Coach-Athlete Q&A

A look at some coach-replies to common questions by topic.

Q: I need your expert advice and help. I am an athlete who is highly motivated, trains well, but is simply a very big guy. Looking @ me, I am clearly the football player type (& even former Assisstant Coach @ Univ. of SC). On a bad day, he could bench press 350lbs. My goal weight is 210.....but currently @ around 225. Can you help shed some light on how we may go about getting enough calories for training, yet still creating the deficit we need to help me lose the weight. If I were to guess, my % of body-fat.....I'd say that it's probably 16%. Not a fat guy at all.....just very muscular w/ some fat.

your thoughts?
E.W.

A: (from Dr. Bill Misner,)

Weight loss during training is quite difficult. The key to losing weight is to EXERCISE->DEPLETE more calories than you DIET->ADD. THE PROBLEM OBSTACLE: HUNGER MAY DRIVE EXERCISING-ATHLETES TO REPLENISH THE EXTRA ENERGY SPENT WITH MORE CALORIES WHICH ONLY VOIDS THE WEIGHT LOSS. What do you do to lose weight during training? Many report difficulty losing off-season weight gain when returning to training. Why is that?

Exercise induces two enzymes, lipoprotein lipase and GLUT-4 protein in muscle which should set the stage for fat weight loss, but it will not if our appetite replenishes the calories spent from exercise. Replacing carbohydrates AFTER a workout at the rate of 60 grams carbohydrate for each hour exercised will not result in fat weight storage BUT every gram over 60 grams carbohydrate eaten per each hour exercise may add fat stores body weight reducing the caloric weight loss column to a weight gain.

Here is an example:
Workout 2 hours, post meal carbohydrate intake = 120 grams carbohydrate
Prior to workouts the muscle glycogen stores are not accessible except to spend for exercise or shivering during the cold. Immediately after 60 minutes or more exercise, the body releases an enzyme called glycogen synthase, which provides a train to carry restoration of muscle glycogen from carbohydrates eaten up to 120 minutes after exercise, though the carbohydrates eaten are most efficiently transferred to muscle glycogen stores during the first 30 minutes.
Unless glycogen synthase is present carbohydrate excess is transferred to fat stores...
Liver glycogen however may be accessed both in and outwards best by fructose fruit sugar.
I notice that this athlete eats carbohydrates prior to training [NOT Good], which is likely why he is stuck at 215-218. Fruit-generates liver glycogen replacement and is therefore the only carbohydrate justified no sooner than 3 hours before a workout if weight loss is a goal. Appetite control and food timing selection must be made a rigid practice if weight loss is to be accomplished during exercise. Quite frankly, weight loss is not efficiently the best choice while training for an endurance-type event, but it can be done. Let me review some of the rationale which may provide an adjunct to weight loss under such conditions when pracitced for 6 weeks duration.

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EXERCISE INDUCED ENZYME MECHANISMS
A research team found that exercise increases the activity of two enzymes, GLUT-4 and LIPOPROTEIN LIPASE[LPL], which are responsible for transporting glucose and fat into your muscles. Lipoprotein lipase plays a role in both the storage and oxidation of body fat. As fat is oxidized, it gets burned for energy. If more fat is oxidized than stored, weight will be lost.

Whether LPL promotes fat storage or fat oxidation depends on whether it's expressed in muscle or fat:

A-LPL in fat tissue takes fat from the blood, and stores it as body fat.
B-LPL in muscle diverts fat away from storage in fat tissue for oxidation.

