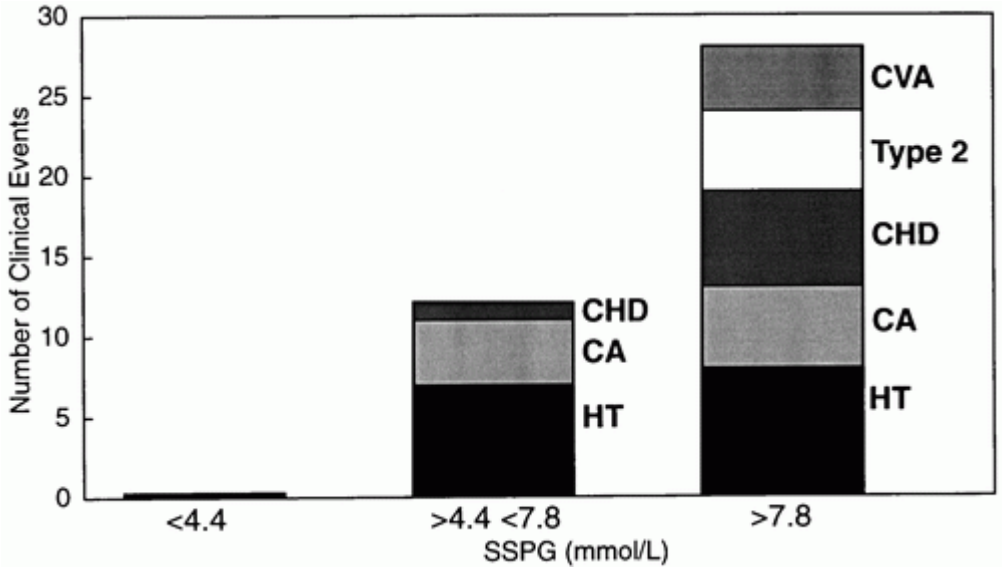
Carbohydrates Inhibit Insulin Sensitivity from Exercise

Exercise increases insulin sensitivity, and that's one of the best reasons for doing regular exercise. But carbohydrates inhibit insulin sensitivity from exercise, so if you eat carbohydrates after exercise, you could be sabotaging your exercise and not getting all of its benefits.

Insulin sensitivity

Insulin sensitivity is critical for health. Most if not all of the diseases of civilization – heart disease, cancer, diabetes, Alzheimer's, and the rest – are accompanied by insulin resistance, that is, a decrease in insulin sensitivity. Increasing insulin sensitivity could help prevent most of these diseases.

The chart below shows what happens when a group of men and women have their insulin sensitivity/resistance measured and are followed for approximately 5 years. They were grouped into tertiles (thirds), equal-numbered groups according to insulin resistance. The group with the greatest insulin sensitivity (lowest resistance) had zero cases of heart disease, stroke, cancer, hypertension, or type 2 diabetes. The majority of cases were in the group with the highest insulin resistance. (Details here.)



Maintaining good insulin sensitivity is that important – your life could depend on it.

Exercise is a good way to improve insulin sensitivity. By draining glycogen stores from muscles and liver, exercise increases GLUT4 receptors on muscle and liver cells, and insulin sensitivity increases.

But eating carbohydrates may sabotage the ability of exercise to increase insulin sensitivity.

The effect of carbohydrates after exercise

Exercise uses a combination of the two kinds of stored energy in the body: carbohydrates, and fats. Generally, the higher the exercise intensity, the greater the amount of glycogen, the storage form of carbohydrate, that the body uses. Low intensity exercise uses a greater amount of fat. The ratio of carbohydrate to fat burned can be determined using the respiratory quotient, a test done in the physiology laboratory.

Even a relatively lean person has enough calories stored as body fat to last for weeks or perhaps even months without eating. Using myself as an example, at 160 pounds body weight and 12% body fat, I have 19 pounds of body fat. At 3,500 calories per pound of body fat, and at a 2,000 calorie daily requirement, my fat stores might last over a month without eating.

