Copyright www.ExerciseCertification.com

Protein Power Book Review

(by the Authors Michael and Mary Eades)

Review by Gus Karageorgos

Authors' main arguments

Like most authors advocating low-carbohydrate eating, Michael and Mary Eades attempt to convince the reader that the increased incidence of obesity and many other diseases of modern-day living (diabetes, high blood pressure, cardiovascular disease, etc.), are in large part, the result of high-carbohydrate diets (and in particular, the excessive intake of refined carbohydrates). While acknowledging the importance of exercise (and in particular, resistance training) in any successful fat-loss program, the authors argue that carbohydrate-rich diets tend to lead to chronic elevations in serum insulin (hyperinsulinemia). Such elevations in serum insulin eventually lead to increase incidence of insulin resistance, diabetes, obesity, high blood pressure, heart disease and many other chronic diseases. Their solution: "a carbohydrate-restricted, moderate-fat, adequate-protein diet that modulates the body's metabolic hormones, including insulin". While recognizing the association between dietary fat and cardiovascular disease, they contend that this occurs "only if you continue to eat a lot of carbohydrate at the same time that you add the fat." Thus, they argue, " if you reduce the amount of carbohydrate when you add the fat, not only will you probably not see any increase; you could even see a reduction in cholesterol levels." The authors are also quite liberal regarding dietary caloric intake on low-carbohydrate eating contending that, "the metabolic alterations that take place as your insulin falls and your sensitivity to it improves increases the rate at which you use calories, and you will find that the standard calorie rules simply don't apply in predicting weight loss".

Authors' Recommendations

For those who have a lot of body fat to lose (need to lose more than 20% of body weight), the authors advocate a very low-carbohydrate (30 grams or less/day), moderate protein (0.6 g/lb. of LBM), fat-rich, ketogenic diet. While recommending a relatively protein-rich diet, they do not advocate "excessive" protein intakes since proteins, themselves, have been shown to elicit an insulin response (even without a commensurate glycemic response). The authors also recommend that carbohydrate sources include foods rich in unrefined, fiber-rich, low-glycemic index (GI) carbohydrates, such as fruits and vegetables.

Such fiber-rich carbohydrates minimize insulin secretion (maximizing the "fat-burning" process) and provide some minerals and vitamins. Realizing that it's almost impossible to get enough of some of these micronutrients on such low levels of carbohydrate intake, the authors then go on to recommend a daily high-quality vitamin supplement. Finally, since ketogenic diets are also known to lead to increased fluid and electrolyte losses (especially potassium and sodium), a 90-mg daily potassium supplement and an increased intake of dietary sodium/fluids are also prescribed. For those who have less fat to lose, want to reduce body fat and build lean tissue (e.g. bodybuilders and athletes), and/or have normal blood lipids, blood pressure, etc., they recommend slightly higher carbohydrate portions (55 grams/day). Finally, during the latter part of the program, where maintenance is the goal, the authors urge you to slowly increase your carbohydrate intake until "you reach a daily carbohydrate gram intake roughly equal to or slightly more than your daily protein intake". Finally, you are warned not to "exceed your prescribed carbohydrate total, (or) you will retain fluid quickly, which will cause a gain in scale weight." When that occurs, the authors recommend that you "drop back to the last carbohydrate gram intake at which your weight remained stable and stay there."

Review and Discussion

While the price (of the paperback edition) of US $6.50 ($8.99 CAN) is very agreeable, there are few (if any) references listed to support many of the authors' claims. While few long-term studies have been done looking specifically at low-carbohydrate, ketogenic diets in healthy subjects, the few studies that have been done in this area do not support many of the authors' claims. For instance:

Do ketogenic diets really improve blood lipid profiles? While any caloric-deficient diet will have some initial favorable effects on blood lipids (as a result of the weight loss), long-term, low-carbohydrate, ketogenic diets have not been shown to provide any added benefits. In fact, most human studies looking at the health benefits/safety of low-carbohydrate, ketogenic diets are not particularly favorable. For instance, fairly long-term, supervised ketogenic diets used in the treatment of pediatric epilepsy show an increase incidence of "kidney stones (3-5%), recurrent infections (2%), metabolic derangements [hyperuricemia (2%), hypocalcemia (2%), decreased amino acid levels, acidosis (2%)], hypercholesterolemia (29-59%), irritability, lethargy" (1). The unfavorable blood lipids and elevated serum cholesterol levels are particularly interesting since such findings have also been reported in a number of other studies looking at low-carbohydrate, ketogenic diets. For instance, in a short-term study looking at the changes in serum cholesterol of a hypocaloric 1,500 low-carbohydrate diet (only 7g carbohydrate/day), "the serum cholesterol increased in every case, from an average base line of 215 mg/100ml to 248 mg/100ml during the diet". (2) This was particularly surprising because (as mentioned above) most hypocaloric diets (even low-carbohydrate diets) usually display an initial cholesterol-reducing effect as a result of the weight loss. Another study of about 5 months duration noted similar findings: "Krehl and colleagues studied the effects of a low carbohydrate diet on serum cholesterol in a group of seven obese women and four normal male prison inmates. The group of obese women were given a diet with less than 1,200 calories/day. The serum cholesterol fell initially (during the first two weeks of weight reduction) but tended to return to pre-diet level with the passage of time. The normal group was then tried on six isocaloric diets (2,500 to 2,900 calories) composed of less than 12 gm carbohydrate per day and varying fat to protein ratios from 70% fat and 30% protein to 30% fat and 70% protein. In all subjects, serum cholesterol increased greatly during diet periods in which the percent of calories derived from fat exceeded 50%. Two of the subjects who were given a supplement of 50 gm per day of carbohydrate (mainly starch) exhibited a smaller increase in serum cholesterol." (3) Moreover, in the fifth month when the subjects returned to a more normal mixed, higher-carbohydrate diet, there was a dramatic drop in cholesterol values. Similar findings have been reported in other studies.

Can you eat all you want on a low-carbohydrate diet and still lose fat/weight? While this is implied in the book, it is misleading. Even though the excretion of ketones in urine and breath does allow for a bit more weight loss/caloric intake, this can contribute at most, an extra 100 kcal/day. Furthermore, the more rapid weight loss often reported during the first few weeks of a low-carbohydrate diet is primarily the result of excessive water (not fat) losses. Moreover, long-term studies (up to a year) show that further weight reduction will not occur even on a low-carbohydrate diet, if caloric intake is not sufficiently decreased.

Are carbohydrates more fattening than other macronutrients?

Most short-term, hypercaloric experimental studies (involving non-ketogenic, mixed diets) done on humans and animals tend to slightly favor high-carbohydrate groups (e.g. less fat deposition). In fact, it has been argued that, "to induce substantial rates of carbohydrate conversion into fat, the body's total glycogen stores must be considerably raised, from their usual 4-6 g/kg body wt to > 8-10g/kg body wt. This requires deliberate and sustained over-consumption of large amounts of carbohydrates for > 2-3 days" (4). Thus, in the short-term, excess calories from carbohydrates are slightly less likely to be stored as body fat as compared to excess calories from dietary fats, especially if those calories are spread over smaller, more frequent meals. Furthermore, the fluctuations in blood glucose and serum insulin (that may occur in susceptible individuals on diets rich in refined carbohydrates) can be minimized by relying on fiber-rich, low-GI carbohydrates such as fruits and vegetables. Spreading your total caloric intake over smaller, more frequent meals ("grazing") also tends to minimize rapid fluctuations in blood glucose (BG) and insulin levels. An abundance of

epidemiological and migrant studies offer little support to the notion that carbohydrates are somehow more fattening. While in some studies, an inverse association between percentage of energy from fat and median body mass (BMI) was observed in European females, such an association did not occur among European males (5). In fact, other studies, "indicate a positive association between dietary fat consumption and relative weights in adults from 10 less-developed populations". (6) Similar findings have been reported in a number of short-term experimental studies in both animals and humans. In the final analysis, overall caloric balance (regardless of dietary source) is probably the most important factor determining body fat levels.

Does increasing protein intakes while dieting help preserve muscle tissue?

The few studies comparing hypocaloric, high-carbohydrate, moderate-protein diets to hypocaloric, moderate-carbohydrate, high-protein diets do seem to favor the high-protein group so that "a hypoenergy diet providing twice the RDA for protein was more effective in retaining body protein in weight lifters than a diet with higher carbohydrate but the RDA for protein." (7). While the evidence is not overwhelming, there may be some benefit (in terms of preventing muscle loss) in increasing protein intakes when one is dieting. In fact, when resistance trainees are dieting, it may advantageous to slightly curb one's carbohydrate intake and maintain or slightly increase protein intake. Of course, the best approach is to never let oneself put on too much body fat to begin with.

Does a high-carbohydrate diet play a role in insulin resistance and diabetes?

