DIFFERENCES IN BODY COMPOSITION BETWEEN USERS AND NON-USERS OF HYDROXYCUT

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Abstract. Miller, AJ, Sturgis, AL, McHorney, MR, Sinz, MJ. Differences in Body Composition Between Users and Non-users of Hydroxycut. *J. Undergrad. Kin. Res. 2006; 1(2): 31-36.* The very popular Hydroxycut has been a substance that has been scrutinized for the lack of knowledge about its long term side effects. There has not been, however, a lot of research done on the actual intended effects of Hydroxycut on a person's body composition. We have taken this issue and have studied the effects of Hydroxycut on someone who uses it as a daily supplement verses someone who does not use it as a daily supplement. Seven Males between the ages of 22 and 23 were tested for body fat percentage using bioelectrical impedance at the beginning and end of a three week training period. Four of the subjects were required to supplement Hydroxycut daily, along with designated exercise. The other three subjects performed the daily exercise but did not supplement Hydroxycut for weight loss. At the end of the three week trial, we found very interesting data. The mean body fat percentage, during the three week training period, had actually increased for the hydroxycut using group, while the non-using group's body fat percentage dropped using the paired-t test. The Hydroxycut user group's body fat percentage went from a mean of 13.01% up to a mean of 13.12%. The non-user group's body fat percentage went from 18.1% to 17.37%. There was no significant difference in loss of body fat percentage in this study, but there was enough interesting information to spark more interest on the topic leading to a hope for more studies to come and discover the short-term/positive effects of the supplement.

Key words: Hydroxycut, supplement, body fat percentage, ergogenic aids, Food and Drug Administration, ephedrine, balanced diet, skin fold caliper

INTRODUCTION

Americans are obsessed with speed. We like fast cars, fast food, fast athletes and fast travel. Patience and long-term exertion are not virtues, especially in the business of weight loss. Plastic surgery, various over the counter medications, and alternate medicine supplements has quickly replaced traditional means of cutting access body fat. Advertisers are now spending billions each year pushing one weight loss supplement over another. One specific supplement that will be the focus of this study is Hydroxycut. Hydroxycut consists of various ingredients that claim to be research-proven. These ingredients include gymnema sylvestre extract, chromium polynicotinate, garcinia cambogia extract and hydroxycitric acid (HCA), all of which raises work and fat oxidation to achieve normal blood sugar levels; according to the Hydroxycut website.
[1](http://www.hydroxycut.com/MEN/PRODUCT_FACTS/HYD/index.shtml)

On April 12th, 2004 the Food and Drug Administration (FDA) banned any dietary supplement containing ephedrine. Since Hydroxycut has found popular ways to claim their product is effective without ephedra, the new ephedra-free form has become a popular seller. Referring again to the company website[1], Hydroxycut claims: "Lose up to 4.5 times the weight than diet and exercise alone". This has raised a lot of questions about the true effectiveness of the supplement.

Our purpose will be to examine any evidence that proves Hydroxycut actually helps lose fat. The Hydroxycut website[1] claims it needs to be taken with a well balanced diet and exercise – so is the supplement helping if these two other traditional means of weight loss are being met?

There are also many questions about the long-term and short-term effects. Most of the research done on Hydroxycut has been done on their long-term and/or short-term side effects. There have not been many investigations done on the actual short-term intended effects of the drug. Our group will be focusing on the positive, and beneficial, effects of Hydroxycut. The purpose of our study was to evaluate the effect of Hydroxycut on body fat percentage. With a balanced diet and exercise, we hope to prove that Hydroxycut will have a more positive effect on a person's body fat percentage than a person who has not added Hydroxycut supplements to their training.

METHODS

Subjects

The subjects for this study included seven individuals from the University of Wisconsin – Eau Claire. The subjects' ages ranged from 22-23 years of age. All of the subjects were males. These non-university athlete participants ranged from physically active to embarrassingly stagnant. This study was approved by the institutional review board of the University of Wisconsin – Eau Claire. Written consent was required, and all study procedures were conducted in accordance with the ethical standards for research in human subjects. Every subject had signed and dated a consent/privacy form. Each student was subjected to the same workout rituals, with no drastic change in diet, with only a fraction (4/7) of the students taking the tested supplement. These four subjects, when signing the consent form, had agreed to take the designated supplement as recommended by the four members of the study team. All of the subjects had consented to performing a designated workout program including cardiovascular and muscular workouts.

