



EURONUT-SENECA STUDY ON NUTRITION AND THE ELDERLY: INTAKE OF FOODS AT FOUR SITES

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19.1 INTRODUCTION

The assessment of the dietary situation of the elderly enrolled in the Euronut-SENECA project included the evaluation of their food and nutrient intake as well as aspects of diet habits and diet awareness. Apart from food intake data comparative data collected from about 2,600 elderly people from 19 European towns have been published in a supplement to the European Journal of Clinical Nutrition [1]. These results show a great variability from site to site in energy and nutrient intake [2,3], dietary habits and diet awareness [4]. There is now, for several reasons, a need to also provide data regarding food intake:-

- first, to examine the importance of specific foods as nutrient sources
- secondly, to contribute to the Euronut-Nutriscan Nutrition Atlas of Europe
- thirdly, to provide data for projects working to the comparability of European nutrient data bases (FLAIR Eurofoods-Enfant).

For this paper preliminary food intake data from four sites have been assembled for comparative purposes.

19.2 METHODS

19.2.1 Data collection

Food consumption data were gathered, in personal interviews, by trained investigators using a modified version of the dietary history method [5], according to the detailed instructions given in a manual of operations [6]. In order to assess the subjects' usual pattern of intake, subjects were questioned about their usual intake, covering the previous month as the reference method. Portion sizes were recorded in household measures, whereby portion sizes of the foods most frequently used were weighed by the interviewer. Using country-specific food consumption tables quantitative food intake data were locally converted into nutrients [7]. In order to compare food intake data, they were classified according to the 14 main groups of the 1987 version of the Eurocode-2 system [8].

1. Milk and milk products
2. Eggs and egg products
3. Meat and meat products
4. Poultry, game and products
5. Fish, molluscs, reptiles, crustaceans and products
6. Oils, fats and products
7. Grains and products
8. Pulses, seeds, kernels and products
9. Vegetables and products
10. Fruit and products
11. Sugar and sugar products
12. Beverages (except milk)
13. Miscellaneous, soups, sauces and products
14. Food for special nutritional use.

The code is a food-group oriented system in development to enable food comparisons within Europe and internationally [8]. Grouped food intake data will be presented for elderly examinees from Roskilde/ Denmark (R/DK, 96 men, 98 women), Culemborg/ Netherlands (C/NL, 114 men, 124 women), Yverdon/ Switzerland (Y/CH, 117 men, 124 women) and from Vila Franca de Xira/ Portugal (V/P, 111 men, 111 women).

19.2.2 Statistics

Statistical analyses were carried out using the SAS package (SAS, 1985). Centre and sex specific descriptives (means, SD, SEM and percentiles) were calculated for each food group.

19.3 RESULTS AND DISCUSSION

Tables 19.1-19.13 describe the grouped food intake data. Median intake of milk and milk products ranged from 189 to 392 g/day. Categorical breakdown into the three subgroups cheese, cream and other foods in this main group was hampered by some ambiguities due to the lack of specificity of the subgroups. With milk and milk products as the main dietary sources of calcium,

these findings are in line with findings regarding dietary calcium intake. At the four sites comparable quantities of eggs and egg products were consumed, with generally lower intakes in women. The highest intake of meat and meat products not including poultry and game was found in Roskilde/ DK and Culemborg/ NL with median intakes from 90 to 124 g/day. In Vila Franca de Xira/P meat intake was far less (36-45 g/day). Regarding the consumption of fish, molluscs, reptiles, crustaceans and products an opposite pattern was observed with lower intakes in Roskilde and Culemborg (medians from 8-22 g/day) and the higher intake in Vila Franca de Xira (48-69 g/day). Such a high intake of fish is not surprising in a town like Vila Franca de Xira which is situated on the coast. Median values of intakes of oils, fat and products varied between 13 and 48 g/day with high intakes in the northern European towns and low intakes in the southern European town. Such findings need to be examined further in relation to serum lipid profiles and total dietary fat intake.

Grain and grain products were eaten in median daily amounts varying from 130-250 g/day. A distinction between wheat grain, rice grain and other products in this main group was difficult to make because of the enormous variety of breads, bakery foods, breakfast cereals and mixed dishes in this food group. Pulses and seeds were mostly consumed in Culemborg, which probably has to do with the popularity of a traditional Dutch dish including pulses and bacon. Over all centres, the median intake of vegetables and products including potatoes was higher among men; the lowest consumption, for both sexes, in Vila Franca de Xira. In this town, the elderly examinees consume about 200 g (median) of fruit and fruit products per day. Slightly higher intakes were found in Culemborg, the Netherlands whereas in Roskilde, Denmark and Yverdon, Switzerland intakes were much lower. Regarding the distribution of sugar and intake of sugar products Culemborg differed markedly from the other towns with a 3-6 fold higher median intake (103 g/day for men and 81 g/day for women). This corresponds with a high intake of mono- and disaccharides in Culemborg (P50: 133 g/day for men, 111 g/day for women).

