

Effect of Yacon, a Root Crop Rich in Fructo-Oligosaccharides, on Colonic Transit in Healthy Volunteers

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Background I

Yacon (*Smallanthus sonchifolia*)

- Root crop from the Andean region
- Classified under the asteraceae family
- Root consumption since pre-Inca times
- Root contains the highest levels of naturally found fructooligosaccharides



Yacon sirup

- Production depends on evaporator technology (commonly used for production of maple syrup)
- Physical and sensorial characteristics similar to honey

Background II

Fructo-oligosaccharides (= FOS)

- Low in calories
- Promotes absorption of Ca^{2+} (through SFA)
 - Can lead to an increase of bone density
- Promotes absorption of vitamin (especially B complexes)
- Reduces cholesterol levels
- Preventive effect on colonic cancer
 - C57BL/6J-Min/+ mice model for colonic cancer
 - Short-chain FOS reduced incidence of colon tumors
- Yacon roots and leaves contain polyphenols with anti-oxidative activity.



Background III

FOS effects on the GI tract

- Increase of peristaltic
- Reduction of intestinal transit time

- Similar to laxative
 - Increase in the amount of water retained by the fecal matter
 - Increase in the osmotic effect

- Yacon could be used for the treatment of constipation.
- A thorough evaluation of yacon on colonic transit has not been done.



Aim

to evaluate the effect of yacon syrup
on colonic transit in healthy volunteers

Method

Subjects

- 8 healthy females and 8 healthy males
- 29 ± 5 years (18 to 57 years)

Exclusion criteria

- Chronic constipation (less than 3 BM/week)
- Diarrhea (more than 3 BM/day)
- IBS symptoms according to ROM II criteria

Study

- Double-blind, randomized
- Placebo-controlled cross-over trial
- Single center

Method II

Study Design

Two period study

- Duration of each period: 2 weeks
- Washout period in between: 2 weeks

Treatments

- Period 1: 20 g placebo syrup (20g molasses/day)
- Period 2: 20 g yacon syrup (= 6.4g FOS/day)
- Sequence randomized

Data Analyses

Measurement of Colonic Transit Time (CTT)

- 1 capsule = 10 radio-opaque markers
- 1 capsule for 6 days (= day 9 to 14 of study period)
- 24 hrs after ingestion of the last capsule: abdominal X-ray

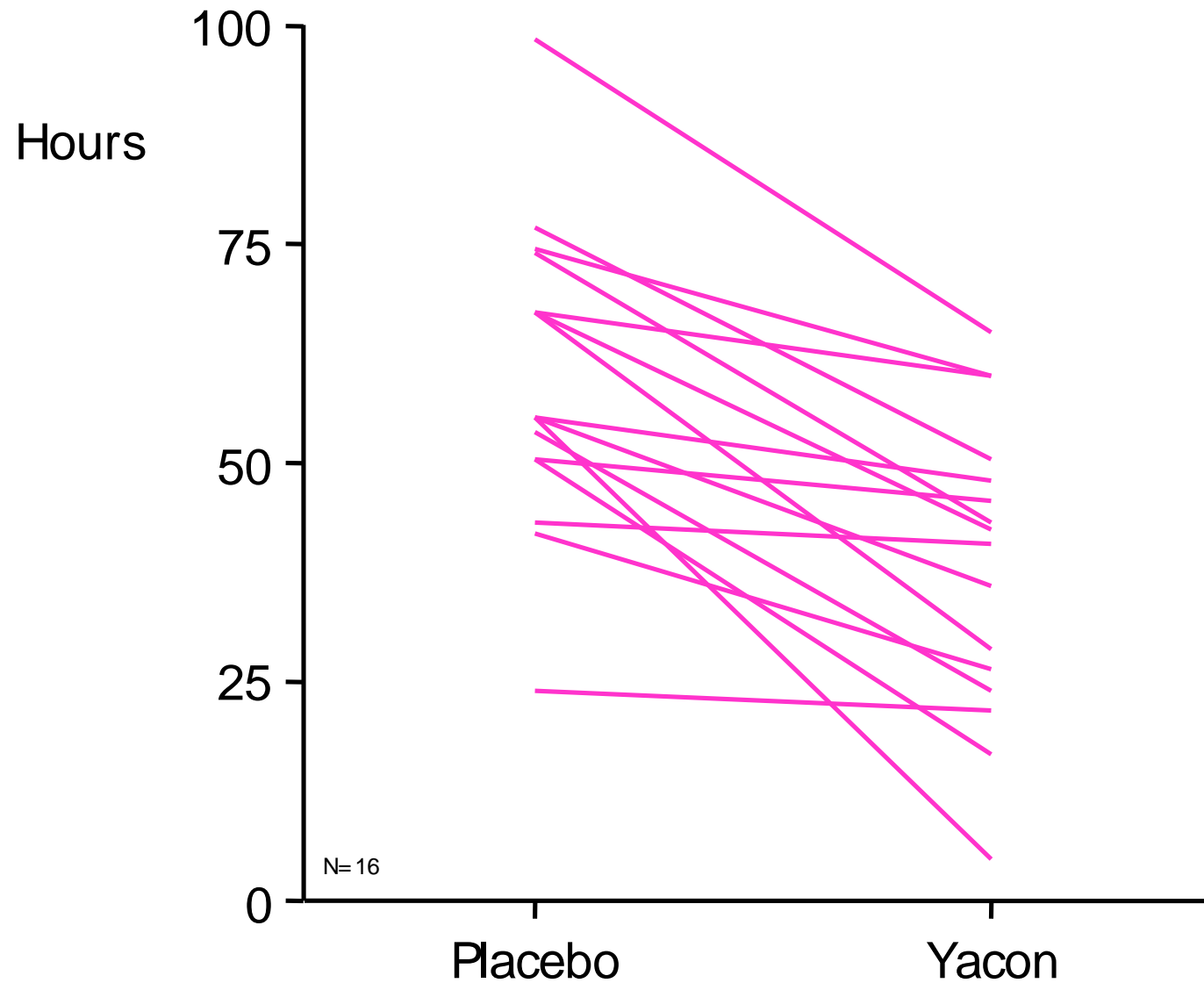
Calculation of CTT (hrs)

