

Dietary fatty acid intake, its food sources and determinants in healthy European adolescents. The HELENA study.

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Supplemental table 1 Percentage contributions of food groups to the intake of fats and fatty acids in European adolescent boys.

Food Group	Total Fat		SFA		Lauric A		Myristic A		Palmitic A		Stearic A		MUFA		Oleic A		Cholesterol	
	%	R	%	R	%	R	%	R	%	R	%	R	%	R	%	R	%	R
Beverages	2.18		2.02		2.29		1.84		2.24		1.84		1.95		1.94		2.06	
Water	0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Coffee and tea	0.09		0.11		0.10		0.15		0.11		0.08		0.07		0.07		0.05	
Fruit and vegetable juices	0.37		0.19		0.08		0.05		0.32		0.09		0.16		0.17		0.00	
Carbonated/soft/isotonic drinks	0.06		0.03		0.02		0.01		0.05		0.02		0.01		0.01		0.00	
Alcoholic beverages	0.03		0.05		0.28		0.07		0.02		0.02		0.02		0.02		0.02	
Soups / bouillon	1.63		1.64		1.81		1.56		1.74		1.63		1.69		1.67		1.99	
Bread and Cereals	6.43		5.29		6.45		5.18		5.44		4.66		6.53		6.52		3.01	
Bread and rolls	4.97	7	4.28	8	6.02	7	4.61	7	4.28	8	3.39	7	4.71	7	4.49	7	2.42	
Breakfast cereals	0.74		0.47		0.06		0.09		0.54		0.80		0.84		0.96		0.02	
Flour	0.72		0.54		0.37		0.48		0.62		0.47		0.98		1.07		0.57	
Potatoes & Grains	5.48		3.97		4.49		3.63		4.45		3.18		4.90		5.00		7.61	
Rice and other grains	1.55		1.11		0.71		0.99		1.31		0.92		2.07		2.25		0.68	
Starch roots, potatoes	2.12		1.49		2.86	9	1.22		1.58		1.26		1.49		1.44		0.49	
Pasta	1.81		1.37		0.92		1.42		1.56		1.00		1.34		1.31		6.44	4
Vegetables & Fruits	3.24		2.46		2.30		2.21		2.82		2.03		3.56		3.76		1.55	
Vegetables	2.58	10	2.11		2.12		2.08		2.26	10	1.84		2.99	10	3.15	9	1.50	
Fruits	0.45		0.25		0.16		0.09		0.41		0.12		0.18		0.18		0.03	
Olives & avocado	0.21		0.10		0.02		0.04		0.15		0.07		0.39		0.43		0.02	
Dairy & Soy products	16.78		22.91		22.63		32.95		20.17		17.40		14.53		14.04		13.55	
White milk and buttermilk	5.16	6	7.23	6	7.36	5	10.85	3	6.32	6	5.04	6	4.38	8	4.13	8	4.85	5
Yogurt and fromage blanc (quark)	1.29		1.82		1.79		2.75	8	1.59		1.27		1.09		1.03		1.09	
Milk and yogurt beverages	1.67		2.33	9	1.76		2.70	9	2.04		2.61	9	1.44		1.43		1.11	
Soya beverages	0.12		0.04		0.01		0.01		0.06		0.04		0.08		0.09		0.00	
Cheese	7.49	3	10.13	3	9.87	3	14.89	2	8.96	3	7.31	4	6.65	3	6.48	4	4.54	6
Desserts and puddings milk based	1.03		1.34		1.83		1.73		1.19		1.12		0.88		0.87		1.95	
Desserts and puddings soya based	0.02		0.01		0.01		0.01		0.01		0.01		0.01		0.01		0.00	
Other milk products	0.00		0.01		0.00		0.01		0.00		0.00		0.00		0.00		0.01	
Fat & Oil	8.28		9.16		8.75		12.27		8.64		7.16		8.31		7.46		4.26	
Margarine and lipids of mixed origins	2.58	9	1.62		1.41		1.46		1.89		1.64		3.16	9	2.72		0.70	
Butter and animal fats	5.70	5	7.54	5	7.34	6	10.81	4	6.75	5	5.52	5	5.15	5	4.74	6	3.56	8
Meat/Fish/Egg/Meat alternative	28.74		23.50		12.97		12.85		28.34		28.33		33.30		33.91		49.61	
Meat	24.46	1	20.54	1	8.58	4	10.61	5	25.03	1	25.80	1	28.94	1	29.41	1	33.08	1
Fish products	1.15		0.94		3.57	8	1.23		0.81		0.53		0.87		0.74		4.16	7
Eggs	1.81		1.50		0.63		0.85		1.88		1.48		1.91		1.99		12.22	2
Meat substitutes and vegetarian products	0.10		0.06		0.04		0.03		0.07		0.05		0.07		0.08		0.03	
Nuts and seeds	1.05		0.36		0.10		0.08		0.42		0.36		1.37		1.54		0.00	
Pulses (excluding fresh peas, sweet corn and broad bean)	0.17		0.10		0.05		0.05		0.13		0.11		0.14		0.15		0.12	
Restgroup	28.84		30.68		40.14		29.06		27.89		35.42		26.90		27.35		18.34	
Cakes, pies, biscuits	12.01	2	13.64	2	19.16	1	17.35	1	12.10	2	11.26	3	11.44	2	10.51	2	11.55	3
Savoury snacks	2.20		1.19		2.50	10	0.38		1.50		0.96		0.63		0.64		0.03	
Sugar, honey, jam and syrup	0.20		0.27		0.27		0.39		0.24		0.19		0.16		0.15		0.12	
Confectionery non chocolate	0.22		0.12		0.27		0.09		0.10		0.11		0.34		0.38		0.02	
Chocolate	6.52	4	7.86	4	1.59		1.86		6.93	4	17.43	2	6.53	4	7.40	3	0.66	
Sauces	4.90	8	4.90	7	13.50	2	5.90	6	4.33	7	3.18	8	4.91	6	5.29	5	3.18	9
Creams	0.31		0.43		0.58		0.63		0.37		0.30		0.26		0.25		0.36	
Miscellaneous	2.48		2.27	10	2.27		2.46	10	2.32	9	1.99	10	2.63		2.73	10	2.42	