Beverages including all alcoholic and non-alcoholic drinks excluding milk were at three of the sites drunk in median quantities of about 1000-1500 g/day. A surprisingly low intake was found in Vila Franca de Xira where median intakes were 252 g/day for men and 45 g/day for women. These values need to be checked and verified, questioning the inclusion of tea and coffee as in the liquid form. Daily consumption of soups and sauces varied from 29 to 327 g/day (medians). At none of the sites products for special nutritional use were part of daily food intake.

Findings reported here are based on the 1987 preliminary version of the Eurocode-2 system and should be interpreted with some caution. Rules for classifying mixed foods and products listed in the code as 'other' or 'undefined' were not provided and criteria for arbitrary decisions not given. Yet, the classification of foods according to the main groups allows for a general and rough comparison of food intake data across the four sites, which shows that marked differences in food consumption exist with possible implications for health. During the past years the Eurocode system has been reviewed and revised [9] partly on the basis of specific and well-defined problems encountered in the SENECA project.

The resulting system now has:

- 13 main groups with the classification of meat, game and poultry into one group,
- foods for special nutritional use incorporated in the corresponding main groups,
- a procedure developed for categories formerly described as 'other/ undefined',
- a denotation of mixed foods or dishes which might be linked to a national recipe code.

In addition a manual will be developed which describes clearly the rules and criteria for classification. Such improvements will make the system more usable and it is envisaged that the revised code will be used in SENECA's follow up, when the project is resumed in the longitudinal phase in 1993.

19.4 FOOD INTAKE

Table 19.1. Milk products (g/day).

	n	mean	P50	SD	SEM	min	max	P5	P10	P25	P75	P90	P95
MALES													
R/DK	96	301	233	240	24	10	1228	36	45	139	432	575	727
C/NL	114	414	370	227	21	31	1227	101	144	255	532	694	824
V/P	111	293	260	266	25	0	1056	0	0	30	500	564	950
Y/CH	117	320	284	232	21	4	1566	40	72	138	451	619	670
FEMALES													
R/DK	98	269	219	213	21	0	1143	18	49	125	348	553	738
C/NL	124	387	392	193	17	30	1227	83	125	249	515	620	669
V/P	111	280	250	276	26	0	1025	0	1	13	432	656	899
Y/CH	124	232	189	161	14	0	1146	51	69	119	311	451	498
TOTAL													
R/DK	194	285	225	227	16	0	1228	29	49	134	382	566	727
C/NL	238	400	385	210	14	30	1227	83	136	250	522	647	774
V/P	222	286	254	271	18	0	1056	0	1	26	445	638	899
Y/CH	241	275	228	203	13	0	1566	51	69	124	387	521	619

R/DK = Roskilde, C/NL = Culemborg, Netherlands; V/P = Vila Franca de Zira, Portugal; Y/CH = Yuerdon, Switzerland.

Table 19.2. Eggs and egg products (g/day).

	n	mean	P50	SD	SEM	min	max	P5	P10	P25	P75	P90	P95
MALES													
R/DK	96	24	17	22	2	0	99	0	0	7	34	60	64
C/NL	114	16	13	15	1	0	73	0	1	6	23	36	50
V/P	111	15	10	18	2	0	108	0	0	3	20	29	39
Y/CH	117	15	14	14	1	0	115	0	0	7	20	29	36
FEMALES													
R/DK	98	18	17	17	2	0	87	0	0	9	26	43	50
C/NL	124	14	14	11	1	0	50	0	1	7	19	25	36
V/P	111	9	7	9	1	0	54	0	0	3	15	17	22
Y/CH	124	11	9	10	1	0	57	0	0	4	14	22	28
TOTAL													
R/DK	194	21	17	20	1	0	99	0	0	9	26	50	60
C/NL	238	15	13	13	1	0	73	0	1	6	21	29	39
V/P	222	12	7	14	1	0	108	0	0	3	17	25	32
Y/CH	241	13	11	12	1	0	115	0	0	4	18	25	29

Table 19.3. Meat (g/day).

