%) were baby food and 13 (32%) were juices and ciders as shown in Table 5. Of these 40 samples tested, two (5%) were found to contain arsenic above the 10 µg/Kg (ppb) reporting level. There was no arsenic reported in the remaining 38 (95%) samples.

A sample of grape juice was found to contain 12.3 µg/Kg (ppb) of arsenic. No action level has been set by the FDA for arsenic in grape juice. The FDA has issued draft guidance of 10 µg/Kg (ppb) of arsenic in apple juice[3]. A sample of rice baby food / cereal was found to contain 88.6 µg/Kg (ppb) arsenic. Rice is known to contain arsenic, and the FDA has established an action level of 100 (µg/kg) [4].

Conclusions

Nearly all the food we eat, with the exception of organically grown produce, has been intentionally treated with pesticides during the course of production. If pesticides used during food production have been applied in accordance with the approved use of the product, the levels resulting on the food will be below the EPA tolerance. The results of this work allow the consumer to gain a better understanding of the prevalence and levels of pesticide residues in the food they consume.

Naturally occurring arsenic may be present in some of the foods we consume. The organic designation does not seem to be an accurate reflection of the amount of arsenic in a given sample. The amount of arsenic found in samples of baby food tested seems best correlated to the amount of rice contained in the sample. The CAES currently does not perform arsenic speciation which determines both organic and inorganic arsenic in a sample. Although some values of arsenic in samples may seem high, they may not truly represent the true amount of inorganic arsenic contained in a sample.

References

1) https://portal.ct.gov/-/media/CAES/DOCUMENTS/Publications/Bulletins/b1006pdf.pdf?la=en Krol, W.J., Arsenault, T., Mattina, M. J. I. 2006. Pesticide Residues in Produce Sold in Connecticut 2005. Bulletin 1006. The Connecticut Agricultural Experiment Station, New Haven, CT. Retrieved May 26, 2021.
2) https://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/ucm151384.htm Guidance for Industry: Bottled Water and Arsenic; Small Entity Compliance Guide, April 2009. Food and Drug Administration, Office of Food Safety, 5001 Campus Drive, College Park, MD 20740. Retrieved May 26, 2021.
3) https://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/ucm360020.htm Draft Guidance for Industry: Arsenic in Apple Juice - Action Level, July 2013. Food and Drug Administration, Center for Food Safety and Applied Nutrition, 5001 Campus Drive, College Park, MD 20740. Retrieved May 26, 2021.
4) https://www.fda.gov/regulatory-information/search-fda-guidance-documents/guidance-industry-action-level-inorganic-arsenic-rice-cereals-infants Guidance for Industry: Action Level for Inorganic Arsenic in Rice Cereals for Infants. Food and Drug Administration, Office of Food Safety, 5001 Campus Drive, College Park, MD 20740. Retrieved May 26, 2021.
5) https://www.gpo.gov/fdsys/pkg/PLAW-111publ353/pdf/PLAW-111publ353.pdf PUBLIC LAW 111–353—JAN. 4, 2011. Retrieved January 17, 2020.
6) https://cabportal.touchstone.a2la.org/index.cfm?event=directory.detail&labPID=FD1ACBE9-DCA4-49AE-8AB3-93783BF2B089 Organization/Accreditation Information. Retrieved May 26, 2021.
7) https://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title40/40cfr180_main_02.tpl Electronic Code of Federal Regulations Title 40, Chapter I, Subchapter E, Part 180. Retrieved May 26, 2021.
8) https://portal.ct.gov/-/media/CAES/DOCUMENTS/Publications/Bulletins/B123pdf.pdf Johnson, S.W. Examination of Food Products sold in Connecticut. Bulletin 123. The Connecticut Agricultural Experiment Station, New Haven, CT. Retrieved June 2, 2021.

Acknowledgements:

This Federal Award Project Title "FDA LFFM- Continuation of human and animal food/feed programs at the CT Agricultural Experiment Station" supported by the Food and Drug Administration (FDA) of the U.S. Department of Health and Human Services (HHS) as part of a financial assistance award FAIN U19FD007094 totaling $675,000 with 100 percent funded by FDA/HHS. The contents are those of the author(s) and do not necessarily represent the official views of, nor an endorsement, by FDA/HHS, or the U.S. Government.

