

## SUPPLEMENTARY MATERIAL

### Article

#### **CARBOHYDRATES FROM SOURCES WITH A HIGHER GLYCEMIC INDEX DURING ADOLESCENCE: IS EVENING RATHER THAN MORNING INTAKE RELEVANT FOR RISK MARKERS OF TYPE 2 DIABETES IN YOUNGER ADULTHOOD?**

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### **SUMMARY of supplemental material**

**Table S1:** Prospective relation of GI and GL of morning (before 11 am) intake as well as morning carbohydrate intake from low- and higher-GI food sources during adolescence to **HOMA2 sensitivity** in young adulthood (N=252).

**Table S2:** Prospective relation of GI and GL of morning (before 11 am) intake as well as morning carbohydrate intake from low- and higher-GI food sources during adolescence to **hepatic steatosis index (HSI)** in young adulthood (N=253).

**Table S3:** Prospective relation of GI and GL of morning (before 11 am) and evening (after 6 pm) intake as well as morning and evening intake from low- and higher-GI food sources during adolescence to **fatty liver index (FLI)** in young adulthood (N=253).

**Table S4:** Prospective relation of GI and GL of morning (before 11 am) and evening (after 6 pm) intake as well as morning and evening intake from low- and higher-GI food sources during adolescence to **fetuin A (mg/l)** in young adulthood (N=253).

**Table S5:** Prospective relation of GI and GL of morning (before 11 am) and evening (after 6 pm) intake as well as morning and evening intake from low- and higher-GI food sources during adolescence to **fibroblast growth factor 21 (FGF-21, pg/ml)** in young adulthood (N=253).

**Table S6:** Prospective relation of GI and GL of morning (before 11 am) and evening (after 6 pm) intake as well as morning and evening intake from low- and higher-GI food sources during adolescence to **interleukin 1 receptor antagonist (IL-1ra, pg/ml)** in young adulthood (N=249).

**Table S7:** Prospective relation of GI and GL of morning (before 11 am) and evening (after 6 pm) intake as well as morning and evening intake from low- and higher-GI food sources during adolescence to **omentin (ng/ml)** in young adulthood (N=249).

**Table S1:** Prospective relation of GI and GL of morning (before 11 am) intake as well as morning intake from low- and higher-GI food sources during adolescence to **HOMA2 sensitivity (%)** in young adulthood (N=252).

|  | Predicted means <sup>1</sup> of HOMA2 sensitivity (%)<br>by exposure tertiles<br>(exposures: morning GI, GL, low-GI-CHO, higher-GI-CHO) |                       |                    | p for trend <sup>2</sup> |
|--|---|-----------------------|--------------------|--------------------------|
|  | low exposure (T1)   | average exposure (T2) | high exposure (T3) |                          |
|  | MORNING   |                       |                    |                          |
| <b>Glycemic index (GI)</b>             |   |                       |                    |                          |
| <i>Median GI</i>                       | 52.2 (50.0; 53.8)   | 56.3 (55.2; 57.0)     | 59.6 (58.7; 60.8)  |                          |
| Model A <sup>3</sup>                   | 81.2 (75.2; 87.4)   | 80.2 (74.3; 86.3)     | 79.2 (73.4; 85.3)  | 0.78                     |
| Model B <sup>4</sup>                   | 80.9 (75.0; 87.1)   | 81.4 (75.5; 87.5)     | 79.8 (74.0; 85.8)  | 0.95                     |
| <b>Glycemic load (GL)</b>              |   |                       |                    |                          |
| <i>Median GL</i>                       | 35.7 (30.4; 42.7)   | 36.1 (30.5; 43.0)     | 45.1 (36.8; 53.9)  |                          |
| Model A <sup>3</sup>                   | 75.5 (69.8; 81.4)   | 81.1 (75.3; 87.1)     | 84.0 (78.1; 90.2)  | 0.23                     |
| Model B <sup>4</sup>                   | 76.6 (69.4; 84.1)   | 81.5 (75.7; 87.5)     | 84.0 (76.9; 91.5)  | 0.96                     |
| <b>CHO with low-GI <sup>5</sup></b>    |   |                       |                    |                          |
| <i>Median low-GI-CHO (E%)</i>          | 15.4 (12.4; 17.1)   | 21.3 (19.5; 23.3)     | 29.0 (26.6; 33.0)  |                          |
| Model A <sup>3</sup>                   | 78.7 (72.8; 84.8)   | 79.0 (73.2; 85.0)     | 83.0 (77.0; 89.2)  | 0.27                     |
| Model B <sup>4</sup>                   | 80.7 (74.7; 86.9)   | 80.1 (74.3; 86.1)     | 81.4 (75.3; 87.6)  | 0.90                     |
| <b>CHO with higher-GI <sup>5</sup></b> |   |                       |                    |                          |
| <i>Median higher-GI-CHO (E%)</i>       | 25.0 (22.5; 27.2)   | 32.9 (31.0; 34.3)     | 39.5 (36.7; 42.8)  |                          |
| Model A <sup>3</sup>                   | 79.7 (73.8; 85.8)   | 81.0 (75.1; 87.1)     | 79.9 (74.0; 86.0)  | 0.83                     |
| Model B <sup>4</sup>                   | 80.4 (74.4; 86.6)   | 82.3 (76.3; 88.5)     | 79.5 (73.4; 85.8)  | 0.99                     |

Values in italic refer to median intakes (25<sup>th</sup>, 75<sup>th</sup> percentile) in each tertile of the respective exposure.

