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PARIS
2008



5th International Whey Conference

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Recent results of the research into the possible contribution of whey powders in the fight against obesity



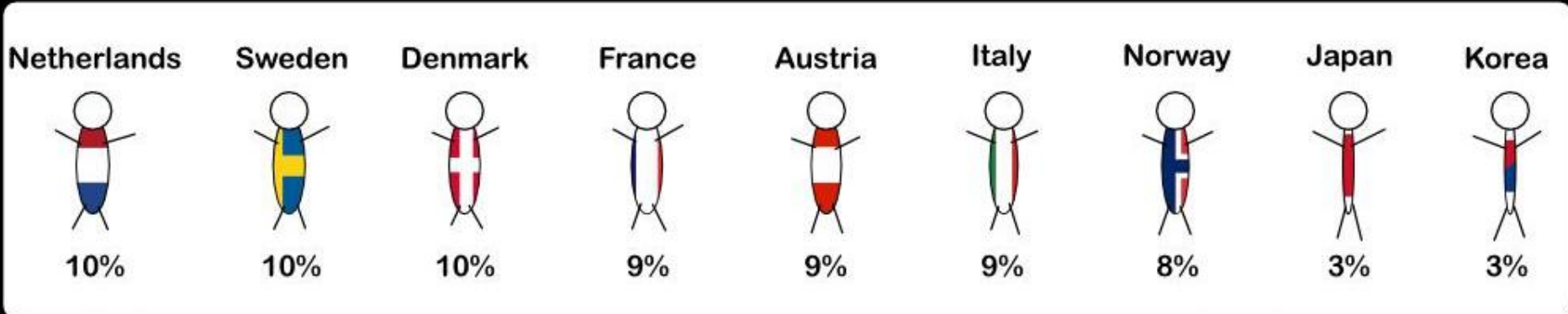
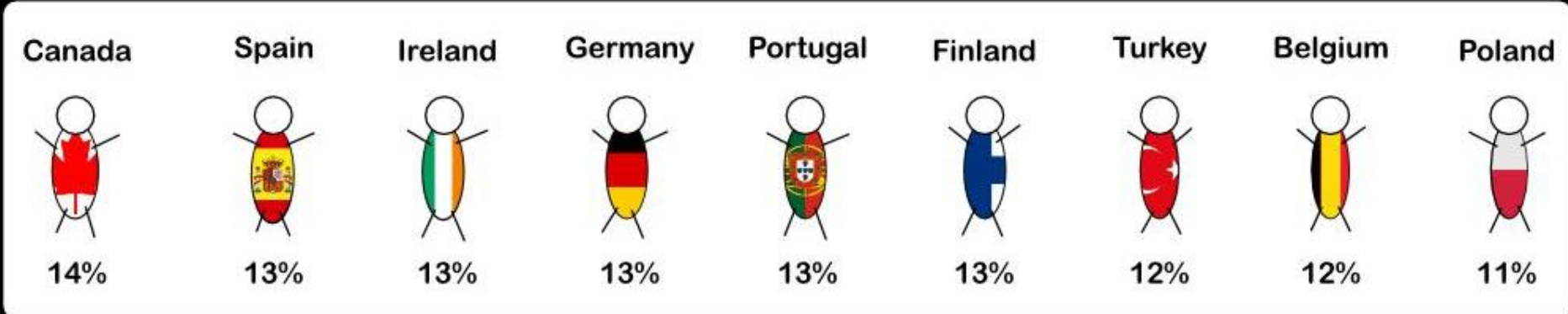
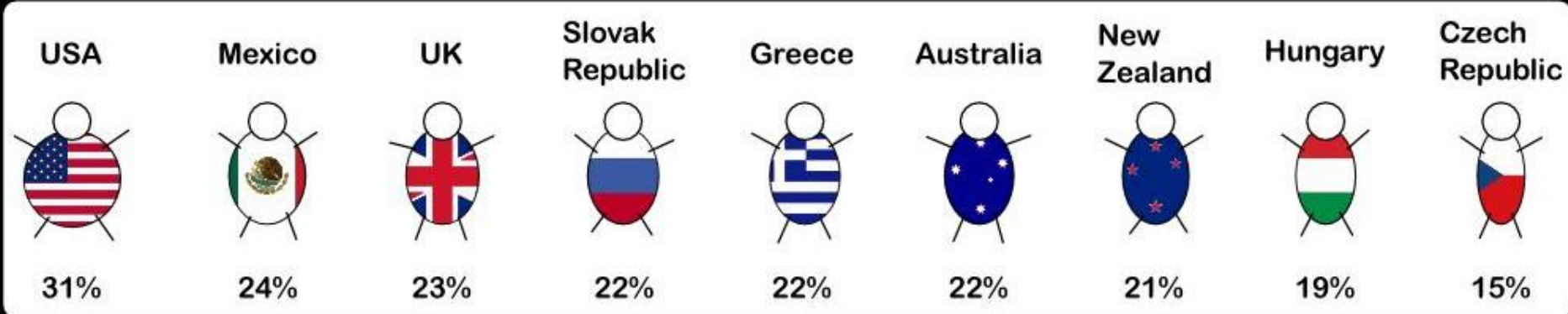
David J Baer, PhD



Beltsville Human Nutrition Research Center

Funded by USDA, ARS and the Whey Protein Research Consortium

OBESITY: The percentage of the population older than 15 with a body-mass index greater than 30.





