

Acute Training Variables, Muscle Growth, Strength, and Power – Exercise Selection and Order

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Exercise Selection

Exercise selection, in terms of pure mass, strength, and power gains, is a bit more cut and dry. Exercise selection can be divided into compound vs. isolation movements, in which the former uses more than one joint, while the latter operates through a single joint. Squats would suffice as an example of a compound movement because they operate at the hips, knee, ankle, and lumbar region of the back joints, while leg extensions provide an excellent example of an isolation movement due to their centralization directly at the knee joint. For muscle growth the data is clear that compound exercises such as squats compared to leg curls result in greater growth hormone and testosterone responses as compared to isolation exercises(1). In addition when comparing compound to compound, or isolation to isolation you should realize that the larger muscle mass exercise will elicit the greatest hormonal response. For example squat jumps resulted in double the increase in testosterone as compared to bench presses(2). It is for this reason that the primary movers such as dead lifts, bent over rows, squats, and military presses should form a foundation of every bodybuilders training regimen. Isolation exercises are still critical for inter and intramuscular balance, as well as stimulating the local release of growth factors in the desired target muscle tissue. On one final note, for strength the majority of time in the weight room should be spent on the exercises in which strength increases are desired. This is known as the specificity principle and should be devoutly adhered to.]

Exercise Order

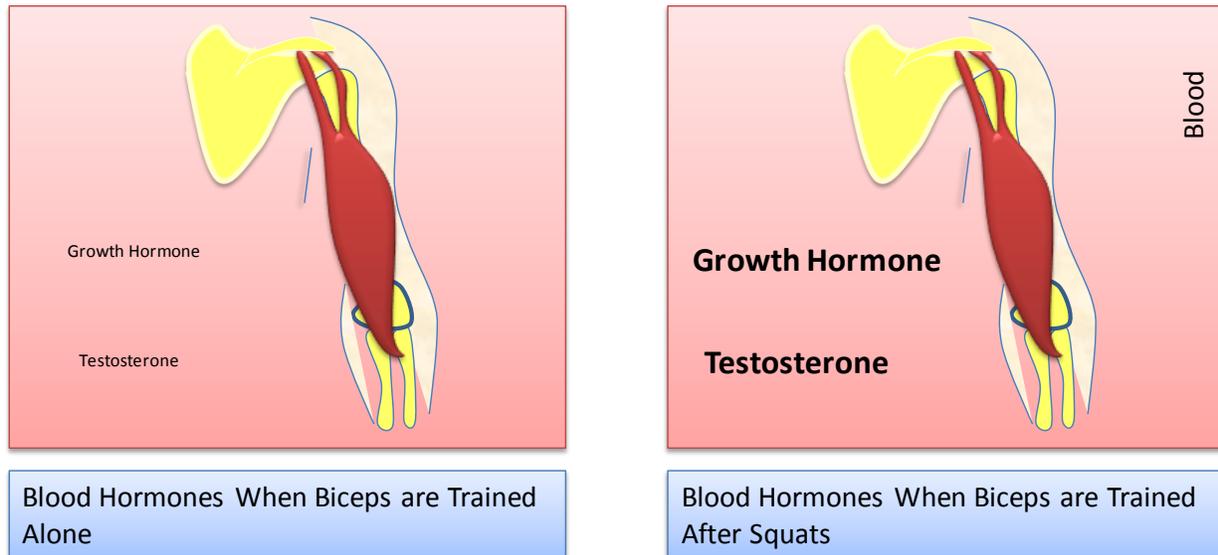


Figure 1.0 Theoretical blood hormone concentrations when biceps are trained alone or after squats.

Generally it is recommended that individuals perform large before small body part exercises for both hypertrophy and strength routines (1, 3-5). The reasons are as follows:

1. Large body part exercises require more coordination and energy and should be performed when fresh(1).
2. Large body part exercises stimulate the greatest hormone response. If these exercises are done at the beginning the hormones will get a chance to interact with all of the muscle groups trained for the remainder of the workout. For example, performing back and then biceps, allows the latter muscle group to be exposed to the massive hormone response from the back workout. Because the largest hormone release occurs during leg workouts, it would be advantageous to at least throw in a few sets of a small body part exercise at the end of the leg work out so that these body parts can be exposed to the large hormone release from legs. This was supported by Campos and his colleagues (6) who found that training arms alone for 9 weeks resulted in a 10% increase in

strength, where as training arms with legs using the same arm workout resulted in a 31% increase in strength. This is illustrated in the figure 1.0

3. If an individual performs small body parts before large they will not be able to lift as much weight with the large body part exercises resulting in lower adaptations (1).

Optimizing Exercise Order for multiple body part exercise sessions

Many individuals perform either full body, or divide training sessions into upper and lower body days. For strength if using a full body routine you will want to maximize the amount of weight you can lift, and for power you will want to maximize explosiveness. To do so alternate upper and lower body exercises, and push with pull exercises (1, 4). For upper and lower body only workouts alternate push and pull exercises (1, 4). For muscle growth on the other hand you will want to maximize the lactate build up within each muscle, and therefore may not want to allow the muscle to rest too much by alternating body parts. In this case it may be advantageous to finish lower body exercises first, followed by upper body exercises. As opposed to using a push pull scheme, simply finish each body part off before moving to a new one.

Table 1.0 Take home messages for exercise choice and order on hypertrophy, strength, and power.

❖ Compound Movements produce a greater hormonal response than isolation movements
❖ When comparing compound movements to compound, or isolation to isolation movements the exercise which stimulates the largest muscle mass will produce the greatest hormonal response. For example squats will produce a greater testosterone response than bench press
❖ Generally compound movements are performed before isolation, and larger body part exercises (legs) are performed before smaller body part exercises (arms).
❖ Often times bodybuilders only train large body parts by themselves. However these exercise sessions produce the greatest hormonal responses making it advantageous to at least introduce a few sets of small body part exercises at the end of the training session.
❖ For full body workouts in order to maximize strength and power alternate upper and lower body exercises, as well as alternate pushing and pulling movements (e.g. bench alternated with bent over rows)
❖ For muscle growth finish the lower body first, and the upper body after and as opposed to using a push pull scheme, simply finish each body part off before moving to a new one.

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