



## Exploratory Data on Furan in Food Data through April 28, 2004

### Background

During investigations relating to review of a petition for the use of irradiation in certain foods, FDA scientists identified the substance furan in a number of foods that undergo heat treatment, such as canned and jarred foods. The presence of furan is a potential concern because, based on high-dose animal tests, furan is considered possibly carcinogenic to humans. FDA has developed a gas chromatography/mass spectrometry method to measure furan levels in food, which is posted on FDA's website at <http://www.cfsan.fda.gov/~lrd/pestadd.html#furan>. FDA is also issuing a [Federal Register Notice](#) (May 10, 2004), requesting data and information from the public on furan in food and furan toxicology, and is bringing the topic of furan to its Food Advisory Committee on June 8, 2004.

### The data

The data presented below (Table 1) are initial results (collected prior to April 28) from an ongoing exploratory survey of foods for furan. We are presenting this initial data set now to inform the public of FDA's progress and to help stimulate research into the formation of furan in food. The results reflect furan levels detected in samples of individual food products.

### Limits of the data

These data are exploratory and should not be understood to be a reflection of the distribution of furan in foods in the U.S. food supply. The data cover a limited number of food categories, a limited number of products in those categories, and a limited number of brands. Also, the data do not fully address the variation from one unit of a food product to another unit of the same product, or from one production lot of a food product to another lot. Also, the choice of products for testing in this exploratory survey should not be taken as an indicator of food product choices by consumers.

### What consumers should understand

Consumers should not view the furan levels in Table 1 as an indicator of furan exposure, or as the "risk" of eating certain foods. First, furan levels alone do not equate to furan exposure; calculating exposure requires consideration of both furan levels, and the amounts of food that consumers eat. Second, estimates of furan exposure take into account not single food items, but the wide variety of foods found in a range of diets. Third, the scope of data in Table 1 is too limited to properly consider potential sources of variation in measured furan levels, such as variability between different units or lots of food and the effect of consumer cooking practices on furan levels.

**Notes:**

1. ND = nondetect
2. The estimated limit of quantitation (LOQ) is 2.0 ppb for coffee, applesauce and juices and 5.0 ppb for all other foods. Values below the LOQ but above the estimated limit of detection (0.7 ppb for coffee, applesauce and juices and 1.5 ppb for all other foods) are reported as <2.0 ppb and <5.0 ppb respectively.
3. Concentrates (infant formulas and broth) were mixed with water (1:1) for analysis. Results are reported as table ready.
4. All ground coffee was brewed using automatic drip coffee makers. Instant coffees were reconstituted per manufacturer directions.
5. Foods with multiple results were from different cans or jars within the same lot.

**Table 1: Furan values in food product samples**

	<b>Product</b>	<b>Furan (ppb)</b>
<b>Baby Foods</b>	Gerber 100% Apple Juice, Lot 1	3.2
	Gerber 100% Apple Juice, Lot 2	3.4
	Beechnut Naturals Apple Juice	2.5
	Beechnut Naturals Apple Juice	2.6
	Earth's Best Apple Juice	8.2
	Gerber 1 <sup>st</sup> Foods Applesauce, Lot 1	4.4
	Gerber 1st Foods Applesauce, Lot 1	5.2
	Gerber Tender Harvest Organic Apples	4.7
	Gerber 1st Foods Applesauce, Lot 2	3.2
	Gerber 1 <sup>st</sup> Foods Applesauce, Lot 2	3.6
	Beechnut Naturals Stage 1 Applesauce, Lot 1	4.7
	Beechnut Naturals Stage 1 Applesauce, Lot 1	3.7
	Beechnut Naturals Stage 1 Applesauce, Lot 2	4
	Earth's Best First Apples	5.3
	Gerber 1 <sup>st</sup> Foods Sweet Potatoes	74.9
	Gerber 1 <sup>st</sup> Foods Sweet Potatoes	90.2
	Gerber 1 <sup>st</sup> Foods Sweet Potatoes	93.1
	Gerber 1 <sup>st</sup> Foods Sweet Potatoes	91
	Gerber 1 <sup>st</sup> Foods Sweet Potatoes	64.7
	Gerber 1 <sup>st</sup> Foods Sweet Potatoes	58
	Beechnut Naturals Stage 1 Tender Golden Sweet Potatoes, Lot 1	74.4
	Beechnut Naturals Stage 1 Tender Golden Sweet Potatoes, Lot 2	75.7
	Beechnut Naturals Stage 1 Tender Golden Sweet Potatoes, Lot 2	81.1
	Beechnut Naturals Stage 1 Tender Golden Sweet Potatoes, Lot 2	84.2
	Beechnut Naturals Stage 1 Tender Golden Sweet Potatoes,	79.7