R, rank; SFA, Saturated Fatty Acid; MUFA, Monounsaturated fatty acid; OA, Oleic acid

Supplemental table 1 Percentage contributions of food groups to the intake of fats and fatty acids in European adolescent boys - continued.

Food Group	Total n-6				Total n-3				R									
	PUFA %	R	PUFA %	LA %	AA %	R	PUFA %	ALA %		EPA %	DPA %	DHA %						
Beverages	2.76		2.68	2.68	2.60		3.26	3.67	1.44	1.31	1.28							
Water	0.00		0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00							
Coffee and tea	0.09		0.08	0.08	0.00		0.13	0.16	0.00	0.00	0.00							
Fruit and vegetable juices	1.13		1.04	1.08	0.00		1.67	2.02	0.00	0.00	0.00							
Carbonated/soft/isotonic drinks	0.19		0.18	0.19	0.00		0.25	0.30	0.00	0.00	0.00							
Alcoholic beverages	0.01		0.01	0.01	0.01		0.01	0.02	0.00	0.00	0.01							
Soups / bouillon	1.34		1.37	1.32	2.59	6	1.20	1.17	1.44	5	1.31	3	1.27	9				
Bread and Cereals	7.79		8.20	8.05	13.30		5.54	6.34	1.62	0.65	1.96							
Bread and rolls	5.98	5	6.21	5	5.99	5	13.00	3	4.68	7	5.38	6	1.28	6	0.51	7	1.47	7
Breakfast cereals	1.20		1.35		1.41		0.06		0.37		0.45		0.00		0.00		0.00	
Flour	0.61		0.64		0.65		0.24		0.49		0.51		0.34	9	0.14	10	0.49	
Potatoes & Grains	10.21		10.57		10.92		1.66		8.25		9.66		1.04		0.77		1.75	
Rice and other grains	1.57		1.66		1.70		0.60		1.09		1.08		0.92	7	0.77	6	1.32	8
Starch roots, potatoes	5.40	6	5.43	6	5.64	6	0.19		5.25	5	6.32	4	0.08		0.00		0.06	
Pasta	3.24	8	3.48	8	3.58	8	0.87	10	1.91		2.26		0.04		0.00		0.37	
Vegetables & Fruits	4.40		4.15		4.27		1.52		5.78		6.52		2.19		1.01		2.40	
Vegetables	2.91	9	2.79		2.85		1.45	8	3.58	10	3.91	10	2.00	3	0.90	5	2.16	5
Fruits	1.32		1.18		1.23		0.01		2.08		2.51		0.00		0.00		0.01	
Olives & advocado	0.17		0.18		0.19		0.06		0.12		0.10		0.19		0.11		0.23	
Dairy & Soy products	5.76		4.84		5.00		0.90		10.84		12.89		0.25		0.19		1.40	
White milk and buttermilk	1.54		1.22		1.26		0.14		3.30		3.95	9	0.01		0.01		0.28	
Yogurt and fromage blanc (quark)	0.37		0.29		0.30		0.00		0.84		1.01		0.00		0.00		0.00	
Milk and yogurt beverages	0.44		0.38		0.40		0.02		0.78		0.93		0.03		0.01		0.03	
Soya beverages	0.51		0.54		0.56		0.00		0.34		0.42		0.00		0.00		0.00	
