

Journal of the Health Resource Center

Journal of the Health Resource Center is published every semester by CSULB Division of Student Services, the Student Health Services, 1250 Bellflower Blvd. Long Beach, CA 90840. Printed in the U.S.A. Copyright © 2004 by the Student Health Services. All rights reserved. Contact CSULB Division of Student Services, the Student Health Services, the Health Resource Center for a subscription, (562) 985-4609.

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Editorial Report

Ming-Yu Cheng, M.D., M.P.M., Dr.P.H.
Coordinator of the Health Resource Center

Obesity among children and adults has risen dramatically in the United States, which has been a cause for alarm among public health officials. Based on the National Health and Nutrition Examination Survey III (1988-1991), 33% of Americans (58 million) are obese. Obesity is directly related to severe chronic diseases, such as diabetes mellitus type II, cardiovascular diseases, certain cancers, hypertension, hyperlipidemia, and sleep apnea. Approximately 300,000 persons die each year in the U.S. due to obesity-related diseases, in spite of the media culture presenting an unnatural image of thinness as a positive attribute. Unfortunately, this causes more confusion about food, exercise, good nutrition, health, and an ideal body weight. In order to combat obesity, dieting has become the solution to this growing problem.

In general terms, how is dieting defined? Dieting is a regulated selection of foods that one consumes in order to control a medical condition or to obtain certain cosmetic benefits. Generally, dieting involves consuming fewer calories. Despite the fact that diets are revolutionizing the way that Americans view weight loss, body fitness, and nutritional standards, most prospective dieters are weary and fearful of getting trapped in a “fad” diet. There are a plethora of weight loss programs and diets generating a multi-million dollar industry.

In order to identify a “good” diet or a “bad” diet, one needs to understand weight loss and how it relates to the individual. Although a good diet is considered one that works, not every person can benefit from the same diet. There are general guidelines to use for assessing whether a certain diet is effective and healthy. An effective diet not only helps the participant achieve the desired weight but also changes a participant’s weight gradually and safely. Altering fixed behavior such as food choices, proportions, and exercise (or lack of exercise) can be a positive solution. A “bad” diet can be characterized by setting extreme limitations on a dieter’s food intake, thus requiring a participant to drastically cut hundreds of calories. Such a sudden and dramatic shift in a dieter’s caloric consumption could cause some to teeter, struggle, and eventually fail in the desired weight loss.

People who are always searching for a way to lose pounds may be swayed to try a variety of popular “fad” diets and may even consume supplements or drugs that are harmful to their health. Navigating through limitless commercial diet options can be confusing and even dangerous. Television, radio, and print media advertising can overwhelm us with messages

about “must try” weight loss programs. Finding an appropriate diet that promises weight loss and a maintenance program is crucial for being rated as successful. Some current popular diets are presented in this issue with a focus on evidence that either supports or refutes the manufacturer’s assertion. The diets presented are Weight Watcher’s Point System, the Atkins Diet, the fluid diet, the Zone Diet, and weight loss supplements and slimming teas. An interwoven critical theme is the importance of exercise. This theme stresses that when energy output exceeds energy input weight loss can occur. Therefore, increasing physical activity (an increase in energy output) is imperative to actualizing weight loss. Another important factor for dieters is a support system, such as a talk therapy group, nutrition counseling, or a support group.

Potential dieters should be realistic about risks and consequences of a particular diet. Only through continued research and analysis can diets be constantly evaluated for their effectiveness. Therefore, this journal presents both positive and negative facts about popular diets in order to assist college students in making wise choices about their health.

The Atkins Diet: Pumping up the Protein

Dannie Allen

A diet high in protein and low in carbohydrates has been popular among those who wish to lose weight. The Atkins Diet is the most famous for this relatively new trend. There are four phases for the individual to progress through: 1) Phase One, Induction; 2) Phase Two, Ongoing Weight Loss; 3) Phase Three, Pre-Maintenance; and 4) Phase Four: Lifetime Maintenance. Controlling carbohydrate intake is based on the theory that an excess will cause an increase of insulin. Avoiding the increase of insulin by limiting carbohydrates and sugars can provide a more balanced energy state. The phases of the Atkins Diet are supposed to help the dieter control carbohydrate intake, engage in physical exercise, and consume proteins and fat in moderation. Changing eating habits and increasing physical activity are the most important components of this diet.

In an attempt to lose weight and achieve a healthier diet and lifestyle, millions of Americans have turned to the Atkins Diet. The latter has four stages: Induction, Ongoing Weight Loss, Pre-Maintenance, and Lifetime Maintenance. The Induction Phase demands a drastic caloric reduction upon the dieter, but this stage only lasts for two weeks. Once this phase has been completed, the dieter enters the Ongoing Weight Loss stage, followed by Pre-Maintenance and concluding with Lifetime Maintenance. The ultimate test of a diet is if it works for the dieter. Some diets work for certain individuals, but not for others. It is important to consult your physician before attempting to begin a diet.

Background of Dr. Robert C. Atkins

The Atkins Diet was founded by Robert C. Atkins, M.D. (1930-2003). Dr. Atkins was the founder and medical chair of the Atkins Center for Complementary Medicine in New York City. Aside from practicing cardiology, Dr. Atkins put into practice the healing arts and advocated that they were a dynamic and safe substitute for pharmaceutical drugs dealing with ailments. Dr. Atkins authored multiple books to endorse controlled carbohydrate intake and proper nutrition. One of the books that Dr. Atkins is most renowned for is *Dr. Atkins' Diet Revolution*. His book, *Dr. Atkins' New Diet Revolution* is one of the top 50 best-selling books of all time and it continues to reside on *New York Times*, *Publishers Weekly*, and *The Wall Street Journal* bestseller lists. For the 2002 edition, the book was updated to meet the needs of an ever-evolving people and society. The book, *Dr. Atkins' Diet Revolution* was updated for the 2002 edition. Dr. Atkins is a pioneer in the fields of nutritional pharmacology and natural medicine, which earned him international notoriety. As a result of his efforts and achievements, Dr. Atkins received the World Organization of Alternative Medicine's Recognition of Achievement Award.

Objectives of the Atkins' Diet

The goal of Dr. Atkins' diet is to help people with issues of weight loss, weight maintenance, overall health, and disease prevention.¹ The Atkins diet aims to help individuals lose weight,

look and feel better, achieve and maintain optimum energy levels, and maintain their ideal body weight. The Atkins Diet mission is to educate individuals about nutrition so that they can maintain their bodies for a healthy life. The premise of the Atkins Diet is to avoid consequences of excess carbohydrate intake, which is attributed to too much insulin release in the body.² The Atkins' Diet Nutritional Approach has the *potential* to positively impact the lives of individuals who face risk factors associated with diabetes, hypertension, and heart disease. It has the *potential* to alleviate ailments such as immune system weakness, certain allergies, and gastrointestinal complications¹ The four phases, as mentioned earlier, are designed to shock the body during Induction, then shift to Ongoing Weight Loss where calories are less restricted, move to Pre-Maintenance, and lastly maintain the weight loss through the Lifetime Maintenance Phase. Ineffectiveness of dieting is usually attributed to user error. Moreover, it is important to realize if a diet (regardless of which diet it is) is not effective, speak to your physician.

Induction, Phase One

The Induction Phase of the Atkins Diet is the first of four. It is called Induction because the function of this phase is to initiate weight loss. Weight loss is induced through calorie restriction. Calorie restriction is specifically no more than 20g of carbohydrates per day. With such a restriction of carbohydrates and sugar (glucose), fat begins to be the primary substance burned in the body. Lipids are a group of organic compounds that include fats, oils, waxes, sterols, and triglycerides. Lipids are non-soluble in water but soluble in non-polar solvents. Lipids in conjunction with proteins and carbohydrates constitute the principle structural material of living cells. In this diet, the co-process of hydrolysis is ketosis. Ketosis is the pathological production of ketone bodies (in the blood). These processes switch the body from a carbohydrate burning metabolic process to a fat burning metabolic process; however, ketosis does not last long.¹ When ketosis is prolonged, a person can become ill. In the Induction Phase, through consuming only a rationed amount of carbohydrates and sugars, the body is able to avoid energy "crashes" due to large consumptions of sugar that cause the blood

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sugar to initially peak, but then to drop. Through the avoidance of blood sugar peaks and dips, a person may experience a more constant and balanced energy state, and can avoid feeling symptoms that include fatigue, mood swings, and brain fog that limit a person from functioning at their best. This stage continues for fourteen days. At this point, it is extremely important to remember the diet must be followed precisely because if done incorrectly, it prevents weight loss.¹

Altering your current standard of food intake can be difficult. Most people participating in the Atkins Diet do so in order to lose weight as a result of unhealthy past food choices. Individuals needing to lose weight may have had diets high in fat and carbohydrates. Food patterns high in these areas are unhealthy. Individuals who have diets that are high in sugar may not realize that there is evidence that suggests that a high amount of sugar in the blood can cause abnormal glucose metabolism, which can then lead to pancreatic carcinogenesis. Impaired glucose metabolism plays a role in pancreatic cancer etiology, and diets that are high in sugar can increase the risk of pancreatic cancer.³ Diets high in fat should be avoided because dietary fat is associated with coronary heart disease.⁴ Nutrition specialists recommend that consumption of products containing saturated fat or hydrogenated fat should be consumed moderately.⁵ Other important factors to consider are carbohydrates, protein, and cholesterol.

Carbohydrates

Eating excess amounts of carbohydrates puts people at risk for heart disease. People who are obese or overweight and insulin resistant are more sensitive to high glycemic foods and beverages. It is best to incorporate a controlled carbohydrate standard into a person's lifestyle in order to protect against weight gain and disease.⁶

Protein

The Atkins Diet strives to incorporate a controlled carbohydrate intake. To accomplish this, the diet implements protein into food choices, while phasing out carbohydrates. By increasing the proportion of protein to carbohydrates in the body (through dieting), there is a positive effect on body composition, glucose homeostasis, and also blood lipids.⁷

Cholesterol

In the Atkins Diet, it is recommended that eggs not be eaten in excess. Eggs contain a high amount of cholesterol, and an excess of cholesterol in the body is not healthy.⁸ In regards

to the relatively higher amounts of protein eaten in the Atkins Diet, it is recommended that the dieter follow the guidelines for meat and protein choices that are outlined in the Atkins book. The recognition of the Atkins Diet stems from studies of the diet that have shown that weight is lost without compromising health. Studies have shown that even with a diet of increased protein and perhaps cholesterol, dieters of the Atkins program have cardiovascular and cholesterol improvements.

Ongoing Weight Loss, Phase Two

Phase Two of the Atkins Diet requires the dieter to incrementally increase carbohydrate intake to either 40g per day or until the person's weight is stabilized. Induction usually takes weight off rapidly, and Phase Two is designed to allow the dieter to personalize their choice of foods to accommodate food and taste preferences. Ongoing weight loss continues to burn and dissolve fats because of ketosis. Also, this phase slows the rate of weight loss to set the foundation for permanent ongoing maintenance. It is strongly suggested that activity level is increased during this phase of the Atkins Diet. Energy deficits can be restored as a result of exercising because the metabolism is stimulated. Exercise can yield weight loss as well as reduce the risk of heart disease through improving the plasma lipid profile.⁹ The role that exercise plays in terms of health maintenance (and weight maintenance) and in the prevention of disease has been recognized over the past two decades. For this reason the Atkins Diet strongly recommends becoming and staying physically active. Obesity in the United States has become more prevalent and has continued to rise.¹⁰ Some people feel that if they are not running marathons, they are not truly physically active. This is untrue. Individuals should start small and gradually move upward. Both walking and vigorous exercise are associated with significant reductions in the incidence of cardiovascular problems, and increased physical activity is associated with health risk reductions.¹¹ By restricting carbohydrate intake, athletic performance can be improved, allowing an individual to engage in routine exercise, which yields multiple health benefits.

