

## Low Carbohydrate Diets: Facts, Myths and Controversy

By Trent Stellingwerff

In the past there have constantly been rumors, gossip and antidotes of how a certain diet will help one lose weight or how a certain pre-event meal may improve performance. The 'grapefruit diet' or even the nutraceutical supplement fen-phen, which has now been banned in North America, have all had their time in the spotlight, along with many others. Recently higher protein and fat diets, such as the 'Zone' diet or the 'Atkins' diet have been getting considerable press and making substantial noise in the general public about their potential for weight loss and even for increased exercise endurance performance.

Whenever a 'new' product or diet hits the market, the scientific community must take time to conduct properly well-controlled research into examining the effectiveness, efficacy and safety of these new products or new diet scheme, before final and accurate conclusions can be made. Although still in its infancy, in terms of studies that need to be conducted, much of the current evidence strongly suggests that these higher protein and higher fat diets are indeed *not* a better way to lose weight or to perform during endurance sports such as running. In fact, in the long term may result in many adverse chronic health problems. But first, what exactly are the 'Zone' and 'Atkins' diets?

### ***'Zone' and 'Atkins' Diets Review:***

Although both the Zone and Atkins diets promote individuals to take in many more of their daily percentage of calories in the form of proteins and fats, and to stay away from carbohydrates, both are also very unique from each other.

The Zone diet recommends carbohydrate, protein and fat dietary contributions be 40%, 30% and 30% of calories, respectively<sup>1</sup>. The diets originator, Dr. Barry Sears, states that these unique ratios of 40% carbs to 30% protein to 30% fat will change the body's normal hormone balance to a more favorable one. Sears claims this more ideal hormone balance doesn't cause as much weight gain from sugars and insulin and could also potentially increase the amount of oxygen to working muscles. In general for a hard working runner, the fat content is acceptable in the Zone diet, but the carbohydrate recommendations are far too low and the protein recommendations far too high. (More on how this can be detrimental to endurance performance and health later).

Contrary to the Zone diet's recommendation of 40% carbohydrate intake, the Atkins diet basically advocates nearly *no* daily dietary carbohydrates (3-15% daily or only 15-50 g of carbs daily!)<sup>2</sup>. The 'Atkins Nutritional Approach' warns of the perils of sugar and the role of sugar in the increasing obesity epidemic in North America, stating the sugars increase insulin and that insulin will then store everything as fat<sup>2</sup>. They recommend that one should only eat fats and proteins to keep insulin levels lower. Of course they fail to tell you that certain proteins also increase insulin levels and that extra protein is converted, or metabolized, to sugars as well and then either used for energy or stored as fat, just like carbohydrates would be.

Unfortunately, with both the Zone and Atkins diets, many of their stated claims are unfounded in the scientific literature and much of the promised benefits are based on selective information where contradictory scientific evidence is conveniently left out. There are several studies which do show a weight loss with a high protein diet, but the effect of the high protein diets on body weight is similar to that of other weight loss diets: just decrease caloric intake and increase caloric expenditure and you will lose weight. A recent review of 107-weight loss studies on high-protein, low-carbohydrate weight loss diets concluded that weight loss was associated with longer diet durations and restriction of calories consumed, but *NOT* with reduced carbohydrate intake<sup>3</sup>. Regardless, both diets work on the premise that increased blood insulin levels are adverse, and keeping insulin low through dietary manipulation is the key to keeping weight off. But is this really the case?

