From: Joyce Donohue
To: Donohue, Joyce
Subject: Fw: Drinking Water Intake estimates.
Date: Thursday, May 02, 2013 2:09:50 PM

Joyce M. Donohue, Ph.D.
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----- Forwarded by Joyce Donohue/DC/USEPA/US on 05/02/2013 01:49 PM -----

From: Joyce Donohue/DC/USEPA/US
To: Michael Doherty/DC/USEPA/US@EPA
Cc: Elizabeth Doyle/DC/USEPA/US@EPA, Kelly Sherman/DC/USEPA/US@EPA, Wynne Miller/DC/USEPA/US@EPA
Date: 11/23/2010 10:56 AM
Subject: Re: Drinking Water Intake estimates.

There is no double counting. The water added at the home is included with the drinking Water intake (87 mg/L F concentration). The beverages in the study that provided our beverages values that were reconstituted at a home were made up using fluoride free (distilled deionized water). Therefore, the fluoride represented came from the commercial water in the products that were not reconstituted by the user plus any fluoride in the reconstituted products before the water was added. Fluoride in milk was not included with beverages in the study we used or in our analysis. Milk was in the food category.

For the 0.5 to 1-year group, there is no beverage because all the water used to reconstitute the powdered formula was in the water grouping and the fluoride in the powdered formula is in the food grouping. Real fruit juices are not considered to be beverages in the market basket surveys, they are considered to be fruits based on the information I received from FDA on the composition of the market baskets.

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Michael Doherty---11/23/2010 10:23:04 AM---The numbers I provided are per-capita direct only. I wonder why some of your direct+indirect number

From: Michael Doherty/DC/USEPA/US

To: Joyce Donohue/DC/USEPA/US@EPA

Cc: Elizabeth Doyle/DC/USEPA/US@EPA, Wynne Miller/DC/USEPA/US@EPA, Kelly Sherman/DC/USEPA/US@EPA

Date: 11/23/2010 10:23 AM

Subject: Re: Drinking Water Intake estimates.

The numbers I provided are per-capita direct only. I wonder why some of your direct+indirect numbers are greater than the direct only values. Isn't it double counting to use direct and indirect for drinking water and to then include a separate input for beverages?

I'll do a little more digging and maybe we can get this resolved before 3:00...

Mike

Joyce Donohue---11/23/2010 09:15:47 AM---We did use consumers only for the final estimates. In the water chapter we also used the per capita

From: Joyce Donohue/DC/USEPA/US

To: Michael Doherty/DC/USEPA/US@EPA

Cc: Elizabeth Doyle/DC/USEPA/US@EPA, Wynne Miller/DC/USEPA/US@EPA

Date: 11/23/2010 09:15 AM

Subject: Drinking Water Intake estimates.

We did use consumers only for the final estimates. In the water chapter we also used the per capita numbers. However, the numbers you have are not in agreement with what we have for the per capita (direct and indirect) values either. The data came from our Office of Water 2004 publication. I added our values in red to your Table below.

In cases where the EPA Child-specific Exposure Factors handbook ages line up with those we used, our numbers (per capita and consumers only) are an exact match. The only age grouping for which that is the case, is the 0.5 to 1 year group but that is where our values differ the most from yours.

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Michael Doherty---11/22/2010 03:49:50 PM---Thanks. That would likely account for the difference in intake estimates. OPP's numbers are per-ca

From: Michael Doherty/DC/USEPA/US

To: Joyce Donohue/DC/USEPA/US@EPA

Date: 11/22/2010 03:49 PM

Subject: Re: Fw: Answering Sussman's Questions on Fluoride

Thanks. That would likely account for the difference in intake estimates. OPP's numbers are per-capita.

I pulled per capita and user only water consumption values out of DEEM. Thought you might like them for comparison.