<sup>1</sup> Model-values are least square means (95% confidence intervals) of HOMA2 sensitivity;

<sup>2</sup> P-values for models are based on linear regression analyses using continuous exposure variables;

<sup>3</sup> Model A (crude model) adjusted for sex and age at blood withdrawal;

<sup>4</sup> Model B additionally adjusted for first born child (yes/no), baseline BMI-SDS, baseline morning intake of saturated fatty acids and animal protein;

<sup>5</sup> Distinction between carbohydrate intake from low- and higher-GI food sources with a GI of 55 as cut-off.

**Table S2:** Prospective relation of GI and GL of morning (before 11 am) intake as well as morning carbohydrate intake from low- and higher-GI food sources during adolescence to **hepatic steatosis index (HSI)** in young adulthood (N=253).

|  | Predicted means <sup>1</sup> of HSI<br>by exposure tertiles<br>(exposures: morning GI, GL, low-GI-CHO, higher-GI-CHO) |                       |                    | p for trend <sup>2</sup> |
|--|---|-----------------------|--------------------|--------------------------|
|  | low exposure (T1)   | average exposure (T2) | high exposure (T3) |                          |
|  | MORNING   |                       |                    |                          |
| <b>Glycemic index (GI)</b>             |   |                       |                    |                          |
| <i>Median GI</i>                       | 52.2 (50.1; 53.8)   | 56.2 (55.2; 57.0)     | 59.6 (58.7; 60.8)  |                          |
| Model A <sup>3</sup>                   | 29.6 (28.8; 30.5)   | 30.5 (31.5; 29.6)     | 30.0 (29.1; 30.9)  | 0.43                     |
| Model B <sup>4</sup>                   | 29.6 (28.9; 30.3)   | 30.5 (29.8; 31.3)     | 30.3 (29.6; 31.0)  | 0.42                     |
| <b>Glycemic load (GL)</b>              |   |                       |                    |                          |
| <i>Median GL</i>                       | 35.7 (30.4; 41.8)   | 36.1 (30.7; 43.0)     | 45.1 (36.8; 53.7)  |                          |
| Model A <sup>3</sup>                   | 30.6 (29.7; 31.6)   | 30.2 (29.4; 31.2)     | 29.3 (28.5; 30.2)  | 0.44                     |
| Model B <sup>4</sup>                   | 30.3 (29.5; 31.2)   | 30.5 (29.8; 31.3)     | 29.5 (28.7; 30.3)  | 0.94                     |
| <b>CHO with low-GI <sup>5</sup></b>    |   |                       |                    |                          |
| <i>Median low-GI-CHO (E%)</i>          | 15.4 (12.5; 17.3)   | 21.3 (19.5; 23.3)     | 29.0 (26.6; 33.0)  |                          |
| Model A <sup>3</sup>                   | 31.0 (30.0; 31.9)   | 29.8 (28.9; 30.7)     | 29.4 (28.6; 30.3)  | 0.041                    |
| Model B <sup>4</sup>                   | 30.7 (30.0; 31.5)   | 30.0 (29.3; 30.7)     | 29.6 (28.9; 30.4)  | 0.24                     |
| <b>CHO with higher-GI <sup>5</sup></b> |   |                       |                    |                          |
| <i>Median higher-GI-CHO (E%)</i>       | 25.0 (22.6; 27.2)   | 32.9 (31.0; 34.3)     | 38.9 (36.6; 42.7)  |                          |
| Model A <sup>3</sup>                   | 29.6 (28.8; 30.5)   | 30.0 (29.1; 30.9)     | 30.6 (29.7; 31.5)  | 0.27                     |
| Model B <sup>4</sup>                   | 29.7 (29.0; 30.4)   | 30.3 (29.6; 31.0)     | 30.4 (29.6; 31.1)  | 0.37                     |

Values in italic refer to median intakes (25<sup>th</sup>, 75<sup>th</sup> percentile) in each tertile of the respective exposure.

<sup>1</sup> Model-values are least square means (95% confidence intervals) of the HSI;

<sup>2</sup> P-values for models are based on linear regression analyses using continuous exposure variables;

<sup>3</sup> Model A (crude model) adjusted for sex and age at blood withdrawal;

<sup>4</sup> Model B additionally adjusted for gestational weight gain, duration of pregnancy and birth weight, maternal educational status (≥12 years of schooling yes/no), maternal overweight (≥25kg/m<sup>2</sup> yes/no), baseline BMI-SDS, baseline morning intake of saturated fatty acids;

<sup>5</sup> Distinction between carbohydrate intake from low- and higher-GI food sources with a GI of 55 as cut-off.

