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Extended Abstract

Nutrition Congress 2015: The impact of inulin fiber consumption on appetite sensations and food intake in acute settings in college age females in Kuwait: A randomized, double-blind, placebo-controlled study- Younis A Salmean- Kuwait University

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Abstract

Animal studies have shown that inulin, a fermentable fiber results in reduced energy intake and weight loss. This study aims to match the effect of inulin supplementation on appetite profile and food intake. 40 college age females (20.3±3.7 years (Mean ± SD)) enrolled from the University of Kuwait were randomized in double-blind fashion to an inulin-drink (16 g/day in 330 ml water) or 330 ml water (placebo). Both drinks were iso-caloric and artificially flavored in identical opaque water bottles. Drinks were took daily for 7 days (adaptation era) and Visual Analogue Scales (VAS) was used for reporting appetite profiles on the 8th day during a feeding lab. Fasted volunteers were managed by the VAS at various time points all the day. There was no significant difference in age or weight between the two groups. The placebo group expended significantly more amounts of energy at lunch when compared to the fiber group (670±174 kcal vs. 554±217 kcal, $p<0.05$). VAS scores indicated that the placebo group had a significantly higher desire for food in the morning compared to the inulin group ($p<0.05$) and this desire remained significant for at least 2 hours and 45 minutes. The placebo group accomplished a sharp rise in hunger and desire for eating food early in the day and also experienced meaningfully weaker fullness and satisfaction ratings during that period ($p<0.05$).

As reviewed before, previous studies suggest that fiber can affect hunger and/or satiety favorably, leading to reduced energy intake. Several animal studies have suggested that consumption of fermentable fibers can increase GLP-1 and proglucagon expression and improve glucose homeostasis. However, to our information, very few, mostly non homogeneous studies with adjustable fiber dosage investigated the impact of ITFs or inulin supplementation on appetite, hunger sensations, and food intake in the adult population. In our study, when participants consumed 16 g/day of ITFs in the morning, the average ratings in their 'desire to eat', 'hunger', and 'prospective food consumption' were significantly lower compared to the control group. In calculation, the fiber group recounted higher 'fullness' grades before lunch, signifying a possible impact from the fiber. However, because the adaptation period was a free-living phase, it is difficult to conclude that the observed benefits, although suggested, are due solely to the ITFs since the amount of food consumed from breakfast to lunch is unknown. However, looking at the data from the test day, where settings and food intake were controlled, it appears that consuming 16 g of ITFs in the morning lowered the desire to eat, hunger, and the interest in food consumption, and enhanced fullness and satisfaction for much longer compared to placebo. This is consistent with the findings of Cani et al, who found that 16 g of ITFs promoted satiety in healthy humans.

The impacts on appetite of the participants was thanks to ITF consumption since both groups consumed equal amounts of energy at breakfast (235 ± 18 kcal vs 230 ± 16 kcal) and were housed in exact conditions with minimal physical disturbances. The lingering impact of the ITFs on appetite sensations can explain why the fiber group has consumed 21% fewer calories from food at lunch, since most sensations favorably varies until 155 min post-breakfast, and shortly before lunch is served at 200 min. It is worth noting that the reduced consumption of food by the fiber group meant that they had more time to interact at the table during lunch, which may have led to a pattern of increased liquid consumption, a naturally anticipated response when liquids accompany meals. It would have been more ideal to provide water in place of juice, considering that liquid calories are less likely to elicit a precise dietary compensation response because swallowing does not trigger the internal satiety signal that masticating does.

One reason for previous studies failing to show a positive impact of fiber supplementation on VAS domains could be the use of inhomogeneous subject populations, in particular, a wider physiological age difference. Harrold included subjects with age ranges from 18–65, 1–64, and 20–60 years, respectively. The innate physiological response and magnitude of appetite and energy regulation complexes for

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older and younger people can be quite different. Anorexigenic signals in older adults prevail over orexigenic signals, contributing to prolonged satiety and inhibition of hunger, which can easily affect VAS reporting in a mixed population of wide physiological age ranges. It is, therefore, suggested that more homogeneous subject populations be used when investigating the impact of fiber on appetite and energy regulation. We designed our study to be practically homogeneous; thus, we enrolled college-age females, which may explain the agreement found in our study with that of Cani et al., where fiber intake had a big impact on satiety in 21–39-year-old participants.

Another probable reason for the contradiction of the results of preceding studies may be the dissimilar doses of ITFs used. The study by Karalus et al. testified no momentous benefits on craving ratings or weight of supplementing the diet with 10 g ITF fiber. The likely explanation for this is often the low fiber doses utilized in the study. The 10 g dose of ITFs isn't likely to supply any marked impact on appetite and hunger sensations. The 16 g of inulin used in our study is likely to be an effective dose to produce meaningful change in appetite sensations, as this amount has been shown to produce favorable changes in appetite sensations, and in appetite-related hormones and peptides.

Our statistics propose an influence on weightiness in the short term. After a week of supplementation, the fiber group saw no significant increase in body weight compared to its baseline, but the control group had a significant increase from its baseline. This is consistent with the findings of Parnell and Reimer, where supplementation with ITFs resulted in a significant reduction in weight in the fiber group while the control group experienced a significant weight gain.

Participants consuming the fiber reported a higher incidence of bloating and flatulence, which was anticipated. Although the incidence was higher among fiber consumers, the fiber was tolerated as no dropouts were reported as a result of supplement use.

In conclusion, dietary supplementation with 16 g/day of ITF fiber in the morning was found to reduce hunger, desire to eat, and prospective food consumption, and to increase fullness and satiety in acute settings, leading to reduced food intake at lunch. These consequences propose that ITF fiber is potentially a useful assistant dietary supplement for curbing appetite and possibly aiding weight management.

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