

Think Muscle Newsletter

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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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From the Introduction:

Recently, I gave a training seminar, and before we got started, someone pulled out this huge 3-ring binder and said "Here is everything you've ever written!" I was actually surprised at the amount of material this amounted to, and also flattered that someone would take the time to copy and assemble it all.

About six months later, that experience came to the surface when it occurred to me that publishing all of my written work in the form of an e-book might have a lot of appeal.

When the idea first occurred to me, I realized that there are several training and nutrition authors whose collected works I would certainly be interested in purchasing, were they available.

So I began searching my computer files, as well as the several magazines and websites I've written for, and the result is well over 110,000 words of my thoughts and approaches to the training sciences.

There are several unique benefits of this volume as well:

- 1) Here, you're seeing my articles before they were "dumbed down" by the magazines they appeared in (this has never happened with the web sites I've worked for, but was common in *Muscle & Fitness* and *Muscle Media 2000*).
- 2) Each article starts with a short introduction from me, explaining either my current thoughts on the subject matter, interesting feedback I've received about the article, and/or "behind the scenes" information that was not originally published.
- 3) Exercises discussed are illustrated with photos (often, the original article did not include photos, particularly if it was originally published on the web).
- 4) The Q&A section is categorized by subject.
- 5) This volume contains a table of contents, a complete exercise glossary linked to photos, a glossary of terms, and an index for convenient access to the information.

The careful reader will notice some contradictions from article to article. I consider myself a student first and a teacher second, so naturally, my approach has changed over the years.... all else being equal, later articles are more indicative of my current philosophy and methods.

I sincerely hope you find the following information beneficial. The learning process is enhanced by carefully considering and questioning the information presented. Can you find loopholes in my reasoning? Can you find opposing research to my conclusions? If so, kudos to you. I'm flattered when I see people reading my writings, but when I see people taking my work beyond my original concepts, it makes me feel like I'm making a difference.

Understanding the difficulty women have in losing lower body fat.

By Bryan Haycock

Having worked with many different female clients, I can attest to the difficulty of getting their lower body as lean as their upper body. Over the years I have tried many different strategies to get them to lose lower body fat like men. One thing I have learned is that patience and commitment make all the difference. If you have those two with you, science can help with the rest.

Some of the things I we have tried are manipulating the ratio of macronutrients in the diet. At best, a low fat diet works for weight loss in the obese, whereas lowering carbs has a tremendous advantage in women who are relatively lean already (by lean I mean 18% or so). Even so, stubborn lower body fat will still plague the female low-carb dieter. Yohimbine, an alpha-2 agonist, has also failed to produce the desired results. Think of alpha-2 receptors as a “brake” for fat cells. Women have a greater proportion of alpha-2 receptors on their lower body fat than men. This, in large part, gives rise to the typical gynoid, or “pear shaped”, fat patterning common in women. It was thought that if you could block the brake with yohimbine you could increase lower body fat loss during a diet. In the end, yohimbine has fallen far short of expectations. Even yohimbine creams have not worked.

So why is it that the fat on a woman’s hips and thighs is so slow to respond to tried and true fat loss techniques? Well, research has demonstrated measurable differences in the lower body fat of men women. For ease in reading I’ll put this in bullet point format:

1. Fat release at rest and before eating (called basal lipolysis) is greater from upper body subcutaneous fat than from lower body fat. This is true for both men and women. Though this does not explain the differences between men and women it does help to know that lower body fat is simply less active.
2. Beta-agonists (e.g. adrenalin, ephedrine, caffeine) do not increase lower body fat breakdown in women, but they do in men. Ouch! This effect may be due to the prevalence of alpha-2 receptors in women’s lower body fat. Once again, we see that what works for the goose will not always work for the gander.
3. There is no gender difference in lower body fat breakdown between men and women during exercise.
4. Estrogen plays a significant role in protecting and ensuring the accumulation of lower body fat in women.

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I have tried to use this information with my clients to help them as best I can to get rid of stubborn lower body fat. For example, using ephedrine and caffeine will not necessarily get rid of lower body fat faster than without it. However, insulin seems to make alpha-2 receptors more sensitive so lowering carbs in a strategic fashion can greatly improve results in the lower body. Birth control pills may also be a factor due to their estrogen content. If a female client is trying to get ready for a show and is using birth control pills, I may suggest she use an alternate form of birth control until after the show. This of course is said only by way of suggestion.

In the end, what ultimately must happen, is that the upper body fat stores must be depleted before the lower body really becomes active. Unfortunately, most women compete just as there upper bodies are ripped but their lower bodies have only begun to lean up. If they would go on an additional 6 weeks, their lower bodies would be ready.