**Table S3:** Prospective relation of GI and GL of morning (before 11 am) and evening (after 6 pm) intake as well as morning and evening intake from low- and higher-GI food sources during adolescence to **fatty liver index (FLI)** in young adulthood (N=253).

|  | Predicted means <sup>1</sup> of FLI<br>by exposure tertiles<br>(exposures: morning and evening GI, GL, low-GI-CHO, higher-GI-CHO) |                       |                    | p for trend <sup>2</sup> |
|--|---|-----------------------|--------------------|--------------------------|
|  | low exposure (T1)   | average exposure (T2) | high exposure (T3) |                          |
|  | <b>MORNING</b>  |                       |                    |                          |
| <b>Glycemic index (GI)</b>             |   |                       |                    |                          |
| <i>Median GI</i>                       | 52.2 (50.1; 53.8)   | 56.2 (55.2; 57.0)     | 59.6 (58.7; 60.8)  |                          |
| Model A <sup>3</sup>                   | 7.9 (6.7; 9.5)  | 8.4 (7.1; 10.1)       | 7.6 (6.4; 9.1)     | 0.85                     |
| Model B <sup>4</sup>                   | 7.9 (6.8; 9.1)  | 8.4 (7.3; 9.8)        | 8.0 (7.0; 9.3)     | 0.90                     |
| <b>Glycemic load (GL)</b>              |   |                       |                    |                          |
| <i>Median GL</i>                       | 35.7 (30.4; 41.8)   | 36.1 (30.7; 43.0)     | 45.1 (36.8; 53.7)  |                          |
| Model A <sup>3</sup>                   | 8.5 (7.1; 10.2)   | 8.4 (7.1; 10.1)       | 7.1 (6.0; 8.5)     | 0.47                     |
| Model B <sup>4</sup>                   | 8.0 (6.8; 9.5)  | 8.9 (7.7; 10.4)       | 7.4 (6.4; 8.8)     | 0.85                     |
| <b>CHO with low-GI <sup>5</sup></b>    |   |                       |                    |                          |
| <i>Median low-GI-CHO (E%)</i>          | 15.4 (12.5; 17.3)   | 21.3 (19.5; 23.3)     | 29.0 (26.6; 33.0)  |                          |
| Model A <sup>3</sup>                   | 9.3 (7.8; 11.3)   | 7.8 (6.6; 9.3)        | 7.0 (5.9; 8.3)     | 0.08                     |
| Model B <sup>4</sup>                   | 9.0 (7.7; 10.5)   | 8.2 (7.1; 9.5)        | 7.2 (6.2; 8.4)     | 0.34                     |
| <b>CHO with higher-GI <sup>5</sup></b> |   |                       |                    |                          |
| <i>Median higher-GI-CHO (E%)</i>       | 25.0 (22.6; 27.2)   | 32.9 (31.0; 34.3)     | 38.9 (36.6; 42.7)  |                          |
| Model A <sup>3</sup>                   | 7.4 (6.3; 8.9)  | 7.5 (6.4; 8.9)        | 9.1 (7.6; 11.0)    | 0.30                     |
| Model B <sup>4</sup>                   | 7.6 (6.6; 8.8)  | 8.0 (7.0; 9.3)        | 8.7 (7.5; 10.2)    | 0.48                     |
| <b>EVENING</b>                         |   |                       |                    |                          |
| <b>Glycemic index (GI)</b>             |   |                       |                    |                          |
| <i>Median GI</i>                       | 53.4 (52.4; 54.3)   | 56.6 (55.9; 57.4)     | 60.2 (59.2; 61.5)  |                          |
| Model A <sup>3</sup>                   | 8.9 (7.5; 10.7)   | 8.5 (7.1; 10.1)       | 6.8 (5.8; 8.0)     | 0.08                     |
| Model B <sup>4</sup>                   | 7.9 (6.8; 9.2)  | 9.0 (7.8; 10.5)       | 7.5 (6.5; 8.6)     | 0.98                     |
| <b>Glycemic load (GL)</b>              |   |                       |                    |                          |
| <i>Median GL</i>                       | 35.6 (26.9; 44.8)   | 37.0 (31.4; 45.2)     | 48.5 (39.9; 55.1)  |                          |
| Model A <sup>3</sup>                   | 8.3 (7.0; 10.0)   | 7.1 (6.0; 8.4)        | 8.6 (7.3; 10.4)    | 0.62                     |
| Model B <sup>4</sup>                   | 7.9 (6.7; 9.4)  | 7.7 (6.7; 9.0)        | 8.7 (7.4; 10.3)    | 0.49                     |
| <b>CHO with low-GI <sup>5</sup></b>    |   |                       |                    |                          |
| <i>Median low-GI-CHO (E%)</i>          | 13.1 (10.3; 14.8)   | 18.7 (17.2; 20.1)     | 24.6 (22.8; 28.1)  |                          |
| Model A <sup>3</sup>                   | 7.9 (6.6; 9.4)  | 8.1 (6.9; 9.7)        | 7.9 (6.7; 9.5)     | 0.58                     |
| Model B <sup>4</sup>                   | 8.7 (7.5; 10.2)   | 8.1 (7.1; 9.4)        | 7.5 (6.5; 8.7)     | 0.36                     |
| <b>CHO with higher-GI <sup>5</sup></b> |   |                       |                    |                          |
| <i>Median higher-GI-CHO (E%)</i>       | 22.8 (20.8; 24.8)   | 30.2 (28.8; 32.0)     | 35.5 (33.8; 38.1)  |                          |
| Model A <sup>3</sup>                   | 7.5 (6.3; 8.9)  | 8.0 (6.7; 9.5)        | 8.5 (7.2; 10.3)    | 0.58                     |
| Model B <sup>4</sup>                   | 7.0 (6.1; 8.1)  | 8.4 (7.3; 9.8)        | 9.0 (7.7; 10.6)    | 0.15                     |

Values in italic refer to median intakes (25<sup>th</sup>, 75<sup>th</sup> percentile) in each tertile of the respective exposure.

