

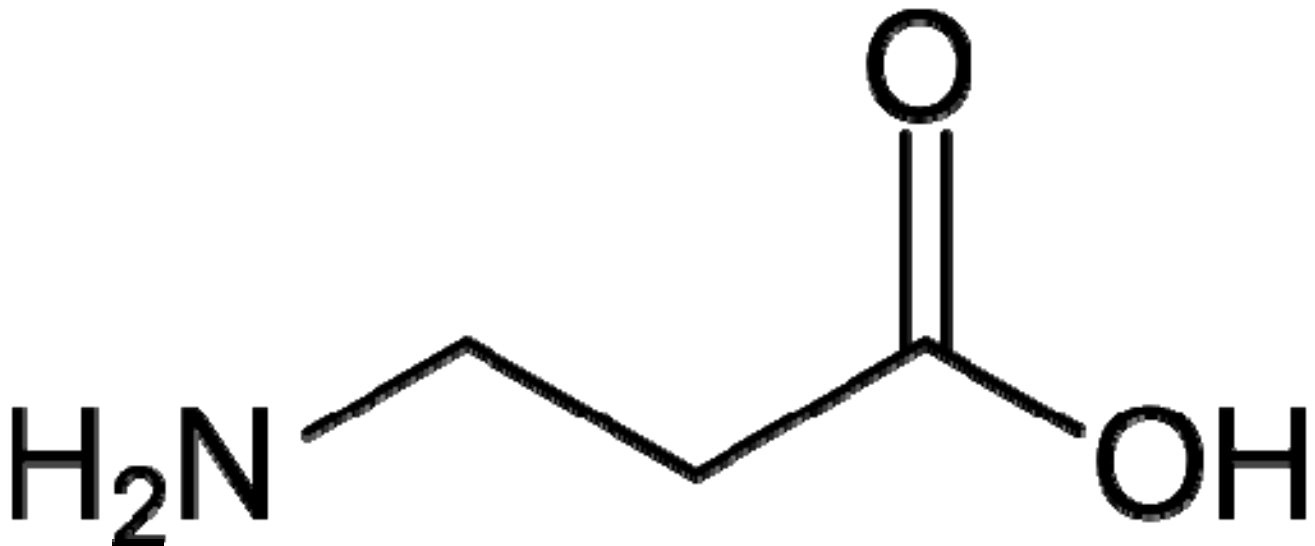
Athletic Edge Nutrition

Presents

The **Beta-Alanine** Revolution

Featuring-**IntraXCell®**

THE Definitive Guide on How Beta-Alanine Can DELAY Muscular Fatigue, Allowing You to Train Harder & Longer



**BONUS BETA-ALANINE SPECIFIC WORKOUT
PLANS INCLUDED**

by Sebastian Balcombe, B.S.E
with Ben Kern, MA, CSCS, James Brown, B.S. & Michael Janovick, Pharm.D.,R.Ph.



The Nutrient Timing Specialists®

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I dedicate this book to my friend Mathew Reeves (1977-1995) who taught me what perseverance and strength truly mean.

Introduction

With literally hundreds of different supplements available and so many that are based on bogus claims and ridiculous hype, it's a challenge to find even one that delivers results. If you've rummaged through the garbage of the supplement scrap heap, you know how difficult it is to find solid science or real-world proof.

IntraXCell/beta-alanine is an exception. This supplement actually lives up to its claims. Finally a supplement since creatine that both the science and bodybuilding community can find some common ground on. While this may not seem like a huge feat to the casual reader, it truly is a rare occurrence in sports nutrition. It is very uncommon to find a supplement that both the bodybuilding and the science community's can embrace as being effective. In sports nutrition history, there have only been a handful of exceptions, beta-alanine can be added to that list. The science behind beta-alanine makes sense and it works. In reading this booklet, you will understand how beta-alanine works. You will also learn how to maximize its use and how it can help you safely work out much harder and longer. Used properly, beta-alanine can take your training and results to new levels, helping you add muscle mass and set personal records