Table 1: 2020 Pesticide Residue Findings in Human Food

Sample ID	Commodity	Sample Source	Town Collected	Organic	Pesticides Found mg / Kg (Parts-per Million)
ES-7200	Tomatoes	DOM	Granby	N	
ES-7201	Cucumbers	MEX	Granby	N	Imid-0.016
ES-7202	Peppers, bell	CA	Granby	N	
ES-7203	Lettuce, romaine	MEX	Granby	N	Mand-0.036
ES-7204	Honeydew melon	GTM	Granby	N	
ES-7205	Celery root juice	CHE	Granby	Y	Perm-0.019
JP-63	Carrots	GTM	Milford	N	
JP-64	Brussels Sprouts	CA	Milford	N	
JP-65	Celery	CA	Milford	N	Prop-0.014
JP-66	Garlic	CA	Milford	Y	
JP-67	Kiwi	ITA	Milford	Y	
JP-68*	Plums, (prune)	NJ	Milford	Y	
ES-7207	Blueberries	CHL	Simsbury	N	
ES-7208	Parsnips	MA	Simsbury	N	Linu-0.037
ES-7209	Peppers	MEX	Simsbury	N	Acet-0.035; Clot-0.014; Imid-0.011
ES-7210	Garlic	ARG	Simsbury	N	
ES-7211*	Apples	MI	Simsbury	N	
JP-79	Mushrooms	NJ	Clinton	N	
JP-80	Arugula	FL	Clinton	N	Clan-0.138; Fena-0.405; Flon-0.272
JP-81	Corn	GTM	Clinton	N	
JP-82	Turmeric	FJI	Clinton	N	
JP-83	Spinach	CAN	Clinton	N	
JP-84*	Mango puree’	NJ	Clinton	Y	
ES7173	Banana	HND	Bristol	N	Azox-0.069
ES7174	Pineapple	CRJ	Bristol	N	
ES7175	Mango	PER	Bristol	N	
ES7176	Lettuce, iceberg	AZ	Bristol	N	
ES7177	Cucumber	CAN	Bristol	N	
ES7178*	Rice cereal	NY	New London	N	
JP-90	Pepper, bell	MEX	S. Windsor	N	Acet-0.015; Meta-0.051
JP-91	Tangelo	CA	S. Windsor	N	Imaz-0.717; Thib-0.729
JP-92	Pineapple	CRJ	S. Windsor	N	
JP-93	Apples	WA	S. Windsor	N	Acet-0.012; Pyri-2.3; Spir-0.07
JP-94	Avocado	DOM	S. Windsor	N	
JP-95*	Carrots	MI	S. Windsor	N	
ES-7213	Brussels Sprouts	MD	Meriden	N	
ES-7214	Peas, snow	GTM	Meriden	N	
ES-7215	Celery	CA	Meriden	N	
ES-7216	Peppers	NC	Meriden	N	
ES-7217	Pear juice	NJ	Meriden	N	
ES-7219	Beans, green	CT	Avon	N	
ES-7220	Squash	MA	Avon	N	
ES-7221	Sweet potato	NC	Avon	N	
ES-7222	Lettuce, leaf	MA	Avon	N	
ES-7223	Apple juice	IL	Avon	Y	
ES-7228	Strawberries	CA	Cheshire	N	Bosc-0.227; Flon-0.042; Flut-0.032; Nova-0.067; Pyra-0.048
ES-7229	Blueberries	MI	Cheshire	N	Bosc-0.034
ES-7230	Squash, yellow	NY	Cheshire	N	
ES-7231	Cucumbers	CAN	Cheshire	N	Meta-0.026

