Herbal extract reduced energy intake by modulating gastrointestinal hormones in overweight women.

Dr. Marcelo Lima Ribeiro

Celestino, MM, Gomes, AC, Botelho, PB, Gambero, A, Mota, JF

NuGO

NUGO WEEK 2015

Barcelona, September 10th 2015

Obesity is a major public health concern.

- 1.9 billion adults were overweight, and 600 million were obese (WHO, 2014)

2014

Increase morbidity and mortality

- 50.8% of people are overweight and, 17.5% are obese

- Atherosclerosis
- Hepatic steatosis
- Type 2 diabetes

Global epidemy

Environment

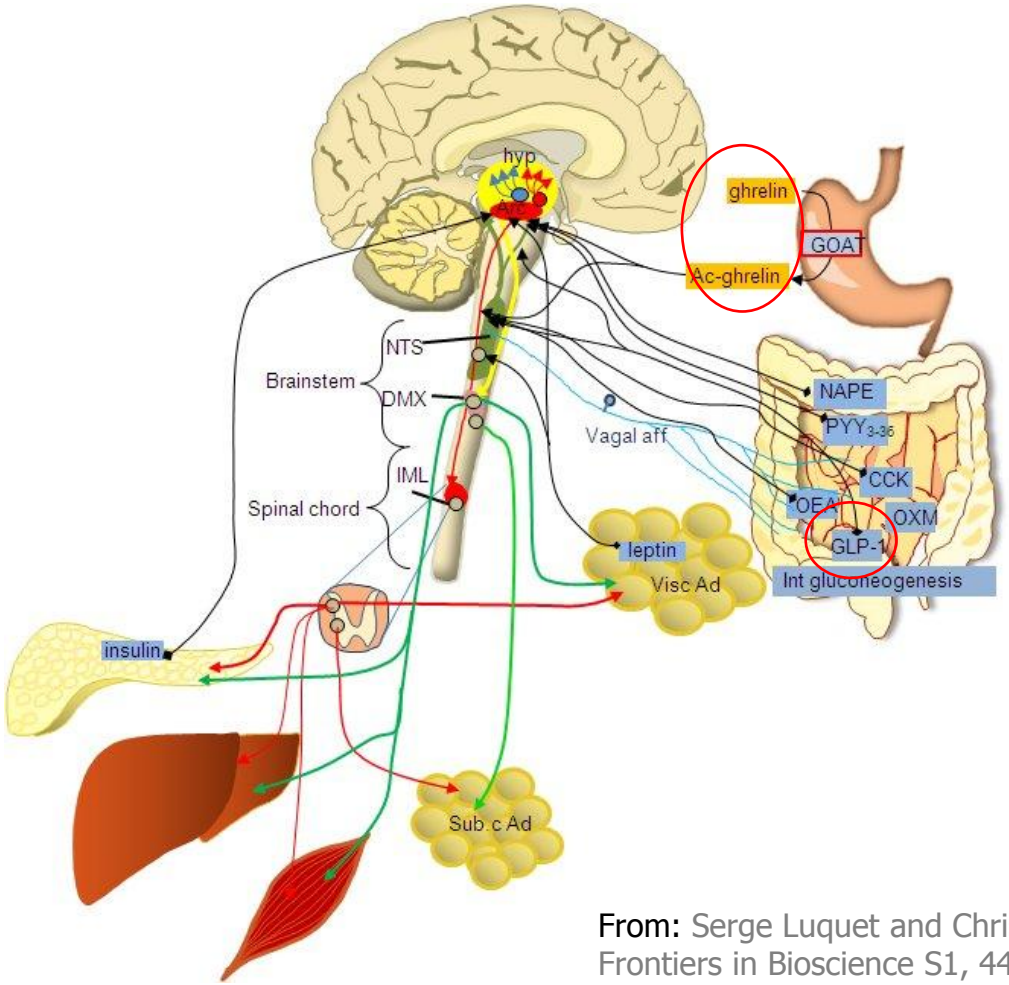
Genetetic

Obesity

Lifestyle

Neurological / Endocrine

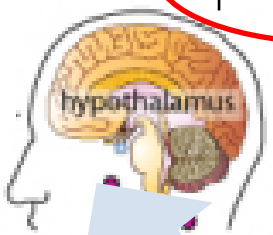
Hypothalamus is crucial for appetite regulation.