	n	mean	P50	SD	SEM	min	max	P5	P10	P25	P75	P90	P95
MALES													
R/DK	96	126	124	43	4	0	274	66	76	98	146	191	209
C/NL	114	128	123	44	4	0	251	53	80	103	155	183	203
V/P	111	58	45	48	5	0	254	3	14	23	83	116	153
Y/CH	117	90	86	36	3	14	214	31	49	69	109	142	156
FEMALES													
R/DK	98	91	90	30	3	36	168	41	51	70	108	135	145
C/NL	124	99	99	41	4	0	203	26	50	71	123	154	171
V/P	111	41	36	31	3	0	197	5	8	17	56	82	93
Y/CH	124	70	66	34	3	0	180	22	30	42	91	116	129
TOTAL													
R/DK	194	109	106	41	3	0	274	49	62	82	132	154	191
C/NL	238	113	111	44	3	0	251	44	56	84	139	171	191
V/P	222	49	40	41	3	0	254	5	9	20	70	97	122
Y/CH	241	79	77	37	2	0	214	28	34	53	101	129	143

Table 19.4. Poultry (g/day).

	n	mean	P50	SD	SEM	min	max	P5	P10	P25	P75	P90	P95
MALES													
R/DK	96	18	13	18	2	0	129	0	0	9	21	40	47
C/NL	114	20	15	25	2	0	199	0	0	5	26	38	61
V/P	111	28	21	27	3	0	136	0	2	10	39	63	76
Y/CH	117	13	11	12	1	0	72	0	0	4	21	28	29
FEMALES													
R/DK	98	14	12	11	1	0	54	0	0	7	21	29	39
C/NL	124	17	12	24	2	0	226	0	0	4	24	35	46
V/P	111	23	18	20	2	0	127	0	3	8	34	48	54
Y/CH	124	11	9	11	1	0	51	0	0	0	18	28	31
TOTAL													
R/DK	194	16	12	15	1	0	129	0	0	9	21	32	43
C/NL	238	18	14	24	2	0	226	0	0	4	24	37	53
V/P	222	25	20	24	2	0	136	0	2	9	36	52	65
Y/CH	241	12	9	12	1	0	72	0	0	0	20	28	30

Table 19.5. Fish, reptiles, etc. (g/day).

	n	mean	P50	SDSEM	min	max	P5	P10	P25	P75	P90	P95	
MALES													
R/DK	96	27	23	24	2	0	114	0	0	11	34	52	96
C/NL	114	21	14	27	3	0	200	0	0	5	28	41	66
V/P	111	75	69	42	4	10	191	21	30	47	105	147	157
Y/CH	117	22	21	15	1	0	71	0	0	11	29	43	57
FEMALES													
R/DK	98	18	14	16	2	0	71	0	1	6	29	42	48
C/NL	124	14	8	16	1	0	91	0	0	0	23	36	44
V/P	111	53	48	29	3	10	145	17	23	33	66	101	111
Y/CH	124	21	20	17	2	0	114	0	3	11	28	35	47
TOTAL													
R/DK	194	22	18	21	1	0	114	0	0	9	32	46	54
C/NL	238	17	11	22	1	0	200	0	0	2	25	38	50
V/P	222	64	54	38	3	10	191	20	24	37	82	119	147
Y/CH	241	22	21	16	1	0	114	0	3	11	29	36	57

Table 19.6. Oils and fats (g/day).

	n	mean	P50	SDSEM	min	max	P5	P10	P25	P75	P90	P95	
MALES													
R/DK	96	50	49	20	2	4	103	16	27	35	62	76	95
C/NL	114	51	48	25	2	1	141	13	21	37	62	80	93
V/P	111	17	16	10	1	1	44	3	5	9	22	30	37
Y/CH	117	35	35	16	1	3	80	10	15	24	45	55	65
FEMALES													
R/DK	98	36	37	14	1	7	69	14	18	24	44	55	61
C/NL	124	36	35	19	2	1	100	10	14	22	49	61	64
V/P	111	14	13	8	1	0	37	4	6	8	18	23	32
Y/CH	124	32	28	17	2	7	104	11	14	20	41	53	61
TOTAL													
R/DK	194	43	41	19	1	4	103	16	20	30	53	66	76
C/NL	238	43	41	23	2	1	141	11	16	25	56	72	83
V/P	222	15	14	9	1	0	44	4	6	8	20	28	33
Y/CH	241	33	31	17	1	3	104	11	15	21	44	53	65

Table 19.7. Wheat products (g/day).

