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## Home

### UCB Food Chain Sampling Results

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Radionuclides, once deposited by rainwater or air onto the ground, will find their way into our food. We are already tracking its path from [rainwater](#) to [creek runoff](#) to [tap water](#). We will monitor how much these isotopes that make their way into our food. For example, cesium-137 in the grass and eventually winds up in our [milk](#)?

We have been collecting produce that is as local as possible to test for the radionuclides. We expect different kinds of plants to take up different quantities of cesium and iodine. We will measure as many different plants and fruits as we are able to. So far, we have collected [mushrooms](#), [spinach](#), [strawberries](#), [cilantro](#), [kale](#), and [arugula](#). We have also collected [seaweed](#) from the Northern California coast. Starting on 5/2, we will begin reporting on [seaweed](#) from the Northern California coast.

The topsoil, grass, and wild mushroom samples collected so far all come from the same area. The comparison of grass samples to each other is a fair "apples to apples" comparison. For most samples, the samples came from different markets and different farms, so there will be many factors. The variety of produce helps provide a picture of the food chain as a whole. But for the most part, the dependence of the food chain results, the grass and soil is what to look at.

In the tables below, we are providing two numbers for each of the isotopes. The first is the concentration unit of Becquerel per kilogram (Bq/kg) which is the number of decays per second per each kilogram of the sample. The number in parentheses after the activity is the number of samples that would need to consume to equal the radiation exposure of a single round trip to Washington D.C. (0.05 mSv). For more information on how this equivalent dose is calculated, see here: [How Effective Dose is Calculated](#)

The experimental setup used for the food testing is the same setup used for the [Experiment](#).

## Topsoil

source: Alameda, CA

Collection Date	Sample Mass	I131	I132	Cs134	Cs137
	kg	Bq/kg (kg**)	Bq/kg (kg**)	Bq/kg (kg**)	Bq/kg (kg**)
04/06/2011 10:15	1.04	12.42±1.24 [MDA=0.25] ( 89)	less than MDA [MDA=0.38]	0.99±0.10 [MDA=0.25] (2.6E+03)	1.5 [MDA=0.25] (2.4E+03)

04/08/2011 08:00	0.91	7.55±0.76 [MDA=0.31] (1.5E+02)	less than MDA [MDA=0.51]	0.41±0.08 [MDA=0.31] (6.3E+03)	0.9 [MDA=0.31] (4.7E+03)
04/13/2011 08:00	1.30	3.79±0.38 [MDA=0.18] (2.9E+02)	less than MDA [MDA=0.25]	1.04±0.10 [MDA=0.21] (2.5E+03)	1.1 [MDA=0.21] (3.1E+03)
04/21/2011 08:00	1.49	1.41±0.14 [MDA=0.15] (7.9E+02)	less than MDA [MDA=0.24]	0.99±0.10 [MDA=0.17] (2.6E+03)	1.2 [MDA=0.17] (3.7E+03)
05/02/2011 18:00	1.26	0.60±0.06 [MDA=0.08] (1.9E+03)	less than MDA [MDA=0.13]	0.76±0.08 [MDA=0.09] (3.4E+03)	1.1 [MDA=0.09] (3.1E+03)

## Grass

source: Alameda, CA

Collection Date	Sample Mass	I131	I132	Cs134	Cs137
	kg	Bq/kg (kg <sup>**</sup> )	Bq/kg (kg <sup>**</sup> )	Bq/kg (kg <sup>**</sup> )	Bq/kg (kg <sup>**</sup> )
04/03/2011 10:00	0.4	9.93±0.99 [MDA=0.31] (1.1E+02)	less than MDA [MDA=0.61]	6.99±0.70 [MDA=0.37] (3.7E+02)	7.0 [MDA=0.37] (5.1E+02)
04/05/2011 08:30	0.36	6.82±0.68 [MDA=0.54] (1.6E+02)	less than MDA [MDA=1.07]	4.39±0.44 [MDA=0.72] (5.9E+02)	3.8 [MDA=0.72] (9.7E+02)
04/06/2011 20:00	0.26	6.02±0.60 [MDA=0.65] (1.8E+02)	less than MDA [MDA=1.09]	4.61±0.46 [MDA=0.85] (5.6E+02)	5.2 [MDA=0.85] (7.1E+02)
04/11/2011 07:30	0.51	1.55±0.15 [MDA=0.29] (7.2E+02)	less than MDA [MDA=0.38]	1.63±0.16 [MDA=0.30] (1.6E+03)	2.2 [MDA=0.30] (1.7E+03)
04/14/2011 08:00	0.45	1.03±0.12 [MDA=0.39] (1.1E+03)	less than MDA [MDA=1.19]	1.38±0.15 [MDA=0.48] (1.9E+03)	1.2 [MDA=0.48] (3.1E+03)
05/02/2011 18:00	0.18	less than MDA [MDA=0.64]	less than MDA [MDA=1.56]	0.92±0.21 [MDA=0.84] (2.8E+03)	1.6 [MDA=0.84] (2.1E+03)