Pre-Maintenance, Phase Three

Pre-Maintenance is the third phase of the Atkins Diet, and it is defined as the state of preparation for permanent slimness. Phase Three bridges losing pounds with maintaining weight.¹ This phase increases the carbohydrate intake of the individual even more. The amount can reach 100g per day but is dictated on a case-dependent basis. If individuals maintain a balanced weight with 80g per day of carbohydrates, they should continue doing what works for them. If one chooses to add new foods to their diet, do so by adding one at a time. If at any time a

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specific food causes an unexpected weight gain, then discontinue eating that food. It is also important to continue including fat in at least one portion of food per day and to continue eating proteins such as chicken, fish, etc. This is an important phase of the Atkins Diet because one becomes accustomed to the moderation of carbohydrates required to maintain their life-long desired weight.¹ A frequently asked question during this phase is, “Why has my appetite increased, and what can I do to manage it?” The answer to this question is that appetites reoccur when the body is no longer in the state of lipolysis. Another possibility for an increase in appetite is that certain foods cause an unstable blood sugar level, thus inducing hunger and food cravings. Controlling an increase in appetite is a key to maintaining a steady intake of fats. During Phase Three, many people wonder why their weight varies by a few pounds every day. The answer is that it is natural for a person’s weight to vary from day to day. Thus it is recommended that people not weigh themselves every single day. Instead, people should weigh themselves on a weekly basis.¹

Lifetime Maintenance, Phase Four

Until Phase Four, the premises of the Atkins Diet are controlling carbohydrate intake, engaging in physical exercise, and consuming proteins, fats, and certain amounts of carbohydrates in moderation. It can be difficult to break previous patterns of overeating. However, by this phase it is hoped that these habits have been successfully tackled. The Atkins Diet promotes lifetime weight maintenance and stresses that old eating routines are not to be resumed. This phase promotes the importance of not returning to past negative eating standards. It is only natural to sometimes feel restrained and therefore have a craving for a particular food when dieting. Dieting can sometimes lead to overeating.¹² Criticism, such as this, is valid in any and all diets. The purpose of a diet is to limit certain foods for the purpose of losing weight. If certain foods are never restricted, one cannot expect to have weight loss. This is a common pitfall with many diets. The Atkins Diet suggests self-control and the avoidance of bingeing and voracious eating episodes. In this final phase, an individual eats natural, unprocessed, nutrient dense carbohydrates.¹ Such carbohydrates are whole grains and whole grain wheat breads. The “bad” carbohydrates to avoid are white rice and those that are processed and contain many preservatives. Such carbohydrates are doughnuts, croissants, chips, snack cakes, etc. The rule to follow for this last phase is to never gain more than five pounds above the goal weight.¹

Atkins Conclusion (Possible Adverse Effects)

As long as there are overweight people, there will be diets. Since obesity is a major intractable health problem in the

United States, we can expect to continue to see the Atkins Diet persisting, as well as many other diets.¹³ The downside is that when individuals become frustrated with their weight, they are more susceptible and can be lured by promises of fast and easy weight loss, instead of using common sense.¹⁴

One of the adverse effects of dieting is its impact on brain function. Results from studies show weight loss has been linked to impairments in cognitive performance.¹⁵ Tasks of vigilance, immediate and working memory, attention, and motor ability are affected during dieting. One cause for these impairments may be linked to the restriction of food. However, this hypothesis has not been proven. Another explanation is psychological. It was reported that being on a diet resulted in increased thoughts about dieting, which left fewer cognitive resources available for other tasks.¹⁵

The Atkins Diet goal is to effectively have individuals lose weight by adjusting their diet to eat healthier. This can prove to be more difficult than it seems. The reason is many people develop eating patterns and attitudes when they are very young under the supervision of their parents or adult caretakers. While being on this diet, although it does progress in moderate stages, an individual can find it hard to break lifetime patterns in just months or even one year. There are long-term impacts for food rules that adults enforce on children, and this can result in many questions.¹⁶ Sometimes, using food to control behavior in a child, either as a punishment or a reward, may have impacts on maladaptive eating behaviors in adulthood. It is very likely that many parents want to have their children eat healthy and develop good eating habits, but the obvious high-rising rates of obesity and the prevalence of eating disorders has created uncertainties as to what are the right actions for a parent to take.¹⁶ People who are prospective Atkins Diet users, should realize that it is hard to change old eating habits.

Atkins Conclusion (Exercise)

The Atkins Diet offers a way to slowly begin to control weight and to become more aware of the nutritional value of different foods. It is important to note that the Atkins Diet strongly promotes exercise. Unfortunately, many individuals want to diet without exercise, thus preventing a desirable weight-loss. The exercise factor cannot be ignored in the dieting process. Weight loss through dieting is stimulated and advanced with physical activity. Exercise burns calories and fats and that is what aids the weight loss process. Including exercise into a daily routine or at least 30 minutes, 3-4 times per week is important. Overweightness and obesity are disorders in which the energy

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intake is greater than the energy expenditure.¹⁷ Methods to gain control over obesity through limiting energy intake have only a certain amount of success at best.¹⁷ This is why the universal claim exists that energy output, through exercise, must be increased in an overweight individual if long term weight loss wants to be achieved.¹⁷ If exercising is ignored, and an individual is participating in the Atkins Diet, it must be expected that the individual will not obtain the best results.

The Atkins Diet is a low carbohydrate diet. A diet that is extremely strict in the amount of carbohydrates consumed is very successful because it yields more weight loss in the individual.¹⁸

Before any diet is attempted, it is very important for the individual to consult a doctor and to be careful of the diet attempted. Based on the literature reviewed, the Atkins Diet should be reserved for individuals with very serious weight problems. Two fundamental concepts to be considered in this diet are eating carbohydrates in moderation and engaging in exercise. The ultimate test of a diet is if it works for the dieter. Some diets work for certain individuals, but not for others. It is important to consult your physician before attempting to begin any diet.

ATKINS' DIET PHASES

<p style="text-align: center;">1ST PHASE</p> <p style="text-align: center;"><u>Induction</u></p> <ul style="list-style-type: none"> • No more than 20g of carbohydrates per day • Exercise • Lasts 14 days 	<p style="text-align: center;">2ND PHASE</p> <p style="text-align: center;"><u>Ongoing Weight Loss</u></p> <ul style="list-style-type: none"> • Increase carbohydrate intake to 40g per day • Continue exercising
<p style="text-align: center;">3RD PHASE</p> <p style="text-align: center;"><u>Pre-Maintenance</u></p> <ul style="list-style-type: none"> • Increase carbohydrate intake to approximately 100g per day, depending on the individual • Avoid unnatural or processed carbohydrates • Continue exercising 	<p style="text-align: center;">4TH PHASE</p> <p style="text-align: center;"><u>Lifetime Maintenance</u></p> <ul style="list-style-type: none"> • Maintain consistency with carbohydrate intake • Make exercise a life-long habit • If certain foods cause an unexplainable weight gain, avoid those certain foods

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References:

1. Atkins RC. *Dr. Atkins' New Diet Revolution*. New York: Harper Collins; 2002.
2. Willit W. *Got fat? Exploring nutrition myths: A news digest from the Center for Health Communication of the Harvard School of Public Health*. Boston 2002.
3. Muchaud DS, Liu S, Giovannucci E. Dietary sugar, glycemic load, and pancreatic cancer risk. *Journal of the National Cancer Institute*. 2002;94(17):1293-1300.
4. Leddy J, Hovarth P, Rowland J. Effect of a high or low fat diet on cardiovascular risk factors in male and female runners. *Medical Science and Sports Exercise*. 1997;29(1):20-25.
5. Lichtenstein AH. Dietary trans fatty acid. *Journal of Cardiopulmonary Rehabilitation*. 2000;20(3):143-146.
6. Liu S, Manson JE. Dietary carbohydrates, physical inactivity, obesity, and the 'metabolic syndrome' as predictors of coronary heart disease. *Current Opinion in Lipidology*. 2002;12(4):395-404.
7. Layman DK, Boileau RA, Erickson DJ. Increasing protein improves body composition and lipids during weight loss. *The Journal of Nutrition*. 2003;133(2):411-417.
8. Kritchevsky SB, Kritchevsky D. Egg consumption and coronary heart disease: an epidemiologic overview. *Journal of the American College of Nutrition*. 2000;19(5):549S-555S.
9. Tsai AC, Sandretto A, Chung Y. Dieting is more effective in reducing weight but exercise is more effective in reducing fat during the early phase of a weight-reducing program in healthy humans. *Journal of Nutritional Biochemistry*. 2003;14:541-549.
10. Zmijewski C, Howard M. Exercise dependence and attitudes towards eating among young adults. *Eating Behaviors*. 2003;4:181-195.
11. Manson JE, Greenland P, LaCroix AZ. Walking compared with vigorous exercise for the prevention of cardiovascular events in women. *New England Journal of Medicine*. 347(10):716-725.
12. Ouwens MA, van Strien T, van der Staak CPF. Tendency toward overeating and restraint as predictors of food consumption. *Appetite*. 2003;40:291-298.
13. Hirsch J. The search for new ways to treat obesity. *Laboratory of Human Behavior and Metabolism*. 2002;99(14):9096-9097.
14. Riley R. Popular weight loss diets. *Clinics in Sports Medicine*. 1999;18(3):691-700.
15. Vreugdenburg L, Bryan J, Kemps E. The effect of self-initiated weight-loss dieting on working memory: The role of preoccupying cognitions. *Appetite*. 2003.
16. Puhl RM, Schwartz MB. If you are good you can have a cookie: How memories of childhood food rules link to adult eating behaviors. *Eating Behaviors*. 2003;4:283-293.
17. Surwit RS, Wang S, Petro AE, et al. Diet-induced changes in uncoupling proteins in obesity-prone and obesity-resistant strains of mice. *Proc. Natl. Acad. Sci*. 1998;95:4061-4065.
18. Abbasi F. High carbohydrate diets, tryglyceride rich lipoproteins, and coronary heart disease risk. *American Journal of Cardiology*. 2000;85:45-48.

Points and Pounds

Cyrus Lutero

The Weight Watchers diet principles were created in 1962 and have since evolved into a multi-million dollar corporation. Approximately one million members worldwide belong to this diet program. Support groups are an essential component of the diet because they generate mutual motivation that assists each individual in attaining and maintaining the desired weight. The diet is based on a point system that is derived from an ideal weight as set by one's physician. Caloric intake is converted to points, and the dieter may consume any foods desired, as long as points for the day are not exceeded. Many dieters utilizing this program have been successful at losing weight and keeping it off, mainly based on the easy point system and the support groups.

Calories and BMI

A major factor in losing weight is regulation of daily caloric intake. A calorie is the general term for the unit of potential energy derived from the foods we eat. Energy is available from foods because they contain carbohydrates, fats, and proteins that can be broken down completely, or metabolized, to yield an energy form that cells can utilize.¹ Weight change is dependent on a simple rule: **Weight change = calories in – calories out**. If an individual burns as many calories as consumed in each day, there's nothing left over for storage in fat cells, and weight remains the same. Eat more than can be burned, and fat and pounds are added.² The U.S. Food and Drug Administration uses a 2,000-calorie basis for a daily caloric intake recommendation. This 2,000-calorie basis must then be altered to fit the individual's specific needs based on gender, age, height, weight, body size, activity level and metabolism.³

An individual's healthy weight may be defined by the body mass index (BMI). The BMI is the ratio of a person's height to weight and is calculated by dividing the weight (in kilograms) by the square of the height (in meters).⁴

$$\text{BMI} = \text{m}^2/\text{kg}^2$$

The National Institutes of Health (NIH) Clinical Guidelines in the *Identification, Evaluation, and Treatment of Overweight and Obesity and Adults*, published in 1998, operationally define *overweight* as a BMI of 25 to 29.9 and *obesity* as a BMI of at least 30.⁵ Under these conditions, more than half of Americans may be considered overweight and about 23% meet the criteria for obesity.⁶ Overweight and obesity are associated with numerous adverse health conditions, including type 2 diabetes and cardiovascular disease.⁷ Calculation of a BMI makes it easy for an individual to identify where the healthy range lies based on height and weight and the decision to gain or lose weight. The drawback to the BMI calculation is that it fails to distinguish fat mass from lean mass.

Turning Calories into Points

With calorie counting and restriction reaching numbers into several thousands of calories per day, combined with the multitude of foods with various carbohydrate, protein, and fat contents, how is an individual who desires to lose weight supposed to keep track? To inform the consumer, most food presently sold will have a nutritional label that lists the number of calories per serving. Cookbooks also provide calorie counts for prepared meals. However in order to keep a more accurate tracking system utilizing these sources for calorie intake, it might be necessary to use a calculator for tabulation and then record these numbers in a notebook. Then there is a problem with frequent dining at restaurants, as most Americans are accustomed. How is an individual on a diet to know how many calories are in a particular meal without requesting paperwork or research from the manager of the restaurant? The tedious counting of calories became simplified in 1997, when Weight Watchers introduced the "POINTS Weight-Loss System."

The Weight Watchers POINT System Diet makes keeping track of daily calorie intake easier. Foods are assigned a point value based on their serving sizes and the number of fat, calories, and fiber they each contain.⁸ The diet is based on controlled portion sizes. People should consume large portions from healthy foods like fruits, vegetables and low-fat meat and very small portions of potentially unhealthy food such as fried foods, chocolate and hamburgers. The dieter is assigned a POINTS target based on the height and ideal weight as set by one's physician or within a weight range determined as a healthy BMI.⁹ The POINTS target varies with each individual depending on the desired weight loss and on the recommended daily caloric intake converted to POINTS. Dieters may then eat the foods they want within a given time period so long as the dieter's point allocation has not been exceeded. There are no special meal plans required for the dieters in the point system. The dieter must maintain a record of his or her POINTS. By doing so, daily calorie intake is regulated using a relatively simple counting and recording system and weight loss is achieved by remaining at or

• POINT SYSTEM •

below the POINTS target.

History of Weight Watchers

After several years of failed diets and prescribed amphetamines, a woman named Jean Nidetch was placed on a “Prudent Diet” for cardiac health, developed by obesity researcher Norman Joliffe in 1961.⁸ Jean consistently encountered the problem of gaining back all the weight she lost once the diet program was completed and the medication had run out. However, with the “Prudent Diet,” she lost seventy-two pounds and has been able to maintain this weight. During this period, she felt a strong need to talk to others about her dieting experience. Hence, she began a meeting with six other dieting women in her Brooklyn, New York, home. The meetings soon outgrew her living room and moved to the basement of her apartment building.¹⁰ In late 1962, she was invited to lecture a group at the home of a New York businessman, Al Lippert, and his wife, Felice, who both suggested that Nidetch transform the meetings into a business.⁸ In May of 1963, Weight Watchers International Inc. was co-founded by Nidetch and the Lipperts.

