

# Child's gluten intake during infancy linked to increased risk of developing type 1 diabetes

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New research presented at the Annual Meeting of the European Association for the Study of Diabetes (EASD) in Barcelona, Spain (16-20 September) shows that a child's intake of gluten at age 18 months is associated with a 46% increased risk of developing type 1 diabetes for each extra 10g of gluten consumed. There was no association found between the mother's intake of gluten during pregnancy and type 1 diabetes in her child, conclude the authors who include Dr. Nicolai Lund-Blix, Oslo University Hospital, and the Norwegian Institute of Public Health, Oslo, Norway.

A previous study from Denmark suggested that a high maternal gluten intake during [pregnancy](#) increased the risk of type 1 diabetes in the [child](#). No studies have investigated the relation between the amount of gluten intake by both the mother during pregnancy and the child in early life and risk of developing type 1 diabetes in childhood. This new study examined the association between the maternal gluten intake during pregnancy, child's gluten intake at age 18 months, and the risk of type 1 diabetes in the child in a Norwegian population-based nationwide study.

The study included 86,306 children in The Norwegian Mother and Child Cohort Study born from 1999 to 2009, followed up until April 2018. The outcome was clinical type 1 diabetes, ascertained in a nationwide childhood diabetes registry. Increased risk was calculated using statistical modelling for maternal gluten intake during pregnancy and child's gluten intake at 18 months. The authors estimated the amount (g/day) of gluten intake from a semi-quantitative food frequency questionnaire at week 22

of pregnancy and from a questionnaire completed by the guardian when the child was 18 months old.

During a mean follow-up of 12.3 years, 346 children (0.4%) developed type 1 diabetes (incidence rate 32.6 per 100,000 person-years). The average gluten intake was 13.6 grams/day for mothers during pregnancy, and 8.8 grams/day for the child at 18 months of age. Maternal gluten intake in mid-pregnancy was not associated with the development of type 1 diabetes in the child. However, the child's gluten intake at 18 months of age was associated with an increased risk of later developing type 1 diabetes, with risk increasing by 46% for each 10g per day increase in gluten intake.

The authors conclude: "This study suggests that the child's gluten intake at 18 months of age, and not the maternal intake during pregnancy, could increase the risk of type 1 diabetes in the child. Our observations may motivate future interventional studies with reduced gluten intake to establish whether there is a true causal association between amount of gluten intake in the child's early diet and type 1 diabetes in susceptible individuals."

The authors discuss some possible reasons for the findings, saying: "There is some evidence that gluten intake may influence the [gut microbiota](#) and induce inflammation in so-called 'leaky gut' (increased absorption of dietary antigens and/or gut infections). These are plausible mechanisms, but the exact mechanism explaining our findings is not known. If anything, we believe that gluten works in combination with another environmental factors such as virus infections in predisposed children."

In this Norwegian study, the main sources of gluten in the diet are cereal and bread. However, at this stage the authors say their study, together with existing evidence, is not enough to encourage people to avoid or

reduce gluten intake.

They say: "We need confirmation from further studies, and ideally a randomised controlled trial (RCT) to determine any relationship between gluten intake and type 1 [diabetes](#) with certainty. Since our findings show the highest risk of developing T1D is in the group with the highest gluten consumption, it could be that simply reducing gluten intake would be enough to reduce risk and this is easier to achieve than complete avoidance. Based on experiences from patients with celiac disease, complete avoidance of [gluten](#) is hard but manageable, but this would probably not be necessary."

Provided by Diabetologia

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