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## **D32 Critical dietary patterns in Finland**

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**National Public Health Institute – KTL**

**Aim**

The aim was to find out whether there are associations between consumption of those foods and those nutrients and contaminants that are crucial for benefit/risk assessment of fish.

**Methods**

The food consumption and nutrient intake by PCDD quartiles, by vitamin D quartiles, and by n-3 fatty acid quartiles were calculated.

**Results**

The food consumption and nutrient intakes were higher in the highest PCDD/f- intake quartiles than lowest intake quartiles, with the exception of alcohol (Tables 1.-9.). The same was true for vitamin D intake quartiles and n-3 fatty acid intake quartiles.

**Conclusions**

Dietary factors and contaminant intakes related to benefit/risk-analysis of fish seems to be strongly directly associated with each other.

Table 1. Food intakes by WHOPCDD/F-TEQ quartiles (female).

FEMALE									
Group	Main food group	Mean	SD	0.05	0.25	0.5	0.75	0.95	
0	Potatoes and other tubers	66.9	54.4	0	19.74	61.86	102.6	175.4	
	Vegetables	110.6	83.91	7.5	49.02	95.6	149.2	270	
	Legumes	4.418	15.41	0	0	0	0	25.01	
	Fruits	273	217.7	8.625	122.5	229.4	371.8	704.6	
	Dairy products	311.2	210.8	29.54	145.4	290.8	433.4	748.1	
	Cereals and cereal products	135	72.25	39.59	81.5	127	174	272.4	
	Meat and meat products	71.09	49.74	0	34.69	65	100.6	164.9	
	Fish and shellfish	6.009	15.52	0	0	0	0	45	
	Eggs and egg products	7.377	10.17	0	1.109	4.227	9.011	28.73	
	Fat	23.68	17.03	4.705	13.04	20.33	30.98	50.5	
	Sugar and confectionary	38.89	41.22	0.98	9	23.9	54.28	111.3	
	Cakes	33.8	35.88	0	0	27.5	50	110	
	Non alcoholic beverages	1563	700.5	571.3	1068	1471	1989	2902	
	Alcoholic beverages	48.38	158.7	0	0	0	0	330	
	Condiments and sauces	11.13	30.92	0	0	0	8	61.2	
	Soups, bouillon	18.39	56.81	0	0	0	0	150	
	Miscellaneous	5.235	24.12	0	0	0	0.206	22	
	1	Potatoes and other tubers	74.08	60.15	0	22.67	70.22	112.6	184.9
		Vegetables	132.7	84.54	17.25	71.45	119.1	186.1	293.1
Legumes		4.996	16.48	0	0	0	0	28	
Fruits		294.1	269.2	8	105.1	235.1	408	761.5	
Dairy products		373.5	231.8	55.93	198.1	328.5	531.9	797.7	
Cereals and cereal products		156.3	84.59	47.1	96	142	192.2	316.5	
Meat and meat products		93.28	57.36	0	53.11	85.68	125.6	210.2	
Fish and shellfish		9.458	19.98	0	0	0	10.3	53.52	
Eggs and egg products		12.01	13.77	0	2.85	7.449	15.11	38.61	
Fat		30.84	17.53	7.24	18.61	28.73	40.05	65.43	
Sugar and confectionary		39.43	37.81	1.5	13.51	28.82	52.43	116.8	
Cakes		37.7	39.36	0	0	29.25	57	111.3	
Non alcoholic beverages		1543	605.2	717.9	1118	1496	1897	2622	
Alcoholic beverages		66.36	241.3	0	0	0	0	320	
Condiments and sauces		13.26	32.86	0	0	0.083	10	69.43	
Soups, bouillon		14.47	47.73	0	0	0	0	150	
Miscellaneous		7.167	43.91	0	0	0	0.15	15	
2		Potatoes and other tubers	72.21	59.13	0	25.5	64.03	103	197.7
		Vegetables	140.9	96.08	20.5	70	124.6	201.2	314.8
	Legumes	5.563	14.73	0	0	0	0	33.9	
	Fruits	303.8	237.9	15.15	132.1	259.3	430.3	728.6	
	Dairy products	420.7	292.3	70.86	207.2	362.2	569	1005	
	Cereals and cereal products	178.2	88.35	56	117.1	165.3	227.4	332.5	
Meat and meat products	100.3	63.9	17.03	54.55	89.99	131.5	220.6		

	Fish and shellfish	17.48	27.04	0	0	0	29.85	66
	Eggs and egg products	17.83	21.18	0	4.066	9.437	24.82	64.88
	Fat	32.79	19.13	7.57	17.66	30.74	43.14	68.2
	Sugar and confectionary	38.1	31.55	2	14.81	28.3	54.39	105.1
	Cakes	40.55	42.91	0	6.5	27.25	60	125
	Non alcoholic beverages	1568	700.4	663.2	1086	1424	1936	2787
	Alcoholic beverages	59.05	140.1	0	0	0	7.5	332.5
	Condiments and sauces	11.95	33.22	0	0	0.3	9	50.12
	Soups, bouillon	18.55	64.91	0	0	0	0	150
	Miscellaneous	1.49	7.744	0	0	0	0	8
3	Potatoes and other tubers	91.67	65.52	0	45.55	82.57	133.5	217.9
	Vegetables	148.8	95.38	22.8	82.51	128.1	195.8	337.8
	Legumes	5.148	12.23	0	0	0	0	33.6
	Fruits	294.7	215.6	28	138.5	256.2	404	743.6
	Dairy products	436.1	257.4	96.34	254.4	387	613.2	886
	Cereals and cereal products	179	100.6	51.34	118	155.3	217	396.7
	Meat and meat products	96.29	71.52	0	43.85	90.44	136.1	236.9
	Fish and shellfish	53.99	52.35	0	15	42.67	82	157.8
	Eggs and egg products	21.11	24.58	0	5.016	12.41	29	69.53
	Fat	39.38	22.93	9.276	23.21	35.64	51.24	80.32
	Sugar and confectionary	46.49	50.71	3.375	16.38	32.75	57.75	135
	Cakes	46.68	51.75	0	6	35	65.5	155
	Non alcoholic beverages	1488	640.4	531.4	1064	1385	1833	2755
	Alcoholic beverages	69.11	167.9	0	0	0	30	390
	Condiments and sauces	11.28	25.13	0	0	0.583	9	71
	Soups, bouillon	14.95	47.48	0	0	0	0	150
	Miscellaneous	2.592	11.57	0	0	0	0.079	10

