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The Think Muscle Newsletter publishes the latest news and research on exercise physiology, dietary supplements, performance enhancement, lifestyle management, health & nutrition, and bodybuilding & fitness. The newsletter is dedicated to providing accurate and unbiased scientifically based information.

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Message from the Editor in Chief:

A couple of items of note this past month is the amendment to the legislation on anabolic steroids and the FTC clamping down on the false claims behind *CortiSlim*.

First off, the United States Senate approved legislation that would amend the Anabolic Steroid Control Act of 2004 (bill S.2195). This bill allows the US Drug Enforcement Agency to add androstendione (andro), Tetrahydrogestrinone (THG) and other steroid precursors to the list of anabolic steroids that are classified as Schedule III Controlled Substances.

The bill was recently ratified by Congress on Monday October 11, 2004. According to Michael J. DiMaggio, Executive Director of the United Supplement Freedom Association, the bill could be expected to take effect on or around January 10th - 15th.

What does this mean? Well in case it isn't obvious, supplement companies can no longer sell and/or market "prohormones", "pro-steroids", and loop-hole steroids. A loop-hole steroid is a steroid that was exactly mentioned in the first version of the bill.

Before you go blaming the government for meddling with your rights to use supplements, understand that this bill was supported by several associations within the supplement industry including, American Herbal Products Association (AHPA), Consumer Healthcare Products Association (CHPA), Council for Responsible Nutrition (CRN), National Nutritional Foods Association (NNFA), and the Utah Natural Products Alliance (UNPA). Nevertheless, the real driving force behind the bill was the U.S. Anti-Doping Agency, the American Medical Association, and the National Football League.

Regardless of how you feel about not being able to use OTC androgens anymore, you've got to like what the FTC is doing about people who scam consumers out of their money by making false claims about their products. The FTC recently announced it would begin stepping up its enforcement efforts against supplement companies making false claims to get you to buy their products (http://www.ftc.gov/opa/2004/11/weightlossma.htm) It appears one of their first initiatives is to put a leash on marketers who make weight loss claims about so-called cortisol suppressing products. From the FTC website

"We will take appropriate enforcement action against firms that promote dietary supplement products with unsubstantiated claims about the benefits of the product," said Dr. Lester M. Crawford, Acting FDA Commissioner. "Consumers rely on the claimed benefits of the product, and we owe it to them that such claims be supported by competent and reliable scientific evidence." (http://www.ftc.gov/opa/2004/10/windowrock.htm):

Speaking of competent and reliable scientific evidence, our friends over at BulkNutrition.com are selling HSN's pre-workout protein PRIMER for a ridiculously low price. I have NEVER seen it priced this low…ever. And I doubt I ever will again. So, don't say I didn't tell you so.

In addition, Amazon has now jumped on the Hypertrophy-Specific bandwagon and called to see if they could begin selling HSN products. Like I could say "no" to Mrs. Amazon. So, you can now get fluffy Driver on Amazon. You will be able to get all your favorite HSN products through Amazon in the very near future.

As Always,

-bryan

P.S. The HST forum will be down for scheduled maintenance (DBM→MYSQLswitch) in the following days. Please forgive any inconvenience that this may cause.

Burning Subcutaneous Bodyfat: Tips for Women…and Men!

If there were a single goal or aim that could be attributed to 99% of the exercising population, it would be to get rid of subcutaneous fat. Sure, there are those who claim to workout because it's healthy, but when it comes down to it, "healthy" simply doesn't motivate people to exercise. "Looks", on the other hand, is a powerful motivator and literally drives the health and fitness industry despite any claim to health and/or fitness. In the end, it all boils down to looking good.

Subcutaneous fat is just a scientific term for the fat that sits in between your muscle and your skin. It's the fat that gives you dimples in your skin known as cellulite. You know what I'm talking about, that cottage cheese look. It's also the fat that gives you "love handles". Add to that, any other roles and folds and jiggly skin all are caused by subcutaneous fat. For the sake of not having to write it over and over again, we'll refer to it as "SC" fat from here on out.

Before we begin a discussion of the research, let me point out that there is a reason why we refer to SC fat in the first place, instead of just referring to it as plain old fat. In general terms, the body has three types of fat stores; SC fat, visceral fat, and intramuscular fat.

As we've already discussed SC fat is the fat underneath your skin. It's the fat that everybody sees. Visceral fat, sometimes called omental fat, is that fat that is stored inside your belly. It is inside where your guts are. It leads to the "pot belly" that men so often get and is highly correlated to heart disease. Finally there is intramuscular fat. Just as the name implies, this is fat that is stored in between muscle fascicles. It is the fat that is referred to as "marbling" when talking about cuts of beef. It is the first fat stores that are drawn upon when active muscles need fat for fuel.

OK, with all the big fat introductions out of the way, let's get down to business. SC fat, being the most noticeable fat, is something we all wish we had less of. So how do we get rid of it? We burn it.