	n	mean	P50	SDSEM	min	max	P5	P10	P25	P75	P90	P95	
MALES													
R/DK	96	214	191	101	10	75	559	100	110	142	265	324	462
C/NL	114	165	156	59	6	47	382	91	102	126	191	239	300
V/P	111	310	251	177	17	72	930	103	139	194	388	569	676
Y/CH	117	201	191	80	7	30	439	86	110	145	255	298	354
FEMALES													
R/DK	98	162	149	81	8	42	655	77	90	109	186	256	300
C/NL	124	135	130	49	4	54	352	78	81	102	159	195	210
V/P	111	209	188	93	9	52	581	90	109	152	265	315	370
Y/CH	124	156	147	66	6	41	398	67	83	108	200	232	258
TOTAL													
R/DK	194	188	166	95	7	42	655	83	97	125	222	291	357
C/NL	238	150	142	56	4	47	382	80	87	112	179	210	274
V/P	222	259	220	150	10	52	930	98	120	159	310	464	581
Y/CH	241	178	164	76	5	30	439	75	92	121	221	270	320

Table 19.8. Pulses, seeds and nuts (g/day).

	n	mean	P50	SDSEM	min	max	P5	P10	P25	P75	P90	P95	
MALES													
R/DK	96	1	0	4	0	0	25	0	0	0	2	4	6
C/NL	114	23	17	24	2	0	151	0	0	7	29	54	68
V/P	111	11	3	18	2	0	112	0	0	0	14	26	40
Y/CH	117	7	3	12	1	0	50	0	0	0	9	24	35
FEMALES													
R/DK	98	1	0	2	0	0	10	0	0	0	1	4	4
C/NL	124	14	10	15	1	0	89	0	0	4	21	34	41
V/P	111	4	0	10	1	0	60	0	0	0	6	12	24
Y/CH	124	6	0	9	1	0	45	0	0	0	9	18	30
TOTAL													
R/DK	194	1	0	3	0	0	25	0	0	0	1	4	5
C/NL	238	18	14	20	1	0	151	0	0	5	25	41	58
V/P	222	8	0	15	1	0	112	0	0	0	9	24	36
Y/CH	241	7	2	11	1	0	50	0	0	0	9	21	30

Table 19.9. Vegetables (g/day).

	n	mean	P50	SDSEM	min	max	P5	P10	P25	P75	P90	P95	
MALES													
R/DK	96	296	279	132	13	32	722	86	150	213	385	453	545
C/NL	114	363	350	141	13	121	1011	184	215	265	418	534	626
V/P	111	206	197	110	10	9	553	55	80	113	285	341	399
Y/CH	117	269	249	104	10	99	674	125	150	195	334	425	455
FEMALES													
R/DK	98	247	234	103	10	17	534	107	127	174	303	392	460
C/NL	124	287	266	118	11	92	680	129	158	200	346	429	488
V/P	111	146	133	83	8	15	425	37	65	90	179	260	344
Y/CH	124	249	237	89	8	25	514	128	150	192	300	377	412
TOTAL													
R/DK	194	271	251	121	9	17	722	104	130	189	335	424	485
C/NL	238	324	307	135	9	92	1011	154	181	225	384	488	605
V/P	222	176	154	102	7	9	553	44	70	104	235	325	367
Y/CH	241	259	242	97	6	25	674	128	150	193	318	390	435

Table 19.10. Fruits (g/day).

	n	mean	P50	SDSEM	min	max	P5	P10	P25	P75	P90	P95	
MALES													
R/DK	96	116	106	95	10	0	585	0	9	41	160	235	282
C/NL	114	230	212	153	14	0	618	22	56	111	339	440	531
V/P	111	240	201	214	20	0	1423	30	48	100	300	467	609
Y/CH	117	169	150	116	11	0	720	17	50	90	225	307	377
FEMALES													
R/DK	98	141	132	96	10	0	405	14	20	52	231	269	308
C/NL	124	237	223	131	12	0	607	44	80	139	317	426	492
V/P	111	216	197	158	15	0	705	16	39	87	290	393	546
Y/CH	124	201	183	115	10	0	531	43	78	123	261	370	401
TOTAL													
R/DK	194	129	120	96	7	0	585	6	16	49	203	250	286
C/NL	238	234	220	142	9	0	618	28	63	127	320	432	503
V/P	222	228	199	188	13	0	1423	23	40	92	294	415	562
Y/CH	241	185	161	116	7	0	720	27	60	108	249	341	394

Table 19.11. Sugar products (g/day).