Cheese	2.41		1.98		2.04		0.38		4.81	6	5.75	5	0.21	10	0.17	9	0.31	
Desserts and puddings milk based	0.43		0.37		0.38		0.36		0.73		0.78		0.00		0.00		0.78	10
Desserts and puddings soya based	0.06		0.06		0.06		0.00		0.04		0.05		0.00		0.00		0.00	
Other milk products	0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Fat & Oil	7.57		7.65		7.95		0.20		7.19		8.62		0.13		0.08		0.25	
Margarine and lipids of mixed origins	4.71	7	5.03	7	5.23	7	0.06		2.98		3.58		0.01		0.00		0.07	
Butter and animal fats	2.86	10	2.62		2.72		0.14		4.21	8	5.04	7	0.12		0.08		0.18	
Meat/Fish/Egg/Meat alternative	32.40		32.36		31.35		53.82		32.45		21.15		90.51		94.51		84.30	
Meat	25.27	1	26.22	1	25.26	1	46.87	1	19.94	1	16.30	1	33.62	2	65.57	1	35.47	2
Fish products	2.10		0.97		0.85		3.47	4	8.30	4	0.66		56.73	1	28.85	2	41.78	1
Eggs	1.70		1.52		1.46		3.25	5	2.68		2.35		0.08		0.09		7.00	3
Meat substitutes and vegetarian products	0.38		0.40		0.42		0.01		0.25		0.30		0.01		0.00		0.01	
Nuts and seeds	2.62		2.93	10	3.03	10	0.12		0.92		1.11		0.00		0.00		0.00	
Pulses (excluding fresh peas, sweet corn and broad bean)	0.33		0.32		0.33		0.10		0.36		0.43		0.07		0.00		0.04	
Restgroup	29.11		29.57		29.81		26.02		26.68		31.14		2.82		1.48		6.67	
Cakes, pies, biscuits	9.14	2	9.06	2	8.63	2	22.38	2	9.58	3	11.04	3	0.04		0.40	8	4.05	4
Savoury snacks	7.92	3	7.58	3	7.86	3	0.47		9.86	2	11.89	2	0.00		0.00		0.01	
Sugar, honey, jam and syrup	0.12		0.11		0.11		0.04		0.19		0.22		0.00		0.00		0.00	
Confectionery non chocolate	0.24		0.27		0.28		0.00		0.07		0.08		0.00		0.00		0.01	
Chocolate	2.78		3.14	9	3.26	9	0.06		0.82		0.98		0.00		0.00		0.13	
Sauces	6.19	4	6.59	4	6.80	4	1.19	9	4.00	9	4.72	8	0.81	8	0.06		0.42	
Creams	0.10		0.08		0.09		0.05		0.21		0.24		0.04		0.04		0.11	
Miscellaneous	2.62		2.74		2.78		1.83	7	1.95		1.97		1.93	4	0.98	4	1.94	6

R, rank; PUFA, Polyunsaturated fatty acid; LA, Linoleic acid; ALA, alpha-linolenic acid; EPA, eicopentaenoic acid; DPA, docosapentaenoic acid; DHA, docosahexaenoic acid

Supplemental table 2 Percentage contributions of food groups to the intake of fats and fatty acids in European adolescent girls.

