

Supplementary Material

Cohort-based reference values for serum ferritin and transferrin and longitudinal determinants of iron status in European children aged 3 to 15 years

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Supplementary Table 1: Final selected GAMLSS models for estimation of serum ferritin and transferrin percentile curves

Sex	Covariates	Distribution	μ	$\log(\sigma)$	ν	$\log(\tau)$
Ferritin						
Male	Age	BCCG	cs(df = 1)	const.	const.	-
Female		BCCG	cs(df = 1)	const.	const.	-
Male	BMI-z-score	BCCG	cs(df = 1)	const.	const.	-
Female		BCCG	linear	const.	const.	-
Transferrin						
Male	Age	BCCG	cs(df = 1)	const.	const.	-
Female		BCT	cs(df = 1)	const.	const.	const.
Male	BMI-z-score	BCCG	linear	linear	const.	-
Female		BCT	linear	const.	const.	const.

BCT: Box-Cox-t; BCCG: Box-Cox-Cole-and-Green; cs: cubic smoothing spline; df: additional degree of freedom

Supplementary Table 2: Descriptive characteristics of the IDEFICS/I.Family study sample for the longitudinal analysis; pooled sample and stratified by sex (continuous variables)

	<u>W0 (2007-2008)</u>					<u>W3 (2013/2014)</u>				
	N	Q25	Median	Mean	Q75	N	Q25	Median	Mean	Q75
All:										
Ferritin [$\mu\text{g/L}$]	810	21.0	29.5	34.3	42.0	812	23.0	33	36.4	44.0
Transferrin [g/L]	812	2.60	2.8	2.81	3.00	812	2.60	2.8	2.85	3.10
Age [years]	812	4.50	6.4	6.12	7.70	812	10.30	12	11.92	13.60
BMI z-score*	812	-0.56	0.1	0.18	0.85	812	-0.34	0.38	0.41	1.16
Waist-to-height	799	0.43	0.45	0.46	0.48	806	0.40	0.42	0.43	0.46
Usual energy intake [kcal/day] ¹	530	1460	1615	1616	1753	812	1375	1544	1564	1742
Usual total iron intake [mg/day] ¹	530	8.0	8.8	8.9	9.6	812	7.9	9.1	9.2	10.4
Usual iron intake from heme sources [mg/day] ¹	530	1.2	1.4	1.4	1.8	812	1.2	1.5	1.5	1.8
Usual vitamin C intake [mg/day] ¹	530	58	68	69	78	812	49	61	62	72
Boys:										
Ferritin [$\mu\text{g/L}$]	410	19.0	27	33.4	40.0	410	23.0	33	37.0	44.0
Transferrin [g/L]	410	2.60	2.8	2.84	3.10	410	2.60	2.8	2.85	3.10
Age [years]	410	4.50	6.35	6.12	7.70	410	10.30	12	11.91	13.60
BMI z-score*	410	-0.62	0.09	0.16	0.85	410	-0.37	0.42	0.45	1.27
Waist-to-height	405	0.43	0.45	0.46	0.48	406	0.40	0.43	0.44	0.46
Usual energy intake [kcal/day] ¹	277	1566	1665	1688	1804	410	1443	1624	1638	1842
Usual total iron intake [mg/day] ¹	277	8.5	9.1	9.2	10.0	410	8.2	9.5	9.5	10.7
Usual iron intake from heme sources [mg/day] ¹	277	1.1	1.6	1.4	1.9	410	1.3	1.6	1.7	1.9
Usual vitamin C intake [mg/day] ¹	277	63	73	74	83	410	48	60	61	71
Girls:										
Ferritin [$\mu\text{g/L}$]	400	24.0	31.5	35.3	43.3	402	23.0	32	35.6	44.0
Transferrin [g/L]	402	2.60	2.8	2.78	3.00	402	2.60	2.8	2.85	3.10
Age [years]	402	4.60	6.4	6.13	7.70	402	10.33	12.1	11.94	13.57
BMI z-score*	402	-0.48	0.12	0.20	0.87	402	-0.31	0.31	0.37	1.05
Waist-to-height	394	0.42	0.45	0.45	0.48	400	0.39	0.42	0.43	0.45
Usual energy intake [kcal/day] ¹	253	1368	1510	1536	1681	402	1333	1473	1489	1638
Usual total iron intake [mg/day] ¹	253	7.8	8.4	8.5	9.1	402	7.5	8.7	8.9	9.9
Usual iron intake from heme sources [mg/day] ¹	253	1.2	1.3	1.4	1.5	402	1.0	1.3	1.4	1.7
Usual vitamin C intake [mg/day] ¹	253	53	62	63	71	402	51	62	63	72

¹Usual dietary intakes of total energy, total iron, iron from heme sources and vitamin C were estimated from 24h dietary recalls linked to food composition tables.

Abbreviations: IDEFICS: Identification and Prevention of Dietary- and Lifestyle-Induced Health Effects in Children and Infants. W0, first examination wave; W3, third examination wave.

Supplementary Table 3. Age-specific reference percentiles of serum ferritin concentrations [$\mu\text{g/L}$] in European children aged 3 to 15 years from the IDEFICS/I.Family cohort (N=3390)

Female (n=1635)						Male (n=1755)					
Age (y)	P5	P25	P50	P75	P95	P5	P25	P50	P75	P95	Age (y)
3.0	12.8	19.7	27.1	37.8	62.8	10.9	16.5	22.8	32.5	58.2	3.0
3.1	12.9	19.9	27.3	38.0	63.1	11.0	16.7	22.9	32.7	58.6	3.1
3.2	13.0	20.0	27.4	38.2	63.5	11.1	16.8	23.1	32.9	59.0	3.2
3.3	13.0	20.1	27.6	38.4	63.8	11.2	16.9	23.3	33.1	59.4	3.3
3.4	13.1	20.2	27.7	38.6	64.2	11.2	17.0	23.4	33.4	59.9	3.4
3.5	13.2	20.3	27.9	38.9	64.5	11.3	17.1	23.6	33.6	60.3	3.5
3.6	13.2	20.4	28.0	39.1	64.9	11.4	17.2	23.8	33.8	60.7	3.6
3.7	13.3	20.5	28.2	39.3	65.3	11.5	17.4	23.9	34.1	61.1	3.7
3.8	13.4	20.6	28.3	39.5	65.6	11.6	17.5	24.1	34.3	61.5	3.8
3.9	13.5	20.7	28.5	39.7	66.0	11.6	17.6	24.2	34.5	61.9	3.9
4.0	13.5	20.8	28.6	39.9	66.3	11.7	17.7	24.4	34.8	62.3	4.0
4.1	13.6	21.0	28.8	40.1	66.6	11.8	17.8	24.6	35.0	62.8	4.1
4.2	13.7	21.1	28.9	40.3	67.0	11.9	18.0	24.7	35.2	63.2	4.2
4.3	13.7	21.2	29.1	40.5	67.3	12.0	18.1	24.9	35.5	63.6	4.3
4.4	13.8	21.3	29.2	40.7	67.7	12.0	18.2	25.1	35.7	64.0	4.4
4.5	13.9	21.4	29.4	40.9	68.0	12.1	18.3	25.2	35.9	64.4	4.5
4.6	13.9	21.5	29.5	41.1	68.3	12.2	18.4	25.4	36.1	64.8	4.6
4.7	14.0	21.6	29.6	41.3	68.7	12.3	18.5	25.5	36.4	65.2	4.7
4.8	14.1	21.7	29.8	41.5	69.0	12.3	18.7	25.7	36.6	65.7	4.8
4.9	14.1	21.8	29.9	41.7	69.3	12.4	18.8	25.9	36.8	66.1	4.9
5.0	14.2	21.9	30.1	41.9	69.6	12.5	18.9	26.0	37.1	66.5	5.0
5.1	14.3	22.0	30.2	42.1	69.9	12.6	19.0	26.2	37.3	66.9	5.1
5.2	14.3	22.1	30.3	42.3	70.3	12.7	19.1	26.3	37.5	67.3	5.2
5.3	14.4	22.2	30.5	42.5	70.6	12.7	19.2	26.5	37.8	67.7	5.3