Dietary Protein and Body Composition

- ~ **Trained individuals**
 - è **Protein increases lean mass**
 - è **Some research with whey**
- ~ **Untrained individuals becoming trained with or without energy restriction**
 - è **Protein increases lean mass**
 - è **Some research with whey**
- ~ **Untrained individuals remaining so without energy restriction**
 - è **One study with dairy - no studies of whey**

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Research Question

Does consumption of **whey** protein, compared to **soy** protein and an isocaloric control (**carbohydrate**) product decrease body weight and change composition in free-living **overweight or obese adults**?

@ energy balance – not intended to be a weight loss study



Research Question

- ~ **“Parallel Arm”, Double-blind, Randomized Controlled Trial**
- ~ **One of three treatments (30 g, 2x/day)**
- ~ **Free-living, N=90**
- ~ **Length of intervention 6 months**

Recruitment

1) Whey Protein (WPC 80) Treatment

2) Soy Protein (Isolate) Treatment

3) Carbohydrate (Maltodextrin) Treatment



- ~ **Added to their habitual diet.**
- ~ **Provided information on the energy content of the product.**
- ~ **Provided calorie guides, minimal nutrition counseling.**



Inclusion Criteria

- 1. BMI > 28 and < 38 kg/m² and body weight < 300 lbs (135 kg)**
- 2. Age 35 to 65 years**
- 3. Fasting glucose < 126 mg/dL**
- 4. Blood pressure < 160/100 mm Hg**
- 5. Total cholesterol < 280 mg/dL**
- 6. Nonsmokers or tobacco users**



Exclusion Criteria

- 1. Volunteers who have lost 10% of body weight within the last 12 months**
- 2. Volunteers who have been on Atkins, South Beach or similar diet in 3 mo prior to start of study**
- 3. Use of antiobesity medications or supplements**
- 4. Volunteers who consume a whey or soy protein supplement**
- 5. Etc.,**



Baseline Characteristics

	N	Age (yr)	Height (m)	Weight (kg)	BMI (kg/m²)
Whey	23	49.3	1.71	90.8	31.0
Soy	25	53.4	1.74	94.3	30.9
CHO	25	50.7	1.71	91.5	31.1

N= 73, Subjects who completed the intervention

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Treatments



Daily Intake from Supplement

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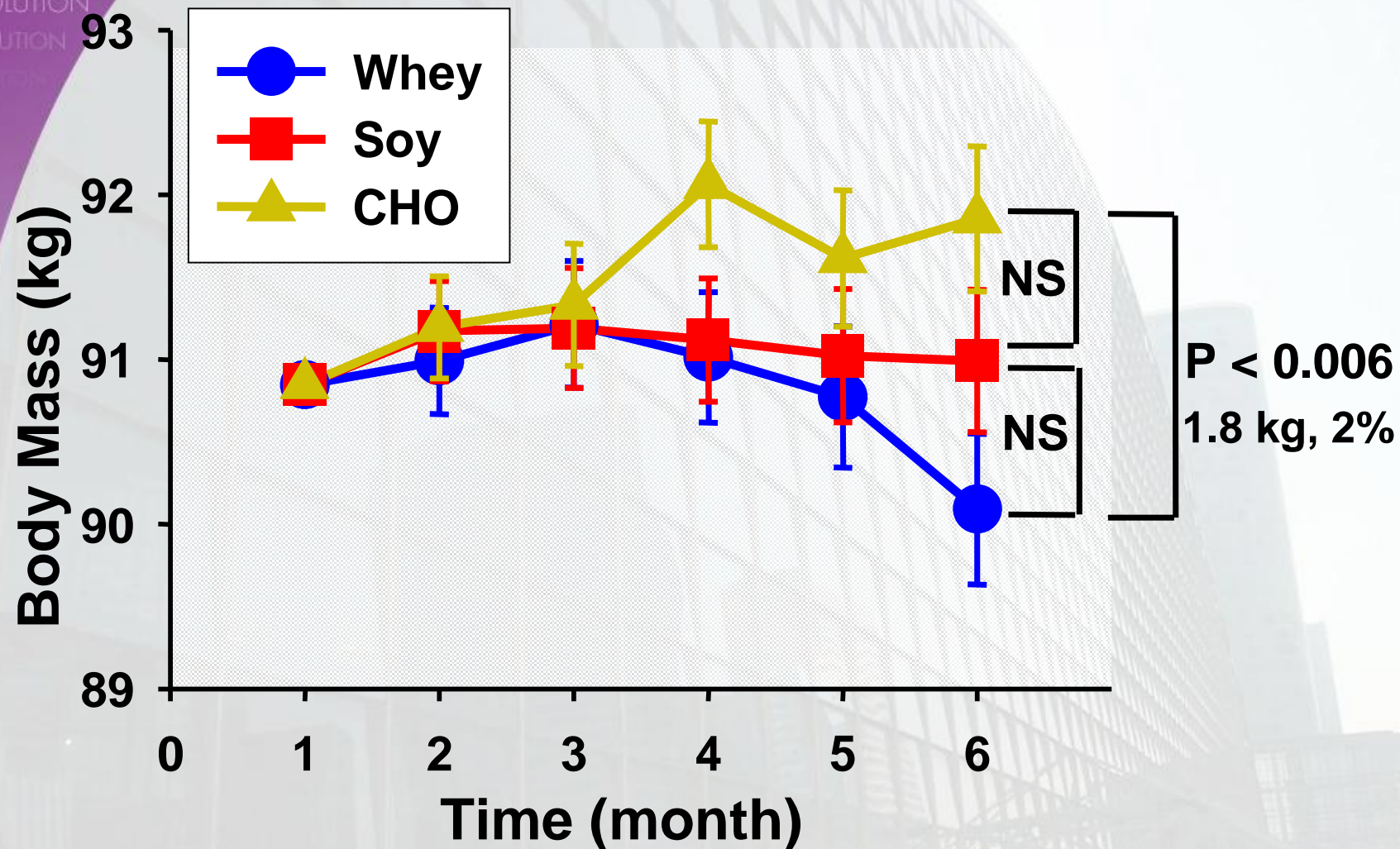
	CHO	Whey	Soy
Amount (g/d)	104	103	104
Protein (g/d)	1	55	56
Total carbohydrate (g/d)	96	37	35
Calcium (mg/d)*	391	446	496
Para-aminobenzoic acid (mg/d)	337	322	339