Mike

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Age range, years	Mean, per-capita (L/day)	Mean, user only (L/day)	90th %ile, per capita (L/day)	90th %ile, user only (L/day)
0.5 - 1	0.173 0.360	0.271 0.467*	0.475 0.885	0.532 0.971*
1 - 2	0.242	0.327	0.5360.	0.711
2 - 4	0.322	0.403	0.708	0.734
1 - 4	0.292 0.311	0.377 0.349	0.708 0.694	0.711 0.723
4 - 7	0.383 0. 406	0.465 0.442	0.943 0.917	0.947 0.943

Joyce Donohue---11/22/2010 02:54:20 PM---I know they are consumers only (direct and indirect) for

the infants. I have to wait until I get ba

From: Joyce Donohue/DC/USEPA/US

To: Michael Doherty/DC/USEPA/US@EPA

Date: 11/22/2010 02:54 PM

Subject: Re: Fw: Answering Sussman's Questions on Fluoride

I know they are consumers only (direct and indirect) for the infants. I have to wait until I get back in the office to check for the other ages. I am working at home today. We have been moving toward consumer only for all age groups. I thought we did this before that shift.

Michael Doherty---11/22/2010 02:19:10 PM---Thanks Joyce, Are your water intake numbers per-capita or for consumers only?

From: Michael Doherty/DC/USEPA/US

To: Joyce Donohue/DC/USEPA/US@EPA

Cc: Christina Swartz/DC/USEPA/US@EPA, Elizabeth Doyle/DC/USEPA/US@EPA, Kelly Sherman/DC/USEPA/US@EPA, William Jordan/DC/USEPA/US@EPA, Wynne Miller/DC/USEPA/US@EPA

Date: 11/22/2010 02:19 PM

Subject: Re: Fw: Answering Sussman's Questions on Fluoride

Thanks Joyce,

Are your water intake numbers per-capita or for consumers only?

Mike

Joyce Donohue---11/22/2010 01:55:26 PM---I put our numbers in red next to yours in your second Table. It is pretty clear that there is a con

From: Joyce Donohue/DC/USEPA/US

To: Michael Doherty/DC/USEPA/US@EPA

Cc: Christina Swartz/DC/USEPA/US@EPA, Cynthia Dougherty/DC/USEPA/US@EPA, Elizabeth Doyle/DC/USEPA/US@EPA, Eric Burneson/DC/USEPA/US@EPA, Kelly Sherman/DC/USEPA/US@EPA, William Jordan/DC/USEPA/US@EPA, Wynne Miller/DC/USEPA/US@EPA

Date: 11/22/2010 01:55 PM

Subject: Re: Fw: Answering Sussman's Questions on Fluoride

I put our numbers in red next to yours in your second Table. It is pretty clear that there is a considerable difference in the mean water intake as well as difference in food and beverage totals

Michael Doherty---11/22/2010 01:05:14 PM---All, The numbers I sent out last week were pulled together from our risk assessment document and a f

From: Michael Doherty/DC/USEPA/US

To: Joyce Donohue/DC/USEPA/US@EPA

Cc: Christina Swartz/DC/USEPA/US@EPA, Cynthia Dougherty/DC/USEPA/US@EPA, Elizabeth Doyle/DC/USEPA/US@EPA, Eric Burneson/DC/USEPA/US@EPA, Kelly Sherman/DC/USEPA/US@EPA, William Jordan/DC/USEPA/US@EPA, Wynne Miller/DC/USEPA/US@EPA

Date: 11/22/2010 01:05 PM

Subject: Re: Fw: Answering Sussman's Questions on Fluoride

All,

The numbers I sent out last week were pulled together from our risk assessment document and a few older dietary runs. In order to confirm the values I was getting, I re-did the numbers today using new dietary modeling runs. The 1-4 age group has been divided into 1-2 and 2-4 in order to be able to make aggregate estimates that leave out F from toothpaste for those under 2 (per FDA recommendations). The 1-4 group is also portrayed intact. Below are my assumptions and what I came up with.

Hopefully this helps clarify where the OPP estimates are coming from.