Lot 2	
Beechnut Naturals Stage 1 Tender Golden Sweet Potatoes, Lot 2	87.1
Beechnut Naturals Stage 1 Tender Golden Sweet Potatoes, Lot 2	87.5
Earth's Best First Sweet Potatoes	88.1
Earth's Best First Sweet Potatoes	82.9
Earth's Best First Sweet Potatoes	73.8
Organic Baby Sweet Potatoes	108
Organic Baby Sweet Potatoes	72.7
Gerber 1 <sup>st</sup> Foods Carrots	38.2
Gerber 1 <sup>st</sup> Foods Carrots	39.6
Beechnut Naturals Stage 1 Tender Sweet Carrots	50.6
Earth's Best First Carrots, Lot 1	20.2
Earth's Best First Carrots, Lot 2	26
Organic Baby Carrots	47.6
Organic Baby Carrots	40.8
Gerber 1 <sup>st</sup> Foods Green Beans	39.6
Gerber 1 <sup>st</sup> Foods Green Beans	42.6
Beechnut Naturals Stage 2 Tender Young Green Beans	34
Beechnut Naturals Stage 2 Tender Young Green Beans	34.2
Organic Baby Green Beans & Rice	72
Organic Baby Green Beans & Rice	66.5
Gerber 1 <sup>st</sup> Foods Squash	38
Gerber 1 <sup>st</sup> Foods Squash	39.4
Gerber 1 <sup>st</sup> Foods Squash	51.3
Beechnut Naturals Stage 1 Butternut Squash, Lot 1	57
Beechnut Naturals Stage 1 Butternut Squash, Lot 1	52.2
Beechnut Naturals Stage 1 Butternut Squash, Lot 2	41.9
Earth's Best Winter Squash	55.1
Beechnut Naturals Stage 2 Chicken Dinner	29.4

	Earth's Best Chicken and Stars	15.9
	Gerber 3 <sup>rd</sup> Foods Pears	5.2
	Beechnut Naturals Stage 1 Bartlett Pears, Lot 1	5.8
	Beechnut Naturals Stage 1 Bartlett Pears, Lot 2	<5.0
	Earth's Best First Pears	5.8
	Gerber 1 <sup>st</sup> Foods Bananas (in plastic containers)	13
	Gerber Tender Harvest Organic Bananas	17.6
	Beechnut Naturals Stage 1 Chiquita Bananas, Lot 1	31.7
	Beechnut Naturals Stage 1 Chiquita Bananas, Lot 2	26.1
	Earth's Best First Bananas	17.7
	Gerber 2 <sup>nd</sup> Foods Garden Vegetables, Lot 1	76
	Gerber 2 <sup>nd</sup> Foods Garden Vegetables, Lot 1	73.4
	Gerber 2 <sup>nd</sup> Foods Garden Vegetables, Lot 2	112
	Gerber 2 <sup>nd</sup> Foods Garden Vegetables, Lot 3	79.4
	Beechnut Naturals Stage 2 Mixed Vegetables, Lot 1	61.5
	Beechnut Naturals Stage 2 Mixed Vegetables, Lot 2	68.1
	Earth's Best Garden Vegetables	51
<b>Infant Formulas</b>	Enfamil with Iron Concentrate	16.8
	Enfamil with Iron Concentrate	18.8
	Enfamil with Iron Concentrate	12.7
	Enfamil ProSobee Concentrate	8.5
	Enfamil ProSobee Concentrate	8.3
	Good Start Supreme Concentrate, Lot 1	ND
	Good Start Supreme Concentrate, Lot 2	ND
	Good Start Supreme DHA & ARA Concentrate, Lot 1	ND
	Good Start Supreme DHA & ARA Concentrate, Lot 2	ND
	Good Start Essentials Soy Concentrate, Lot 1	ND
	Good Start Essentials Soy Concentrate, Lot 2	ND
	Similac with Iron Concentrate, Lot 1	8.6
	Similac with Iron Concentrate, Lot 1	8.5