***An additional 600 mg/d of calcium was provided from a calcium supplement in the form of CaCO₃.**



Body Mass (Ismeans \pm sem)

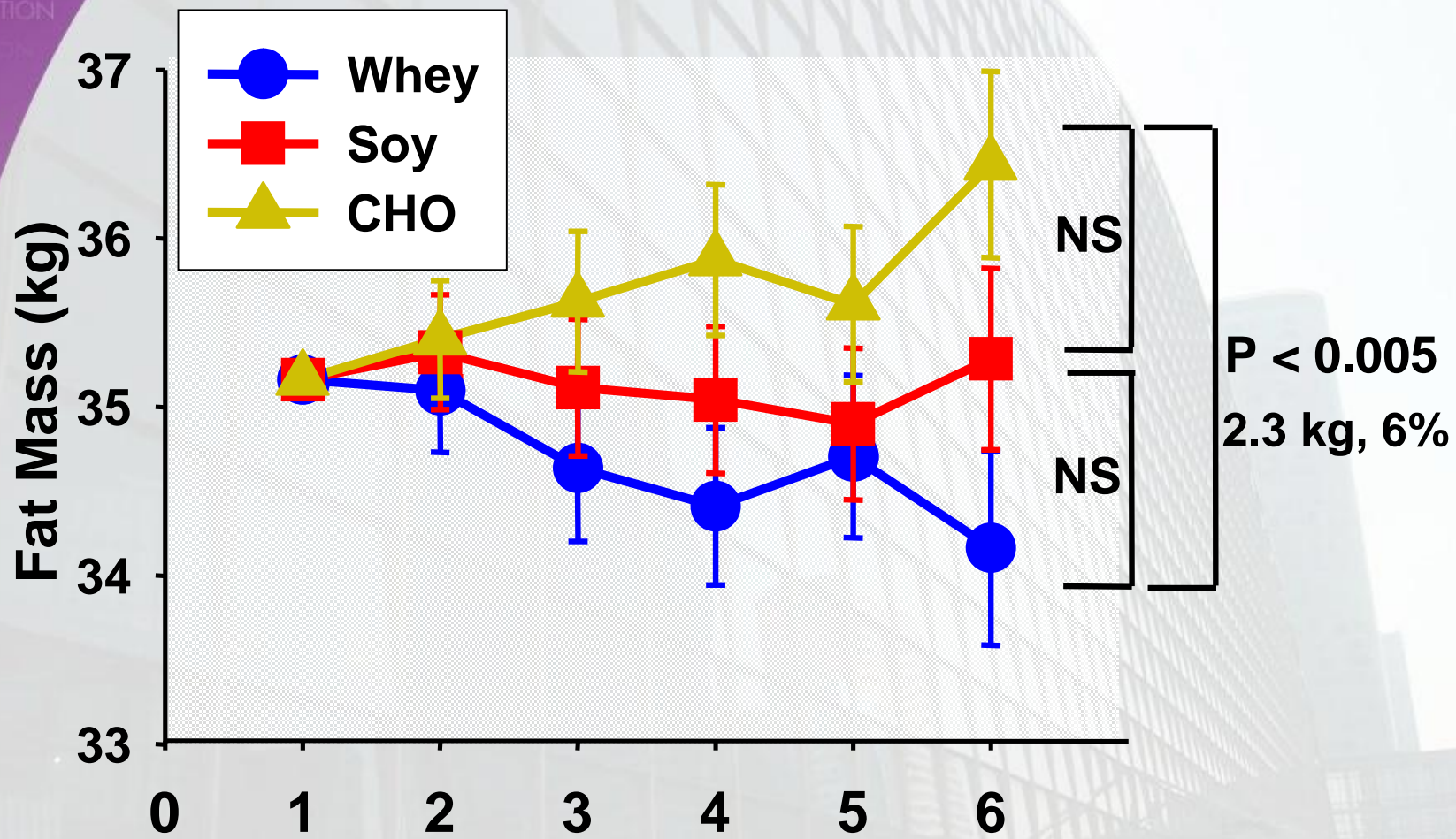
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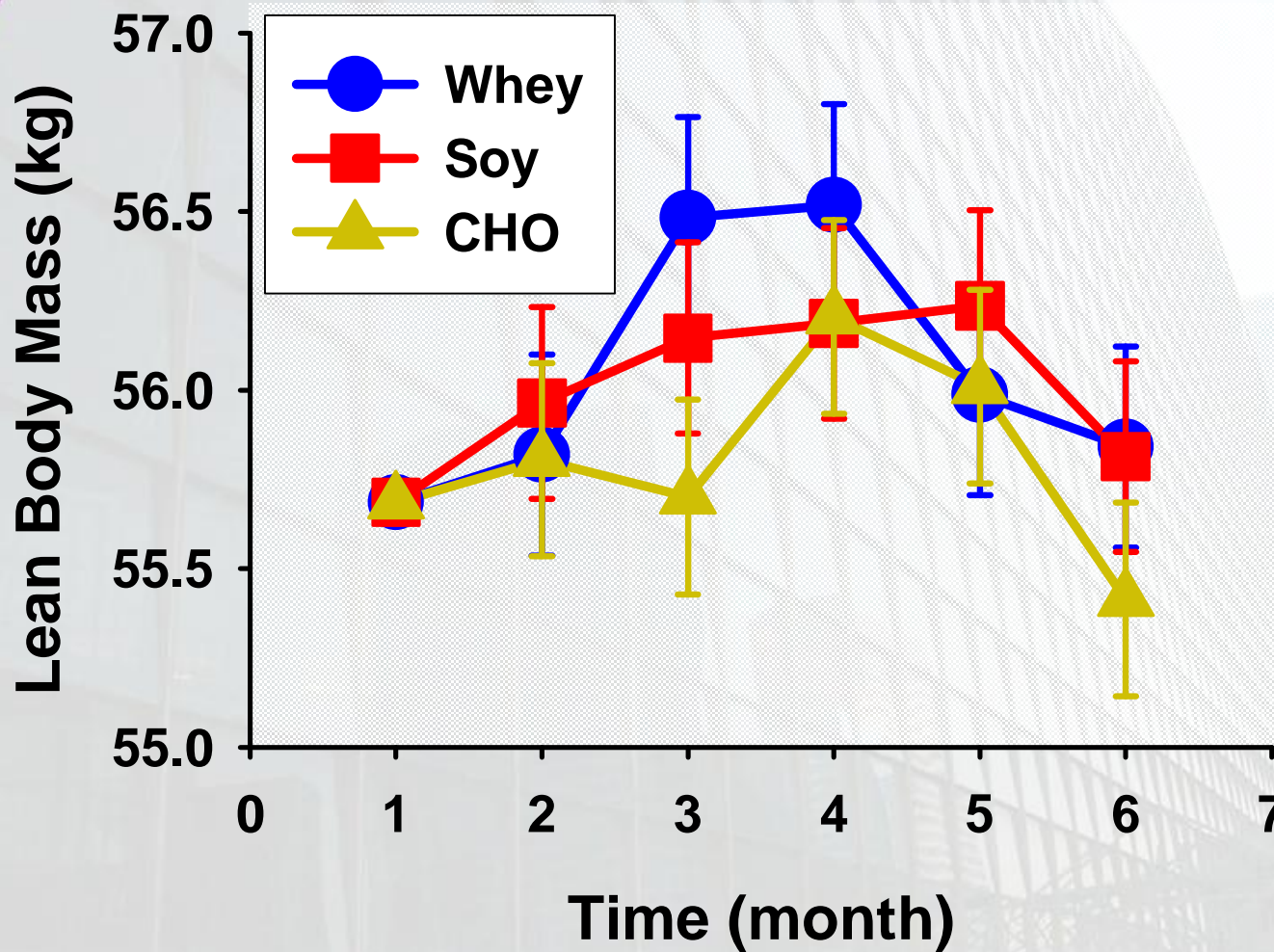
Fat Mass (Ismeans \pm sem)