Table 2. Food intakes by WHOPCDD/F-TEQ quartiles (male).

MALE Group	Main food group	Mean	SD	0.05	0.25	0.5	0.75	0.95	
0	Potatoes and other tubers	101.4	91.03	0	26.08	86.9	153	272.5	
	Vegetables	96.92	86.14	0	37.71	78.21	137	286.5	
	Legumes	3.94	10.67	0	0	0	0	28	
	Fruits	244.5	274.7	0	47.63	170	337.6	748.9	
	Dairy products	389.7	333.7	20.19	143.6	338.7	495.1	1000	
	Cereals and cereal products	183.6	104.6	44.5	115.6	169.8	227.3	372.7	
	Meat and meat products	146.6	101	24	86.1	130.8	176.3	341.7	
	Fish and shellfish	6.866	20.56	0	0	0	0	44.63	
	Eggs and egg products	8.76	11.86	0	1.307	4.797	11.89	32	
	Fat	36.44	22.23	7.32	20.68	30.69	49.45	76.67	
	Sugar and confectionary	34.83	36.82	0	9.866	23.9	48.39	110	
	Cakes	39.46	44.74	0	0	30.5	60	125	
	Non alcoholic beverages	1450	662.4	570	952	1370	1826	2805	
	Alcoholic beverages	233.1	566.6	0	0	0	172.5	1200	
	Condiments and sauces	15.84	37.06	0	0	2.5	17	75.2	
	Soups, bouillon	12.1	50.37	0	0	0	0	100	
	Miscellaneous	2.154	12.63	0	0	0	0	5	
	1	Potatoes and other tubers	115.9	81.44	0	52.68	109	173.7	252.9
		Vegetables	129.3	104.8	8.67	54.27	104.3	176.6	340
		Legumes	6.147	17.64	0	0	0	0	33.6
Fruits		278.8	269.2	0	66	223.6	385.2	764	
Dairy products		481.3	325.1	84.5	225.8	396.3	696.6	1128	
Cereals and cereal products		241.4	110.7	97.55	165	226.3	297	451.7	
Meat and meat products		148.3	93.6	27.24	83	133.8	184.3	325.4	
Fish and shellfish		16.74	37.72	0	0	0	21.75	99.81	
Eggs and egg products		16.17	19.62	0	2.046	8.837	24.39	62.4	
Fat		47.25	22.76	14.79	30.35	45.65	60.72	83.29	
Sugar and confectionary		41.05	38.1	2.13	13.43	30	56.94	110.2	
Cakes		40.09	50.96	0	0	22.5	62.5	150	
Non alcoholic beverages		1503	737.1	552.4	1017	1355	1850	2860	
Alcoholic beverages		254.6	591.5	0	0	0	165	1445	
Condiments and sauces		15.69	31.9	0	0	3.5	20.53	54.3	
Soups, bouillon		22.41	79.13	0	0	0	0	200	
Miscellaneous		2.694	26.92	0	0	0	0.041	5	
2		Potatoes and other tubers	119.9	87.41	0	53.55	108.8	174.2	278.3
		Vegetables	120.8	88.13	7.5	52.05	109.8	171.9	294.5
		Legumes	5.995	16.77	0	0	0	0	40
	Fruits	299.7	291.9	0	82.5	212	458.8	838.4	
	Dairy products	524.9	354.3	80	241.7	473.4	708.7	1253	
	Cereals and cereal products	260.2	129.6	90	166.2	242	317.2	512.5	
	Meat and meat products	168.5	98.2	40	100.7	149.5	215.5	353.8	

	Fish and shellfish	27.36	44.73	0	0	0	44.04	115.5
	Eggs and egg products	23.85	30.02	0	3.132	12.38	31.07	84.22
	Fat	55.15	28.28	17.7	36.64	49.69	69.93	103.2
	Sugar and confectionary	42.13	41.5	2.325	15.6	30.16	55.09	132
	Cakes	44.74	58.72	0	0	25	64	169.5
	Non alcoholic beverages	1554	664.9	699	1102	1456	1864	2738
	Alcoholic beverages	222.9	742.5	0	0	0	175	990
	Condiments and sauces	16.81	34.65	0	0	1.895	15.2	93.12
	Soups, bouillon	15.59	62.74	0	0	0	0	125
	Miscellaneous	1.051	5.191	0	0	0	0	5
3	Potatoes and other tubers	128.5	93.1	0	57.67	122.6	183.1	285.6
	Vegetables	123.7	102.4	6.3	47.48	100.8	174.2	330.6
	Legumes	4.441	14.45	0	0	0	0	33.6
	Fruits	281	284.8	0	73	212.7	386.7	865.8
	Dairy products	542.5	370.7	71.39	264.3	499.5	744.1	1264
	Cereals and cereal products	244.7	131.6	70	149.5	224.8	322.5	468.6
	Meat and meat products	159.4	108.1	0	76.37	143.3	218.4	389.5
	Fish and shellfish	83.66	92.03	0	13.5	69.99	125.3	209
	Eggs and egg products	34.17	43.01	0	5.733	15.17	50.38	117.3
	Fat	59.2	36.11	15.38	34.04	52.27	76.22	120.9
	Sugar and confectionary	43.64	39.04	0.32	16.47	31.94	63.84	114
	Cakes	43.02	56.33	0	0	27.5	63.25	150
	Non alcoholic beverages	1520	689.5	645	1032	1417	1844	2765
	Alcoholic beverages	222.4	394.2	0	0	0	322.5	1200
	Condiments and sauces	14.18	30.17	0	0	0	13.48	73.28
	Soups, bouillon	8.18	51.73	0	0	0	0	15
	Miscellaneous	1.728	13.78	0	0	0	0	5