5.4	14.5	22.3	30.6	42.6	70.9	12.8	19.4	26.7	38.0	68.1	5.4
5.5	14.5	22.4	30.7	42.8	71.1	12.9	19.5	26.8	38.2	68.5	5.5
5.6	14.6	22.5	30.8	43.0	71.4	13.0	19.6	27.0	38.4	68.9	5.6
5.7	14.6	22.5	31.0	43.2	71.7	13.0	19.7	27.1	38.7	69.3	5.7
5.8	14.7	22.6	31.1	43.3	72.0	13.1	19.8	27.3	38.9	69.7	5.8
5.9	14.7	22.7	31.2	43.5	72.3	13.2	19.9	27.5	39.1	70.1	5.9
6.0	14.8	22.8	31.3	43.7	72.5	13.3	20.0	27.6	39.3	70.5	6.0
6.1	14.9	22.9	31.4	43.8	72.8	13.3	20.1	27.8	39.5	70.9	6.1
6.2	14.9	23.0	31.5	44.0	73.0	13.4	20.3	27.9	39.8	71.3	6.2
6.3	15.0	23.0	31.6	44.1	73.3	13.5	20.4	28.1	40.0	71.7	6.3
6.4	15.0	23.1	31.7	44.2	73.5	13.5	20.5	28.2	40.2	72.0	6.4
6.5	15.0	23.2	31.8	44.4	73.7	13.6	20.6	28.3	40.4	72.4	6.5
6.6	15.1	23.2	31.9	44.5	73.9	13.7	20.7	28.5	40.6	72.8	6.6
6.7	15.1	23.3	32.0	44.6	74.1	13.7	20.8	28.6	40.8	73.1	6.7
6.8	15.2	23.4	32.1	44.7	74.3	13.8	20.9	28.8	41.0	73.5	6.8
6.9	15.2	23.4	32.2	44.9	74.5	13.9	21.0	28.9	41.2	73.9	6.9
7.0	15.2	23.5	32.3	45.0	74.7	13.9	21.1	29.0	41.4	74.2	7.0
7.1	15.3	23.5	32.3	45.1	74.9	14.0	21.2	29.2	41.6	74.5	7.1
7.2	15.3	23.6	32.4	45.2	75.0	14.1	21.3	29.3	41.7	74.9	7.2
7.3	15.3	23.6	32.5	45.3	75.2	14.1	21.4	29.4	41.9	75.2	7.3
7.4	15.4	23.7	32.5	45.4	75.3	14.2	21.5	29.6	42.1	75.5	7.4
7.5	15.4	23.7	32.6	45.4	75.5	14.2	21.5	29.7	42.3	75.8	7.5
7.6	15.4	23.8	32.6	45.5	75.6	14.3	21.6	29.8	42.4	76.1	7.6
7.7	15.5	23.8	32.7	45.6	75.7	14.4	21.7	29.9	42.6	76.4	7.7
7.8	15.5	23.8	32.7	45.6	75.8	14.4	21.8	30.0	42.8	76.7	7.8
7.9	15.5	23.9	32.8	45.7	75.9	14.5	21.9	30.1	42.9	77.0	7.9
8.0	15.5	23.9	32.8	45.7	76.0	14.5	22.0	30.2	43.1	77.2	8.0
8.1	15.5	23.9	32.8	45.8	76.1	14.6	22.0	30.3	43.2	77.5	8.1
8.2	15.5	23.9	32.9	45.8	76.1	14.6	22.1	30.4	43.4	77.8	8.2

8.3	15.5	24.0	32.9	45.9	76.2	14.7	22.2	30.5	43.5	78.0	8.3
8.4	15.6	24.0	32.9	45.9	76.2	14.7	22.2	30.6	43.6	78.2	8.4
8.5	15.6	24.0	32.9	45.9	76.2	14.7	22.3	30.7	43.8	78.5	8.5
8.6	15.6	24.0	32.9	45.9	76.3	14.8	22.4	30.8	43.9	78.7	8.6
8.7	15.6	24.0	32.9	45.9	76.3	14.8	22.4	30.9	44.0	78.9	8.7
8.8	15.6	24.0	32.9	45.9	76.2	14.9	22.5	31.0	44.1	79.1	8.8
8.9	15.6	24.0	32.9	45.9	76.2	14.9	22.5	31.0	44.2	79.3	8.9
9.0	15.5	24.0	32.9	45.9	76.2	14.9	22.6	31.1	44.3	79.5	9.0
9.1	15.5	23.9	32.9	45.8	76.2	15.0	22.6	31.2	44.4	79.6	9.1
9.2	15.5	23.9	32.9	45.8	76.1	15.0	22.7	31.2	44.5	79.8	9.2
9.3	15.5	23.9	32.8	45.8	76.0	15.0	22.7	31.3	44.6	80.0	9.3
9.4	15.5	23.9	32.8	45.7	76.0	15.1	22.8	31.4	44.7	80.1	9.4
9.5	15.5	23.9	32.8	45.7	75.9	15.1	22.8	31.4	44.7	80.2	9.5
9.6	15.5	23.8	32.7	45.6	75.8	15.1	22.8	31.5	44.8	80.4	9.6
9.7	15.4	23.8	32.7	45.5	75.6	15.1	22.9	31.5	44.9	80.5	9.7
9.8	15.4	23.7	32.6	45.5	75.5	15.1	22.9	31.5	44.9	80.6	9.8
9.9	15.4	23.7	32.5	45.4	75.4	15.2	22.9	31.6	45.0	80.7	9.9
10.0	15.4	23.7	32.5	45.3	75.2	15.2	23.0	31.6	45.0	80.8	10.0
10.1	15.3	23.6	32.4	45.2	75.1	15.2	23.0	31.6	45.1	80.8	10.1
10.2	15.3	23.6	32.3	45.1	74.9	15.2	23.0	31.7	45.1	80.9	10.2
10.3	15.2	23.5	32.3	45.0	74.7	15.2	23.0	31.7	45.1	81.0	10.3
10.4	15.2	23.4	32.2	44.9	74.5	15.2	23.0	31.7	45.2	81.0	10.4
10.5	15.2	23.4	32.1	44.7	74.3	15.2	23.0	31.7	45.2	81.0	10.5
10.6	15.1	23.3	32.0	44.6	74.1	15.2	23.0	31.7	45.2	81.0	10.6
10.7	15.1	23.2	31.9	44.5	73.9	15.2	23.0	31.7	45.2	81.1	10.7
10.8	15.0	23.2	31.8	44.3	73.7	15.2	23.0	31.7	45.2	81.1	10.8
10.9	15.0	23.1	31.7	44.2	73.4	15.2	23.0	31.7	45.2	81.1	10.9
11.0	14.9	23.0	31.6	44.0	73.2	15.2	23.0	31.7	45.2	81.0	11.0
11.1	14.9	22.9	31.5	43.9	72.9	15.2	23.0	31.7	45.2	81.0	11.1

11.2	14.8	22.8	31.4	43.7	72.6	15.2	23.0	31.7	45.1	81.0	11.2
11.3	14.8	22.8	31.2	43.6	72.4	15.2	23.0	31.7	45.1	80.9	11.3
11.4	14.7	22.7	31.1	43.4	72.1	15.2	23.0	31.7	45.1	80.9	11.4
11.5	14.7	22.6	31.0	43.2	71.8	15.2	23.0	31.6	45.1	80.8	11.5
11.6	14.6	22.5	30.9	43.0	71.5	15.2	22.9	31.6	45.0	80.7	11.6
11.7	14.5	22.4	30.7	42.9	71.2	15.2	22.9	31.6	45.0	80.6	11.7
11.8	14.5	22.3	30.6	42.7	70.9	15.1	22.9	31.5	44.9	80.6	11.8
11.9	14.4	22.2	30.5	42.5	70.6	15.1	22.9	31.5	44.9	80.5	11.9
12.0	14.3	22.1	30.3	42.3	70.3	15.1	22.8	31.5	44.8	80.3	12.0
12.1	14.3	22.0	30.2	42.1	69.9	15.1	22.8	31.4	44.7	80.2	12.1
12.2	14.2	21.9	30.1	41.9	69.6	15.1	22.8	31.4	44.7	80.1	12.2
12.3	14.1	21.8	29.9	41.7	69.3	15.0	22.7	31.3	44.6	80.0	12.3
12.4	14.1	21.7	29.8	41.5	68.9	15.0	22.7	31.3	44.5	79.9	12.4
12.5	14.0	21.6	29.6	41.3	68.6	15.0	22.7	31.2	44.5	79.7	12.5
12.6	13.9	21.5	29.5	41.1	68.2	15.0	22.6	31.2	44.4	79.6	12.6
12.7	13.9	21.3	29.3	40.9	67.9	14.9	22.6	31.1	44.3	79.4	12.7
12.8	13.8	21.2	29.2	40.6	67.5	14.9	22.5	31.0	44.2	79.3	12.8
12.9	13.7	21.1	29.0	40.4	67.2	14.9	22.5	31.0	44.1	79.1	12.9
13.0	13.6	21.0	28.8	40.2	66.8	14.8	22.4	30.9	44.0	79.0	13.0
13.1	13.6	20.9	28.7	40.0	66.4	14.8	22.4	30.9	44.0	78.8	13.1
13.2	13.5	20.8	28.5	39.8	66.1	14.8	22.4	30.8	43.9	78.7	13.2
13.3	13.4	20.7	28.4	39.6	65.7	14.8	22.3	30.7	43.8	78.5	13.3
13.4	13.3	20.5	28.2	39.3	65.3	14.7	22.3	30.7	43.7	78.3	13.4
13.5	13.3	20.4	28.1	39.1	65.0	14.7	22.2	30.6	43.6	78.2	13.5
13.6	13.2	20.3	27.9	38.9	64.6	14.7	22.2	30.5	43.5	78.0	13.6
13.7	13.1	20.2	27.7	38.7	64.2	14.6	22.1	30.5	43.4	77.8	13.7
13.8	13.0	20.1	27.6	38.4	63.9	14.6	22.1	30.4	43.3	77.7	13.8
13.9	13.0	20.0	27.4	38.2	63.5	14.6	22.0	30.3	43.2	77.5	13.9
14.0	12.9	19.9	27.3	38.0	63.1	14.5	22.0	30.3	43.1	77.4	14.0