ES-7232*	Apple-Blueberry	NY	Cheshire	N	Acet-0.018; Pyri-0.332
ES-7234	Squash, yellow	MA	Plainville	N	
ES-7235	Broccoli	CA	Plainville	N	
ES-7236	Blueberries	CA	Plainville	Y	
ES-7237	Lettuce	CT	Plainville	Y	
ES-7238	Apples. Juice	CA	Plainville	Y	
MR-235	Orange, mandarin	CHL	Portland	N	Imaz-0.594; Thib-0.234
MR-236	Plums, (prune)	NY	Portland	N	Acet-0.039
MR-237	Carrots	CA	Portland	N	
MR-238	Apples, Honeycrisp	NY	Portland	N	Acet-0.039; Phos-0.074
MR-239*	Squash	NY	Portland	Y	
LJ-1	Beans, green	GTM	Middletown	N	Bosc-0.025; Meta-0.012
LJ-2	Peppers, green	US	Middletown	N	Difn-0.015; Dimm-0.012
LJ-3	Cucumbers	CAN	Middletown	N	
LJ-4	Lemons	CHL	Middletown	N	Acet-0.011; Imaz-1.192
LJ-27	Tomatoes	MEX	Meriden	N	
LJ-28	Gooseberries	COL	Meriden	N	
LJ-29	Cranberries	MA	Meriden	N	
LJ-30	Carrots	CA	Meriden	Y	
LJ-31	Cauliflower	CAN	Meriden	N	
LJ-32	Mushrooms	MD	Meriden	Y	
LJ-36*	Peaches	NJ	Meriden	Y	
LJ-44	Pineapple	CRJ	Wallingford	N	
LJ-45	Cantaloupe	US	Wallingford	N	Dino-0.013
LJ-46	Honeydew melon	US	Wallingford	N	Dino-0.048; Imid-0.036
LJ-48	Brussels sprouts	US	Newington	N	Azox-0.017; Indo-0.013; Meth-0.011
LJ-49	Celery	CA	Newington	Y	
LJ-50	Cucumbers	MEX	Newington	Y	
LJ-51	Avocado	MEX	Newington	N	Perm-0.065
LJ-52	Raspberry	MEX	Newington	Y	
LJ-53	Dates	CA	Newington	N	
LJ-54	Mushrooms	PA	Newington	N	Thib-0.073
LJ-55	Peas, sugar snap	GTM	Newington	N	Azox-0.099
LJ-56	Pears	WA	Newington	Y	
LJ-77	Tomatoes	NJ	Newington	N	Cyhl-0.015
LJ-78	Squash	PA	Newington	Y	
LJ-79	Mushrooms	NY	Newington	N	
LJ-80	Potatoes	CAN	Newington	N	Azox-0.062; Difn-0.266; Chlp-1.253; Flud-0.210
LJ-87	Apples	MN	Southington	N	Clan-0.027; DipA-0.917; Meth-0.021; Thib-0.271
LJ-88	Mango	**Unk**	Southington	N	
LJ-89	Watermelon	MEX	Southington	N	
LJ-90	Blackberries	MEX	Southington	N	Bifz-0.769; Cypr-0.037; Fenh-0.018; Hexy-0.439
LJ-91	Blueberries	ARG	Southington	N	Bosc-0.025; Cypr-0.046

