

## SECOND OPINION/ by Dr. Henry Olders



Sue Truman

**W**hat disease affects 33% of Canada's population and costs the health-care system \$6 billion per year? Obesity. Spreading rapidly around the world, this scourge doubles in prevalence every five years. But not everyone becomes obese. So is it entirely a question of how many calories you eat, or how much exercise you get? Highly unlikely. These factors are probably less important than genetic makeup interacting with the specific foods a person eats.

The so-called thrifty gene is found in about 25% of the North American population and an even greater proportion of aboriginals. On a typical North American diet, carriers of this gene often become obese and develop adult-onset diabetes, along with cardiovascular disease and high blood pressure. In aboriginal peoples on traditional diets, these illnesses were essentially unknown. What changed?

One hypothesis is that thrifty-genes (TGs) have a metabolism genetically programmed for a low-carbohydrate hunter-gatherer (HG) diet in which game, fish and insects providing fat and protein were supplemented by edible leaves, fruits, flowers, roots and tubers. Without cooking and processing, much of the carbohydrate in the latter could not be absorbed and selective breeding had not yet increased sugar and starch content.

Every autumn, however, the availability of high-carb items increased dramatically, as wild fruits, nuts, vegetables and grains became ripe. HGs who feasted on the plenty accumulated body fat and better survived the winters of scarcity. Those most able to fatten up were more likely to reproduce and pass on their thrifty gene.

Enter the agrarian era, with the culti-



experience as a hunter-gatherer trapped in the postagrarian age. Overweight and unathletic from childhood, I stopped smoking after the birth of my first child and immediately gained 10 lb. Chancing upon the Atkins diet, I easily lost 20 lbs., dropping down to 150 lbs. on my frame of 5' 9". When I stopped the diet, I rapidly gained 5 lbs. Over the next 25 years, my weight crept up to 175 pounds, in spite of running, cross-country skiing, roller-blading and triathlons.

With a family history of diabetes and heart disease, I restarted on the Atkins diet in October 1996, losing 12 lbs. in six weeks. I have kept my weight steady by avoiding potatoes, rice, bread, pasta and sugar—except for special occasions. I eat a lot of meat, cheese, fish and eggs, and high-fibre vegetables daily, particularly lettuce, celery, raw spinach, peas, green beans or broccoli. Glucose-raising fruit juices are out, although I occasionally have raw fruit. Large dollops of mayonnaise accompany meats, foods are fried in canola oil, butter is added to cooked vegetables. A typical breakfast is five strips of bacon and three fried eggs, complete with pan drippings.

A heaping daily tablespoon of psyllium husks in a large glass of water prevents constipation. The diet is also supplemented with a multivitamin, 1,000mg of slow-release vitamin C, 800IU of vitamin E, plus a garlic capsule and  $\beta$ -carotene, calcium and magnesium.

Reading food labels is essential to avoid items containing any form of sugar (glucose, sucrose, dextrose, maltodextrin, corn syrup or solids, fructose). I look for items with a gram or less per serving.

At a weight of 170 lbs., I have put on

# METABOLIC MAYHEM



# METABOLIC MATHEM

## Hunter-gatherers trapped in an agrarian age

variation of foods for storage and consumption. With grains, vegetables and fruits providing a rich and continuous source of carbohydrates, the feast-famine HG metabolism became obsolete. Those responding to the high-carb regimen with quick weight gain remained obese when this fare was available year round. The obese died earlier and reproduced less so over time the gene became less prevalent.

Now enter the 20th century, where, happily, about 75% of the overall population have shucked the gene and can tolerate high-carbohydrate diets year-round without gaining excessive weight. That leaves the other 25%, in whom high-carb eating induces hyperinsulinemia, insulin resistance and their related morbidities.

Why do TG individuals become obese on high-carb diets? Let's consider energy metabolism. Carbohydrates consist of sugar molecules that send blood sugar levels up, signalling the pancreas to secrete insulin. The insulin in turn signals fat and muscle cells to take up sugar from the bloodstream. Muscle cells store the most important of these sugars, glucose, as glycogen, but fat cells turn it into fat. No insulin, no fat storage. Fat cells are continuously breaking down fat and, in the absence of insulin, this fat provides energy for many body organs. Thus, without insulin, a person would lose weight, as in untreated type I diabetes.

In TGs the pancreas secretes more insulin for a given blood sugar level, and thus fat cells store blood sugar as fat more efficiently. A TG eating a high-carb diet will gain weight more quickly and will have hyperinsulinemia.