Mike

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Assumptions:
- Average consumption of foods, beverages, and drinking water
- Indirect water (beverages) = 0.87 mg F/L

- Direct water (drinking water) = 0.00 mg F/L
- SF and soil are the only other contributors (no contribution from toothpaste)

Exposure estimates and fluoride concentration determinations

Age Range (years)	Food + Beverages (mg/kg/day)	SF (mg/kg/day)	Soil (mg/kg/day)	Total (mg/kg/day)	RfD - Total (mg/kg/day)	Body Weight (kg)*	Avg. Drinking Water Consumption (L/day)*	Maximum F Conc. in Drinking Water (mg/L)
0.5 - 1	0.03996	0.0027	0.0018	0.04446	0.036	10.4	0.173	2.1
1-2	0.03132	0.003**	0.0027**	0.03702	0.043	12.7	0.242	2.3
2-4	0.02743	0.003**	0.0027**	0.03313	0.047	15.6	0.322	2.3
1-4	0.02868	0.003	0.0027	0.03438	0.046	14.5	0.292	2.3
4.7	0.02215	0.0029	0.0019	0.02695	0.051	21.0	0.383	2.9

* Averages taken from CSFII via DEEM-FCID.
** Assumed to be the same as the 1-4 year old group

Here are the same numbers accounting for body weight at the front end (i.e., exposure in mg/day) for easier comparison w/ OW estimates.

Age Range (years)	Food + Beverages (mg/day)	SF (mg/day)	Soil (mg/day)	Total (mg/day)	RfD - Total (mg/day)	Body Weight (kg)*	Avg. Drinking Water Consumption (L/day)*	Maximum F Conc. in Drinking Water (mg/L)
0.5 - 1	0.416 0.25	0.028	0.019 0.02	0.462	0.370	10.4 9	0.173 0.467	2.1
1-2	0.398	0.038**	0.034**	0.470	0.546	12.7	0.242	2.3
2-4	0.428	0.047**	0.042**	0.517	0.731	15.6	0.322	2.3
1-4	0.416 0.52	0.044	0.039 0.04	0.499	0.661	14.5 14	0.292 0.349	2.3
4.7	0.465 0.89	0.061	0.040 0.04	0.566	1.114	21.0 21	0.383 0.442< /div>	2.9

* Averages taken from CSFII via DEEM-FCID.
** Assumed to be the same as the 1-4 year old group on a mg/kg/day basis

Joyce Donohue---11/19/2010 04:25:19 PM---Is the water in your beverage category fluoride free? In the three age groups represented in our da

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To: Michael Doherty/DC/USEPA/US@EPA

Cc: Christina Swartz/DC/USEPA/US@EPA, Cynthia Dougherty/DC/USEPA/US@EPA, Elizabeth Doyle/DC/USEPA/US@EPA, Eric Burneson/DC/USEPA/US@EPA, Kelly Sherman/DC/USEPA/US@EPA, William Jordan/DC/USEPA/US@EPA, Wynne Miller/DC/USEPA/US@EPA

11/19/2010 04:25 PM

Date:

Subject: Re: Fw: Answering Sussman's Questions on Fluoride

Is the water in your beverage category fluoride free? In the three age groups represented in our data all of the water used to prepare the beverages was deionized distilled. I realize that would not explain why your values are always lower than those in the studies we selected. Our beverage values did come from a study conducted in the South during summer months.

In my opinion, 2 mg/L would not pass the logic test unless the dietary contribution of fluoride has not changed at all since the 1930's when it was about 13% of the total.

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Michael Doherty---11/19/2010 04:06:09 PM---All, The mathematics being used by our two offices match up. The difference in the "allowable" leve

From: Michael Doherty/DC/USEPA/US

To: Elizabeth Doyle/DC/USEPA/US@EPA

Cc: Cynthia Dougherty/DC/USEPA/US@EPA, Eric Burneson/DC/USEPA/US@EPA, Joyce Donohue/DC/USEPA/US@EPA, Kelly Sherman/DC/USEPA/US@EPA, William Jordan/DC/USEPA/US@EPA, Wynne Miller/DC/USEPA/US@EPA, Christina Swartz/DC/USEPA/US@EPA

Date: 11/19/2010 04:06 PM

Subject: Re: Fw: Answering Sussman's Questions on Fluoride

All,

The mathematics being used by our two offices match up. The difference in the "allowable" level in water is due, primarily, to differences in the numbers being used for the contribution from foods and beverages.

