

Phase Shift Diets - Back to the Future

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I was born in Italy, in the mountains close to Pescara. At the tender age of 6 years I emigrated to Canada with the rest of my family. I was brought up by traditional Italian parents, eating the traditional Italian cuisine of middle Italy.

But there was something in me that didn't like to eat the way that my parents did. I was often chastised by my parents for not eating like a true Italian because I just didn't care for bread at all and preferred meat, salads and vegetables over pasta.

When I began training with weights just before I turned 14 years old, I quickly caught on to the way of eating and supplements that were being used by the bodybuilders of that day. And that seemed to fit in with my natural bend away from carbs and toward protein.

I had protein shakes almost daily using milk, raw eggs, skim milk powder, soy protein powder, wheat germ oil, and at times I tossed in some desiccated liver and brewer's yeast. I also used a vitamin and mineral supplement and protein tablets.

Since I didn't use any carbs in my drinks other than what was in the milk and powders, the drinks were pretty brutal and when I mixed up a batch I had no fears that the other members in my family would drink it on me.

I grew more muscular and stronger on my intuitive high protein, moderate fat, lower carb diet but it wasn't until I attended university at the age of 18 that I began to see why this kind of diet worked for me.

One of my early favorite text books, which had tremendous influence on me, is still in my possession complete with the passages I marked-up over 40 years ago. The text was, "Metabolic and Endocrine Physiology an Introductory Text" written by Jay Tepperman and published in 1962 by the Year Book Medical Publishers.

That book started my research that found me almost every day in the research Stacks at the University of Toronto – 5 to 6 underground floors containing several thousand medical and biological journals and books.

The book gave me my first behind the scenes look at the effects of hormones individually and collectively, including testosterone, insulin, growth hormone, thyroid, and cortisol, along with protein and fat metabolism, and subsequently on body composition.

For the average research student, much of this content may have seemed very dry, but for me it was a hidden gold mine, and started my thinking about diet manipulation to affect these hormones and in turn muscle mass and body fat.

Although the whole book was interesting and important, the chapter that interested and perplexed me more than all the others was that on insulin. This interest was fueled by the fact that insulin was discovered in 1921 by Sir Frederick Banting of the University of Toronto. Banting was the first Canadian to be awarded a Nobel Prize and was enormously popular during his lifetime. "His influence could still be felt in the Banting building", and I took some of my courses in that building.

What captivated me the most was a 23 page section titled, "Endocrine Function of the Pancreas"

I spent as much time on those 23 pages as I did on the rest of the book. Insulin fascinated me since it was a veritable Jekyll and Hyde. Not so much on its effects on glucose, which were prominent in the minds of many since insulin was basically thought of as a hormone that lowered glucose levels in diabetics, but on its effects on body composition, through its impact on carbohydrate, protein and fat metabolism.

I began to learn how lowered insulin and glucose levels resulted in large scale mobilization of stored body fat into the blood. Extremely significant to my future dietary strategy, was the data I found indicating that both too little, and too much insulin had adverse effects on body composition. Too little for too long led to a catabolic state and a loss of muscle mass, and too much led to an excess of body fat due to increased lipid formation and an inhibition of fat breakdown.

In my research at that time I came across papers published in the 1950s and early 1960s showing that fats and carbs had reciprocal effects in the body. Increasing dietary carbs led to an increase in the use of carbs for energy and decreased the use of fat, whereas decreasing carbs increased the use of fat for energy, while at the same time decreasing the use of carbs.

There were also a few studies published during that time that looked at the effects of high fat, high protein, low carb diets on metabolism, not to mention the articles and studies looking at these diets as used by Eskimos.

However, the paper that had the most influence on my views on macronutrient metabolism and how fats and carbs interacted was a paper by PJ Randle published in the April 1963 issue of the Lancet. This paper was titled "The glucose fatty acid cycle: its role in insulin sensitivity and the metabolic disturbances of diabetes mellitus" and spelled out how glucose and fatty acids metabolism interacted and the significance of this interaction. The main take home lesson for me when I read this paper was that dietary carbs inhibited the breakdown and oxidation of fat.