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Preface

Until now, creatine, with numerous research studies to support its effectiveness, was the leading supplement for improving exercise and muscular performance. Since creatine made its explosion into the sports nutrition world in the early nineties, our understanding of exercise physiology and sports nutrition has evolved exponentially. Recent research is giving rise to another supplement breakthrough...one that will change the direction of the industry like creatine did so many years ago. The research supported, **beta-alanine**, contained in **IntraXCell** is the next breakthrough supplement for increasing strength, muscle mass and endurance. With more peer reviewed published research backing its effectiveness, than any other anaerobic ergogenic aid besides creatine. Finally, a supplement that actually lives up to its claims, instead of relying on typical baseless supplement company marketing hype! The science behind beta-alanine and IntraXCell makes sense and it carries over and works in the real world gym and athletic environment. This is a hands-on, easy-to-follow approach - no fancy biochemistry or confusing graphs. When finished reading this guide, you will have no doubt that beta-alanine, in particular the research backed formula, IntraXCell is a highly effective for adding muscle mass and increasing muscular strength and endurance. Additionally, you will have one hundred percent clarity on how to utilize it to maximize your results.

Part I- Background on beta-alanine, fatigue & carnosine

Chapter 1- Exercise, muscle fatigue & beta-alanine's impact

Chapter 2- Beta-alanine & the carnosine connection

Chapter 3- Question & Answer

Chapter 4- Beta-alanine myths debunked

Chapter 1-Exercise, Muscle fatigue & beta-alanine's impact

What benefits can I expect from taking beta-alanine?

- 1 Increases muscle mass**
- 2 Increase muscular strength and power output**
- 3 Boosts muscular anaerobic endurance**
- 4 Increases aerobic endurance**
- 5 Delay Muscular Fatigue - Train Harder & Longer**

How does beta-alanine work?

Below are some key issues occurring during exercise that limits us from reaching our strength and muscle mass goals. We will then explain just how beta-alanine effectively targets these limitations.

What stops us from making NEW muscle gains, BIG increases in strength and limits us from reaching our full potential?

The sequence of events looks like this:

1. Our energy systems release large amounts of hydrogen ions (H⁺) during high intensity exercise.
2. H⁺ cause fatigue and cause your muscles pH to drop (become more acidic).
3. As our muscles pH quickly drops, so does your strength, while muscular fatigue increases.
4. At the same time, fatigue causing free radicals are increased with exercise.

The Result of these events: Strength plummets, fatigue sets in and muscles are not adequately worked. Without sufficient overload, your muscles cannot and will NOT grow.

How can beta-alanine combat these events?

1. By dramatically boosting the concentrations of a powerful H⁺ buffer inside our muscles called **carnosine**.
2. Carnosine is a naturally occurring di-peptide made up with the amino acid, beta-alanine and histidine and has the ability to stabilize muscular pH by soaking up (H⁺).
3. Carnosine is found in both type I and type II muscle fibers, but is highest in type II muscle fibers. Type II muscle fibers are primarily used in high intensity strength workouts and are the most responsive to muscular growth.
4. By increasing carnosine concentrations in type II muscle fibers, you greatly enhance their ability to buffer/absorb increased amounts of H⁺ that are released during exercise.

The End Result: Beta-alanine keeps us in an optimal pH range by buffering/absorbing H⁺, while simultaneously fighting fatigue-causing, free radicals. In doing so, our muscles are able to perform at much higher levels.

Chapter 2-Beta-Alanine and the carnosine connection

What is Beta-Alanine and where do we get it?