	Similac with Iron Concentrate, Lot 2	11.6
	Similac Advance Concentrate, Lot 1	7.5
	Similac Advance Concentrate, Lot 2	8.4
<b>Coffee</b>	Maxwell House Coffee (brewed)	37.4
	Maxwell House Coffee (brewed)	40.4
	Folgers Classic Roast Coffee Crystals	<2.0
	Folgers French Roast Coffee (brewed)	44.7
	Nescafe Classic Instant Coffee	<2.0
	Nescafe Classic Instant Coffee	<2.0
	Starbucks Yukon Blend whole bean (brewed)	84.2
	Maxwell House Sanka Decaffeinated Coffee (brewed)	33.6
	Maxwell House Sanka Decaffeinated Instant Coffee	<2.0
	Folgers Classic Decaf (brewed)	42.5
	Folgers Classic Decaf (brewed)	38.3
	Folgers Classic Decaf (brewed)	52.6
	Nescafe Taster's Choice Decaffeinated Instant Coffee	4.8
	Nescafe Taster's Choice Decaffeinated Instant Coffee	7.2
<b>Mixtures (e.g. soups, sauces, broths, chili)</b>	Ragu Traditional Pasta Sauce	11
	Ragu Traditional Spaghetti Sauce	26.1
	Francesco Rinaldi Traditional Spaghetti Sauce	<5.0
	Francesco Rinaldi Traditional Spaghetti Sauce	<5.0
	Prego Traditional Spaghetti Sauce, Lot 1	5.9
	Prego Traditional Spaghetti Sauce, Lot 1	6.1
	Prego Traditional Spaghetti Sauce, Lot 2	<5.0
	College Inn Chicken Broth, Lot 1	8.2
	College Inn Chicken Broth, Lot 2	6.7
	Swanson Chicken Broth, Lot 1	12.7
	Swanson Chicken Broth, Lot 2	9.7
	Campbell's Chicken Broth, Lot 1	15.2
	Campbell's Chicken Broth, Lot 1	18.2
	Campbell's Chicken Broth, Lot 2	13.3

	Campbell's Chunky Old Fashioned Vegetable Beef Soup	52
	Campbell's Chunky Beef with Country Vegetables	49.7
	Progresso Rich & Hearty Slow Cooked Vegetable Beef Soup	81.4
	Progresso Traditional Beef & Vegetables Soup	110
	Safeway Hearty Beef and Country Vegetables Soup, Lot 1	125
	Safeway Hearty Beef and Country Vegetables Soup, Lot 2	110
	Hormel Chili with Beans	77
	Giant Chili with Beans, Lot 1	66.3
	Giant Chili with Beans, Lot 2	94.4
	Castleberry's Hot Dog Chili Sauce, Lot 1	46
	Castleberry's Hot Dog Chili Sauce, Lot 2	35
	Franco-American Spaghetti, Lot 1	39.2
	Franco-American Spaghetti, Lot 1	42.9
	Franco-American Spaghetti, Lot 2	36.7
	Food Lion Mini Beef Ravioli, Lot 1	42.2
	Food Lion Mini Beef Ravioli, Lot 2	42.7
	Chef Boyardee Beefaroni, Lot 1	29.8
	Chef Boyardee Beefaroni, Lot 2	42.3
<b>Fish</b>	StarKist Solid White Albacore Tuna in water	<5.0
	Chicken of the Sea Chunk White Tuna in water	6.4
	Bumble Bee Solid White Albacore in water, Lot 1	<5.0
	Bumble Bee Solid White Albacore in water, Lot 2	<5.0
	Chicken of the Sea Solid White Albacore Tuna in water, Lot 1	6.3
	Chicken of the Sea Solid White Albacore Tuna in water, Lot 2	7.1
<b>Canned Fruit, Fruit Juices and Vegetables</b>	Bush's Original Baked Beans, Lot 1	56.3
	Bush's Original Baked Beans, Lot 2	61
	Hanover Baked Beans Brown Sugar & Bacon, Lot 1	89.7
	Hanover Baked Beans Brown Sugar & Bacon, Lot 2	117
	Hanover Baked Beans Brown Sugar & Bacon, Lot 2	122
	Campbell's Pork & Beans, Lot 1	78.6

Campbell's Pork & Beans, Lot 2	78.7
Campbell's Pork & Beans, Lot 2	85.6
Del Monte Sweet Corn Cream Style	39.1
Giant Home Sliced Green Beans	6.3
Green Giant Cut Green Beans	5.9
Musselman's Premium Natural Apple Juice, Lot 1	2.5
Musselman's Premium Natural Apple Juice, Lot 2	3.4
Giant Orchard Harvest Apple Juice, Lot 1	<2.0
Giant Orchard Harvest Apple Juice, Lot 2	<2.0
Motts 100% Apple Juice	<2.0
White House 100% Apple Juice	<2.0
Minute Maid 100% Apple Juice (juice box)	<2.0
Giant Concord Grape Juice	3.2
Giant White Grape Juice	<2.0
Welch's White Grape Juice	ND
Welch's Concord Grape Juice	<2.0
Libby's Juicy Juice white grape flavored	2.3
Libby's Juicy Juice grape flavored	2.8
Northland Cranberry Juice	3.4
Ocean Spray Light Cranberry Juice Cocktail	ND
Ocean Spray Cranberry Juice Cocktail	<2.0
Giant Cranberry Flavored Juice Blend	<2.0

Furan in Food, Thermal Treatment; Request for Data and Information; Federal Register, May 10, 2004  
(available in [PDF](#))

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