



Think Muscle Newsletter #23

February 2003

ISSN: 1532-0561

28,356 opt-in subscribers

Full PDF Version: <http://www.thinkmuscle.com/newsletter/023.pdf> (542 kb)

Full Word Version: <http://www.thinkmuscle.com/newsletter/023.doc> (278 kb)

=====

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.

=====

Table of Contents

- 1) Message from the Editor in Chief: A New Year Means New Personal Bests As Well As New Challenges!
- 2) ThinkMuscle Q&A: If there is only one steroid receptor, why so many different effects?
How much do I increase the weight each workout to get the most growth?

=====

Message from the Editor in Chief: A New Year Means New Personal Bests As Well As New Challenges

by Bryan Haycock

It is a new year and a time to recommit to our goals and ourselves. This means not only continuing to do what we're doing well, but also improving on those things we aren't. I'll be the first to admit, this is easier said than done. If you've been in the game awhile, you know what I'm talking about.

Here are some simple steps you can take to make sure you aren't kicking yourself come June because you're not in the shape you committed to being in.

>Pick a date: Pick a starting date to begin your new program or schedule. Right it down on the calendar, or on a piece of paper where you'll see it all the time.

>Write down your new schedule or workout in detail: One of the hardest things about changing our routine is the fact that we aren't accustomed, or habituated, to doing it. So writing it down in detail will allow you not to have to think about it so much when you start. You will have already been over it time and again, and you can refer to it the morning of that first day.

> Prepare ahead of time: If you are going start a new workout that requires that you change exercises, or add cardio that you aren't accustomed to doing, you will want to experiment with those exercises ahead of time so that you know what your strengths and weaknesses are. If you don't, you will end up wasting a lot of time that first day trying to figure out how much weight to use, or finding out you can't do that much cardio.

> Tell other people about your plans: Making your plans public, or simply sharing them to others, places more expectations on you to follow through because you know that other people are expecting you to. Nobody likes to admit defeat to their friends and family, especially when their only obstacle was their own complacency.

> Understand "why" you are doing this: This is perhaps the most important of all. If you fail to find an important reason (important to "you" anyway) to go through all this work, you will most likely give up before you've reached your goals. This is why many people pick a local contest or show to compete in. It gives them a reason to keep going when they start to feel tired and hungry. You **MUST** have a good answer when you find yourself asking, "Why am I putting myself through this?" It doesn't matter why you do it, just as long as it is genuinely important to you.

So, in summary, pick a date to start your new program. Plan out and write down in detail what you will do each day. Gather the necessary info (weights, machines, etc) about any new exercises your going to do ahead of time. And finally, tell other people what you are planning and why it is so important to you. Not only will that put pressure on you to follow through, but they will also be there to support you when you need them.

I'm sure most of you have heard this before, but sometimes we just need to be reminded. Best of luck to all of you this year and let me know how it's going along the way, whether good or bad. I'm here to help.

-bryan

Hats off to Gunter Schlierkamp for beating Ronnie at the Pro GNC Show of Strength contest in New Orleans on November 9th. Don't get me wrong, Ronnie is one of a kind,

but its good to see the nicest 300lb guy in bodybuilding get his due now and then. Great job Gunter!

=====

ThinkMuscle Q&A with Bryan Haycock

Question:

Mr. Haycock,

I consider myself well versed on steroids and how they work, but one thing that continually has me puzzled is this; if there is only one androgen receptor that all steroids bind to in order to induce growth, how come there are so many diverse effects of different synthetic steroids. Some make you bloat, others don't. Some give you insomnia, other don't. Some give you hiccups and make you snore, while yet again, others don't. No one has been able to offer me an explanation for this. Any insight you might shed on this would be really appreciated.

Thanks in advance.

Answer: Much of the confusion about the wide range of side effects of steroids comes from their various non-genomic actions. As the term “non-genomic” doesn't seem to come up very often in locker room steroid conversations let me explain.

