



‘Feeding young children aged 1 to 5 years’

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Annex 12

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Annex 12: Milk substitution analyses

Table A12.1 Average per 100 gram values of liquid whole, semi skimmed, 1% and skimmed milk

Average	Whole milk ¹	Semi skimmed milk ¹	1% milk ²	Skimmed milk ¹
Energy (kcal)	63	46	41	34
Energy (kJ)	265	195	173	144
Fat (g)	3.6	1.7	1.0	0.3
Saturated fatty acids (g)	2.29	1.07	0.6	0.13
Calcium (mg)	120	120	123	125
Iodine (µg)	31	30	30	30
Vitamin A retinol equivalents (µg)	38	20	9	1
Riboflavin (mg)	0.23	0.24	0.23	0.22

Values from Composition of Foods Integrated Dataset (2019).

¹ Whole, semi-skimmed and skimmed milk pasteurised average: average of summer and winter values

² 1% milk – values calculated as average of skimmed and semi-skimmed

Annex 12: Milk substitution analyses

Table A12.2 Mean intakes of energy and nutrients before and after substitution of whole milk with semi skimmed milk in children aged 12 to 18 months – by 5th and 95th percentiles of whole milk consumption

Milk intake	Metric	Energy kcal/d		Energy_kJ/d		Fat g/d		Sat fat g/d		Calcium mg/d		Iodine µg/d		VitA µg/day		Riboflavin mg/day	
		Whole	Semi-skimmed	Whole	Semi-skimmed	Whole	Semi-skimmed	Whole	Semi-skimmed	Whole	Semi-skimmed	Whole	Semi-skimmed	Whole	Semi-skimmed	Whole	Semi-skimmed
No milk	mean	899	899	3786	3786	33.6	33.6	13.4	13.4	667	667	111	111	757	757	1.17	1.17
	median	906	906	3810	3810	32.5	32.5	12.6	12.6	615	615	97	97	680	680	1.08	1.08
	sd	216	216	909	909	10.5	10.5	4.9	4.9	268	268	55	55	403	403	0.49	0.49
	Base	268															
Lowest 5% milk consumption	mean	846	843	3561	3549	32.6	32.2	13.1	12.9	561	561	96	96	681	678	0.93	0.93
	median	828	825	3484	3469	31.6	31.3	12.4	12.1	570	570	91	91	619	615	0.95	0.95
	sd	217	217	913	912	10.0	10.0	4.7	4.7	176	176	34	34	471	471	0.36	0.37
	Base	54															
Middle 90% milk consumption	mean	975	920	4107	3882	38.3	32.3	18.1	14.2	824	824	167	164	709	652	1.54	1.57
	median	964	912	4063	3849	37.7	31.9	17.9	13.8	823	823	169	166	633	574	1.53	1.56
	sd	195	191	822	802	9.7	9.1	5.0	4.2	228	228	54	52	360	363	0.43	0.44
	Base	905															
Top 5% milk consumption	mean	1082	947	4556	4002	47.7	32.7	25.4	15.7	1262	1262	285	278	697	554	2.37	2.45
	median	1012	879	4270	3723	45.8	31.0	24.7	14.9	1218	1218	272	265	587	448	2.33	2.42
	sd	202	188	851	793	9.6	8.0	4.8	3.7	214	214	53	52	313	306	0.38	0.39
	Base	48															
All	mean	958	914	4034	3853	37.5	32.6	17.2	14.0	798	798	157	154	718	672	1.47	1.50
	median	954	906	4018	3814	36.9	32.0	16.9	13.7	781	781	154	151	637	584	1.44	1.46
	sd	206	198	867	832	10.3	9.4	5.6	4.4	264	264	65	63	373	377	0.51	0.53
	Base	1275															

Annex 12: Milk substitution analyses

Table A12.3 Mean intakes of energy and nutrients before and after substitution of whole milk with 1% fat milk in children aged 12 to 18 months – by 5th and 95th percentiles of milk consumption.