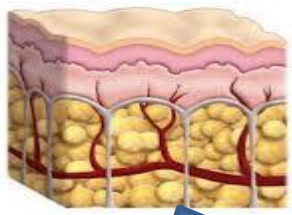


From: Serge Luquet and Christophe Magnan.
Frontiers in Bioscience S1, 448-465, 2009

Ghrelin, the "hunger hormone"

↑ Appetite

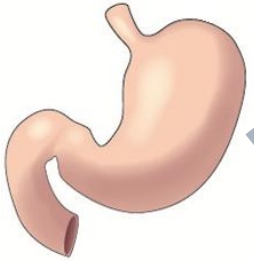




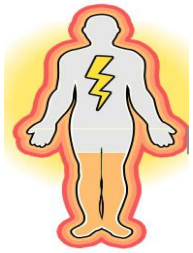
↑ Adipogenesis and Lipogenesis

↑pre-prandial

↓post-prandial



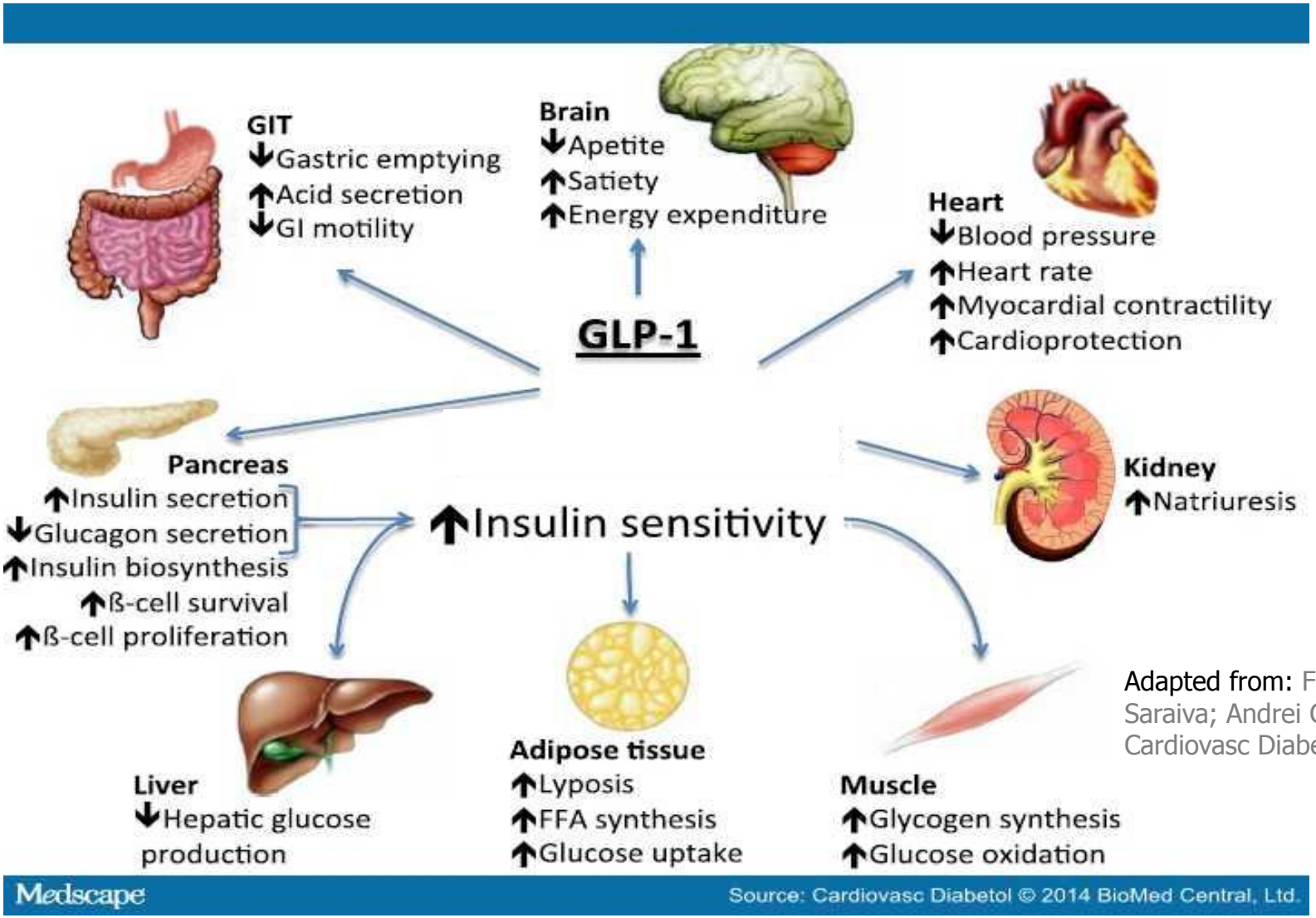
↑ Food intake



↓ Energy expenditure

Tschop et al. (2000). Nakazato et al. (2001), Callahan et al. (2004), Asakawa et al. (2005)

GLP-1 controls satiety



Adapted from: Francisco Kerr Saraiva; Andrei C Sposito. Cardiovasc Diabetol. 13, 2014

Willms et al. (1996), Meeran et al. (1999), Macdonald et al. (2002), Schirra et al. (2006), Punjabi et al. (2011)