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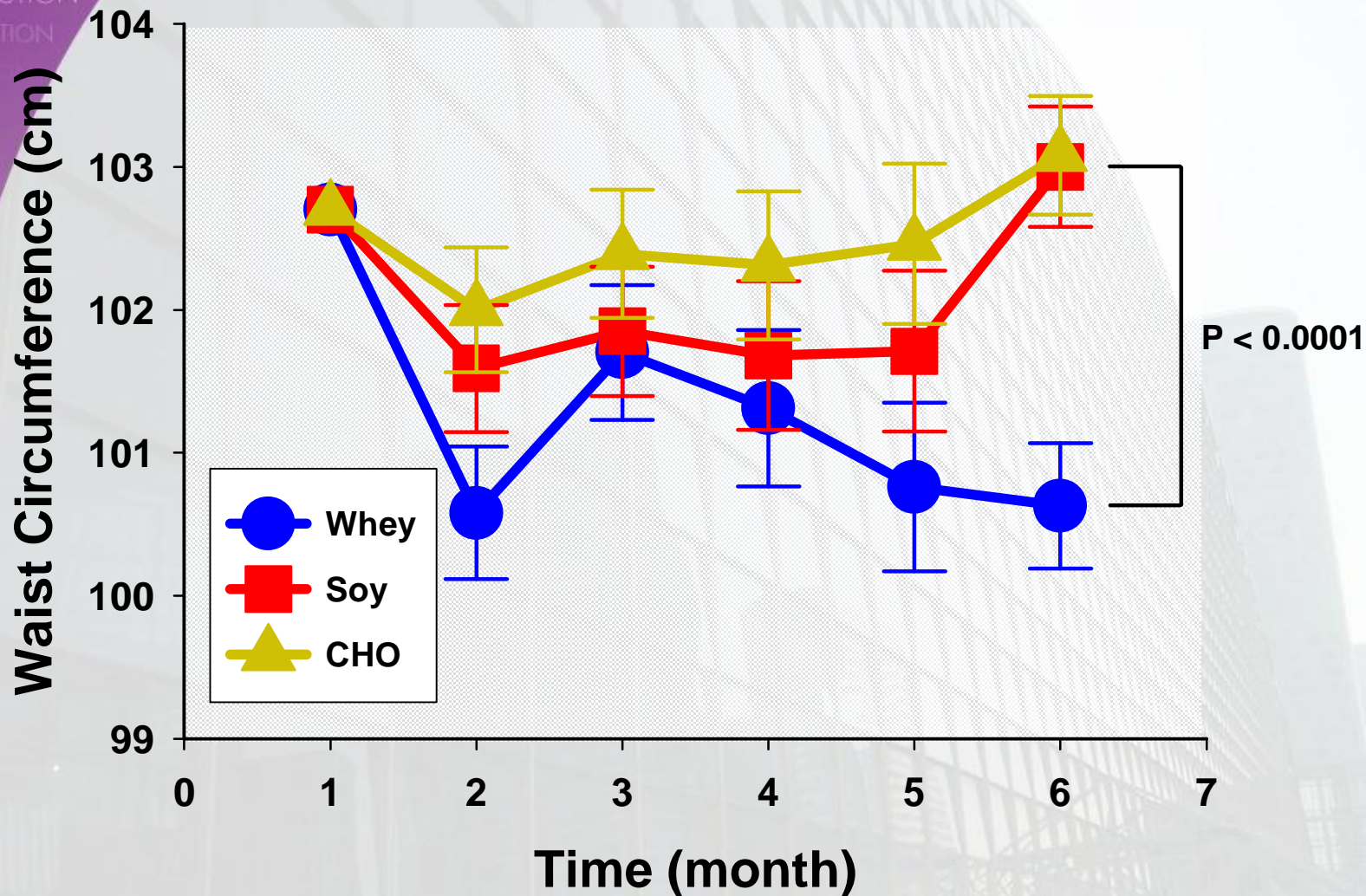
Lean Body Mass (Ismeans \pm sem)





Waist Circumference (Ismeans \pm sem)

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Dietary Intake

Trt	Energy kcal/d	Fat	Protein --- % of energy ---	CHO	Protein g/kg BW/d
Whey	2186 (9.14 MJ)	27.2	24.0	48.8	1.44
Soy	2267 (9.49 MJ)	28.0	23.9	48.2	1.43
CHO	2167 (9.07 MJ)	28.1	14.0	57.3	0.83



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Hunger/Satiety Assessment

Visual Analog Scale (VAS)