Milk intake	Metric	Energy kcal/d		Energy_kJ/d		Fat g/day		Sat fat g/day		Calcium mg/day		Iodine µg/day		VitA µg/day		Riboflavin mg/day	
		Whole	1%	Whole	1%	Whole	1%	Whole	1%	Whole	1%	Whole	1%	Whole	1%	Whole	1%
No milk	mean	899	899	3786	3786	33.6	33.6	13.4	13.4	667	667	111	111	757	757	1.17	1.17
	median	906	906	3810	3810	32.5	32.5	12.6	12.6	615	615	97	97	680	680	1.08	1.08
	sd	216	216	909	909	10.5	10.5	4.9	4.9	268	268	55	55	403	403	0.49	0.49
	Base	268															
Lowest 5% milk consumption	mean	846	842	3561	3545	32.6	32.1	13.1	12.8	561	562	96	96	681	676	0.93	0.93
	median	828	824	3484	3465	31.6	31.2	12.4	12.0	570	571	91	91	619	613	0.95	0.95
	sd	217	217	913	912	10.0	10.0	4.7	4.7	176	176	34	34	471	471	0.36	0.36
	Base	54															
Middle 90% milk consumption	mean	975	904	4107	3812	38.3	30.0	18.1	12.7	824	834	167	164	709	616	1.54	1.54
	median	964	898	4063	3782	37.7	29.5	17.9	12.3	823	832	169	166	633	543	1.53	1.53
	sd	195	190	822	800	9.7	9.3	5.0	4.2	228	231	54	52	360	367	0.43	0.43
	Base	905															
Top 5% milk consumption	mean	1082	907	4556	3828	47.7	27.1	25.4	12.0	1262	1285	285	278	697	467	2.37	2.37
	median	1012	839	4270	3547	45.8	25.5	24.7	11.3	1218	1244	272	265	587	363	2.33	2.33
	sd	202	184	851	776	9.6	7.6	4.8	3.4	214	218	53	52	313	303	0.38	0.38
	Base	48															
All	mean	958	901	4034	3796	37.5	30.7	17.2	12.8	798	805	157	154	718	643	1.47	1.47
	median	954	893	4018	3768	36.9	30.0	16.9	12.3	781	790	154	151	637	564	1.44	1.44
	sd	206	197	867	828	10.3	9.6	5.6	4.3	264	269	65	63	373	383	0.51	0.51
	Base	1275															

Annex 12: Milk substitution analyses

Table A12.4 Mean intakes of energy and nutrients before and after substitution of whole milk with skimmed milk in children aged 12 to 18 months – by 5th and 95th percentiles of milk consumption

Milk intake	Metric	Energy_kcal/d		Energy kJ/d		Fat mg/d		Sat fat g/d		Calcium mg/d		Iodine_µg/d		VitA_µg/d		Riboflavin mg/d	
		Whole	Skimmed	Whole	Skimmed	Whole	Skimmed	Whole	Skimmed	Whole	Skimmed	Whole	Skimmed	Whole	Skimmed	Whole	Skimmed
No milk	mean	899	899	3786	3786	33.6	33.6	13.4	13.4	667	667	111	111	757	757	1.17	1.17
	median	906	906	3810	3810	32.5	32.5	12.6	12.6	615	615	97	97	680	680	1.08	1.08
	sd	216	216	909	909	10.5	10.5	4.9	4.9	268	268	55	55	403	403	0.49	0.49
	Base	268															
Lowest 5% milk consumption	mean	846	841	3561	3540	32.6	32.0	13.1	12.7	561	562	96	96	681	674	0.93	0.93
	median	828	823	3484	3459	31.6	31.1	12.4	11.9	570	572	91	91	619	612	0.95	0.95
	sd	217	217	913	912	10.0	10.0	4.7	4.7	176	176	34	34	471	470	0.36	0.36
	Base	54															
Middle 90% milk consumption	mean	975	882	4107	3719	38.3	27.8	18.1	11.2	824	840	167	164	709	591	1.54	1.51
	median	964	877	4063	3698	37.7	27.0	17.9	10.7	823	838	169	166	633	518	1.53	1.49
	sd	195	190	822	800	9.7	9.6	5.0	4.3	228	233	54	52	360	370	0.43	0.42
	Base	905															
Top 5% milk consumption	mean	1082	852	4556	3598	47.7	21.6	25.4	8.3	1262	1301	285	278	697	404	2.37	2.30
	median	1012	783	4270	3314	45.8	20.6	24.7	7.7	1218	1261	272	265	587	316	2.33	2.25
	sd	202	179	851	755	9.6	7.2	4.8	3.2	214	220	53	52	313	301	0.38	0.37
	Base	48															
All	mean	958	883	4034	3721	37.5	28.9	17.2	11.6	798	811	157	154	718	622	1.47	1.45
	median	954	874	4018	3690	36.9	28.3	16.9	11.0	781	795	154	151	637	547	1.44	1.42
	sd	206	197	867	828	10.3	10.1	5.6	4.6	264	272	65	63	373	387	0.51	0.49
	Base	1275															

