
Abstract: *Opuntia ficus-indica* is a cactus plant rich in dietary fiber and vitamins. It can be considered as a functional food, and some of its extracted components can be added as functional ingredients to improve postprandial glycemic regulation. The aim of changing our dietary habits by eating such foods is to reduce blood glucose levels after ingesting a starchy food together with the nopal product, which can decrease the risk of developing type 2 diabetes and cardiovascular disease or help in managing such diseases. The objective of this study was to examine the effect of Nopal cladodes on postprandial glycemic and insulinemic response, and also on appetite related variables. Three different batches of Nopal cladode flour were examined and characterized for their starch and dietary fiber contents. An in-vitro digestion method (Hydrolysis Index, HI) was performed to mimic the human digestion process and used to predict the impact of the nopal flour on the glycemic index (GI) with white wheat bread as a reference. One of the flour batches was then chosen to be included in a pilot meal study, where the nopal flour was separated into its water soluble and insoluble fractions, which were used to produce soluble and insoluble fraction-containing breads. Seven healthy volunteers participated in a randomized pilot study designed to investigate the postprandial glycemic and insulinemic responses of the test breads. The Nopal flour breads made from the three different batches had equivalent dietary fiber contents, and Analysis of variance (ANOVA) results showed that there were no significant differences in HI between the nopal flour breads and a reference wheat flour bread without nopal flour supplement. Performing a Tukey's range test showed a significant difference between two of the batches HI values. Due to the limited amount available of the flour from the batch with the lowest HI, and thus a low predicted glycemic response, the human pilot study was performed with the flour with the second lowest HI. The HI values for the soluble and insoluble fraction breads produced from this batch were not different and, using ANOVA-repeated measurements, the in vivo glycemic and insulinemic responses showed no statistical significance either. The appetite variables followed a similar statistical tendency except for the fullness feeling after eating the nopal bread with added soluble fraction, as it was higher than the reference bread at 120 min ($p=0.0349$). Nopal cladodes flour can partly replace wheat flour to increase the beneficial health effects of bread; still the mechanisms behind the postprandial glycemic regulation should be further investigated on a larger study population.

Key words: Nopal, Cladodes, Dietary fiber, Hydrolysis index, Glycemic response, Appetite variables