It had become evident to Nidetch that positive dieting was not only based on good eating habits, but also by being a member of a dieting support group. The support groups generate mutual motivation that assists individuals in attaining and maintaining their desired weight. The meetings are still held in the same manner as they were in 1963. Weekly fees are collected, the member is weighed on a scale, and encouragement is given. A leader, who is a lifetime member of the program, runs the meeting. At these gatherings, the floor is opened, and members share their experiences and goals. A change in eating habits and lifestyle is emphasized. Weight Watchers became a public owned company in 1968 and was purchased as a subsidiary by the H. J. Heinz Company in 1978. The company was then purchased again by Artal Luxembourg, S.A., in 1999. Weight Watchers currently has over one million members worldwide in 30 countries.⁹ The client base is 95% female.¹¹

Winning with POINTS

Weight Watchers and the POINT system diet are popular with dieters because of the suggested ease of transforming calories from food into points. Conversion may be achieved by calculating calories using a formula provided by Weight Watchers or referring to literature that assigns points for various food trends. A goal weight is determined by the individual member that must be at least 5 pounds less than the member’s joining weight and ideally within the BMI range of 20-25.¹²

Another attractive aspect of the POINTS Weight-Loss System is the fact that dieters may eat whatever foods they want as long as the number of assigned points is not exceeded. The principle of portion control is reinforced to help members learn to achieve a healthy body weight.⁹ A Weight Watchers member no longer has to have a scale or ruler on hand to follow the food plan. Instead, the member is taught how to estimate portion sizes visually: a tablespoon, for example, is about the size of a thumb tip and a teaspoon is a fingertip.⁸ Since all foods are considered, no additional costs are incurred from having to purchase pre-packaged foods as with other popular diet programs. The company has since relaxed on pushing the idea of dieters eating anything as it’s main selling point. According to Marion Nestle, the head of nutrition and food studies at NYU, “Now it allows you to go out to dinner with friends and be a normal person”.¹¹

The latest addition to the POINTS Weight-Loss System is the incorporation of FlexPOINTS. According to Weight Watchers, an additional 35 points are added to the dieter’s weekly point target as designated by the standard POINTS plan. Dieters may spend these 35 points in any way they please. These extra FlexPOINTS are enough to cover all kinds of occasions and food indulgences, but more importantly the wider margin serves as a safety zone when the dieter needs it.¹³ Activity POINTS may be earned through exercise and may be swapped with foods. For example, when a dieter exercises and burns calories, points are earned, enabling the dieter to consume more points without any penalty.

Support Group Component

Perhaps the most important and overlooked component of the Weight Watchers POINTS Weight-Loss System is the weekly support group meetings held all over the world that are the basis for the Weight Watchers’ concept. The Weight Watchers program helps members recognize and overcome the challenges they may face on their weight-loss journey.¹⁴ Meetings are structured to include specific topics with handouts ranging from staying motivated, managing stress, eating out, and going on vacation.¹⁴ Meetings are led by members who have been successful with the program and have reached their goal weight. They are able to serve as role models for other members of the group.¹⁴ Exercise plans are designed to help members burn calories through aerobic activities of their choice. Members are encouraged to keep track of their food intake and behavioral patterns related to food.¹⁴ In 2001, *WeightWatchers.com* was launched in order for the company to provide the same Weight-Loss tools and advice to members wanting an online component

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to compliment the meetings and to provide services to those who are unable to attend meetings.

For over 40 years Weight Watchers has been a major force in the area of weight loss. The most obvious factor for the company's success lies in the simplicity and flexibility of the POINTS Weight-Loss System. The capability of having an option to not drastically alter one's choice of food and still lose weight is an appealing concept. Also, the Weight Watchers plan is very affordable, costing only \$13 per week with minimal expenses for snacks, cookbooks, and diet calculators.¹¹ If added to supplement a traditional meeting based program, online services cost approximately \$30 for the first 3 months and \$13 for each additional month. Online services alone cost approximately \$60 for the first 3 months and \$15 for each additional month. No vitamin supplements are necessary, and pre-packaged or pre-prepared foods are not required to be purchased. This keeps costs lower for the members.

The company's lean organizational structure makes for fairly large profit margins, currently at 19%. There are more than 34,000 employees, of whom 98% are part-time, which controls costs. The weekly meetings are typically held in inexpensively rented local facilities such as churches to further minimize costs.¹¹ Furthermore, Weight Watchers implements aggressive advertising techniques through numerous television ads, before and after success stories, and spokespersons such as Sarah Ferguson, the Duchess of York, who brought royal glamour and notoriety to the program.⁸

Points and Pounds

Maintaining a balanced diet is ideal for weight loss and maintenance, but having the ability to "lose weight without sacrificing foods people love" leaves the door open for dieters on the POINTS program to include fatty and sugar filled foods. Surprisingly, both foods high in fat and calories may contain the same converted points total as healthy, proportional meals low in fat and calories. Therefore, this diet makes it possible for a dieter to eat unhealthy foods in small portions. A dieter is presented with the option of eating small portions of foods such as hamburgers, french fries, doughnuts, mozzarella sticks, and chicken nuggets that equal the allocated point total, while theoretically losing weight during the process. A mixture of healthy foods with low point values and potentially unhealthy fast or fried foods with high point values is probably not the best choices while on a diet, since the overall nutritional value would be questionable. Problems such as high cholesterol and hypertension are then increased with an unbalanced diet. Also,

undesirable binge eating is made possible with the allocation of FlexPOINTS to the traditional POINTS Weight-Loss system. Despite the temptation of a free choice of foods, most dieters on the POINTS program make an extended effort to eat healthier and more nutritional foods.

Moreover, the POINTS Weight-Loss System formula does not take into account the amount of protein in a meal. With the current popularity of low carbohydrate and high protein diets, there may be some concern that the POINTS Weight Loss System formula does not stress higher amounts of protein intake. It is interesting to note that the actual Weight Watchers POINTS formula is currently under strict U.S. Patent laws and is as follows:

$$\text{Point} = (\text{calories}/50) + (\text{fat grams}/12) - (\min\{r, 4\}/5)$$

The value increases by one point for every 12 grams of fat, and decreases by about one point for every five grams of fiber such as oat bran, fruits and vegetables. The last part of the equation " $\min\{r, 4\}$ " is either equal to the number of dietary fiber grams or 4, whichever is smaller. In simplest terms, total fat becomes a point *penalizer*, while fiber becomes a point *enhancer*. In recent years, there has been a growing body of research that indicates protein helps individuals lose fat in addition to building muscle. Weight loss is certainly foreseeable if caloric restriction of fat and fiber is exercised. But without any consideration of protein, a dieter on the Weight Watchers POINTS system will need to pay more attention to the *quality* and not just the *quantity* of the calories in the diet.¹⁵

In an attempt to resolve problems and concerns inherent with weight loss plans such as maintaining long-term weight loss, Weight Watchers stresses that members must restructure their lives so that new social patterns reflect the ideas of recording eating habits, proper nutrition, dining out, and portion control to support weight loss for the long term.¹⁶ Weight Watchers provides support programs for managing attitudes and behavior by helping members to identify food-related behavior patterns and teaching new skills for dealing with them.¹⁷ They also attempt to help members understand their problems and take positive action, thereby helping to make weight-loss skills permanent.¹⁷ A well-balanced nutritious diet, exercise, self-reliance, and self-discipline are necessary for any and all attempts at long-term weight loss.

Does Weight Watchers Work?

Prior to starting a weight loss program, it is

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recommended that a dieter visit a physician to determine a healthy weight for the individual. The National Institute of Health advises that weight loss programs should strive for an initial weight loss of approximately 10% of body weight.⁵ According to a study published in *Obesity Research*, an initial four-week, short-term evaluation of Weight Watchers versus a self-help weight loss condition showed that Weight Watchers participants showed greater improvements than self-help participants on all measures.¹⁸ Weight losses averaged 1.87 kg for those on the Weight Watchers program and 0.77 kg for those on the self-help program.¹⁸ Losing weight on the Weight Watchers POINT system is slow, with predicted weight loss one to two pounds per week.¹⁸

In a long-term, two-year study of the Weight Watchers program compared to a self-help program, the Weight Watchers program provided a modest weight loss, greater than that of the self-help program over the test period.¹⁹ The self-help group was able to lose and maintain approximately 1.3 to 1.4 kg for the first year, after which weight tended to increase until it returned to baseline at two years.¹⁹ The Weight Watchers group maintained a weight loss of 4.3 to 5.0 kg at the end of the first year and 2.7 to 3.0 kg at the end of the second year.¹⁹ Individuals who attended 78% or more of the Weight Watchers meetings maintained a mean weight loss of almost 5 kg at the end of the two-year study.¹⁹

Conclusion

All diet programs have advantages and disadvantages. However, it has been concluded from these studies that the Weight Watchers POINTS Weight-Loss System is successful. With the Weight Watchers program food choice, individuals begin to take responsibility for their eating habits. People are more likely to continue with a diet that feels natural to them. The simplicity of counting calories with points, the ability of dieters to eat whatever they want, the addition of FlexPOINTS to provide room for unexpected food indulgences, group support through meetings, low cost and the longevity of the company make Weight Watchers a popular choice.

The weekly meetings and member support help address the challenge of choosing healthy, nutritious foods in lieu of unhealthy choices with equal point value. Weight Watchers does not provide a quick solution to gaining weight, being overweight or obese. Instead, the program offers a plan to change the eating habits and lifestyle of an individual. The simple and supportive nature of Weight Watchers and the POINTS Weight-Loss System makes it an ideal weight loss program for people who wish to make a lifetime commitment to losing weight and keeping it off.

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References:

1. Insel P, Turner RE, Ross D. *Discovering Nutrition*. 1st ed. Sudbury: Jones and Bartlett; 2003.
2. Harvard University School of Public Health. Healthy Weight. Available at: <http://www.hsph.harvard.edu/nutritionsource/weight.html>. Accessed October 29, 2003.
3. Food and Drug Administration. Counting Calories [PDF File]. Available at: www.fda.gov/fdac/graphics/foodlabelspecial/pg44.pdf. Accessed October 29, 2003.
4. National Institute of Diabetes and Digestive and Kidney Diseases. Overweight, Obesity, and Health Risk National Task Force for the Prevention and Treatment of Obesity. *Archives of Internal Medicine*. 2000;160:898-904.
5. National Institutes of Health. Clinical guidelines on the identification, evaluation, and treatment of overweight and obesity in adults: The evidence report. *Obesity Research*. 1998;6(Suppl 2):51S-210S.
6. Flegal KM, Carroll MD, Kuczmarski RJ, Johnson CL. Overweight and obesity in the United States: Prevalence and trends, 1960-1994. *Internal Journal of Obesity Related Metabolic Disorders*. 1998;22:39-47.
7. National Institute of Diabetes and Digestive and Kidney Diseases. Dieting and the Development of Eating Disorders in Overweight and Obese Adults: National Task Force on the Prevention and Treatment of Obesity. *Archives of Internal Medicine*. 2000;160:2581-2589.
8. Hendley J. Weight Watchers at Forty: A Celebration. *Gastronomica-The Journal of Food and Culture*. 2003;3(1):16-21.
9. Weight Watchers International Inc. About Us-Corporate Backgrounder [Web page]. Available at: http://www.weightwatchers.com/about/prs/wwi_template.aspx?GCMSID=1000561. Accessed October 22, 2003.
10. Nidetch J. *The Story of Weight Watchers*. New York: New American Library; 1970.
11. Florian E. When It Comes to Fat, They're Huge. *Fortune*. 2002;146(7):54.
12. Lowe MR, Miller-Kovach K, Phelan S. Weight-loss maintenance in overweight individuals one to five years following a successful completion of a commercial weight loss program. *International Journal of Obesity*. 2001;25(3):325-331.
13. Weight Watchers International Inc. FlexPoints. Available at: <http://www.weightwathchers.com/plan/flex/index.aspx>. Accessed November 10, 2003.
14. Weiner S. The addiction of overeating: Self-help groups as treatment models. *Journal of Clinical Psychology*. 1998;54(2):163-167.
15. Finn C. The Secret Weight Watchers Points Formula Exposed. Available at: www.thefactsaboutfitness.com/print/17feb2003.htm. Accessed October 16, 2003.
16. Martin DD. From appearance tales to oppression tales: Frame alignment and organizational identity. *Journal of Contemporary Ethnography*. 2002;31(2):158-206.
17. Weight Watchers International Inc. *Challenges and Choices*. New York: Weight Watchers Inc.; 1990.
18. Lowe MR, Frye N, Miller-Kovach K, Phelan S. An initial evaluation of a commercial weight loss program: Short term effect on weight, eating behavior, and mood. *Obesity Research*. 1999;7(1):51-59.
19. Heshka S, Anderson JW, Atkinson R, et al. Weight loss with self-help compared with a structured commercial program: A randomized trial. *Journal of the American Medical Association*. 2003;289(14):1792-1798.

The Zone Diet: Optimal Eating

Kristen Force

The Zone Diet, developed by Barry Sears, Ph.D., has become a popular diet program that reportedly improves energy levels, mental clarity, and physical endurance. Insulin levels in the body are the critical factor for controlling weight and staying in the “zone,” which is a term used by athletes to describe their highest performance level. Protein, fat, and carbohydrate blocks are calculated on an individual basis to determine the proper amounts for consumption in order to lose weight. The elements of good nutrition are the foundation for the Zone Diet. Critics of the diet insist that the actual reason for weight loss is due to the reduction in calories and fat, not necessarily from planning meals around blocks and insulin levels.