1. How hungry to you feel right now?



Not at all hungry

As hungry as I have ever felt

2. How strong is your desire to eat right now?



Very weak

Very strong

3. How much food do you think you can eat right now?



Nothing at all

A large amount

4. How full does your stomach feel right now?



Not at all full

Very full

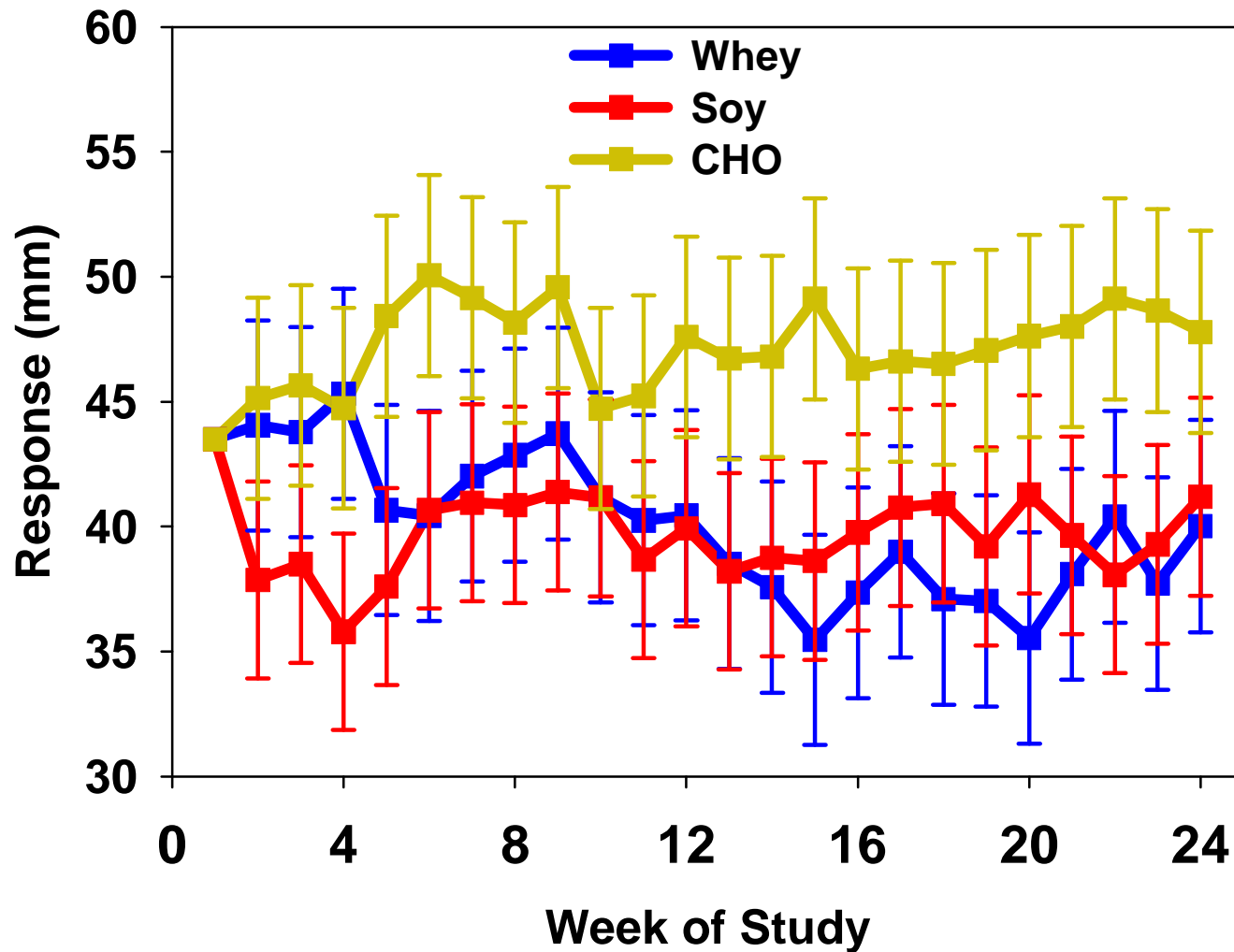


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How hungry to you feel right now?