## Wild Mushrooms

source: Alameda, CA

Collection Date	Sample Mass	I131	I132	Cs134	Cs137
	kg	Bq/kg (kg <sup>**</sup> )	Bq/kg (kg <sup>**</sup> )	Bq/kg (kg <sup>**</sup> )	Bq/kg (kg <sup>**</sup> )
04/02/2011 10:00	0.39	7.35±0.73 [MDA=0.37] (1.5E+02)	less than MDA [MDA=1.15]	less than MDA [MDA=0.33]	less than MDA [MDA=0.33]

05/02/2011 18:00	0.49	less than MDA [MDA=0.11]	less than MDA [MDA=0.26]	less than MDA [MDA=0.24]	less than MDA [MDA=0.24]
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## Seaweed

source: coastal areas of Northern California

Collection Date	Sample Mass	I131	I132	Cs134	Cs137
	kg	Bq/kg (kg <sup>**</sup> )	Bq/kg (kg <sup>**</sup> )	Bq/kg (kg <sup>**</sup> )	Bq/kg (kg <sup>**</sup> )
04/19/2011	0.55	less than MDA [MDA=0.15]	less than MDA [MDA=0.57]	less than MDA [MDA=0.30]	less than MDA [MDA=0.30]

## Spinach

source: various local organic farms

Collection Date	Food Mass	I131	I132	Cs134	Cs137
	kg	Bq/kg (kg <sup>**</sup> )	Bq/kg (kg <sup>**</sup> )	Bq/kg (kg <sup>**</sup> )	Bq/kg (kg <sup>**</sup> )
04/08/2011 (Best By Date)	0.284	1.47±0.15 [MDA=0.50] (7.5E+02)	less than MDA [MDA=0.88]	less than MDA [MDA=0.43]	less than MDA [MDA=0.43]
04/06/2011 (Purchase Date)	0.30	1.44±0.15 [MDA=0.54] (7.7E+02)	less than MDA [MDA=1.66]	less than MDA [MDA=0.89]	less than MDA [MDA=0.89]
04/07/2011 (Purchase Date)	0.25	2.50±0.25 [MDA=0.63] (4.4E+02)	less than MDA [MDA=0.97]	0.89±0.19 [MDA=0.73] (2.9E+03)	1.14±0.19 [MDA=0.73] (3.3E+03)
04/20/2011 (Purchase Date)	0.56	less than MDA [MDA=0.28]	less than MDA [MDA=0.39]	less than MDA [MDA=0.23]	less than MDA [MDA=0.23]
04/28/2011 (Purchase Date)	0.44	less than MDA [MDA=0.27]	less than MDA [MDA=0.46]	less than MDA [MDA=0.34]	less than MDA [MDA=0.34]
04/28/2011 (Purchase Date)	0.42	less than MDA [MDA=0.20]	less than MDA [MDA=0.36]	less than MDA [MDA=0.22]	less than MDA [MDA=0.22]

## Strawberries

source: various local organic farms

Purchase Date	Food Mass	I131	I132	Cs134	Cs137
	kg	Bq/kg (kg <sup>**</sup> )	Bq/kg (kg <sup>**</sup> )	Bq/kg (kg <sup>**</sup> )	Bq/kg (kg <sup>**</sup> )
04/01/2011	1.23	0.21±0.03 [MDA=0.10] (5.3E+03)	0.35±0.07 [MDA=0.29] (4.3E+05)	0.71±0.07 [MDA=0.13] (3.6E+03)	0.71±0.07 [MDA=0.13] (5.3E+03)

