

Effect of *Triticum turgidum* subsp. *turanicum* wheat (Khorosan) on irritable bowel syndrome: a double-blinded randomised dietary intervention trial

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The aim of the present study was to examine the effect of a replacement diet with organic, semi-whole-grain products derived from *Triticum turgidum* subsp. *turanicum* (ancient) wheat on irritable bowel syndrome (IBS) symptoms and inflammatory/biochemical parameters. A double-blinded randomised cross-over trial was performed using twenty participants (thirteen females and seven males, aged 18–59 years) classified as having moderate IBS. Participants received products (bread, pasta, biscuits and crackers) made either from ancient or modern wheat for 6 weeks in a random order. Symptoms due to IBS were evaluated using two questionnaires, which were compiled both at baseline and on a weekly basis during the intervention period. Blood analyses were carried out at the beginning and end of each respective intervention period.

During the intervention period with ancient wheat products, patients experienced a significant decrease in the severity of IBS symptoms, such as abdominal pain ($P < 0.0001$), bloating ($P = 0.004$), satisfaction with stool consistency ($P < 0.001$) and tiredness ($P < 0.0001$). No significant difference was observed after the intervention period with modern wheat products. Similarly, patients reported significant amelioration in the severity of gastrointestinal symptoms only after the ancient wheat intervention period, as measured by the intensity of pain ($P = 0.001$), the frequency of pain ($P < 0.0001$), bloating ($P < 0.0001$), abdominal distension ($P < 0.001$) and the quality of life ($P < 0.0001$). Interestingly, the inflammatory profile showed a significant reduction in the circulating levels of pro-inflammatory cytokines, including IL-6, IL-17, interferon- γ , monocyte chemoattractant protein-1 and vascular endothelial growth factor after the intervention period with ancient wheat products, but not after the control period. In conclusion, significant improvements in both IBS symptoms and the inflammatory profile were reported after the ingestion of ancient wheat products.