

# Beyond Calories

*Science confirms the influence of hormones in energy metabolism*

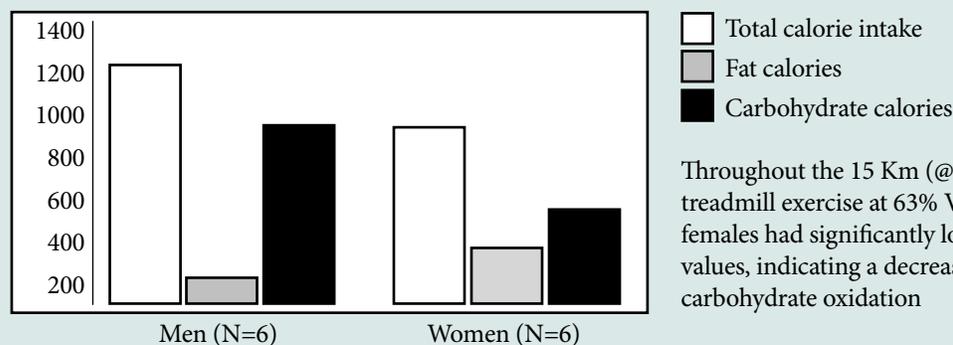
As long as I can remember the fundamental truth in energy metabolism focused on energy in vs. energy out. The influence of insulin and other hormones in energy metabolism wasn't discussed. The simplicity of this energy balance equation blinds many clinicians and scientists to a far more complex reality in energy metabolism. Now scientists in far reaching arenas are recognizing there is much more to energy metabolism than the difference between energy in and energy out.

Mark Tarnopolsky of McMasters University in Canada has spearheaded research regarding gender differences in metabolism. His findings are nothing short of fascinating. Women and men metabolize carbohydrate and fat differently.

I first became aware of Tarnopolsky's work when I read about research in 1995 that showed female athletes didn't store glycogen as readily as male athletes when carbohydrate loading. This finding made me gasp. I have counseled several women while they trained for a marathon. Not one of them lost weight, none of them lost fat weight and some gained weight.

Recent studies by Tarnopolsky demonstrate that early storage of glycogen is similar between genders; it may be that the ability to carbohydrate load is gender specific. Many studies repeatedly show that men rely much more on carbohydrate fuels during activity than women. In submaximal exercise women burn more fat. See Table 1 (*Gender Differences in Metabolism*, M. Tarnopolsky, 1999)

**Table 1 Calculated Fuel Utilization During Exercise**



I think some interesting questions follow these kinds of studies. What does it mean when a woman doesn't utilize carbohydrate or store glycogen as readily as a man? What happens to that energy? (see Calories, pg 3)

## THE SPECTRUM OF INSULIN RESISTANCE AND TYPE 2 DIABETES

Insulin resistance (IR), Insulin Resistance Syndrome (IRS) and Type 2 Diabetes were significant topics at the 1999 Diabetes Assoc. Conference in San Diego this past June. One UCLA diabetes specialist, Anne Peters, MD, has developed quite aggressive measures of assessing insulin resistance syndrome, and prefers to call it Cardiovascular Dysmetabolic Syndrome. Here are some of the indicators she looks for:

<b>Fasting Triglyceride &gt;140 mg/dl</b>	<b>HDL-C levels &lt;40 or</b>	<b>Hypertension</b>
<b>Fasting Glucose &gt; 110 mg/dl***</b>	<b>Total Chol: HDL-C &gt; 5</b>	<b>BMI &gt; 2</b>
<b>***(Peters uses FBG &gt;90 mg/dl)</b>	<b>Fasting Insulin &gt; 12</b>	<b>Waist:Hip &gt;.85</b>

Dr. Peters noted that **insulin resistance occurs as early as 20 years before impaired glucose tolerance**. This is a finding that concurs with my clinical observations. Many individuals experience difficulty metabolizing glucose far before they present classic clinical symptoms. Earlier signs of insulin resistance include weight gain and hypoglycemic-like symptoms such as fatigue and poor concentration.

Anyone with these symptoms doesn't need to hear their health care provider tell them, "you're fine". Experiencing the symptoms of insulin resistance doesn't feel fine. Everyone deserves to enjoy healthful, vibrant energy metabolism.