Americans appear to set never-ending goals toward improved physical appearance and health. Unfortunately, not everyone makes educated, well-researched decisions regarding his or her approach to physical well being. This can lead to less than desired results or even tragic consequences.

This article aims to introduce and explain the inner workings of a currently popular diet, the Zone Diet, so that people thinking about changing their nutritional habits can be armed with knowledge about the role of food in body functioning. Good health is critical to a long and enjoyable life and should be nurtured. Too often health is not fully appreciated until it is gone.

The Zone Diet was created by Barry Sears, Ph.D. and has been promoted through a number of Sears’ books discussing topics such as weight loss, disease prevention, and enhancement of mental productivity. The name of the diet is taken from a term commonly used by athletes to describe a time when they are at their highest level of performance. The “zone” is analogous to optimal health and the diet claims that people can constantly live in the “zone” based on nutritional choices.¹

Advocates claim that following this diet will improve energy levels, mental clarity, and physical endurance, all which ultimately promote weight loss.² Critics agree that weight loss does occur, but at the expense of key nutrients and complex carbohydrates.²

Basics of the Zone Diet

Sears, a molecular biologist, developed this diet after studying the relationship between health problems, particularly heart disease, and high-carbohydrate diets.² He became interested in the relationship between the types of nutrients consumed and the resulting insulin levels in the body. Insulin’s effect on the production of eicosanoids – modified fatty acids that act as hormones – is the basis of Sears’ dietary program.^{2,3} His research and dietary program are centered around finding a balance

between “good” and “bad” eicosanoids.

The descriptive terms used (good and bad) are a bit misleading because natural substances produced by the body cannot be so definitively categorized. Consider cholesterol as an example: high-density lipoproteins (HDL) are considered beneficial while low-density lipoproteins (LDL) are considered harmful, but without LDL the body could not function properly. The molecules transported by LDL, including essential fatty acids in addition to cholesterol, are necessary for cell growth. The real issue is not the presence of “bad” cholesterol or eicosanoids or other substances, but the balance between two opposing types, which can have positive and negative physiologic effects.

Eicosanoids play a crucial role in almost all physiological functions, including those in the immune, cardiovascular, reproductive, and nervous systems. The ubiquitous chemical messengers occur in very small concentrations, but can have very potent effects. These effects include vasodilation or vasoconstriction of blood vessels, menstrual cramps, and immune responses to foreign pathogens. Anti-inflammatory drugs such as aspirin, ibuprofen, and some steroids block enzymes that synthesize eicosanoids.³

Examining the effects of eicosanoids can help one to better understand the relationship between good and bad and the importance of balance. For example, a high production of bad eicosanoids induces high blood pressure by causing vasoconstriction in the arteries. But too many good eicosanoids can create low pressure, which can lead to shock. It is clear that the body needs a specific balance to achieve optimal health because too much of either would be harmful.

According to Sears, food is not just a source of calories, but a way to control the amounts and types of eicosanoids produced. This ultimately controls the release and balance of hormones in the body and leads to fine maintenance of the “zone.”⁴ The Zone Diet claims to limit the production of the negative eicosanoids by choosing foods that are lower insulin

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stimulators.²

Carbohydrates trigger insulin production, which in turn lowers blood sugar levels. The sugar in fruits was once most commonly associated with this quick spike in insulin release, but Sears' research suggests that many complex carbohydrates, such as rice and potatoes, create a similar result.² The Zone Diet's official website states that Sears conducted and published his research as a means of controlling insulin production. To achieve this, a specific diet must be followed for each meal. The guidelines of the diet consist of 40% carbohydrates, 30% protein, and 30% fat. This is similar to the Food Guide Pyramid created by the U.S. Department of Agriculture, which also recommends that dietary fat not make up more than 30% of the daily nutrients consumed.⁵

Complex carbohydrates, such as pasta, grains, and starches are to be avoided in favor of fruits and vegetables. Sears suggests that the human body is not evolved enough to efficiently process insulin-stimulating complex sugars. It has been reported that Sears says removing the base of the Food Guide Pyramid (carbohydrates) would leave a Zone-favorable diet.⁴ Fruits and vegetables would have to be the source of the 40% of carbohydrates that are to make up each meal.

Instead of carbohydrate-based meals, Sears' Zone Diet is based on the premise that humans are carnivores and evolved from ancestors that got a vast majority of their nutrients from meat thousands of years ago.⁶ Low-fat protein, such as fish, is recommended, as opposed to red meats that contain high amounts of saturated fats.

The remaining 30% of the diet is comprised of fat, but one must remember that not all fat is created equal. Monounsaturated fats are recommended when following this nutritional plan. These fats are found in plant oils such as olive oil, almonds, avocados, and peanuts.

It is recommended while on the diet to consume the daily allowances of macronutrients in equal proportions or blocks to avoid an overabundance of any single macronutrient group. Blocks are explained in greater detail below. One is advised to determine how much protein he or she requires and plan meals around this value. Every meal should have a nearly equal amount of carbohydrates and protein, including snacks. Some critics say this can be time consuming and difficult, especially when eating away from home.²

Calculating one's daily protein requirement is the first

step toward building a Zone-favorable diet. This is a unique value that depends on one's weight, percentage of body fat, and amount of physical activity. Sears suggests thinking of this requirement as a prescription drug, and, like medicine, it should be spread evenly throughout the day. Consuming too much protein in one meal can overload the body's capacity for protein utilization and, depending on the type of protein, can introduce a large amount of arachidonic acid into the body, which is a building block of bad eicosanoids.¹

The hormone glucagon functions in direct opposition to insulin. Both are released from the pancreas and affect blood glucose levels. While insulin lowers blood glucose levels by increasing cellular uptake of glucose, glucagon raises blood glucose levels by breaking down glycogen, the stored form of glucose. Although protein primarily stimulates glucagon, it also has an effect on insulin secretion, and rising insulin levels takes a person out of the Zone. In addition, overabundance of protein at one meal can lead to an inadequate amount in other meals, which can also take a person out of the Zone by creating an imbalance between insulin and glucagon. The glucagon-stimulating protein is needed to counteract the insulin-stimulating carbohydrates.

Eating in Blocks

Once the required amount of protein has been determined, it should be divided into "blocks" of equal value. For example, a woman who has a daily protein requirement of 77 grams should divide that into the number of blocks she needs to consume in a day. Eleven blocks are recommended for women, which can be broken into three blocks at breakfast, lunch, and dinner and two snacks consisting of one block each.

For every block of protein consumed, a block of carbohydrates should also be eaten. Since each meal should be composed of 40% carbohydrates, this would make each carbohydrate block slightly larger than the protein blocks. Continuing the previous example, a person who requires 77 grams of protein would require 102 grams of carbohydrates each day. Rounding each value to a number divisible by the number of blocks simplifies the math. For example, 102 can be rounded to 99. Dividing this value into 11 equal blocks would result in 9-gram carbohydrate blocks.

Fats have a bad reputation, but the body requires a certain amount for normal body processes. Fats are the building blocks of eicosanoids and also control how fast carbohydrates enter the blood stream and stimulate insulin release from the

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pancreas. In addition, fat triggers the release of cholecystokinin (CCK), a hormone in the stomach that sends a signal to the brain that the body is satisfied and full.

The diet recommends making 30% of each meal come from fat, but it is important to evaluate the fat content of the protein in the meal and the type of fat that will be added in the fat blocks. As mentioned earlier, arachidonic acid is the chemical building block for bad eicosanoids and is found in egg yolks, organ meats such as liver, and fatty red meats. The Zone Diet suggests reducing the consumption of these foods to a minimum or even eliminating them entirely. Saturated fats should also be limited but do not have to be cut out completely. This type of fat is found in animal products, including milk, cheese, and meat.

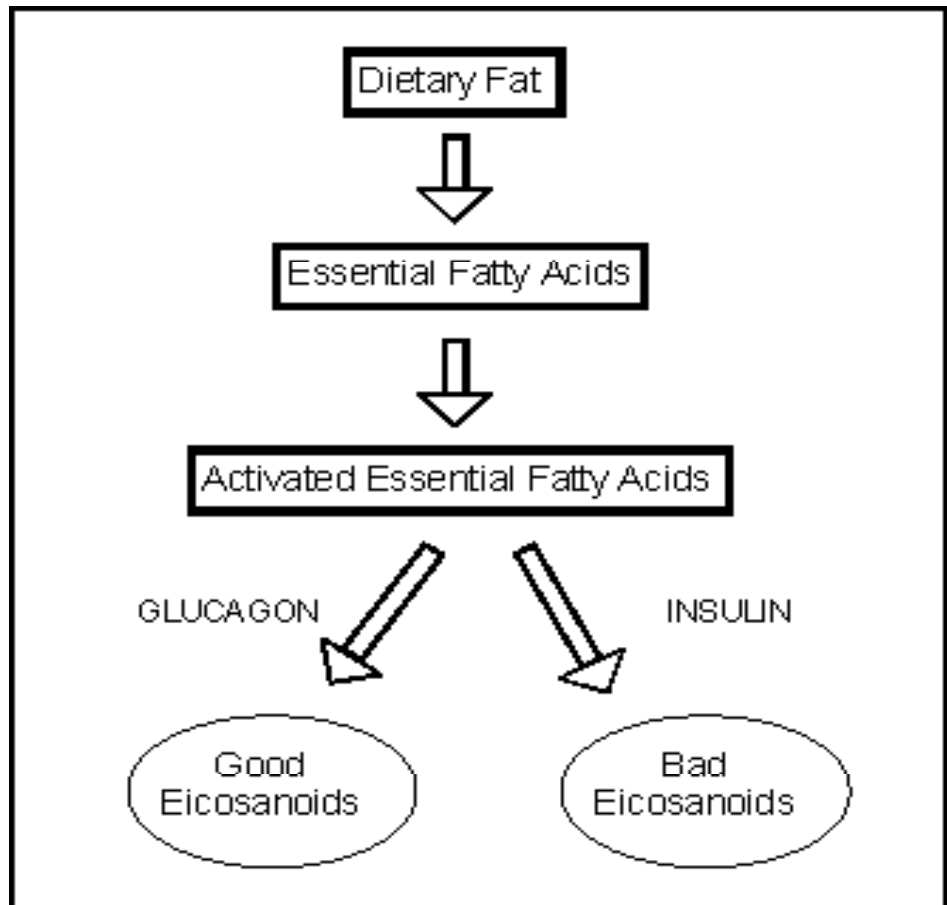
Monounsaturated fats are what Sears considers “good”

fat. They are eicosanoid neutral, meaning they cannot be converted into eicosanoids at all and have no effect on insulin levels. This type of fat is a good addition to a diet that has been carefully balanced between protein and carbohydrates because it does not tip the scale in either direction (toward glucagon or insulin production). Good sources of monounsaturated fats are olives, macadamia nuts, and avocados.

The same number of blocks of fat should be consumed as the other micronutrients, but each block will only contain approximately 1.5 grams of fat. This means that a meal consisting of three protein blocks, three carbohydrate blocks, and three fat blocks will have 4.5 grams of fat. The ratio of macronutrient blocks should be 1:1:1 at every meal and snack.

Those who criticize the diet say the positive results that

Image reproduced from *The Zone*.



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participants feel, such as weight loss and increased energy, may be due to eating smaller, more frequent meals and more fruits and vegetables, rather than the effects of insulin and eicosanoid production.²

The Zone Diet does provide guidelines to help make proper food choices when away from home.^{1,7} The “Eyeball Method” can be used to approximate serving sizes without tedious calculations. Starting with protein, a serving size for a meal should be equal to the size and thickness of the palm of a hand. Carbohydrates are broken into two categories: favorable and unfavorable, an important distinction when determining a serving size. If favorable carbohydrates, such as broccoli or strawberries are chosen, an amount equal to two fists can be eaten in a meal.⁷ Unfavorable carbohydrates, such as pasta and potatoes, are limited to one tight fist worth. Finally, dietary fat must be considered. This is often the most difficult area for people, but it can be the easiest. While 30% of the nutrients consumed should be from fat, it doesn’t take much to reach this value. Adding a few nuts, some olive oil, or a couple of olives to each meal will provide an adequate and moderate amount of fat. If the protein portion of the meal is already high in fat, do not add any extra.¹

One’s hand can also provide additional guidelines of dietary needs throughout the day. The five fingers should be a reminder to eat at least five times a day; three meals and two snacks. It is recommended to eat within an hour of waking and within an hour of going to sleep at night. The hand also serves as a reminder to never let more than five hours pass without eating a meal or a snack.

Why is this Good for Weight Loss?

Long-term maintenance of a dietary plan requires a basic understanding of the foundations of nutrition. Carbohydrates are currently at the center of many debates, but what really is a carbohydrate? Pasta and bread – yes - but also fruits, vegetables, and sweets. Glucose is the sugar molecule building block of carbohydrates and is absolutely necessary for the body’s survival. Many glucose molecules linked together into a polymer create a complex carbohydrate. While the muscles and tissues of the body can convert protein or fat into a usable energy source, the brain can only process glucose.

According to Sears, too much insulin in the bloodstream can increase fat storage and inflammation in the body because excess nutrients are stored instead of burned. These conditions

are associated with obesity, type-2 diabetes, and heart disease.⁶ By regulating the level of blood sugar, the body’s metabolic function is optimized, which in turn allows excess body fat to be burned.