04/07/2011	1.06	0.32±0.04 [MDA=0.15] (3.5E+03)	less than MDA [MDA=0.41]	0.50±0.06 [MDA=0.19] (5.2E+03)	0.4 [MDA=0.15] (7.7E+03)
04/20/2011	1.08	less than MDA [MDA=0.11]	less than MDA [MDA=0.40]	0.49±0.05 [MDA=0.15] (5.3E+03)	0.6 [MDA=0.15] (5.8E+03)
04/20/2011	1.20	less than MDA [MDA=0.073]	less than MDA [MDA=0.13]	0.27±0.03 [MDA=0.10] (9.5E+03)	0.2 [MDA=0.10] (1.4E+04)
04/28/2011	1.08	less than MDA [MDA=0.09]	less than MDA [MDA=0.21]	0.23±0.03 [MDA=0.11] (1.1e+04)	0.4 [MDA=0.11] (8.7E+03)
04/28/2011	1.02	less than MDA [MDA=0.08]	less than MDA [MDA=0.14]	0.29±0.03 [MDA=0.12] (8.9e+03)	0.4 [MDA=0.12] (8.4E+03)

## Cilantro

source: various local organic farms

Purchase Date	Food Mass	I131	I132	Cs134	Cs137
	kg	Bq/kg (kg**)	Bq/kg (kg**)	Bq/kg (kg**)	Bq/kg
04/04/2011	0.50	less than MDA [MDA=0.34]	less than MDA [MDA=0.41]	less than MDA [MDA=0.34]	less than MDA [MDA=0.34]

## Kale

source: various local organic farms

Purchase Date	Food Mass	I131	I132	Cs134	Cs137
	kg	Bq/kg (kg**)	Bq/kg (kg**)	Bq/kg (kg**)	Bq/kg
04/06/2011	0.34	less than MDA [MDA=0.64]	less than MDA [MDA=0.81]	less than MDA [MDA=0.87]	0.65±0.05 [MDA=0.15] (5.7E+03)
04/07/2011	0.38	0.93±0.13 [MDA=0.47] (1.2E+03)	less than MDA [MDA=0.64]	1.14±0.20 [MDA=0.80] (2.3E+03)	0.59±0.05 [MDA=0.15] (6.2E+03)
04/20/2011	0.50	less than MDA [MDA=0.28]	less than MDA [MDA=0.44]	less than MDA [MDA=0.30]	less than MDA [MDA=0.30]
04/20/2011	0.34	less than MDA [MDA=0.35]	less than MDA [MDA=0.64]	less than MDA [MDA=0.47]	less than MDA [MDA=0.47]
04/28/2011	0.60	less than MDA [MDA=0.23]	less than MDA [MDA=0.55]	less than MDA [MDA=0.26]	less than MDA [MDA=0.26]

04/28/2011	0.41	less than MDA [MDA=0.19]	less than MDA [MDA=0.39]	0.39±0.07 [MDA=0.26] (6.6e+03)	0.52: [MDA (7.1e
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## Arugula

source: various local organic farms

Purchase Date	Food Mass	I131	I132	Cs134	Cs137
	kg	Bq/kg (kg <sup>**</sup> )	Bq/kg (kg <sup>**</sup> )	Bq/kg (kg <sup>**</sup> )	Bq/kg
04/07/2011	0.38	0.41±0.07 [MDA=0.24] (2.7E+03)	less than MDA [MDA=1.11]	less than MDA [MDA=0.35]	0.66: [MDA (5.6E
04/20/2011	0.36	less than MDA [MDA=0.32]	less than MDA [MDA=0.90]	less than MDA [MDA=0.49]	less t [MDA
04/28/2011	0.313	less than MDA [MDA=0.31]	less than MDA [MDA=0.57]	less than MDA [MDA=0.37]	less t [MDA

\*\* The number in parentheses is the number of kilograms of the item that on equal the radiation exposure of a single round trip flight from San Francisco to see how we calculate these numbers, please visit [our explanation of the eq](#)

Note: "MDA" is the estimated minimum detectable activity for a given isotope

UC Berkeley • College of Engineering • American Nuclear Society, UCB, Student Section

4155 Etcheverry Hall, MC 1730, Berkeley, CA 94720 • FAX 510-643-9685

• Main Office: Maria Drezgich, 510-642-4077

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