

Daily Popcorn Snack as part of a Hypocaloric Diet Decreases Body Weight and Body Fat

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Abstract

Energy imbalances stemming from poor dietary choices and physical inactivity have been targeted as significant contributors to the current high prevalence of overweight and obesity in the United States. Excess body weight and body fat are risk factors for numerous chronic diseases such as metabolic syndrome, coronary heart disease, and diabetes. Snacking on high calorie, energy dense foods may exacerbate weight problems. Low-fat popcorn is a fiber-rich, whole grain, low energy-dense snack that may improve diet quality and consequently affect modifiable risk factors.

In a three-group randomized design, the effects of consuming 94% fat-free Popcorn (100 kcal/day) as a component of either a MyPyramid hypocaloric diet (HypoPop, n=64) or a usual diet (UsualPop, n=61) were compared in men and women (BMI 27-37, 35-70 years) for 12 weeks. A third group followed their usual diet while limiting popcorn (Control, n=57) and all three groups followed a progressive cardiovascular exercise program. Body composition was measured at baseline and week 12 using dual energy X-ray absorptiometry (DXA).

Modest reduction in body weight occurred in the UsualPop and Control groups. Compared to these two groups, HypoPop had significantly greater decreases in body weight (-12.84 ± 7.97 lbs), BMI (-2.04 ± 1.22), waist circumference (-4.92 ± 3.15 cm), body fat (-2.15 ± 1.69%), and fat mass (-3.99 ± 2.59 kg) ($p < 0.05$).

Incorporating 94% fat-free popcorn as a daily snack as part of a hypocaloric diet may aid in weight loss and body composition improvements, reducing risk factors for chronic diseases.

Background

Figure 1. CDC: Obesity & Health Consequences



The Centers for Disease Control links overweight and obesity to increased risk for coronary heart disease, Type II Diabetes, hypertension, dyslipidemia, and more. Abdominal obesity has been linked to abnormal lipid and glucose handling, playing a central role in Metabolic Syndrome. Weight loss and fat loss may help reduce the progression and severity of these chronic diseases. Dietary approaches that create a negative energy

balance focused on calorie restriction and an increase in physical activity are recommended, however, many people continue to struggle with weight loss and maintenance. High calorie, energy dense foods may exacerbate weight problems. Snacking on a fiber-rich, whole grain, low energy-dense snack such as low-fat popcorn may be a simple strategy to help people reduce energy intake and impact modifiable risk factors like body mass index, body fat, and waist circumference.

Methods

One hundred eighty-two overweight or obese sedentary subjects (BMI 27-37) between the ages of 35 to 70 participated in this three-group randomized study that compared the effects of daily consumption of a 100 Calorie bag of 94% fat-free Popcorn as a component of either a hypocaloric diet (HypoPop, n=64) or a usual diet (UsualPop, n=61) for 12 weeks. HypoPop subjects followed the MyPyramid eating pattern, with diets providing a 500 kilocalorie deficit. A third group followed their usual diet while limiting popcorn (Control, n=57) and all three groups followed a progressive cardiovascular exercise program.

At baseline and week 12, body weight was measured using a digital scale, waist circumference was measured at the narrowest part of the torso using a spring loaded measuring tape, and body composition was measured using dual energy X-ray absorptiometry (iDXA GE).

Variable (n=182)	Mean ± SD	Variable (n=182)	Mean ± SD
Weight (lb)	199.17 ± 26.63	Total Cholesterol (mg/dL)	192.11 ± 34.72
Age (years)	52.04 ± 9.31	Triglycerides (mg/dL)	139.00 ± 74.09
BMI (kg/m ²)	31.92 ± 2.84	Glucose (mg/dL)	82.50 ± 15.98
Waist Circumference (cm)	96.51 ± 10.31	Insulin (μU/mL)	9.18 ± 6.81
Body Fat %	42.86 ± 5.83	Systolic BP (mm Hg)	114.76 ± 14.18
CRP (mg/L)	3.01 ± 2.24	Diastolic BP (mm Hg)	73.89 ± 9.10