Food Group	Total Fat		SFA		Lauric A		Myristic A		Palmitic A		Stearic A		MUFA		Oleic A		Cholesterol	
	%	R	%	R	%	R	%	R	%	R	%	R	%	R	%	R	%	R
Beverages	2.69		2.66		2.32		2.62		2.87		2.47		2.44		2.40		2.25	
Water	0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Coffee and tea	0.39		0.52		0.48		0.75		0.47		0.37		0.32		0.30		0.26	
Fruit and vegetable juices	0.42		0.21		0.10		0.06		0.36		0.10		0.19		0.20		0.00	
Carbonated/soft/isotonic drinks	0.06		0.03		0.02		0.01		0.05		0.02		0.01		0.01		0.00	
Alcoholic beverages	0.02		0.03		0.12		0.04		0.02		0.02		0.02		0.02		0.02	
Soups / bouillon	1.80		1.87		1.60		1.76		1.97		1.96	10	1.90		1.87		1.97	
Bread and Cereals	6.40		5.36		6.78		5.44		5.47		4.52		6.46		6.46		2.94	
Bread and rolls	5.02	7	4.34	8	5.52	7	4.68	7	4.38	8	3.42	8	4.77	7	4.58	6	4.27	
Breakfast cereals	0.64		0.37		0.05		0.07		0.44		0.62		0.76		0.87		0.01	
Flour	0.74		0.65		1.21		0.69		0.65		0.48		0.93		1.01		0.66	
Potatoes & Grains	5.27		3.84		5.43		3.54		4.20		3.08		4.36		4.32		8.35	
Rice and other grains	0.88		0.67		0.74		0.62		0.76		0.54		1.07		1.13		0.60	
Starch roots, potatoes	2.48	10	1.84		3.58	9	1.62		1.89		1.58		1.87		1.80		0.70	
Pasta	1.91		1.33		1.11		1.30		1.55		0.96		1.42		1.39		7.05	4
Vegetables & Fruits	3.60		2.67		2.65		2.31		3.14		2.17		3.74		3.94		1.59	
Vegetables	2.64	9	2.20	10	2.51	10	2.19		2.35	9	1.94		2.88	9	3.00	9	1.57	
Fruits	0.65		0.35		0.13		0.10		0.58		0.17		0.25		0.26		0.01	
Olives & advocado	0.31		0.12		0.01		0.02		0.21		0.06		0.61		0.68		0.01	
Dairy & Soy products	17.04		23.08		21.82		32.56		20.48		17.87		14.71		14.23		13.72	
White milk and buttermilk	4.33	8	6.08	6	6.25	5	8.95	4	5.31	6	4.32	6	3.75	8	3.54	8	4.09	7
Yogurt and fromage blanc (quark)	1.32		1.86		1.76		2.76	9	1.64		1.33		1.12		1.06		1.10	
Milk and yogurt beverages	1.75		2.46	9	1.84		2.90	8	2.16	10	2.70	9	1.52		1.51		1.18	
Soya beverages	0.55		0.20		0.04		0.05		0.27		0.21		0.35		0.40		0.03	
Cheese	7.59	3	10.55	3	9.96	3	15.38	2	9.33	3	7.70	4	6.66	3	6.44	4	4.59	6
Desserts and puddings milk based	1.44		1.86		1.91		2.42	10	1.70		1.56		1.26		1.23		2.63	10
Other milk products	0.06		0.07		0.06		0.10		0.07		0.05		0.05		0.05		0.10	
Fat & Oil	7.09		7.56		7.30		9.76		7.18		6.14		7.24		6.49		3.41	
Margarine and lipids of mixed origins	1.98		1.31		1.54		1.18		1.43		1.35		2.26		1.98		0.53	
Butter and animal fats	5.11	6	6.25	5	5.76	6	8.58	5	5.75	5	4.79	5	4.98	6	4.51	7	2.88	9
Meat/Fish/Egg/Meat alternative	28.24		22.54		13.12		12.49		27.38		26.64		33.06		33.65		47.59	
Meat	22.43	1	18.70	1	6.90	4	9.36	3	23.17	1	23.51	1	26.84	1	27.19	1	29.99	1
Fish products	1.72		1.43		4.97	8	1.87		1.25		0.82		1.30		1.09		5.34	5
Eggs	1.88		1.60		0.94		0.97		1.96		1.58		1.99		2.07		12.11	3
Meat substitutes and vegetarian products	0.26		0.17		0.10		0.12		0.22		0.14		0.21		0.23		0.10	
Nuts and seeds	1.83		0.58		0.18		0.15		0.69		0.53		2.63	10	2.97	10	0.00	
Pulses (excluding fresh peas, sweet corn and broad bean)	0.12		0.06		0.03		0.02		0.09		0.06		0.09		0.10		0.05	
Restgroup	29.68		32.26		40.58		31.29		29.25		37.09		28.01		28.53		20.12	
Cakes, pies, biscuits	13.46	2	15.20	2	20.17	1	19.15	1	13.60	2	12.62	3	12.90	2	12.09	2	13.14	2
Savoury snacks	1.80		1.06		2.05		0.47		1.31		0.86		0.59		0.59		0.12	
Sugar, honey, jam and syrup	0.24		0.32		0.31		0.46		0.29		0.23		0.19		0.18		0.15	
Confectionery non chocolate	0.20		0.09		0.11		0.06		0.09		0.12		0.34		0.38		0.02	
Chocolate	6.28	4	7.78	4	1.55		1.88		6.86	4	17.62	2	6.26	4	7.10	3	0.70	
Sauces	5.47	5	5.39	7	13.76	2	6.35	6	4.79	7	3.60	7	5.49	5	5.93	5	3.61	8
Creams	0.53		0.73		0.75		1.08		0.65		0.53		0.45		0.42		0.50	
Miscellaneous	1.70		1.69		1.88		1.84		1.66		1.51		1.79		1.84		1.88	