This, along with other papers and books available at that time made me realize that high glucose and insulin concentrations suppress fatty acid oxidation and that there is a preferential use of glucose when dietary carbs are available and this resulted in a preservation of fat stores.

Another one of my majors at university in my honours science course, which I completed and then went on to medical school, was genetics. I found the subject fascinating and it

was at this time that I first started thinking about how our genetic structure and the current environment. Evolutionary theories, coupled with the information on the effects of macronutrients on metabolism and body composition formed my early ideas of my innovative phase shift diets.

What I then attempted to do, and continue to do to this day, is to put our genetics and metabolism in perspective and manipulate both by making specific changes in the environment, mostly through macronutrient and micronutrient manipulation.

The principles and theories behind my phase shift diets, as exemplified by my Metabolic Diet and its variations, such as the Anabolic Solutions and Radical Diet, are complex and when trying to work out the minutiae, it's obvious that more research needs to be done. But then that's the case in any of the advanced research being done today.

But the principles behind the diet can be taught, and when learned provide a basis for understanding nutrition and how it affects our metabolism, and how we can manipulate it to maximize health, body composition and performance.

And it's important at this time in my life to share the knowledge I have accumulated in more than four decades so that others can see more clearly just what it's all about and how to use the knowledge for improving themselves and for teaching others.

In this article I'm going to put some of the principles of my Metabolic Diet in perspective as far as man's nutritional history.

Man's Survival - The History of Food

It's estimated that humanoids have been on this earth for millions of years and that modern man has been around for at least a few hundred thousand years. Some genetic theorists believe modern man emigrated from Africa around 100,000 BC and dispersed around the world by 50,000 BC based on the X chromosome.

It's generally felt that farming had its beginning about 10,000 years ago (marking the beginning of the Neolithic Revolution – see <http://en.wikipedia.org/wiki/Neolithisation>) and that it was introduced into Europe from the Near East more than 8,000 years ago, then spread west and north to the Atlantic Ocean. It's likely that the farmers influenced the Paleolithic hunter-gatherers--whose ancestors arrived on the European continent as long as 40,000 years ago—to adopt farming.

A number of recent genetic studies have supported this model. For example, one study concluded that less than 25% of the mtDNA gene pool of modern Europeans could be traced to incoming early farmers (*Science*, 10 November 2000, page 1080)

But this controversy is unimportant for the purposes of this discussion. What is important is that humans evolved during the Paleolithic period, from approximately 2.6 million years

ago to 10,000 years ago. And that starting 10,000 years ago there was a gradual transition from a hunter-gatherer mode of subsistence which was practiced by all early human societies prior to that time, to one based more upon the deliberate nurturing and cultivation of crops for the purpose of food production.

That time span prior to agriculture has defined modern man's genetic makeup and there has been little change in the past 10,000 years.¹ However, the diet and lifestyle that shaped out genes have changed dramatically.

Granted there is evidence of some evolutionary change during this time to the present, mainly in genes affected by the shifts in habitats, food sources, population densities, and pathogen exposures, which have likely led to direct selection pressures on medically relevant phenotypes.² However, many of the genetic tendencies of our hunter-gatherer ancestors still prevail.

Recipe for Disaster

Given the fact that for most of man's time on earth the problem was lack of food rather than an abundance, the biggest genetic hurdle for modern man is all about excess calories. And because of shifts in the types of food available, the excess calories are the constant macronutrient content of the modern diet. Couple that with a relatively sedentary lifestyle and it spells the recipe for our current obesity dilemma.

Genetically our bodies are engineered for gaining weight and not for weight loss. That's because weight loss mimics starvation and in our past episodic starvation was the norm and threatened survival.

In fact through most of our history episodic starvation that has shaped our genes with the result that our metabolism has evolved to counteract most of human history has produced efficient metabolic adaptations to episodic starvation. So the body is genetically programmed to gain whatever weight it can to prepare for the all too common food shortage. The result is that in times when food is plentiful we're programmed to gain as much weight as possible, and increasing to the max our storage energy supply (mainly fat).