Not at all hungry

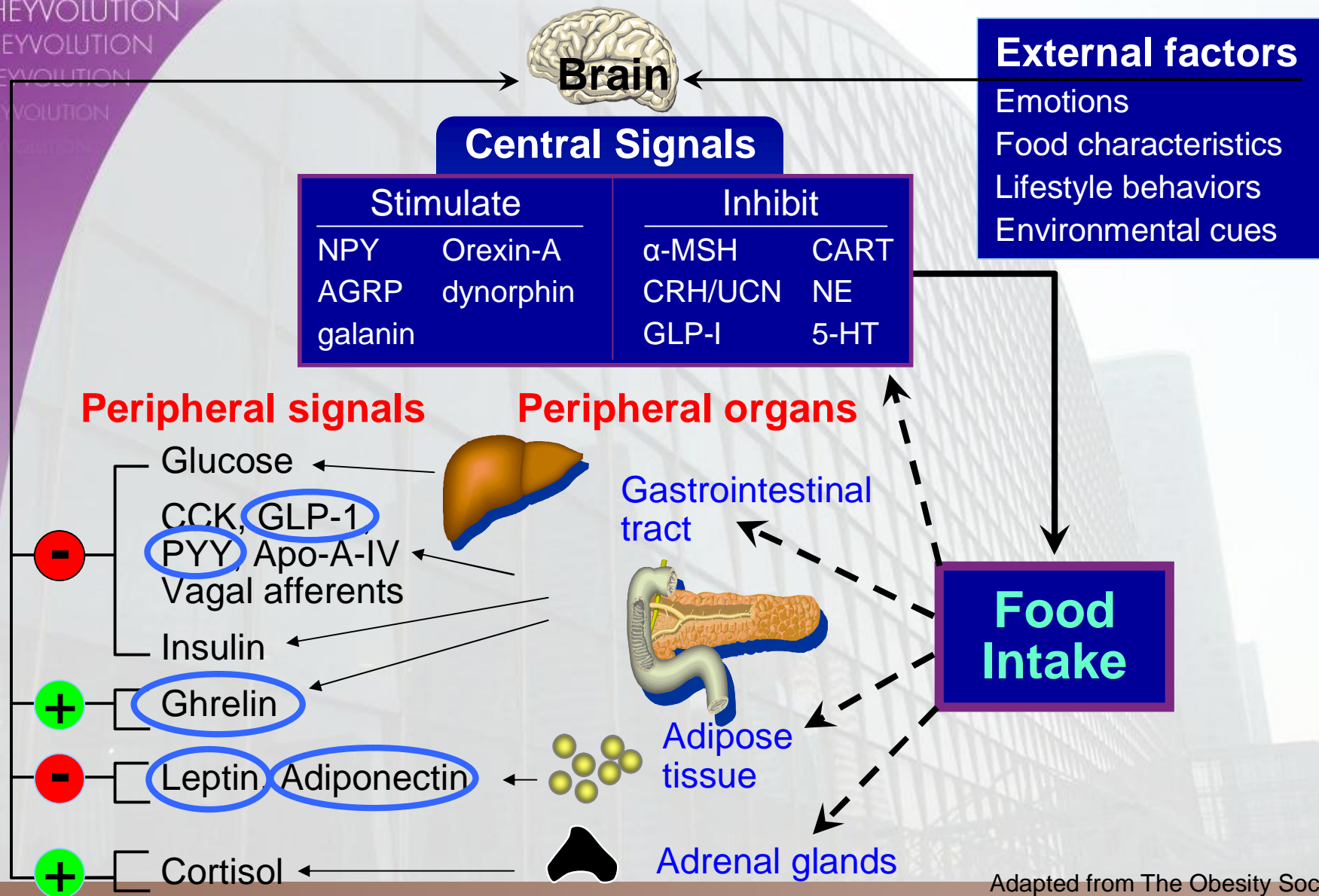
As hungry as I have ever felt





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Regulation of Food Intake





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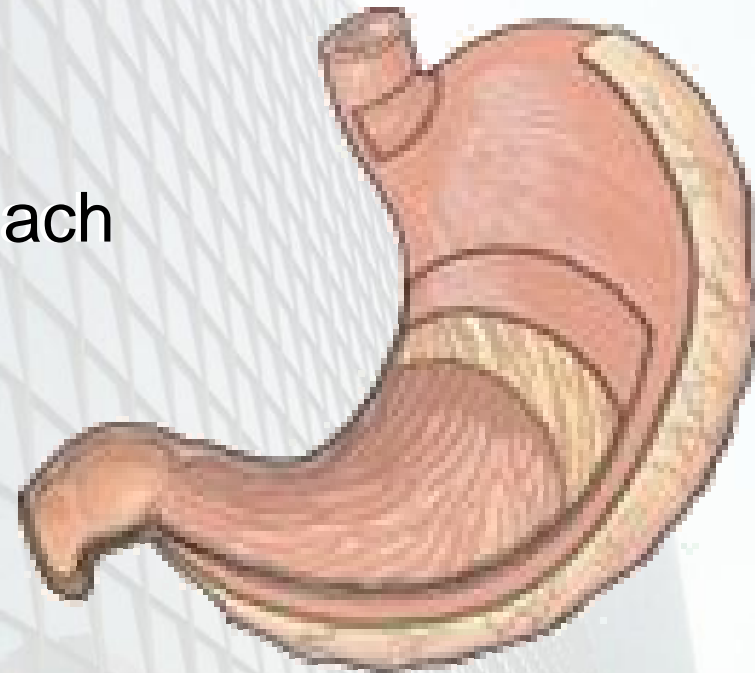
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Gherlin