R, rank; SFA, Saturated Fatty Acid; MUFA, Monounsaturated fatty acid; OA, Oleic acid

Supplemental table 2 Percentage contributions of food groups to the intake of fats and fatty acids in European adolescent girls - continued.

Food Group	Total n-6					Total n-3												
	PUFA %	R	PUFA %	LA %	AA %	PUFA %	R	ALA %	R	EPA %	R	DPA %	R	DHA %	R			
Beverages	2.85		2.71	2.70	2.96		3.64	4.23		1.41		0.96		1.04				
Water	0.00		0.00	0.00	0.00		0.00	0.00		0.00		0.00		0.00				
Coffee and tea	0.19		0.16	0.17	0.00		0.33	0.41		0.00		0.00		0.00				
Fruit and vegetable juices	1.21		1.12	1.15	0.00		1.77	2.18		0.00		0.00		0.00				
Carbonated/soft/isotonic drinks	0.18		0.17	0.17	0.00		0.24	0.30		0.00		0.00		0.00				
Alcoholic beverages	0.01		0.01	0.01	0.01		0.01	0.01		0.00		0.00		0.01				
Soups / bouillon	1.26		1.25	1.20	2.95	6	1.29	1.33		1.41	4	0.96	6	1.03	8			
Bread and Cereals	7.49		7.86	7.71	13.52		5.41	6.30		1.27		1.40		1.86				
Bread and rolls	5.90	4	6.12	4	5.92	4	13.23	3	4.64	7	5.39	6	1.16	5	1.38	3	1.60	6
Breakfast cereals	1.03		1.16		1.20		0.06		0.32		0.40		0.00		0.00		0.00	
Flour	0.56		0.58		0.59		0.23		0.45		0.51		0.11		0.02		0.26	
Potatoes & Grains	10.09		10.48	10.78	1.82		7.88	9.44		0.71		1.07		1.43				
Rice and other grains	1.01		1.06		1.07		0.64		0.72		0.67		0.61	7	1.07	4	1.07	7
Starch roots, potatoes	5.52	6	5.58	5	5.76	5	0.30		5.21	5	6.40	4	0.08		0.00		0.10	
Pasta	3.56	9	3.84	9	3.95	9	0.88	10	1.95		2.37		0.02		0.00		0.26	
Vegetables & Fruits	5.24		4.87	5.00	1.54		7.27	8.55		1.74		1.14		1.91				
Vegetables	3.16		2.96		3.02		1.45	8	4.26	8	4.87	8	1.61	3	1.05	5	1.74	5
Fruits	1.85		1.67		1.73		0.00		2.88		3.55	10	0.00		0.00		0.01	
Olives & advocado	0.23		0.24		0.25		0.09		0.13		0.13	10	0.09		0.16		0.16	
Dairy & Soy products	7.04		6.26	6.44	1.10		11.46	13.90		0.14		0.27		1.41				
White milk and buttermilk	1.27		1.02		1.05		0.17		2.65		3.23		0.00		0.00		0.26	
Yogurt and fromage blanc (quark)	0.37		0.29		0.30		0.00		0.82		1.01		0.00		0.00		0.00	