Annex 12: Milk substitution analyses

Table A12.5 Mean intakes of energy and nutrients before and after substitution of whole milk with semi-skimmed milk in children aged 12 to 18 months by 5th and 95th percentiles of energy intake

Milk intake	Metric	Energy kcal/d		Energy kJ/d		Fat_g/d		Satfat_g/d		Calcium_mg/d		Iodine_µg/d		VitA_µg/d		Riboflavin_mg/d	
		Whole	Semi-skimmed	Whole	Semi-skimmed	Whole	Semi-skimmed	Whole	Semi-skimmed	Whole	Semi-skimmed	Whole	Semi-skimmed	Whole	Semi-skimmed	Whole	Semi-skimmed
No milk	mean	899	899	3786	3786	33.6	33.6	13.4	13.4	667	667	111	111	757	757	1.17	1.17
	median	906	906	3810	3810	32.5	32.5	12.6	12.6	615	615	97	97	680	680	1.08	1.08
	sd	216	216	909	909	10.5	10.5	4.9	4.9	268	268	55	55	403	403	0.49	0.49
	Base	268															
Lowest 5% energy intake	mean	560	526	2360	2219	21.1	17.3	10.0	7.5	490	490	100	98	491	455	0.99	1.01
	median	595	546	2512	2306	22.1	16.6	10.1	7.2	473	473	89	88	399	389	0.95	0.98
	sd	116	111	488	467	5.9	5.2	3.4	2.3	191	191	48	46	302	300	0.45	0.47
	Base	50															
Middle 90% energy intake	mean	971	915	4092	3861	38.4	32.1	18.2	14.1	833	833	169	166	708	649	1.55	1.59
	median	963	906	4061	3814	38.1	31.9	17.9	13.8	824	824	169	166	629	568	1.53	1.56
	sd	150	145	633	612	8.2	7.6	4.7	3.6	226	226	57	55	360	365	0.44	0.46
	Base	905															
Top 5% energy intake	mean	1417	1343	5967	5663	57.8	49.6	26.9	21.6	1170	1170	233	229	902	824	2.10	2.14
	median	1380	1316	5797	5539	55.4	48.7	26.6	21.4	1125	1125	227	225	875	784	1.92	1.97
	sd	119	115	502	486	8.0	7.3	5.3	3.5	289	289	77	75	375	383	0.60	0.62
	Base	52															
All	mean	958	914	4034	3853	37.5	32.6	17.2	14.0	798	798	157	154	718	672	1.47	1.50
	median	954	906	4018	3814	36.9	32.0	16.9	13.7	781	781	154	151	637	584	1.44	1.46
	sd	206	198	867	832	10.3	9.4	5.6	4.4	264	264	65	63	373	377	0.51	0.53
	Base	1275															

Annex 12: Milk substitution analyses

Table A12.6 Mean intakes of energy and nutrients before and after substitution of whole milk with 1% fat milk in children aged 12 to 18 months by 5th and 95th percentiles of energy intake