For foods and beverages, we have the following differences (estimates in mg/day)

Office	0.5 - 1 year	1 - 4 year	4 - 7 year
OW	0.25	0.52	0.89
OPP	0.42	0.42	0.46

There are also a difference in body weight for the youngest group (OW = 9 kg, OPP = 11 kg) and a slight difference for the 1-4 year olds (OW = 14 kg, OPP = 14.6 kg).

In terms of the precision of the numbers available to us, I don't think there's any difference between 1.94 and 1.5 mg F/L that we should hang our hats on. I still maintain that given the different way that our two offices are deriving their estimates, the values are in remarkable agreement. There are strengths and weaknesses with both approaches, and I don't think that one is better than the other. My recommendation would be that for this type of determination, we round to the nearest whole number, in this case 2 mg/L.

Mike

Elizabeth Doyle---11/19/2010 01:42:55 PM---Kelly, The concentrations by age for the mean intake are exactly that. We believe that your estimat

From: Elizabeth Doyle/DC/USEPA/US

To: Kelly Sherman/DC/USEPA/US@EPA

Cc: Cynthia Dougherty/DC/USEPA/US@EPA, Eric Burneson/DC/USEPA/US@EPA, Joyce Donohue/DC/USEPA/US@EPA, Michael Doherty/DC/USEPA/US@EPA, William Jordan/DC/USEPA/US@EPA, Wynne Miller/DC/USEPA/US@EPA

Date: 11/19/2010 01:42 PM

Subject: Re: Fw: Answering Sussman's Questions on Fluoride

Kelly,

The concentrations by age for the mean intake are exactly that. We believe that your estimate is too high in all cases.

Kelly Sherman---11/19/2010 12:55:49 PM---Thanks, Joyce. Your concentration calcuations are helpful, but they don't directly answer Sussman's

From: Kelly Sherman/DC/USEPA/US

To: Joyce Donohue/DC/USEPA/US@EPA

Cynthia Dougherty/DC/USEPA/US@EPA, Elizabeth Doyle/DC/USEPA/US@EPA, Eric

Cc: Burneson/DC/USEPA/US@EPA, William Jordan/DC/USEPA/US@EPA, Wynne Miller/DC/USEPA/US@EPA, Michael Doherty/DC/USEPA/US@EPA

Date: 11/19/2010 12:55 PM

Subject: Re: Fw: Answering Sussman's Questions on Fluoride

Thanks, Joyce. Your concentration calcuations are helpful, but they don't directly answer Sussman's question, which is -- what changes have to happen to the other sources of fluoride exposure in order to keep the sulfuryl fluoride tolerances.

Specifically, he wants to know what the water concentration would have to be to keep the aggregate exposure estimate for children younger than 4 years below the RfD of 0.08 if we assume (1) no fluoride exposure from toothpaste; (2) mean water intake; and (3) SF is a source of exposure.

Our calculations show that the answer to that question is 1.97 mg F/L. Do you get the same answer to that question?

Re the population estimates - thanks for the information. We need to caucus here to figure out exactly what to relay back to Sussman.

Thanks!

Kelly Sherman
Office of Pesticide Programs
U.S. Environmental Protection Agency
(703) 305-8401

Joyce Donohue---11/19/2010 11:47:37 AM---Dear Kelly: Attached are our calculations for the three youngest age levels in our analysis. Our re

From: Joyce Donohue/DC/USEPA/US

To: Kelly Sherman/DC/USEPA/US@EPA

Cc: Cynthia Dougherty/DC/USEPA/US@EPA, Elizabeth Doyle/DC/USEPA/US@EPA, Eric Burneson/DC/USEPA/US@EPA, William Jordan/DC/USEPA/US@EPA, Wynne Miller/DC/USEPA/US@EPA

Date: 11/19/2010 11:47 AM

Subject: Re: Fw: Answering Sussman's Questions on Fluoride

Dear Kelly:

Attached are our calculations for the three youngest age levels in our analysis. Our results differ from those in your e-mail. We did the calculations using our 1 tooth brushing per day. Using two brushings would decrease the water concentrations left for drinking water. We also provided the concentrations at the 90th percentile drinking water intakes which are used by the Office of Water. Please let me know if you have any questions?

[attachment "Concentration and population estimates_wfm.doc" deleted by Elizabeth Doyle/DC/USEPA/US]

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