Animal studies show that mice with high levels of LPL in their muscles are resistant to the effects of a high-fat diet. SOME SCIENTISTS THINK DRUGS THAT INCREASE LPL IN MUSCLE COULD RESOLVE OBESITY IN HUMANS. "Exercise increases the expression of lipoprotein lipase (LPL) and GLUT-4 in skeletal muscle. Intense exercise increases catecholamines, and catecholamines without exercise can affect the expression of both LPL and GLUT-4. To test the hypothesis that adrenergic-receptor signaling is central to the induction of LPL and GLUT-4 by exercise, six untrained individuals [age 28 +/- 4 (SD) yr, peak oxygen uptake 3.6 +/- 0.3 l/min] performed two exercise bouts within 12 days. Exercise consisted of cycling at approximately 65% peak oxygen uptake for 60 min with (block trial) and without (control trial) adrenergic-receptor blockade. Exercise intensity was the same during the block and control trials. Plasma catecholamine concentrations were significantly higher and heart rates were significantly lower during the block trial compared with the control trial, consistent with known effects of adrenergic-receptor blockade. However, blockade did not prevent the induction of either LPL or GLUT-4 proteins assayed in biopsies of skeletal muscle. LPL WAS SIGNIFICANTLY INCREASED BY 170-240% AND GLUT-4 WAS SIGNIFICANTLY INCREASED BY 32-51% AT 22 HOURS AFTER EXERCISE compared with before exercise during both the control and block trials. These findings provide evidence that exercise increases muscle LPL and GLUT-4 protein content via signals generated by alterations in cellular homeostasis and not by adrenergic-receptor stimulation [1].

WATER CONSUMED 30' BEFORE MEALS QUENCHES APPETITE
Super hungry after a workout? Drinking water has been shown to suppress the appetite. Subjects were given access to a buffet-style lunch that allowed them to choose a variety of different foods. The table below shows you exactly how many calories subjects ate at lunch after consuming the different drinks:
SIZE OF DRINK--------CALORIES CONSUMED AT LUNCH
No drink----------1,032 calories
300ml----------758 calories
450ml----------698 calories
600ml----------625 calories
The larger the volume of fluid consumed before lunch, the fewer calories were consumed at lunch. Hunger ratings were three times lower following the 600ml drink, compared to the 300ml drink. Feelings of fullness were three

times higher following the 600ml drink, compared to the 300ml drink. The larger drinks had -0- calories in them and a fiber [Guar Gum] to add thickness to the drink for a feeling of fullness. After exercise or 30 minutes before eating, drink 300-600ml water to "fool" the stomach into sending a "full" signal to the brain [2, 3].
A well-hydrated body is appetite suppressed by calorie-free water consumed at least 30-minutes prior to eating. This indicates that by expanding food volume with fluid intake, a reductions in appetite results in less or low calorie intake. Any form of liquified foods such as SOUP, also reduces appetite calorie-cravings.

WHAT FOODS REDUCE APPETITE?
Researchers set out to identify particular properties of foods that can affect satiety. They examined the effects of caloric level, energy density, and sensory-specific satiety on food intake in normal weight, non-dieting males. Eating time and initial palatability ratings were held constant.
SOUP WAS FOUND TO REDUCE SECOND COURSE INTAKE SIGNIFICANTLY MORE THAN THE OTHER PRELOADS.
ORDER OF HOW THREE PREMEALS REDUCED APPETITE
1-TOMATO SOUP
2-MELON
3-CHEESE ON CRACKERS
The two second meal courses were macaroni-beef casserole and grilled cheese sandwiches.
This reduction could be partially accounted for by the low energy density of tomato soup; however, soup reduced intake more than the melon preload, which was matched for energy density. Sensory-specific satiety did not explain the satiating efficiency of the soup. Thus, during a meal, tomato soup is more satiating than the melon and cheese on crackers [4].

Though I am biased in this suggestion, one of the best-researched papers on this subject is the "American Fitness Profesionals & Associates' Weight Management Position Paper." You may want review the paper in it's entirety [5].

Small meal, low carbohydrates, timed small carbohydrate repletion dose [60 grams carbohydrate per each hour exercise taken post exercise only], limit red meat and dairy or avoid if possible, using fish, soy, whey or egg whites for protein sources during diet. Increasing fiber from whole raw fruits and vegetables will help replete glycogen while not contributing to fat weight gain. I would encourage this athlete to assume a lifestyle that automatically generates a healthy body composition mass [BMI] which is shown to support health and endurance exercise outcome.

Kindly keep me informed as to your progress.

REFERENCES
[1] J Appl Physiol. 2000 Jul;89(1):176-81.
[2] American Journal of Clinical Nutrition, 67, 1170-1177.
[3] By Permission, courtesy of Christian Finn's Weekly Research Update, Issue 74, May 13, 2002 http://christianfinn.com/