Project no: 022936
Project acronym: Beneris
Project title: Benefit-risk assessment for food: an iterative value-of-information approach

Instrument: STP-Specific Targeted Project

D29 and D30:

Contaminant intakes among Finnish adults, by sex and age group

Due date of deliverable:	**1 January, 2008**
Actual submission date:	**24 April, 2008**
Dissemination level:	**PU**
Start date of project:	**April, 1st 2006**
Duration:	**3,5 years**

Organisation name of the lead contractor for this deliverable: **KTL**

D29 and D30:
contaminant intake among Finnish adults by sex and age group

Subjects and methods

Data on food consumption was obtained from FINDIET survey which was carried out as part of the FINRISK 2002 Study which monitors cardiovascular risk factors. A random sample of 12 000 persons 25 to 64 years of age and stratified for sex and 10-year age groups was taken from the population register. The participation rate was 65%, i.e. 8799 subjects. The study was carried out in five areas: 1) Helsinki area, 2) cities of Turku and Loimaa and some rural communities in southwestern Finland, and in the provinces of 3) North Carelia, 4) North Savo, and 5) Oulu. Of the invited subjects 32% were randomly selected also to the dietary survey. The final sample of the dietary survey was 2007 subjects. The participants were interviewed using the 48-h recall. The dietary intake data consisted of all days of the week except Fridays. The National Food Composition Database Fineli® (www.fineli.fi) was used to calculate the fish consumption.

The daily intakes were estimated using probabilistic non-parametric simulation (400 simulations per round) with assumption that there is intraindividual variation in food contaminant concentration between days (no brand loyalty –assumption). A software (C-SIDE®) was used to obtain usual contaminant intake based on simulation results. The software gives the long-run average of daily intakes (usual daily intake) by taking into accouint day-to-day –correlation and nuisance effects, such as day-of-week and interview sequence. It allows exceptions from normality through grafted polynomial transformations and recognizes the measurement error associated with one-day dietary intake.

The daily intake was calculated per kilogram bodyweight. Measured bodyweight was used.

Results

The 95th percentiles of daily intake per bodyweight for both PCB compounds and methylmercury were highest among 54-65 year old men (Tables 1. and 3.), whereas for PCDD/F compounds the 95th percentiles of daily intake per bodyweight was highest among 45-54 year old men.

Table 1. 95th percentile of intake of PCB-coumpounds/ per kg body weigth by sex and age group in Finland

	men 25-34	women 25-34	men 35-44	women 35-44	men 45-54	women 45-54	men 55-64	women 55-64
PCB81	1,253083	1,245113	1,531128	1,271404	1,84792	1,138972	1,989875	1,274085
PCB77	38,93486	18,70672	22,7584	13,6612	33,50649	21,71494	38,61905	21,20777
PCB126	15,00534	8,683935	10,81576	6,661855	14,14434	9,595113	18,25805	9,092055
PCB169	2,71792	2,976441	5,171554	2,838697	6,881704	3,591378	6,127995	3,227519
PCB18	0,258642	0,276391	0,319108	0,278922	0,331669	0,288454	0,367223	0,276905
PCB28_31	0,968195	1,041303	1,190476	1,008897	1,196266	1,08183	1,333283	0,982882
PCB33	0,244238	0,256449	0,283233	0,259534	0,261361	0,245431	0,268446	0,226331
PCB51	0,024377	0,022202	0,025984	0,022649	0,027775	0,021206	0,028648	0,023391
PCB52	1,380459	0,741173	1,052003	0,68285	1,188589	0,846649	1,617	0,896338
PCB49	0,556429	0,289731	0,487556	0,28608	0,477997	0,326138	0,639291	0,34887
PCB47	0,247667	0,210632	0,376461	0,226837	0,31516	0,217283	0,337887	0,226719
PCB74	0,455311	0,344378	0,662777	0,328574	0,575922	0,380764	0,615827	0,340015
PCB66	0,950747	0,434975	0,656564	0,364278	0,725331	0,499739	0,908496	0,472163
PCB60	0,176502	0,10087	0,186527	0,087437	0,170689	0,116882	0,20005	0,106374
PCB101	4,899003	1,938105	2,377644	1,226376	4,055559	2,359441	4,06599	2,194882
PCB99	2,157208	0,92682	1,247326	0,755887	1,706436	1,078388	1,959348	1,02998
PCB110	3,125985	1,315837	1,536764	0,794569	3,090521	1,669518	2,896481	1,528682
PCB123	0,764112	0,161021	0,194471	0,115889	0,341051	0,195562	0,375268	0,199499
PCB118	3,610426	1,91096	2,490777	1,435664	3,288647	2,102957	3,76995	1,928346
PCB114	0,05276	0,033223	0,060288	0,027965	0,059197	0,039872	0,069487	0,035305
PCB122	0,009598	0,00717	0,011666	0,009051	0,014232	0,007964	0,013046	0,007324
PCB105	1,363972	0,567787	0,704298	0,400268	0,986556	0,639764	1,190627	0,618258
PCB153	10,12862	4,495213	5,536416	3,386892	8,799774	5,286591	10,36524	5,327243
PCB141	0,888857	0,426591	0,553792	0,313965	0,800561	0,518228	1,017058	0,484301
PCB138	7,887043	3,500977	4,517393	2,625263	6,673358	4,048521	7,767118	3,946366
PCB167	0,253805	0,107144	0,126949	0,079775	0,202355	0,124866	0,254017	0,126914
PCB128	1,320972	0,470133	0,608323	0,344321	0,928867	0,555619	1,079987	0,546078
PCB156	0,454865	0,269889	0,365343	0,190318	0,484003	0,306008	0,604687	0,29294
PCB157	0,113462	0,050973	0,068467	0,038369	0,097711	0,065651	0,122059	0,061739
PCB187	2,625719	0,838762	0,894922	0,542115	1,922669	0,97498	1,809739	1,038764
PCB183	0,770263	0,382997	0,502912	0,295752	0,826168	0,449115	0,919639	0,470208
PCB180	2,56509	1,619539	1,93905	1,095677	3,087118	1,715243	3,514336	1,715454
PCB170	1,13707	0,720474	0,867338	0,518581	1,416479	0,772965	1,604642	0,788596
PCB189	0,042277	0,027354	0,053959	0,027382	0,061929	0,038967	0,071634	0,033026
PCB194	0,270421	0,13469	0,187033	0,10854	0,307203	0,171706	0,349847	0,170418
PCB206	0,042931	0,037856	0,073291	0,045811	0,08562	0,047661	0,091506	0,043026
PCB209	0,031157	0,027976	0,045629	0,033372	0,066447	0,032736	0,055924	0,029478
Sum	44,9797	24,36281	33,28797	22,10075	44,95288	30,87218	61,02055	30,21353
WHOPCB_TEQ	2,470346	1,419188	1,691078	1,02702	2,274411	1,494612	2,847343	1,41594
indPCBs	22,50125	13,13642	21,2386	10,78576	24,2401	16,01383	30,7193	15,19193