Also, beware of trainers/coaches who have only trained men. There are a lot of things they may not know about or take into consideration when training a women. Some of these things could really make a difference in a woman's success at getting the body she wants.

There are a few other tricks of the trade, but if I told you all of them nobody would need me anymore...can't have that now can we.

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Androgen receptors down regulate...Don't they? Part 2.

By Bryan Haycock MS.

In [part 1](#) of this article we discussed the mistake of thinking about androgen receptors (testosterone receptors) in the same way we think of other receptors such as beta-receptors. Beta-receptors down regulate in response to beta-adrenergic stimulation whereas there is good evidence that androgen receptors increase in numbers in response to androgens. We also discussed the various affects of testosterone on muscle growth. Testosterone does far more than simply increase the rate of protein synthesis!

Now in part 2 we will finish our discussion of androgen receptor regulation as it pertains to the way muscle cells grow. The very mechanism of real muscle growth opens the door for increased androgen receptor number in response to testosterone treatment.

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Don't forget Satellite cells!

Satellite cells are myogenic stem cells, or pre-muscle cells, that serve to assist regeneration of adult skeletal muscle. Following *proliferation* (reproduction) and subsequent *differentiation* (to become a specific type of cell), satellite cells will fuse with one another or with the adjacent damaged muscle fiber, thereby increasing the number of myonuclei for fiber growth and repair. Proliferation of satellite cells is necessary in order to meet the needs of thousands of muscle cells all potentially requiring additional nuclei. Differentiation is necessary in order for the new nucleus to behave as a nucleus of muscle origin. The number of myonuclei directly determines the capacity of a muscle cell to manufacture proteins, including androgen receptors.

In order to better understand what is physically happening between satellite cells and muscle cells, try to picture 2 oil droplets floating on water. The two droplets represent a muscle cell and a satellite cell. Because the lipid bilayer of cells are hydrophobic just like common oil droplets, when brought into proximity to one another in an aqueous environment, they will come into contact for a moment and then fuse together to form one larger oil droplet. Now whatever was dissolved within one droplet (i.e. nuclei) will then mix with the contents of the other droplet. This is a simplified model of how satellite cells donate nuclei, and thus protein-synthesizing capacity, to existing muscle cells.

Enhanced activation of satellite cells by testosterone requires IGF-1. Those androgens that aromatize are effective at not only increasing IGF-1 levels but also the sensitivity of satellite cells to growth factors.³ This action has no direct effect on protein synthesis, but it does lead to a greater capacity for protein synthesis by increasing fusion of satellite cells to existing fibers. This increases the number of myonuclei and therefore the capacity of the cell to produce proteins. That is why large bodybuilders will benefit significantly more from high levels of androgens compared to a relatively new user.

Testosterone would be much less effective if it were not able to increase myonucleation. There is finite limit placed on the cytoplasmic/nuclear ratio, or the size of a muscle cell in relation to the number of nuclei it contains.⁴ Whenever a muscle grows in response to training there is a coordinated increase in the number of myonuclei and the increase in fiber cross sectional area (CSA). When satellite cells are prohibited from donating viable nuclei, overloaded muscle will not grow.^{5,6} Clearly, satellite cell activity is a required step, or prerequisite, in compensatory muscle hypertrophy, for without it, a muscle simply cannot significantly increase total protein content or CSA.

More myonuclei mean more receptors

So it is not only true that testosterone increases protein synthesis by activating genetic expression, it also increases the capacity of the muscle to grow in the future by leading to the accumulation of myonuclei which are required for protein synthesis. There is good reason to believe that testosterone in high enough doses may even encourage new fiber formation. To quote the authors of a recent study on the effects of steroids on muscle cells:

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"Intake of anabolic steroids and strength-training induce an increase in muscle size by both hypertrophy and the formation of new muscle fibers. We propose that activation of satellite cells is a key process and is enhanced by the steroid use."7

Simply stated, supraphysiological levels of testosterone give rise to increased numbers of myonuclei and thereby an increase in the number of total androgen receptors per muscle fiber. Keep in mind that I am referring to testosterone and testosterone esters. Not the neutered designer androgens that people take to avoid side effects.

Another group of researchers are quoted as saying:

"...it is intriguing to speculate that the upregulation of AR levels via the administration of pharmacological amounts of androgens might convert some muscles that normally have a minor or no response to muscles with enhanced androgen responsiveness"(8)

This is not an argument to rapidly increase the dosages you use. It takes time for these changes to occur and the benefits of higher testosterone levels will not be immediately realized. It does shed some light however on the proportional differences between natural and androgen assisted bodybuilders physiques.