Yerba-mate

Ilex paraguariensis

Polyphenols
Caffeine
Tannins
Saponins

Antiinflammatory
Vasodilator
Cardioprotective
CNS stimulant
Antimutagenic
Thermogenic
Antioxidant
Weight loss

Guarana

Paullinia cupana

Caffeine
Saponins
Phenolic compounds
Tannins

CNS stimulant
Antioxidant
Antiinflammatory
Immunomodulatory
Thermogenic
Reducing appetite

Damiana

Turnera diffusa

Flavonoids

Anti-anxiolytic
Antioxidant
Antiinflammatory
GLP-1 receptor agonists
Inhibiting DPP-IV

Matsumoto et al. (2009), Arçari et al. (2011), Hussein et al. (2011), Taha et al. (2012), Portella, et al. (2013)

Yerba-mate
Ilex paraguariensis

Guarana
Paullinia cupana

Damiana
Turnera diffusa

Antiinflammatory
Vasodilator
Cardioprotective
CNS stimulant
Antimutagenic
Thermogenic
Antioxidant
Weight loss

CNS stimulant
Antioxidant
Antiinflammatory
Immunomodulatory
Thermogenic
Reducing appetite

Anti-anxiolytic
Antioxidant
Antiinflammatory
GLP-1 receptor agonists
Inhibiting DPP-IV

↓ Oxidative stress
Inflammation
Adiposity
Adipogenesis
Energy intake
Appetite

↑ Satiety
Thermogenesis
[GLP-1]

YGD reduced body weight in clinical trials

↓ Body weight
(-5 kg/45days)

↓ Caloric intake
(-17.3%)