<sup>1</sup> Model-values are least square means (95% confidence intervals) of the FLI;

<sup>2</sup> P-values for models are based on linear regression analyses using continuous exposure variables;

<sup>3</sup> Model A (crude model) adjusted for sex and age at blood withdrawal;

<sup>4</sup> Model B additionally adjusted for gestational weight gain, duration of pregnancy and birth weight, maternal educational status (≥12 years of schooling yes/no), maternal overweight (≥25kg/m<sup>2</sup> yes/no), baseline BMI-SDS, baseline morning or evening intake of saturated fatty acids;

<sup>5</sup> Distinction between carbohydrate intake from low- and higher-GI food sources with a GI of 55 as cut-off.

**Table S4:** Prospective relation of GI and GL of morning (before 11 am) and evening (after 6 pm) intake as well as morning and evening intake from low- and higher-GI food sources during adolescence to **fetuin A (mg/l)** in young adulthood (N=253).

|  | Predicted means <sup>1</sup> of fetuin A (mg/l)<br>by exposure tertiles<br>(exposures: morning and evening GI, GL, low-GI-CHO, higher-GI-CHO) |                       |                    | p for trend <sup>2</sup> |
|--|---|-----------------------|--------------------|--------------------------|
|  | low exposure (T1)   | average exposure (T2) | high exposure (T3) |                          |
|  | MORNING   |                       |                    |                          |
| <b>Glycemic index (GI)</b>             |   |                       |                    |                          |
| <i>Median GI</i>                       | 52.2 (50.1; 53.8)   | 56.2 (55.2; 57.0)     | 59.6 (58.7; 60.8)  |                          |
| Model A <sup>3</sup>                   | 273 (263; 284)  | 270 (260; 280)        | 278 (267; 288)     | 0.53                     |
| Model B <sup>4</sup>                   | 276 (266; 286)  | 269 (259; 279)        | 278 (268; 289)     | 0.77                     |
| <b>Glycemic load (GL)</b>              |   |                       |                    |                          |
| <i>Median GL</i>                       | 35.7 (30.4; 41.8)   | 36.1 (30.7; 43.0)     | 45.1 (36.8; 53.7)  |                          |
| Model A <sup>3</sup>                   | 273 (263; 283)  | 268.9 (259.0; 279.0)  | 279 (268; 289)     | 0.87                     |
| Model B <sup>4</sup>                   | 269 (258; 281)  | 270.0 (260.1; 280.2)  | 284 (273; 296)     | 0.60                     |
| <b>CHO with low-GI <sup>5</sup></b>    |   |                       |                    |                          |
| <i>Median low-GI-CHO (E%)</i>          | 15.4 (12.5; 17.3)   | 21.3 (19.5; 23.3)     | 29.0 (26.6; 33.0)  |                          |
| Model A <sup>3</sup>                   | 273 (263; 283)  | 274.8 (264.8; 285.1)  | 273 (263; 283)     | 0.83                     |
| Model B <sup>4</sup>                   | 274 (263; 284)  | 274.3 (264.2; 284.7)  | 275 (264; 286)     | 0.75                     |
| <b>CHO with higher-GI <sup>5</sup></b> |   |                       |                    |                          |
| <i>Median higher-GI-CHO (E%)</i>       | 25.0 (22.6; 27.2)   | 32.9 (31.0; 34.3)     | 38.9 (36.6; 42.7)  |                          |
| Model A <sup>3</sup>                   | 275 (265; 285)  | 270 (260; 280)        | 276 (266; 286)     | 0.82                     |
| Model B <sup>4</sup>                   | 276 (265; 286)  | 270 (260; 280)        | 277 (267; 288)     | 0.92                     |
| <b>EVENING</b>                         |   |                       |                    |                          |
| <b>Glycemic index (GI)</b>             |   |                       |                    |                          |
| <i>Median GI</i>                       | 53.4 (52.4; 54.3)   | 56.6 (55.9; 57.4)     | 60.2 (59.2; 61.5)  |                          |
| Model A <sup>3</sup>                   | 270 (260; 280)  | 275 (265; 286)        | 275 (265; 285)     | 0.91                     |
| Model B <sup>4</sup>                   | 271 (261; 282)  | 276 (266; 287)        | 275 (265; 285)     | 0.74                     |
| <b>Glycemic load (GL)</b>              |   |                       |                    |                          |
| <i>Median GL</i>                       | 35.6 (26.9; 44.8)   | 37.0 (31.4; 45.2)     | 48.5 (39.9; 55.1)  |                          |
| Model A <sup>3</sup>                   | 266 (256; 276)  | 267 (260; 276)        | 288 (278; 299)     | 0.026                    |
| Model B <sup>4</sup>                   | 262 (251; 273)  | 268 (258; 278)        | 293 (281; 304)     | 0.005                    |
| <b>CHO with low-GI <sup>5</sup></b>    |   |                       |                    |                          |
| <i>Median low-GI-CHO (E%)</i>          | 13.1 (10.3; 14.8)   | 18.7 (17.2; 20.1)     | 24.6 (22.8; 28.1)  |                          |
| Model A <sup>3</sup>                   | 274 (264; 284)  | 272 (262; 282)        | 274 (264; 284)     | 0.72                     |
| Model B <sup>4</sup>                   | 275 (265; 286)  | 273 (263; 283)        | 275 (264; 285)     | 0.74                     |
| <b>CHO with higher-GI <sup>5</sup></b> |   |                       |                    |                          |
| <i>Median higher-GI-CHO (E%)</i>       | 22.8 (20.8; 24.8)   | 30.2 (28.8; 32.0)     | 35.5 (33.8; 38.1)  |                          |
| Model A <sup>3</sup>                   | 265 (255; 275)  | 274 (264; 284)        | 282 (272; 292)     | 0.039                    |
| Model B <sup>4</sup>                   | 265 (254; 275)  | 274 (264; 285)        | 283 (273; 294)     | 0.029                    |