Beta-alanine is a non-essential amino acid and is the only naturally occurring beta-amino acid. Not to be confused with regular alanine, beta- alanine is classified as a non-proteinogenic amino acid, as it is not believed to be used in the building of proteins. The greatest natural dietary sources of beta-alanine are believed to be obtained through ingesting the beta-alanine containing dipeptides: carnosine, anserine and balenine, rather than directly

ingesting beta-alanine. These dipeptides are commonly found in protein rich foods such as chicken, beef, pork and fish. However, obtaining beta-alanine through these dipeptides is not the only way, as our bodies can synthesize it in the liver from the catabolism of pyrimidine nucleotides which are broken down into uracil and thymine and then metabolized into beta-alanine and B-aminoisobutyrate. Of course, it can also be conveniently ingested through direct supplementation of the beta-alanine supplement IntraXCell.

Is beta-alanine safe?

While this is not a common frequently asked question, it should be. We understand many people care most about gaining muscle, looking great and performing at their best but safety should not be overlooked. We believe it should actually be one of the first questions asked when considering a new supplement, even before you question efficacy.

The answer to the safety question is a resounding yes. Studies, going up to 12 weeks of continued beta-alanine use, have looked at a large array of blood biochemical, hematological and hormonal markers and no negative changes have occurred whatsoever. While it is impossible to say beta-alanine is one hundred percent safe until longer term studies are complete, we do know that up to 12 weeks of continued beta-alanine supplementation is indeed safe.

What is CARNOSYN® brand beta-alanine and how is it different from generic beta-alanine?

Like all ingredients there are different grades with different purity levels. **Carnosyn®** brand beta-alanine is the multi patented, research backed, premium form of beta-alanine. All the other types of beta-alanine are generic and usually made in china. The beta-alanine in **IntraXCell**, is 100% CARNOSYN® brand beta-alanine.

Who can benefit from beta-alanine?

Beta-alanine is the most versatile ingredient in sports nutrition today and can greatly benefit a large variety of training types:

1. Individuals participating in resistance training looking to gain strength, endurance and gain lean body mass
2. High intensity cross trained athletes, MMA fighters
3. Cyclists, runners, swimmers
4. Sport specific training that requires both strength & endurance
5. Active individuals who have reached a training plateau and are looking for a supplement to take them to the next level
6. **Simply put, beta-alanine will allow you to reach your specific goals faster, by allowing you to train harder and longer**

How much beta-alanine is needed to increase carnosine enough to cause performance increases?

Research has shown that between 3.2 grams and 6.4 grams per day, will significantly boost carnosine levels and improve muscular performance. The most recent research, now using 4-5 grams a day, is showing comparable carnosine concentration and performance improvements to those using 6.4 g daily. **Based off the research, 3-4 grams of beta-alanine a day, seems like the optimal daily dosing protocol.** IntraXCell, supplies 4 grams of beta-alanine a day, to effectively increase muscle carnosine concentrations, leading to increases in muscular performance. **WARNING:** *Don't be fooled by other "me too" companies who are now jumping on the band wagon by "window dressing" their products with beta-alanine for marketing purposes. The problem is, they are NOT listing the amount of beta-alanine in them. Without knowing exactly how much daily beta-alanine the product is supplying, how can you know if you are getting in the efficacious range of 3.2-6.4g a day, and actually benefiting from beta-alanine's ability to boost muscular carnosine concentrations to a significant enough level to increase muscular performance? The answer is you can't, so don't be fooled by undisclosed amounts of beta-alanine on product labels. Even worse are the new pre-workout products sprinkling undisclosed amounts of beta-alanine in their formula's. Not only do you have no idea*

how much beta-alanine you are getting, but beta-alanine is a daily supplement and is needed to be taken seven days a week to adequately increase muscle carnosine levels. Pre-workout products are not a good vehicle for optimal beta-alanine supplementation. Don't be duped into thinking you have experience the true powerful benefits of beta-alanine with your pre-workout formula.