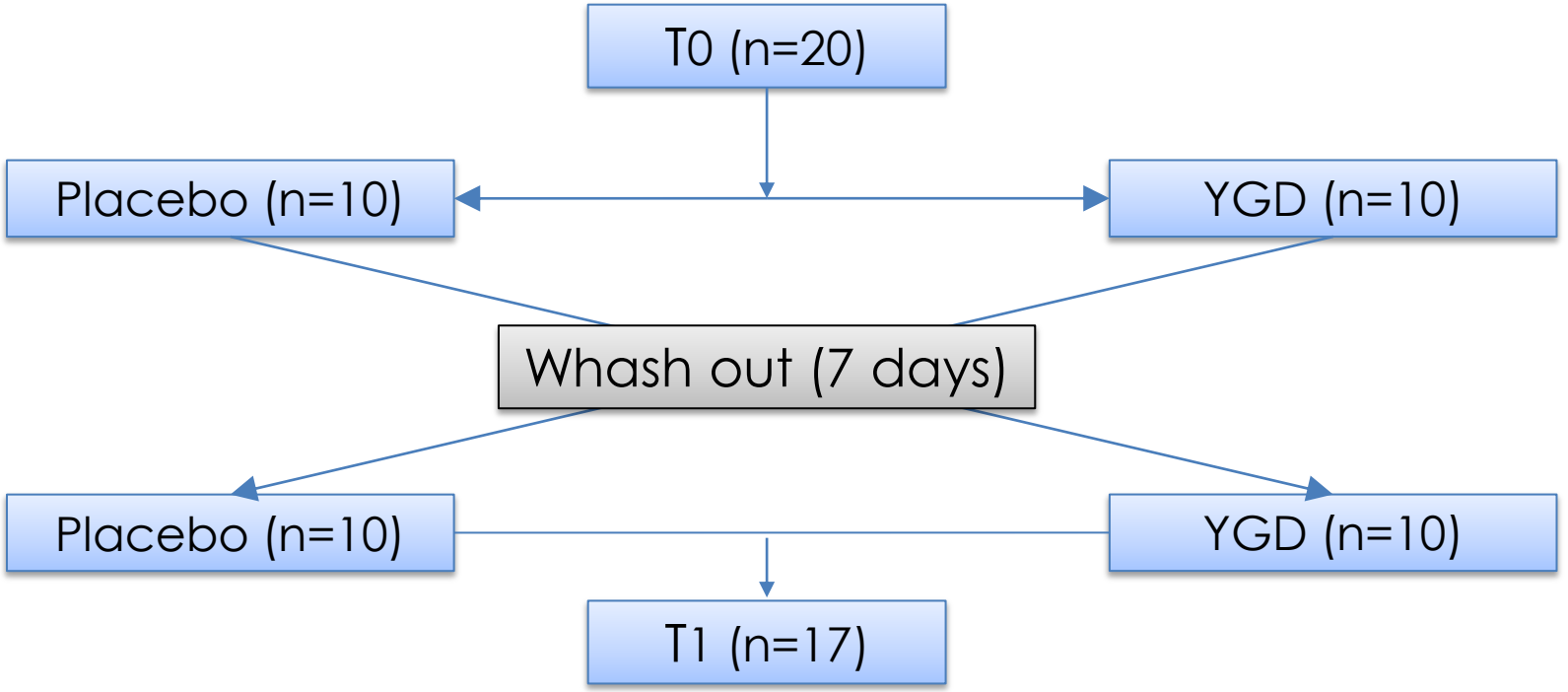
Delayed gastric emptying

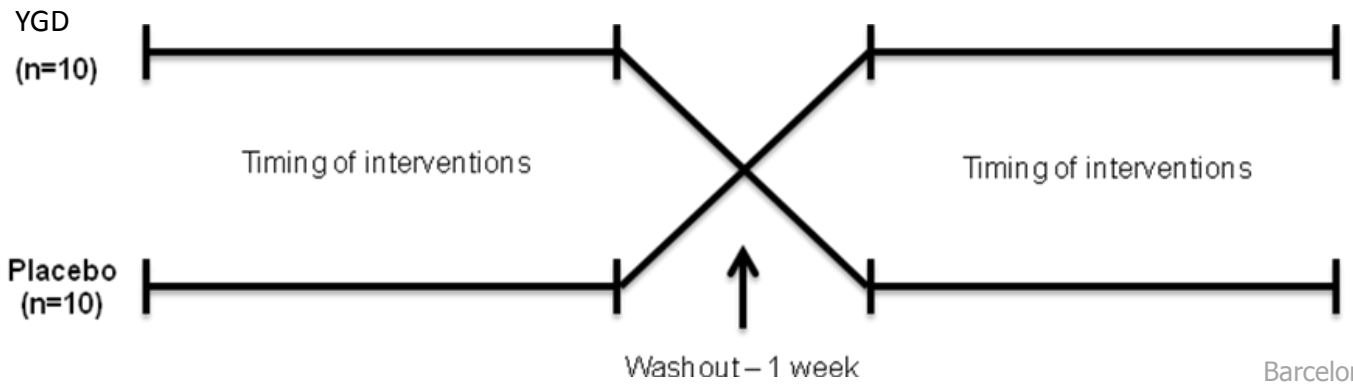
Andersen; Fogh, (2001), Harrold et al. (2013)

AIM

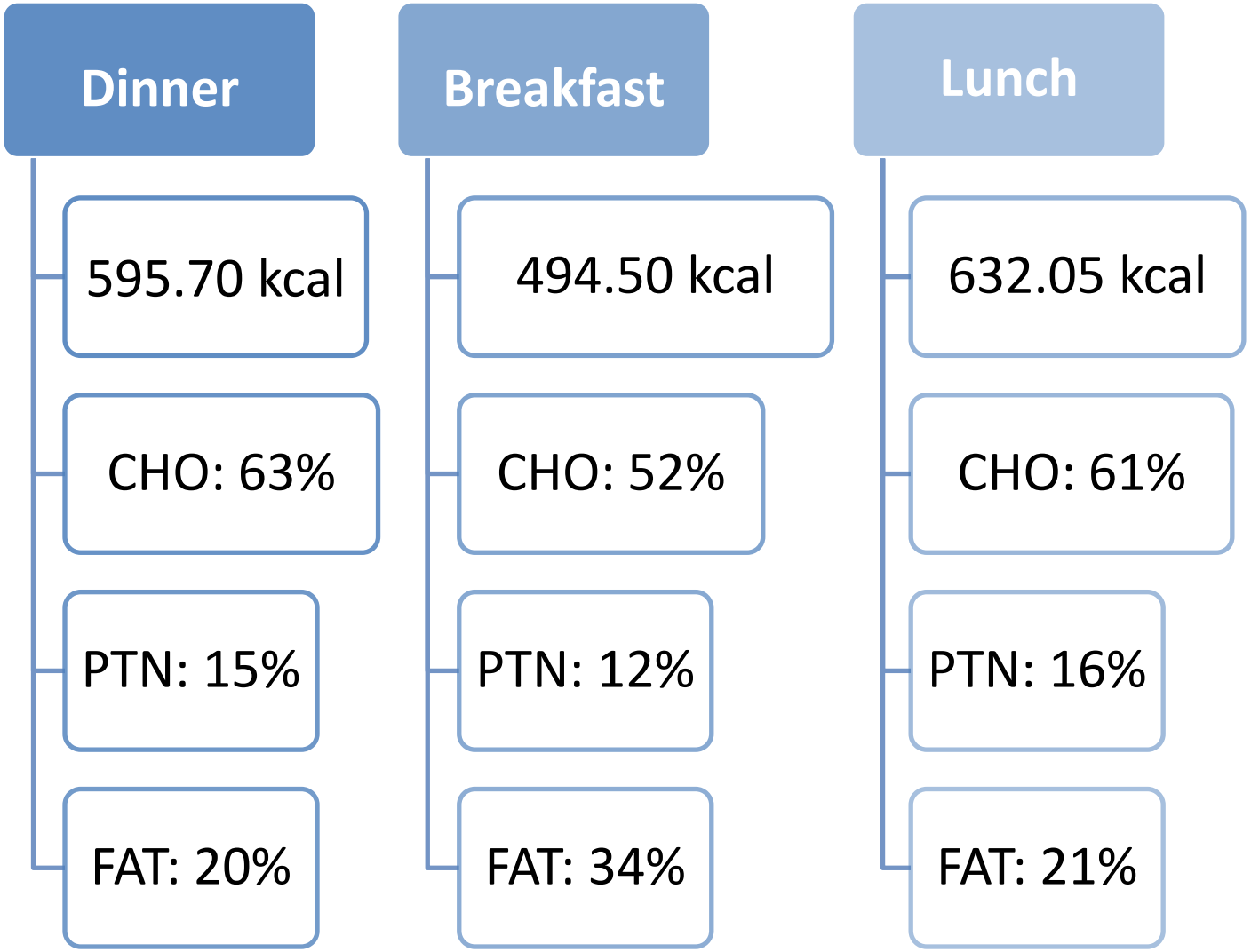
Evaluate the effects of YGD on food intake, acylated ghrelin and GLP-1 concentrations after consuming meals in overweight and obese women