Table 3. Nutrient intakes by WHOPCDD/F-TEQ quartiles (female).

## FEMALE

	nutrient	mean	stddev	0.05	0.25	0.5	0.75	0.95
1	Energy, KJ/day	5243	1610	2937	3941	5062	6399	8035
	Total fat, g/day	40.67	16.61	19.56	28.72	37.69	49.95	71.79
	n-3 fatty acids	0.995	0.51	0.371	0.683	0.903	1.19	2.045
	DHA, mg/day	33.15	48.45	0.234	6.528	15.04	37.08	136.9
	EPA, mg/day	16.05	22.59	0.029	4.039	8.327	16.47	67.99
	Selenium, µg/day	42.92	14.18	21.06	31.2	43.12	51.84	65.2
	Folate, µg/day	202.1	84.28	84.71	142.3	192.6	241.4	353.6
	Vitamin D, µg/day	1.542	1.074	0.47	0.829	1.309	1.961	3.443
	Sodium chloride, g/day	5348	1914	2584	4052	5110	6476	8910
	WHOPCDD/F-TEQ	0.104	0.032	0.054	0.078	0.104	0.132	0.152
2	Energy, KJ/day	6360	1702	4105	5141	6200	7310	9434
	Total fat, g/day	55.11	18.11	32.63	42.82	51.66	64.03	92.14
	n-3 fatty acids	1.373	0.667	0.613	0.903	1.274	1.632	2.577
	DHA, mg/day	71.56	158.5	2.452	11.8	29.44	71.48	248
	EPA, mg/day	32.71	87.43	2.342	7.283	13.43	28.77	120.4
	Selenium, µg/day	51.16	14.01	30.94	41.15	49.84	59.09	76.79
	Folate, µg/day	232.6	93.05	126.6	169.8	217.9	270.4	385
	Vitamin D, µg/day	2.337	2.278	0.718	1.236	1.901	2.788	4.991
	Sodium chloride, g/day	6600	1875	4217	5292	6356	7769	9727
	WHOPCDD/F-TEQ	0.25	0.057	0.171	0.202	0.244	0.295	0.349
3	Energy, KJ/day	6856	1666	4304	5775	6755	7841	9843
	Total fat, g/day	62.53	19.17	30.91	50.64	61.5	74.68	92.92
	n-3 fatty acids	1.655	0.775	0.684	1.142	1.532	1.951	3.021
	DHA, mg/day	140.7	285	5.749	17.87	55.83	142.5	541.8
	EPA, mg/day	58.47	107.9	4.941	10.48	25.37	61.1	235.2
	Selenium, µg/day	58.32	15.91	36.54	47.39	56.07	67.94	87.61
	Folate, µg/day	251.8	121.4	139.2	184.9	236.6	288.1	394
	Vitamin D, µg/day	3.347	2.353	1.143	1.854	2.798	4.163	7.286
	Sodium chloride, g/day	7034	1936	4327	5571	6822	8141	10653
	WHOPCDD/F-TEQ	0.571	0.135	0.385	0.454	0.557	0.689	0.794
4	Energy, KJ/day	7681	2249	4590	6128	7573	8759	11600
	Total fat, g/day	75.56	29.19	35.69	55.05	71.71	92.11	123.7
	n-3 fatty acids	2.494	1.149	1.009	1.659	2.292	3.147	4.476
	DHA, mg/day	439.3	459.6	9.764	89.52	282	700.3	1432
	EPA, mg/day	171	168.9	6.887	40.35	113	247.3	542.1
	Selenium, µg/day	68.95	20.79	37.56	54.73	67.55	79.58	107.8
	Folate, µg/day	272.1	124.3	140.4	206.8	256.4	313.5	418.7
	Vitamin D, µg/day	7.692	5.664	1.891	4.011	5.713	9.754	19.86
	Sodium chloride, g/day	8108	2317	4482	6412	8009	9636	11947
	WHOPCDD/F-TEQ	1.43	1.104	0.844	0.984	1.213	1.508	2.43

Table 4. Nutrient intakes by WHOPCDD/F-TEQ quartiles (male).