The Zone Diet is promoted as a healthy option for a variety of individuals regardless of age, activity level, or gender, but the majority of Americans who have tried the diet do it as a weight loss technique.² And most people who strictly follow the rules of the diet will experience weight loss, but determining the long-term benefits requires a more in-depth look. Critics of the Zone Diet challenge Sears’ explanation of why the weight loss occurs and contend that the result is due more to reduced caloric intake than to what is actually being consumed.²

Many dieticians do agree that the diet has benefits, but the cause is debatable. What Sears attributes to the body’s control of insulin could be due to consuming more balanced meals, eating smaller, more frequent meals, and eating more fruits and vegetables.²

Adding Supplements to a Zone Diet

Zone Diet guidelines recommend that participants should supplement their diet to ensure all nutritional requirements are met. Gamma-linolenic acid (GLA), an omega-6 unsaturated fatty acid derived from plant seed oil, is recommended on a limited basis. Sears has expressed concern that GLA can lead to both positive and negative eicosanoids based on one’s diet. To control its fate, the specific 1:1 ratio of carbohydrates-to-proteins must be consumed at each meal. According to Sears, a person on the Zone Diet can supplement one to 10 milligrams of GLA per day, but it is not necessary when a Zone-favorable diet is followed.^{1,4} The recommended amount for a healthy person is 1 to 2 milligrams per day, according to the Zone Diet. This can easily be achieved by eating cooked (not instant) oatmeal at least three times a week.¹ Those suffering from rheumatoid arthritis often use GLA, but in much larger quantities.⁸ Supplemental GLA is found in evening primrose oil, borage oil, and black currant seed oil.⁹

Omega-3 fatty acids receive strong support from Sears and are reflected in the recommendations for followers of the Zone Diet. The diet claims that to get the necessary amount of omega-3 fatty acids, a person would have to consume a 32-ounce serving of ocean salmon each day. Instead, the diet provides supplements for purchase or most can be found at any health foods store. Some supplements, especially in Canada, require a

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prescription.

The Zone Diet claims that supplementing a diet with this fatty acid will improve a person's complexion, increase energy, create better mental acuity, and improve athletic performance.¹⁰ The U.S. government and other health organizations have not found evidence to prove or disprove these claims. Many factors can contribute to overall well-being in addition to one supplement.¹¹

The U.S. Food and Drug Administration has determined that omega-3 fatty acids in dietary supplements may reduce the risk of coronary heart disease, but the findings are not conclusive.¹¹ Omega-3 fatty acids, as well as omega-6, play an important role in the function of eicosanoids because these hormones are formed from tissues that contain highly unsaturated fatty acids acquired by the group of omega fatty acids. The balance of tissue fatty acids is affected by the amount of dietary omega-3 consumed, ultimately resulting in an effect on eicosanoid production and function.¹²

Studies have shown that consuming fish, which contains high amounts of omega-3 fatty acids, correlates to a lower risk of coronary heart disease, but it is not clear if the cause is the fatty acids or another component of the fish. The recommended daily allowance for omega-3 fatty acids is no more than 2 grams.¹¹

In addition to omega-3 fatty acids, the Zone Diet necessitates the use of a vitamin E supplement to provide balance among the nutrients consumed. This fat-soluble vitamin is thought to protect cells from free radicals that cause cellular membrane damage, a route used by cancer and other diseases to invade the body's cells. The supplement manufactured specifically for the Zone Diet contains 20 times more vitamin E than many others.¹⁰ The recommended daily allowance for vitamin E is 15 milligrams for healthy adults.¹³

Vitamin E is considered an antioxidant because it helps protect the phospholipids in cell membranes from oxidation.¹⁴ Its functions are not fully understood, but no symptoms of extreme excess have been well documented. Those deficient in vitamin E can have symptoms ranging from anemia to the appearance of advanced aging.^{14, 15} Deficiency is rare, but individuals who follow a low-fat diet could put themselves at risk because vegetable oils are a good source.¹³ This vitamin is found in vegetable oils, nuts, seeds, and green leafy vegetables.^{13, 14}

Free radicals are very reactive atoms or groups of atoms that contain at least one unpaired electron. Electrons have the

need to pair with other electrons through covalent and ionic bonding to reach a state of balance; the high reactivity in free radicals is due to the electron's unbalance and thus creates rapid reactions.¹⁵

The aging process is closely correlated to free radicals. Their involvement is due to the unpaired electrons attacking protein molecules in collagen, which are fibers found in flexible tissues such as the lungs, blood vessels, muscles, and skin. This creates cross-linking between the fibers, resulting in stiffening and hardening of the tissue and giving skin a wrinkled appearance.¹⁵

Antioxidants are used by the body as a defense against free radical damage. Vitamin E appears to be a natural free radical inhibitor by terminating the chain reactions caused by the unpaired electrons before vital molecules in the body are damaged or destroyed. The body has a system of enzymes designed to identify free radicals and destroy them, but micronutrients such as vitamin E also contribute.¹⁵

Effects of Smoking and Alcohol on a Zone-Perfect Lifestyle

Smoking and drinking are behavioral risk factors that can have a profound effect on one's health, especially concerning the cardiovascular system. Smoking increases the production of free radicals, which can lead to serious health problems. As discussed earlier, free radicals destroy fatty acids, the building blocks of eicosanoids, by depleting the body's reserves of antioxidants.^{1, 15} Because the body continually produces new cells to replace those that have been damaged, the effects of smoking can be reversed if one quits smoking. In time, the risk of heart disease for former smokers can return to the same level as someone who has never smoked.

The line between good and bad consumption of alcohol is much finer than with smoking; moderation is the key. Sears attributes the positive effects of alcohol to its ability to aid in the production of good eicosanoids when consumed in moderate amounts. A higher level of these "positive" hormones decreases platelet aggregation and allows the blood to flow faster without as much buildup.

Moderate consumption is defined as one 4-ounce glass of wine for women and two glasses for men.¹⁶ Research has led scientists to consider red wine as the most heart-healthy alcoholic beverage.¹⁷ Of course, those who do not drink are not advised to

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begin, but those who already consume alcohol should do so in moderation. Excessive drinking creates additional risk factors for heart disease and other health conditions.

Conclusion

It is clear that many people have found success with the Zone Diet, but it is unlikely that all members of the nutrition field will agree on what actually creates these results. While one can argue that the fine balance of insulin makes all the difference, another can attribute weight loss and increased energy to more balanced meals with greater amounts of fruits and vegetables. The important thing for Americans to remember is that any maintainable goal requires commitment and dedication. One's diet plays an important role in physical health and deserves time for preparation and planning.

Supplements should be researched and even discussed with a physician before taking to ensure proper dosage and compatibility with other medications and nutrients in the diet. Deficiencies in one's diet can be corrected through supplementation, but daily requirements are unique to each person and should be dealt with on an individual basis. Supplements may not be appropriate or necessary for everyone.

Moderation is key to any element of the diet, including alcohol. Individuals who do not already drink are not encouraged to begin, but drinking on a limited basis does appear to help fight heart disease. Research has found no benefits to smoking and anyone interested in maintaining physical well-being should abstain. Anything consumed by the body, including tobacco, affects nutrition and can detract from positive goals set by an individual.

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References:

1. Sears B, Lawren B. *The Zone*. New York: HarperCollins; 1995.
2. Look Great Naked: The Zone. Available at: <http://home.earthlink.net/~bdubay/zone.htm>. Accessed August 7, 2003.
3. Vander A, Sherman J, Luciano D. *Human Physiology*. New York: McGraw-Hill; 2001.
4. Babal K. The Zone: Sound Advice or Just Another Diet? Available at: <http://www.healthwell.com/hnbreakthroughs/feb98/thezonediet.htm>. Accessed August 7, 2003.
5. The Food Guide Pyramid. Available at: http://www.pueblo.gsa.gov/cic_text/food/food-pyramid/main.htm. Accessed December 3, 2003.
6. Diet Review: The Zone Diet. Available at: http://www.healthyweightforum.org/eng/diets/zone_diet. Accessed October 7, 2003.
7. The Eyeball Method. Available at: http://www.zoneperfect.com/site/content/guide_03_EyeballMethod.asp. Accessed November 17, 2003.
8. Zurier RB, Rossetti RG, Jacobson EW, et al. Gamma-linolenic acid treatment of rheumatoid arthritis. A randomized, placebo-controlled trial. *Arthritis and Rheumatism*. 1996;39(11):1808-1817.
9. Should I Take a GLA Supplement? Available at: http://www.zoneperfect.com/Site/content/QA_Detail.asp. Accessed October 28, 2003.
10. Frequently Asked Questions: Omega-3 Supplements. Available at: http://store.zoneperfect.com/site/content/omega3_faq.asp. Accessed October 28, 2003.
11. FDA Announces Decision on Another Health Claim for Dietary Supplements. Available at: <http://www.fda.gov/bbs/topics/ANSWERS.html>. Accessed August 21, 2003.
12. Essential Fatty Acids Education: Eicosanoids. Available at: <http://efaeducation.nih.gov/sig/ods.html>. Accessed August 21, 2003.
13. Rimm EB, Williams P, Fosher K, Criqui M, Stempfer MJ. Moderate alcohol intake and lower risk of coronary heart disease: meta-analysis of effects on lipids and haemostatic factors. *British Medical Journal*. 1999;319(7224):1523-1528.
14. Campbell N. *Biology*. San Francisco: Benjamin/Cummings; 2001.
15. Brady J, Russell J, Holum J. *Chemistry: Matter and Its Changes*. New York: John Wiley & Sons; 2000.
16. Alcohol, Wine and Cardiovascular Disease. Available at: <http://www.americanheart.org/presenter.jhtml?identifier=4422>. Accessed October 20, 2003.
17. Pace-Asciak CR, Hahn S, Diamandis EP, Soleas G, Goldberg DM. The red wine phenolics trans-resveratrol and quercetin block human platelet aggregation and eicosanoid synthesis: implications for protection against coronary heart disease. *Clinica Chimica Acta*. 1995;235(2):207-219.

Herbs and Pills to Fight Fat

Amanda Matthews

Supplements consumed for weight loss have become increasingly popular for people who want to “easily” lose pounds. Ingredients found in these supplements supposedly increase metabolism and/or suppress the appetite. They contain a variety of unregulated herbs and sometimes caffeine. Unlike prescription drugs, weight loss supplements sold over the counter do not require scientific background research to be produced and sold. Many of the manufacturers claim that their products either break down fat or block the formation of body fat. Slimming teas are another over-the-counter weight loss product; however, based on research there is little evidence that supports this assertion. Negative side effects are commonly reported with the teas. Consumers must be very careful when consuming these types of weight-loss supplements and teas due to the side effects of the herbs and other ingredients.

Dieters may use weight loss supplements in an attempt to lose weight quickly and easily. These supplements contain ingredients that supposedly aid in weight loss by increasing metabolism or suppressing appetite. Common supplements include Xenadrine-EFX[®], Herbalife[®], Metabolife[®], Ripped Fuel[®], and Citrimax[™] Plus. The supplements contain a “proprietary blend” of substances that the companies formulate for weight loss. Many of the substances are herbs that contain specific amounts of compounds thought to promote weight loss. Caffeine, green tea extract, and *Garcinia cambogia* are a few examples of ingredients found in the pills. This article describes supplement regulation, explains how weight loss occurs, and examines the most common ingredients found in both weight loss supplements and diet teas.

Supplement Regulation

Unlike prescription weight loss pharmaceuticals, weight loss supplements do not need the backing of scientific research to be produced and sold. This difference in regulation occurs because the Food and Drug Administration (FDA) classifies weight loss supplements under the umbrella of foods, not drugs.¹ ² The Dietary Supplement Health and Education Act (DSHEA) of 1994 defined dietary supplements and created a regulatory framework for the safety and labeling of dietary substances.¹

By law, the manufacturer must include the following information on its supplement label: a descriptive name of the product stating that it is a “supplement,” the name and address of the manufacturer, a complete list of the ingredients, and the net contents of the product.¹ In addition, the bottles must have a “Supplement Facts” panel that identifies every ingredient found in the product. If the substance is not listed then it must be printed in the “other ingredient” statement.¹ Therefore, the weight loss supplements do not contain ingredients in addition to those listed on the label.

Under DSHEA, the manufacturer, not the government, determines whether or not the supplement is safe. Also, the manufacturer is also responsible for the research and evidence needed to support its weight loss claims.¹ Moreover, the manufacturer does not have to provide evidence of a product’s safety or effectiveness to the FDA before or after marketing it.¹ For dietary supplements developed after 1994, the manufacturer must demonstrate that a diet supplement’s ingredients are safe unless the ingredient is already part of the food supply.¹ The consumer cannot assume a weight loss supplement is effective and safe based solely on its availability at stores.

In order to remove a dietary supplement from the market, the FDA must prove that it is unsafe.¹ However, the FDA might not have reports from consumers about injuries or illness because companies are not required to forward reports to the FDA.¹ This process of removing a weight loss supplement from the shelves can be lengthy and complicated.

How Weight Loss Occurs

Body weight depends upon the balance between both energy input and output. Energy input refers to the amount of energy that a person consumes in food and drink, while energy output refers to the amount of energy used.² Adjustments in either energy input or energy output can result in weight change. Weight loss can occur by decreasing energy input and/or increasing energy output.³

Energy input decreases when a dieter consumes fewer calories each day. Decreasing calorie consumption can be challenging. However, if a dieter does not feel hungry then less food will be consumed. Satiety, the feeling of satisfaction and fullness that occurs during a meal, halts eating and influences how much food is consumed.² Gastric distention, nutrients in the small intestine, and gastrointestinal hormones send signals to a

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region of the brain that controls appetite called the hypothalamus. When a person experiences satiety, he/she does not feel like eating. Some weight loss supplements claim to make its consumers feel satiated. As a result, the consumer does not feel hungry, eats less food, and loses weight.