Values in italic refer to median intakes (25<sup>th</sup>, 75<sup>th</sup> percentile) in each tertile of the respective exposure.

<sup>1</sup> Model-values are least square means (95% confidence intervals) of the fetuin A;

<sup>2</sup> P-values for models are based on linear regression analyses using continuous exposure variables;

<sup>3</sup> Model A (crude model) adjusted for sex and age at blood withdrawal;

<sup>4</sup> Model B additionally adjusted for gestational weight gain, duration of pregnancy and birth weight, maternal educational status ( $\geq 12$  years of schooling yes/no), maternal overweight ( $\geq 25\text{kg/m}^2$  yes/no), baseline BMI-SDS, baseline morning or evening intake of saturated fatty acids;

<sup>5</sup> Distinction between carbohydrate intake from low- and higher-GI food sources with a GI of 55 as cut-off.

**Table S5:** Prospective relation of GI and GL of morning (before 11 am) and evening (after 6 pm) intake as well as morning and evening intake from low- and higher-GI food sources during adolescence to **fibroblast growth factor 21 (FGF-21, pg/ml)** in young adulthood (N=253).

|  | Predicted means <sup>1</sup> of FGF-21 (pg/ml)<br>by exposure tertiles<br>(exposures: morning and evening GI, GL, low-GI-CHO, higher-GI-CHO) |                       |                    | p for trend <sup>2</sup> |
|--|--|-----------------------|--------------------|--------------------------|
|  | low exposure (T1)  | average exposure (T2) | high exposure (T3) |                          |
|  | <b>MORNING</b>   |                       |                    |                          |
| <b>Glycemic index (GI)</b>             |  |                       |                    |                          |
| <i>Median GI</i>                       | 52.2 (50.1; 53.8)  | 56.2 (55.2; 57.0)     | 59.6 (58.7; 60.8)  |                          |
| Model A <sup>3</sup>                   | 73.5 (59.3; 90.7)  | 71.9 (58.2; 88.7)     | 93.4 (75.8; 114.7) | 0.09                     |
| Model B <sup>4</sup>                   | 73.9 (59.3; 91.7)  | 71.5 (57.5; 88.6)     | 94.2 (76.2; 116.2) | 0.09                     |
| <b>Glycemic load (GL)</b>              |  |                       |                    |                          |
| <i>Median GL</i>                       | 35.7 (30.4; 41.8)  | 36.1 (30.7; 43.0)     | 45.1 (36.8; 53.7)  |                          |
| Model A <sup>3</sup>                   | 73.3 (59.3; 90.5)  | 78.0 (63.2; 96.0)     | 86.3 (69.9; 106.2) | 0.57                     |
| Model B <sup>4</sup>                   | 64.6 (50.2; 82.8)  | 79.7 (64.3; 98.4)     | 96.8 (76.1; 122.7) | 0.12                     |
| <b>CHO with low-GI <sup>5</sup></b>    |  |                       |                    |                          |
| <i>Median low-GI-CHO (E%)</i>          | 15.4 (12.5; 17.3)  | 21.3 (19.5; 23.3)     | 29.0 (26.6; 33.0)  |                          |
| Model A <sup>3</sup>                   | 85.3 (68.8; 105.4)   | 73.0 (59.0; 90.0)     | 79.4 (64.1; 97.9)  | 0.46                     |
| Model B <sup>4</sup>                   | 85.1 (68.2; 105.9)   | 72.4 (58.2; 89.7)     | 80.8 (64.3; 101.0) | 0.58                     |
| <b>CHO with higher-GI <sup>5</sup></b> |  |                       |                    |                          |
| <i>Median higher-GI-CHO (E%)</i>       | 25.0 (22.6; 27.2)  | 32.9 (31.0; 34.3)     | 38.9 (36.6; 42.7)  |                          |
| Model A <sup>3</sup>                   | 67.6 (54.6; 83.4)  | 91.6 (74.4; 112.5)    | 79.4 (64.3; 97.9)  | 0.97                     |