Milk intake	Metric	Energy kcal/d		Energy kj/d		Fat g/day		Sat fat g/day		Calcium mg/d		Iodine µg/day		VitA_µg/day		Riboflavin mg/day	
		Whole	1%	Whole	1%	Whole	1%	Whole	1%	Whole	1%	Whole	1%	Whole	1%	Whole	1%
No milk	mean	899	899	3786	3786	33.6	33.6	13.4	13.4	667	667	111	111	757	757	1.17	1.17
	median	906	906	3810	3810	32.5	32.5	12.6	12.6	615	615	97	97	680	680	1.08	1.08
	sd	216	216	909	909	10.5	10.5	4.9	4.9	268	268	55	55	403	403	0.49	0.49
	Base	268															
Lowest 5%	mean	560	515	2360	2175	21.1	15.9	10.0	6.6	490	496	100	98	491	433	0.99	0.99
	median	595	531	2512	2240	22.1	14.7	10.1	6.3	473	478	89	88	399	387	0.95	0.95
	sd	116	111	488	468	5.9	5.5	3.4	2.3	191	195	48	46	302	301	0.45	0.45
	Base	50															
Middle 90%	mean	971	899	4092	3788	18.2	12.6	833	843	833	843	169	166	708	612	1.55	1.55
	median	963	891	4061	3763	17.9	12.2	824	832	824	832	169	166	629	540	1.53	1.53
	sd	150	146	633	613	4.7	3.7	226	231	226	231	57	55	360	369	0.44	0.44
	Base	905															
Top 5%	mean	1417	1322	5967	5568	57.8	46.5	26.9	19.6	1170	1183	233	229	902	776	2.10	2.10
	median	1380	1297	5797	5451	55.4	44.8	26.6	19.6	1125	1141	227	225	875	707	1.92	1.92
	sd	119	118	502	498	8.0	8.0	5.3	3.6	289	295	77	75	375	391	0.60	0.60
	Base	52															
All	mean	958	901	4034	3796	37.5	30.7	17.2	12.8	798	805	157	154	718	643	1.47	1.47
	median	954	893	4018	3768	36.9	30.0	16.9	12.3	781	790	154	151	637	564	1.44	1.44
	sd	206	197	867	828	10.3	9.6	5.6	4.3	264	269	65	63	373	383	0.51	0.51
	Base	1275															

Annex 12: Milk substitution analyses

Table A12.7 Mean intakes of energy and nutrients before and after substitution of whole milk with skimmed milk in children aged 12 to 18 months by 5th and 95th percentiles of energy intake

Milk intake	Metric	Energy_kcal/d		Energy_kJ/d		Fat g/d		Satfat g/d		Calcium g/d		Iodine µg/d		Vit A µg/d		Riboflavin mg/d	
		Whole	Skimmed	Whole	Skimmed	Whole	Skimmed	Whole	Skimmed	Whole	Skimmed	Whole	Skimmed	Whole	Skimmed	Whole	Skimmed
No milk	mean	899	899	3786	3786	33.6	33.6	13.4	13.	667	667	111	111	757	757	1.17	1.17
	median	906	906	3810	3810	32.5	32.5	12.6	12.6	615	615	97	97	680	680	1.08	1.08
	sd	216	216	909	909	10.5	10.5	4.9	4.9	268	268	55	55	403	403	0.49	0.49
	Base	268															
Lowest 5% energy intake	mean	560	501	2360	2116	21.1	14.5	10.0	5.6	490	500	100	98	491	417	0.99	0.97
	median	595	503	2512	2122	22.1	13.3	10.1	5.1	473	481	89	88	399	350	0.95	0.94
	sd	116	112	488	473	5.9	6.0	3.4	2.7	191	198	48	46	302	302	0.45	0.43
	Base	50															
Middle 90% energy intake	mean	971	875	4092	3692	38.4	27.5	18.2	11.0	833	850	169	166	708	586	1.55	1.52
	median	963	867	4061	3662	38.1	26.8	17.9	10.5	824	838	169	166	629	510	1.53	1.50
	sd	150	147	633	619	8.2	8.5	4.7	4.0	226	234	57	55	360	373	0.44	0.43
	Base	905															
Top 5% energy intake	mean	1417	1291	5967	5442	57.8	43.5	26.9	17.5	1170	1192	233	229	902	742	2.10	2.05
	median	1380	1268	5797	5333	55.4	42.0	26.6	17.4	1125	1151	227	225	875	655	1.92	1.87
	sd	119	125	502	525	8.0	9.1	5.3	4.2	289	299	77	75	375	398	0.60	0.58
	Base	52															
All	mean	958	883	4034	3721	37.5	28.9	17.2	11.6	798	811	157	154	718	622	1.47	1.45
	median	954	874	4018	3690	36.9	28.3	16.9	11.0	781	795	154	151	637	547	1.44	1.42
	sd	206	197	867	828	10.3	10.1	5.6	4.6	264	272	65	63	373	387	0.51	0.49
	Base	1275															

Annex 12: Milk substitution analyses

Table A12.8 Mean age (months) for 5th and 95th percentile whole milk consumption groups

