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# An Egg White Breakfast is More Satiating than an Equal Calorie Whole Egg Breakfast



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## Background

Foods that are more filling at the same energy level offer a strategy to help individuals eat less and manage their weight. Whole eggs are highly satiating and have been shown to reduce subsequent energy intake [1-2]. The protein content of eggs is likely one factor that contributes to their effect on satiety [3-5]. Volume and/or weight of the food consumed also contributes to satiety [6-8]. Egg whites provide greater volume, weight and more protein per kcal than whole eggs, suggesting that egg whites may be even more satiating than whole eggs.

Commercial egg whites (Egg Beaters®) are prepared by removing the yolk and fortifying to achieve a vitamin and mineral content similar to whole eggs. By removing the yolk, the fat and cholesterol are removed, and the calorie density (calories/gram) is decreased.

## Purpose

The purpose of this study is to compare the satiety of commercially prepared egg whites to whole eggs.

## Methods

In a randomized, balanced, cross-over manner, 53 men and women (ages 39 ± 10, BMI 22 ± 2) consumed two 330 kcal breakfasts: 2 slices toast, 10 g margarine, 284 mL non-caloric beverage and eucaloric portions of either egg whites (Egg Beaters® Original, ConAgra Foods) or whole eggs. Participants completed 10-cm satiety visual analogue scales at 30-minute intervals for three hours. Thereafter, they ate as much as desired from a large portion of macaroni and cheese. Energy intake was calculated by converting grams consumed (pre-weight minus post-weight) to calories using labeled nutrition information.

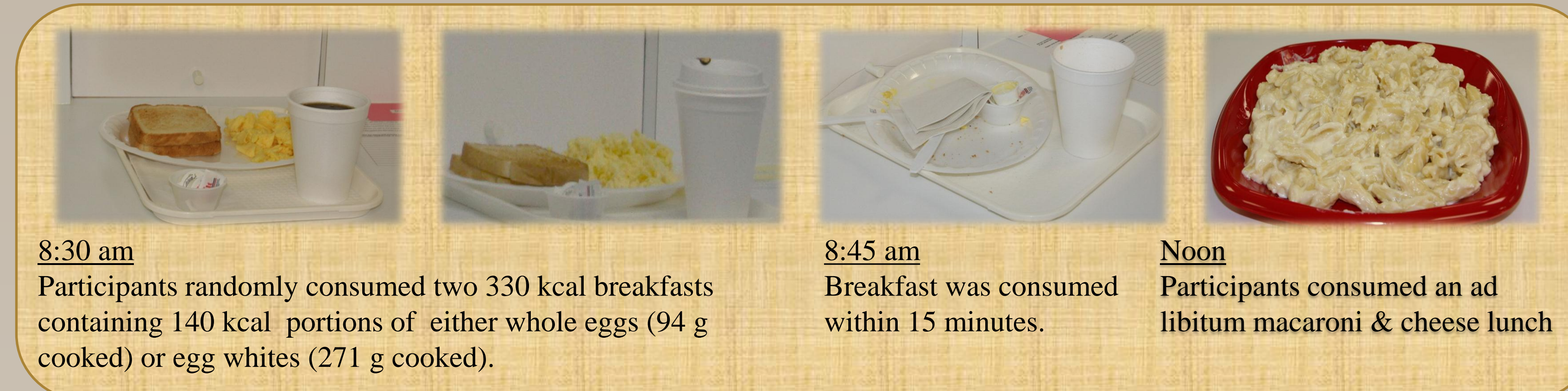
### Test Foods, raw

	Egg Whites	Whole Eggs	Difference
<b>Volume</b>	282 mL (1.2 cups)	97 mL (Equal to 2 large eggs)	185 mL
<b>Weight, g</b>	288	100	188 g
<b>Energy, kcal</b>	140	140	0
<b>Protein, g</b>	29	13	16
<b>Fat, g</b>	1	9.5	-8.5
<b>CHO, g</b>	4	1	3

Energy consumption and satiety scores were analyzed using ANOVA, and Tukey's method was used for mean comparisons at alpha = 0.05.