Beta-alanine, fighting muscular fatigue, through boosting carnosine

There are a handful of ways carnosine is thought to impact performance but its most studied function, is its role as an intracellular buffer. Carnosine helps stabilize muscular pH by soaking up hydrogen ions (H⁺) that are released at an accelerated rate during exercise. Our bodies work to keep our pH in balance by utilizing various buffering systems. Buffers largely work by soaking up H⁺ to maintain optimal pH balance, which we need to function most effectively. As mentioned above, our muscles function best in a specific pH range. When pH drops below that range, so does muscular performance. By helping to keep our muscles in a more optimal pH range, they can continue to contract with more force for a longer period of time. There are a handful of buffering systems that work in our bodies. Some maintain pH in extra cellular fluids (ECF) outside of the cell, while others perform their duties in intracellular fluids (ICF) inside the cell and some perform in both. Our focus in this booklet is on exercise performance and, as mentioned above, the primary source of H⁺ released during exercise is from lactic acid and ATP breakdown. Take a guess where this breakdown and release of H⁺ is occurring? If you guessed inside our muscles or intracellular, you would be correct. As a result, the first line of defense in absorbing the H⁺ is going to be within the cell from intracellular buffers such as carnosine, not from extra cellular buffers. Aside from carnosine being just where we need it, buffering H⁺ inside our cells, it has additional, unique attributes that make it really shine. Carnosine is unique; in that, other natural buffering systems our bodies use are also used in many other cellular reactions aside from buffering, watering down much of their buffering abilities.

How much can beta-alanine increase our muscles carnosine concentrations?

Researchers have shown that when supplementing with beta-alanine for just 4 weeks, we can increase our carnosine concentration by 42-65%. Longer beta-alanine studies going up to 10-12 weeks, show carnosine concentrations increased up to 80%. **Due to the fact that beta-alanine continues to build carnosine concentrations ATLEAST up to 12 weeks, we recommend IntraXCell users to stay on IntraXCell continuously for a minimum of 12 weeks.**

How do we know beta-alanine is actually increasing carnosine levels?

Researchers have proven it by actually taking muscle biopsies (using a hollow needle to remove a small sample of muscle tissue) prior to the study and at various time points throughout the study. What they found is that beta-alanine does, in fact, effectively and significantly increases carnosine concentrations in the range of 42-80%, depending on the dosing and duration of the study.

If the benefits are derived from boosting intracellular carnosine levels, why not just directly take carnosine instead of its precursor beta-alanine?

When you ingest carnosine intact, most of it is broken down in the gastrointestinal (GI) tract into its constituent amino acids, beta-alanine and histidine. Some intact carnosine does escape the GI tract freely but even that amount is quickly broken down in our blood by the enzyme carnosinase. In a very short time, all the carnosine you just ingested is either eliminated or broken down into beta-alanine and histidine. These two amino acids are then taken into the muscle, where they are converted back into carnosine with the help of the enzyme carnosine synthetase. Unfortunately, only about 40% of the carnosine you take actually contains beta-alanine, making it an inefficient source at best. You are better off, from both efficiency and a

financial standpoint, taking beta-alanine directly. You would have to take substantially more carnosine just to approach the increased concentrations of carnosine achieved by taking the scientifically recommended dose of beta-alanine. Clearly, taking beta-alanine is the superior solution to increasing carnosine levels.

Does beta-alanine have any impact on hormonal levels?

Multiple studies have now looked at beta-alanine's impact on growth hormone, testosterone, and cortisol levels and it has NO impact on them positively or negatively.

How do the other key ingredients in IntraXCell's formula work with the beta-alanine content and support intracellular carnosine levels?

One of carnosine's attributes beyond stabilizing muscular pH, is its ability to act as an intracellular antioxidant that can fight cellular fatigue. Knowing these secondary benefits of carnosine, we have combined other ingredients with beta-alanine that have the ability to boost yet another powerful intracellular antioxidant called glutathione. At the same time, the IntraXCell formula can directly work with carnosine's antioxidant ability.

