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The binding of bile acids by biscuits with bioactive substances during *in vitro* digestion

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The aim of this study was to determine the sorption of a primary bile acid (cholic acid - CA) and secondary bile acids (deoxycholic - DCA and lithocholic acids - LCA) by bioactive biscuits (BB1 and BB2) in two sections of the gastrointestinal tract. The content of dietary neutral detergent fiber (NDF) and its fractions: cellulose (C), hemicellulose (H) and lignin (L) was assayed using Van Soest method, while total dietary fiber (TDF), soluble (SDF) and insoluble (IDF) fractions were assayed using Asp method. *In vitro* digestion was carried out in a bioreactor at the temperature of 37°C and constant stirring applied (200 rpm). Enzymes: pepsin and pancreatin, and bile salts: CA, DCA and LCA were added to the culture. In the section of the small intestine, faecal bacteria were added, which had been isolated from human large intestine. The ability to bind bile acids was estimated using UHPLC equipment. Biscuits with bioactive substances - BB1 and BB2 - showed higher DCA acid binding capacity in the small intestine and large intestine sections of the tract, as compared to the control sample (CB). The highest content of TDF was observed in BB1 and BB2 (11.2 and 12.8g/100g of product, respectively) in comparison to control biscuits (CB) - 8.7%. The content of L fraction was highest in BB2 and BB1, 3.26% and 2.38% respectively, while CB and BB1 showed the highest level of H fraction. The highest content of C fraction was observed for BB1 (1.99%), while the lowest for CB (0.95%). Taking into consideration the high content of DF in bioactive biscuits (BB1 and BB2) and their high bile acid sorption ability, it seems that the products can be used as dietary supplements beneficial for human health.

Biography

Krzysztof Dziedzic is employed as a contract researcher (a post-doctoral position) at Poznan University of Life Sciences, Department of food service and catering, Poland. His research is focused on designing bio-food with health-promoting characteristics. The bioavailability of food components is determined in experiments *in vitro* simulating human gastrointestinal tract. His work also involves research into probiotic properties of bioactive substances and the influence of dietary fibre on bile acid binding in *in vitro* digestive environment.

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