## MALE

	nutrient	mean	stddev	0.05	0.25	0.5	0.75	0.95
1	Energy, KJ/day	7323	2414	3896	5779	7080	8656	11421
	Total fat, g/day	62.25	25.6	27.05	45.31	61.14	75.79	105.1
	n-3 fatty acids	1.502	0.853	0.592	0.876	1.327	1.905	2.928
	DHA, mg/day	58.12	133.8	2.049	13.33	29.3	65.13	153.7
	EPA, mg/day	30.38	98.48	2.306	9.026	16.25	28.3	76.69
	Selenium, µg/day	61.13	22.55	29.92	45.44	58.3	72.11	104.9
	Folate, µg/day	242.1	103.4	103.4	178.3	226.7	287.8	462
	Vitamin D, µg/day	2.182	1.447	0.617	1.237	1.869	2.824	4.881
	Sodium chloride, g/day	7661	2844	3489	5742	7503	9107	12535
	WHOPCDD/F-TEQ	0.127	0.048	0.051	0.088	0.126	0.168	0.203
2	Energy, KJ/day	8886	2141	5729	7344	8613	10281	12655
	Total fat, g/day	80.86	25.83	47.13	62.94	76.74	93.86	127
	n-3 fatty acids	2.046	0.85	0.959	1.441	1.965	2.504	3.665
	DHA, mg/day	123.8	191.8	7.825	24.76	47.98	124	589
	EPA, mg/day	53.76	80.15	5.23	12.2	22.75	53.97	241.6
	Selenium, µg/day	72.76	21.58	43.1	57.87	69.48	84.71	111.8
	Folate, µg/day	299.6	116	178.5	226.1	283.3	334.8	476.1
	Vitamin D, µg/day	3.746	2.582	1.341	2.183	3.165	4.294	7.79
	Sodium chloride, g/day	9405	2662	5623	7587	8968	11316	14147
	WHOPCDD/F-TEQ	0.337	0.079	0.223	0.268	0.328	0.4	0.469
3	Energy, KJ/day	9739	2674	6239	7981	9414	11004	15072
	Total fat, g/day	94.97	31.89	51.87	74.31	91.16	109.2	148.9
	n-3 fatty acids	2.505	1.062	1.057	1.702	2.261	3.145	4.475
	DHA, mg/day	224.2	299.1	11.12	35.17	100.6	303.8	798.3
	EPA, mg/day	98.75	136.9	6.985	18	43.86	125.3	368.3
	Selenium, µg/day	82.91	24.63	50.14	64.49	79.84	98.33	119.4
	Folate, µg/day	321.2	208.8	171.7	238.6	295	350.5	529.6
	Vitamin D, µg/day	5.555	4.126	1.546	3.05	4.618	6.928	11.82
	Sodium chloride, g/day	10400	2987	5910	8387	10151	12119	16243
	WHOPCDD/F-TEQ	0.702	0.144	0.503	0.577	0.67	0.843	0.938
4	Energy, KJ/day	10334	3144	5808	8059	9952	12218	16269
	Total fat, g/day	109	41.24	50.77	78.34	104.2	130.6	186.5
	n-3 fatty acids	3.697	1.83	1.493	2.41	3.341	4.532	7.051
	DHA, mg/day	653.1	616.9	33.2	170.9	497.8	884.4	1927
	EPA, mg/day	269.3	259.6	15.68	69.82	204.8	377.9	836
	Selenium, µg/day	97.69	32.49	51.35	76.86	94.45	115.3	148
	Folate, µg/day	322.9	118.3	167.3	242.3	298.4	379.2	568.3
	Vitamin D, µg/day	11.49	8.746	3.051	5.558	9.778	14.26	27.33
	Sodium chloride, g/day	11793	3867	6878	9213	11269	14003	18328
	WHOPCDD/F-TEQ	1.751	2.906	0.987	1.119	1.344	1.713	2.921



Table 5. Food intakes by vitamin D quartiles (female).

FEMALE									
Group	Main food group	Mean	SD	0.05	0.25	0.5	0.75	0.95	
0	Potatoes and other tubers	66.52	57.09	0	10.76	63.53	95.13	175.4	
	Vegetables	121.6	89.88	10.5	60	102.6	170.4	287.8	
	Legumes	5.582	17.68	0	0	0	0	29.9	
	Fruits	293.5	244	9	127.4	247.4	412.7	704.6	
	Dairy products	306.9	206.9	50.01	156.1	282	411.2	741.9	
	Cereals and cereal products	143.3	89.29	37.65	78.98	130.2	180	304	
	Meat and meat products	78.83	57.5	0	39.5	70.8	111.2	181.2	
	Fish and shellfish	2.3	8.995	0	0	0	0	18.9	
	Eggs and egg products	6.485	7.533	0	0.818	4.209	8.994	20.39	
	Fat	20.63	15.35	2.506	10.71	17.28	27.65	46.57	
	Sugar and confectionary	37.41	38.1	0.98	10.01	25.79	52.94	106.7	
	Cakes	30.86	35.07	0	0	21	46.5	107.5	
	Non alcoholic beverages	1599	687.5	683.7	1099	1521	2009	2902	
	Alcoholic beverages	80.91	262.6	0	0	0	0	495	
	Condiments and sauces	10.36	24.74	0	0	0	8	60.68	
	Soups, bouillon	16.81	53.08	0	0	0	0	150	
	Miscellaneous	8.267	44.49	0	0	0	0.206	30	
	1	Potatoes and other tubers	70.32	55.45	0	25.9	63.53	106.9	181.9
		Vegetables	140	96.19	22.6	74	119.7	187.4	314.8
Legumes		4.448	11.23	0	0	0	0	29.26	
Fruits		295.8	245.9	8.5	123.4	249.9	405.2	805	
Dairy products		386.1	264.2	79.04	195.9	329	507.5	922.5	
Cereals and cereal products		163.3	84.41	58	96.53	145.3	202.9	334.4	
Meat and meat products		97.41	56.58	18.54	55.02	89.57	130.2	206	
Fish and shellfish		9.157	19.25	0	0	0	7.215	59.81	
Eggs and egg products		14.19	16.04	0	2.889	8.489	19.67	49	
Fat		28.6	14.43	8.353	19.24	26.86	35.74	56.58	
Sugar and confectionary		42.73	43.55	2	13.48	30.57	60.37	126	
Cakes		38.11	39.76	0	0	30	55	115	
Non alcoholic beverages		1481	620.5	625.1	1046	1419	1812	2501	
Alcoholic beverages		55.41	141.2	0	0	0	2.325	337.3	
Condiments and sauces		13.38	33.14	0	0	0.95	11.82	61.2	
Soups, bouillon		19.25	57.3	0	0	0	0	150	
Miscellaneous		3.975	22.34	0	0	0	0.06	11.25	
2		Potatoes and other tubers	75.21	61.71	0	23.05	64.88	115.5	190.6
		Vegetables	131	89.57	12.97	60	116.8	183.1	300.8
	Legumes	4.369	11.53	0	0	0	0	25.2	
	Fruits	294.9	235.9	17.13	134.8	238	411.1	720.6	
	Dairy products	429.5	265.1	64	214.1	401.1	618	933.8	
	Cereals and cereal products	164.6	77.73	45	112.6	154.8	202.2	321.3	
Meat and meat products	100.6	65.18	14.08	53.85	90.72	132	226.5		