1. **N-Acetyl-L-Cysteine (NAC)** - NAC increases glutathione levels inside the cell which is a power antioxidant that fights cellular fatigue. Interestingly beta-alanine has now been shown to increase the synthesis of glutathione by increasing the availability of its precursor cysteine. Beta-Alanine and NAC work perfectly together.
2. **Vitamin E** – Vitamin E has been shown to increase carnosine levels more than carnosine alone. Carnosine has been shown to increase Vitamin E antioxidant ability. These two operate hand in hand.
3. **Alpha-Lipoic-Acid** – alpha-lipoic-acid is a highly versatile antioxidant that boosts the above other two antioxidants, vitamin E and the end result of NAC supplementation (boosted glutathione levels).

Chapter 3- Question & Answer

How exactly do hydrogen ions (H⁺) decrease strength and increase fatigue?

When we exercise, especially when it's at a high intensity, our body's energy systems release large amounts of hydrogen ions (H⁺). The release and accumulation of H⁺ causes our muscle's pH to drop (become more acidic). **This process is occurring whether you feel a burn or not.**

The breakdown of the high energy compound ATP and the subsequent rise in H⁺ concentrations occur in all of our energy systems but H⁺ buildup is most prevalent in an energy system called glycolysis, which also produces lactic acid. At physiological pH, lactic acid dissociates (releases) H⁺ and is the primary source of released H⁺ ions during exercise. **It is the released H⁺ from lactic acid that causes muscular fatigue and performance problems, not lactic acid or the leftover lactate ions as many incorrectly believe.** While lactic acid is the primary source of released H⁺, it is not the only source. H⁺ ions are also being released at a rapid rate when you break down ATP during exercise. With the presence of many sources during energy production releasing H⁺, pH quickly drops quickly. As our muscles pH quickly drops, so does their ability to contract forcibly and maintain a high level of performance throughout your workout session. Not being able to perform and maintain forceful muscular contractions and push your body to the limit during your workout sessions seriously hampers your ability to maximally overload your muscles and force new muscle gains.

***Section summary:** H⁺ causes your muscles pH to drop, in turn decreasing your strength and causing you to fatigue faster. These limitations stop you from adequately overloading your muscles, which is what is needed in forcing new muscle gains.*

At what point during my workout set will beta-alanine exert its strongest effects?

Boosting carnosine levels with beta-alanine is effective at all points during your set, whether you're lifting heavy or doing endurance work, but will exert its largest benefits in our energy system called glycolysis. Your body uses three energy systems to perform work: the ATP-PC system(think creatine), which is primarily used during heavy lifting and for sets up into the 5-6 rep range; the glycolytic system(think beta-alanine), which is predominantly used roughly within the 7-15 rep range and up; and the oxidative/fat system, which is used primarily in endurance training. Our energy systems are utilized simultaneously; however, depending on the level of intensity or duration of exercise and fitness levels of the individual, certain energy systems will become more dominant in producing energy needed for that activity. Anybody who trains with weights will primarily use the first two systems and, in both cases, the build-up of hydrogen ions will contribute to fatigue in both systems, especially glycolysis.

Glycolysis is where the supplement creatine falls a little short and beta-alanine is strongest

Creatine is mostly effective in the ATP-PC system, which relies on stored ATP and re-synthesis using phosphocreatine (PC) for intense, high-energy contractions. Taking creatine will help your explosive strength but it likely won't help you as much as beta-alanine will in the 7-15 rep range. As anyone trying to build bigger muscles knows, you must train in both low (1-6) and moderate to high (7-15) rep ranges to maximize muscle mass gains. Beta-alanine, by increasing carnosine concentrations, can buffer/fight the H⁺ build-up that occurs in both these ranges, but more so in the moderate to high (7-15) rep ranges than creatine can. On the contrary, creatine is better suited to the lower rep set up into the 5-6 rep range, allowing you to maintain forceful contractions for longer periods of time.

Decreasing cellular fatigue is an additional strength of beta-alanine. A recent study demonstrates that beta-alanine outperformed creatine in decreasing cellular fatigue, giving it yet another advantage over what has been

considered the most effective sport supplement of the last decade.

