

Experimental study to investigate the impact of a patented herb extract formulation Yerba Maté, Guarana and Damiana (YGD; Zotrim®) on food intake and appetite ratings in women.

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Background

Zotrim® is a mixed herbal preparation containing Yerba Maté, Guarana and Damiana (YGD), common ingredients of commercially available drinks and available in the UK as a food supplement. (Ruxton et al., 2005; 2007).

YGD has been found to significantly delay gastric emptying, reducing the time to perceived gastric fullness and inducing significant weight loss over 45 days in overweight patients (Andersen and Fogh, 2001).

Self report data suggest that weight loss is associated with reduced meal size and snacking (Ruxton, 2004; 2005; 2007).

However, the effects of Zotrim on human food intake, feeding behaviour and subjective feelings of appetite and satiety have yet to be determined.

Aims of the Study

This study was designed to examine the short term effects of oral administration of YGD and a soluble dietary fibre on feeding behaviour, food intake and appetite. In the current study only YGD data are presented. The specific objectives were:

- To assess appetite following administration of YGD or placebo with water.
- To demonstrate a reduction in gram and kcal intake in an *ad-libitum* meal following YGD administration.
- To investigate the influence of YGD administration on food choice within the *ad-libitum* meal.

Recruitment

Normal and overweight female volunteers were recruited by advertisement across the University campus and through local and regional press.

Table 1 Participants (n = 58)

	M ± SD
Age (yrs)	21.31 ± 3.79
Weight (kg)	60.16 ± 6.09
BMI (kg/m ²)	21.78 ± 1.99

Methodology

Design: A randomised counter-balanced within-subject single-blind cross-over design

Procedure: On study days participants reported to the lab and were given their first dose of product or control with 100 ml water fifteen minutes prior to a fixed load breakfast. This was then followed four hours later by a second dose of product or control fifteen minutes before an *ad-libitum* lunch.

Appetite: Evaluated by 100 mm Visual Analogue Scales (VAS) (hunger, fullness, desire to eat, prospective consumption, satisfaction, thirst and nausea) at time points (T1-9): pre dose, pre and post fixed load breakfast, hourly between breakfast and lunch, pre dose, pre and post lunch.

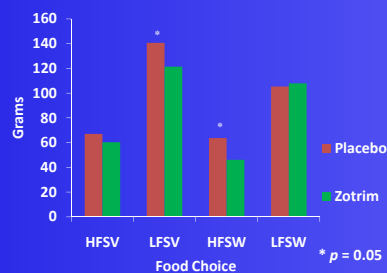
Gram and energy intake: Measured at *ad-libitum* buffet lunch consisting of twelve high and low fat savoury and sweet foods.

Results

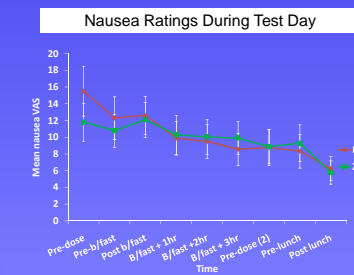
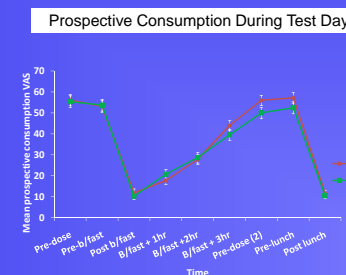
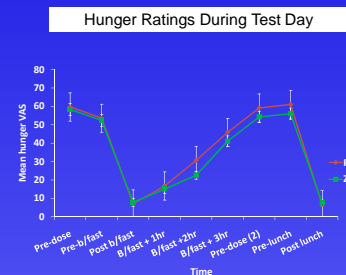
Table 2 Ad Libitum Lunch

	N	Mean Intake in Grams (g) (± SD)	Mean Intake in Kilocalories (kcal) (± SD)
Condition A (placebo)	58	375.60 (± 138.46)	752.14 (± 296.27)
Condition B (YGD)	58	328.96 (± 177.20)	619.94 (± 263.51)

Figure 1 Food Choice



Figures 2 – 5 Appetite Ratings



Key Findings

- YGD administration produced a significant reduction in gram (46.6g, 12.4%) intake at the *ad-libitum* test meal compared to placebo (F(1,57) = 10.589, p = 0.002).
- YGD administration produced a significant reduction in kcal (132.2kcal, 17.6%) intake at the *ad-libitum* test meal compared to placebo (F(1,57) = 11.320, p < 0.001).
- Administration of YGD produced a significant reduction in gram intake, of high fat sweet items (17.6g, 27.6%) compared to placebo (t (57) 2.207, p = 0.031).
- YGD produced a significant reduction in gram intake of low fat savoury items (19.3g, 13.7%) compared to placebo (t (57) 2.593, p = 0.012).

References

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- There was a significant difference in time taken to consume the *ad-libitum* lunch (F (1,57) = 8.429, p = 0.005), with a shorter lunch duration after YGD (16 minutes) compared to placebo (19 minutes).
- Main effects of treatment on hunger (F (1,56) = 4.448, p = 0.039) and desire to eat (F (1,57) = 4.448, p = 0.039) were found, with less hunger and less desire to eat in the YGD condition compared to placebo. Trends showed prospective consumption was lower in the YGD condition.
- No significant effects of the product on thirst or nausea were observed.

Implications

The current data are consistent with self-reported changes in appetite seen in previous studies.

These acute effects on appetite and food intake may be related to the known effects of YGD on gastric emptying.

However, the YGD formulation contains a number of active ingredients. Research needs to be conducted to ascertain whether these effects on appetite underpin reported YGD induced reductions in body weight.

The long term effect of YGD on appetite control and the physiological mechanisms underpinning satiety need to be studied over a period of significant weight loss.