Subjects and Study Design

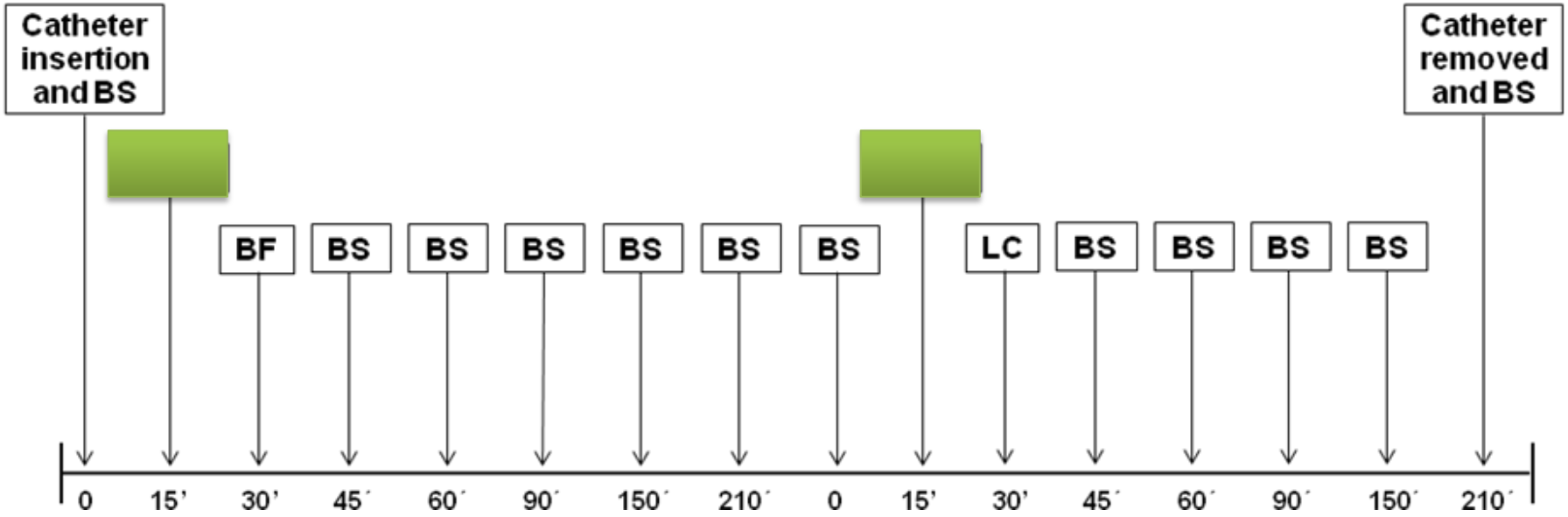




Subjects and Study Design



Subjects and Study Design



Placebo - 100 mg of lactose, OR **YGD** - three tablets containing Yerba Mate (112 mg), Guarana (95 mg) and Damiana (36 mg) standardized extracts

Anthropometric Assessment

(HEYWARD; STOLARCZYK, 2000)

- BMI was calculated as: current weight (kg)/ height2 (m)

-

- Waist circumference

(ISBD, 2007)

- DEXA DPX NT GE®

Biochemical Assessment

- Glucose was measured using a glucose meter
- Acylated ghrelin and GLP-1 were analyzed using a magnetic bead-based multiplex kit (Millipore)

Results

Anthropometric characteristics of participants.