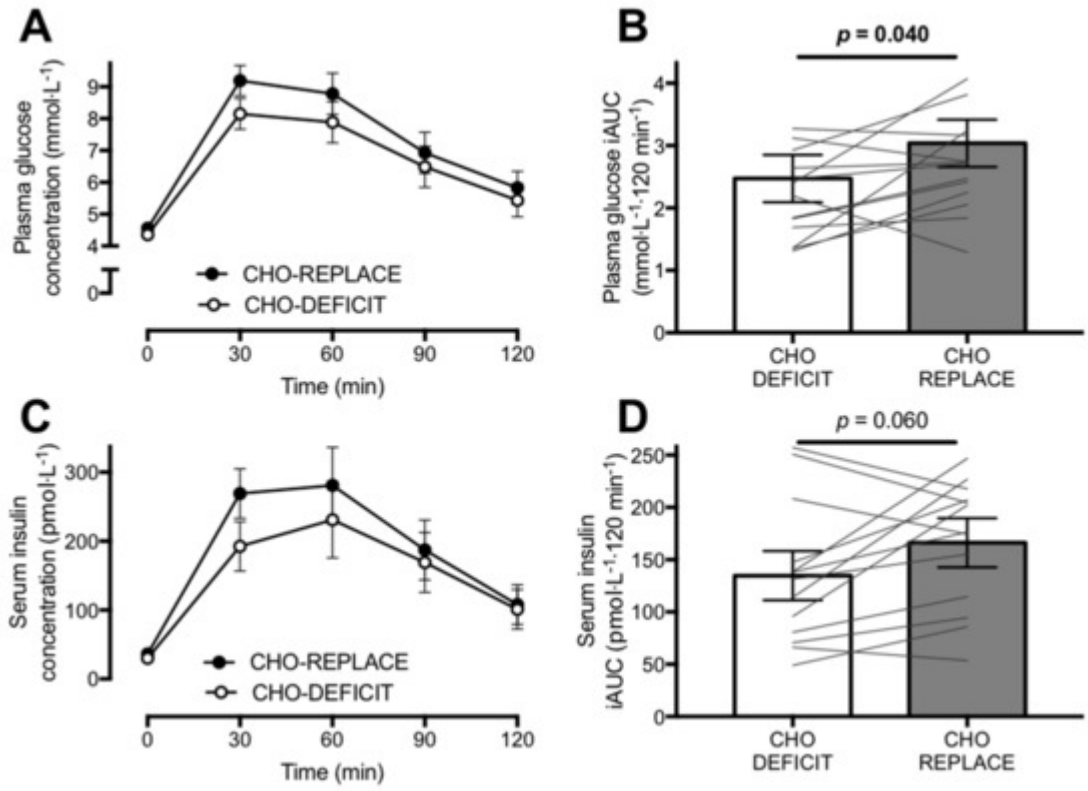
In contrast, the average person stores only about 1500 to 2000 calories in the form of glycogen. The liver contains about 100 grams, and muscles 400 grams; at 4.5 calories a gram,

The ability of exercise to drain glycogen stores is crucial to its ability to improve insulin action. If you immediately replace the lost glycogen by eating a high-carbohydrate meal, you may lose the insulin-sensitizing benefit of exercise.