A study undertaken at the University of Tokyo compared the effects of exercise frequency on SC fat and visceral fat.(1) They examined the interaction of two different frequencies of aerobic exercise training (30 min at 50-60% of maximal heart rate per session) and a self-administered caloric restriction program on the changes in subcutaneous and visceral fat mass over a period of 13 wk.

Twenty-six sedentary young women (27.9% body fat) were randomized into three groups: a non-exercising control group; a group who undertook 1-2 sessions/wk plus a 240 kcal caloric restriction (1-2SW); and a group who undertook 3-4 sessions/wk *without* caloric restriction (3-4SW).

There was an equivalent decrease in the percentage of body fat and total fat mass in both exercise groups compared with the control group. This can be attributed to an equivalent caloric deficit being achieved in both the 1-2SW group and the 3-4SW group.

Reduction in SC fat was significant in 3-4SW, but not in 1-2SW or the Control group. A negative correlation was observed between training frequency and changes in SC fat mass. In other words, the more frequently they exercised, the greater the impact on SC fat. In contrast, visceral fat decreased significantly and equivalently in both groups except the control group. There was no correlation between training frequency and changes in visceral fat.

These results clearly suggest that the decrease in SC fat, but not visceral fat, is proportional to the amount of aerobic exercise training. A change in VFM appears to be related solely to a deficit in caloric balance either by caloric restriction or by increased caloric expenditure through exercise.

The above results can be explained by differences in the sensitivity of each type of fat cell to stimuli such as fasting (i.e. dieting) and catecholamines.

The difference in sensitivity to caloric restriction is due to the different induction thresholds for metabolism-related gene expression. (2) The expression of beta3-adrenergic receptor, hormone sensitive lipase, and uncoupling protein-2 genes increases in visceral fat at the onset of dieting whereas SC fat generally is less responsive or will not respond at all to the stimulus of caloric restriction.

Again, catecholamines such as adrenaline and noradrenaline are powerful lipolytic messengers in fat tissue. The act via beta2-adrenergic receptors. Alpha2-adrenergic receptors counteract the effects of adrenalin and noradrenalin on fat cells. SC fat cells have more alpha2 and fewer beta2 receptors than visceral fat cells. (4) This combined with reduced dieting induced gene expression largely explain why love handles hold on and saddle bags stay in the saddle while the belt continues to get looser. (3)

What our current study demonstrates is that in order to get SC fat burning you have to hit it with a higher level of lipolytic stimuli, namely more adrenalin and noradrenaline and that more frequently. We do this with moderately intense and sufficiently frequent cardio. Dieting alone, and particularly low-fat high-carb/insulin diets, will yield disappointing results particularly for women.

References:

1. Abe T, Kawakami Y, Sugita M, Fukunaga T. Relationship between training frequency and subcutaneous and visceral fat in women. *Med Sci Sports Exerc*. 1997 Dec;29(12):1549-53.

2. Li Y, Bujo H, Takahashi K, Shibasaki M, Zhu Y, Yoshida Y, Otsuka Y, Hashimoto N, Saito Y. Visceral fat: higher responsiveness of fat mass and gene expression to calorie restriction than subcutaneous fat. *Exp Biol Med* (Maywood). 2003 Nov;228(10):1118-23.

3. Linder K, Arner P, Flores-Morales A, Tollet-Egnell P, Norstedt G. Differentially expressed genes in visceral or subcutaneous adipose tissue of obese men and women. *J Lipid Res.* 2004 Jan;45(1):148-54.

4. Arner P, Hellstrom L, Wahrenberg H, Bronnegard M. Beta-adrenoceptor expression in human fat cells from different regions. *J Clin Invest.* 1990 Nov;86(5):1595-600.

PowerLifting: Research says Bigger Muscles = Bigger Totals

As the author of Hypertrophy-Specific Training (HST) I am the first to acknowledge that different training methods yield different results. Certainly there is a difference between Strength-Specific Training (SST) and HST. Interestingly, a recent study revealed that in the end, HST might also benefit those individuals seeking only strength.

The study was done at Indiana University and looked at the relationship between muscle size, and overall power lifting performance. (1) Twenty elite male power lifters (including four world and three US national champions) were tested for FFM, skeletal muscle distribution and isolated muscle thickness at 13 anatomical sites. Muscle thickness was measured with B-mode ultrasound. Best lifting performance in the bench press, squat, and dead lift was recorded from competition performance.

Significant correlations were observed between muscle distribution and performance of all three lifts. Interestingly, subscapular muscle thickness was the single best predictor of power lifting performance in each lift. Measurements at this site reflect the thickness of the upper lat just below the shoulder blade.

Performance of the squat, bench, and dead lift was strongly correlated with FFM and FFM relative to standing height. In other words, the more muscle the lifter had, the stronger he was. The results of this investigation demonstrate, as the authors suggest, that power lifting performance is a function of overall muscle mass and, therefore, may be limited by a persons ability to put on muscle.