	Fish and shellfish	14.02	21.55	0	0	0	25	59.5
	Eggs and egg products	20.19	23.7	0	4.702	10.77	28.2	75.53
	Fat	37.01	18.01	10.62	24.73	36.12	45.95	70.5
	Sugar and confectionary	41.32	37.53	1	15.18	31	57.76	113
	Cakes	43.99	47.74	0	4	31.75	66	142
	Non alcoholic beverages	1498	656.6	634.5	1078	1370	1844	2777
	Alcoholic beverages	48.57	151.3	0	0	0	0	315
	Condiments and sauces	13.33	37.82	0	0	0	9	83.12
	Soups, bouillon	15.2	51.91	0	0	0	0	150
	Miscellaneous	1.841	7.913	0	0	0	0.03	8
3	Potatoes and other tubers	92.82	64.55	0	47	82.57	136	214.2
	Vegetables	140.4	87.99	22.9	78.06	123.8	193	318.6
	Legumes	5.73	17.42	0	0	0	0	40
	Fruits	281.5	218.4	22.5	124.4	228.4	391.9	705.5
	Dairy products	419	259.2	61.6	234.7	377.4	570	875
	Cereals and cereal products	177.4	99.51	55	110	153.4	217.5	392.2
	Meat and meat products	84.07	66.3	0	31.8	67.43	123.8	214.6
	Fish and shellfish	61.45	49.77	0	28.35	51.48	88	159.2
	Eggs and egg products	17.47	21.83	0	3.631	10.08	23.62	59.13
	Fat	40.45	24.66	10.19	22.62	35.82	51.91	80.78
	Sugar and confectionary	41.45	44.35	0.916	14.21	29.45	52.18	125.4
	Cakes	45.74	47.09	0	10	37	63.5	137.5
	Non alcoholic beverages	1585	679.7	590.1	1113	1497	2011	2774
	Alcoholic beverages	58.12	138.6	0	0	0	7.5	355
	Condiments and sauces	10.55	24.97	0	0	0	7.395	61.2
	Soups, bouillon	15.09	56.38	0	0	0	0	150
	Miscellaneous	2.411	12.73	0	0	0	0.06	9

Table 6. Food intakes by vitamin D quartiles (male).

MALE									
Group	Main food group	Mean	SD	0.05	0.25	0.5	0.75	0.95	
0	Potatoes and other tubers	104.8	86.01	0	34.17	92.15	166.1	252.9	
	Vegetables	107	98.33	0	37.83	82.63	144	309.8	
	Legumes	6.119	18.39	0	0	0	0	39.55	
	Fruits	261.6	257.9	0	44.6	194.7	380.5	756.1	
	Dairy products	392.5	298.9	23.53	173	325.7	526.9	985.5	
	Cereals and cereal products	203.4	118.4	44.5	132.3	179.4	263.5	443.7	
	Meat and meat products	134.2	78.73	29.1	84.37	124.5	170.1	289.1	
	Fish and shellfish	4.094	12.42	0	0	0	0	33.88	
	Eggs and egg products	8.52	11.07	0	1.087	4.609	13.36	30	
	Fat	36.49	27.1	6.8	17.58	29.78	49.27	78.2	
	Sugar and confectionary	36.53	38.77	1.15	9.894	24.74	48.53	110.2	
	Cakes	35.85	47.22	0	0	17.5	55.5	129	
	Non alcoholic beverages	1458	727	552.4	949.4	1333	1808	2836	
	Alcoholic beverages	256.4	597.7	0	0	0	250	1200	
	Condiments and sauces	17.14	36.13	0	0	3.78	19	67.37	
	Soups, bouillon	14.19	62.44	0	0	0	0	100	
	Miscellaneous	1.847	11.92	0	0	0	0	5	
	1	Potatoes and other tubers	99.69	83.21	0	32.17	86.9	150.5	251.4
		Vegetables	121.2	93.73	3.525	55.09	104.1	166.3	298.2
		Legumes	4.682	11.95	0	0	0	0	33.6
Fruits		285.7	305.3	0	72.49	211.5	397	895	
Dairy products		512.9	357.7	68.62	217	437.3	749.8	1193	
Cereals and cereal products		234.2	119.8	81	154.5	215.3	287.2	465.7	
Meat and meat products		171.7	110.1	35.73	103	149.2	212.9	369.4	
Fish and shellfish		9.25	21.19	0	0	0	3.362	51.71	
Eggs and egg products		20.14	23.64	0	3.066	10.23	31.05	71.03	
Fat		43.84	21.1	15.38	30	40.61	52.31	82.61	
Sugar and confectionary		41.78	43.34	1.518	15	28.65	52.91	135.2	
Cakes		43.67	53.14	0	0	25	70	161	
Non alcoholic beverages		1523	710.2	606.9	1016	1398	1825	3085	
Alcoholic beverages		249.8	777.2	0	0	0	165	1030	
Condiments and sauces		18.1	37.07	0	0	2.5	18	93.12	
Soups, bouillon		12.97	47.4	0	0	0	0	135	
Miscellaneous		0.86	4.979	0	0	0	0	5	
2		Potatoes and other tubers	122.6	88.05	0	60.56	116.1	173.5	283.9
		Vegetables	117.2	86.68	9.4	51.26	103.9	158.2	292
		Legumes	4.947	14.89	0	0	0	0	33.6
	Fruits	286.3	296.5	0	61.49	199.5	401.8	875	
	Dairy products	511.1	345	62.5	257.3	470.7	698.2	1045	
	Cereals and cereal products	248	118.2	100	165.1	228.8	305	470	

