

Supplementary Table 1. Anthropometric measurements, maternal caffeine intake level and cohort retention.

Measurement	Target age	Age (months)		Cohort retention	Height (cm)		Cohort retention	Maternal caffeine intake level					
		Mean	N		Mean	N		Mean	N	Low	Average	High	Very high
1	6 months	1.5	49672	5.0	98%	39175	57	77%	49672	46%	44%	7%	3%
2	3 months	3.1	49912	6.4	98%	49122	62	96%	49912	46%	44%	7%	3%
3	5-6 months	5.6	47047	7.9	92%	46640	68	92%	47047	46%	44%	7%	3%
4	8 months	8.2	37612	8.8	74%	37493	71	74%	37612	47%	43%	7%	3%
5	1 year	12.2	38660	9.9	76%	39046	76	77%	38660	47%	43%	7%	3%
6	15-18 months	15.9	38757	10.9	76%	38842	81	76%	38757	47%	43%	7%	3%
7	2 years	25.3	20485	13.0	40%	20855	89	41%	20485	48%	42%	7%	3%
8	3 years	36.0	30588	15.1	60%	29747	97	58%	30588	47%	43%	7%	3%
9	5 years	62.1	19340	20.0	38%	19768	113	39%	19340	46%	44%	7%	3%
10	7 years	84.7	18699	25.1	37%	19550	126	38%	18699	47%	43%	7%	3%
11	8 years	97.0	11685	28.7	23%	12312	132	24%	11685	47%	42%	7%	4%

Supplementary Table 2. Estimation of caffeine intake during pregnancy in the Norwegian Mother and Child Cohort Study.

Food item containing caffeine	Reported frequency	Serving	Caffeine concentration (mg/100g of food)
Filtered coffee	Cups per day, week or months	1 cup (125ml)	57
Boiled/pressed coffee	Cups per day, week or months	1 cup (125ml)	57
Powdered instant coffee	Cups per day, week or months	1 cup (125ml)	40
Decaffeinated coffee	Cups per day, week or months	1 cup (125ml)	2
Caffe latte/cappuccino	Cups per day, week or months	1 cup (125ml)	21
Espresso	Cups per day, week or months	1 cup (125ml)	114
Black tea	Cups per day, week or months	1 cup (250ml)	16
Caffeinated soft drinks, sugar sweetened and artificially sweetened	Cups per day, week or months	1 glass (250 ml)	12
Energy drink	Cups per day, week or months	1 glass (250 ml)	15
Chocolate milk	Cups per day, week or months	1 glass (250 ml)	15
Chocolate, medium dark			38
Sandwich spreads with cocoa			13
Deserts with coca			3
Cakes with cocoa			4
Sweets with cocoa			9

Supplementary Table 3. Definitions of overweight and obesity

Reference	Description	Age (years)	Overweight and/or obesity (kg/m ²)		Prevalence (%) ^a	
			Males	Females	Males	Females
International Obesity Task Force (IOTF) ¹	Study-specific BMIs	3	17.89	17.56	10.77	12.44
(BMJ 2000 May 6; 320 (7244); 1240-Table 4)	were calculated for age and sex	5	17.42	17.15	14.30	18.28
		8	18.44	18.35	3.61	5.24

^aBased on BMI calculated from the predicted anthropometric data.

From Cole TJ, Bellizzi MC, Flegal KM, Dietz WH. Establishing a standard definition for child overweight and obesity worldwide: international survey. *BMJ*. 2000;320(7244):1240-1243

Supplementary Table 4. Parental and pregnancy-related characteristics by category of maternal caffeine intake during pregnancy (n=50,943)