14.1	12.8	19.7	27.1	37.8	62.8	14.5	21.9	30.2	43.0	77.2	14.1
14.2	12.7	19.6	26.9	37.6	62.4	14.5	21.9	30.2	42.9	77.0	14.2
14.3	12.7	19.5	26.8	37.3	62.0	14.4	21.8	30.1	42.9	76.9	14.3
14.4	12.6	19.4	26.6	37.1	61.6	14.4	21.8	30.0	42.8	76.7	14.4
14.5	12.5	19.3	26.5	36.9	61.3	14.4	21.7	30.0	42.7	76.5	14.5
14.6	12.4	19.2	26.3	36.7	60.9	14.4	21.7	29.9	42.6	76.4	14.6
14.7	12.4	19.0	26.1	36.4	60.5	14.3	21.7	29.8	42.5	76.2	14.7
14.8	12.3	18.9	26.0	36.2	60.2	14.3	21.6	29.8	42.4	76.0	14.8
14.9	12.2	18.8	25.8	36.0	59.8	14.3	21.6	29.7	42.3	75.9	14.9
15.0	12.1	18.7	25.7	35.8	59.4	14.2	21.5	29.6	42.2	75.7	15.0

Abbreviation: IDEFICS: Identification and Prevention of Dietary- and Lifestyle-Induced Health Effects in Children and Infants.

Supplementary Table 4. BMI-specific reference percentiles of serum ferritin concentrations [$\mu\text{g/L}$] in European children aged 3 to 15 years from the IDEFICS/I.Family cohort (N=3390)

Female (n=1635)						Male (n=1755)					
BMI z-score	P5	P25	P50	P75	P95	P5	P25	P50	P75	P95	BMI z-score
-2.0	13.6	21.3	29.5	41.4	68.5	14.1	21.6	30.0	42.9	76.1	-2.0
-1.9	13.6	21.4	29.6	41.4	68.6	14.1	21.6	30.0	42.9	76.1	-1.9
-1.8	13.6	21.4	29.6	41.5	68.7	14.1	21.6	30.0	42.8	76.1	-1.8
-1.7	13.6	21.4	29.7	41.6	68.8	14.1	21.6	30.0	42.8	76.0	-1.7
-1.6	13.7	21.5	29.7	41.6	68.9	14.0	21.6	29.9	42.8	75.9	-1.6
-1.5	13.7	21.5	29.8	41.7	69.0	14.0	21.5	29.9	42.7	75.8	-1.5
-1.4	13.7	21.5	29.8	41.7	69.1	14.0	21.5	29.8	42.6	75.6	-1.4
-1.3	13.7	21.6	29.9	41.8	69.2	14.0	21.4	29.8	42.5	75.4	-1.3
-1.2	13.7	21.6	29.9	41.9	69.3	13.9	21.4	29.7	42.4	75.2	-1.2
-1.1	13.8	21.6	29.9	41.9	69.4	13.9	21.3	29.6	42.2	74.9	-1.1
-1.0	13.8	21.6	30.0	42.0	69.5	13.8	21.2	29.4	42.0	74.6	-1.0
-0.9	13.8	21.7	30.0	42.0	69.6	13.8	21.1	29.3	41.9	74.3	-0.9
-0.8	13.8	21.7	30.1	42.1	69.7	13.7	21.0	29.2	41.7	74.0	-0.8
-0.7	13.8	21.7	30.1	42.2	69.8	13.6	20.9	29.1	41.5	73.7	-0.7
-0.6	13.9	21.8	30.2	42.2	69.9	13.6	20.9	28.9	41.3	73.4	-0.6
-0.5	13.9	21.8	30.2	42.3	70.0	13.5	20.8	28.8	41.2	73.1	-0.5
-0.4	13.9	21.8	30.2	42.3	70.1	13.5	20.7	28.7	41.0	72.8	-0.4
-0.3	13.9	21.9	30.3	42.4	70.2	13.4	20.6	28.6	40.9	72.6	-0.3
-0.2	13.9	21.9	30.3	42.5	70.3	13.4	20.6	28.5	40.7	72.3	-0.2
-0.1	14.0	21.9	30.4	42.5	70.4	13.4	20.5	28.5	40.6	72.2	-0.1
0.0	14.0	22.0	30.4	42.6	70.5	13.3	20.5	28.4	40.6	72.0	0.0
0.1	14.0	22.0	30.5	42.6	70.6	13.3	20.5	28.4	40.5	72.0	0.1
0.2	14.0	22.0	30.5	42.7	70.7	13.3	20.5	28.4	40.5	72.0	0.2
0.3	14.0	22.1	30.5	42.8	70.8	13.3	20.5	28.4	40.6	72.0	0.3

0.4	14.1	22.1	30.6	42.8	70.9	13.4	20.5	28.5	40.6	72.2	0.4
0.5	14.1	22.1	30.6	42.9	71.0	13.4	20.6	28.5	40.7	72.3	0.5
0.6	14.1	22.1	30.7	42.9	71.1	13.4	20.6	28.6	40.9	72.6	0.6
0.7	14.1	22.2	30.7	43.0	71.2	13.5	20.7	28.8	41.1	72.9	0.7
0.8	14.1	22.2	30.8	43.1	71.3	13.6	20.8	28.9	41.3	73.3	0.8
0.9	14.2	22.2	30.8	43.1	71.4	13.7	21.0	29.1	41.5	73.8	0.9
1.0	14.2	22.3	30.8	43.2	71.5	13.7	21.1	29.3	41.8	74.3	1.0
1.1	14.2	22.3	30.9	43.3	71.6	13.9	21.3	29.5	42.2	74.9	1.1
1.2	14.2	22.3	30.9	43.3	71.7	14.0	21.5	29.8	42.6	75.5	1.2
1.3	14.2	22.4	31.0	43.4	71.8	14.1	21.7	30.1	43.0	76.3	1.3
1.4	14.3	22.4	31.0	43.4	71.9	14.3	21.9	30.4	43.5	77.2	1.4
1.5	14.3	22.4	31.1	43.5	72.0	14.5	22.2	30.8	44.0	78.1	1.5
1.6	14.3	22.5	31.1	43.6	72.1	14.7	22.5	31.3	44.6	79.2	1.6
1.7	14.3	22.5	31.2	43.6	72.2	14.9	22.9	31.7	45.3	80.4	1.7
1.8	14.3	22.5	31.2	43.7	72.3	15.1	23.2	32.2	46.0	81.7	1.8
1.9	14.4	22.6	31.2	43.7	72.4	15.4	23.6	32.7	46.7	83.0	1.9
2.0	14.4	22.6	31.3	43.8	72.5	15.6	24.0	33.3	47.5	84.4	2.0
2.1	14.4	22.6	31.3	43.9	72.6	15.9	24.4	33.9	48.4	85.8	2.1
2.2	14.4	22.6	31.4	43.9	72.7	16.2	24.8	34.5	49.2	87.4	2.2
2.3	14.4	22.7	31.4	44.0	72.8	16.5	25.3	35.1	50.1	88.9	2.3
2.4	14.5	22.7	31.5	44.0	72.9	16.8	25.7	35.7	51.0	90.5	2.4
2.5	14.5	22.7	31.5	44.1	73.0	17.1	26.2	36.4	51.9	92.2	2.5
2.6	14.5	22.8	31.5	44.2	73.1	17.4	26.7	37.0	52.9	93.8	2.6
2.7	14.5	22.8	31.6	44.2	73.2	17.7	27.2	37.7	53.8	95.5	2.7
2.8	14.5	22.8	31.6	44.3	73.3	18.0	27.6	38.4	54.8	97.2	2.8
2.9	14.6	22.9	31.7	44.3	73.4	18.3	28.1	39.0	55.7	98.9	2.9
3.0	14.6	22.9	31.7	44.4	73.5	18.6	28.6	39.7	56.7	100.6	3.0

Abbreviation: IDEFICS: Identification and Prevention of Dietary- and Lifestyle-Induced Health Effects in Children and Infants.