While a diet very rich in carbohydrates (especially high-GI carbohydrates), does have a tendency to increase blood triglyceride levels and may reduce HDL (the "good" cholesterol) levels in the short-term in some individuals (especially in people with hypertriglyceridemia or with hyperinsulinemia), there is still a lot of debate on its precise effect on insulin resistance. Moreover, a large number of studies have found a consistent positive association between total and saturated fat intake and hyperinsulinemia. Very likely, typical "Western" diets, rich in high-GI, refined carbohydrates that are also rich in saturated and trans fats are probable contributing factors. Interestingly, in developing countries whose diets are often very rich in fiber-rich, unrefined carbohydrates (up to 80%), rates of insulin resistance and diabetes are very low. Of course, other factors (increased physical activity, low body fat, etc.) probably play an important (if not the major) role for these associations. Furthermore, high intakes of dietary fat and elevated free fatty acid (FFA) concentrations are two of the seven major risk factors believed to contribute in insulin resistance. In fact, a high-fat, low-carbohydrate, ketogenic diet has long been used as an experimental model in a number of different animals to produce insulin resistance. Although proof of a cause and effect relationship is always difficult to ascertain in associations between nutrition and disease, a number of human studies have found a positive correlation between intakes of saturated fat and fasting insulin and, interestingly, a negative correlation between carbohydrate intake and fasting insulin. This is the reason why low-fat diets often form the basis of current dietary recommendations to people with diabetes. While, the universality of these recommendations has begun to be questioned more recently by a number of researchers (in particular there may be some benefit in replacing the saturated fats with increased intakes of the so-called "good" fats instead of carbohydrates), few (if any) nutritionists would recommend a low-carbohydrate, ketogenic diet for the prevention of insulin resistance. This is in light of some evidence suggesting "that elevated free acids (such as would occur in patients consuming a low-carbohydrate ketogenic diet) may promote both vascular thrombosis and cardiac arrhythmias." (8)

Are high-carbohydrates, low-fat diets then, the solution to obesity and health problems?

Not very likely. For instance, despite a small (3-4%) decline in fat intake (as percentage of energy), the incidence of obesity has seen a small but steady increase in a number of industrialized nations (including the United States) in recent years. A number of other factors including a more sedentary life-style are probably contributing factors. There have, however, been a few positive findings. In particular, from 1950 to 1990 there has been a steady decrease in cardiovascular mortality (up to 50%) in a number of industrialized countries including Canada and the USA. While improvements in medical treatment may partly explain these findings, it's unlikely they can fully account for them, since mortality from other diseases such as cancer have actually seen a slight increase despite similar improvements in medical treatment. This has led

many researchers to speculate that improved dietary habits (and in particular, the major decline in consumption of saturated fats) over the past 40 years may partly explain such positive findings. In the final analysis, total caloric balance (intake minus output) is by far the most important factor determining body fat. In terms of health, a diet rich in a variety of foods with particular limitations in saturated and trans fats and high-GI, refined carbohydrates is recommended. Substituting such foods in the diet, with more fiber-rich, unrefined low-GI carbohydrates (e.g. fruits, vegetables and legumes), monounsaturated fats (e.g. olive and canola oils) and omega-3 polyunsaturated fatty acid-rich oils (such as fish, walnuts, etc.) is also recommended. While ketogenic diets [and more recently cyclic ketogenic diets (CKDs)] continue to become quite popular among some bodybuilders and others wishing to lose body fat, there continues to be very little evidence to support their use. Moreover, even if a more favorable fat-loss/muscle maintenance ratio is shown to occur with the use of such diets in future research, the potential health risks must clearly be taken into consideration. At present, the little research that has been done in this area does not seem to offer much support for many of the main premises put forth in this book. While the book does offer the interested reader a fairly compact, affordable, easy-to-read, practically-oriented guide on the low-carbohydrate, ketogenic diet, the paucity of references and one-sidedness is a major drawback. Moreover, to blame a large part of modern-day chronic disease and morbidity on excessive carbohydrate consumption is clearly unsupported.

REFERENCES

1.Ballaban-Gil, K. et al. (1998). Complications of the ketogenic diet. Epilepsia, 39 (7):744-748.

2.Rickman, F. et al. (1974). Changes in serum cholesterol during the Stillman Diet. JAMA, 228(1):54-58.

3.Ibid., p. 56.

4.Flatt, J. (1995). Use and storage of carbohydrate and fat. Am J Clin Nutr, 61 (suppl):952S-9S.

5.Willett, W. (1998). Is dietary fat a major determinant of body fat? Am J Clin Nutr, 67 (suppl):556-62S.

6.Lissner, L. et al. (1995). Dietary fat and obesity: evidence from epidemiology. Eur J of Clin Nutr, 49:79-90.

7.Walberg, M. et al (1988). Macronutrient content of a hypoenergy diet affects nitrogen retention and muscle function in weight lifters. Int J of Sports Med 9:261-66.

8.Council on Foods and Nutrition (1973). A critique of low-carbohydrate ketogenic weight reduction regimens. JAMA, 224 (10):1415-19.