	Maternal caffeine intake during pregnancy							
	Low caffeine intake (<50mg/day) N=23,437		Average caffeine intake (50-199mg/day) N=22,239		High caffeine intake (200-299mg/day) N=3,633		Very high caffeine intake (≥300mg/day) N=1,634	
	N	%	N	%	N	%	N	%
Maternal age (years)								
<20	247	1.1	94	0.4	20	0.6	6	0.4
20-29	12,426	53.0	8,643	38.9	1,185	32.6	474	29.0
≥30	10,764	45.9	13,502	60.7	2,428	66.8	1,154	70.6
Maternal education (years)								
<13	7,025	30.0	5,993	27.0	1,142	31.4	755	46.2
13-16	10,725	45.7	9,538	42.9	1,512	42.6	623	38.1
>16	5,687	24.3	6,708	30.1	979	27.0	256	15.7
Parity								
Primiparous	14,260	60.8	11,053	49.7	1,492	41.1	492	30.1
Multiparous	9,177	39.2	11,186	50.3	2,141	58.9	1,142	69.9
Pre-pregnancy BMI (kg/m ²)								
<18.5	690	2.9	644	2.9	89	2.5	44	2.7
18.5-24.9	15,466	66.0	14,893	67.0	2,416	66.5	999	61.1
25-29.9	5,071	21.6	4,838	21.7	785	21.6	406	24.9
≥30	2,210	9.4	1,864	8.4	343	9.4	185	11.3
Maternal daily energy intake (in tertiles, kcal)								
<2,000	9,211	39.3	6,791	30.5	802	22.1	347	21.2
2,000-2,500	7,803	33.3	7,619	34.3	1,137	31.3	458	28.1
>2,500	6,423	27.4	7,829	35.2	1,694	46.6	829	50.7
Maternal smoking during pregnancy								
Never	22,500	96.0	20,532	92.3	3,005	82.7	999	61.1
Ever	937	4.0	1,707	7.7	628	17.3	635	38.9
Nausea/vomiting in pregnancy								
Never	6,057	25.8	6,949	31.3	1,358	37.4	673	41.2
Ever	17,380	74.2	15,290	68.7	2,275	62.6	961	58.8
Paternal BMI (kg/m ²)								
<18.5	51	0.2	47	0.2	13	0.3	5	0.3
18.5-24.9	10,538	44.6	9,831	44.2	1,547	42.6	661	40.4
25-29.9	10,526	45.3	10,254	46.1	1,699	46.8	756	46.3
≥30	2,322	9.9	2,107	9.5	374	10.3	212	13.0
Paternal smoking during pregnancy								
Never	19,338	82.5	18,029	81.1	2,752	75.7	1,007	61.6
Ever	4,099	17.5	4,210	18.9	881	24.3	627	38.4

Paternal caffeine intake								
1 st quartile	2,253	(29%)	1,504	(20%)	168	(15%)	44	(14%)
2 nd quartile	1,605	(21%)	1,495	(20%)	202	(18%)	51	(16%)
3 rd quartile	1,950	(26%)	2,186	(30%)	356	(33%)	82	(25%)
4 th quartile	1,832	(24%)	2,211	(30%)	371	(34%)	145	(45%)
Child's gender								
Boys	11,821	50.4	11,430	51.4	1,871	51.5	820	50.2
Girls	11,616	49.6	10,809	48.6	1,762	48.5	814	49.8
Gestational age								
(in weeks, median, IQR)	40.1	1.9	40.3	1.9	40.3	1.9	40.3	1.7

p-value < 10⁻⁵ of chi square tests of all cross-tabulations presented in table

¹IOM : Institute of Medicine

Supplementary Table 5. Maternal caffeine intake in pregnancy and risk of overweight/obesity at age 3, 5 and 8 years, after adjustment for birth weight.

Maternal daily caffeine intake	Risk of overweight and/or obesity ^a , after additional adjustment for birth weight					
	Age 3 years		Age 5 years		Age 8 years	
	OR	95%CI	OR	95%CI	OR	95%CI
Low (<50 mg)	1.00		1.00		1.00	
Average (50-199 mg)	1.08	1.02,1.15	1.03	0.97,1.08	0.97	0.88,1.06
High (200-299 mg)	1.21	1.09,1.36	1.16	1.05,1.28	1.14	0.96,1.34
Very high (≥300 mg)	1.53	1.32,1.78	1.36	1.19,1.55	1.35	1.09,1.68

The same population was included at each age since the outcome was defined using model-derived anthropometrics.