Supplementary Table 5. Age-specific reference percentiles of serum transferrin concentrations [g/L] in European children aged 3 to 15 years from the IDEFICS/I.Family cohort (N=3416)

Female (n=1656)						Male (n=1760)					
Age (y)	P5	P25	P50	P75	P95	P5	P25	P50	P75	P95	Age (y)
3.0	2.24	2.57	2.78	3.00	3.39	2.31	2.61	2.84	3.08	3.46	3.0
3.1	2.24	2.57	2.78	3.00	3.39	2.31	2.61	2.84	3.08	3.46	3.1
3.2	2.24	2.57	2.78	3.00	3.39	2.31	2.61	2.84	3.08	3.46	3.2
3.3	2.24	2.56	2.78	3.00	3.39	2.31	2.61	2.84	3.08	3.45	3.3
3.4	2.24	2.56	2.77	3.00	3.39	2.31	2.61	2.84	3.08	3.45	3.4
3.5	2.24	2.56	2.77	3.00	3.38	2.31	2.61	2.83	3.08	3.45	3.5
3.6	2.24	2.56	2.77	3.00	3.38	2.31	2.61	2.83	3.07	3.45	3.6
3.7	2.24	2.56	2.77	2.99	3.38	2.31	2.61	2.83	3.07	3.45	3.7
3.8	2.24	2.56	2.77	2.99	3.38	2.31	2.61	2.83	3.07	3.45	3.8
3.9	2.24	2.56	2.77	2.99	3.38	2.31	2.61	2.83	3.07	3.45	3.9
4.0	2.24	2.56	2.77	2.99	3.38	2.31	2.60	2.83	3.07	3.45	4.0
4.1	2.24	2.56	2.77	2.99	3.38	2.31	2.60	2.83	3.07	3.45	4.1
4.2	2.24	2.56	2.77	2.99	3.38	2.30	2.60	2.83	3.07	3.44	4.2
4.3	2.24	2.56	2.77	2.99	3.38	2.30	2.60	2.83	3.07	3.44	4.3
4.4	2.24	2.56	2.77	2.99	3.38	2.30	2.60	2.83	3.07	3.44	4.4
4.5	2.24	2.56	2.77	2.99	3.38	2.30	2.60	2.82	3.07	3.44	4.5
4.6	2.24	2.56	2.77	2.99	3.38	2.30	2.60	2.82	3.06	3.44	4.6
4.7	2.24	2.56	2.77	2.99	3.38	2.30	2.60	2.82	3.06	3.44	4.7
4.8	2.24	2.56	2.77	2.99	3.38	2.30	2.60	2.82	3.06	3.44	4.8
4.9	2.24	2.56	2.77	2.99	3.38	2.30	2.60	2.82	3.06	3.44	4.9
5.0	2.24	2.56	2.77	2.99	3.38	2.30	2.60	2.82	3.06	3.43	5.0
5.1	2.24	2.56	2.77	2.99	3.38	2.30	2.59	2.82	3.06	3.43	5.1
5.2	2.24	2.56	2.77	2.99	3.38	2.30	2.59	2.82	3.06	3.43	5.2
5.3	2.23	2.56	2.77	2.99	3.37	2.30	2.59	2.82	3.06	3.43	5.3

5.4	2.23	2.56	2.77	2.99	3.37	2.30	2.59	2.82	3.06	3.43	5.4
5.5	2.23	2.56	2.76	2.99	3.37	2.29	2.59	2.82	3.06	3.43	5.5
5.6	2.23	2.55	2.76	2.99	3.37	2.29	2.59	2.81	3.05	3.43	5.6
5.7	2.23	2.55	2.76	2.99	3.37	2.29	2.59	2.81	3.05	3.43	5.7
5.8	2.23	2.55	2.76	2.98	3.37	2.29	2.59	2.81	3.05	3.43	5.8
5.9	2.23	2.55	2.76	2.98	3.37	2.29	2.59	2.81	3.05	3.43	5.9
6.0	2.23	2.55	2.76	2.98	3.37	2.29	2.59	2.81	3.05	3.42	6.0
6.1	2.23	2.55	2.76	2.98	3.37	2.29	2.59	2.81	3.05	3.42	6.1
6.2	2.23	2.55	2.76	2.98	3.37	2.29	2.59	2.81	3.05	3.42	6.2
6.3	2.23	2.55	2.76	2.98	3.37	2.29	2.59	2.81	3.05	3.42	6.3
6.4	2.23	2.55	2.76	2.98	3.37	2.29	2.58	2.81	3.05	3.42	6.4
6.5	2.23	2.55	2.76	2.98	3.37	2.29	2.58	2.81	3.05	3.42	6.5
6.6	2.23	2.55	2.76	2.98	3.37	2.29	2.58	2.81	3.05	3.42	6.6
6.7	2.23	2.55	2.76	2.98	3.37	2.29	2.58	2.81	3.04	3.42	6.7
6.8	2.23	2.55	2.76	2.98	3.37	2.29	2.58	2.80	3.04	3.42	6.8
6.9	2.23	2.55	2.76	2.98	3.37	2.29	2.58	2.80	3.04	3.42	6.9
7.0	2.23	2.55	2.76	2.98	3.37	2.29	2.58	2.80	3.04	3.41	7.0
7.1	2.23	2.55	2.76	2.99	3.37	2.28	2.58	2.80	3.04	3.41	7.1
7.2	2.23	2.55	2.76	2.99	3.37	2.28	2.58	2.80	3.04	3.41	7.2
7.3	2.23	2.56	2.76	2.99	3.37	2.28	2.58	2.80	3.04	3.41	7.3
7.4	2.23	2.56	2.77	2.99	3.37	2.28	2.58	2.80	3.04	3.41	7.4
7.5	2.24	2.56	2.77	2.99	3.37	2.28	2.58	2.80	3.04	3.41	7.5
7.6	2.24	2.56	2.77	2.99	3.38	2.28	2.58	2.80	3.04	3.41	7.6
7.7	2.24	2.56	2.77	2.99	3.38	2.28	2.58	2.80	3.04	3.41	7.7
7.8	2.24	2.56	2.77	2.99	3.38	2.28	2.58	2.80	3.04	3.41	7.8
7.9	2.24	2.56	2.77	2.99	3.38	2.28	2.58	2.80	3.04	3.41	7.9
8.0	2.24	2.56	2.77	2.99	3.38	2.28	2.58	2.80	3.04	3.41	8.0
8.1	2.24	2.56	2.77	2.99	3.38	2.28	2.57	2.80	3.04	3.41	8.1
8.2	2.24	2.56	2.77	2.99	3.38	2.28	2.57	2.80	3.04	3.41	8.2

8.3	2.24	2.56	2.77	2.99	3.38	2.28	2.57	2.80	3.03	3.41	8.3
8.4	2.24	2.56	2.77	2.99	3.38	2.28	2.57	2.80	3.03	3.41	8.4
8.5	2.24	2.56	2.77	2.99	3.38	2.28	2.57	2.80	3.03	3.41	8.5
8.6	2.24	2.56	2.77	3.00	3.39	2.28	2.57	2.80	3.03	3.41	8.6
8.7	2.24	2.57	2.78	3.00	3.39	2.28	2.57	2.80	3.03	3.41	8.7
8.8	2.24	2.57	2.78	3.00	3.39	2.28	2.57	2.80	3.03	3.41	8.8
8.9	2.24	2.57	2.78	3.00	3.39	2.28	2.57	2.80	3.03	3.41	8.9
9.0	2.25	2.57	2.78	3.00	3.39	2.28	2.57	2.80	3.03	3.41	9.0
9.1	2.25	2.57	2.78	3.00	3.39	2.28	2.57	2.80	3.03	3.41	9.1
9.2	2.25	2.57	2.78	3.00	3.39	2.28	2.57	2.80	3.03	3.41	9.2
9.3	2.25	2.57	2.78	3.01	3.40	2.28	2.57	2.80	3.03	3.41	9.3
9.4	2.25	2.57	2.79	3.01	3.40	2.28	2.57	2.80	3.03	3.41	9.4
9.5	2.25	2.58	2.79	3.01	3.40	2.28	2.57	2.80	3.03	3.41	9.5
9.6	2.25	2.58	2.79	3.01	3.40	2.28	2.57	2.80	3.03	3.41	9.6
9.7	2.25	2.58	2.79	3.01	3.40	2.28	2.57	2.80	3.04	3.41	9.7
9.8	2.26	2.58	2.79	3.01	3.41	2.28	2.58	2.80	3.04	3.41	9.8
9.9	2.26	2.58	2.79	3.02	3.41	2.28	2.58	2.80	3.04	3.41	9.9
10.0	2.26	2.58	2.80	3.02	3.41	2.28	2.58	2.80	3.04	3.41	10.0
10.1	2.26	2.58	2.80	3.02	3.41	2.28	2.58	2.80	3.04	3.41	10.1
10.2	2.26	2.59	2.80	3.02	3.42	2.28	2.58	2.80	3.04	3.41	10.2
10.3	2.26	2.59	2.80	3.02	3.42	2.28	2.58	2.80	3.04	3.41	10.3
10.4	2.26	2.59	2.80	3.03	3.42	2.28	2.58	2.80	3.04	3.41	10.4
10.5	2.27	2.59	2.80	3.03	3.42	2.29	2.58	2.80	3.04	3.42	10.5
10.6	2.27	2.59	2.81	3.03	3.42	2.29	2.58	2.81	3.04	3.42	10.6
10.7	2.27	2.60	2.81	3.03	3.43	2.29	2.58	2.81	3.05	3.42	10.7
10.8	2.27	2.60	2.81	3.04	3.43	2.29	2.58	2.81	3.05	3.42	10.8
10.9	2.27	2.60	2.81	3.04	3.43	2.29	2.59	2.81	3.05	3.42	10.9
11.0	2.27	2.60	2.81	3.04	3.43	2.29	2.59	2.81	3.05	3.42	11.0
11.1	2.28	2.60	2.82	3.04	3.44	2.29	2.59	2.81	3.05	3.43	11.1