Supported by ConAgra Foods, Inc.

## Methods



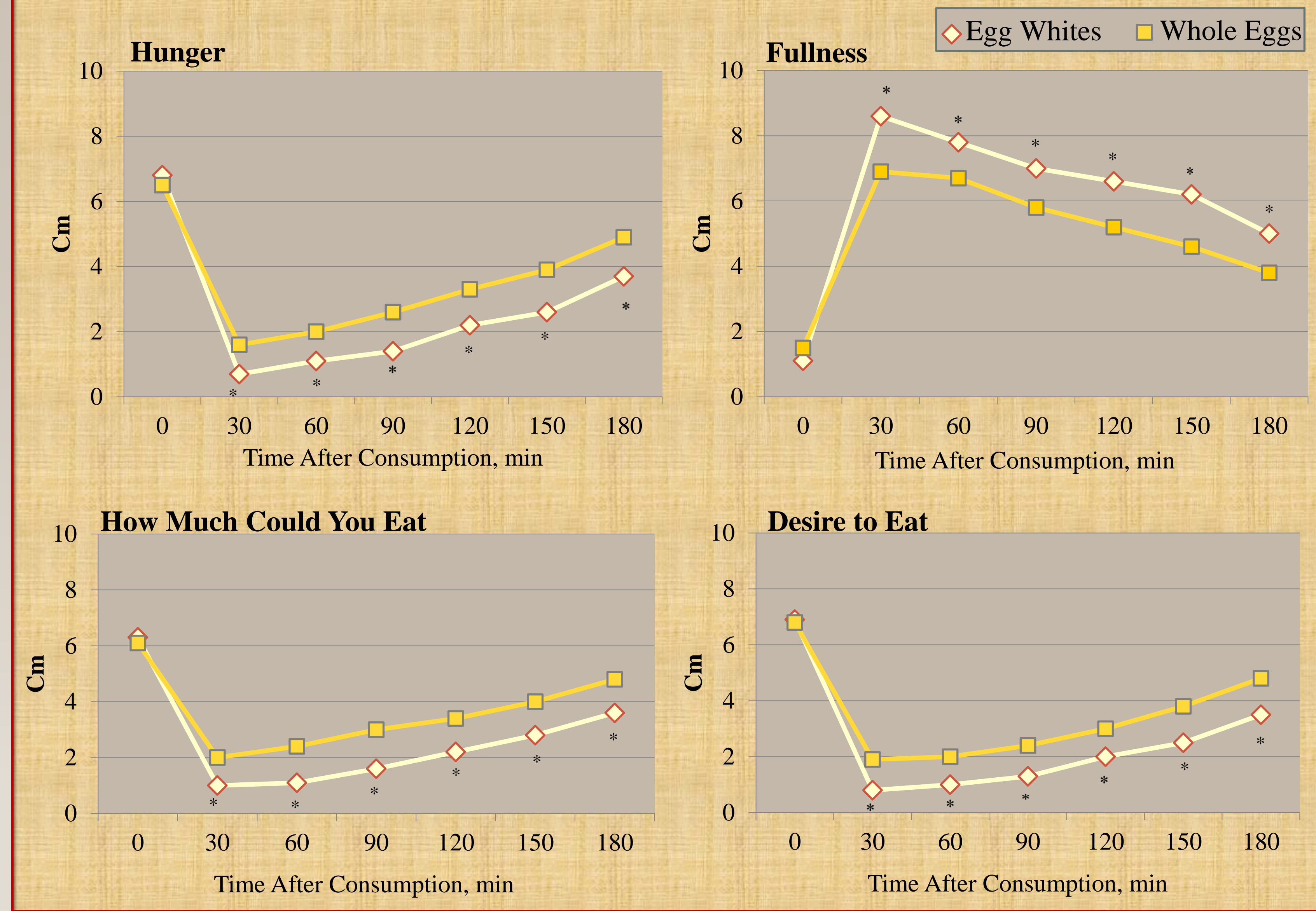
**8:30 am**  
Participants randomly consumed two 330 kcal breakfasts containing 140 kcal portions of either whole eggs (94 g cooked) or egg whites (271 g cooked).