All models adjusted for maternal age, parity, parental education, pre-pregnancy BMI, total energy intake, nausea and/or vomiting during pregnancy, paternal BMI, parental smoking during pregnancy, gestational age, gender and birth weight

^a Overweight and/or obesity in children, according to the International Obesity Task Force definition

Supplementary Table 6. Maternal caffeine intake during pregnancy from different sources and risk of excess growth in infancy (from birth to age 12 months) and overweight/obesity at age 3, 5 and 8 years

	Child's growth parameters											
	Excess growth ^a			Overweight/obesity at age 3 years ^b			Overweight/obesity at age 5 years ^b			Overweight/obesity at age 8 years ^b		
	OR	95%	CI	OR	95%	CI	OR	95%	CI	OR	95%	CI
Caffeine from black coffee												
0-50	1.00			1.00			1.00			1.00		
50-200	1.18	1.11	1.26	1.18	1.11	1.26	1.12	1.05	1.18	1.11	1.00	1.23
200-300	1.31	1.06	1.62	1.14	0.91	1.41	1.11	0.92	1.34	1.09	0.77	1.53
>300	1.72	1.45	2.03	1.69	1.44	1.99	1.39	1.20	1.61	1.48	1.17	1.88
Caffeine from black tea												
0-50	1.00			1.00			1.00			1.00		
50-200	1.11	1.01	1.21	1.07	0.98	1.18	1.05	0.97	1.14	1.20	1.04	1.38
200-300	1.74	0.93	3.25	1.16	0.56	2.40	1.22	0.65	2.31	0.28	0.04	2.07
>300	1.67	0.50	5.54	0.86	0.20	3.75	0.86	0.25	2.97	NE		
Caffeine from soda drinks												
0-50	1.00			1.00			1.00			1.00		
50-200	1.20	1.08	1.33	0.96	0.86	1.07	0.96	0.88	1.06	1.01	0.87	1.18
200-300	1.40	0.95	2.06	1.13	0.77	1.65	1.18	0.84	1.65	1.48	0.91	2.41
>300	1.21	0.22	6.58	0.48	0.06	3.79	0.73	0.16	3.34	NE		

NE: not estimated

^a Excess growth is defined as a WHO weight-for-age z-score difference >0.67 between birth and age 12 months. Model adjusted for maternal age, parity, parental education, pre-pregnancy BMI, total energy intake, nausea and/or vomiting during pregnancy, paternal BMI, parental smoking during pregnancy, gestational age and gender, and mutually adjusted for maternal caffeine intake from black coffee, black tea and soda drinks.

^b Overweight and/or obesity, according to International Obesity Task Force definition.

All models adjusted for maternal age, parity, parental education, pre-pregnancy BMI, total energy intake, nausea and/or vomiting during pregnancy, paternal BMI, parental smoking during pregnancy, gestational age, gender and birth weight, and mutually adjusted for maternal caffeine intake from black coffee, black tea and soda drinks.

Supplementary Table 7. Sensitivity after excluding very high caffeine drinkers and using no black coffee drinkers (n=23,402) as the reference group.

	No coffee drinkers OR (95%CI)	Caffeine intake <199mg OR (95%CI)	Caffeine intake 200-299mg OR (95%CI)
Excess infant growth	1.00	1.07 (1.01,1.13)	1.25 (1.12,1.39)
Overweight			
3 years	1.00	1.12 (1.06,1.19)	1.21 (1.08,1.35)
5 years	1.00	1.08 (1.03,1.14)	1.17 (1.06,1.29)
8 years	1.00	1.02 (0.93,1.12)	1.15 (0.98,1.36)

^a Excess growth is defined as a WHO weight-for-age z-score difference >0.67 between birth and age 12 months.

^b Overweight and/or obesity, according to International Obesity Task Force definition.