Relevant HUMAN research on IntraXCell & beta-alanine continues to pile up

Another important point to raise in regards to the IntraXCell/beta-alanine research, is the subjects used in the studies. What is often found with sport supplement research is the subjects used in the studies are often sedentary individuals. This is important to mention, because it is easy to bring about big changes in performance or body composition changes when you are using individuals who do not exercise (sedentary) and are often out of shape. The results from studies using subjects that are sedentary is yet another reason why so many supplements disappoint in bodybuilding and athletic communities. The good news is, the studies on IntraXCell and beta-alanine use, strength, power or endurance athletes and the results are still highly impressive, showing big performance increases.

How long will it take to start noticing benefits?

Performance benefits typically occur in as little as **two weeks**, although some individuals will notice benefits within one week. As carnosine levels increase, the benefits will follow. The most dramatic results are generally experienced within the 3-4 week range but they don't stop there. *Recent research is now showing carnosine levels continue to increase for a minimum of 12 weeks which is why we recommend staying on IntraXCell for at least three months to optimize your carnosine levels.*

Are there any methods that may increase beta-alanine's ability to increase carnosine levels?

Yes. A recent study showed that a group of subjects taking beta-alanine with carbohydrates increased performance gains in half the time of the group taking an equal amount of beta-alanine without carbohydrates.

Carbohydrates spike insulin and one of insulin's effects is to increase amino acid (such as beta-alanine) transport into our cells.

Taking beta-alanine pre-workout and post-workout may increase the uptake of beta-alanine into our muscles. Amino acid nutrient timing studies have clearly shown when amino acids are ingested pre-workout and post-workout, their delivery and uptake into our muscles is increased. The improved uptake is largely due to increased blood flow during exercise.

What is the prickling that many experience when they first take beta-alanine?

The prickling - called parathesia - is caused by beta-alanine binding to nerve receptors, activating them and causing them to discharge/fire. Many of these nerves are below the skin, giving a prickling/pins-and-needles sensation. This sensation begins approximately 15-20 minutes after ingesting beta-alanine and usually continues for 1-1.5 hours. The intensity varies depending on dosing, individual sensitivity and potentially from activators of Ca²⁺ channels, such as caffeine. This sensation, though generally enjoyed, often subsides over a few weeks of continued use. Carbohydrates/food may also blunt the prickling effect from beta-alanine.

Is beta-alanine really the “next creatine”?

Beta-Alanine shares many similarities and parallels with creatine, it's often touted as “The Next Creatine.” While it is understandable why these two powerhouse supplements are often compared, it's a great injustice to both beta-alanine and creatine to use titles like that, as it leads people to believe one can replace the other. Let's first look at some of the similarities and then some of the ways they are different.

Similarities between beta-alanine and creatine:

- The performance research has been pioneered by many of the same researchers who did the original groundbreaking research on creatine.
- Beta-alanine has already accumulated enough peer reviewed university research, to surpass all anaerobic ergogenic supplements except for creatine. And the research is still being published at an alarming rate.
- Never has the sports nutrition science community seen such an effective supplement since creatine in terms of improving performance and increasing muscle mass.
- Beta-alanine is believed to become as popular if not more popular than creatine in time.
- They both improve anaerobic strength, power, endurance and increase muscle mass.
- Beta-alanine must be taken daily and must accumulate before its benefits are noticed. It does not instantly affect you like stimulants such as caffeine.
- Both have been shown very safe in the research.

How beta-alanine and creatine are different?

- Beta-Alanine takes 1-2 weeks of continued use for it to start increasing performance gains. Creatine usually only takes a few days.
- While they both increase anaerobic strength, power, endurance, they work by emphasizing their effects through different energetic pathways in the body to bring about these changes.
- Beta-alanine is more effective in improving strength and power in the 7-15 rep range, while creatine is superior in the 5-6 rep range or less.
- Beta-alanine is superior to creatine in delaying muscular fatigue.
- Creatine quickly causes you to gain water weight through cell volumizing, beta-alanine has no impact on water weight.
- In many people, beta-alanine causes paresthesia (prickling/pins and needles sensation under the skin). Creatine does not.
- Beta-alanine can likely impact aerobic endurance more so than creatine.