Milk and yogurt beverages	0.44		0.37		0.39		0.01		0.81		0.99		0.05		0.02		0.06	
Soya beverages	2.12		2.24		2.32		0.01		1.46		1.80		0.00		0.00		0.01	
Cheese	2.21		1.78		1.82		0.37		4.66	6	5.70	5	0.09		0.25	7	0.18	
Desserts and puddings milk based	0.61		0.54		0.54		0.52		1.02		1.13		0.00		0.00		0.87	10
Other milk products	0.02		0.02		0.02		0.02		0.04		0.04		0.00		0.00		0.03	
Fat & Oil	7.08		7.30	7.55	0.13		5.87	7.19		0.08		0.05		0.19				
Margarine and lipids of mixed origins	3.75	8	4.06	8	4.20	8	0.08		2.02		2.47		0.00		0.00		0.08	
Butter and animal fats	3.33	10	3.24	10	3.35	10	0.05		3.85	10	4.72	9	0.08		0.05		0.11	
Meat/Fish/Egg/Meat alternative	32.40		32.08	31.17	54.50		34.16	21.35		93.37		94.74		86.50				
Meat	22.87	1	23.83	1	22.98	1	45.04	1	17.53	1	15.33	1	22.88	2	50.87	1	26.25	2
Fish products	2.99		1.41		1.24		5.68	4	11.84	2	0.99		70.21	1	43.63	2	54.12	1
Eggs	1.66		1.49		1.43		3.58	5	2.58		2.32		0.07		0.19	8	6.07	3
Meat substitutes and vegetarian products	0.73		0.77		0.80		0.08		0.48		0.59		0.01		0.05		0.05	
Nuts and seeds	3.89	7	4.33	7	4.46	7	0.06		1.44		1.76		0.17	9	0.00		0.00	
Pulses (excluding fresh peas, sweet corn and broad bean)	0.26		0.25		0.26		0.06		0.29		0.36		0.03		0.00		0.01	
Restgroup	27.82		28.45	28.68	24.45		24.30	29.06		1.29		0.36		5.67				
Cakes, pies, biscuits	10.67	2	10.78	2	10.52	2	20.88	2	10.05	3	11.81	2	0.03		0.12	10	4.02	4
Savoury snacks	5.72	5	5.39	6	5.56	6	0.42		7.56	4	9.32	3	0.01		0.00		0.02	
Sugar, honey, jam and syrup	0.12		0.11		0.11		0.04		0.19		0.24		0.00		0.00		0.00	
Confectionery non chocolate	0.19		0.21		0.22		0.00		0.06		0.07		0.00		0.00		0.00	
Chocolate	2.34		2.63		2.72		0.08		0.73		0.89		0.00		0.00		0.13	
Sauces	7.11	3	7.63	3	7.85	3	1.29	9	4.19	9	5.03	7	0.67	6	0.10		0.56	
Creams	0.14		0.11		0.11		0.04		0.31		0.38		0.00		0.00		0.06	
Miscellaneous	1.53		1.59		1.59		1.70	7	1.21		1.32		0.58	8	0.14	9	0.88	9

R, rank; PUFA, Polyunsaturated fatty acid; LA, Linoleic acid; ALA, alpha-linolenic acid; EPA, eicopentaenoic acid; DPA, docosapentaenoic acid; DHA, docosahexaenoic acid