

Publication

A 4-week high-AGE diet does not impair glucose metabolism and vascular function in obese individuals.

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)**ID** 4643294**Author(s)** Linkens, Armand Ma; Houben, Alfons Jhm; Niessen, Petra M; Wijckmans, Nicole Eg; de Goei, Erica Ec; Van den Eynde, Mathias Dg; Scheijen, Jean Ljm; van den Waarenburg, Marjo Ph; Mari, Andrea; Berendschot, Tos Tjm; Streese, Lukas; Hanssen, Henner; van Dongen, Martien Cjm; van Gool, Christel Cjaw; Stehouwer, Coen DA; Eussen, Simone Jmp; Schalkwijk, Casper G**Author(s) at UniBasel** [Streese, Lukas](#) ; [Hanssen, Henner](#) ;**Year** 2022**Title** A 4-week high-AGE diet does not impair glucose metabolism and vascular function in obese individuals.**Journal** JCI insight**Volume** 7**Number** 6**Pages / Article-Number** 3**Keywords** Clinical Trials; Glucose metabolism; Microcirculation; Vascular Biology**Mesh terms** Diabetes Mellitus, Type 2; Diet; Glucose; Glycation End Products, Advanced; Humans; Inflammation; Insulin Resistance; Lipids; Lysine; Male; Obesity

BACKGROUND Accumulation of advanced glycation endproducts (AGEs) may contribute to the pathophysiology of type 2 diabetes and its vascular complications. AGEs are widely present in food, but whether restricting AGE intake improves risk factors for type 2 diabetes and vascular dysfunction is controversial. **METHODS** Abdominally obese but otherwise healthy individuals were randomly assigned to a specifically designed 4-week diet low or high in AGEs in a double-blind, parallel design. Insulin sensitivity, secretion, and clearance were assessed by a combined hyperinsulinemic-euglycemic and hyperglycemic clamp. Micro- and macrovascular function, inflammation, and lipid profiles were assessed by state-of-the-art in vivo measurements and biomarkers. Specific urinary and plasma AGEs N ϵ -(carboxymethyl)lysine (CML), N ϵ -(1-carboxyethyl)lysine (CEL), and N δ -(5-hydroxy-5-methyl-4-imidazolone-2-yl)-ornithine (MG-H1) were assessed by mass spectrometry. **RESULTS** In 73 individuals (22 males, mean \pm SD age and BMI 52 \pm 14 years, 30.6 \pm 4.0 kg/m²), intake of CML, CEL, and MG-H1 differed 2.7-, 5.3-, and 3.7-fold between the low- and high-AGE diets, leading to corresponding changes of these AGEs in urine and plasma. Despite this, there was no difference in insulin sensitivity, secretion, or clearance; micro- and macrovascular function; overall inflammation; or lipid profile between the low and high dietary AGE groups (for all treatment effects, P > 0.05). **CONCLUSION** This comprehensive RCT demonstrates very limited biological consequences of a 4-week diet low or high in AGEs in abdominally obese individuals. **TRIAL REGISTRATION** Clinicaltrials.gov, NCT03866343; trialregister.nl, NTR7594. **FUNDING** Diabetesfonds and ZonMw.

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