## PROTEIN: IS TOO MUCH A PROBLEM?

Over the past three years a plethora of higher and excessively high protein diets have gained commercial popularity. Many health care advocates who promote a high carbohydrate diet are quick to dismiss these programs (ie: The Zone, Protein Power, Dr. Atkins, etc) Even moderate thinkers are worried.

The number one concern I hear from many dietitians are risks linked with eating too much protein. In fact, these risks are more folklore than truth.

### HOW MUCH PROTEIN IS OK?

#### Here's a historical perspective: (per day)

Paleolithic man	168 g	34% PRO
Preneolithic man	250 g/	50% PRO
Baffin Is Eskimos	280 g	56% PRO
Aust. Aborigines	400 g	80% PRO
Masai	300 g	60% PRO

Adapted from ADA lecture by Mary Gannon, PhD San Diego, 1999

First, excessive protein does not harm the kidneys. The only research that associates protein intake and kidney function are studies looking at subjects with kidney disease. Healthy kidneys are well equipped to handle a higher protein intake.

Second, man has historically eaten many more grams of protein and a much higher percent of calories from protein (see table above). The real problem with eating excessive protein is that an individual may inadvertently not eat enough carbohydrate. Too little carbohydrate can make someone feel tired, fatigued and unable to concentrate, too.

Thirdly, many nutrition experts assume protein sources are sources of excessive fat and calories. They couldn't be more misguided. There are many lean sources of red meat, pork, lamb as well as fish, poultry and vegetarian sources of protein. In addition, choosing one higher fat food in a meal does not destine that meal to be high fat. Clients are more likely to consistently eat a healthful diet when they are given permission to eat favorite higher fat foods in moderation.

I suspect that if glucose is not burned immediately as fuel, it probably ends up in fat stores. The question begs to be asked, "How much carbohydrate fuel does a woman need? Are women in general better off eating less carbohydrate? I think the answers to most of these questions will be, "it depends".

For now it is important to remember that while intriguing, these studies have very small sample sizes (typically N=12-16 subjects). With small sample size comes many obstacles due to problems with statistical power as well as significant variances within the group. This is to be expected. Until more data is available, it is probably more important to simply keep in mind that differences occur. I envision a spectrum of gender differences in energy metabolism, with individuals from both sexes interspersed along that continuum. It is still far more important to assess the individual than make any overt assumptions about energy metabolism because of one's sex.

## Women metabolize energy in concert with their menstrual cycle

Tarnopolsky continued his research looking at the differences in energy metabolism for women between the follicular phase of the menstrual cycle (from the onset of bleeding to ovulation) and the luteal phase (from ovulation to the next period). No surprise for the masses of women craving carbohydrate before their period: women metabolize carbohydrate far better during and after their period than the one or two weeks just before it.

These findings complement my clinical observations perfectly. Counter-intuitively, the time women most crave carbohydrate is the time they are least able to use it for fuel. This is when more protein and a bit more fat is needed in the diet.

### Calories (from page 1)

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Dear friends, clients and colleagues,

The significance of insulin resistance in our health and well being as well as disease continues to reveal itself through progressive research and clinical observations. And many books and articles have been written. They tell you how to eat, what to eat, when to eat but all too often with little research to support the recommendations. It almost seems the more bizarre and restricted the recommendations, the more likely people will invest in the program. Thankfully, there is a better way.

I have recently prepared a series of workshops regarding many aspects of insulin resistance. I plan to present workshops on a quarterly basis, choosing from topics listed below. If you are interested in attending one of these events, please register below. I’ll look forward to seeing you there!

On site presentations are also available. Call me for more information!

### Insulin Resistance and Energy Metabolism

Getting Lean: The Role of Food Composition and Losing Fat Weight  
 Children At Risk: What can you do to help your child manage their weight  
 How to feed athletes: Not everyone benefits from a high carbohydrate diet

### Insulin Resistance and Women’s Health

How Menarchy and the Menstrual Cycle Effects Energy Metabolism  
 How to Avoid Excess Fat Gain During Pregnancy and Lose Fat Weight  
 During Breastfeeding  
 Why Women Get Fat During Menopause

### Insulin Resistance and Reducing Your Risk of Disease

The Link Between Heart Disease and Diabetes: How Your Diet Can Help  
 Preventing Type II Diabetes: The path from insulin resistance to high blood sugar  
 Your Diet and High Blood Pressure: Bring back the salt shaker—it’s not the problem!  
 My Tummy Hurts: How your diet contributes to gas, bloating and poor elimination