Most people know that there is only one typical, or sometimes called “classical”, androgen receptor (AR). The AR is an intracellular receptor, meaning that it resides within cells (as apposed to the membrane surface) and once bound to an androgen, travels to the nucleus of the cell and binds to the DNA where it initiates the expression of various proteins.

The AR exerts a wide range of effects even though there is only one typical AR. Testosterone (Test) is able to exert different effects in different tissues by virtue of it acting “as is” in some tissues, and acting as its 5-alpha reduced counterpart dihydrotestosterone (DHT) in the same and/or other tissues.

DHT has different binding properties than Test. DHT binds stronger, and stays bound longer than Test. This subtle difference in the strength and duration of binding is able to produce a tremendous range of different actions in the body from the time you're a fetus to a full grown adult.

Some synthetic steroids are more like Test, and others are more like DHT. But this still doesn't explain all the differences seen among synthetic androgens. The differences beyond binding properties can then be explained by these “non-genomic” properties mentioned earlier.

Within the last 5 years or so, more attention has been drawn to the non-genomic effects of steroids and trying to understand them. They are called “non-genomic” because they don’t directly involve the steroid bound to the AR acting directly on the cells DNA.

It is now understood that steroids can act on the cell membrane to bring about various second messenger effects. These second messenger pathways involve kinase pathways driven by classical receptors (MAPk, ERK, MEK, etc), as well as cyclic AMP, lipase and other kinase pathways (PI3K, PKA, PKC, etc), including ion fluxes (Ca⁺⁺), which are driven by atypical receptors. All in all, steroids affect cells through several different pathways and at least one atypical steroid receptor, none of which involve what most people consider the true “intracellular” mechanism of steroid action.

Most all of these non-genomic affects of steroids are acute, or immediate. Meaning, they occur within seconds or minutes of the steroid interacting with the cell. This helps to explain why so many different organs have androgen receptors or are sensitive to androgen levels. For example, in tissues taken from rats, (in order of sensitivity):

Hypothalamus
Adrenal gland
Epididymis
Thyroid gland
Pituitary gland
Quadriceps muscle
Kidney
Seminal vesicle
Testis
Liver
Submaxillary gland
Bulbocavernosus muscle (penis)
Vagina
Heart
Ovary
Uterus

The hypothalamus, part of the CNS, has a higher concentration of ARs than even the quads. That is an interesting fact. Of course this is from rats but humans would no doubt show more or less “similar” distributions.

One question that has recently been brought to my attention deals with how steroids increase strength. Aside from increases in contractile proteins, strength is largely a product of the nervous system. The involvement of the nervous system in generating strength starts in the brain (which can show fatigue believe it or not) and finishes with the structures involved in excitation contraction coupling.

It is perfectly reasonable that androgens act as a direct CNS stimulant through non-genomic pathways by increasing cAMP activity and enhancing Ca⁺⁺ flux from the

sarcoplasmic reticulum. Keep in mind that these are the same second messenger pathways utilized by catecholamines and like drugs including adrenaline, noradrenaline, ephedrine, and caffeine.

It is time for bodybuilders and steroid gurus alike to update their knowledge of the mechanism of action of the drugs they use and direct the use of. There is plenty of research available (see below) so no one claiming to be an expert has an excuse not to be well informed about the non-genomic actions of steroids.

Sample References: (There are many, many, more like these)

