**Combined intraduodenal administration of lauric acid and L-tryptophan reduces postprandial glycaemia in type 2 diabetes by enhancing stimulation of glucoregulatory hormones and slowing gastric emptying**

**Introduction and aims:** We have recently reported, in healthy men, that combined intraduodenal administration of the fatty acid, lauric acid (‘C12’) and the amino acid, L-tryptophan (‘Trp’), in loads of 0.3 and 0.1 kcal/min, that are individually ineffective, stimulates plasma cholecystokinin (CCK) and glucagon-like peptide-1 (GLP-1), known to slow gastric emptying, suppresses energy intake and/or lowers postprandial glucose. We have now examined whether these effects are evident in type 2 diabetes (T2D).

**Materials and methods:** Males with T2D (n=11; age: 69±7 years; HbA1c: 51±5 mmol/mol [6.8±0.3%]; BMI: 28±1 kg/m2), managed by diet or metformin only, received on four separate occasions, in a double-blind, randomised, cross-over fashion, 45-min intraduodenal infusions of iso-osmotic solutions of either: (i) C12 (0.3 kcal/min), (ii) Trp (0.1 kcal/min), (iii) C12+Trp (0.4 kcal/min), or (iv) 0.9% saline (control), commencing 30 min before consumption of a mixed-nutrient drink (350 mL, 500 kcal, 74 g carbohydrate), labelled with 100 mg 13C-acetate for measurement of gastric emptying by breath test.

**Results:** C12+Trp, but not C12 or Trp, reduced both the overall and peak (control: 11.1±0.6 mmol/L, Trp: 10.3±0.5 mmol/L, C12: 10.7±0.6 mmol/L, C12+Trp: 9.8±2.5 mmol/L; P<0.05) plasma glucose response to the drink. C12+Trp, but not C12 or Trp, also slowed gastric emptying (P<0.05), and stimulated plasma CCK, GIP and GLP-1 pre-drink (P<0.05).

**Conclusion:** In T2D, combined intraduodenal administration of C12+Trp lowers postprandial glucose markedly, primarily by slowing of gastric emptying, an effect which may be mediated by CCK and/or GLP-1.