- Number of markers x 2.4

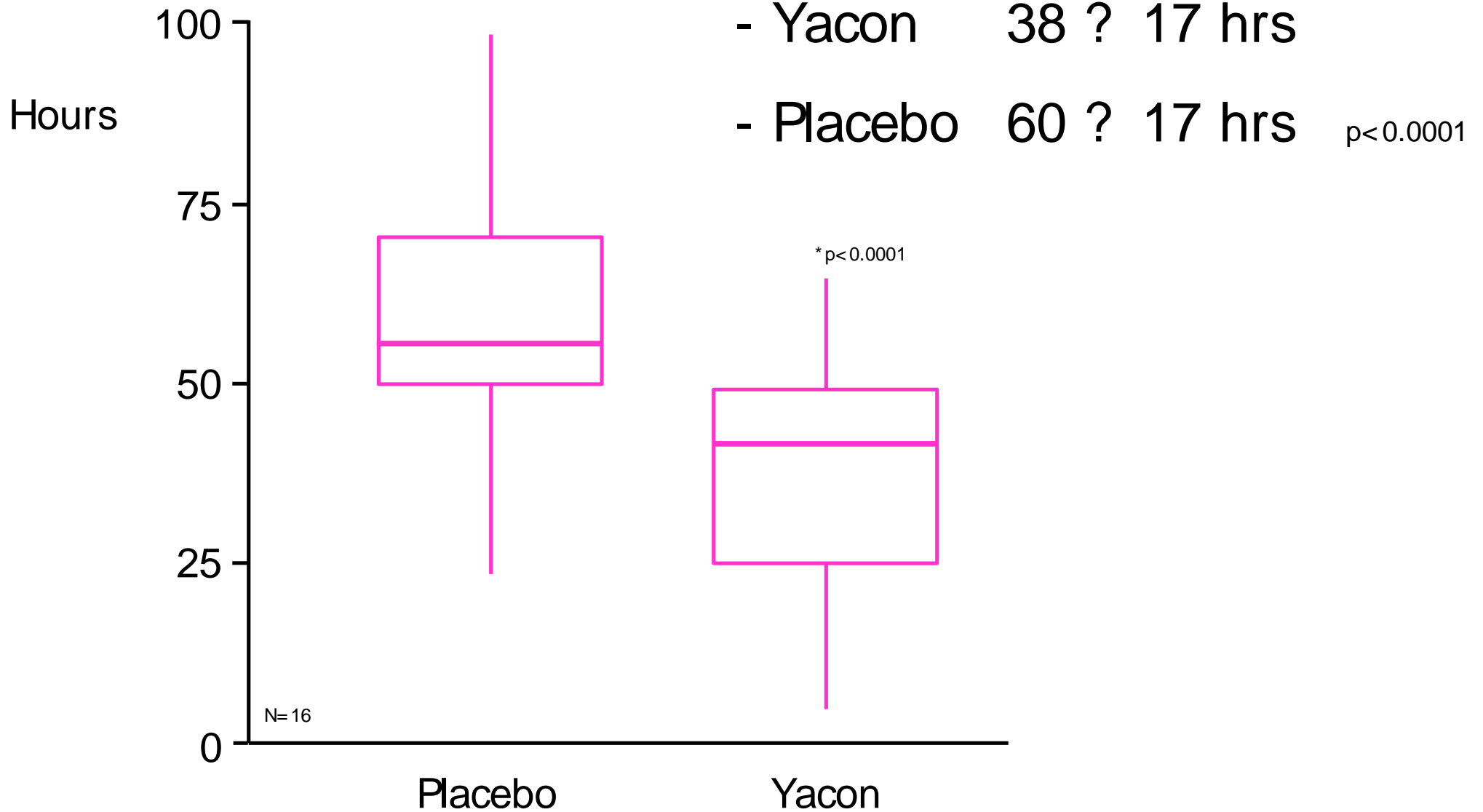
Statistical Analyses

- Mean ? SD
- Box-Whisker plot
- Paired t-test ($p < 0.05$)

Results: Colonic Transit Time I



Colonic Transit Time II



Results II: Clinical parameter

Stool consistency Bristol Stool Form Scale

O'Donnell et al., BMJ 1990

- Placebo	2.7 ? 0.7	
- Yacon	2.8 ? 0.7	p= 0.48

Stool frequency

- Placebo	1.1 ? 0.4 BM/day	
- Yacon	1.3 ? 0.6 BM/day	p= 0.17

Bloating (measured as days with bloating)

- Placebo	0.9 ? 1.1	
- Yacon	0.6 ? 1.0	p= 0.26

Side effects

- No relevant side effects

Summary

In healthy subjects

- Yacon treatment markedly accelerated CTT.
- Yacon treatment marginally increased bowel movements and stool consistency.
- Yacon treatment was well tolerated.
- Yacon is a dietary fiber with a potential for clinical application.
- Due to the low caloric content of yacon, the root could be an useful treatment in constipated diabetics or obese patients.
- Further studies are needed in constipated patients to confirm these data.