1. Losel R, Wehling M. Nongenomic actions of steroid hormones. *Nat Rev Mol Cell Biol.* 2003 Jan;4(1):46-55.
- 2: Schmidt BM, Christ M, Falkenstein E, Wehling M. Nongenomic steroid actions: completing the puzzle. Aldosterone as an example. *Exp Clin Endocrinol Diabetes.* 1998;106(6):441-5.
- 3: Cato AC, Nestl A, Mink S. Rapid actions of steroid receptors in cellular signaling pathways. *Sci STKE.* 2002 Jun 25;2002(138):RE9.
- 4: Christ M, Haseroth K, Falkenstein E, Wehling M. Nongenomic steroid actions: fact or fantasy? *Vitam Horm.* 1999;57:325-73.
- 5: Falkenstein E, Tillmann HC, Christ M, Feuring M, Wehling M. Multiple actions of steroid hormones--a focus on rapid, nongenomic effects. *Pharmacol Rev.* 2000 Dec;52(4):513-56.
- 6: Wehling M. Specific, nongenomic actions of steroid hormones. *Annu Rev Physiol.* 1997;59:365-93.
- 7: Schmidt BM, Gerdes D, Feuring M, Falkenstein E, Christ M, Wehling M. Rapid, nongenomic steroid actions: A new age? *Front Neuroendocrinol.* 2000 Jan;21(1):57-94.
- 8: Gerdes D, Christ M, Haseroth K, Notzon A, Falkenstein E, Wehling M. Nongenomic actions of steroids--from the laboratory to clinical implications. *J Pediatr Endocrinol Metab.* 2000 Jul-Aug;13(7):853-78.
- 9: Joels M. Modulatory actions of steroid hormones and neuropeptides on electrical activity in brain. *Eur J Pharmacol.* 2000 Sep 29;405(1-3):207-16.
- 10: Spindler KD. Interactions between steroid hormones and the nervous system. *Neurotoxicology.* 1997;18(3):745-54.

Question:

Hi. How do I decide how big an increment (i.e. weight increase) to use from workout to workout? I hear some people say to just use tiny increases (i.e. small percentages) in weight and others advising bigger increments. I'm not interested in strength so much as I am in size, so what should I do if I want to put on as much size as possible?

Thanx!

Answer: It is important not to get too caught up in small percentages. In other words, no need to split hairs when you don't actually have a view of the hairs you're trying to split. We cannot predict exactly how much weight to use at any given time because we simply can't see into the muscle tissue itself. Therefore we work our way along by finding an advantageous starting point and then keeping track of where we've most recently been.

The Principles Involved:

Your muscle, depending on the size of the muscle group, will not likely be able to sense a small increase in load, such as 2.5 pounds or 1 kilo. Your CNS won't really know the difference either. It doesn't get direct feedback from your muscle tissue about actual tension levels (aside from golgi and to a lesser extent spindles). The CNS is more sensitive to the degree of exhaustion, or a given level of output for a given duration. "You" will however because you know what you loaded on the bar last time and you know that you're putting 1 kilo more weight on this time. So aside from a mind game we play with ourselves, we need to try to make each workout a relatively more severe structural challenge to our muscle tissue. The challenge to our CNS and to ourselves is secondary to this. This is an important element that distinguishes Hypertrophy-Specific Training from other methods of training done for other reasons.

Speaking short term, what your muscles are responding to from workout to workout (~48 hours later) is the "repeated" structural challenge. The frequency that this occurs is also important. This will be true for about 3-4 weeks. The more frequent the load, and the more sensitive your tissue is to that loading, the longer you can get away with no increase in load. You heard me correctly. Until your tissue is finished building up its resistance to the current level of abuse you're putting it through, it will continue to respond (i.e. change) to the workouts even if the weight has not increased. Depending on the absolute amount of weight used, and the level of conditioning the tissue had when you started, this can work for anywhere from 3-4 weeks. However, there is a definite curve of diminishing returns during those weeks. The last workout won't be near as productive as the 2nd or 3rd workout.

Despite this short term efficacy of constant or static weight loads, increasing the load from workout to workout does serve an obvious purpose. It helps to cause adequate physical trauma to the tissue more consistently, thereby more consistently activating important hypertrophic pathways like satellite cell activity and internal mechanotransduction pathways. Too little or no damage due to imperceptibly small increments means your muscle's ability to resist trauma will soon catch up to you and growth will stop. Too much damage from huge increments means you're headed for injury and possibly fiber necrosis and an increase in fibrous connective tissue (not good).

The Application of those Principles:

So how do we apply the principles we just discussed? After all, just knowing that something works a certain way, doesn't mean you know how to make it do what you want it to. So let's summarize this first. You want the tissue to be traumatized more than just on the first workout. So, considering the tissue's ability to rapidly protect itself from further trauma (growing resistant to the tension itself), you have to continually increase the weight in order to stay ahead of the tissue's physical adaptation to the last workout. This is fundamentally contrary to ALL other programs before HST which preach full recovery before hitting the muscle again. Anybody serious about hypertrophy will need to train again *before* the muscle is recovered.