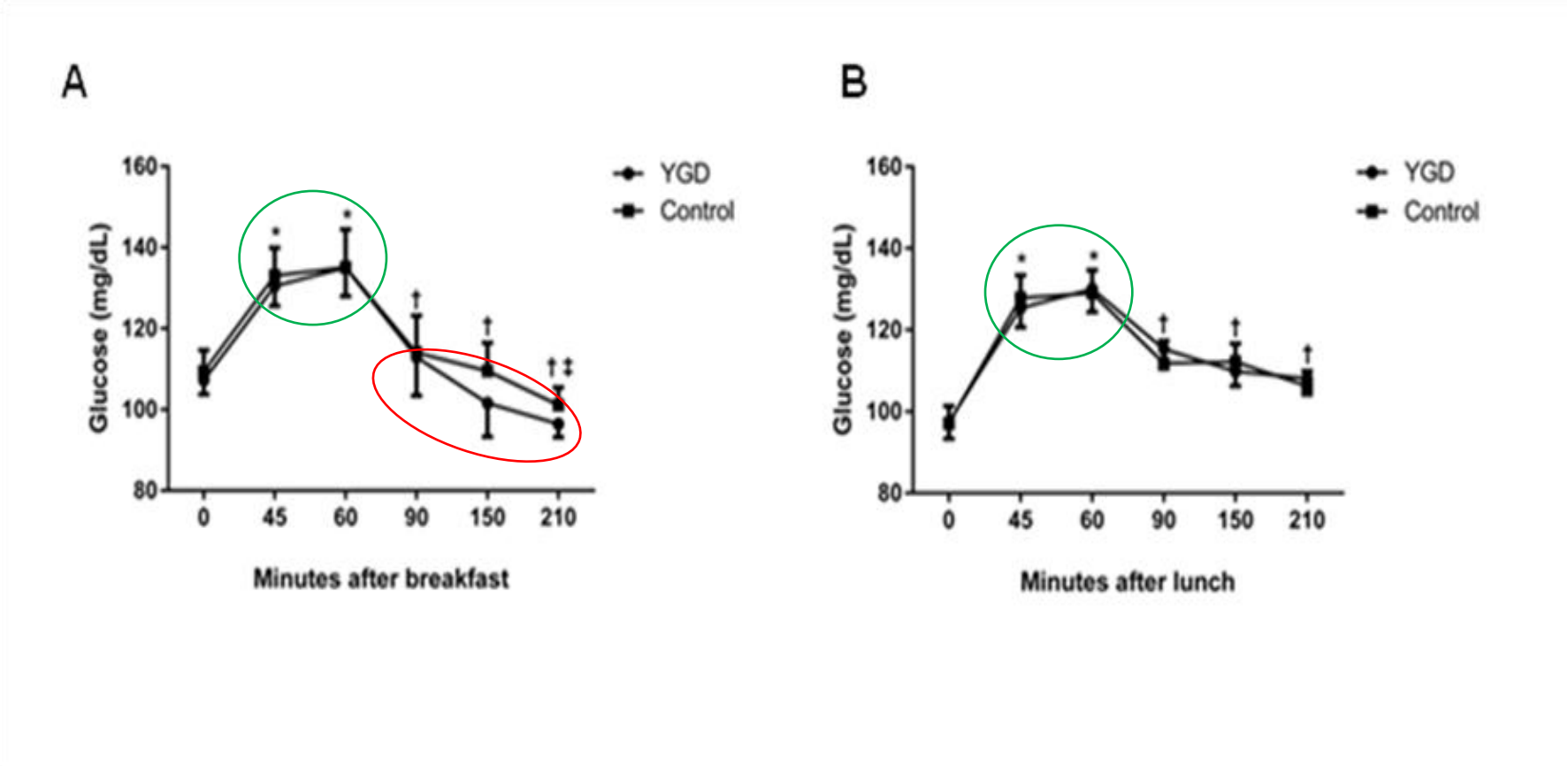
Variable	Mean ± SEM
Age (years)	32.8 ± 1.6
BMI (kg/m²)	31.49 ± 0.84
Body mass (kg)	82.29 ± 2.68
Body fat (%)	49.28 ± 0.86
Fat-free mass (%)	49 ± 0.82
Waist circumference (cm)	88.0 ±2.0

Results

Energy intake and grams of macronutrients at the test meals across the study (mean ± SEM).