Another effect is a rapid drop in blood sugar levels, possibly to values even lower than before eating. In some, these sharp decreases trigger the adrenals to secrete hormones responsible for the "fight or flight" response to stress, which may be

experienced as anxiety. With low blood sugar producing lightheadedness and tremulousness, we have the symptoms of reactive hypoglycemia.

At some point, high insulin levels and overweight cause fat cells to start ignoring insulin, a condition called "insulin resistance." One consequence is reduced weight gain, another is diabetes mellitus, which occurs when rising blood sugar spills over into the urine.

This cascade and its potentially life-threatening consequences call for a second look at the low-fat, low-protein, high-carbohydrate diets universally advocated by nutritionists, dietitians, cardiologists and fitness experts today. In a quarter of us it can cause not prevent overweight and thus it's partially respon-

sible for today's epidemic of obesity and type II diabetes.

These experts are misguided in applying a diet suitable for the agrarian metabolism to that of TG carriers. Food manufacturers that profit from adding sugar and starch to their products naturally support these experts.

I submit that TG individuals can avoid obesity and its attendant illnesses by following a low-carbohydrate diet, high in fat and/or protein. Yet high fat especially causes sheer panic in many health- and weight-conscious people. Fat contains 9Kcal/g versus 4Kcal/g for carbohydrates or proteins. So won't eating fats cause rapid weight gain? Only if there are appreciable insulin levels in the blood when dietary fat is being absorbed, which is the case when carbohydrates are eaten along with the fat. Most truly fattening

dishes are combinations of high fat and high carbohydrate: potato chips and chocolate bars, cheesecake and ice cream, hamburgers and fries. These foods virtually guarantee weight gain in TG carriers.

So how can you tell if you're among the 25% who must avoid these combination foods? Some overt markers of being TG are: a tendency to obesity, particularly central; obesity-linked type II diabetes; gestational diabetes; reactive hypoglycemia; a strong family history of these conditions; aboriginal race. To complicate things, some individuals have a little-understood metabolism falling between the HG and agrarian types.

### THE THRIFTY-GENER SOLUTION

But what can thrifty-geners do to prevent or reverse obesity and diabetes? Eat low-carb diets, I submit. Dr. Robert Atkins, a Manhattan cardiologist, has published a number of books on low-carb eating, his latest being *Dr. Atkins' New Diet Revolution*, which includes recipes and carb charts. One caution: read the entire book before starting, and don't just replace some carbohydrates with fat. This is certain to make you gain weight.

Low-carb eating requires a major re-orientation of lifestyle. Once you've taken the plunge, however, it's easy to stick with. After all, you can eat as much as you want of foods made tasty—and satiating—by fat. With fat suppressing appetite, carb cravings often disappear, as do the gas, indigestion and bloating that follow carbohydrate-rich meals. The diet "cures" diseases caused by carbohydrates, such as lactose or gluten intolerance. Recent reports suggest that higher fat intakes also reduce stroke risk and that substantial intake of monounsaturated fats mitigates breast cancer risk.

Let me tell you about my personal

lean muscle, thanks to weight training and cross-country skiing. My endurance when running, cycling or skiing has improved. Because I burn fats instead of glycogen when exercising, I no longer "run into the wall" or "bonk" when my muscles run out of glycogen. Gone are the hypoglycemic symptoms I used to get after eating lunch following a distance run. My lipid profile has improved. Testing me after seven months on the diet, my doctor said he had never seen such high HDL in a male!

I stress, however, that low-carb is not for everyone and might harm those lacking the TG. I have concerns about the carcinogenic potential of fried and grilled animal foods. My doctor friends worry about the ketotic state induced by a very low carbohydrate intake. I remind them that the Inuit did very well on their traditional diet, which essentially excluded carbohydrates for most of the year.

I believe low-carb eating is gradually gaining acceptance. Cookbooks are starting to appear, and we can hope that farmers will return to growing high-fibre, low-starch and low-sugar produce. The dangers of consuming too little fat are starting to be recognized. I believe the benefits of low-carb eating for obese diabetics will eventually win over the skeptics—patients and doctors alike. *MD*

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## LIPID VALUES

**Dr. Olders, 1997, on the Atkins high-protein, high-fat, low-carb diet vs. a high-carb, high-fibre, low-fat diet, 1993:**

	May 1997	Sept. 1993
	(mmol/L)	
<b>Total chol.</b>	<b>4.88</b>	<b>5.95</b>
<b>HDL chol.</b>	<b>2.06</b>	<b>1.61</b>
<b>LDL chol.</b>	<b>2.62</b>	<b>3.99</b>
<b>Triglycerides</b>	<b>0.44</b>	<b>0.94</b>