| Model B <sup>4</sup>                   | 66.5 (53.2; 82.8)  | 90.8 (73.1; 112.3)    | 82.1 (65.8; 102.1) | 0.24                     |
| <b>EVENING</b>                         |  |                       |                    |                          |
| <b>Glycemic index (GI)</b>             |  |                       |                    |                          |
| <i>Median GI</i>                       | 53.4 (52.4; 54.3)  | 56.6 (55.9; 57.4)     | 60.2 (59.2; 61.5)  |                          |
| Model A <sup>3</sup>                   | 71.3 (57.6; 88.0)  | 77.9 (63.1; 95.8)     | 88.9 (72.0; 109.4) | 0.22                     |
| Model B <sup>4</sup>                   | 70.6 (56.3; 88.1)  | 77.0 (62.0; 95.3)     | 91.0 (73.3; 112.7) | 0.16                     |
| <b>Glycemic load (GL)</b>              |  |                       |                    |                          |
| <i>Median GL</i>                       | 35.6 (26.9; 44.8)  | 37.0 (31.4; 45.2)     | 48.5 (39.9; 55.1)  |                          |
| Model A <sup>3</sup>                   | 77.8 (62.8; 96.2)  | 76.0 (61.4; 93.7)     | 83.5 (67.6; 103.0) | 0.24                     |
| Model B <sup>4</sup>                   | 80.6 (62.8; 103.0)   | 76.3 (61.2; 94.8)     | 80.6 (63.4; 102.0) | 0.34                     |
| <b>CHO with low-GI <sup>5</sup></b>    |  |                       |                    |                          |
| <i>Median low-GI-CHO (E%)</i>          | 13.1 (10.3; 14.8)  | 18.7 (17.2; 20.1)     | 24.6 (22.8; 28.1)  |                          |
| Model A <sup>3</sup>                   | 81.4 (65.8; 100.4)   | 77.9 (63.1; 96.0)     | 77.8 (62.9; 96.1)  | 0.74                     |
| Model B <sup>4</sup>                   | 84.3 (67.3; 105.1)   | 78.0 (63.0; 96.3)     | 75.7 (60.6; 94.3)  | 0.42                     |
| <b>CHO with higher-GI <sup>5</sup></b> |  |                       |                    |                          |
| <i>Median higher-GI-CHO (E%)</i>       | 22.8 (20.8; 24.8)  | 30.2 (28.8; 32.0)     | 35.5 (33.8; 38.1)  |                          |
| Model A <sup>3</sup>                   | 72.3 (58.4; 89.3)  | 80.1 (64.8; 98.6)     | 85.2 (69.0; 104.9) | 0.25                     |
| Model B <sup>4</sup>                   | 71.9 (57.2; 90.1)  | 80.4 (64.8; 99.3)     | 85.5 (68.3; 106.8) | 0.27                     |

Values in italic refer to median intakes (25<sup>th</sup>, 75<sup>th</sup> percentile) in each tertile of the respective exposure.

<sup>1</sup> Model-values are least square means (95% confidence intervals) of the FGF-21;

<sup>2</sup> P-values for models are based on linear regression analyses using continuous exposure variables;

<sup>3</sup> Model A (crude model) adjusted for sex and age at blood withdrawal;

<sup>4</sup> Model B additionally adjusted for gestational weight gain, duration of pregnancy and birth weight, maternal educational status (≥12 years of schooling yes/no), maternal overweight (≥25kg/m<sup>2</sup> yes/no), baseline BMI-SDS, baseline morning or evening intake of saturated fatty acids;

<sup>5</sup> Distinction between carbohydrate intake from low- and higher-GI food sources with a GI of 55 as cut-off.

**Table S6:** Prospective relation of GI and GL of morning (before 11 am) and evening (after 6 pm) intake as well as morning and evening intake from low- and higher-GI food sources during adolescence to **interleukin 1 receptor antagonist (IL-1ra, pg/ml)** in young adulthood (N=249).