11.2	2.28	2.61	2.82	3.04	3.44	2.29	2.59	2.81	3.05	3.43	11.2
11.3	2.28	2.61	2.82	3.05	3.44	2.30	2.59	2.82	3.06	3.43	11.3
11.4	2.28	2.61	2.82	3.05	3.44	2.30	2.59	2.82	3.06	3.43	11.4
11.5	2.28	2.61	2.83	3.05	3.45	2.30	2.60	2.82	3.06	3.44	11.5
11.6	2.28	2.61	2.83	3.05	3.45	2.30	2.60	2.82	3.06	3.44	11.6
11.7	2.29	2.61	2.83	3.06	3.45	2.30	2.60	2.83	3.07	3.44	11.7
11.8	2.29	2.62	2.83	3.06	3.46	2.31	2.60	2.83	3.07	3.44	11.8
11.9	2.29	2.62	2.83	3.06	3.46	2.31	2.61	2.83	3.07	3.45	11.9
12.0	2.29	2.62	2.84	3.06	3.46	2.31	2.61	2.83	3.07	3.45	12.0
12.1	2.29	2.62	2.84	3.06	3.46	2.31	2.61	2.84	3.08	3.45	12.1
12.2	2.30	2.62	2.84	3.07	3.47	2.31	2.61	2.84	3.08	3.46	12.2
12.3	2.30	2.63	2.84	3.07	3.47	2.32	2.61	2.84	3.08	3.46	12.3
12.4	2.30	2.63	2.84	3.07	3.47	2.32	2.62	2.84	3.09	3.46	12.4
12.5	2.30	2.63	2.85	3.07	3.47	2.32	2.62	2.85	3.09	3.47	12.5
12.6	2.30	2.63	2.85	3.08	3.48	2.32	2.62	2.85	3.09	3.47	12.6
12.7	2.30	2.63	2.85	3.08	3.48	2.32	2.63	2.85	3.10	3.47	12.7
12.8	2.31	2.64	2.85	3.08	3.48	2.33	2.63	2.86	3.10	3.48	12.8
12.9	2.31	2.64	2.86	3.08	3.48	2.33	2.63	2.86	3.10	3.48	12.9
13.0	2.31	2.64	2.86	3.09	3.49	2.33	2.63	2.86	3.10	3.49	13.0
13.1	2.31	2.64	2.86	3.09	3.49	2.33	2.64	2.86	3.11	3.49	13.1
13.2	2.31	2.64	2.86	3.09	3.49	2.34	2.64	2.87	3.11	3.49	13.2
13.3	2.31	2.65	2.86	3.09	3.49	2.34	2.64	2.87	3.11	3.50	13.3
13.4	2.32	2.65	2.87	3.09	3.50	2.34	2.64	2.87	3.12	3.50	13.4
13.5	2.32	2.65	2.87	3.10	3.50	2.34	2.65	2.88	3.12	3.50	13.5
13.6	2.32	2.65	2.87	3.10	3.50	2.35	2.65	2.88	3.13	3.51	13.6
13.7	2.32	2.65	2.87	3.10	3.50	2.35	2.65	2.88	3.13	3.51	13.7
13.8	2.32	2.66	2.87	3.10	3.51	2.35	2.66	2.89	3.13	3.52	13.8
13.9	2.32	2.66	2.88	3.11	3.51	2.36	2.66	2.89	3.14	3.52	13.9
14.0	2.33	2.66	2.88	3.11	3.51	2.36	2.66	2.89	3.14	3.52	14.0

14.1	2.33	2.66	2.88	3.11	3.51	2.36	2.67	2.90	3.14	3.53	14.1
14.2	2.33	2.66	2.88	3.11	3.52	2.36	2.67	2.90	3.15	3.53	14.2
14.3	2.33	2.66	2.88	3.11	3.52	2.37	2.67	2.90	3.15	3.53	14.3
14.4	2.33	2.67	2.89	3.12	3.52	2.37	2.67	2.90	3.15	3.54	14.4
14.5	2.33	2.67	2.89	3.12	3.52	2.37	2.68	2.91	3.16	3.54	14.5
14.6	2.33	2.67	2.89	3.12	3.53	2.37	2.68	2.91	3.16	3.55	14.6
14.7	2.34	2.67	2.89	3.12	3.53	2.38	2.68	2.91	3.16	3.55	14.7
14.8	2.34	2.67	2.89	3.12	3.53	2.38	2.69	2.92	3.17	3.55	14.8
14.9	2.34	2.68	2.89	3.13	3.53	2.38	2.69	2.92	3.17	3.56	14.9
15.0	2.34	2.68	2.90	3.13	3.53	2.38	2.69	2.92	3.17	3.56	15.0

Abbreviation: IDEFICS: Identification and Prevention of Dietary- and Lifestyle-Induced Health Effects in Children and Infants.

Supplementary Table 6. BMI-specific reference percentiles of serum transferrin concentrations [g/L] in European children aged 3 to 15 years from the IDEFICS/I.Family cohort (N=3416)

Female (n=1656)						Male (n=1760)					
BMI z-score	P5	P25	P50	P75	P95	P5	P25	P50	P75	P95	BMI z-score
-2.0	2.16	2.46	2.66	2.88	3.25	2.28	2.54	2.72	2.92	3.23	-2.0
-1.9	2.17	2.47	2.67	2.88	3.26	2.28	2.54	2.73	2.93	3.24	-1.9
-1.8	2.17	2.48	2.68	2.89	3.26	2.28	2.54	2.73	2.93	3.24	-1.8
-1.7	2.17	2.48	2.68	2.90	3.27	2.29	2.54	2.74	2.94	3.25	-1.7
-1.6	2.18	2.49	2.69	2.90	3.28	2.29	2.55	2.74	2.95	3.26	-1.6
-1.5	2.18	2.49	2.70	2.91	3.29	2.29	2.55	2.75	2.95	3.27	-1.5
-1.4	2.19	2.50	2.70	2.92	3.29	2.29	2.55	2.75	2.96	3.28	-1.4
-1.3	2.19	2.50	2.71	2.92	3.30	2.29	2.56	2.76	2.97	3.29	-1.3
-1.2	2.20	2.51	2.71	2.93	3.31	2.29	2.56	2.76	2.97	3.30	-1.2
-1.1	2.20	2.51	2.72	2.94	3.32	2.29	2.56	2.76	2.98	3.31	-1.1
-1.0	2.21	2.52	2.73	2.94	3.32	2.29	2.57	2.77	2.98	3.31	-1.0
-0.9	2.21	2.53	2.73	2.95	3.33	2.30	2.57	2.77	2.99	3.32	-0.9
-0.8	2.22	2.53	2.74	2.96	3.34	2.30	2.57	2.78	3.00	3.33	-0.8
-0.7	2.22	2.54	2.74	2.96	3.35	2.30	2.58	2.78	3.00	3.34	-0.7
-0.6	2.23	2.54	2.75	2.97	3.35	2.30	2.58	2.79	3.01	3.35	-0.6
-0.5	2.23	2.55	2.76	2.98	3.36	2.30	2.58	2.79	3.02	3.36	-0.5
-0.4	2.24	2.55	2.76	2.98	3.37	2.30	2.59	2.80	3.02	3.37	-0.4
-0.3	2.24	2.56	2.77	2.99	3.38	2.30	2.59	2.80	3.03	3.38	-0.3
-0.2	2.25	2.57	2.77	3.00	3.38	2.30	2.59	2.81	3.03	3.39	-0.2
-0.1	2.25	2.57	2.78	3.00	3.39	2.30	2.59	2.81	3.04	3.40	-0.1
0.0	2.26	2.58	2.79	3.01	3.40	2.31	2.60	2.82	3.05	3.41	0.0
0.1	2.26	2.58	2.79	3.01	3.41	2.31	2.60	2.82	3.05	3.41	0.1
0.2	2.27	2.59	2.80	3.02	3.41	2.31	2.60	2.82	3.06	3.42	0.2
0.3	2.27	2.59	2.80	3.03	3.42	2.31	2.61	2.83	3.07	3.43	0.3

