

# **An Analysis of Food Consumption Based upon Body Clock Circadian Rhythm for Obese and Overweight Individuals in a Four Week Case Controlled Weight Loss Study for a Commercially Available Weight Loss Program**

## **Background**

The number of adults struggling with obesity and weight loss continues to rise, and numerous weight management programs are attempting to help consumers with this increasingly common condition. According to data from the National Health and Nutrition Examination Survey (NHANES) 2013 – 2014, over 1/3 of all adults in the United States are obese (1).

Previous research has shown that obesity can be prevented or reversed through a strategy involving the planned consumption of food during a specified time period during the day, referred to by scientists as time restricted feeding (2,3). In this study, subjects' natural body clock circadian rhythms determined their meal windows and meal times throughout the day, for a period of 4 weeks.

## **Objective**

The main purpose of this 4-week case controlled, parallel-group study was to evaluate changes in body weight when obese and overweight adults followed the Jenny Craig Rapid Results program with new Enhanced Dedicated Client Support Model vs. the non-body clock circadian rhythm Jenny Craig weight management program.

## **Methods**

Cases were defined as 38 obese/overweight adults (n = 32 women, n = 6 men) with an average age ( $\pm$  standard error of the mean) of  $43.6 \pm 1.5$  y, body weight of  $225.5 \pm 6.7$  lbs. and body mass index (BMI) of  $36.9 \pm 0.9$  kg/m<sup>2</sup> who were enrolled and completed the 28-day Jenny Craig Rapid Results Program. Subjects had no known history of food allergies, heart disease, diabetes, eating disorders, or celiac disease. The daily energy intake targets for subjects were based on BMI, and ranged from 1200 kcal/day to 2000 kcal/day. Subjects had to purchase 4 complete weekly menus (7 breakfasts, 7 lunches, 7 dinners, 7 snacks, 1 box bars or shakes) and attend 5 weekly consultations. The subjects' weights were recorded during each weekly consultation. Each day, subjects consumed all the foods listed on the Rapid Results menu as it pertained to their circadian rhythms. The menus placed higher calorie food items in the beginning of the day, and lower calorie items near the end of the day based on optimal circadian rhythm-determined macronutrient metabolism. Subjects recorded their start/stop times on the Rapid Results menu.

Controls were defined as 178 obese/overweight adults (n = 158 women, n = 30 men) with an average age ( $\pm$  standard error of the mean) of  $43.6 \pm 0.6$  y, body weight of  $224.0 \pm 2.8$  lbs. and recommended weight loss of  $\geq 30$  lbs. These subjects were selected from clients in the Jenny Craig weight management program. Controls were chosen based on their age, gender, amount of weight to lose, and starting weight as it related to those in the Rapid Results program. Clients had similar starting weights ( $\pm 5$  lbs.), age ( $\pm 3$  yrs.), recommended weight loss ( $\geq 30$  lbs.) and gender to a corresponding

individual on the Rapid Results Program. All cases and controls had to remain active on the program for at least 4 weeks, which included 5 weekly consultations and weigh-ins.

## Results

Subjects in both programs lost a significant amount of weight between the baseline and the end of week 4. Those on the Rapid Results program lost approximately 37.8% more weight during the 4 weeks than subjects on the non-body clock circadian rhythm Jenny Craig weight management program (all values  $p < 0.0001$ ).

## Conclusions

The Jenny Craig Rapid Results program results in significant weight loss over a 4-week period due to its concentration on natural circadian rhythm feeding and calorie metabolism, calorie focused menu structure, and comprehensive, personalized client support, and is superior to the non-body clock circadian rhythm Jenny Craig weight management program.