Models adjusted for maternal age, parity, parental education, pre-pregnancy BMI, total energy intake, nausea and/or vomiting during pregnancy, paternal BMI, parental smoking during pregnancy, gestational age and gender.

Supplementary Table 8. Maternal caffeine intake in early pregnancy and risk of overweight/obesity at pre-school (3-5 years) and school (6-8 years) age, using measured anthropometric values

Maternal daily caffeine intake	Risk of overweight and/or obesity at pre-school and school age ^a					
	Pre-school age (n=31,482)			School age (n=19,722)		
	N/% cases	OR	95% CI	N/% cases	OR	95% CI
Low (<50 mg)	14,723/13	1.00		9,204/12	1.00	
Average (50-199 mg)	13,706/14	1.06	0.99,1.14	8,471/12	1.03	0.93,1.13
High (200-299 mg)	2,135/16	1.21	1.07,1.39	1,386/14	1.13	0.95,1.35
Very high (≥300 mg)	918/20	1.52	1.27,1.81	664/18	1.32	1.04,1.66

All models adjusted for maternal age, parity, parental education, pre-pregnancy BMI, total energy intake, nausea and/or vomiting during pregnancy, paternal BMI, parental smoking during pregnancy, gestational age and gender

^a Overweight and/or obesity, according to International Obesity Task Force definition.

Supplementary Table 9. Maternal caffeine intake in early pregnancy and child's height and height gain velocity during childhood

Maternal daily caffeine intake	Child's developmental period						
	Infancy		Toddlerhood		Pre-school age		School age
	3 m	6 m	12 m	18 m	3 y	5 y	8 y
	Beta	Beta	Beta	Beta	Beta	Beta	Beta
	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)
<i>Height (in cm)</i>							
Average (50-199 mg)	0.00 (-0.03,0.03)	0.00 (-0.04,0.03)	-0.03 (-0.07,0.02)	-0.04 (-0.09,0.00)	-0.05 (-0.10,0.01)	-0.02 (-0.09,0.05)	0.02 (-0.07,0.10)
High (200-299 mg)	-0.01 (-0.07,0.05)	-0.01 (-0.07,0.06)	-0.04 (-0.12,0.04)	-0.07 (-0.15,0.02)	-0.09 (-0.20,0.01)	-0.08 (-0.21,0.05)	-0.05 (-0.21,0.12)
Very high (≥ 300 mg)	-0.03 (-0.12,0.05)	-0.01 (-0.10,0.09)	0.00 (-0.12,0.11)	-0.02 (-0.15,0.10)	-0.09 (-0.24,0.07)	-0.13 (-0.31,0.06)	-0.17 (-0.41,0.07)
<i>Height gain velocity (in mm/month)</i>							
Average (50-199 mg)	0.05 (0.02,0.09)	-0.01 (-0.05,0.02)	-0.03 (-0.07,0.01)	-0.01 (-0.05,0.03)	0.02 (-0.02,0.06)	0.02 (-0.02,0.06)	0.02 (-0.02,0.07)
High (200-299 mg)	0.08 (0.01,0.14)	-0.01 (-0.08,0.05)	-0.05 (-0.12,0.02)	-0.04 (-0.11,0.04)	0.01 (-0.07,0.08)	0.02 (-0.06,0.09)	0.02 (-0.06,0.10)
Very high (≥ 300 mg)	0.11 (0.01,0.21)	0.04 (-0.06,0.14)	-0.04 (-0.14,0.06)	-0.06 (-0.16,0.05)	-0.04 (-0.15,0.07)	-0.03 (-0.14,0.08)	-0.03 (-0.15,0.09)

Abbreviations: Beta: beta coefficients, CI: confidence intervals

Effect estimates derive from linear mixed effect models with input of all anthropometric information from age 1 month to 8 years and adjusted for maternal age, parity, maternal education, pre-pregnancy BMI, nausea and/or vomiting during pregnancy, maternal smoking during pregnancy, gestational age, gender and birth weight