|  | Predicted means <sup>1</sup> of IL-1ra (pg/ml)<br>by exposure tertiles<br>(exposures: morning and evening GI, GL, low-GI-CHO, higher-GI-CHO) |                       |                    | p for trend <sup>2</sup> |
|--|--|-----------------------|--------------------|--------------------------|
|  | low exposure (T1)  | average exposure (T2) | high exposure (T3) |                          |
|  | <b>MORNING</b>   |                       |                    |                          |
| <b>Glycemic index (GI)</b>             |  |                       |                    |                          |
| <i>Median GI</i>                       | 52.2 (50.2; 53.8)  | 56.2 (55.2; 57.0)     | 59.5 (58.5; 60.6)  |                          |
| Model A <sup>3</sup>                   | 205 (189; 223)   | 208 (192; 226)        | 212 (196; 232)     | 0.51                     |
| Model B <sup>4</sup>                   | 206 (190; 224)   | 206 (191; 225)        | 215 (198; 235)     | 0.62                     |
| <b>Glycemic load (GL)</b>              |  |                       |                    |                          |
| <i>Median GL</i>                       | 35.7 (30.4; 41.6)  | 35.9 (30.4; 42.9)     | 45.4 (37.1; 53.9)  |                          |
| Model A <sup>3</sup>                   | 202 (187; 220)   | 210 (194; 229)        | 213 (196; 233)     | 0.23                     |
| Model B <sup>4</sup>                   | 198 (182; 216)   | 212 (196; 231)        | 218 (200; 240)     | 0.08                     |
| <b>CHO with low-GI <sup>5</sup></b>    |  |                       |                    |                          |
| <i>Median low-GI-CHO (E%)</i>          | 15.4 (12.4; 17.3)  | 21.4 (19.5; 23.3)     | 28.8 (26.5; 32.7)  |                          |
| Model A <sup>3</sup>                   | 215 (198; 236)   | 206 (190; 224)        | 204 (189; 222)     | 0.58                     |
| Model B <sup>4</sup>                   | 213 (196; 233)   | 208 (192; 226)        | 207 (191; 225)     | 0.96                     |
| <b>CHO with higher-GI <sup>5</sup></b> |  |                       |                    |                          |
| <i>Median higher-GI-CHO (E%)</i>       | 25.0 (22.5; 27.2)  | 32.9 (31.0; 34.3)     | 38.6 (36.5; 42.8)  |                          |
| Model A <sup>3</sup>                   | 205 (190; 224)   | 201 (186; 218)        | 220 (202; 241)     | 0.18                     |
| Model B <sup>4</sup>                   | 206 (190; 225)   | 201 (187; 219)        | 221 (202; 242)     | 0.21                     |
| <b>EVENING</b>                         |  |                       |                    |                          |
| <b>Glycemic index (GI)</b>             |  |                       |                    |                          |
| <i>Median GI</i>                       | 53.3 (52.4; 54.3)  | 56.6 (55.9; 57.4)     | 60.2 (59.1; 61.5)  |                          |
| Model A <sup>3</sup>                   | 216 (199; 236)   | 216 (199; 236)        | 194 (180; 211)     | 0.19                     |
| Model B <sup>4</sup>                   | 216 (198; 236)   | 217 (200; 237)        | 196 (182; 212)     | 0.23                     |
| <b>Glycemic load (GL)</b>              |  |                       |                    |                          |
| <i>Median GL</i>                       | 34.4 (26.9; 44.8)  | 37.1 (31.3; 44.6)     | 48.5 (40.0; 55.1)  |                          |
| Model A <sup>3</sup>                   | 231 (211; 252)   | 193 (180; 209)        | 204 (189; 222)     | 0.36                     |
| Model B <sup>4</sup>                   | 233 (182; 213)   | 196 (182; 213)        | 202 (186; 221)     | 0.37                     |
| <b>CHO with low-GI <sup>5</sup></b>    |  |                       |                    |                          |
| <i>Median low-GI-CHO (E%)</i>          | 13.1 (10.3; 14.7)  | 18.5 (17.2; 20.0)     | 24.6 (22.8; 28.2)  |                          |
| Model A <sup>3</sup>                   | 204 (189; 222)   | 210 (194; 229)        | 211 (194; 230)     | 0.57                     |
| Model B <sup>4</sup>                   | 204 (188; 222)   | 211 (195; 230)        | 213 (196; 233)     | 0.41                     |
| <b>CHO with higher-GI <sup>5</sup></b> |  |                       |                    |                          |
| <i>Median higher-GI-CHO (E%)</i>       | 22.5 (20.8; 24.9)  | 30.2 (28.8; 32.0)     | 35.4 (33.7; 38.1)  |                          |
| Model A <sup>3</sup>                   | 211 (230; 194)   | 206 (225; 191)        | 208 (227; 192)     | 0.39                     |
| Model B <sup>4</sup>                   | 212 (233; 195)   | 207 (226; 192)        | 208 (227; 192)     | 0.34                     |

Values in italic refer to median intakes (25<sup>th</sup>, 75<sup>th</sup> percentile) in each tertile of the respective exposure.

<sup>1</sup> Model-values are least square means (95% confidence intervals) of IL-1ra;

<sup>2</sup> P-values for models are based on linear regression analyses using continuous exposure variables;

<sup>3</sup> Model A (crude model) adjusted for sex and age at blood withdrawal;

<sup>4</sup> Model B additionally adjusted for gestational weight gain, maternal educational status (≥12 years of schooling yes/no), baseline BMI-SDS, baseline morning or evening intake of animal protein;

<sup>5</sup> Distinction between carbohydrate intake from low- and higher-GI food sources with a GI of 55 as cut-off.

