

SUPPLEMENTAL MATERIAL

Carbohydrate Intake in Early Childhood and Body composition and Metabolic Health:
Results from the Generation R Study

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Table S1. Associations of carbohydrate intake at the expense of other macronutrients at the age of 1 year with body composition up to age 10 years

	BMI (SDS) (n=3,573)	FMI (SDS) (n=3,112)	FFMI (SDS) (n=3,112)
Total carbohydrate intake (5E%)			
5E% lower fat	0.01 (-0.01, 0.04)	-0.003 (-0.03, 0.02)	0.02 (-0.01, 0.05)
5E% lower protein	-0.14 (-0.19, -0.08)	-0.08 (-0.14, -0.02)	-0.04 (-0.10, 0.03)
Total monosaccharide and disaccharide intake (5E%)			
5E% lower fat	0.02 (-0.01, 0.05)	0.01 (-0.02, 0.04)	0.02 (-0.01, 0.05)
5E% lower protein	-0.14 (-0.20, -0.09)	-0.08 (-0.14, -0.02)	-0.04 (-0.10, 0.03)
5E% lower polysaccharides	0.02 (-0.003, 0.05)	0.03 (-0.002, 0.05)	0.001 (-0.03, 0.03)
Total polysaccharide intake (5E%)			
5E% lower fat	-0.002 (-0.03, 0.03)	-0.02 (-0.05, 0.01)	0.02 (-0.02, 0.05)
5E% lower protein	-0.16 (-0.23, -0.10)	-0.11 (-0.18, -0.04)	-0.04 (-0.12, 0.04)
5E% lower monosaccharides	-0.02 (-0.05, 0.003)	-0.03 (-0.05, 0.002)	-0.001 (-0.03, 0.03)

Values are regression coefficients based on covariate-adjusted linear regression models and reflect differences in body composition (age- and sex specific SD-scores) per 5 E% higher intake of carbohydrate or its subtypes at the expense of either dietary fat or protein.

Table S2. Adjusted associations of carbohydrate intake, at the expense of other macronutrients at the age of 1 year with metabolic health up to age 10 years

	Triglycerides (SDS) (n=2,548)	Total cholesterol (SDS) (n=2,554)	HDL-cholesterol (SDS) (n=2,556)	LDL-cholesterol (SDS) (n=2,554)	Insulin (SDS) (n=2,548)
Total carbohydrate intake (5E%)					
5E% lower fat	0.04 (0.003, 0.07)	0.01 (-0.03, 0.04)	-0.01 (-0.05, 0.02)	0.000 (-0.04, 0.04)	-0.002 (-0.03, 0.03)
5E% lower protein	0.08 (0.01, 0.15)	0.01 (-0.07, 0.09)	-0.01 (-0.09, 0.07)	0.001 (-0.08, 0.08)	0.01 (-0.06, 0.08)
Total monosaccharide and disaccharide intake (5E%)					
5E% lower fat	0.05 (0.02, 0.09)	-0.001 (-0.04, 0.04)	-0.03 (-0.07, 0.004)	0.003 (-0.04, 0.04)	-0.01 (-0.04, 0.02)
5E% lower protein	0.07 (-0.003, 0.15)	0.02 (-0.07, 0.10)	0.003 (-0.08, 0.08)	0.002 (-0.08, 0.08)	0.02 (-0.05, 0.09)
5E% lower polysaccharides	0.04 (0.01, 0.08)	-0.02 (-0.05, 0.02)	-0.05 (-0.09, -0.02)	0.01 (-0.03, 0.05)	-0.02 (-0.05, 0.01)
Total polysaccharide intake (5E%)					
5E% lower fat	0.01 (-0.03, 0.05)	0.02 (-0.03, 0.06)	0.02 (-0.02, 0.06)	-0.004 (-0.05, 0.04)	0.01 (-0.03, 0.05)
5E% lower protein	0.03 (-0.06, 0.12)	0.03 (-0.06, 0.13)	0.06 (-0.04, 0.15)	-0.01 (-0.10, 0.09)	0.04 (-0.04, 0.12)
5E% lower monosaccharides	-0.04 (-0.08, -0.01)	0.02 (-0.02, 0.05)	0.05 (0.02, 0.09)	-0.01 (-0.05, 0.03)	0.02 (-0.01, 0.05)

Values are regression coefficients based on covariate-adjusted linear regression models and reflect differences in metabolic outcomes (age- and sex specific SD-scores) per 5 E% higher intake of carbohydrate or its subtypes at the expense of either dietary fat or protein.

