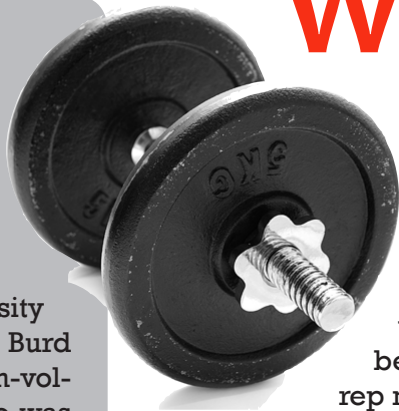


## New loading strategy?

A McMaster University study led by Nicholas Burd found that low-load, high-volume resistance exercise was more effective for stimulating muscle protein synthesis than high-load, low volume exercise. On different days, test subjects performed knee extension to failure using load of 90 percent or 30 percent of 1-rep maximum.

The scientists used sophisticated methods to measure muscle protein synthesis from muscle biopsies taken during recovery. The high-rep, low-load workout stimulated protein synthesis the most. While the study has important implication for bodybuilders, we need more research to support this training method.



# WEIGHT FOR IT

## Free weights beat Smith Machine

Many people like to train on Smith Machines because they are safe and allow greater training loads. Jared Coburn and co-workers from California State University, Northridge found free-weight bench presses coughed great activation of the medial deltoid (middle shoulder muscle) than Smith Machine bench presses at 70 and 90 percent of maximal effort (1-rep minimum).

There were no differences in activation levels of the anterior deltoids or pectoralis major (chest) muscles. They measured muscle activation using electromyography. Free weights cause greater upper body muscle activation during the bench press. Also, the Smith Machine requires a specific bar path during exercise, which could place abnormal stress on the joints and possibly increase the risk of injury.

## On the *Swiss* ball

Swiss ball exercises are widely used to build core muscle strength and promote spinal stability. Several recent studies found that whole-body exercises such as squats, cleans and snatches overload core muscles better than isolation exercises performed on Swiss balls.

An Australian study of advanced Swiss ball exercises led by Paul Marshall found that Swiss ball rolls and bridges caused significant activation of the abdominal and spinal muscles.

While these exercises caused enough muscle activation to trigger a training response, people in the study had trouble maintaining a neutral spine, which could make advance Swiss ball exercises dangerous. The goal during most sports movements, particularly those involving rotation, should be a stiff, neutral spine and generate power from the legs and hips. Good technique is critical for maximizing force and reducing the risk of injury to the spine.