**8:45 am**  
Breakfast was consumed within 15 minutes.

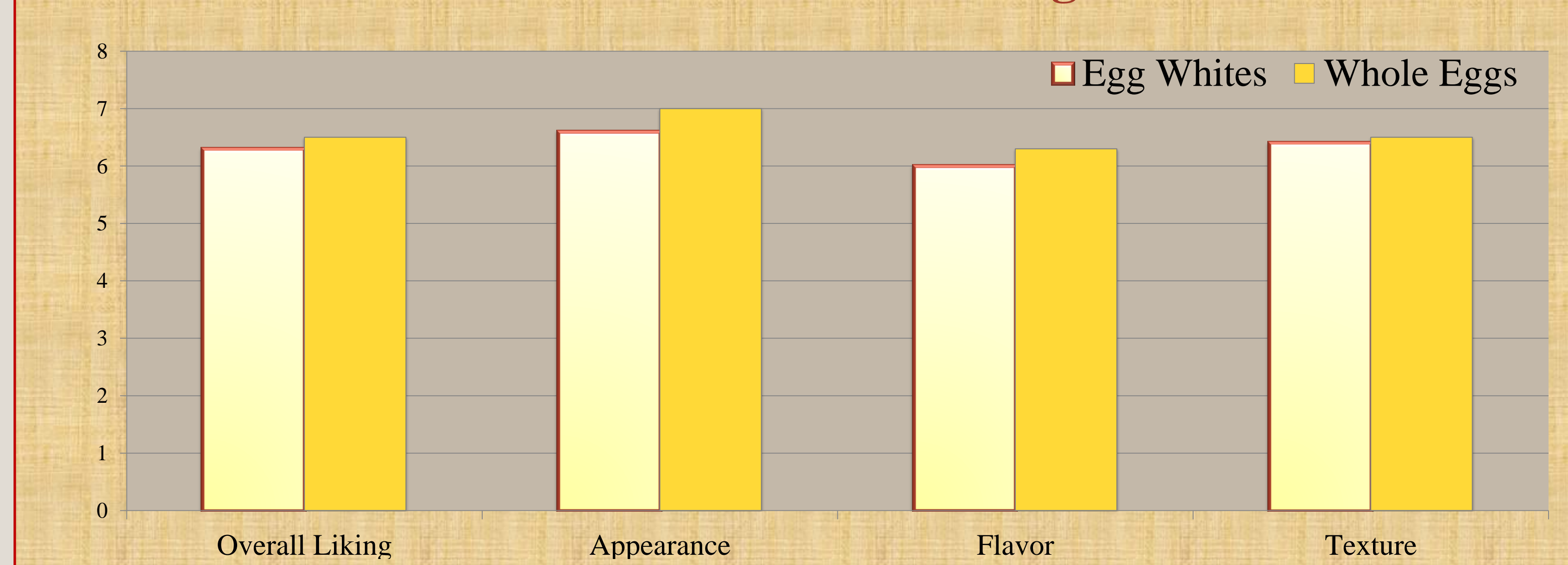
**Noon**  
Participants consumed an ad libitum macaroni & cheese lunch