0.4	2.28	2.60	2.81	3.03	3.43	2.31	2.61	2.83	3.07	3.44	0.4
0.5	2.28	2.60	2.82	3.04	3.43	2.31	2.61	2.84	3.08	3.45	0.5
0.6	2.29	2.61	2.82	3.05	3.44	2.31	2.62	2.84	3.09	3.46	0.6
0.7	2.29	2.62	2.83	3.05	3.45	2.31	2.62	2.85	3.09	3.47	0.7
0.8	2.30	2.62	2.83	3.06	3.46	2.31	2.62	2.85	3.10	3.48	0.8
0.9	2.30	2.63	2.84	3.07	3.46	2.31	2.62	2.86	3.11	3.49	0.9
1.0	2.31	2.63	2.85	3.07	3.47	2.31	2.63	2.86	3.11	3.50	1.0
1.1	2.31	2.64	2.85	3.08	3.48	2.32	2.63	2.87	3.12	3.51	1.1
1.2	2.32	2.64	2.86	3.09	3.49	2.32	2.63	2.87	3.13	3.52	1.2
1.3	2.32	2.65	2.87	3.09	3.49	2.32	2.64	2.88	3.13	3.53	1.3
1.4	2.33	2.66	2.87	3.10	3.50	2.32	2.64	2.88	3.14	3.54	1.4
1.5	2.33	2.66	2.88	3.11	3.51	2.32	2.64	2.88	3.14	3.55	1.5
1.6	2.34	2.67	2.88	3.11	3.52	2.32	2.64	2.89	3.15	3.56	1.6
1.7	2.34	2.67	2.89	3.12	3.52	2.32	2.65	2.89	3.16	3.57	1.7
1.8	2.35	2.68	2.90	3.13	3.53	2.32	2.65	2.90	3.16	3.58	1.8
1.9	2.35	2.68	2.90	3.13	3.54	2.32	2.65	2.90	3.17	3.59	1.9
2.0	2.36	2.69	2.91	3.14	3.55	2.32	2.66	2.91	3.18	3.60	2.0
2.1	2.36	2.69	2.91	3.15	3.55	2.32	2.66	2.91	3.18	3.61	2.1
2.2	2.37	2.70	2.92	3.15	3.56	2.32	2.66	2.92	3.19	3.62	2.2
2.3	2.37	2.71	2.93	3.16	3.57	2.32	2.66	2.92	3.20	3.63	2.3
2.4	2.38	2.71	2.93	3.17	3.58	2.32	2.67	2.93	3.20	3.64	2.4
2.5	2.38	2.72	2.94	3.17	3.58	2.32	2.67	2.93	3.21	3.65	2.5
2.6	2.39	2.72	2.94	3.18	3.59	2.32	2.67	2.94	3.22	3.66	2.6
2.7	2.39	2.73	2.95	3.19	3.60	2.32	2.67	2.94	3.23	3.67	2.7
2.8	2.40	2.73	2.96	3.19	3.61	2.32	2.68	2.94	3.23	3.68	2.8
2.9	2.40	2.74	2.96	3.20	3.61	2.32	2.68	2.95	3.24	3.69	2.9
3.0	2.41	2.74	2.97	3.20	3.62	2.32	2.68	2.95	3.25	3.70	3.0

Abbreviation: IDEFICS: Identification and Prevention of Dietary- and Lifestyle-Induced Health Effects in Children and Infants.

Supplementary Table 7: Cross-sectional associations of usual total iron intake with serum ferritin [µg/L] in girls and boys during two examination waves and sensitivity analyses in the IDEFICS/I.Family study

Model	Main model			Sensitivity analysis including usual vitamin C intake ²			Sensitivity analysis with usual iron intake from heme sources ² as exposure		
Wave 0 (2007/2008)									
Logistic Regression (Girls: n=428, Boys: n=455)									
Odds ratio for having a sufficient iron status (ref.: deficient status) ¹	OR	95%-CI		OR	95%-CI		OR	95%-CI	
Total iron intake [mg/d] ²									
Girls	1.08	0.33	4.17	1.03	0.29	4.47	1.25	0.06	35.24
Boys	1.48	0.95	2.40	1.47	0.91	2.48	1.28	0.76	2.14
Mainly vegetarian diet ³									
Girls	NA	NA	NA	NA	NA	NA	NA	NA	NA
Boys	0.32	0.04	6.53	0.32	0.04	6.53	0.33	0.05	6.72
Vitamin C intake [mg/d] ²									
Girls				1.01	0.95	1.07			
Boys				1.00	0.98	1.03			
Linear Model (Girls: n =428, Boys: n =455)									
β estimate	β	95%-CI		β	95%-CI		β	95%-CI	
Total iron intake [mg/d] ²									
Girls	2.03	-0.53	4.59	2.83	0.04	5.62	9.68	3.10	16.26
Boys	0.73	-1.75	3.21	0.06	-2.64	2.76	2.77	-0.37	5.91
Mainly vegetarian diet ³									
Girls	-2.38	-15.32	10.57	-2.53	-15.46	10.40	3.92	-9.70	17.54
Boys	-6.12	-24.67	12.44	-5.75	-24.30	-12.81	-5.09	-23.63	13.44
Vitamin C intake [mg/d] ²									
Girls				-0.09	-0.21	0.03			
Boys				0.09	-0.05	0.23			
Wave 3 (2013/2014) (Girls: n =679, Boys: n =715)									
Logistic Regression									
Odds ratio for having a sufficient iron status (ref.: deficient status) ¹	OR	95%-CI		OR	95%-CI		OR	95%-CI	
Total iron intake [mg/d] ²									
Girls	1.04	0.83	1.31	1.07	0.85	1.38	1.77	0.93	3.57
Boys	1.17	0.89	1.56	1.11	0.83	1.50	2.17	0.86	5.85
Mainly vegetarian diet ³									
Girls	0.47	0.20	1.23	0.46	0.20	1.20	0.71	0.27	2.04
Boys	0.33	0.12	1.02	0.33	0.12	1.02	0.57	0.17	2.09
Vitamin C intake [mg/d] ²									
Girls				0.99	0.97	1.01			
Boys				1.01	0.99	1.04			
Linear Model									
β estimate	β	95%-CI		β	95%-CI		β	95%-CI	
Total iron intake [mg/d] ²									
Girls	-0.15	-1.25	0.95	-0.55	-1.71	0.61	2.85	0.03	5.66
Boys	1.11	-0.26	2.49	0.90	-0.55	2.35	5.47	1.21	9.72
Mainly vegetarian diet ³									
Girls	-4.09	-9.50	1.31	-4.03	-9.42	1.36	-2.09	-7.83	3.66
Boys	-2.06	-9.16	5.04	-2.00	-9.10	5.10	2.01	-5.82	9.84
Vitamin C intake [mg/d] ²									
Girls				0.10	0.00	0.19			
Boys				0.05	-0.06	0.16			

Adjusted for usual energy intake, age, BMI-z-score, sex, country and ISCED

¹Iron deficiency defined according to the WHO: children aged <5 years: serum ferritin <12 µg/L; children of 5 years or older: serum ferritin <15 µg/L.

²Usual dietary intakes of total iron, iron from heme sources and vitamin C were estimated from 24h dietary recalls linked to food composition tables.

³Children were classified as mainly vegetarian if they replied to the specific question to typically exclude meat, poultry, sausage and fish from their diet in the Food Frequency Questionnaire. Some of them however reported later on to occasionally consume meat or fish.

Abbreviations: β , β estimate; IDEFICS: Identification and Prevention of Dietary- and Lifestyle-Induced Health Effects in Children and Infants; NA, not available – number of mainly vegetarians too low; OR, Odds ratio.