Table S3. Associations of carbohydrate intake at age 1 year with body composition up to age 10 years in children with a Dutch ethnic background only

	BMI (SDS) (n=2,437)	FMI (SDS) (n=2,437)	FFMI (SDS) (n=2,437)
Total carbohydrate intake (10g/d)			
Model 1	0.01 (-0.01, 0.02)	0.01 (-0.01, 0.02)	-0.002 (-0.02, 0.02)
Model 2	0.002 (-0.01, 0.02)	-0.001 (-0.02, 0.01)	0.002 (-0.02, 0.02)
Total monosaccharide and disaccharide intake (10g/d)			
Model 1	0.001 (-0.01, 0.02)	0.01 (-0.002, 0.03)	-0.01 (-0.03, 0.004)
Model 2	-0.003 (-0.02, 0.01)	0.01 (-0.01, 0.02)	-0.01 (-0.03, 0.005)
Total polysaccharide intake (10g/d)			
Model 1	0.01 (-0.01, 0.03)	-0.01 (-0.03, 0.01)	0.02 (-0.003, 0.04)
Model 2	0.01 (-0.01, 0.03)	-0.01 (-0.03, 0.01)	0.02 (-0.001, 0.05)

Values are regression coefficients and 95% confidence intervals based on linear mixed models reflect differences in body composition (age- and sex specific SD-scores) per 10 grams/day higher energy-adjusted carbohydrate intake.

Model 1 (basic) is adjusted for sex, ethnicity, age dietary assessment, and total energy intake.

Model 2 (confounder) is additionally adjusted for breastfeeding, birth weight, screen time, sports participation, household income, maternal educational level, maternal age, maternal BMI, smoking during pregnancy, and folic acid supplements.

Table S4. Associations of carbohydrate intake at age 1 year with metabolic health up to age 10 years in children with a Dutch ethnic background only

	TG (SDS) (n=1,755)	Total cholesterol (SDS) (n=1,759)	HDL-cholesterol (SDS) (n=1,761)	LDL-cholesterol (SDS) (n=1,758)	Insulin (SDS) (n=1,757)
Total carbohydrate intake (10g/d)					
Model 1	0.03 (0.01, 0.05)	0.01 (-0.01, 0.04)	-0.004 (-0.03, 0.02)	0.01 (-0.01, 0.04)	0.02 (-0.01, 0.02)
Model 2	0.03 (0.01, 0.05)	0.01 (-0.01, 0.04)	-0.003 (-0.03, 0.02)	0.01 (-0.01, 0.03)	0.02 (-0.01, 0.03)
Model 3	0.03 (0.01, 0.05)	0.01 (-0.01, 0.04)	-0.003 (-0.03, 0.02)	0.01 (-0.01, 0.03)	0.02 (-0.01, 0.03)
Total monosaccharide and disaccharide intake (10g/d)					
Model 1	0.03 (0.01, 0.05)	0.01 (-0.01, 0.03)	-0.02 (-0.04, 0.004)	0.02 (-0.01, 0.04)	0.001 (-0.02, 0.02)
Model 2	0.03 (0.01, 0.05)	0.01 (-0.01, 0.03)	-0.02 (-0.04, 0.01)	0.02 (-0.005, 0.04)	0.001 (-0.02, 0.02)
Model 3	0.03 (0.01, 0.05)	0.01 (-0.01, 0.03)	-0.01 (-0.03, 0.01)	0.01 (-0.01, 0.03)	0.001 (-0.02, 0.02)
Total polysaccharide intake (10g/d)					
Model 1	-0.01 (-0.04, 0.02)	0.01 (-0.02, 0.04)	0.03 (-0.002, 0.06)	-0.01 (-0.04, 0.02)	0.01 (-0.01, 0.04)
Model 2	-0.01 (-0.04, 0.02)	0.01 (-0.02, 0.04)	0.03 (-0.002, 0.06)	-0.01 (-0.04, 0.02)	0.01 (-0.01, 0.04)
Model 3	-0.01 (-0.04, 0.02)	0.01 (-0.02, 0.04)	0.02 (-0.01, 0.05)	-0.005 (-0.03, 0.03)	0.02 (-0.01, 0.04)

Values are regression coefficients and 95% confidence intervals from linear regression models and reflect differences in metabolic outcomes (age- and sex specific SD-scores) per 10 grams/day higher energy-adjusted carbohydrate intake. **Bold** values indicate statistically significant effect estimates.

Model 1 (basic) is adjusted for sex, ethnicity, age dietary assessment, and total energy intake.

Model 2 (confounder) is additionally adjusted for breastfeeding, birth weight, screen time, sports participation, household income, maternal educational level, maternal age, maternal BMI, smoking during pregnancy, and folic acid supplements.

Model 3 (body composition) is additionally adjusted for FMI and FFMI.