Table 1. Baseline Subject Characteristics

Results

Figure 2. Changes in Body Weight

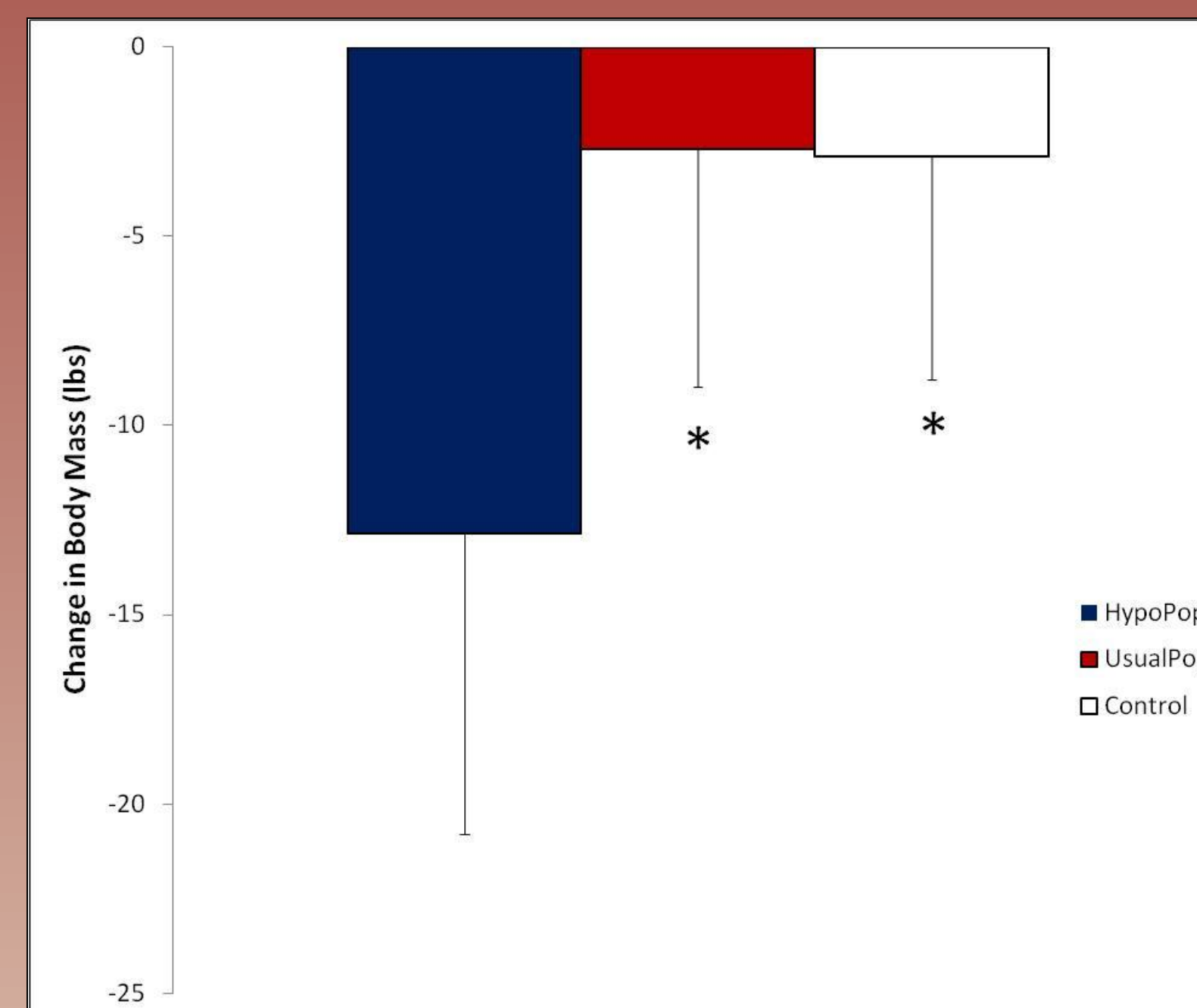
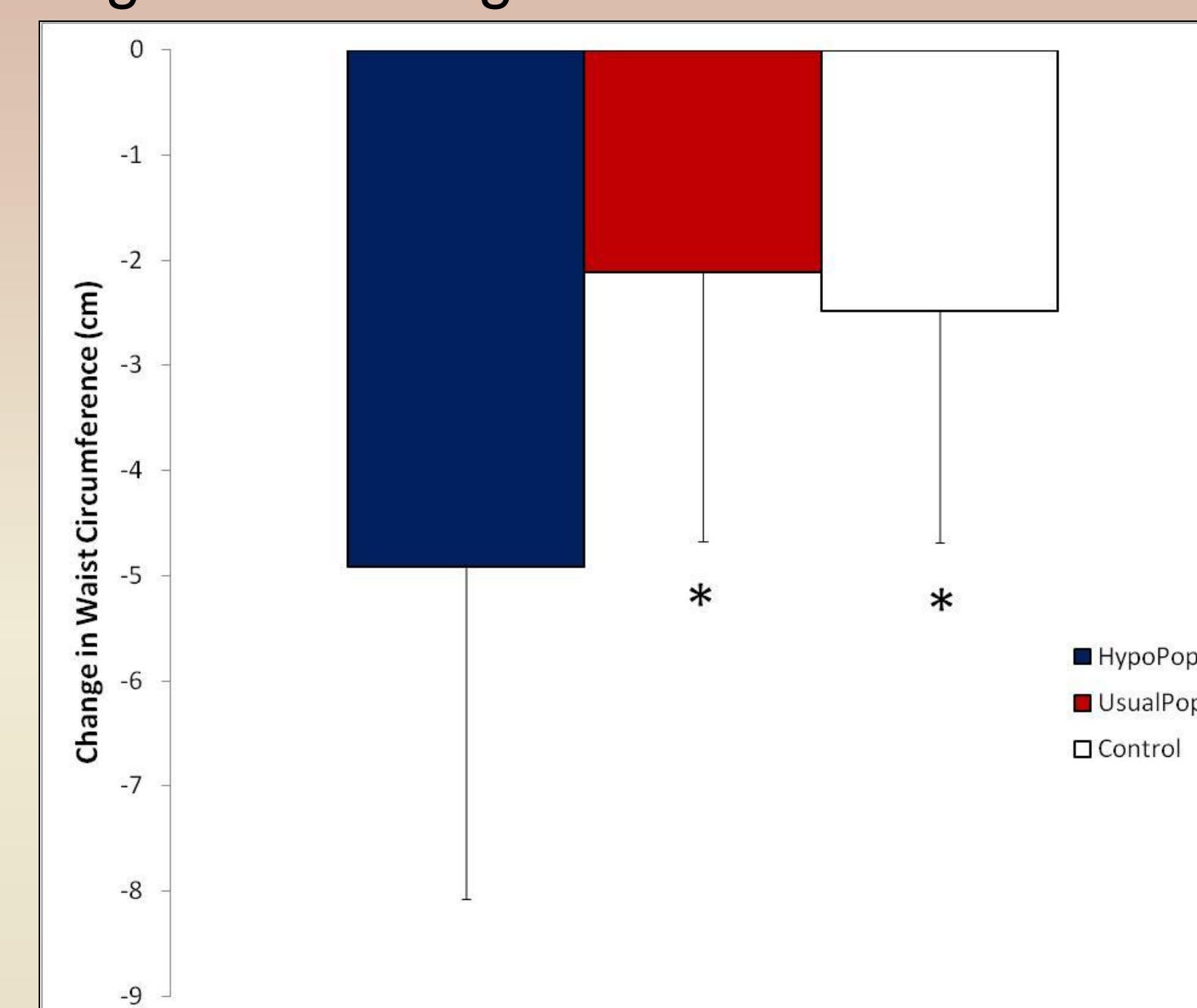