Supplementary Table 8: Longitudinal associations of usual total iron intake with serum ferritin [µg/L] at W3 (2013/2014) adjusted for serum ferritin at W0 (2007/08) in girls and boys and sensitivity analyses in the IDEFICS/I.Family study

Model	Main model			Sensitivity analysis including usual vitamin C intake ²			Sensitivity analysis with usual iron intake from heme sources ² as exposure		
Longitudinal associations (Girls: n =400, Boys: n =410)									
Logistic Regression									
Odds ratio for having a sufficient iron status (ref.: deficient status)¹	OR	95%-CI		OR	95%-CI		OR	95%-CI	
Total iron intake [mg/d]²									
Girls	1.19	0.89	1.66	1.29	0.93	1.87	1.75	0.74	4.74
Boys	0.94	0.67	1.37	0.89	0.61	1.32	2.85	0.76	12.53
Mainly vegetarian diet³									
Girls	0.37	0.12	1.44	0.38	0.12	1.47	0.60	0.16	2.69
Boys	0.29	0.08	1.39	0.30	0.08	1.42	0.60	0.13	3.48
Vitamin C intake [mg/d]²									
Girls		0		0.98	0.96	1.01		0	
Boys		0		1.02	0.98	1.05		0	
Linear Model									
β estimate	β	95%-CI		β	95%-CI		β	95%-CI	
Total iron intake [mg/d]²									
Girls	-0.46	-1.66	0.74	-0.47	-1.77	0.83	3.29	0	6.58
Boys	0.57	-0.96	2.11	0.57	-1.06	2.21	3.45	-1.32	8.22
Mainly vegetarian diet³									
Girls	-4.76	-11.5	1.98	-4.76	-11.51	1.99	-2.41	-9.57	4.75
Boys	-3.37	-11.63	4.9	-3.36	-11.65	4.92	-0.77	-9.83	8.29
Vitamin C intake [mg/d]²									
Girls		0		0	-0.12	0.12		0	
Boys		0		0	-0.13	0.13		0	

Models adjusted for usual energy intake, age, BMI-z-score, sex, country, ISCED (all at W3) and ferritin at W0

¹Iron deficiency defined according to the WHO: children aged <5 years: serum ferritin <12 µg/L; children of 5 years or older: serum ferritin <15 µg/L.

²Usual dietary intakes of total iron, iron from heme sources and vitamin C were estimated from 24h dietary recalls linked to food composition tables

³Children were classified as mainly vegetarian if they replied to the specific question to typically exclude meat, poultry, sausage and fish from their diet in the Food Frequency Questionnaire. Some of them however reported later on to occasionally consume meat or fish.

Abbreviations: β, β estimate; IDEFICS: Identification and Prevention of Dietary- and Lifestyle-Induced Health Effects in Children and Infants; OR, Odds ratio; W0, first examination wave; W3, third examination wave.

Supplementary Table 9: Cross-sectional and longitudinal associations (linear model) from W0 (2007/2008) to W3 (2013/2014) of usual total iron intake with serum transferrin [g/L] in girls and boys and sensitivity analyses in the IDEFICS/I.Family study

Model	Main model			Sensitivity analysis including usual vitamin C intake ¹			Sensitivity analysis with usual iron intake from heme sources ¹ as exposure		
Wave 0 (Girls n =428, Boys n =455)									
β estimate	β	95%-CI		β	95%-CI		β	95%-CI	
Total iron intake [mg/d]¹									
Girls	0.01	-0.05	0.07	0.02	-0.04	0.08	0.08	-0.07	0.23
Boys	-0.01	-0.05	0.03	0	-0.04	0.05	-0.04	-0.09	0.01
Mainly vegetarian diet²									
Girls	-0.03	-0.32	0.27	-0.03	-0.32	0.27	0.03	-0.28	0.34
Boys	0.33	0.05	0.61	0.32	0.04	0.60	0.31	0.04	0.59
Wave 3 (Girls n =679, Boys n =715)									
β estimate	β	95%-CI		β	95%-CI		β	95%-CI	
Total iron intake [mg/d]¹									
Girls	0	-0.02	0.03	0	-0.02	0.03	0.01	-0.05	0.07
Boys	0	-0.02	0.02	0	-0.02	0.02	-0.06	-0.12	0.01
Mainly vegetarian diet²									
Girls	0.03	-0.08	0.15	0.03	-0.08	0.15	0.04	-0.08	0.16
Boys	0.10	-0.02	0.21	0.10	-0.02	0.21	0.05	-0.07	0.18
Longitudinal (Girls n=402, Boys n=410)									
β estimate	β	95%-CI		β	95%-CI		β	95%-CI	
Total iron intake [mg/d]¹									
Girls	0	-0.02	0.02	0	-0.03	0.02	0.05	-0.02	0.11
Boys	0	-0.02	0.03	0	-0.02	0.03	-0.03	-0.11	0.04
Mainly vegetarian diet²									
Girls	0.05	-0.07	0.18	0.05	-0.07	0.18	0.09	-0.05	0.22
Boys	0.05	-0.08	0.18	0.05	-0.08	0.18	0.02	-0.12	0.16

Adjusted for usual energy intake, age, BMI-z-score, sex, country and ISCED

¹Usual dietary intakes of total iron, iron from heme sources and vitamin C were estimated from 24h dietary recalls linked to food composition tables.

²Children were classified as mainly vegetarian if they replied to the specific question to typically exclude meat, poultry, sausage and fish from their diet in the Food Frequency Questionnaire. Some of them however reported later on to occasionally consume meat or fish.

Abbreviations: β, β estimate; IDEFICS: Identification and Prevention of Dietary- and Lifestyle-Induced Health Effects in Children and Infants; W0, first examination wave; W3, third examination wave.

Table 10: Cross-sectional associations of usual total iron intake with serum ferritin [$\mu\text{g/L}$] and sensitivity analyses excluding children with high CRP >5 mg/L in the IDEFICS/I.Family study

Model	Main model			Sensitivity analysis including usual vitamin C intake ²			Sensitivity analysis with usual iron intake from heme sources ² as exposure		
Wave 0 (2007/2008) (N=829)									
Logistic Regression									
Odds ratio for having a sufficient iron status (ref.: deficient status) ¹	OR	95%-CI		OR	95%-CI		OR	95%-CI	
Total iron intake [mg/day] ²	1.43	0.95	2.20	1.42	0.91	2.28	1.27	0.76	2.11
Mainly vegetarian diet ³ (ref: omnivore diet)	0.48	0.08	9.20	0.48	0.08	9.21	0.51	0.08	9.85
Vitamin C intake [mg/day] ²				1.00	0.98	1.03			
Linear Model									
β estimate	β	95%-CI		β	95%-CI		β	95%-CI	
Total iron intake [mg/day] ²	1.12	-0.52	2.76	0.78	-1.00	2.57	2.54	0.10	4.97
Mainly vegetarian diet ³	-2.62	-13.21	7.97	-2.46	-13.05	8.14	-1.25	-11.92	9.41
Vitamin C intake [mg/day] ²				0.04	-0.05	0.14			
Wave 3 (2013/2014) (N=1,308)									
Logistic Regression									
Odds ratio for having a sufficient iron status (ref.: deficient status) ¹	OR	95%-CI		OR	95%-CI		OR	95%-CI	
Total iron intake [mg/day] ²	1.09	0.92	1.31	1.09	0.91	1.32	1.84	1.08	3.24
Mainly vegetarian diet ³ (ref: omnivore diet)	0.38	0.20	0.78	0.38	0.20	0.78	0.60	0.28	1.34
Vitamin C intake [mg/day] ²				1.00	0.99	1.02			
Linear Model									
β estimate	β	95%-CI		β	95%-CI		β	95%-CI	
Total iron intake [mg/day] ²	0.48	-0.36	1.32	0.20	-0.69	1.10	3.80	1.44	6.16
Mainly vegetarian diet ³ (ref: omnivore diet)	-3.82	-8.17	0.52	-3.77	-8.11	0.57	-0.82	-5.53	3.89
Vitamin C intake [mg/day] ²				0.07	0	0.14			

Adjusted for usual energy intake, age, BMI-z-score, sex, country and ISCED

¹Iron deficiency defined according to the WHO: children aged <5 years: serum ferritin <12 $\mu\text{g/L}$; children of 5 years or older: serum ferritin <15 $\mu\text{g/L}$

²Usual dietary intakes of total iron, iron from heme sources and vitamin C were estimated from 24h dietary recalls linked to food composition tables.

³Children were classified as mainly vegetarian if they replied to the specific question to typically exclude meat, poultry, sausage and fish from their diet in the Food Frequency Questionnaire. Some of them however reported later on to occasionally consume meat or fish.

Abbreviations: β , β estimate; IDEFICS: Identification and Prevention of Dietary- and Lifestyle-Induced Health Effects in Children and Infants; OR, Odds ratio.