Now don't get me wrong, everyone knows that you can indeed train in such a way as to increase strength temporarily. This is a type of "strength conditioning". This is what an athlete does to prepare for a contest. He will manipulate his loads and volume in order to "peak" on the designated day of the event.

The effect of this type of training manipulation or "strength conditioning" is neuromuscular in nature. The temporary increases in strength from is attributed to several fairly rapid neural adaptations including altered recruitment patterns, rate coding, motor unit synchronization, reflex potentiation, prime mover antagonist activity, and prime mover agonist activity. Aside from incremental changes in the cross sectional area (CSA) of muscle fibers, voluntary force production is largely a matter of "activating" motor units.

So, when you get a room full of athletes who are all strength-conditioned to the same degree, the determining factor in how strong they are depends primarily on the total

amount of muscle mass they carry and their height. (2,3) Theoretically, you could predict the best lifter simply by doing the kind of anthropometric measurements done in this study. In the real world however, you have conflicting variables such as talent (skill/technique), injuries, mental hang-ups, and ergogenic drugs. All of these come into play on the day of the event and when the playing field is fairly even, it is one or a combination of these that will determine the winner for that day.

Speaking of drugs, testosterone alone has a unique ability to both increase the CSA of muscle fibers, and alter the architecture of the muscle to enhance its strength generating capacity. (4) In case you are unfamiliar with the term muscle "architecture", a muscle is either fusiform, unipennate, bipennate, or multipennate. Pennation refers to the angle that muscle fibers sit in relation to the orientation of the muscle. For example, muscle fibers in the biceps are not pennated, whereas those in the triceps are. The "cross striations" you see in the quads and triceps show the pennation of those muscles. Pennation allows a greater number of fibres to contribute to force production, but reduces the contribution of each individual fibre to force production. The greater the pennation of a muscle, the more force it is able to produce. These benefits are obviously what makes testosterone the drug of choice for strength athletes. "A little dab'll do ya" as the saying goes. But I digress, this is not an article about testosterone.

In summary, the more muscle mass you can accrue, the higher your totals will be given that you remain free from injury, and prepare effectively for the event. In closing I would highly recommend that you read for yourself the following studies:

- Brechue WF, Abe T. The role of FFM accumulation and skeletal muscle architecture in powerlifting performance. *Eur J Appl Physiol*. 2002 Feb;86(4):327-36.
- Ford LE, Detterline AJ, Ho KK, Cao W. Gender- and height-related limits of muscle strength in world weightlifting champions. *J Appl Physiol*. 2000 Sep;89(3):1061-4.
- Lietzke, MH. Relation between weight-lifting totals and body weight. *Science* 124: 486-487, 1956

In the above research papers you will find more evidence for the relationship between muscle mass and absolute strength. Not only that, but you will have the privilege of reading that evidence from authors for more exacting in their language than I have presented here. In the mean time, if you find you are struggling to increase your strength, you may want to focus on building more muscle first. Then, once you have gained some mass, use some strength-specific training methods to condition the muscle for performance strength.

References:

1) Brechue WF, Abe T. The role of FFM accumulation and skeletal muscle architecture in powerlifting performance. *Eur J Appl Physiol*. 2002 Feb;86(4):327-36.

2) Ford LE, Detterline AJ, Ho KK, Cao W. Gender- and height-related limits of muscle strength in world weightlifting champions. *J Appl Physiol*. 2000 Sep;89(3):1061-4.

3) Lietzke, MH. Relation between weight-lifting totals and body weight. *Science* 124: 486-487, 1956

4) Blazevich AJ, Giorgi A. Effect of testosterone administration and weight training on muscle architecture. Med Sci Sports Exerc. 2001;33:1688–1693

Reader Survey
Tell Us What You Think?

1. Message from the Editor in Chief:
   [ ] It was good.
   [ ] It was okay.
   [ ] I didn' t like it.
   [ ] I' m not interested.

2. Burning Subcutaneous Bodyfat: Tips for Women…and Men!
   [ ] It was good.
   [ ] It was okay.
   [ ] I didn' t like it.
   [ ] I' m not interested.

3. PowerLifting: Research says Bigger Muscles = Bigger Totals
   [ ] It was good.
   [ ] It was okay.
   [ ] I didn' t like it.
   [ ] I' m not interested.

4. What type of articles would you like to see in the future? (Check all that apply.)
   [ ] Anabolic Steroids and Pharmaceuticals
   [ ] Anti-aging medicine
   [ ] Body Transformation
   [ ] Children' s Health and Nutrition
   [ ] Competitive Bodybuilding
   [ ] Diet and Nutrition Reviews
   [ ] Dietary Supplements
   [ ] Exercise Physiology
   [ ] Fitness Competitions
   [ ] Fitness Psychology
   [ ] General Health Topics
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   [ ] Seniors Health Topics
   [ ] Sports Specific Training
   [ ] Women' s Health and Nutrition

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I hope you have enjoyed the latest issue of the Think Muscle Newsletter. Suggestions? Comments? Questions? I'd love to he ar them!

Best regards,

-bryan

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