So we know that the load must be continually increased in order to grow consistently. However, this poses a problem to us because we are only so strong. Unlike Superman, there is only so much weight that we can lift. So our well-validated strategy to continually increase the weight is only a temporary solution. Here we come to another juncture that is fundamentally different from other programs. Some programs, unable to understand why growth stops, would have you change exercises to “confuse” the muscle. After all, don’t all our organs grow in response to confusion? Just think if this were true, people with blond hair would have HUGE brains. (Just kidding... relax ;)). Others would have you simply train harder, do more sets, do forced reps, decrease the rest period, or whatever they can think of to make the same weight loads “feel” for difficult. They call it upping the “intensity”. Why? Because they don’t really understand why they have stopped growing. If you don’t know why you’ve stopped growing, you are going to have a very hard time fixing the problem.

So back to our dilemma, we deal with our the problem of limited strength with Strategic Deconditioning (SD), which then allows us to use the minimum possible weight that will still produce hypertrophy when we start. This is the only reason using submax weights during an HST cycle works. After SD you have effectively decreased the amount of weight required to stimulate growth. And at the same time you have given yourself some headroom to increase the weight each and every workout for a decent length of time before you max out your strength.

Even when using SD properly, we still end up with certain limitations, or boundaries that we must work within. The lower boundary is that we still have to start with a good amount of weight to cause hypertrophy, regardless of how weak we are. The upper boundary is due to the fact that we are only so strong so we can’t increase the weight forever. The difference between the lower boundary (minimum amount of starting weight) and the upper boundary (max strength) will differ from one person to another. Sure, these boundaries change over time. We get stronger over time and we also tend to be more or less conditioned when we start. So both boundaries can move up or down over time.

Here is the key to understanding the answer to your question about increments. The smaller the difference between your required starting weight and your max strength will determine what kind of increments you will use. This is not complicated nor does it need to be. On *average* you should be able to make 6 increments between your minimum effective weight and your repetition max. It is not uncommon however that people will need to reduce the number of increments and repeat a few poundages to accommodate small muscle groups such as shoulders (lateral raises etc). All in all you will end up increasing the weight 18 -20 times over the course of 6-8 weeks. This consistent increase in load and Strategic Deconditioning has a great deal to do with the effectiveness of HST.

In the end it isn’t necessary to focus on how big of an increment to make. What will determine your success is more dependent upon how wide the range is between your *effective* starting poundages during the 15s and your ending poundages used for 5s or

negatives. So your goal for continued success, cycle after cycle, is to increase that range by either decreasing the effective starting weight and/or increasing the finishing weight of the cycle.

Team Think Muscle

Be on the Cutting Edge!

Spread the word about the Think Muscle Newsletter and send the latest information on health, fitness, nutrition, training, and supplementation to all your colleagues, friends, and family. Give all these people THE BEST and latest information to allow them to increase their knowledge base and develop their best body ever! By sharing this incredible information, you are giving the gift of health. ACT NOW! Anyone can subscribe to the FREE weekly newsletter online at <http://www.thinkmuscle.com/newsletter.htm>. You can also send us the name and email addresses of five of your friends and we will automatically send them an invitation to join and a copy of our most recent newsletter. Imagine people you refer getting this amazing and detailed information for FREE. They will definitely be indebted to you! If you refer five people to us, we will also enroll you for FREE into Team Think Muscle, which will give you some great benefits in the future -- more details to come!

Reader Survey

Tell Us What You Think?

1. Message from the Editor in Chief: A New Year Means New Personal Bests

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

2. Q&A: Non-genomic effects of steroids

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

3. Q&A: Weight Increments Necessary to Grow

- 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
- Lifestyle Management
- Men's Health
- Powerlifting
- Seniors Health Topics
- Sports Specific Training
- Women's Health and Nutrition

=====

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

Best regards,

-bryan
www.thinkmuscle.com