The other part of the weight loss equation is energy output. Energy output, also called energy expenditure, refers to the total amount of energy used in a day.² An increase in energy expenditure from increases in basal metabolism and/or physical activity can lead to weight loss. Energy expenditure primarily depends on physical activity and basal metabolism.³ Physical activity includes all action during the 24 hour period, including sleep, housework, and strenuous exercise. The other factor is basal metabolism, the minimal energy the body requires to support itself when resting and awake. Breathing, heartbeat, and body temperature are all examples of body processes that require energy.³ The basal metabolic rate (BMR) is the rate at which the body expends energy for these activities, and it varies according to the individual. Many weight loss supplements claim to work by increasing the metabolic rate.

Cells can obtain their energy for these various processes by metabolizing carbohydrates, proteins, and fats obtained from the diet. Body fat can also be used as an energy source. The process of breaking down stored fat into fatty acids is called lipolysis. The resulting fatty acids circulate in the bloodstream so other cells can obtain them for energy. Fatty acid oxidation is the process by which cells obtain energy from these fatty acids. When lipolysis and fatty acid oxidation are stimulated, body fat is reduced.² Many weight loss supplements claim to increase lipolysis and fatty acid oxidation.⁴ By using certain weight loss supplements, then, the consumer would primarily use body fat as an energy source and would lose body fat as a result.

Alternatively, some weight loss products attempt to reduce body fat by blocking the reverse process, the formation of body fat, also called lipogenesis. A reduction in body fat would result in weight loss.²

Overall, both a decreased energy input and an increased energy output are important components of weight loss. Weight loss supplements theoretically alter energy input or output so the consumer loses weight while also following a moderate diet. The supplements' ingredients supposedly increase satiety, increase energy expenditure, or increase the use of body fat for energy.⁵

Common Ingredients of Weight Loss Supplements

The components of weight loss supplements are intended to support weight loss. Though the amount and type of ingredient varies by product, some ingredients are found in the majority of supplements. Some of the common ingredients are hydroxycitric acid, caffeine, yerba mate, Epigallocatechin gallate, and chromium picolinate.

Hydroxycitric Acid

Hydroxycitric acid (HCA) is the active ingredient of an extract derived from *Garcinia cambogia* or *Garcinia indica*, plants native to India.⁶ Products containing HCA include Hydroxycut®, Metabolife® Ephedra-Free, Mega T™ Green Tea Dietary Supplement, Metabolite™, Metabolite™ Ultra, Ultra Burn™, and Citrimax™. The products generally list *Garcinia cambogia* as the ingredient along with the percentage of HCA the *Garcinia cambogia* contains. For example, Citrimax™, a product primarily composed of *Garcinia cambogia*, contains 250 mg of HCA per pill.

HCA purportedly causes fat loss by reducing lipogenesis and curbing appetite.⁷ HCA does inhibit an enzyme involved in lipogenesis. However, the role of HCA in actual body fat reduction is uncertain. Researchers have conducted studies, but none have provided conclusive evidence of HCA's efficacy for weight loss. Five of the seven studies have not been published in peer-reviewed journals.⁷

In most of the studies, HCA was used in combination with other weight loss agents. Therefore, the usefulness of HCA itself could not be determined. A study published in 1998 by the Journal of the American Medical Association showed that subjects using HCA did not lose significantly more weight than subjects using a placebo.⁶

In addition, the mechanism for weight loss via HCA is questionable. Most of the body's stored fat comes from dietary fat, not from lipogenesis, the conversion of carbohydrates into fat.³ Therefore, the reduction of lipogenesis within the body, the hypothesized action of HCA, would not have a significant impact on a person's amount of stored fat.⁷

HCA is considered safe. No adverse effects have been reported in the literature.⁷ Daily intake of HCA should range between 750-1500 mg/day.^{6,8} Scientific research does not support significant weight loss with HCA usage. More research

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studies need to be done on HCA without other slimming agents.⁶

Caffeine

Caffeine is a xanthine alkaloid found in tea leaves, cocoa, coffee, guarana (a seed from an Amazonian shrub), and kola nut (a nut from two evergreen trees of the cocoa family in tropical North Africa).⁹

Products containing caffeine include Stacker 2®, Xtreme Lean™, Hydroxycut®, Xenadrine® EFX, Ripped Fuel®, and Diet Fuel®. Most of the weight loss supplements contain caffeine. It might be listed as an individual ingredient or as a plant component. A typical dose ranges from 50-200 mg per pill. Yerba mate, green tea, cocoa, guarana, and kola are all used as caffeine sources.

Caffeine is a stimulant that increases alertness, heart rate, urine production, and blood pressure. In addition, caffeine can interrupt sleep and cause nervousness and irritability. Caffeine can suppress appetite, but the effects are short lived and do not last long enough to produce significant weight loss.¹⁰

Evidence shows that caffeine increases free fatty acid levels in the bloodstream and spares glycogen, the storage form of glucose, in endurance events.⁷ In other words, it enhances the use of fat instead of glucose for energy during endurance exercise. This effect is useful for endurance activities but not for dieting.

Caffeine does not have a significant effect on energy expenditure, even with dosages of 600 mg per day.^{7, 11, 12}

Caffeine is generally safe for consumption according to the FDA.¹³ Caffeine does not accumulate in the bloodstream or body and is normally excreted within several hours following consumption.¹³ Large doses of caffeine can cause nervousness, anxiety, insomnia, gastrointestinal discomfort, and dependence.

Daily intake of caffeine should not exceed 300 mg, but this amount varies from person to person.¹³ Though caffeine is the major component of many weight loss supplements, it has no documented effect on weight loss.^{7, 11} It can, however, increase the availability of free fatty acids during endurance events such as long distance running.

Yerba Mate

Yerba mate extract is derived from the leaves of an Amazonian evergreen tree, *Ilex paraguariensis*. The primary ingredients are xanthine alkaloids (caffeine, theobromine, and theophylline), saponins, and chlorogenic acid.⁹ The components responsible for supposed weight loss effects have not been identified.⁹

Products containing yerba mate include Herbalife®, Metabolife® Ephedra-Free, Xtreme Lean™, Advanced Formula Xtreme Lean™, Metabolite™, TruLean™, and yerba mate tea. The products generally list yerba mate with the percentage of caffeine the yerba mate contains.

Yerba mate tea is the most popular beverage in South America. However, yerba mate is also used for medicinal purposes. For example, some South Americans and Europeans use yerba mate for fatigue, depression, weight loss, and diuresis.

Appetite suppression and an increase in fatty acid oxidation might be responsible for the weight loss that supposedly occurs with yerba mate usage. A study in Switzerland connected yerba mate usage with an increase in fatty acid oxidation, the breakdown of fat for energy. However, the study did not correlate yerba mate with weight loss.⁹ Another study using yerba mate along with damiana and guarana, two other plant medicinals, showed that the use of the three plants slowed gastric emptying, which made subjects feel full longer and led to decreased calorie consumption and subsequent weight loss.¹⁴ No research has been done in the United States. Overall, a limited amount of research exists.

Yerba mate is considered safe according to the FDA.⁹ South American countries have used yerba mate to treat a variety of conditions over the past hundreds of years. However, scientific evidence for its role in weight loss is limited.⁹ Since yerba mate contains caffeine, daily consumption should not exceed 300 mg caffeine, which equals four cups of yerba mate tea.^{9, 13}

Epigallocatechin Gallate (EGCG)

EGCG is a strong polyphenol, phenolic compounds known for their antioxidant properties, found in green tea extract.¹⁵ Green tea comes from the leaves of the plant *Camellia sinensis*.

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Xenadrine® EFX, Herbalife®, Metabolife® Ephedra-Free, Ripped Fuel®, Hydroxycut®, Stacker 2®, Mega-T™ Green Tea Dietary Supplement, Xtreme Lean™, Advanced Formula Xtreme Lean™, Diet Fuel®, TruLean™, Chromaslim®, Dexatrim Results™, and Metabolift® all contain EGCG derived from green tea extract. For example, Mega-T™ and Dexatrim Results™ contain 90 mg of EGCG per pill. EGCG is safe to use in supplement form or in green tea.¹⁵

Green tea is both a social beverage and a medicinal in Asian countries. Traditional Chinese Medicine uses green tea to relieve indigestion, for detoxification, and to increase energy.¹⁵ Diet supplements rely on green tea extract as a source of EGCG, which supposedly reduces appetite and promotes fat oxidation.¹⁵ One study in the American Journal of Clinical Nutrition showed that green tea extract usage led to a four percent increase of energy expenditure and an increase in fatty acid oxidation.¹⁶ This finding was not due to the caffeine content of green tea. Caffeine alone had a small, insignificant effect on energy expenditure and no effect on fatty acid oxidation. Researchers theorized that the polyphenols, primarily EGCG, were responsible for green tea's effects.¹⁶ Though this study provided evidence that EGCG increases metabolism, it did not show a connection to weight loss. Overall the scientific research on green tea is limited.

Chromium Picolinate

Chromium picolinate and chromium nicolinate, a similar compound, are organic derivatives of chromium, an element necessary for normal carbohydrate and lipid metabolism.³ Chromium aids in the uptake of glucose for energy by the body's cells.

Product examples include Chromaslim®, Chromic Fuel®, T-lite®, Mega-T™, Fat Burners, Metabolite™, Dexatrim® without caffeine, Citrimax™, and Metabolife® Ephedra-Free. A typical dose contains 50-200 micrograms (mcg). For example, Chromic Fuel® contains 200 mcg of chromium picolinate per pill.

Chromium is an essential mineral required for glucose uptake. The FDA's recommendation for daily chromium intake is 25 mcg/day for women aged 19-30 and 35 mcg/day for men aged 19-30.¹⁷ Most supplements contain 100-200 mcg of chromium picolinate per capsule. Supposedly, the supplemental chromium increases energy expenditure by enhancing glucose uptake by cells. It also increases satiety.³

Scientific research suggests that chromium may not help dieters lose weight, though chromium does play a role in glucose uptake. Its connection to weight loss is uncertain.^{3,7} Some studies have demonstrated that chromium supplementation leads to fat loss when combined with exercise, but the study methods have been criticized. Other studies have shown that chromium has no effect on weight loss.⁷ Overall the research does not support a connection of chromium picolinate to weight loss. Though a certain amount of chromium is essential for normal body function, consumption beyond the official recommendations does not provide additional benefits or weight loss.³

Overconsumption of chromium does not provide additional benefits, but it most likely will not lead to toxicity. An upper limit, based on research gathered by an FDA committee, gives a daily intake level beyond which adverse effects might occur. Chromium does not have an upper limit because few adverse effects have been associated with excess chromium consumption.¹⁸

Though an upper limit does not exist, excess chromium intake might have the potential for adverse effects. Currently, data on adverse effects is limited. Therefore, supplement users should take caution and consume no more than the label indicates.¹⁸ Case reports of kidney or renal damage have not been convincingly associated with excess dietary or supplemental chromium. However, individuals with preexisting renal and liver disease may be susceptible to adverse effects and should, therefore, consume no more than 25-35 mcg per day.¹⁸

Overall, the recommended daily intake for chromium is 25-35 micrograms per day, but an upper limit for intake is not needed based on research findings. However, supplement users should still take caution and follow the label's instructions. Chromium is essential for body function, but excess consumption does not benefit the healthy individual. Moreover, scientific evidence does not support weight loss through chromium picolinate supplementation.⁷

Other Ingredients

Capsaicin is the major ingredient of hot chilies, peppers, and other spicy food dishes. Weight loss supplements such as Optislim 2000® contain this spice, which supposedly increases weight loss through appetite reduction and metabolism increase. No evidence exists to support usage of capsaicin, though the spiciness could add variety to a diet.⁷

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Carnitine supposedly increases fat metabolism to cause weight loss. Found naturally in muscle, carnitine aids in fat oxidation for energy.³ Taking a supplement with carnitine, however, does not increase carnitine levels in the muscle.⁷ Therefore, supplemental carnitine cannot affect fat metabolism. No controlled studies on weight loss effects have been published, and no adverse affects have been noted with usage.

Chitosan is derived from the powdered shells of marine crustaceans such as prawns and crabs. Supposedly chitosan binds to dietary fat to prevent fat absorption during digestion. Some studies support that chitosan works with a reduced calorie diet, but another study shows no effect on weight loss.⁷ Overall, the research evidence does not support weight loss, and no adverse effects have been noted.¹⁹ If chitosan is effective at fat absorption then malabsorption of essential nutrients is possible.⁷ However, chitosan is not a proven fat blocker.

Citrus Aurantium is an ingredient of Herbalife®, Ripped Fuel®, and other weight loss supplements. Many supplement companies have replaced ephedra with citrus aurantium.²⁰ It purportedly increases metabolism, but more research needs to be done to assess this claim and its safety.

Ephedra or **ma huang**, a Chinese herb, contains ephedrine, an adrenaline-like compound that stimulates the central nervous system, increases blood pressure and heart rate, decreases appetite, and increases energy.²¹ Diet supplements typically combine ephedra with caffeine (usually from guarana) and salicylic acid (usually from white willow bark) to maximize its weight loss effects.