* - Denotes Baby Food

Table 2: 2020 Pesticide Residue Findings in Animal Food

Sample ID	Brand Name; Commodity	Sample Source	Town Collected	Pesticides Found mg / Kg (Parts-per Million)
KAN21-21P	Purina Friskies, Shreds with Chicken gravy	MO	Middlefield	PipB-0.082
KAN21-25P	Purina Pro Plan, Salmon Entrée	MO	Middlefield	
KAN21-29P	Hill Science Diet, Liver & Chicken Entrée	KS	Middlefield	
KAN21-33P	Blue Healthy Gourmet, Turkey & Chicken Entrée Pate	CT	Middlefield	
KAN21-37P	Wellness, Minced Chicken Dinner Cat Food	MA	Middlefield	
KAN21-41P	Hentastic, Peck 'n; mix Herb Surprise	SC	Middlefield	
KAN21-50P	Fromm Family Foods, LLC. Salmon Tuna Chovy Recipe	WI	Middlefield	Difn-0.018
KAN21-52P	Blue Seal Original Flavor, mini Dog Biscuts	IA	Middlefield	
KAN21-54P	Kaytee Fiesta, Guinea Pig Food	WI	Middlefield	
KAN21-56P	Bravo HomeStyle Complete, Beef Dinner for Dogs	CT	Middlefield	
KAN21-61P	Nutrena; Country Feeds Hay Extender	MN	Litchfield	
KAN21-65P	Nutrena; Active 12 Pellet – Horse	MN	Litchfield	PipB-0.012
KAN21-69P	Tribune Equine Nutrition; Essential K	OH	Litchfield	
KAN21-73P	Kalmbach Feeds; 17% Milk Marker Goat Feed	OH	Litchfield	Mala-0.028; PipB-0.1
KAN21-77P	Nutrena; Country Feed Gamebird/ Turkey Fin./Main 16%	MN	Litchfield	
KAN21-81P	Nutrena Naturewise; Performance Rabbit	MN	Litchfield	
KAN21-83P	Nutrena – Country Feeds; Pig Feed 14%	MN	Litchfield	
KAN21-85P	Cargill; Dairy Focus Lactation Pellet	MN	Litchfield	
KAN21-87P	Nutrena Country Feeds; Meat Bird 22% Crumble	MN	Litchfield	
KAN21-89P	Mazuri Waterfowl; Maintenance Diet	MN	Litchfield	Mala-0.043

Table 3: The 36 Pesticides / 69 Analytes Found in 2020; their Abbreviations and Frequency.

Acet – Acetamiprid (7)	DipA – Diphenylamine (1)	Mand – Mandipropamid (1)
Azox – Azoxystrobin (4)	Fena – Fenamidone (1)	Meta – Metalaxyl (3)
Bifz – Bifenazate (1)	Fenh – Fenhexamid (1)	Meth – Methoxyfenozide (2)
Bosc – Boscalid (4)	Flon – Flonicamid (2)	Nova – Novaluron (1)
Clan – Chlorantraniliprole (2)	Flud – Fludioxonil (1)	Perm – Permethrin (2)
Chlp – Chlorpropham (1)	Flut – Flutriafol (1)	Phos – Phosmet (1)
Clot – Clothianidin (1)	Hexy – Hexythiazox (1)	PipB – Piperonyl Butoxide (3)
Cyhl – Cyhalothrin, lambda (1)	Imaz – Imazalil (3)	Prop – Propiconazole (1)
Cypr – Cyprodinil (2)	Imid – Imidacloprid (3)	Pyra – Pyraclostrobin (1)
Difn – Difenoconazole (3)	Indo – Indoxacarb (1)	Pyri – Pyrimethanil (2)
Dimm – Dimethomorph (1)	Linu – Linuron (1)	Spir – Spirodiclofen (1)
Dino – Dinotefuran (2)	Mala – Malathion (2)	Thib – Thiabendazole (4)

Table 4: Source Country Abbreviations; Pesticide Samples, Arsenic Samples (Pesticide, Arsenic)

ARG – Argentina (2, 0)	DOM – Dominican Republic (2, 0)	NLD – Netherlands (0, 1)
CAN – Canada (6, 1)	GTM – Guatemala (6, 0)	PER – Peru (1, 0)
CHL – Chile (3, 0)	HND – Honduras (1, 0)	TUR – Turkey (0, 1)
COL – Columbia (1, 0)	ITA – Italy (1, 0)	BRA – Brazil (0, 1)
CRJ – Costa Rica (3, 0)	MEX – Mexico (10, 0)	CHE – Switzerland (1, 0)