<b><u>Week 4: Weight Loss Results*</u></b>	
<b>Body Weight (lbs.)</b>	
<b>Rapid Results</b>	-11.64 ± 0.70
<b>95% CI</b>	(-13.04, -10.23)
<b>JC Weight Management Program</b>	-8.45 ± 0.27
<b>95% CI</b>	(-8.98, -7.92)

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\*Values reported are change from baseline weight ± standard error of the mean  
95 % CI = 95% confidence intervals for change from baseline weight

## References

1. Centers for Disease Control and Prevention (CDC). National Center for Health Statistics (NCHS). National Health and Nutrition Examination Survey Data. Hyattsville, MD: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, [2013-2014] [<https://www.cdc.gov/obesity/data/adult.html>]
2. Chaix A, Zarrinpar A, Miu P, Panda S. Time-restricted feeding is a preventative and therapeutic intervention against diverse nutritional challenges. *Cell. Metab.* 2014 Dec 2; 20(6): 991–1005. doi: 10.1016/j.cmet.2014.11.001. [PMC free article] [PubMed] [Cross Ref]
3. Longo VD, Mattson MP. Fasting: molecular mechanisms and clinical applications. *Cell Metabolism.* 2014 Jan 16; 19 (2):181–192. doi: 10.1016/j.cmet.2013.12.008. [PMC free article] [PubMed] [Cross Ref]

## Four Week Weight Loss Results for Obese and Overweight Adults Participating in a Commercially Available Weight Loss Program Based on Body Clock Circadian Rhythm

### Objective

The main purpose of this 4-week case controlled study was to evaluate changes in body weight when obese and overweight adults followed the Jenny Craig Rapid Results program with new Enhanced Dedicated Client Support Model.

### Methods

Cases were defined as 31 obese/overweight adults (n = 28 women, n = 3 men) with an average age ( $\pm$  standard error of the mean) of  $41.6 \pm 1.6$  y, body weight of  $226.9 \pm 10.4$  lbs. and body mass index (BMI) of  $37.2 \pm 1.4$  kg/m<sup>2</sup> who were enrolled and completed the 28-day Jenny Craig Rapid Results Program. Subjects had no known history of food allergies, heart disease, diabetes, eating disorders, or celiac disease. The daily energy intake targets for subjects were based on BMI, and ranged from 1200 kcal/day to 2000 kcal/day. Subjects had to purchase 4 complete weekly menus (7 breakfasts, 7 lunches, 7 dinners, 7 snacks, 1 box bars or shakes) and attend 5 weekly consultations. The subjects' weights were recorded during each weekly consultation. Each day, subjects consumed all the foods listed on the Rapid Results menu as it pertained to their circadian rhythms. The menus placed higher calorie food items in the beginning of the day, and lower calorie items near the end of the day based on optimal circadian rhythm-determined macronutrient metabolism. Subjects recorded their start/stop times on the Rapid Results menu.

### Results

The means, standard deviations, standard errors and 95% confidence limits for weight and BMI data are shown in Table 1. For example, the 95% confidence limits for absolute weight change are -14.5 lbs. and -10.1 lbs., whereas the 95% confidence limits for absolute BMI change are -2.3 kg/m<sup>2</sup> and -1.7 kg/m<sup>2</sup>.

**Table 1. Summary Statistics for Weight and BMI**

Variable	N	Mean	Std Dev	Std Error	Lower 95% CL for Mean	Upper 95% CL for Mean
<b><u>Weight Results:</u></b>						
Start_Weight	31	226.87	57.74	10.37	205.69	248.05
Week_4_Weight	31	214.58	52.99	9.52	195.15	234.02
Weight_change	31	-12.28	6.03	1.08	-14.50	-10.07
Percent_Weight_change	31	-5.30	1.50	0.27	-5.85	-4.75
<b><u>BMI Results:</u></b>						
BMI_start	31	37.23	7.64	1.37	34.42	40.03
BMI_end	31	35.22	7.00	1.26	32.65	37.78
BMI_change	31	-2.01	0.87	0.16	-2.33	-1.69

## Conclusions

The Jenny Craig Rapid Results program results in significant weight loss over a 4-week period due to its concentration on natural circadian rhythm feeding and calorie metabolism, calorie focused menu structure, and comprehensive, personalized client support.

<b><u>Week 4: Weight Loss Results*</u></b>	
<b>Body Weight (lbs.)</b>	
<b>Rapid Results</b>	-12.28 ± 1.08
<b>95% CI</b>	(-14.50, -10.07)

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\*Values reported are change from baseline weight ± standard error of the mean  
95 % CI = 95% confidence intervals for change from baseline weight