Table 11: Longitudinal associations of usual total iron intake with serum ferritin [$\mu\text{g/L}$] at W3 (2013/2014) adjusted for serum ferritin at W0 (2007/08) and sensitivity analyses excluding children with high CRP >5 mg/L in the IDEFICS/I.Family study

Model	Main model			Sensitivity analysis including usual vitamin C intake ²			Sensitivity analysis with usual iron intake from heme sources ² as exposure		
N=766									
Logistic Regression									
Odds ratio for having a sufficient iron status at W3 (ref.: deficient status)¹	OR	95%-CI		OR	95%-CI		OR	95%-CI	
Total iron intake [mg/day]²	1.07	0.86	1.36	1.09	0.86	1.41	1.89	0.91	4.19
Mainly vegetarian diet³ (ref: omnivore diet)	0.34	0.14	0.89	0.34	0.14	0.89	0.54	0.20	1.64
Vitamin C intake [mg/day]²				1.00	0.98	1.02			
Linear Model									
β estimate	β	95%-CI		β	95%-CI		β	95%-CI	
Total iron intake [mg/day]²	-0.08	-0.97	0.81	-0.16	-1.12	0.81	2.52	-0.09	5.13
Mainly vegetarian diet³ (ref: omnivore diet)	-4.85	-9.92	0.21	-4.85	-9.92	0.22	-2.81	-8.29	2.68
Vitamin C intake [mg/day]²				0.02	-0.07	0.10			

Adjusted for usual energy intake, age, BMI-z-score, sex, country, ISCED (all at W3) and ferritin at W0

¹Iron deficiency defined according to the WHO: children aged <5 years: serum ferritin <12 $\mu\text{g/L}$; children of 5 years or older: serum ferritin <15 $\mu\text{g/L}$.

²Usual dietary intakes of total iron, iron from heme sources and vitamin C were estimated from 24h dietary recalls linked to food composition tables.

³Children were classified as mainly vegetarian if they replied to the specific question to typically exclude meat, poultry, sausage and fish from their diet in the Food Frequency Questionnaire. Some of them however reported later on to occasionally consume meat or fish.

Abbreviations: β , β estimate; IDEFICS: Identification and Prevention of Dietary- and Lifestyle-Induced Health Effects in Children and Infants; OR, Odds ratio; W0, first examination wave; W3, third examination wave.

Table 12: Cross-sectional and longitudinal associations (linear model) from W0 (2007/2008) to W3 (2013/2014) of usual total iron intake with serum transferrin [g/L] and sensitivity analyses excluding children with high CRP >5 mg/L in the IDEFICS/I.Family study

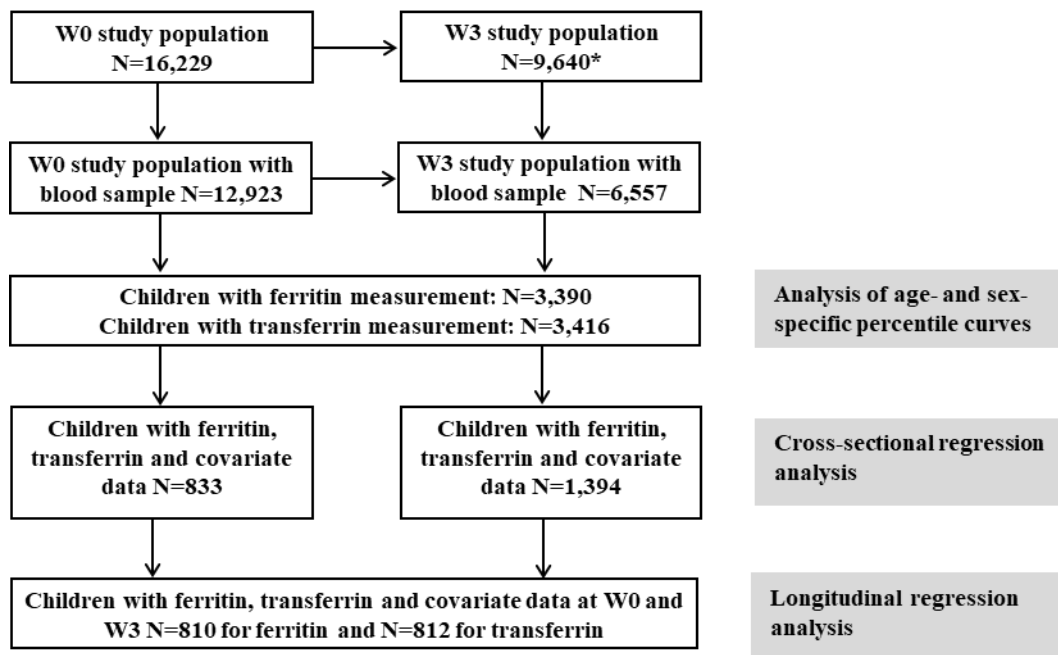
Model	Main model			Sensitivity analysis including usual vitamin C intake ¹			Sensitivity analysis with usual iron intake from heme sources ¹ as exposure		
Wave 0 (2007/2008) (N=829)									
β estimate	β	95%-CI		β	95%-CI		β	95%-CI	
Total iron intake¹ [mg/day]	0	-0.03	0.03	0.01	-0.02	0.05	-0.01	-0.05	0.04
Mainly vegetarian diet² (ref: omnivore diet)	0.14	-0.06	0.34	0.14	-0.06	0.34	0.14	-0.06	0.34
Wave 3 (2013/2014) (N=1.308)									
β estimate	β	95%-CI		β	95%-CI		β	95%-CI	
Total iron intake¹ [mg/day]	0	-0.01	0.02	0	-0.02	0.02	0	-0.05	0.04
Mainly vegetarian diet² (ref: omnivore diet)	0.08	0	0.16	0.08	0	0.16	0.08	-0.01	0.17
Longitudinal (N=768)									
β estimate	β	95%-CI		β	95%-CI		β	95%-CI	
Total iron intake¹ [mg/day]	0	-0.01	0.02	0	-0.02	0.02	0.02	-0.03	0.07
Mainly vegetarian diet² (ref: omnivore diet)	0.07	-0.02	0.16	0.07	-0.03	0.16	0.09	-0.01	0.19

Adjusted for usual energy intake, age, BMI-z-score, sex, country and ISCED

¹Usual dietary intakes of total iron, iron from heme sources and vitamin C were estimated from 24h dietary recalls linked to food composition tables.

²Children were classified as mainly vegetarian if they replied to the specific question to typically exclude meat, poultry, sausage and fish from their diet in the Food Frequency Questionnaire. Some of them however reported later on to occasionally consume meat or fish.

Abbreviations: β, β estimate; IDEFICS: Identification and Prevention of Dietary- and Lifestyle-Induced Health Effects in Children and Infants; W0, first examination wave; W3, third examination wave.



*including remaining participants of 1,050 newly recruited children at W1 and 1,512 newly recruited children at W3.
W0, baseline survey; W3, follow-up after 6 years

Supplementary Figure 1. Flow chart of inclusion of children of the IDEFICS/I.Family study into the analytical study samples. IDEFICS: Identification and Prevention of Dietary- and Lifestyle-Induced Health Effects in Children and Infants.

	Ferritin	Transferrin	Age	BMI z-score	Waist-to-Height	Energy/day	Total Fe/day	Heme-Fe/day	Vit C/day	CRP	Ferritin W0	Transferrin W0
Ferritin	1											
Transferrin	-0.24	1										
Age	-0.17	0.15	1									
BMI z-score	0.06	0.14	0.07	1								
Waist-to-Height	0.15	0.16	-0.02	0.79	1							
Energy/day	0.00	-0.03	0.04	-0.16	-0.12	1						
Total Fe/day	0.04	0.00	0.02	-0.11	-0.06	0.76	1					
Heme-Fe/day	0.17	-0.01	0.11	0.03	0.10	0.02	0.04	1				
Vit C/day	0.01	0.01	0.13	0.05	0.02	0.13	0.11	0.12	1			
CRP	0.22	0.07	-0.02	0.22	0.32	-0.09	-0.08	0.06	0.02	1		
Ferritin W0	0.39	-0.06	0.11	0.05	0.06	0.04	0.09	0.16	-0.01	0.00	1	
Transferrin W0	-0.09	0.52	-0.05	0.04	0.10	-0.07	-0.06	-0.11	-0.03	0.14	-0.25	1

Supplementary Figure 2. Correlation coefficients of serum ferritin and transferrin concentrations with further dietary and metabolic variables in European children from the IDEFICS/I.Family study at W3. All variables presented in the figure were assessed at W3 except specified otherwise.

Total energy intake per day and dietary intakes of iron and vitamin C were estimated from 24h dietary recalls linked to food composition tables.

Abbreviations: CRP, C-reactive protein, Total Fe/day, total usual dietary iron intake per day; ; heme-Fe/day, usual iron intake from heme sources per day; VitC/day, usual vitamin C intake per day; IDEFICS: Identification and Prevention of Dietary- and Lifestyle-Induced Health Effects in Children and Infants; W0, first examination wave 2007-2008; W3, third examination wave 2013-2014.