

Efficacy of a meal replacement diet plan compared to a food-based diet plan after a period of weight loss and weight maintenance: a randomized controlled trial *Nutrition Journal* 2010, 9:11

Increasingly, meal replacement diet plans have been demonstrated to provide safe, effective, sustainable weight loss, and have also been shown to yield significant improvements in health outcomes. Nutrient rich, portion-controlled meal replacements are a strategic tool that may assist dieters as they navigate the obesigenic environment by providing a convenient alternative to over-sized, high fat, empty calorie choices.

For these reasons, this study sought to evaluate the impact of a portion controlled meal replacement diet plan on body weight and body composition compared to an isocaloric, food-based diet plan for a 16-week period of weight loss and 24-week period of weight maintenance.

Following a low-energy diet consisting of five, 90-110 kcal meal replacements daily and one self-prepared meal (MD group) led to twice the weight loss at the end of 16-weeks compared to a food group prescribed the same number of calories based on food selection guidelines of the USDA Food Guide Pyramid. Clinically significant weight loss, a loss of at least 5% of starting body weight in one year ; was achieved by 93% of participants following the MD diet compared to only 55% of the FB group in a 10-month time period.

Moreover, a robust mean weight loss of 12.3% was observed among the MD group after 16 weeks, a magnitude many drugs currently used for obesity pharmacotherapy do not achieve

Significant improvements in body composition were also observed in the MD group compared to the FB group after 16 weeks of weight loss. MD participants lost five times more body fat and seven times more visceral fat, while maintaining more than twice the amount of lean muscle mass.

Maintenance of lean muscle mass during weight loss on a hypocaloric diet is an important difference between the meal replacement diet plan under study and other weight loss plans.

Sustaining lean muscle mass is a crucial mechanism for maintaining weight loss, as muscle provides a higher contribution to resting metabolic rate (RMR) than does fat.

A likely explanation for the favorable body composition changes observed in the MD group is the macronutrient composition (low fat, low carbohydrate, higher protein) of the meal replacements, which is difficult to achieve without significant planning when dieters self-prepare meals.

After 16 weeks of weight loss and another 24 weeks of weight maintenance, both groups experienced improvements in biochemical outcomes and other clinical indicators of health, like blood pressure and pulse.

At 40 weeks, significant differences in the magnitude of improvement in biomarkers of cardiovascular health emerged in the MD group compared to the FB group. Significant improvements in diastolic blood pressure, waist circumference, and oxidative stress were found only in the MD group.

Concentrations of CRP were also significantly decreased from baseline in the MD group, especially among those with high baseline CRP.

Decreases in total fat, visceral fat, and waist circumference may be responsible for the decreases seen in inflammation and oxidative stress, as abdominal fat has been shown to produce inflammatory molecules that underlie metabolic syndrome and cardiovascular disease. This is highlighted by recent research which found central obesity to be an independent predictor of coronary heart disease and cardiovascular disease deaths, and waist circumference alone as a very good predictor of health risk and mortality in overweight and obese individuals.

A possible factor contributing to the greater overall effectiveness for initial weight

loss on the meal replacement diet plan studied is ease of use for the end-user, leading to enhanced compliance with the diet plan. Better adherence to the diet using meal replacements has been shown over both the short-term and long-term as well as among subgroups of individuals, such as those with type 2 diabetes, who are often challenging in terms of compliance and achievement of weight loss.

This was demonstrated by the greater number of the MD group completing the both the 16-week weight loss phase and 24-week weight maintenance phase.

Conclusions

In conclusion, we found that a meal replacement diet plan of a fixed macronutrient composition yielded clinically significant weight loss for 93% of obese participants.

This is roughly twice as much as the rate demonstrated in controlled clinical trials of currently approved pharmacologic agents for obesity treatment. Also, the intervention with meal replacements yielded changes in body composition that favorably impacted many cardiovascular health outcomes. Our data suggest that the meal replacement diet plan evaluated is an effective strategy for producing robust initial weight loss, and for achieving improvements in a number of health parameters during weight maintenance, including inflammation and oxidative stress, two key factors recently understood to underlie our most common chronic diseases.
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