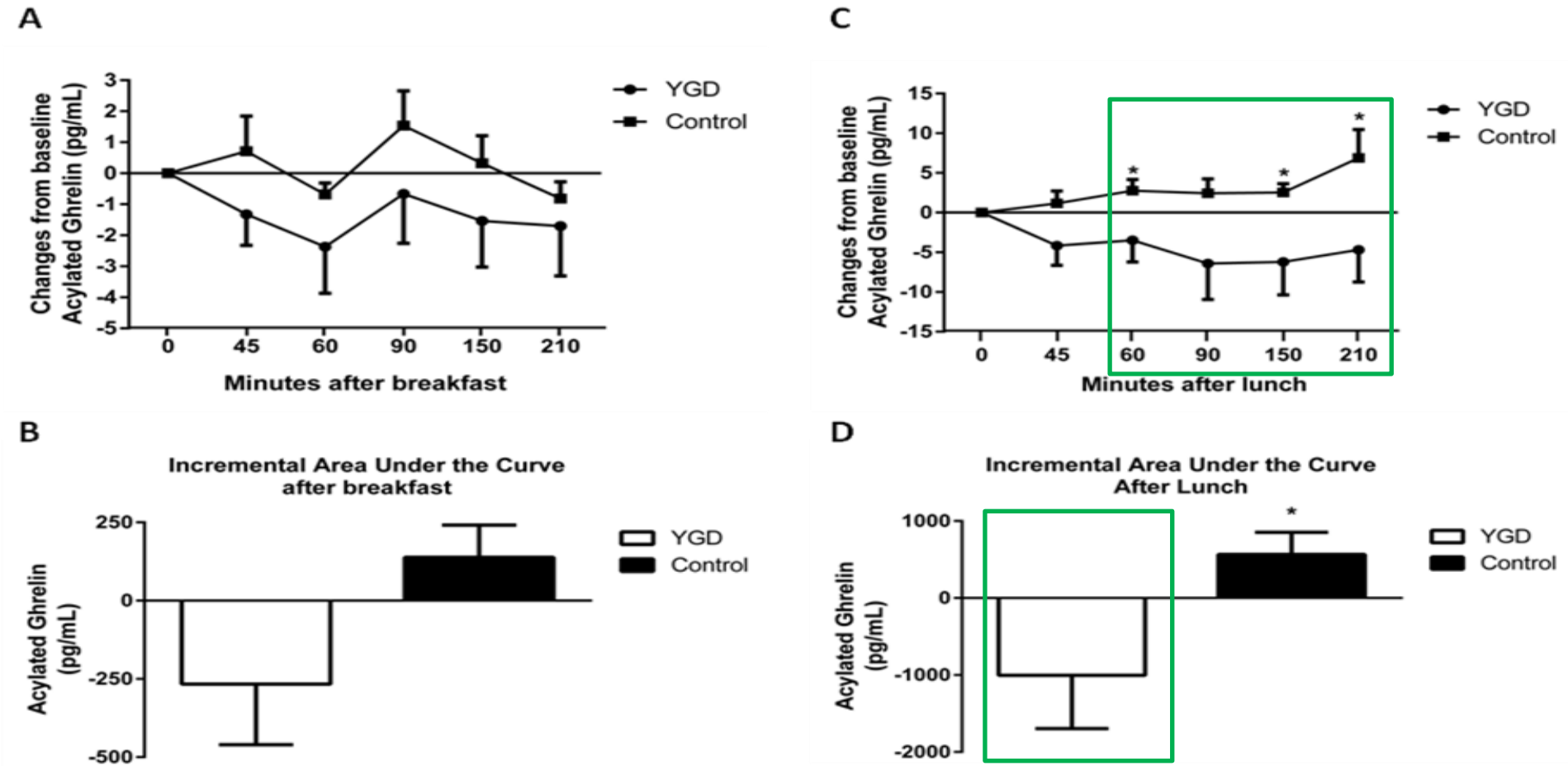
	Control (n=17)	YGD (n=17)	
	Mean ± SEM	Mean ± SEM	*p* value
Energy-Breakfast (kcal)	455.70 ± 12.67	435.25 ± 15.78	0.088
Energy-Lunch (kcal)	548.98 ± 14.37	505.71 ± 17.52	0.005*
Carbohydrate-Breakfast (g)	57.73 ± 2.00	56.41 ± 2.35	0.522
Carbohydrate-Lunch (g)	79.66 ± 3.12	70.02 ± 3.82	0.004*
Protein-Breakfast (g)	14.92 ± 0.56	13.73 ± 0.76	0.022*
Protein-Lunch (g)	24.58 ± 0.42	23.69 ± 0.47	0.039*
Lipid-Breakfast (g)	18.34 ± 0.43	17.19 ± 0.67	0.018*
Lipid-Lunch (g)	14.67 ± 0.06	14.54 ± 0.07	0.031*