	Meat and meat products	170.5	95.35	40	102.9	154.9	228.6	340.7
	Fish and shellfish	22.63	40.7	0	0	0	35.55	99.81
	Eggs and egg products	27.04	33.02	0	4.116	13.82	37.94	99.6
	Fat	55.8	21.77	20.24	42.49	55.95	70.77	92.92
	Sugar and confectionary	43.08	38.12	2.175	16.8	32.8	61.43	113.6
	Cakes	44.44	55.66	0	0	30	63.75	150
	Non alcoholic beverages	1499	681.1	611.4	1038	1370	1838	2598
	Alcoholic beverages	245.4	518.4	0	0	0	247.5	1433
	Condiments and sauces	11.78	21.16	0	0	1.839	15	54
	Soups, bouillon	16.93	67.25	0	0	0	0	150
	Miscellaneous	3.216	27.22	0	0	0	0.058	6.5
3	Potatoes and other tubers	138.6	92.7	5.4	69.26	130.8	190.2	287.5
	Vegetables	125.2	105.3	8.4	46.76	100.8	175.2	345.5
	Legumes	4.774	14.64	0	0	0	0	31.75
	Fruits	270.4	260.4	0	83.75	197	394.9	728.3
	Dairy products	522	382.6	71.39	244.1	411.8	726.4	1296
	Cereals and cereal products	244.4	131.1	75	149.1	225	314.1	503.1
	Meat and meat products	146.5	110.2	4.5	66.97	128.6	196.6	389.5
	Fish and shellfish	98.7	88.15	0	51.6	83.9	130.6	216.1
	Eggs and egg products	27.27	40.37	0	3.356	10.35	32.86	112.3
	Fat	61.93	37	18.82	35.45	53.41	80.08	128.2
	Sugar and confectionary	40.27	35.23	0.32	14.26	31.57	54.17	104.9
	Cakes	43.37	55.15	0	0	29.75	60	150
	Non alcoholic beverages	1548	635.2	657.5	1123	1479	1911	2765
	Alcoholic beverages	181.1	381.4	0	0	0	172.5	980
	Condiments and sauces	15.5	36.82	0	0	0	13.25	80.97
	Soups, bouillon	14.16	69.52	0	0	0	0	35
	Miscellaneous	1.696	13.75	0	0	0	0	5

Table 7. Food intakes by n-3 fatty acids quartiles (female).

FEMALE									
Group	Main food group	Mean	SD	0.05	0.25	0.5	0.75	0.95	
0	Potatoes and other tubers	61.17	54.16	0	7.14	55.55	90.5	159.1	
	Vegetables	118.4	93.06	10	50.1	101.6	160.2	300.8	
	Legumes	4.206	12.69	0	0	0	0	28	
	Fruits	289.3	239.6	13.72	131.9	235	409.7	697.9	
	Dairy products	330.9	224.2	55	169.8	278.6	448.7	787.2	
	Cereals and cereal products	125.1	72.34	36.28	74.07	110	158	272.4	
	Meat and meat products	73.1	55.66	0	39	62	99.43	172.9	
	Fish and shellfish	5.586	14.37	0	0	0	0	38.48	
	Eggs and egg products	9.907	15.16	0	1.032	5.386	11.6	38.36	
	Fat	15.19	8.782	2.506	9.3	14.01	19.7	31.38	
	Sugar and confectionary	35.1	38.9	0	9.17	19.5	50	104.5	
	Cakes	30.56	31.19	0	0	25	46.5	90.75	
	Non alcoholic beverages	1504	686	571.3	970.1	1444	1859	2902	
	Alcoholic beverages	64.56	216	0	0	0	0	337.3	
	Condiments and sauces	9.628	30.61	0	0	0	5.57	48.9	
	Soups, bouillon	16.49	56.13	0	0	0	0	150	
	Miscellaneous	7.294	44.6	0	0	0	0.075	16.2	
	1	Potatoes and other tubers	68.87	53.83	0	26.36	65	95.32	169.7
		Vegetables	132.9	89.65	12.97	69.64	115.3	183.1	302.7
Legumes		5.846	16.64	0	0	0	0	28	
Fruits		291.5	247.6	8.5	120.1	249.5	385.5	749.8	
Dairy products		383.5	249.8	67.58	184.9	341.1	527	821	
Cereals and cereal products		162.8	89.38	60.27	99	148	199.7	325	
Meat and meat products		85.91	55.5	8.95	49	77.3	114.3	194.7	
Fish and shellfish		13.78	22.86	0	0	0	20	61.1	
Eggs and egg products		15.14	18.78	0	3.027	8.932	19.36	53.89	
Fat		26.52	11.65	7.57	18.78	25.43	34.25	45.4	
Sugar and confectionary		38.01	36.36	1.5	12.96	29.5	51.73	108.7	
Cakes		35.59	39.34	0	0	25	52.5	115	
Non alcoholic beverages		1538	623.6	620.6	1131	1432	1939	2519	
Alcoholic beverages		51.53	122.8	0	0	0	0.75	330	
Condiments and sauces		12.25	30.75	0	0	0.044	9	70.35	
Soups, bouillon		15.94	48.11	0	0	0	0	150	
Miscellaneous		3.231	18.79	0	0	0	0.1	12	
2		Potatoes and other tubers	83.39	61.14	0	37.5	75.23	117	191.9
		Vegetables	138.3	97.48	15.75	66	115.1	199.4	308.9
	Legumes	4.248	11.44	0	0	0	0	28	
	Fruits	305	247.5	9	139	256.6	426.6	776.2	
	Dairy products	416.1	267.8	56.3	210.8	373.2	564.4	939.9	
	Cereals and cereal products	168.8	80.96	46.8	110	157.4	212.5	322.3	