Table 2. 95th percentile of intake of PCDD/F-coumpounds/ per kg body weight by sex and age group in Finland

	men 25-34	women 25-34	men 35-44	women 35-44	men 45-54	women 45-54	men 55-64	women 55-64
2378-TCDF	3,126315	1,014658	1,401185	0,604446	1,69098	0,928526	1,740353	1,017602
2378-TCDD	0,088398	0,110595	0,154451	0,09724	0,183947	0,132636	0,212248	0,131787
12378-PF	0,3443	0,241126	0,480617	0,191065	0,466614	0,235305	0,412476	0,25407
23478-PF	0,708725	1,253822	2,783779	0,745511	4,689699	2,453551	3,603298	2,484326
12378-PD	0,146255	0,212178	0,406409	0,189368	0,52616	0,294571	0,457125	0,302065
123478-HF	0,070564	0,085069	0,096405	0,073548	0,13991	0,094554	0,136186	0,096897
123678-HF	0,078058	0,094258	0,1286	0,082453	0,209227	0,120327	0,172726	0,134546
234678-HF	0,086998	0,100244	0,12375	0,091494	0,177469	0,115584	0,168323	0,128991
123789-HF	0,107495	0,103377	0,11196	0,095724	0,112992	0,09313	0,113125	0,086741
123478-HD	0,091235	0,092558	0,09908	0,085783	0,112391	0,085725	0,104977	0,079613
123678-HD	0,192875	0,243553	0,328764	0,226591	0,474308	0,296078	0,437544	0,312148
123789-HD	0,09476	0,094364	0,104734	0,089923	0,113734	0,086001	0,110045	0,082723
1234678-F	0,304218	0,386721	0,362988	0,329751	0,302305	0,318756	0,460108	0,296384
1234789-F	0,16243	0,154857	0,171714	0,145273	0,16897	0,136218	0,162316	0,125313
1234678-D	0,47936	0,547651	0,574291	0,507466	0,520223	0,484404	0,54713	0,458561
OCDF	0,49019	0,481548	0,521391	0,452155	0,521634	0,414441	0,496175	0,385677
OCDD	1,7003	1,611206	2,046667	1,612682	1,881153	1,661704	2,006842	1,342431
Sum	5,34825	6,207789	7,821103	5,67609	9,198521	7,703784	10,21426	6,744461
$WHO_{PCDD/F}$-TEQ	1,01642	1,330314	1,349789	1,033699	3,42394	1,668579	2,644028	2,033328

Table 3. 95th percentile of intake of methylmercury/ per kg body weight by sex and age group in Finland.

sex	age	
male	25-34	0,0414
female	25-34	0,034853
male	35-44	0,133747
female	35-44	0,056433
male	45-54	0,074798
female	45-54	0,051087
male	55-64	0,159622
female	55-64	0,053362