Figure 3. Changes in Waist Circumference



* Different than HypoPop, $p < 0.05$

Figure 4. Changes in Body Mass Index

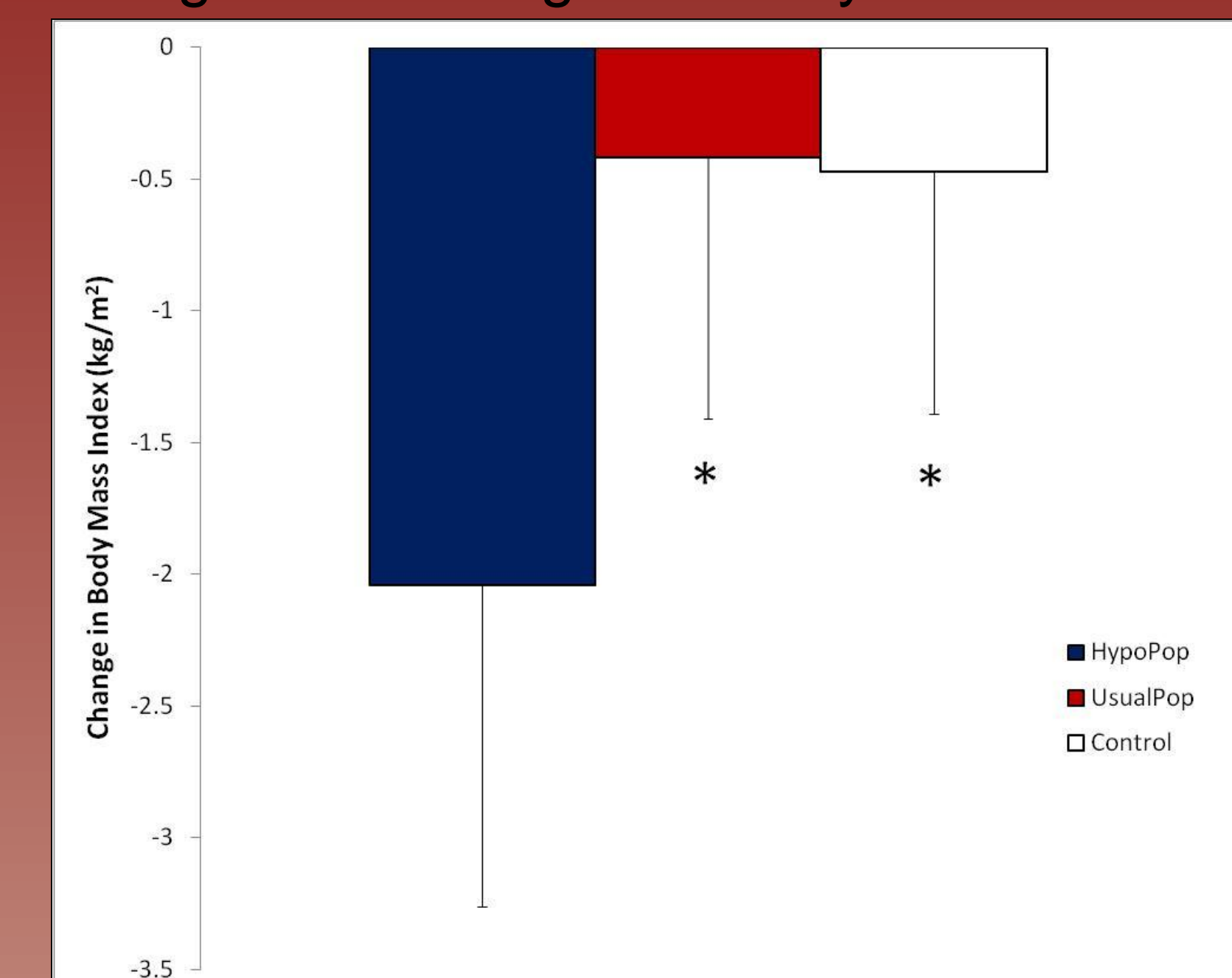


Figure 5. Changes in Body Fat Percentage