~ Produced in the stomach

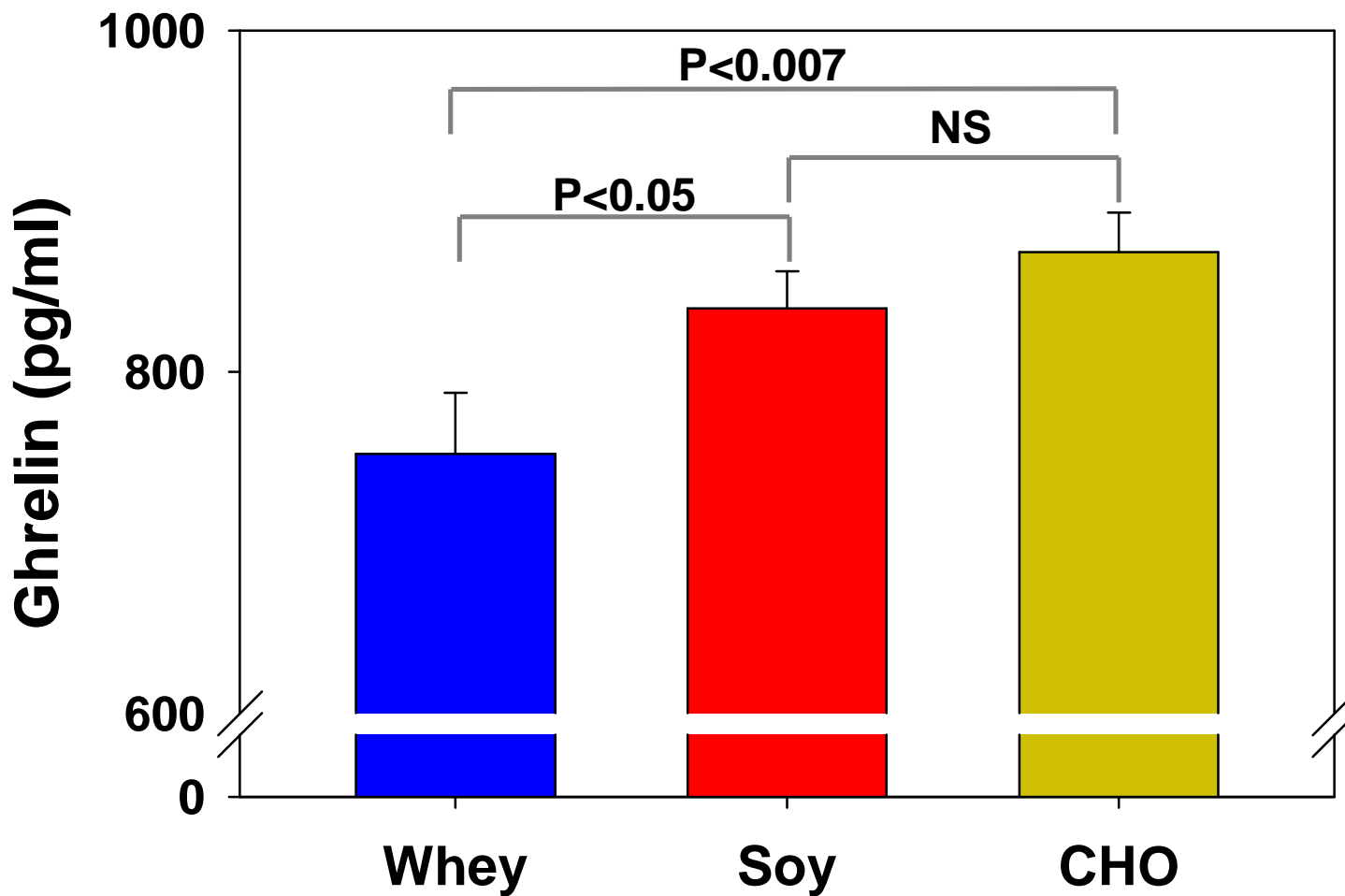
~ Stimulates appetite





Circulating Ghrelin Concentration

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Other recent advances

A whey-protein supplement increases fat loss and spares lean muscle in obese subjects: a randomized human clinical study

Nutrition & Metabolism Frestedt et al., 5:8, 2008

- ~ Prolibra (Glanbia), a proprietary dairy-derived ingredient containing whey proteins, peptides and milk minerals vs maltodextrin
- ~ Weight loss study, 3 mo intervention
- ~ Obese
- ~ Prolibra group lost more fat mass than maltodextrin



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- 1. During the 6 mo intervention, we added approximately 64,400 kcal (268 MJ). Without any compensation, this could result in an increase in body weight of approximately 20 lb (4.5 kg).**
- 2. Compared to added calories from carbohydrate, added calories from whey protein results in a decrease in body weight and waist circumference.**
- 3. And, the change in body weight is associated with a decrease in body fat without affecting lean body mass.**





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