Post-Exercise Carbohydrate-Energy Replacement Attenuates Insulin Sensitivity

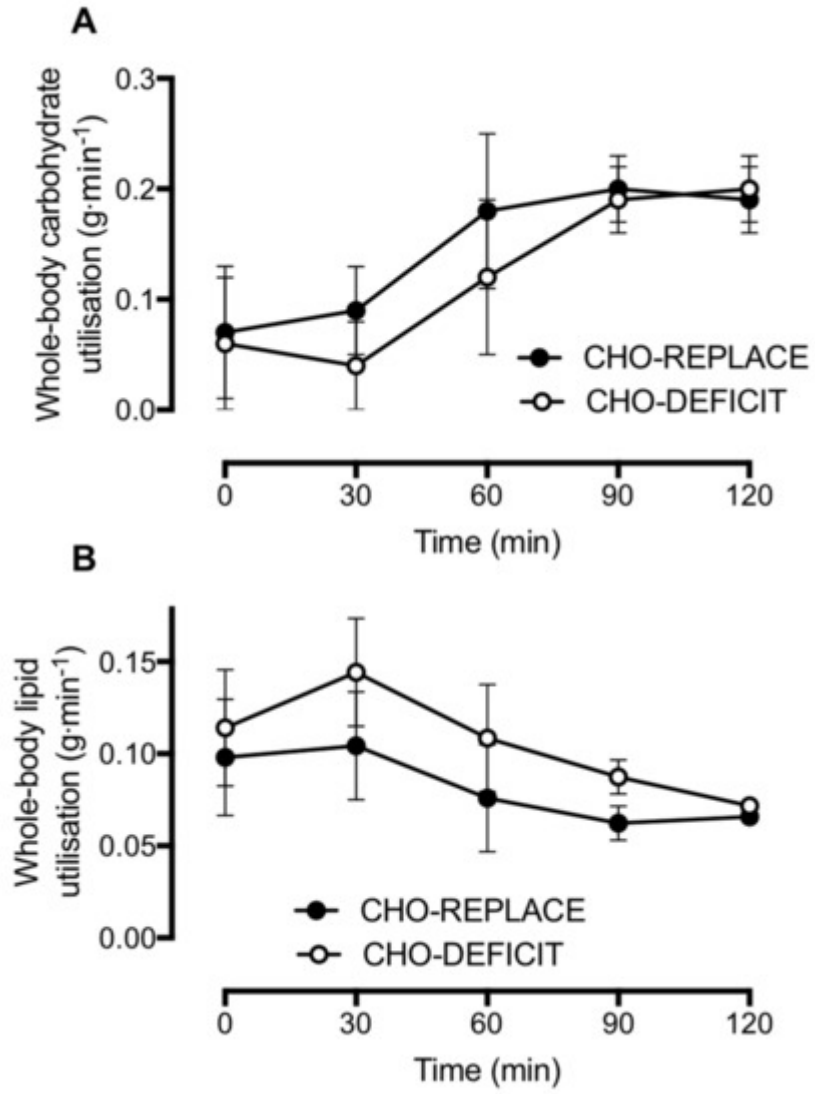
[and Glucose Tolerance the Following Morning in Healthy Adults]

Fourteen healthy adults exercised for 90 minutes at 70% VO2max. They then drank either a placebo, or a drink with about 220 grams of carbohydrate in the form of maltodextrin. The study had a crossover design, so all participants did both interventions. They then went through a glucose tolerance test the next day, and glucose and insulin were measured. Results below:



Both glucose and insulin were higher in the group that replenished glycogen stores with maltodextrin.

Furthermore, during the glucose tolerance test, those who had taken the carbohydrate burned less fat.



> The present study demonstrates that replacement of the carbohydrate utilized during a single bout of exercise impairs both insulin sensitivity and glucose tolerance by ~20–25% the following morning, relative to when the exercise-induced carbohydrate deficit is maintained. Importantly, these changes were most clearly apparent in the postprandial state. Furthermore, postprandial fat oxidation was suppressed by post-exercise replacement of carbohydrate use. Previous work has demonstrated that, whilst exercise is a potent method of stimulating muscle glucose uptake and insulin sensitivity, the carbohydrate deficit induced by exercise is key factor that mediates these responses.

Conclusion

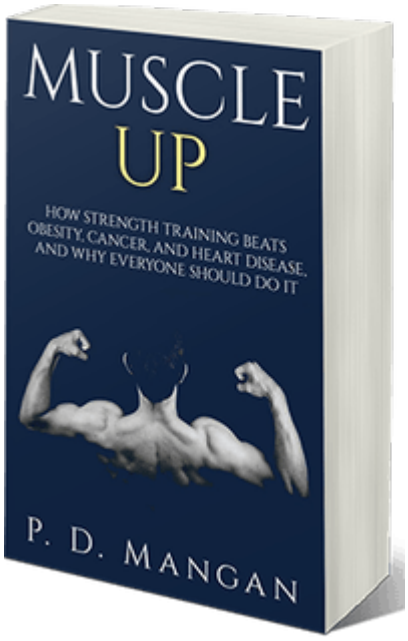
The insulin-sensitizing effect of exercise depends in part on depleting glycogen stores. Replacing glycogen with a large amount of carbohydrate, as is the practice for many, both athletes and non-athletes, impairs the effect of exercise.

Don’t self-sabotage your exercise regimen by eating lots of carbs.

Since the higher the exercise intensity, the more glycogen is burned, high-

intensity exercise is a good way to improve insulin sensitivity.

PS: For more on high-intensity training, see my book, Muscle Up.



PPS: Check out my Supplements Buying Guide for Men.

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