Linseed dietary fibers reduce apparent digestibility of energy and fat and weight gain in growing rats. - DTU Orbit (01/01/2019)

Dietary fibers (DF) may affect energy balance, an effect often ascribed to the viscous nature of some water soluble DF, which affect luminal viscosity and thus multiple physiological processes. We have tested the hypothesis that viscous linseed DF reduce apparent nutrient digestibility, and limit weight gain, in a randomized feeding trial where 60 male, growing, Wistar rats, with an initial weight of ~200 g, were fed different diets (n = 10 per group): low DF control (C), 5% DF from cellulose (5-CEL), CEL + 5% DF from whole (5-WL) or ground linseed (5-GL), CEL + 5% DF from linseed DF extract (5-LDF), and CEL + 10% DF from linseed DF extract (10-LDF). Diets were provided ad libitum for 21 days. Feed intake and faecal output were measured during days 17-21. Faecal fat excretion increased with increasing DF content and was highest in the 10-LDF group. Apparent fat digestibility was highest with the C diet (94.9% ± 0.8%) and lowest (74.3% ± 0.6%) with the 10-LDF diet, and decreased in a non-linear manner with increasing DF (p<0.001). Apparent fat digestibility also decreased with increased accessibility of DF (5-WL vs. 5-GL) and when the proportion of viscous DF increased (5-GL vs. 5-LDF). The 10-LDF resulted in a lower final body weight (258 ± 6.2 g) compared to C (282 ± 5.9 g), 5-CEL (281 ± 5.9 g), and 5-WL (285 ± 5.9 g) (p<0.05). The 10-LDF diet reduced body fat compared to 5-CEL (p<0.01). In conclusion, DF extracted from linseed reduced apparent energy and fat digestibility and resulted in restriction of body weight gain in growing rats.

General information
State: Published
Organisations: National Food Institute, Division of Nutrition, Aarhus University, Agriculture and Agri-Food Canada, Reduce-Center, University of Copenhagen
Contributors: Kristensen, M., Knudsen, K. E. B., Jørgensen, H., Oomah, D., Buegel, S., Toubro, S., Tetens, I., Astrup, A.
Pages: 3287-3298
Publication date: 2013
Peer-reviewed: Yes

Publication information
Journal: Nutrients
Volume: 5
Issue number: 8
ISSN (Print): 2072-6643
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 4.35 SJR 1.557 SNIP 1.403
Web of Science (2017): Impact factor 4.196
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 4.29 SJR 1.543 SNIP 1.411
Web of Science (2016): Impact factor 3.55
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 4.07 SJR 1.481 SNIP 1.408
Web of Science (2015): Impact factor 3.759
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 3.78 SJR 1.392 SNIP 1.289
Web of Science (2014): Impact factor 3.27
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 3.86 SJR 1.309 SNIP 1.241
Web of Science (2013): Impact factor 3.148
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
Scopus rating (2012): CiteScore 2.12 SJR 0.662 SNIP 1.005
Web of Science (2012): Impact factor 2.072
ISI indexed (2012): ISI indexed no
Scopus rating (2011): CiteScore 0.8 SJR 0.29 SNIP 0.369