Table 5: Findings of Arsenic in Samples Tested in 2020

Sample ID	Brand Name; Commodity	Sample Source	Town Collected	Organic	Amount Found µg / Kg (Parts-per Billion)
ES-7199	Nice; Apple Juice	TUR	Bristol	Y	< 10
JP-60	Beechnut; Sweet Potato Puree' BF	NLD	Shelton	Y	< 10
ES-7206	Biotta; Celery Root Juice	CHE	Granby	Y	< 10
JP-69	Plum Organics; Just Prunes BF	NJ	Milford	Y	< 10
ES-7212	Gerber; Apples BF	MI	Simsbury	N	< 10
JP-85	Plum Organics; Mango BF	NJ	Clinton	Y	< 10
ES7179	Beechnut; Rice Baby Cereal BF	NY	New London	N	88.6*
JP-96	Gerber; Carrots BF	MI	S. Windsor	N	< 10
ES-7218	Goya; Pear Nectar Juice	NJ	Meriden	N	< 10
ES-7224	Topco; Apple Juice	IL	Avon	Y	< 10
ES-7233	Beechnut; Apples + Blueberries BF	NY	Cheshire	N	< 10
ES-7239	Knudsen; Apple Juice	CA	Plainville	Y	< 10
LJ-5	Little Journey; Apple Banana Blueberry BF	IL	Middletown	Y	< 10
LJ-6	Little Journey; Apple Pear Spinach BF	IL	Middletown	Y	< 10
LJ-7	Little Journey; Apple Sweet Potato BF	IL	Middletown	Y	< 10
MR-240	Earth's Best; Squash, Chicken, Rice BF	NY	Portland	N	< 10
MR-241	Suja; Strawberry Raspberry Lemon Juice	CA	Cheshire	Y	< 10
MR-242	Suja; Orange Mango Pineapple Cucumber Spinach Juice	CA	Cheshire	Y	< 10
MR-243	Cheibundi; Cherry Apple Juice	NY	Cheshire	Y	< 10
MR-244	Sicilia; Lime Juice	BRA	Cheshire	Y	< 10
MR-245	Sprout; Peas Corn Carrot Chicken BF	NJ	Cheshire	Y	< 10
LJ-33	Plum Organics; Apple Broccoli BF	NJ	Meriden	Y	< 10
LJ-34	Organics Happy Baby; Mango BF	NY	Meriden	Y	< 10
LJ-35	Plum Organics; Peach BF	NJ	Meriden	Y	< 10
LJ-37	Gerber; Pear BF	MI	Wallingford	N	< 10
LJ-38	Gerber; Carrot BF	MI	Wallingford	N	< 10
LJ-39	Gerber; Banana Mango BF	MI	Wallingford	Y	< 10
LJ-40	Sprout; Sweet Potato Apple Spinach BF	NJ	Wallingford	Y	< 10
LJ-41	Sprout; Pear Kiwi Peas Spinach BF	NJ	Wallingford	Y	< 10
LJ-42	Gerber; Pear Spinach BF	CAN	Wallingford	Y	< 10
LJ-43	Kedem; Grape Juice	NY	Wallingford	N	12.3**
JP-103	Gerber; Apple Prune BF	MI	Glastonbury	Y	< 10
LJ-47	Simply Nature; Pomegranate Plum Juice	IL	Newington	N	< 10
LJ-62	Cheribundi; Cherry Apple Juice	NY	Hamden	N	< 10
LJ-63	Sprout; Carrot Strawberry Grape Sweet Potato BF	NJ	Hamden	Y	<10
LJ-64	Sprout; Squash Peach Pineapple BF	NJ	Hamden	Y	< 10
LJ-65	Sprout; Squash Peas Spinach Pineapple BF	NJ	Hamden	Y	< 10
LJ-66	Sprout; Sweet Potato Mango Apricot Carrot	NJ	Hamden	Y	< 10

	Date BF				
JP-113	Gerber; Pear Juice	MI	Hartford	N	< 10
JP-118	Beechnut; Mango BF	NY	Hartford	N	< 10

BF – Baby Food

* The US FDA has established an action level of 100 µg/Kg of inorganic arsenic in rice.

** The US FDA has proposed an action level of 10 ug/Kg of inorganic arsenic in apple juice. The reported value includes organic & inorganic arsenic. Arsenic was not speciated for inorganic arsenic.