Maintenance of the kind of muscle mass seen in top-level bodybuilders today requires a given level of androgens in the body. That level will vary from individual to individual depending on their genetics. Nevertheless, if the androgen level drops, or if they were to "cycle off" the absolute level of lean mass will also drop. Likewise, as the level of androgens goes up, so will the level of lean mass that individual will be able to maintain. All of this happens without any evidence of AR down regulation. More accurately it demonstrates a relationship between the amount of androgens in the blood stream and the amount of lean mass that you can maintain. This does not mean that all you need is massive doses to get huge. Recruitment of satellite cells and increased myonucleation requires consistent "effective" training, massive amounts of food, and most importantly, time. Start out with reasonable doses. Then, as you get bigger you can adjust your doses upwards.

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A tip for those who use cardio to get ready for a Body-Transformation, Bodybuilding, or Fitness competition.

Anybody who has ever competed in a bodybuilding contest knows what it is like to spend hours on a treadmill. Not only that, but try spending those hours while nearly starving yourself half to death. It isn't "fun", but to many it is very rewarding. So much so that they do it year after year, always trying to better their condition compared to the year before. I thought I would share with those Think Muscle readers interested in getting ready for a body-transformation, bodybuilding or fitness competition, a tip that will help them with this preparation.

Two things generally are required to get lean enough to compete in bodybuilding or fitness. One, you must cut your calories, and two, you must increase your cardio. Now there are some who might argue that you don't have to do both but I have seldom seen someone really ripped who doesn't use both.

The biggest mistake I see with both novice and experienced competitors is the introduction of both high volume cardio and very low calories at the same time. In essence, they go from off season mass building to marathon running semi-starvation virtually overnight. This creates a tremendous burden on the system. This burden ultimately leads to significant losses of both size and strength.

Understand that endurance training creates a catabolic environment *only when calories are insufficient*. When sufficient calories and protein are consumed, the body responds in an anabolic manner to moderate endurance training. This anabolism serves to enhance the

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body's ability to perform such exercise in the future. If a person were to go from no exercise, to a lot of exercise all at once, there is a 12-14 day period of adaptation during which nitrogen balance is negative. With sufficient protein, this negative nitrogen balance does not necessarily lead to a net loss of muscle protein.

When you go on a diet, there is an obligatory loss of lean as well as fat tissue (under normal conditions). Increasing protein intake will help to reduce the amount of muscle loss, but it will not prevent it.

Combining both high volume endurance exercise with caloric restriction leads to rapid decreases in bodyweight, but it also leads to rapid losses of muscle tissue and often puts undue stress on the immune system.

The solution? You'll have to find that out for yourself...just kidding. The solution is to begin your cardio before you begin your diet. In fact, to optimize the amount of food you can eat and still lose fat you must ramp up your cardio and increase your caloric intake at the same time to prevent any drop in bodyweight for the first two weeks as least. This way you will be eating a lot of food just to maintain bodyweight. This makes the body much more sensitive to reductions in calories/carbs.

If you've left yourself plenty of time to get ready for this future photo shoot or event, take about 4-6 weeks to slowly increase you calories until your bodyweight stabilizes at a higher weight. This generally happens after a 5-8 pound gain. You may feel fat doing this but it is all preparatory to "better dieting". So once your bodyweight has stabilized at a higher point, slowly introduce your cardio. Be careful not to let your bodyweight drop during this 2-4 week period. Try to consume lots of carbs and lean protein to *maintain* weight. Guys can get away with a slight increase in fat intake as well. Remember, we are not trying to get fat, only to maintain bodyweight and muscle while introducing cardio into our training.

Once you're doing as much cardio as you are ever going to do during your diet, slowly begin to reduce the amount of carbohydrates in the diet. If you've done it right, you will be consuming tons of carbs before you even begin to diet. All of this allows you to play with your carb intake at a much higher level than you could if you had cut them right at the beginning. I have also seen that people will lose fat consuming many more carbs than usual when taking this approach.

Overall, shoot for about a pound of weight loss per week. This may seem slow, but if you've followed these instructions, the diet is much easier to stick to because you are consuming many more calories during the diet.

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Reader Survey

Tell Us What You Think?

1. [Understanding the difficulty women have in losing lower body fat.](#)

- It was good.
- It was okay.
- I didn't like it.
- I'm not interested.

2. [Androgen receptors down regulate...Don't they? Part 2](#)

- It was good.
- It was okay.
- I didn't like it.
- I'm not interested.

2. [A tip for those who use cardio to get ready for a Body-Transformation, Bodybuilding, or Fitness competition.](#)

- It was good.
- It was okay.
- I didn't like it.
- I'm not interested.

3. *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

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- [] Sports Specific Training
- [] Women's Health and Nutrition

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

Best regards,

The Think Muscle Editorial Staff

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