	Meat and meat products	97.83	57.37	8.25	55.46	94.91	129.2	207.2
	Fish and shellfish	21.46	30.9	0	0	0	34	93.48
	Eggs and egg products	15.12	16.57	0	3.995	9.09	19.97	53.42
	Fat	35.36	14.01	13.81	26.56	34.91	43.14	61.15
	Sugar and confectionary	41.32	35.9	2.219	15.76	30.64	59.34	115.8
	Cakes	41.99	43.85	0	7	30	63	126
	Non alcoholic beverages	1605	702.3	675.3	1142	1461	1998	2868
	Alcoholic beverages	46.4	126.1	0	0	0	0	269
	Condiments and sauces	12.81	31.02	0	0	0.3	10	66.6
	Soups, bouillon	20.24	65.39	0	0	0	0	150
	Miscellaneous	3.584	15.34	0	0	0	0.06	18
3	Potatoes and other tubers	91.43	67.68	0	38.5	86.1	137.4	214.2
	Vegetables	143.4	82.39	31.69	84.07	132.6	193.8	306.3
	Legumes	5.824	17.46	0	0	0	0	43.17
	Fruits	279.9	208	23.8	124.8	235.4	401.5	691.3
	Dairy products	411.2	265.3	61.6	227.1	361.9	570	886
	Cereals and cereal products	191.8	97.75	70	126.5	172.5	232.1	392.2
	Meat and meat products	104.1	73.8	6.2	47	94.36	143.8	250.7
	Fish and shellfish	46.11	54.48	0	0	28.72	66.06	159.2
	Eggs and egg products	18.17	23.78	0	2.889	9.487	24.44	64.88
	Fat	49.59	23.87	17.97	34.31	46.58	61.28	95.45
	Sugar and confectionary	48.48	50.15	2.985	18.26	36.46	59.35	135.3
	Cakes	50.57	52.68	0	6	40	75	153
	Non alcoholic beverages	1515	634.5	640.9	1059	1424	1870	2777
	Alcoholic beverages	80.46	230.7	0	0	0	28.05	495
	Condiments and sauces	12.93	30.36	0	0	1.736	9.865	72.47
	Soups, bouillon	13.68	47.15	0	0	0	0	100
	Miscellaneous	2.383	11.68	0	0	0	0.079	9

Table 8. Food intakes by n-3 fatty acids quartiles (male).

MALE Group	Main food group	Mean	SD	0.05	0.25	0.5	0.75	0.95	
0	Potatoes and other tubers	94.29	79.53	0	19.33	88.52	150	231.2	
	Vegetables	100.8	93.28	0	34.94	79.1	138.5	270.2	
	Legumes	4.084	13.35	0	0	0	0	27.75	
	Fruits	251.3	254.3	0	53.54	184.1	350.6	748.9	
	Dairy products	461.9	367.1	34.41	208.4	383.1	621.1	1207	
	Cereals and cereal products	186.7	104.8	48	121.8	166.6	241.1	380	
	Meat and meat products	121.5	75.8	21	70.27	112.7	160.3	264.7	
	Fish and shellfish	9.74	30.57	0	0	0	0	46	
	Eggs and egg products	14.02	21.9	0	1.626	5.602	17.31	62.4	
	Fat	28.11	20.54	5.777	15.18	23.77	35.7	58.02	
	Sugar and confectionary	33.92	37.09	1.5	9.693	21	43.97	108.8	
	Cakes	34.79	41.93	0	0	20	55.5	123	
	Non alcoholic beverages	1395	687.1	552.4	877.6	1300	1699	2674	
	Alcoholic beverages	218.2	538.5	0	0	0	165	1155	
	Condiments and sauces	15.51	37.55	0	0	2.5	15.4	64.99	
	Soups, bouillon	14.87	59.55	0	0	0	0	125	
	Miscellaneous	2.143	12.64	0	0	0	0	5	
	1	Potatoes and other tubers	110.8	88.4	0	37.77	101.3	173.5	267.7
		Vegetables	116.5	88.47	7.8	54.5	93.44	157.8	303.8
		Legumes	5.181	16.03	0	0	0	0	33.6
Fruits		263.4	238.3	0	85.05	210.4	381.9	689.5	
Dairy products		516.6	325.3	93.65	242.4	469.3	708.9	1133	
Cereals and cereal products		228.1	114.6	70	151.3	210.8	280.5	452.6	
Meat and meat products		151.5	85.84	27.65	93.38	143.1	190.9	335.8	
Fish and shellfish		21.34	40	0	0	0	28.83	120	
Eggs and egg products		19.18	25.07	0	3.282	8.946	25.49	72.46	
Fat		42.57	17.24	18.24	31.01	40.25	52.13	73.7	
Sugar and confectionary		41.54	37.98	2.13	17	30.36	55.35	110.9	
Cakes		43.55	54.82	0	0	23.75	69.25	161.5	
Non alcoholic beverages		1503	654.2	583.7	1072	1393	1820	2838	
Alcoholic beverages		209.4	453.2	0	0	0	187.5	1165	
Condiments and sauces		14.86	26.14	0	0	1.179	19.57	60	
Soups, bouillon		13	52.14	0	0	0	0	125	
Miscellaneous		1.2	5.523	0	0	0	0	5	
2		Potatoes and other tubers	111.6	80.87	0	50.35	101.9	156.7	251.4
		Vegetables	120.5	88.05	7.5	49.25	109.2	162.9	295.9
		Legumes	4.699	14.75	0	0	0	0	33.6
	Fruits	312.3	327.7	0	88.61	211.5	443.4	950	
	Dairy products	440.9	311.4	51.71	206.3	385	602.7	1075	
	Cereals and cereal products	247.1	135.9	75	153.6	228.6	311.2	500.8	