Several consumer claims against ephedra led the government to question its use in diet supplements.²² The FDA supported a RAND Corporation study that reviewed ephedra health claims and scientific research. It ultimately concluded that ephedra might be associated with health risks and a limited amount of weight loss.²³ Due to these findings, in February 2003, the FDA announced actions it would take to protect Americans from the potential risks.²¹ The FDA also proposed to limit the manufacturing and marketing of ephedra-based dietary supplements, and many companies have already followed suit, discontinuing ephedra lines and marketing their 'ephedra-free' products.²²

More recently, in December 2003, the FDA stated that dietary supplements containing ephedra should not be consumed

due to unreasonable risk for illness or injury. The FDA also warned manufacturers that it intends to prohibit the sale of products containing ephedra.²⁴

St. John's Wort is an herb commonly used to treat depression in Europe. However, this herbal remedy is also a component of some diet supplements, including Metabolift® and Ripped Fuel®. Studies have indicated that St. John's Wort has antidepressant effects, but no evidence connects it with weight loss.^{7, 25} Researchers have suggested that the antidepressant effect might reduce depression-related eating.⁷ Though St. John's Wort is safe for consumption, it interacts with certain drugs used to control HIV infection and to treat cancer.²⁵

Slimming Teas

A few examples of slimming teas are Traditional Medicinals® Weight Control tea, Yogi Tea® Fasting™ tea, and Trim Maxx® tea. The teas are usually steeped for five to fifteen minutes and consumed prior to sleeping. Weight loss or slimming teas contain ingredients such as dandelion, gotu kola, parsley, shitake mushrooms, reishi mushrooms, uva ursi, wild yam, astragalus, goldenseal, senna, cascara sagrada, juniper, dandelion leaves, aloe, rhubarb root, buckthorn, and castor oil.^{5, 26, 27}

These substances have a laxative effect but not a weight loss effect.²⁶ Any weight loss that does occur is minor, temporary, and due to water loss.^{5, 26} Some consumers believe that increased bowel movements will prevent absorption of food, thereby decreasing the body's calorie intake.³ However, the majority of food absorption occurs in the small intestine before the food material reaches the colon, the site of laxative action.^{3, 26} Accordingly, in 1995 the Food Advisory Committee of the FDA concluded that laxative-induced diarrhea does not significantly reduce calorie absorption.²⁶

The teas can be safe when used according to the instructions. However, individuals may respond differently to the tea and might not want to drink less tea than the label recommends.²⁶ First-time users who drink more than the recommended amount might experience short-term effects. These effects include stomach cramps, nausea, vomiting, and diarrhea lasting several days. Chronic effects, including severe pain and constipation from loss of colon function, usually occur when people use the products for years.

Life-threatening results usually occur in individuals who are already nutritionally compromised, including drastic

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dieters, anorexics, and bulimics. Fainting and dehydration are possible. Also, electrolyte disorders due to low potassium can lead to irregular heartbeat, paralysis, or even death.^{26, 27} The FDA is considering whether or not to add a warning to the product label.²⁶

Slimming teas are ineffective products for weight loss. In addition, chronic consumption can lead to negative side effects and severe consequences in nutritionally compromised individuals. Consumers should follow instructions carefully when using slimming teas and other supplements containing diuretics. Product use should be discontinued if diarrhea, loose stools, or stomach pain develop.

The ingredients found in weight loss supplements are generally safe, but their usefulness in weight loss is less certain. In most cases, not enough research has been done to verify an ingredient's efficacy. Other ingredients, such as chromium picolinate, clearly do not affect weight loss. At the very least, taking a weight loss supplement might give a dieter a psychological boost to follow a diet.

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References:

1. Center for Food Safety and Applied Nutrition. Overview of dietary supplements. Available at: <http://www.cfsan.fda.gov/dms/ds-oview.html>. Accessed September 15, 2003.
2. Whitney EN, Cataldo CB, Rolfes SR. *Understanding Normal and Clinical Nutrition*. Stamford: Wadsworth; 2002.
3. Wardlow G. *Perspectives in Nutrition*. New York: McGraw-Hill Companies; 1999.
4. Weight loss dietary supplements. Available at: <http://www.weight-loss-dietary-supplements.com>. Accessed August 26, 2003.
5. W3Commerce. Weight loss dietary supplements. Available at: http://www.weight-loss-dietary-supplements.com/html/dietary_supplements.com/html/dietary_supplements_secrets.html. Accessed August 26, 2003.
6. Heymsfield SB, Allison DB, Vasselli JR, Pietrobelli A, Greensfield D, Nunez C. *Garcinia cambogia* (hydroxycitric acid) as a potential antiobesity agent. *Journal of the American Medical Association*. November 11, 1998;280(18):1596-1600.
7. Egger G, Cameron-Smith D, Stanton R. The effectiveness of popular, non-prescription weight loss supplements. *The Medical Journal of Australia*. 1999;171:604-608.
8. Schardt D. Fat burners. *Nutrition Action Newsletter*; 1999.
9. Taylor L. *Herbal Secrets of the Rainforest*. Vol 2003. London: Sage Press; 2003.
10. Mayo Clinic. Caffeine: does it help you lose weight? Available at: <http://www.MayoClinic.com>. Accessed September 18, 2003.
11. Boozer CN, Daly PA, Homel P, et al. Herbal ephedra/caffeine for weight loss: a 6-month randomized safety and efficacy trial. *International Journal of Obesity*. 2002;26:593-604.
12. Astrup A, Breum L, Toubro S, Hein P, Quaade F. The effect and safety of an ephedrine/caffeine compound compared to ephedrine, caffeine and placebo in obese subjects on an energy restricted diet. *International Journal of Obesity Related Metabolic Disorders*. April 1992;16(4):269-277.
13. International Food Information Council. Everything you need to know about caffeine. Available at: <http://www.ific.org>. Accessed October 28, 2003.
14. Anderson T, Fogh J. Weight loss and delayed gastric emptying following a South American herbal preparation in overweight patients. *Journal of Human Nutrition and Dietetics*. June 2001;14(3):243.
15. MotherNature.com. Epigallocatechin Gallate. Available at: www.mothenature.com/Library?Ency?Index.cfm?id=2102007. Accessed September 25, 2003.
16. Dulloo AG, Curet C, Rohrer D, et al. Efficacy of a green tea extract rich in catechin polyphenols and caffeine in increasing 24-h energy expenditure and fat oxidation in humans. *American Journal of Clinical Nutrition*. 1999;70:1040-1045.
17. Trumbo P, Yates A, Schlicker S, Poos M. Dietary Reference Intakes. *Journal of the American Dietetic Association*. March 2001;101(3):43a-43g.
18. Standing Committee on the Scientific Evaluation of Dietary Reference Intakes at the Food and Nutrition Board of the Institute of Medicine. *Dietary Reference Intakes for Vitamin A, Vitamin K, Arsenic, Boron, Chromium, Copper, Iodine, Iron, Manganese, Molybdenum, Nickel, Silicon, Vanadium, and Zinc*. Washington, D.C.: National Academy Press; 1998.
19. Pittler MH, Abbot NC, Harkness EF, Ernst E. Randomized, double-blind trial of chitosan for body weight reduction. *European Journal of Clinical Nutrition*. May 1999;53(5):379-381.
20. Preuss HG, DiFerdinando D, Bagchi M, Bagchi D. Citrus aurantium as a thermogenic, weight-reduction replacement for ephedra: an overview. *Journal of Medicine*. 2002;33(1-4):247-264.
21. Food and Drug Administration. HHS acts to reduce potential risks of dietary supplements containing ephedra. Available at: <http://www.fda.gov/bbs/topics/NEWS/2003/NEW00875.html>. Accessed September 16, 2003.
22. American Heart Association. American Heart Association urges ban of popular dietary supplements. Available at: <http://www.americanheart.org/presenter/jhtml?identifier=3010678>. Accessed August 14, 2003.
23. Food and Drug Administration. Evidence on the safety and effectiveness of ephedra: implications for regulation. Available at: <http://www.fda.gov/bbs/topics/NEWS/ephedra/whitepaper.html>. Accessed September 15, 2003.
24. Food and Drug Administration. FDA Plans Regulation Prohibiting Sale of Ephedra-Containing Dietary Supplements. Available at: www.fda.gov. Accessed January 27, 2004.

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25. National Center for Complementary and Alternative Medicine. St. John's Wort and the treatment of depression. Available at: <http://www.nccam.nih.gov/health/stjohnswort/index.htm>. Accessed September 26, 2003.
26. Kurtzweil P. Dieter's brews make tea time a dangerous affair. *FDA Consumer*; 1997.
27. Mayo Clinic. Herbal diet pills. Available at: <http://www.MayoClinic.com>. Accessed September 18, 2003.

Fluid Diet: More Liquids to Lose Weight?

Yumiko Nagase Lee

Both commercial diets and common myth purport that drinking water aids in weight loss. In actuality, based on a review of recent studies, a fluid diet is not efficacious in a weight-loss process. Regardless of its type or temperature, scientific evidence refutes the hypothesis that large quantities of liquid can enhance weight loss over a long period of time. However, it has been shown one's health can be improved through increased fluid consumption, as in the case of helping prevent mild chronic dehydration. Intake of fluids, especially water, is essential to sustain normal physiological functions. The exact amount of fluid needed can vary for each individual, their energy expenditure, and environmental conditions.

Americans have become overly obsessed with weight reduction. People are interested in diets and discussing their body images. On the contrary, according to the National Health and Nutrition Examination Survey II (NHANES II, 1976-1980),¹ the number of obese individuals increased to 34 billion, of whom 13 million were severely obese, defined as a Body Mass Index (BMI) of 30.0 or greater. In accordance with NHANES III (1988-1991), 33% of Americans (58 million) are obese.² For obesity related health care in 1995, health economists predicted that Americans spent about \$99.2 billion.³ On the other hand, the government has recognized that obesity is a serious public health concern. *Healthy People 2000* included a goal for reducing obesity prevalence in the United States to less than 20%.⁴

Most adults should maintain a constant body weight by balancing between energy intake and energy expenditure. There is no biological reason to suggest that body weight should increase as one ages; there is more evidence to the contrary.^{5,6} When the balance between energy input and energy use collapses, weight gain or reduction will occur. For instance, if you consume more energy than your body requires, you will gain weight. In contrast, if you consume less energy than you actually need or you use, you will lose weight. Today, many people suffer from energy imbalance regardless of age. Weight maintenance is one of the most difficult tasks when someone has an energy imbalance. With societal pressures of being thin and the fact that more people are gaining weight, many may have tried one or

more diets to lose pounds and inches. However, the effectiveness of those diets might not be examined carefully enough for us to understand them.

There are a multitude of diets in existence, including the cabbage diet, the apple diet, the chicken soup diet, the high protein diet, the Zone diet, and even diets comprised of special supplements and medications to reduce weight. For some, in order to attain their ideal weights, special treatments such as seeking help from a health care professional, joining a commercial program, or taking supplements may be attractive. Nevertheless, the necessity of those treatments is questionable. Such decisions as whether to use complementary or alternative medicine are also important health care choices.

Another popular weight loss strategy, which has been around for a while but has never been vigilantly scrutinized before, is the "fluid diet." This diet allegedly decreases weight through increasing satiety and metabolism solely by drinking water. In this article, the fluid diet will be examined, including the physiological factors, fluid selection, obesity food choices, and adverse effects.

What Is The Fluid Diet?

Many commercial-based diet websites claim drinking enough fluids between meals, especially water, can help reduce weight. These websites claim fullness caused by water can

Maintaining Weight

Energy Input = Energy Used

• FLUID DIET •

help reduce the appetite. Unfortunately, there is no scientific evidence supporting this claim you may have seen on websites. We truly do not know if the claims are reliable when there are no listed authors and clinical trial articles to support the assertions. Unknown, unqualified, and undocumented diet specialists on many websites indicate a lack of water consumption causes Americans to eat unbalanced and unhealthy diets, and often these diets are much higher in both calories and fat. There is no instruction for how much water consumption is necessary to lose weight for this diet strategy. Many people simply choose to drink as much water as possible between their meals for the purpose of losing weight. The websites state that the result of this diet may vary with individuals. Interestingly, successful dieters contend that by drinking water, instead of eating snacks, they can regulate their food intake and feel better by possibly recovering from chronic dehydration, even though they might not necessarily lose weight directly from this diet plan.

According to the Institute of Medicine (IOM) and the Food and Nutrition Board (FNB), who develop Dietary Reference Intakes (DNIs) for nutrients, the official recommendation of daily water intake is under investigation.⁷ The recommendation of drinking eight glasses of water every day may not be true. The amount of water you should consume will depend on individual needs. It is not known exactly how much fluid intake is scientifically 'enough' for a day. However, we all know that an individual needs to consume as much water as he/she excretes in a day to maintain a normal body function.

