Methods: The FA proportions were measured in plasma PL, CE and TG fractions in 1364 Finnish men aged 45 to 68 y at baseline (mean ± SD: age 55 ± 5.6 year; body mass index 26.5 ± 3.5 kg/m^2; fasting plasma glucose 5.8 ± 0.6 mmol/l). The prospective follow-up study included only men who were non-diabetic at baseline and had data available at the follow-up (n=1302). A total of 71 participants developed new T2DM during the follow-up.
Results: After the adjustment for confounding factors, total saturated FAs, palmitoleic acid (16:1n-7), di-homo-gamma-linolenic acid (20:3n-6) and estimated stearoyl coenzyme A desaturase 1 and delta-6 desaturase (D6D) enzyme activities significantly predicted the worsening of glycemia, whereas total PUFA, linoleic acid (18:2n-6) and elongase activity were the main predictors for decreased Glucose AUC. Estimated D6D activity and dihomo-gamma-linolenic acid (20:3n-6) increased the risk of incident T2DM. The results were consistent across the three different lipid fractions, but FA proportions in PL and CE were stronger predictors for worsening of glycemia and incident T2DM than FA proportions in TG.
Conclusion: FA proportions in plasma lipid fractions and their ratios reflecting desaturase and elongase enzyme activities predicted the worsening of glycemia and incident T2DM.
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17. Prospective relevance of fruit and vegetable consumption during puberty for risk markers of type 2 diabetes in young adulthood – the role of the dietary glycemic index

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Objective: A higher consumption of fruits and vegetable (FV) may confer a lower risk of developing type 2 diabetes. This protective link may be partly attributable to flavonoids provided by these foods (FV-flavonoid). In addition, many fruits in particular are also characterized by a low or intermediate glycemic index (GI). This study examined the prospective associations of habitual FV or FV-flavonoid intake during puberty with homeostasis model assessment insulin resistance (HOMA-IR), alanine aminotransferase (ALT) and γ-glutamyltransferase (GGT) in younger adulthood and whether these are partly attributable to the dietary GI.
Methods: Healthy participants from the DONALD Study were eligible for analysis if they had provided a fasting blood sample in adulthood (18-39 y) and at least two 3-day dietary records during puberty (girls: 9-15y, boys: 10-16y, n=260). Additional multivariable regression analyses among those providing at least three 24-h urines in puberty (n=222) addressed urinary hippuric acid (HA), a biomarker of FV-flavonoid.
Results: A higher FV intake was independently related to lower HOMA-IR values (p_{trend}=0.03) and a tendency for lower GGT values (p_{trend}=0.099) in adulthood. These associations were removed by additional inclusion of dietary GI (conditional model, p=0.2 and p=0.5). Similarly, associations between higher HA excretion in puberty and lower adult HOMA-IR (p=0.03) and GGT (p=0.0001) were attenuated in a conditional model with dietary GI (p=0.08 and p=0.0005). Associations between pubertal HA and adult ALT (p=0.009) were not responsive to dietary GI adjustments. FV-flavonoids estimated from dietary records were not related to adult risk markers of type 2 diabetes (p>0.05).