Ongoing research validates this scenario.

For example in the past decade or so many hormonal mechanisms and mediators have been elucidated that participate in the regulation of appetite and food intake, storage patterns of adipose tissue, and development of insulin resistance, including leptin, ghrelin, orexin, PYY 3-36, cholecystokinin, and adiponectin.

The adipokines are mediators produced by adipose tissue; their action is thought to modify many obesity-related diseases.

Leptin and ghrelin are considered to be complementary in their influence on appetite, with ghrelin produced by the stomach modulating short-term appetitive control (i.e. to eat when the stomach is empty and to stop when the stomach is stretched). Leptin is produced by adipose tissue to signal fat storage reserves in the body, and mediates long-term appetitive controls (i.e. to eat more when fat storages are low and less when fat storages are high).

Although administration of leptin may be effective in a small subset of obese individuals who are leptin-deficient, many more obese individuals are thought to be leptin-resistant, and this resistance has been implicated in obesity in some people

While the exact role of these hormones and mechanisms, and their interactions have still to be worked out, it's obvious that when dieting they work together to produce ensure survival by reducing metabolic rate, spare vital tissues while at the same time making use of stored fat and protein (muscle), and dramatically increase appetite.

The bottom line is that peripheral and central signals are intertwined to sense the metabolic status of the individual and through a complex series of actions and interactions, the central nervous system has developed a meticulously interconnected circuitry to keep us adequately fed and to sabotage any and all efforts to lose weight and/or body fat.

But as we'll learn at the MDNCC seminar, while our genes may predetermine us to some extent, by manipulating our nutritional environment we can make dramatic shifts from what is to what could be.

While all of this will be covered in my upcoming seminar, making the process both easy to understand while at the same time cutting edge as far as the research going on today, the one message that is most important is that even if you're not genetically gifted you can succeed. And the way to succeed is by understanding and following the principles behind the Metabolic Diet.

Phase Shift Diets

The Metabolic Diet is a structured phase shift diet. As such, it's different from any other diet out there today. That's because all of the other diets are monophasic diets in which you eat the same every day. Whether it's the Zone or Atkins or South Beach, they're all monotone diets.

And it's only because of our recent past that we all follow this kind of diet and think that, with some minor variations, it's the natural diet for us humans.

But that's not true.

Unstructured Phase Shift Diets

It doesn't matter whether we follow a high carb, low carb, high protein, low protein, high fat, low fat kind of diet, it's not the best diet because they're all the result of modern agriculture and industry which guarantees us a constant supply of palatable foods.

For most of the time that man has been on earth this wasn't the case.

Up to the time when agriculture took hold there was no guarantee of a regular diet. Unlike today you couldn't go to the grocery store and get what you needed. You ate what you could scrounge up.

If you killed an animal, then you basically had a low carb meat-based diet for as long as the meat lasted. When you ran out and didn't bag anything else, you foraged for what you could get from plants above and below ground, and the diet was higher in carbs.

As such, we're genetically more suited to phase shift diets, diets with varying macronutrient content, as against the monophasic (the same diet every day) diets that almost everyone today is on.

This somewhat erratic phase shift diet that has shaped our genes essentially ended only a relatively short time ago. Once agriculture took hold the carbohydrate content of the diets increased. However regardless of what most of us are used to eating today, the point still remains that our genes are still optimized for phase shift dieting, high protein, low carb sometimes, and lower protein higher carbs at other times, rather than the relatively recent agriculturally based monophasic diets.

And although modern man for the most part follows a high carb monophasic diet, high protein, low carb diets lived on with special groups. For example, Ori Hofmekler, in his book "The Warrior Diet", writes that the diet of soldiers of the Roman army consisted mainly of high quality protein foods such as meat, fish, eggs, and cheese, with carbohydrates playing a secondary role. When these high protein foods were unavailable, they ate more carbs to make up the calorie deficit. So even in these cases the Roman soldiers, while following a low carb diet when they had the necessary foods, actually followed an unstructured phase shift diet.

