FAT METABOLISM & ACUTE RESISTANCE EXERCISE IN TRAINED MEN.

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OVERVIEW

Muscle contractions rely on the hydrolysis of adenosine triphospate (ATP) to adenosine diphospate (ADP) as fuel. Whether the original energy intake is carbohydrate, protein or fat, the human body has the ability to break down the nutrients to synthesize ATP as needed. If your goal is to increase fat burning through resistance exercise (RE), it is important to understand the science and differentiate fact from fiction.

EXERCISE FUEL

Power-driven activities lasting a few seconds, such as weight lifting, use ATP and creatine phosphate (CP) stored in muscles. Approximately 50 percent of the energy from food consumption is stored as ATP and CP in your body, ready for action. Exercises lasting longer than two minutes draw on muscle glycogen stores. Eventually, glucose and free fatty acids (FFA) fuel further energy needs when glycogen stores are depleted. FFA utilization, called oxidation, is purely aerobic, resulting in a glycogen- and glucose-sparing effect. However, the major source of FFA is body fat. Given that the release of FFA is a lengthy process relative to carbohydrate energy sources, it is more prevalent during low-intensity exercise.

RESISTANCE EXERCISE

Despite short bursts of intense energy output, it is not uncommon for RE sessions to last 30 to 60 minutes for many recreational athletes and even longer for bodybuilders. The longer the RE duration, the more likely your body will begin to use fat to supply energy for your overall metabolism. This also applies as you become more trained, increasing muscle mass and therefore increasing metabolism. The American College of Sports

Medicine (ACSM) loosely defines “trained” as someone who exercises approximately an hour a day, five times a week.

THE EVIDENCE

A study by researchers at East Carolina University examined the effect of RE on fat oxidation in eight trained men, as reported in the ASCM's “Resource Manual for Guidelines for Exercise Testing and Prescription." Subjects averaged 24 years of age and performed at least three days of RE weekly for over two years. Their body fat ranged from 6.9 to 11.1 percent. Their average intake was 2,565 calories — 40.1 percent of calories from carbohydrate, 23.1 percent from protein, 27.7 percent from fat and 8.1 percent from alcohol. The subjects were required to consume at least 200 g of carbohydrates on the day before each RE session, which was performed in a fasting state in the morning. The researchers found that calorie expenditure was elevated by 10.5 percent on RE days and fat oxidation was elevated by 105 percent for 40 minutes following the session, with up to 12 hours of increased metabolism reported in previous literature. Although the theory was not examined, the researchers suggested that such an increase in fat metabolism is a mechanism to spare glycogen in the recovery stage of RE.

FAT BURNING

RE is not a form of exercise that relies heavily on fat as a fuel. Furthermore, you are not encouraged to exercise in a fasting state. However, the duration of the training session, the need to replenish muscle glycogen stores and the synthesis of new muscle mass are factors that lead to significant increases in fat metabolism to fuel vital body functions.

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