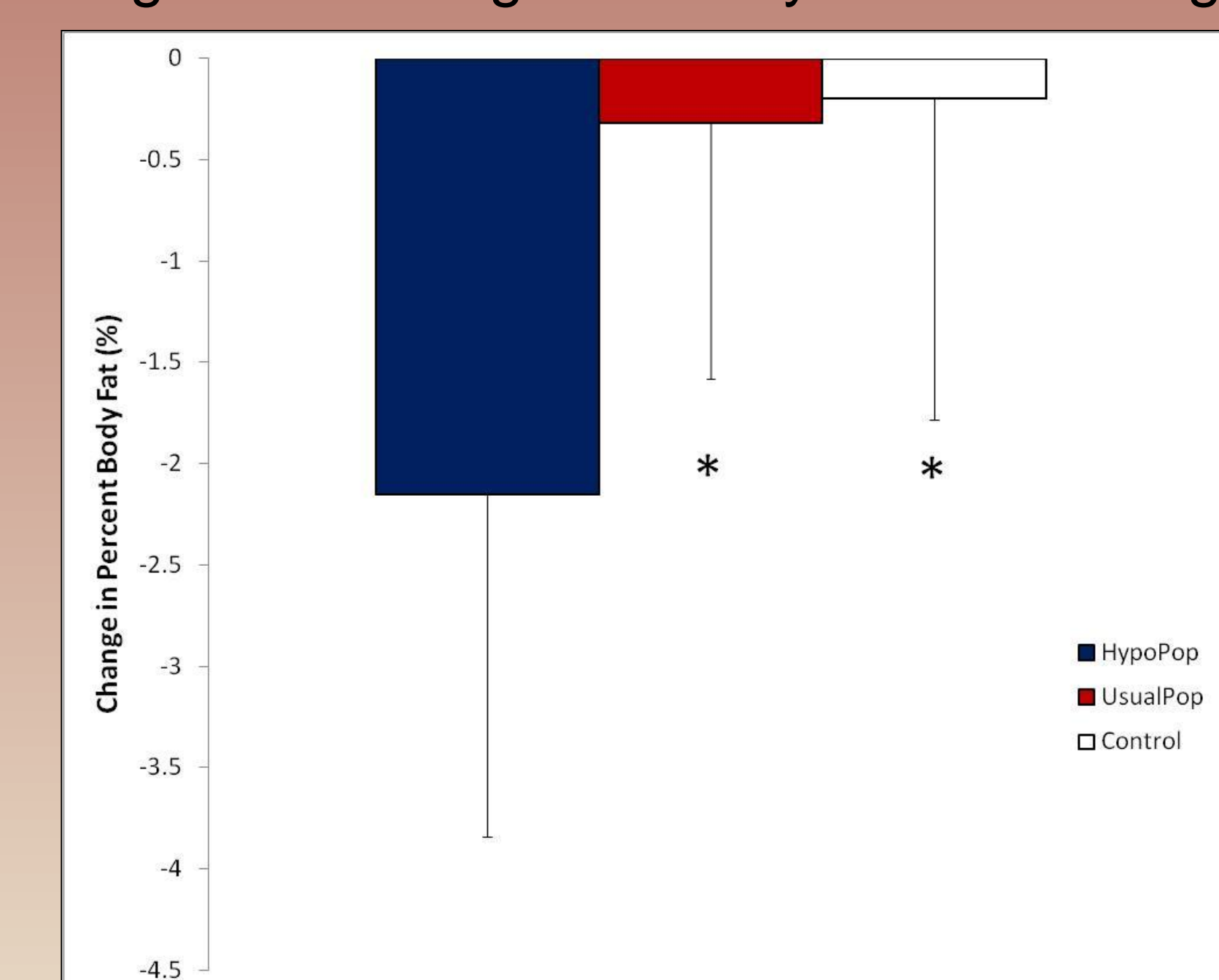
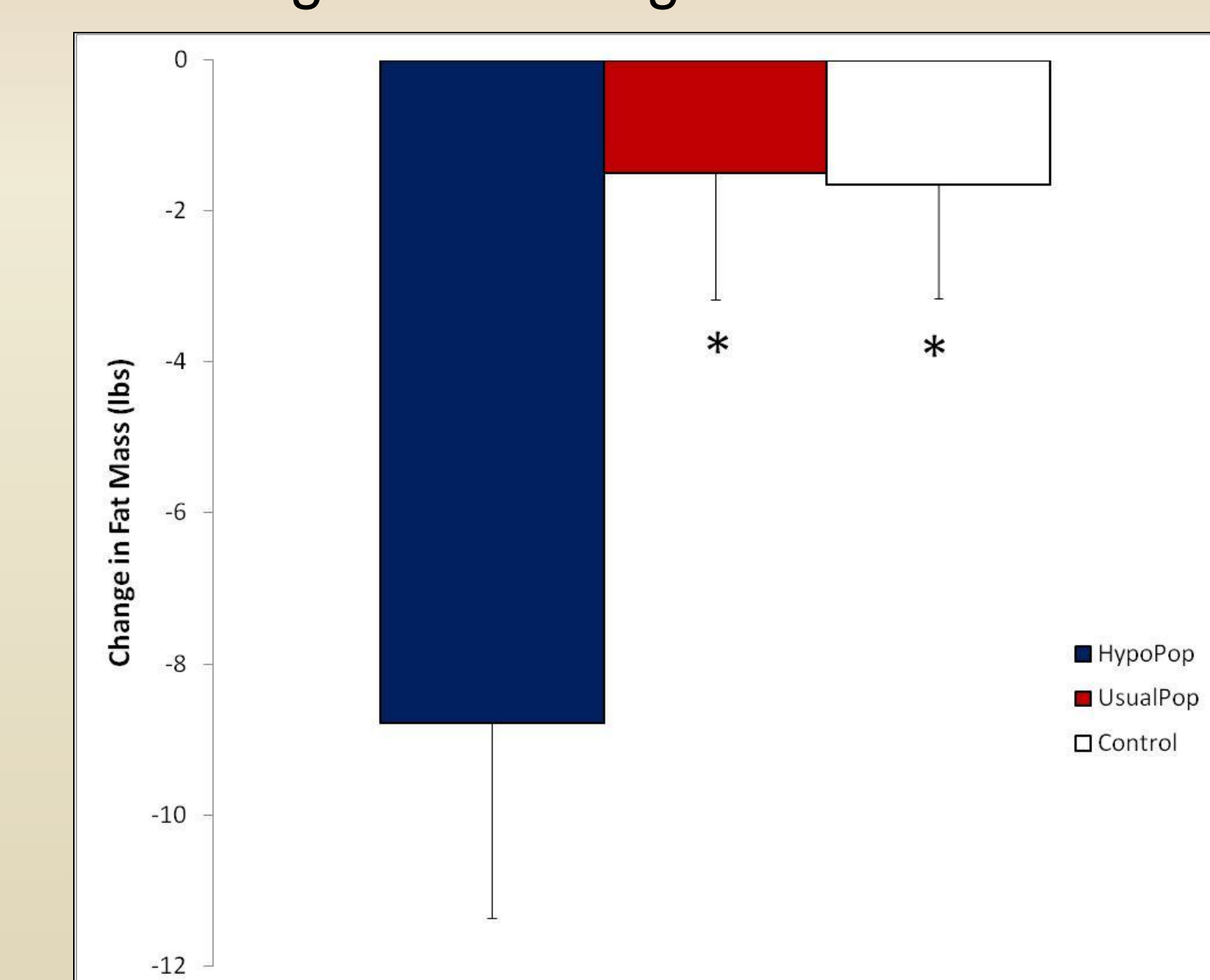


Figure 6. Changes in Fat Mass



Conclusions

Results support that daily snacking on 94% fat-free, whole grain popcorn as part of a hypocaloric diet can contribute to reductions in body weight, waist circumference, and fat mass in overweight and obese individuals.



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