Milk intake	mean	CI_lower	CI_upper	median	percentile_2.5	percentile_97.5	min	max	sd	Base
No milk	14.09	13.89	14.29	13.50	12.00	16.72	12.00	17.00	1.67	268
Lowest 5%	14.18	13.74	14.62	13.50	12.00	16.77	12.00	17.00	1.64	54
Middle 90%	14.47	14.36	14.58	14.50	12.00	16.81	12.00	17.00	1.65	905
Top 5%	14.07	13.59	14.55	13.50	12.00	16.69	12.00	17.00	1.70	48
All	14.36	14.27	14.45	13.50	12.00	16.79	12.00	17.00	1.66	1275

Table A12.9 Mean age (months) for 5th and 95th percentile energy intake groups

Milk intake	mean	CI_lower	CI_upper	median	percentile_2.5	percentile_97.5	min	max	sd	Base
No milk	14.09	13.89	14.29	13.50	12.00	16.72	12.00	17.00	1.67	268
Lowest 5%	14.12	13.72	14.53	13.50	12.00	15.93	12.00	17.00	1.47	50
Middle 90%	14.43	14.32	14.54	13.50	12.00	16.81	12.00	17.00	1.67	905
Top 5%	14.82	14.43	15.21	14.50	12.00	16.81	12.00	17.00	1.44	52
All	14.36	14.27	14.45	13.50	12.00	16.79	12.00	17.00	1.66	1275

Table A12.10 The number of children in both the low or high 5th percentile milk consumption group and in the high or low 5th percentile energy intake group

Energy intake		Whole milk consumption group (5.0 percentiles groups)			Total
		Lowest 5% consumers	Middle 90% consumers	Highest 5% consumers	
Energy intake group (kcal 5 percentile groups)	Lowest 5% kcals	8	42	0	50
	Middle 90% kcals	45	821	39	905
	Highest 5% kcals	1	42	9	52
Total		54	905	48	1007

Based on weighted data. Totals may not add up due to rounding.

Cases in both lowest 5% whole milk consumption group AND lowest 5% kcal energy group n = 8 cases.

Cases in both highest 5% whole milk consumption group AND highest 5% kcal energy group n = 9 cases.

Table A12.11 The % of participants below the LRNI for vitamin A in each group (before and after substitution) – in the low or high 5th percentile whole milk consumption groups.

Milk consumption			Below Vitamin A LRNI (before substitution)	Below Vitamin A LRNI (after substitution semi skimmed)	Below Vitamin A LRNI (after substitution 1%)	Below Vitamin A LRNI (after substitution skimmed)
Whole milk consumption group (5 percentiles)	No whole milk	%	4.6	4.6	4.6	4.6
	Lowest 5% consumers	%	9.3	9.3	9.3	9.3
	Middle 95% consumers	%	1.0	2.3	5.3	9.0
	Highest 5% consumers	%	0.0	0.0	11.2	25.2
Total			2.0	3.0	.6	8.7

Based on weighted data. Totals may not add up due to rounding.

Table A12.12 The % of participants below the LRNI for vitamin A in each group (before and after substitution) – 5th percentile energy intake groups

Milk consumption			Below Vitamin A LRNI (before substitution)	Below Vitamin A LRNI (after substitution semi skimmed)	Below Vitamin A LRNI (after substitution 1%)	Below Vitamin A LRNI (after substitution skimmed)
Energy intake group (kcal 5 percentile groups)	No whole milk	%	4.6	4.6	4.6	4.6
	Lowest 5% kcals	%	13.0	21.0	27.2	27.7
	Middle 90% kcals	%	0.8	1.7	5.0	9.0
	Highest 5% kcals	%	0.0	0.0	0.0	7.3
Total		%	2.0	3.0	5.6	8.7

Based on weighted data. Totals may not add up due to rounding.

Table A12.13 Proportion of survey participants meeting the estimated average requirement for energy

Original DNSIYC dataset	%
Less than EAR energy	13.6
More than EAR energy	86.4
Total	100.0
After substituting whole milk with semi skimmed milk	%
Less than EAR energy	17.7
More than EAR energy	82.3
Total	100.0
After substituting whole milk with 1% milk	%
Less than EAR energy	19.5
More than EAR energy	80.5
Total	100
After substituting whole milk with skimmed milk	%
Less than EAR energy	23.5
More than EAR energy	76.5
Total	100

Values calculated using UK weighted DNSIYC dataset