Structured Phase Shift Diets

Taking a hint from what must have occurred as far as unstructured phase shift diets (low carb phases followed by higher carb ones), especially those of primitive man, and in special groups such as the Roman soldiers mentioned above, I started thinking about the consequences of shifting from low carb to higher carb diets on a structured basis.

It occurred to me, as I've already stated, that in all lower carb diets based on the availability of meat, fowl, fish, eggs and cheese there were times when these foods were in short supply. At these times carbohydrates filled the energy gap and the diet was then a higher carb one.

With this idea in mind, I experimented with phase shift diets to see what would happen if periods of low carb were alternated with periods of higher carbs. What I found, after several years of trying many different phase shift variations, was that a longer carb restricted phase followed by a shorter higher carb phase resulted in more favorable changes in body composition than any other diet, including the monophasic low carb diets that are so popular today, including the Atkins, Zone and South Beach Diets.

So back in the late 1960s, before even Atkins introduced and then made popular his low carb diet, and way before all the others, I was working on improving the low carb diet and attempting to make up for its shortcomings as far as body composition and performance.

My conclusion after several years of experimenting and research was that while low carb diets are great for losing weight and body fat, it's not all that great for increasing muscle mass and for maximizing body composition.

Part of the problem is that while you're stimulating some of the anabolic hormones with the low carb diets, you're not making use of the potent anabolic effects of insulin, and the beneficial synergism of insulin with other hormones and growth factors.

In order to do that you need to somehow combine the effects of the low carb diet on losing weight and body fat, with dietary changes that also made use of the anabolic effects of insulin, while at the same time minimizing the counter productive effects that insulin has on body fat.

I worked on this puzzle back in the late 1960s, giving birth to my ideas about structured phase shift diets, and refined it over the ensuing decades. I used this diet in the 1970s and 1980s when I was an elite powerlifter and won every title there was to win in Powerlifting.

I first published this diet as the Anabolic Diet over a decade ago, and then followed it up with a more generalized and more exhaustive Metabolic Diet, and later specialized versions of the Metabolic Diets, the Anabolic Solution books and the Radical Diet.

The Metabolic Diet

The Metabolic Diet is the first ever structured phase shift diet designed to replace all other diets for optimizing body composition and performance.

The Metabolic Diet, previously known in a more restrictive form as the Anabolic Diet, is the only diet that works to minimize body fat while at the same time maximizing lean body mass, giving you that look lean muscled look we all want.

The low carb phase of the Metabolic Diet, which is usually 5 to 6 days, switches the metabolism over to burning fat as the body's primary fuel. The higher carb phase, which is usually one to two days, maximizes the effects of insulin (as well as testosterone, growth hormone and IGF-I) on protein synthesis but minimize its effects on fat metabolism.

The Metabolic Diet is structured so that the effects of the low carb phase on fat and energy metabolism, and the decreased effects of insulin on fat metabolism, are carried over into the higher carb phase. The end result is a continual burning off of body fat, but a sparing of muscle protein during the low carb phase. If desired, the higher carb phase is also useful for increasing muscle mass.

Another advantage of my phase shift diets, unlike all the low carb diets, is that they're socially more acceptable since for most the higher carb phase usually coincides with the weekend. They also allow a variety of foods into the diet that would normally not be allowed on a straight and constant low carb diet, making the diet easier to adhere to.

My phase shift diets are optimized for maximizing body composition and accomplish this much more effectively than all the other diets, all of which are monophasic diets, regardless of their macronutrient content.

As well, they're healthier than any monophasic diet could ever be as they allow a maximum dietary variety of foods, albeit not at the same time. And keep in mind that in my opinion the phase shift diet is the most natural diet for humans, since genetically were more suited to this type of diet than any other.

Also keep in mind that the association between obesity and cardiovascular problems, and a high-fat intake that occurs in diets high in both fat and carbohydrates simply doesn't happen with the Metabolic Diet.