	n	mean	P50	SDSEM	min	max	P5	P10	P25	P75	P90	P95	
MALES													
R/DK	96	42	36	36	4	0	190	3	7	16	55	90	125
C/NL	114	107	103	63	6	0	410	9	32	67	141	177	212
V/P	111	25	17	23	2	0	134	0	2	9	35	53	73
Y/CH	117	38	36	23	2	0	110	0	7	22	54	71	77
FEMALES													
R/DK	98	29	24	26	3	0	131	0	3	10	43	61	84
C/NL	124	80	81	43	4	0	190	13	24	47	105	136	158
V/P	111	27	22	23	2	0	121	0	0	8	40	53	68
Y/CH	124	27	23	21	2	0	108	0	3	13	38	53	62
TOTAL													
R/DK	194	35	28	32	2	0	190	1	4	12	48	71	93
C/NL	238	93	89	55	4	0	410	10	28	53	127	159	187
V/P	222	26	21	23	2	0	134	0	0	9	36	53	69
Y/CH	241	33	30	23	1	0	110	0	5	14	49	62	73

Table 19.12. Drinks (g/day).

	n	mean	P50	SDSEM	min	max	P5	P10	P25	P75	P90	P95	
MALES													
R/DK	96	1477	1354	601	61	578	3539	659	890	1061	1707	2214	2806
C/NL	114	1215	1185	456	43	243	3065	572	689	893	1465	1790	1997
V/P	111	341	262	309	29	0	1311	0	13	87	520	768	1000
Y/CH	117	1128	1098	405	37	399	2186	529	615	880	1397	1711	1928
FEMALES													
R/DK	98	1611	1452	813	82	315	3966	650	731	993	2120	2831	3250
C/NL	124	1107	1030	438	39	295	2620	573	630	833	1339	1650	1902
V/P	111	139	45	194	18	0	855	0	0	0	193	452	558
Y/CH	124	1125	1106	419	38	173	2496	443	622	870	1340	1710	1858
TOTAL													
R/DK	194	1545	1388	718	52	315	3966	659	751	1012	1902	2608	3074
C/NL	238	1159	1130	449	29	243	3065	572	648	853	1403	1781	1997
V/P	222	240	135	277	19	0	1311	0	0	16	408	600	815
Y/CH	241	1127	1100	411	26	173	2496	486	618	880	1356	1710	1867

Table 19.13. Miscellaneous (g/day).

	n	mean	P50	SDSEM	min	max	P5	P10	P25	P75	P90	P95	
MALES													
R/DK	96	135	114	85	9	9	419	42	50	71	171	256	312
C/NL	114	73	48	90	8	0	624	0	2	14	92	177	257

V/P	111	336	327	195	19	0	1027	61	100	188	400	653	700
Y/CH	117	95	47	115	11	0	630	0	0	11	143	262	321
FEMALES													
R/DK	98	95	91	59	6	0	309	14	26	48	129	163	211
C/NL	124	43	29	49	4	0	232	0	1	6	58	103	146
V/P	111	323	326	216	20	0	1319	60	90	187	373	653	735
Y/CH	124	78	43	88	8	0	337	0	0	9	118	217	256
TOTAL													
R/DK	194	115	101	76	5	0	419	25	36	58	149	224	260
C/NL	238	58	36	73	5	0	624	0	1	8	77	145	203
V/P	222	329	326	205	14	0	1319	61	94	187	386	653	700
Y/CH	241	86	44	102	7	0	630	0	0	9	135	246	300

19.5 SUMMARY

- This chapter describes preliminary food intake data from Denmark (M: 96, F: 98), Netherlands (M: 114, F: 124), Switzerland (M: 117, F: 124) and Portugal (M: 111, F: 111) included in the Euronut-SENECA study.
- Food consumption data were obtained in a personal interview using a modified version of the dietary history method consisting of two parts:
 1. an estimated 3-day record and a check list of foods;
 2. usual intake, covering the preceding month.Portion sizes were recorded in household measures and checked by weighing. Country-specific food consumption tables were used to convert food intake data into nutrients.
- Median intakes of milk and milk products ranged from 189 to 392 g/day and for grains & pulses between 130-250 g/day. Median intakes of red meat were highest in Denmark and Switzerland (90-124 g/day) and lowest in Portugal (36-45g/day); the reverse was true for fish intake (8-22 g/day and 48-69 g/day respectively). Sugar & sugar product intakes were 3-6 fold higher in the Netherlands (median M 103 g/day, F 81 g/day) compared with other centres.

19.6 REFERENCES

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CHAPTER 19

EURONUT SENECA STUDY ON NUTRITION AND THE ELDERLY: INTAKE OF FOODS AT FOUR SITES

19.1 INTRODUCTION

19.2 METHODS

19.2.1 Data collection

19.2.2 Statistics

19.3 RESULTS AND DISCUSSION

19.4 FOOD INTAKE

19.5 SUMMARY

19.6 REFERENCES