Physiology Behind Water Intake Concepts

Water constitutes 40% to 60% of the total body mass. In healthy individuals, water intake is controlled mainly by thirst. The human body demands water intake when it feels thirsty. Thirst control centers are located in the ventromedial and anterior hypothalamus, close to the centers that regulate the antidiuretic hormone (ADH). Thirst is stimulated when osmolality increases or extracellular volume decreases.⁸ The body has no provision for water storage; therefore, the amount of water lost every 24 hours must be replaced to maintain health and body efficiency. Under ordinary circumstances, a reasonable allowance based on recommended caloric intake is 1 ml/kcal for adults which translates to 35 ml/kg of usual body weight.⁸ Based on the information, if you weigh 130 pounds (lb) (58.5 kilogram (kg)), for instance, you should drink about 2 liters (L) of water every day. Furthermore, according to *Sports and Exercise Nutrition*, by William McArdle, an adult requires 2.5 L (2.5 to 3 quarts) of water each day for a normal condition. Water can be consumed

through three different sources: 1) liquids; 2) foods; and 3) metabolic processes. Normally the average individual consumes 1.2L or 41 ounces (oz) of water in liquid form, 1 L from foods, particularly fruits and vegetables, and 0.3 L from metabolic water production during energy-yielding reactions. This amount is the minimum requirement to replace water lost from urine and feces, the skin, and vapor in expired air each day.⁹ The water requirement fluctuates with environmental conditions, body conditions, and behaviors. The human requires more water in hot weather, with high body temperature, and during and after exercises.

In regard to human physiological function, drinking excess water, such as drinking 10 L of water intentionally, will promote more elimination from your body rather than facilitation of weight loss. You may need to urinate many times in a day, but you may not necessarily reduce weight. Nonetheless, many commercial dieting companies recommend this specific diet for the following three reasons.

(1) Increase of water intake will facilitate increase of fat degradation in liver because water is the activator of this mechanism.

The important functions of lipids in the body include 1) energy reserve; 2) protection of vital organs; 3) thermal insulation; and 4) transport medium for fat-soluble vitamins. Although it is clear that fat can provide critical functions, it still remains important to get rid of unwanted, excess fat when overweight or obese. In general, fat for those overweight people is unnecessary and should be eliminated to be healthy. Although the establishment of muscle is the most efficient way of reducing fat mass, many people do not want to spend time and energy exercising. "Melting fat" without losing muscle is one of the most attractive catch phrases for those people who want to lose only fat by drinking water. Three water molecules are required to break down a triglyceride molecule (fat) into glycerol and three fatty acid molecules. The claim is that water must initiate fat degradation, and as you drink more water, you should lose triglycerol molecules from you body.¹⁰ Unfortunately, since the body has to maintain osmolality, water molecules will not reach adipose tissue (fat) to change its metabolic rate. Therefore, drinking large quantities of water may not facilitate fat degradation.

(2) Drinking cold water induces weight loss due to a reduction of body temperature.

By drinking cold water, the body works harder to increase its temperature; thereby, increasing energy expenditure.

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important to remember that calorie-free beverages will not cause weight gain, and they may not help weight loss.²⁰

Types of Fluids and Your Appetite

It is important to note that energy dense drinks not only do not increase satiety, but also provide unwanted extra calories. According to the USDA National Nutrient Database for Standard Reference, Release 16 provides data for different types of beverages. Whereas water has no calories, a 12 oz regular beer is 150 kcal, 6 oz of fruit juice is 85 kcal, 1 cup of whole milk is 150 kcal.²¹ Hence, it is important to drink water, not other types of beverages, when a person is thirsty. Coffee and tea (without sweetener added) also do not have any calories; however, these beverages do have a diuretic effect.

Liquid meal replacement is a popular diet strategy in the United States. However, there has not been enough research or systematic assessments completed on the safety and effectiveness of a meal replacement regimen for weight management. This type of diet may provide sufficient amounts of nutrients, but the value of an enjoyable mealtime is very important to our lives and can provide us with satiety.²² Satiety is not only gained from proper nutrients, but also from the sight, taste and texture of balanced foods. Although this popular diet strategy can help initial weight loss, the short-term use does not substitute for a long-term healthy eating pattern that must be a lifetime commitment in order to achieve and maintain a healthy weight.²³

The Nationwide Food Consumption Surveys indicate another important reason for drinking water other than for weight loss promotion. Chronic, mild dehydration is rampant among the U.S. population. Some factors that may increase the likelihood of this chronic, mild dehydration include poor thirst mechanism and common consumption of natural diuretics such as caffeinated drinks and alcohol. It is important for people to understand the importance of fluid intake.²⁴ When one is thirsty, always reach for water.

The Obese and Their Food Choices

The Surgeon General, the National Academy of Sciences, the American Heart Association, and the American Dietetic Association all advocate the reduction of fat intake to 30% or less of calories. However, a survey conducted by the National Center for Health Statistics (NCHS) found that the proportion of U.S. adults who are overweight increased from 8% to 33% in the past decade. Many studies supported that

counting grams of fat is not the only the contributing factor for the overweight epidemic in the United States. Excess energy intake might be the key for weight control. According to the latest NHANES III, the total average energy intake by adults increased from 1969 calories to 2200 calories during the time period between 1978 and 1990.⁸

Human obesity is considered to be the result of an interaction of genetic and environmental variables such as diet. Although the precise contribution of diet is still unclear, both energy intake and the composition of diet may play major roles in weight regulation. Interestingly, studies on sugar and fat preferences among obese women showed that preferences for fat increased with body weight.^{16,25} Massively obese women selected fat, rich taste, and they chose meals with a greater proportion of fat.¹⁶ Obese men and women may overconsume fat from different sources. In one study, obese women were asked to list their top ten favorite foods. Those listed were bread, doughnuts, cake, cookies, ice cream, chocolate, pies, and other desserts.²⁶ In contrast, obese men listed steaks, roasts, hamburgers, french-fried potatoes, pizza, and ice cream. In both cases, males and females preferred eating energy dense food rather than water or less dense food regardless of the forms or types of food.²⁶ However, according to a study conducted by Rolls et al., there was no significant difference between the macronutrient composition for rating hunger and fullness between meals.²⁷ It is important to note that every calorie counts for a weight gain. Energy density of a diet is important. Because fat is ~9 kcal/g, whereas carbohydrate and protein are ~4 kcal/g, limitation of dietary fat as well as alcohol (7 kcal/g) are effective means to reduce both energy density and total energy intake.⁶ Since alcohol contains a higher caloric density than protein and carbohydrates, individuals who choose to consume alcohol should be aware that it is a source of “empty” calories. Another study conducted by Kirkmeyer and Mattes discovered that energy content of food rather than the relative importance of a food’s macronutrient composition might be the primary determinant of a food’s impact on hunger.^{28, 29}

Adverse Effects of the Fluid Diet

Water intoxication occurs as a result of an excess of water in intracellular fluid (ICF) volume and is accompanied by osmolar dilution. As described above, there is no concrete measurement of how much is too much water for the normal human body. Drinking unlimited amounts of water may cause cells to enlarge and burst. For example, after remaining in a swimming pool for an extended period of time, you begin to experience swelling in the hands. The increased volume of

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ICF causes the cells particularly brain cells, to swell, leading to symptoms of headache, nausea, vomiting, muscle twitching, convulsions with impending stupor, and possibly death. Papilledema, blurring of vision, and blindness may also result.⁸ An increase of body fluids may cause high blood pressure due to increased blood volume. Some observational and experimental studies indicate that weight is directly associated with blood pressure and hypertension.²⁸

Conclusion

While eating can be considered one of life's greatest pleasures, the act of limiting one's caloric intake also has become desirable as a means to attain and maintain the perfect weight. Food consumption control is one of the techniques to reduce weight and inches. There are many types of diets and finding the right one may be the most difficult task when someone is trying to lose weight. However, the basis of a good diet is the balance between matching intake energy to overall energy needs. If one consumes more excess energy intake than what is required for their energy needs, weight will be gained. Drinking water can help reduce appetite for a short period of time, but in the long term, a water diet will not provide a positive result for the reason of weight loss. However, drinking water can help reduce chronic mild dehydration. It is important to drink water, which does not contain any calories, when you are thirsty. The human body must be replenished with water every 24 hours to maintain normal body functions. The inclusion of physical activity into a life pattern also can help achieve the balance of energy expenditure with energy intake. When someone is involved in physical activity, the water intake requirement increases. A balance of good nutrition, including water intake, and physical activity are important components for maintaining a healthy life.

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References:

1. U.S. Department of Health and Human Services & Centers for Disease Control and Prevention. National Center for Health Statistics. July 2002. Available at: http://ccc.cdc.gov/mchs/about/major/nhances/survey_results_and_products.htm.
2. Kuczmarski RJ, Flegal KM, Campbell SM, Johnson CL. Increasing prevalence of overweight among US adults. The National Health and Nutrition Examination Surveys, 1960 to 1991. *Journal of American Medical Association*. 1994;272(3):205-211.
3. Wolf AM, Colditz GA. Current estimates of the economic cost of obesity in the United States. *Obesity Research*. 1998;6(2):97.
4. United States Department of Health and Human Services. *Healthy People 2000: National health promotion and disease prevention objectives*. Washington D.C.: U.S. Government Printing Office; 1991.
5. Langseth L, Vanderveen J, Frattali V. The new reference daily intakes: For better or for worse? *Nutritional Reviews*. 1992;50(4):119-124.
6. Krauss MR, Eckel HL, Harword B, Apple JL. American Heart Association Scientific Statement: AHA Dietary Guidelines. Revision 2000: A Statement for Health Care Professionals From the Nutrition Committee of the American Heart Association. *Circulation*. 2000;102:2284.
7. Institutes of Medicine. *Dietary Reference Intake for Electrolytes and Water*: Institute of Medicine of the National Academy; 2003.
8. Mahan LK, Escott-Stump S. *Krause's Food, Nutrition, and Diet Therapy*. 10th ed. Philadelphia: W.B. Saunders Company; 2000.
9. McArdle WD, Katch FI, Katch VL. *Sports & Exercise Nutrition*. Hagerstown: Lippincott Williams & Wilkins; 1999.
10. Ettinger S. Macronutrients: Carbohydrates, Proteins, and Lipids. In: Mahan L, Escotte-Stump, S., ed. *Food, Nutrition, & Diet Therapy*. 10th edition ed. Philadelphia: A Harcourt Health Science Company; 2000:43.
11. Johnson RK. Energy. In: Mahan K, Escott-Stump, S., ed. *Food, Nutrition, & Diet Therapy*. 10th edition ed. Philadelphia: A Harcourt Health Science Company; 2000:19.
12. Layton J. Does drinking ice water burn calories? Available at: www.sciencenet.org.uk. Accessed November 4, 2003.
13. Blundell JE, Lawton CL, Hill AJ. Mechanisms of appetite control and their abnormalities in obese patients. *Hormone Research*. 1993;39(supple 3):72.
14. Hall WL, Milward DJ, Rogers PJ, Morgan ML. Physiological mechanisms mediating aspartame-induced satiety. *Physiology and Behavior*. 2003;78(4-5):557-562.
15. Rolls BJ, Kim S, Ingrid CF. Effects of drinks sweetened with sucrose or aspartame on hunger, thirst and food intake in men. *Physiology and Behavior*. 1990;48(1):19-26.
16. Drewnowski A, Massien C, Louis-Sylvestre J, Fricker J, Chapelot D, Apfelbaum M. The effects of aspartame versus sucrose on motivational ratings, taste preferences and energy intakes in obese and lean women. *International Journal of Obesity*. 1994;18:570-578.
17. Hollie RA, Leonard EH. Effects of sensory stimulation and postingestive consequences on satiation. *Physiology and Behavior*. 2000;70(5):465-470.
18. Lappalainen R, Mennen L, van Weert L, Mykkanen H. Drinking water with a meal: A simple method of coping with feeling of hunger, satiety and desire to eat. *European Journal of Clinical Nutrition*. 1993;47(11):815-819.
19. Almiron-Roig E, Drewnowski A. Hunger, thirst, and energy intakes following consumption of caloric beverages. *Physiology and Behavior*. 2003;79(4-5):767-773.
20. Rolls BJ, Bell EA, Thorwart ML. Water incorporated into a food but not served with a food decreases energy intake in lean women. *American Journal of Clinical Nutrition*. 1999;70(4):448-455.
21. United States Department of Agriculture. *USDA National Nutrient Database for Standard Reference, Release 16*: USDA; 2003.
22. Heymsfield SB, van Mierlo CA, van der Knaap HC, Heo M, Frier HI. Weight management using a meal replacement strategy: Meta and pooling analysis from six studies. *International Journal of Obesity and Related Metabolic Disorders*. 2003;27(5):537-549.
23. Rothacker DQ, Staniszewski BA, Ellis PK. Liquid meal replacement vs traditional food: A potential model for women who cannot maintain eating habit change. *Journal of the American Dietetic Association*. 2001;101(3):345-347.
24. Kleiner SM. Water: An essential but overlooked nutrient. *Journal of American Dietetic Association*. 1999;99(2):

• FLUID DIET •

- 200-206.
25. Drewnowski A, Brunzell JD, Sande K, Iverius PH, Greenwood MRC. Sweet tooth reconsidered: Taste responsiveness in human obesity. *Physiological Behavior*. 1985;35:617-622.
 26. Drewnowski A, Kurth C, Holden-Wiltse J, Saari J. Food preferences in human obesity: Carbohydrates versus fats. *Appetite*. 1992;18:207-221.
 27. Rolls BJ, Kim S, McNelis AL, Fischman MW, Foltin R, Moran TH. Time course of effects of preloads high in fat or carbohydrate on food intake and hunger ratings in humans. *The American Journal of Physiology*. 1991;260(4):R756-763.
 28. Stamler J. Epidemiologic findings on body mass and blood pressure in adults. *Annual Epidemiology*. 1991;1: 347-362.
 29. Kirkmeyer SV, Mattes RD. Effects of food attributes on hunger and food intake. *Obesity*. 2000;24(9):1167-1175.

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