Although several studies have shown that both lean and obese people are capable of rapidly adjusting fat oxidation to fat intake on a higher fat diet when glycogen stores are low in muscle, the Metabolic Diet allows you to remain in fat burning mode, sparing muscle protein, even through the shorter higher carb phases.

The Metabolic Diet gives you the best of both worlds, variety in the foods you're allowed to eat, and maximum results as far as minimizing body fat. Once you've adapted to utilizing fat as your body's primary fuel, you'll continue to do so even when carb intake is high over a short period of time as the body stays primed to burn fat preferentially.

Cultural Carbohydrates

First of all it's important to realize that humans can exist on almost any macronutrient mix, whether it be low fat, high fat, low carb, high carb, low protein, high protein. Your metabolism will adjust to whatever you feed your body up to a point. So all of us, regardless of age and sex, have the ability to adjust macronutrient utilization and oxidation in response to changes in diet composition.^{3,4,5,6,7}

However you have to provide your body with the four basics: enough calories, the essential amino acids, the essential fatty acids, and water. That means you have to have some protein and fat in your diet to survive.

It's interesting to note that although there are essential amino acids and essential fats, there are no essential carbs. That means we can live if we have fat and protein in our diets, but carbohydrates are almost superfluous. Lacking carbs, the body can make glucose from both protein and fat (the glycerol portion of fatty acids).

So where do carbs fit in? For most of us carbs make up a significant part of our diets. The reason is that since you tend to eat what's most available, in our agriculturally based world that means carbs. Carbs are easy to produce, inexpensive and provide a lot of calories. As such, different societies depend on foods that are most available, but not necessarily the best foods for our metabolism.

Because they're easy to get and supply needed calories, they have become a staple of every agricultural society. They're a cultural and convenience food. As such, Italians eat pasta, much of the third world eats rice, and the English-speaking world eats potatoes. And we all eat some form of bread.

The Carbohydrate Dilemma

As I mentioned the Metabolic Diet, and my other diets, are phase shift diets. It's far superior to the straight low carb diets because it maximizes the response to the various hormones, including insulin. The low-carb diets have reduced the insulin response, but remember, insulin is a very anabolic hormone.

The two phases, a longer low carb phase, and a shorter higher carb phase, present different scenarios metabolically, leading to better body composition results. And because there are two phases to the diet you really don't miss out on anything, as long as you eat the foods that you're allowed in each phase. Each food has its time and you needn't ever feel deprived.

The Higher Carb Phase

The higher carb phase of the Metabolic Diet isn't a problem for anyone. In fact it allows you to have foods that you can't have on the low carb phase. For most of use it means that you can have your breads, pizza, potatoes, spaghetti, etc. in this phase.

The Low Carb Phase

It's the low carb phase that people have most trouble with, especially people where high carb foods are considered part of the cultural tradition, and something that everyone eats every day. This is the crux of the problem of low carb for most people.

But all is not lost even though carbs are almost a given in most people's diets and going on a long term low carb diet may seem like an impossibility given the culture and customs. Most cultures are steeped in foods that are low in carbs and many that are high in protein. The list of the foods that fit the low carb phase of the Metabolic Diet is very long indeed.

The MDNCC Seminar

On October 7th and 8th of this year I'll be giving my first MDNCC seminar in Italy. Those that attend this seminar will learn more about diet and nutrition than most dieticians, and more about the research that's going on today, and what this research means and will mean, than most doctors and researchers.

They'll learn how to manipulate their metabolism through targeted nutrition, how to control their body weight and body composition, and how to improve their health, well being and performance. And they'll learn how they can use these principles to guide and teach others.

Even though this information can be extremely complex I'll make it easy for you to understand, and provide you with a framework that will prove useful to you for your entire life. I'll open your eyes on simple ways to understand all of today's diets and nutritional supplements, and give you the ability to place anything new that comes along into context.

And at the end of the seminar everyone in attendance will receive a Certificate of Attendance, which I will personally sign. Getting the Certificate of Attendance means you will have completed the first required step towards your full MDNCC certification.



Metabolic Diet Nutritional Certification Council



Mauro Di Pasquale M.D.

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