## Results

### Mean Satiety Ratings at 30-Minute Intervals

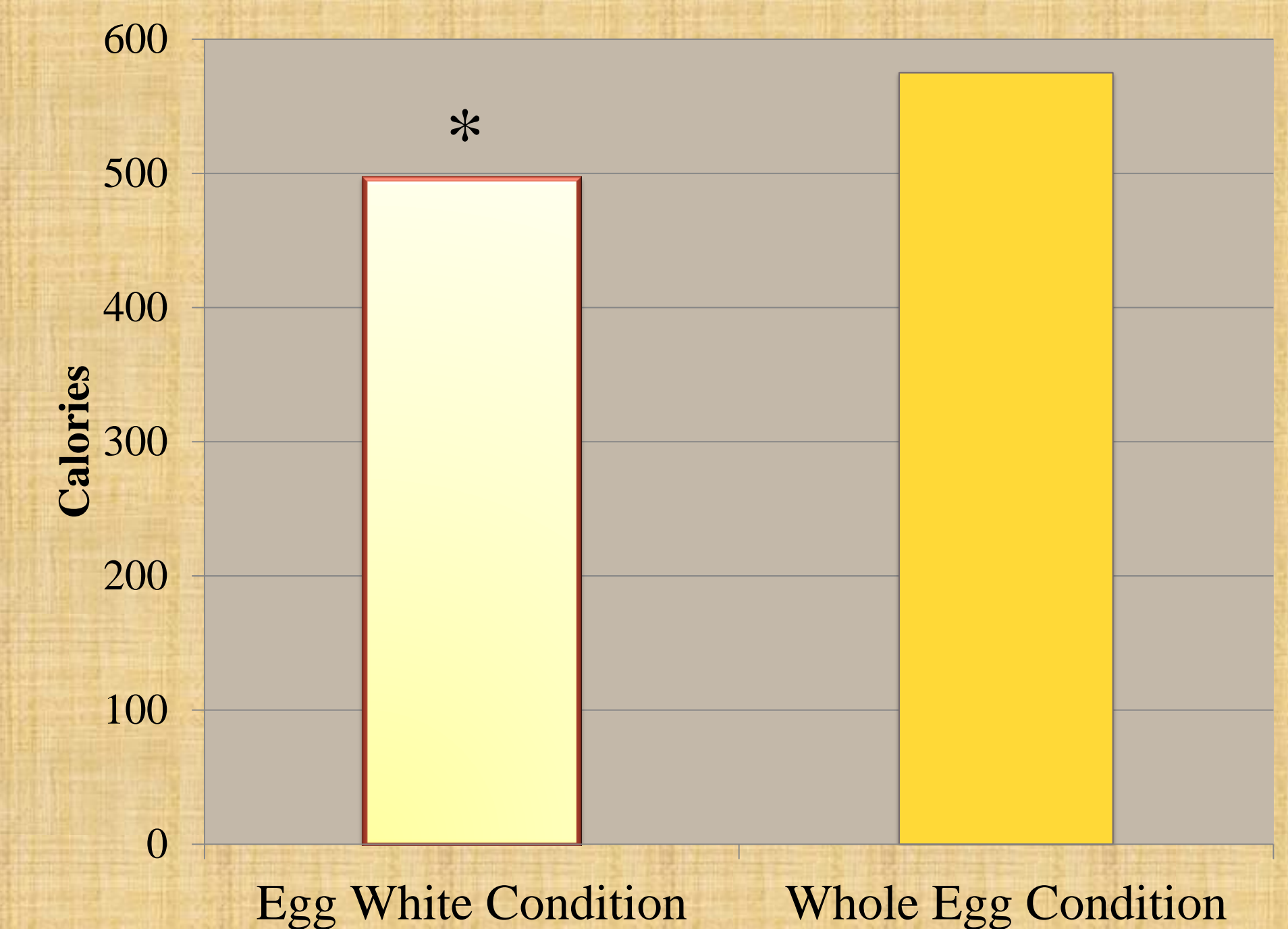


### Mean Hedonic Ratings



## Results

### Mean Energy Intake at Lunch: Egg White vs. Whole Egg Breakfast



## Conclusions

A 140 kcal portion of egg whites provided more than twice the volume compared to 140 kcal whole eggs, and when consumed as part of the same breakfast, resulted in greater satiety over 3 hours and 14% (79) fewer calories consumed at lunch. For those wishing to maintain or reduce energy intake with less hunger, choosing egg whites instead of whole eggs may be a beneficial breakfast choice.



## References

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