**Table S7:** Prospective relation of GI and GL of morning (before 11 am) and evening (after 6 pm) intake as well as morning and evening intake from low- and higher-GI food sources during adolescence to **omentin (ng/ml)** in young adulthood (N=249)

|  | Predicted means <sup>1</sup> for omentin (ng/ml)<br>by exposure tertiles<br>(exposures: morning and evening GI, GL, low-GI-CHO, higher-GI-CHO) |                       |                    | p for trend <sup>2</sup> |
|--|--|-----------------------|--------------------|--------------------------|
|  | low exposure (T1)  | average exposure (T2) | high exposure (T3) |                          |
|  | <b>MORNING</b>   |                       |                    |                          |
| <b>Glycemic index (GI)</b>             |  |                       |                    |                          |
| <i>Median GI</i>                       | 52.2 (50.2; 53.8)  | 56.2 (55.2; 57.0)     | 59.5 (58.5; 60.6)  |                          |
| Model A <sup>3</sup>                   | 364 (343; 386)   | 373 (352; 396)        | 401 (378; 426)     | 0.011                    |
| Model B <sup>4</sup>                   | 362 (341; 384)   | 375 (354; 398)        | 400 (377; 424)     | 0.003                    |
| <b>Glycemic load (GL)</b>              |  |                       |                    |                          |
| <i>Median GL</i>                       | 35.7 (30.4; 41.6)  | 35.9 (30.4; 42.9)     | 45.4 (37.1; 53.9)  |                          |
| Model A <sup>3</sup>                   | 379 (357; 403)   | 370 (349; 393)        | 389 (366; 413)     | 0.32                     |
| Model B <sup>4</sup>                   | 374 (351; 399)   | 370 (349; 392)        | 393 (369; 418)     | 0.09                     |
| <b>CHO with low-GI <sup>5</sup></b>    |  |                       |                    |                          |
| <i>Median low-GI-CHO (E%)</i>          | 15.4 (12.4; 17.3)  | 21.4 (19.5; 23.3)     | 28.8 (26.5; 32.7)  |                          |
| Model A <sup>3</sup>                   | 393 (370; 418)   | 368 (347; 391)        | 377 (355; 400)     | 0.29                     |
| Model B <sup>4</sup>                   | 397 (373; 422)   | 366 (345; 388)        | 375 (353; 398)     | 0.13                     |
| <b>CHO with higher-GI <sup>5</sup></b> |  |                       |                    |                          |
| <i>Median higher-GI-CHO (E%)</i>       | 25.0 (22.5; 27.2)  | 32.9 (31.0; 34.3)     | 38.6 (36.5; 42.8)  |                          |
| Model A <sup>3</sup>                   | 371 (350; 394)   | 380 (358; 403)        | 386 (364; 411)     | 0.41                     |
| Model B <sup>4</sup>                   | 366 (344; 389)   | 377 (356; 400)        | 394 (370; 419)     | 0.10                     |
| <b>EVENING</b>                         |  |                       |                    |                          |
| <b>Glycemic index (GI)</b>             |  |                       |                    |                          |
| <i>Median GI</i>                       | 53.3 (52.4; 54.3)  | 56.6 (55.9; 57.4)     | 60.2 (59.1; 61.5)  |                          |
| Model A <sup>3</sup>                   | 367 (346; 390)   | 379 (357; 402)        | 392 (370; 417)     | 0.13                     |
| Model B <sup>4</sup>                   | 370 (346; 391)   | 379 (357; 402)        | 390 (367; 414)     | 0.21                     |
| <b>Glycemic load (GL)</b>              |  |                       |                    |                          |
| <i>Median GL</i>                       | 34.4 (26.9; 44.8)  | 37.1 (31.3; 44.6)     | 48.5 (40.0; 55.1)  |                          |
| Model A <sup>3</sup>                   | 370 (348; 393)   | 393 (370; 417)        | 375 (354; 398)     | 0.96                     |
| Model B <sup>4</sup>                   | 371 (348; 396)   | 388 (366; 412)        | 377 (354; 402)     | 0.97                     |
| <b>CHO with low-GI <sup>5</sup></b>    |  |                       |                    |                          |
| <i>Median low-GI-CHO (E%)</i>          | 13.1 (10.3; 14.7)  | 18.5 (17.2; 20.0)     | 24.6 (22.8; 28.2)  |                          |
| Model A <sup>3</sup>                   | 385 (363; 409)   | 386 (364; 410)        | 367 (346; 389)     | 0.23                     |
| Model B <sup>4</sup>                   | 384 (361; 408)   | 386 (364; 409)        | 367 (346; 390)     | 0.26                     |
| <b>CHO with higher-GI <sup>5</sup></b> |  |                       |                    |                          |
| <i>Median higher-GI-CHO (E%)</i>       | 22.5 (20.8; 24.9)  | 30.2 (28.8; 32.0)     | 35.4 (33.7; 38.1)  |                          |
| Model A <sup>3</sup>                   | 379 (357; 402)   | 389 (364; 410)        | 373 (351; 396)     | 0.66                     |
| Model B <sup>4</sup>                   | 379 (356; 404)   | 385 (363; 409)        | 372 (351; 396)     | 0.64                     |

Values in italic refer to median intakes (25<sup>th</sup>, 75<sup>th</sup> percentile) in each tertile of the respective exposure.

<sup>1</sup> Model-values are least square means (95% confidence intervals) of omentin;

<sup>2</sup> P-values for models are based on linear regression analyses using continuous exposure variables;

<sup>3</sup> Model A (crude model) adjusted for sex and age at blood withdrawal;

<sup>4</sup> Model B additionally adjusted for gestational weight gain, maternal educational status (≥12 years of schooling yes/no), baseline BMI-SDS, baseline morning or evening intake of animal protein;

<sup>5</sup> Distinction between carbohydrate intake from low- and higher-GI food sources with a GI of 55 as cut-off.