Resistance training before aerobic exercise: Is this the right order? [1]

Dear Alice,

I have read that the best exercise sequence for calorie burning is doing resistance training first, followed by aerobic exercise (within 45 minutes of a weightlifting session). The reasoning behind this theory being that the lactate build-up/produced during weight training can be used as pyruvate/fuel and one can therefore exercise for a longer period of time (leading to greater calorie expenditure). Is this true?

Many thanks,

Pepe

Answer

Dear Pepe,

Any exercise, including both resistance training and aerobic exercise, will burn calories and help you reap the benefits of being active. The order of resistance training and aerobic exercise could make a slight difference in energy expenditure, but it is wise to do both if you want to maximize calorie burn.

The theory you refer to is the process of glucose metabolism — or more simply put, how the body uses energy in exercise. Resistance training (anaerobic exercise) and aerobic exercise (such as running, walking, and swimming) are different in how they use energy. During anaerobic exercise (exercise that does not require oxygen to produce the necessary energy, or ATP, to carry out the activity) lactic acid is formed when pyruvate (an intermediate substance in glucose metabolism) combines with hydrogen, in the presence of lactate dehydrogenase. Lactic acid quickly diffuses from the muscle into the blood, where it is buffered and carried away. If this didn’t occur, you’d tire out quickly. As you continue to work out, the clearance of lactic acid can't keep up with its formation. Lactic acid build-up inactivates certain enzymes that are involved in energy transfer and decreases the muscles’ ability to contract — leading to more fatigue.

The order of aerobic and resistance training can be important in maintaining energy since the
lactic acid that has remained in the muscle can be reversed back into an energy source (pyruvate) during recovery or when the pace of exercise is slowed. How quickly this recovery occurs varies individually. In this way, the order does affect calorie burn, since more energy may mean you can do more exercise. Although some lactic acid dissipates from the muscles and turns into glucose, this doesn't happen very quickly and it probably won't lead to a burst of energy.

Some studies have suggested that when resistance training takes place after aerobic exercise more energy is expended than when anaerobic exercise comes first. For example, a short bout of aerobic exercise (such as a brisk walk or light jog on the treadmill) before weight lifting will help your muscles warm up and could improve the calorie burn you get from your workout. Both resistance training and aerobic exercise burn calories, but in different ways. Any way you look at it, exercise puts some pep in your step.

Alice!
Category:
Nutrition & Physical Activity [2]
Fitness [3]
Cardiovascular/Aerobic Exercise [4]
Weight Training [5]

Related questions

Weight training: Do I need to change my workout to see results? [6]
What’s a healthy weightlifting schedule? [7]
Is soreness a good indicator of a good workout? [8]
Losing fat and building muscle mass: Can this be done simultaneously? [9]

Published date:
May 16, 2003
Last reviewed on:
Mar 27, 2015
Go Ask Alice! is not an emergency or instant response service.

If you are in an urgent situation, please visit our Emergency page to view a list of 24 hour support services and hotlines.

Source URL: https://goaskalice.columbia.edu/answered-questions/resistance-training-aerobic-exercise-right-order

Links