Instrumentation

The only instrument used in this study was a Tanita bioelectrical impedance scale. The model number of this certain Tanita scale is the BWB-627-A. This particular scale required researchers to enter the subjects' height, age and gender. The subjects then stood on the scale with their feet on the metal sensors. The scale then took the person's weight followed by the body fat percent. A standard wall measuring system was used to record the subjects' height.

Procedures

The subjects who used Hydroxycut supplemented it as follows: week one = 1 pill x 3 times/day; week two = 2 pills x 3 times/day; week three = 3 pills x 3 times/day. The pills were to be taken 30-60 minutes before meals (breakfast, lunch, and dinner) and also to be taken with an eight ounce glass of water.

Both the hydroxycut users and non users were to lift using the following weight lifting program developed by the University of Wisconsin at Eau Claire football program. This is a developmental phase workout program which includes lifting three days a week for three weeks (see Table 1).

		Day 1		Day 2		Day 3	
Exercise	**%**	**Reps x wt**	**act**	**Reps x wt**	**act**	**Reps x wt**	**act**
Overhead Squats	fs	12 x		12 x		12 x	
Power Cleans & Front squats	85	6 x		6 x		6 x	
	90	4 x		4 x		4 x	
	90	4 x		4 x		4 x	
	95	2 x		2 x		2 x	
Push Press	Na	6 x		6 x		6 x	
	Na	6 x		6 x		6 x	
	Na	4 x		4 x		4 x	
Calf Raises	Na	20 x		20 x		20 x	
	Na	20 x		20 x		20 x	
Dead Lifts (SL)	FS	12 x		12 x		12 x	
	FS	12 x		12 x		12 x	
Lunges	Na	10 x		10 x		10 x	
	Na	10 x		10 x		10 x	
Front Raises	FS	10 x		10 x		10 x	
Lateral Raises	FS	10 x		10 x		10 x	
Rear Delts	FS	10 x		10 x		10 x	

Table 1. Lifting program that all subject followed during the three-week training period.

Both groups were also required to follow the included cardiovascular workout program: 20-30 minute run, 3 days per week with a heart rate of 70-80% of the predicted max heart rate. The formula used to find the predicted max heart rate was as follows: 220-age=max heart rate. On the first day of the study, the subjects had their height, weight and body fat percentage measured using a Tanita scale. The researchers plugged in the subjects height, weight and gender into the data module on the scale. The subjects then stood on the scale making sure the heels and balls of their feet were in good connection with the four sensors on the scale. A few seconds later, the module displayed the results. We performed this same protocol 3 times for each subject. For one of the subjects we had to perform the test 4 times due to an outlier on one of the weight readings. This same procedure was then used at the end of the three week period.

Statistical Analysis

We calculated the difference of body fat percentage over a three week period between users and non-users of Hydroxycut. Independent *t*-tests were used to determine the difference

between the two groups' body fat percentage over that three week period. The groups used were Hydroxycut users vs. non-Hydroxycut users A significance level of $p<0.05$ was used. The depended variables are the body fat percentages of the subjects and the independent variable is the supplementation or non-supplementation of Hydroxycut.

Results

User Subjects	Age	Height (cm)	Weight (kg) (pre-testing)	Body Fat % (pre-testing)	Weight (kg) (post-testing)	Body Fat % (post-testing)
Hydroxycut 1	22	180.3cm	81.2kg	16.75%	80.7kg	17.66%
Hydroxycut 2	22	180.3cm	70.3kg	7.0%	69.9kg	6.6%
Hydroxycut 3	23	174.0cm	84.4kg	15.4%	84.6kg	13.7%
Hydroxycut 4	22	176.5cm	74.8kg	12.9 %	75.1kg	14.5%
Mean ± S.D.	22.25 ± 0.5	177.8cm ± 3.1	77.7kg ± 6.33	13.01 % ± 4.31	77.6kg ± 6.43	13.12% ± 4.66

Table 2. Results of bioelectrical impedance testing before and after a three-week training period with Hydroxycut supplementation.