	Meat and meat products	171.3	116.2	30.32	94.91	147.6	217.4	405.3
	Fish and shellfish	32.63	47.72	0	0	0	57.3	130
	Eggs and egg products	23.83	33.29	0	2.781	11.05	31.41	99.6
	Fat	53.34	20.59	23.6	39.64	50.34	64.66	88.51
	Sugar and confectionary	42.85	41.43	1	14.07	30.39	60.45	129
	Cakes	46.25	54.63	0	0	33.5	67	161
	Non alcoholic beverages	1482	693.6	498.7	992.8	1368	1830	2696
	Alcoholic beverages	252.3	779.5	0	0	0	250	1050
	Condiments and sauces	13.8	28.9	0	0	1.948	15.2	56.5
	Soups, bouillon	10.09	42.28	0	0	0	0	75
	Miscellaneous	2.999	27.02	0	0	0	0	6.5
3	Potatoes and other tubers	149	96.58	7.2	86.25	140.2	192.6	322
	Vegetables	132.7	111.6	7	47.18	106.5	189.9	345.8
	Legumes	6.558	16.18	0	0	0	0	42
	Fruits	277.1	291.4	0	49.44	197	432.7	772.2
	Dairy products	519.1	389.7	47.15	218	442	748	1270
	Cereals and cereal products	268	120.6	101.2	180.5	248.7	344.6	492.9
	Meat and meat products	178.6	109.6	20	104.9	160.2	241.1	390.3
	Fish and shellfish	70.96	94.56	0	0	51.93	112.2	216
	Eggs and egg products	25.95	36.52	0	3.754	11.23	35.8	97.16
	Fat	74.05	33.91	31.04	51.76	69.66	88	138.5
	Sugar and confectionary	43.34	38.82	1.68	17.1	31.86	60.51	113.2
	Cakes	42.74	58.49	0	0	21.75	60	150
	Non alcoholic beverages	1648	700.4	740	1173	1508	2020	3075
	Alcoholic beverages	252.8	524.1	0	0	0	282.5	1250
	Condiments and sauces	18.35	39.57	0	0	1.542	18	88.53
	Soups, bouillon	20.3	86.04	0	0	0	0	175
	Miscellaneous	1.277	13.31	0	0	0	0	3.84



Table 9. Intakes of WHOPCDD/F-TEQ by vitamin D quartiles (female and male).

	Vitamin D quartiles	WHOPCDD/F-TEQ		0.05	0.25	0.5	0.75	0.95
		Mean	SD					
FEMALE	0	0.214	0.19	0.054	0.087	0.142	0.255	0.633
	1	0.339	0.263	0.084	0.142	0.25	0.447	0.845
	2	0.547	0.366	0.094	0.248	0.472	0.776	1.243
	3	1.255	1.189	0.269	0.724	1.096	1.493	2.43
MALE	0	0.262	0.226	0.053	0.106	0.181	0.332	0.729
	1	0.431	0.315	0.09	0.182	0.343	0.586	1.116
	2	0.666	0.404	0.18	0.34	0.599	0.941	1.27
	3	1.56	2.954	0.35	0.854	1.315	1.706	2.921

Table 10. Intakes of WHOPCDD/F-TEQ by n-3 fatty acids quartiles (female and male).

	n-3 fatty acids quartiles	WHOPCDD/F-TEQ		0.05	0.25	0.5	0.75	0.95
		Mean	SD					
FEMALE		0.223	0.225	0.054	0.087	0.138	0.249	0.75
	1	0.426	0.386	0.088	0.145	0.292	0.584	1.214
	2	0.603	0.454	0.096	0.268	0.494	0.834	1.449
	3	1.104	1.213	0.158	0.469	0.95	1.394	2.187
MALE	0	0.307	0.342	0.053	0.106	0.183	0.389	0.887
	1	0.555	0.642	0.106	0.216	0.4	0.666	1.462
	2	0.728	0.717	0.121	0.295	0.571	0.964	1.71
	3	1.329	2.903	0.234	0.663	1.08	1.508	2.258