### ***Is Insulin Really the Enemy?***

The basic philosophy of the Zone and Atkins diet is that obesity and ill health is the result of in taking an excess of carbohydrates, which increases insulin to process and store these sugars. Insulin, in fact, is also used to store and process proteins and to make lean muscle mass. Obese people *do* have higher levels of insulin, since excess size and body fat make obese individuals less sensitive to insulin. Therefore, the body produces more insulin for the desired effect (Type II Diabetes), but high insulin levels *do not* result in obesity; obesity leads to higher insulin! As an individual loses weight, they become more insulin sensitive and the body down regulates insulin production, thus, lean individuals generally have much lower insulin levels. Carbohydrates and insulin are also vital to the runner after a hard workout or race, when muscle glycogen (stored carbohydrate) stores are depleted, (see Running Room Article ‘Optimizing Performance AFTER the Event in the Jan./Feb. 2004 magazine pgs. 34-35) to allow for rapid uptake of carbohydrate into the muscle and rapid re-synthesis of glycogen for the next run. As Dr. Samuel Cheuvront noted in his review, “While the Zone diet generally regards insulin as the enemy, it is quite clear that insulin is an ally in the quest to resynthesize the muscle glycogen necessary for optimal endurance performance”<sup>1</sup>.

### ***Potential Long-Term Health Risks Associated with the Atkins/Zone Diets:***

Many recent media reports have touted the potential short-term weight loss that sometimes occurs with the use of very high protein and fat diets, but many of these reports have ignored or biased several of the potential risks and medical problems that occur when individuals adhere to these diets for a long time. Some of the potentially associated long-term health risks of the high protein/fat diets and low carbohydrate diets are as follows<sup>4</sup>:

1. *Colorectal Cancer:* The World Cancer Research Fund has reported that long-term high intakes of red meat are considered a probable contributor to colorectal cancer risk. High protein diets are also low in fiber, and fiber appears to be protective against this type of cancer.
2. *Heart Disease:* Most high protein/fat diets are also very high in dietary cholesterol and saturated fats and the effects of said diets on blood cholesterol levels is an ongoing research controversy. Nevertheless, diets high in saturated fats do contribute to ‘hardening’ of the arteries and increases the risk for heart problems.
3. *Impaired Kidney Function:* High protein diets are associated with reduced kidney function. In fact in the U.S. the American Academy of Family Physicians notes that high animal protein intake is largely responsible for the high rate of kidney stones in the U.S. and recommends protein restriction to those individuals to combat the reoccurrence of kidney stones.
4. *Osteoporosis:* It is pretty well established that very high protein diets increase urinary calcium losses and has been shown to potentially increase the risk of fracture in several studies.

Not only have high protein and fat diets been associated with these potential health risks, it is also very well established that they don’t help endurance performance.

### ***Endurance Performance with High Protein and High Fat Diets:***

There have only been a couple of very well-controlled scientific studies examining endurance exercise with the low-carbohydrate diets, of which there was a recent review in an exercise physiology handbook chapter<sup>5</sup>. Two studies in particular examined the effects of a longer-term low carbohydrate diet (under 15% carbs) had on cycling performance. One study found a 34% decrease in performance at 90% of max while another study by Phinney et al. had their cyclists at a much lower max level of 65% heart rate and found very inconsistent results. Subjects either increased performance by ~50% or decreased performance by nearly 40%. Of course, the exercise intensity of only 65% of max is very low, when compared to racing intensities and the Phinney commented on this saying: “Cyclist [who were] fed the low carbohydrate diet were limited in their ability to exercise at more than 65% of max, thus, actual racing performance would certainly be hampered in this situation.” One needs to remember that 65% of max in running, for many people, isn’t even marathon race pace so one can quickly see how this type of diet doesn’t provide you with the correct type of fuel.

***Take Home Message:***

So after reading this article, I hope that you don't walk away thinking that all proteins and fats are bad for you. Certain moderate amounts of protein and fats, and certain types are vital to your well-being and running performance. In fact, most experts agree that if you are a more serious runner, then having a slightly higher intake of protein compared to the general population is warranted. This should also be coupled with a nutritious mixed diet. Watch for an article examining how much protein and what types of protein a runner should eat, in the next Running Room Magazine issue.

So, in a nutshell, this author would recommend having a balanced nutritious diet, coupled with a consistent exercise program. It is much safer and effective to take in more nutritiously balanced, less calorie-dense meals and expending more energy through increased activity to control body composition, then trying to find a quick, and often not lasting, fix through one of the many fad diets.

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## **References**

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