Non-user subjects	Age	Height (cm)	Weight (kg) (pre-testing)	Body Fat % (pre-testing)	Weight (kg) (post-testing)	Body Fat % (post-testing)
Non-user 1	22	182.9cm	88.5kg	12.9 %	86.72kg	10.8%
Non-user 2	22	186.7cm	98.9kg	21.7 %	99.8kg	23.1%
Non-user 3	22	182.9cm	93.9kg	19.7 %	92.2kg	18.2%
Mean ± S.D.	22	184.16 ± 2.19	93.7kg ± 5.2	18.1 % ± 4.61	92.9kg ± 6.6	17.37% ± 6.19

Table 3. Results of bioelectrical impedance testing before and after a three-week training period where Hydroxycut was NOT supplemented.

Subjects	Difference in Body Fat Percent (pretest to posttest)	Difference in Weight (kg) (pretest to posttest).
Users	-0.81%	1.00%
Non-users	1.04%	1.01%

Table 4. Difference in weight and body fat percent before and after the three-week training period for both user and non-user groups.

There was no significant difference in body fat percentage between the user group (M=-0.81) and the non-user group (M=1.04), t(7) = , p<0.05.
When comparing the actual weight loss, the user group gained body fat percentage but essentially lost weight in their total average (see table 1). The non-user group lost both weight and body fat percentage (see table 2 and 3).

Discussion

This study showed no significant difference in the supplementation of Hydroxycut versus the non-supplementation of Hydroxycut. These findings took us by surprise at first as we had hypothesized that Hydroxycut would indeed increase the weight loss if used properly. After careful reflection and considerations, we have come to the realization of many things that could have and more than likely hindered the accuracy of our study.

The first limitation we faced was having a limited time to perform the study. Even though Hydroxycut.com promises extremely fast results, they do not give any promise of any specific weight loss in a certain amount of time. We would have liked to think that in just three weeks our subjects who were using Hydroxycut would have shown some kind of decrease in body fat percentage, but instead they actually increased their percentage. This too raises many questions as to why did the subjects who supplemented Hydroxycut in their daily diets gain fat and not lose it. With careful consideration, we have concluded a number of things. All of the using subjects were males ages 22-23. All of the using subjects are very active, yet social men just from knowing them on a personal basis. This tells us that even though they may have supplemented Hydroxycut, poor diets with high levels of hops, barley and fermented yeast can cause havoc to a person's body fat percentage. This is not to say that the non-user group does not drink but during this three week training period, they did go to establishments as often as the user group. One aspect of the solution that was neglected was a proper diet. Hydroxycut.com does make the claim that you can "lose up to 4.5 times the weight than diet and exercise alone". They also go on to say that you do need to have a proper diet and exercise to go along with the supplementation.

In our pre-testing research, we did not find many studies on the intended effects of Hydroxycut. Most of the studies we found researched the side effects of weight loss supplements' ingredients. Hydroxycut's website was one of the locations we found claims of Hydroxycut working. The website broke Hydroxycut down into ingredients and described the benefits of each ingredient. The three main ingredients of Hydroxycut are Gymnema Sylvestre, Garcinia Cambogia and Green Tea. Garcinia Camogia is standardized with 60% HCA (Hydroxycitric Acid). HCA is said to be the "core active ingredient"(1) of Garcinia Cambogia. One article we reviewed was an article written by Stephanie Chelf of Natural Health magazine. Chelf and the Natural Health magazine seem to be big supporters of HCA. Her article not only explained how HCA works chemically but also cited other findings of HCA working positively. With that in mind, this was not a peer reviewed article. We did fail to locate any peer reviewed articles discussing the weight loss effects of Hydroxycut.

Conclusion

With all of the factors taken into consideration, question arises as to the outcome of the results if certain factors had not been neglected. Either way, in this study of the effects of body composition with supplementation of Hydroxycut versus no supplementation of Hydroxycut, we have found no significant difference. This study is not saying that Hydroxycut does not work, it only states that in this three week study, with the given subjects and the given conditions, no significant difference had been found between users of Hydroxycut and non-users of Hydroxycut.

As fascinated as we are with the fast paced world of today, for a college aged male, trying to lose a few extra pounds using Hydroxycut, you may want to give yourself a little more than three weeks to do so.

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