Results



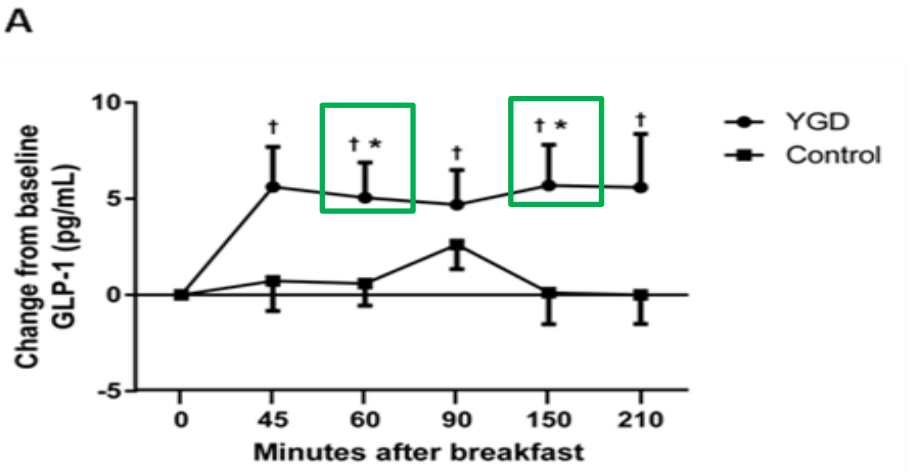
Glucose concentrations after breakfast (A) or lunch (B) with YGD or placebo supplementation. * p< 0.05 vs 0 minutes in both groups; † p<0.05 vs 45 and 60 minutes in both groups; ‡ p<0.05 vs 90 minutes after breakfast only in YGD group.

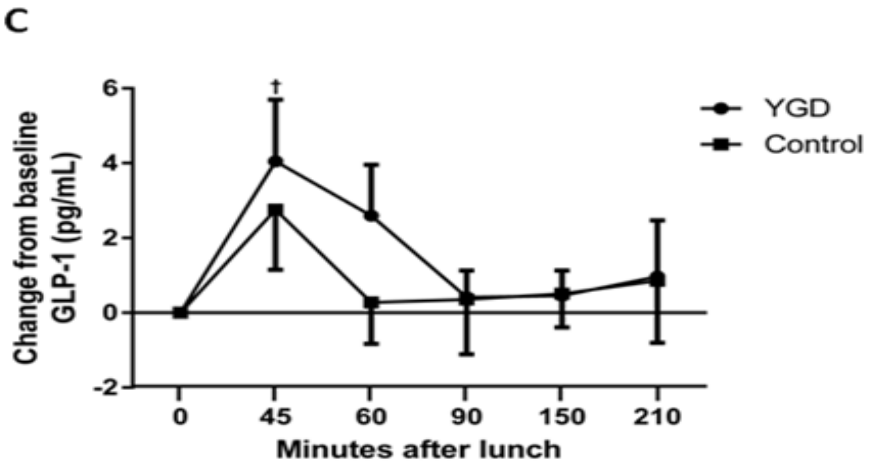
Results

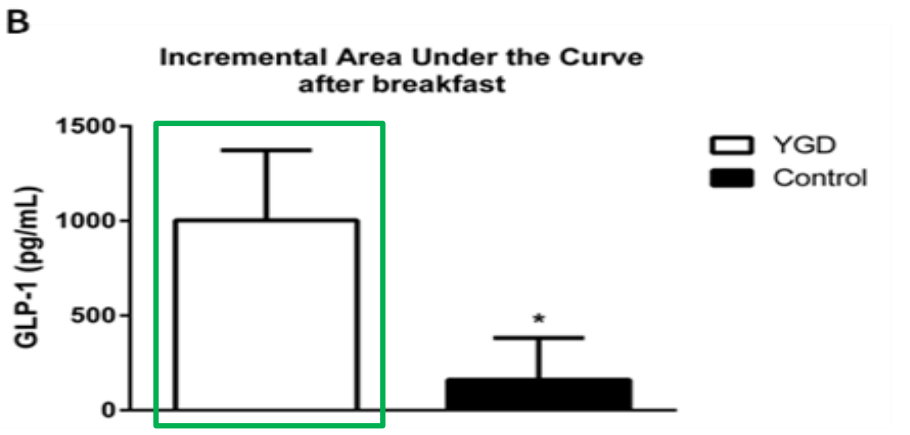


Postprandial profiles of acylated ghrelin after breakfast (A) and after lunch (C). Incremental area under the curve for acylated ghrelin after breakfast (B) and after lunch (D). *p<0.05 versus control group.

Results







Postprandial profiles of GLP-1 after breakfast (A) and after lunch (C). Incremental area under the curve for GLP-1 after breakfast (B) and after lunch (D). *p< 0.05 versus control group; † p<0.05 versus baseline.

Discussion

Slowed intestinal transit

↓ Ghrelin

↑ GLP-1

Reduced food consumption
Calorie intake

Weight loss

Andersen and Fogh, (2001), Harrold et al. (2013)

It is concluded YGD is capable of reducing energy and macronutrient intake by decreasing acylated ghrelin concentrations and increasing GLP-1 concentrations in overweight and obese women.

Acknowledgements