Summary- One does not replace the other. And they work VERY well together.

The only times, we would suggest you replace creatine with beta-alanine:

- You are a creatine non responder.
- You are an aerobic endurance athlete. Creatine works predominantly as an anaerobic performance enhancer and will have little impact on aerobic performance, while beta-alanine is also a highly anaerobic supplement, it has been shown in research to positively impact aerobic performance as well.
- The increased water gain could negatively affect a competition you are participating in.

While both supplements, are powerhouses in their own right and work incredibly well as standalone supplements, they work great stacked together, as the ultimate, one two punch!

Chapter 4- Myths Debunked

Take extra histidine along with beta-alanine since histidine is a component of carnosine

This is false, as histidine is already present in high concentrations in muscle, while beta-alanine is only present only in small amounts. Researchers have determined that it is beta-alanine that drives carnosine synthesis, not histidine. Since this has been proven repeatedly in research, there is no need to supplement with extra histidine to increase carnosine levels. There are potentially some select populations like vegans, vegetarians or the elderly that may not get enough histidine in their diets and are thus deficient, which may compromise optimal carnosine levels. But, we still don't recommend taking just extra histidine with beta-alanine. Instead, we recommend these groups simply bump up their total protein intake which will in turn solve their possible histidine deficiency. For the majority of healthy people, only

beta-alanine is needed as histidine deficiency is rare and no extra supplementation is needed to increase carnosine concentrations.

If I don't feel the prickling, beta alanine isn't working on me?

The prickling sensation does not occur at all in some individuals, even when taking 4-6 grams of beta-alanine at one time. Do not worry if you are in this group. The prickling is NOT a sign that beta-alanine is working or being absorbed by your muscles and converted to carnosine. If you are feeling nothing, you need not be concerned as it is still increasing your carnosine stores as research has repeatedly shown.

A good example of this phenomenon is when combining carbohydrates with beta-alanine. Not only do carbohydrates blunt much of the prickling sensations, they also increase beta-alanine's performance gains faster than beta-alanine without carbohydrates.

Another good example is comparing studies that measure carnosine concentrations using multiple small 800 mg doses of beta-alanine vs. studies using multiple doses of 1.6 g of beta-alanine. The total daily amount of beta-alanine ingested is similar and the duration of the studies using both dosage strategies is matched up as well. 800 mg is low enough to cause little to no prickling, based off feedback from both research and anecdotal, where as 1.6 g can cause quite a lot. The outcome of both studies showed carnosine concentrations were very similar.

Taking taurine at the same time as beta-alanine is going to stop beta-alanine from working

While in theory, it may seem that there is potential for problems when taking these two together (they share the same transporter into tissues), it hasn't yet been supported in the research to any level of significance. In fact, a recent study showed that the increase in muscle carnosine with beta-alanine was *not* reduced when taurine was taken along with it.

Just in case you wanted more proof to support recent research. Since there is

a group of studies that used either beta-alanine by itself or beta-alanine with taurine, we examined them to determine if there were any differences in the resulting carnosine concentrations. While more research is always needed, there are quite a few beta-alanine vs. beta-alanine plus taurine studies, and their outcomes are all the same. There is little to no difference in carnosine concentrations. In other words, taurine does not appear to inhibit beta-alanine from being absorbed to any level of significance, otherwise carnosine levels would have been lower in the beta-alanine plus taurine studies. Another key point to mention is that carnosine is much higher in type II muscle fibers, while taurine is much more concentrated in type I muscle fibers, even further lessening potential competitive uptake.

Beta-alanine replaces creatine

Beta-alanine does *not* replace creatine. As shown above, they work differently and creatine is still effective for maximizing strength and power and more effective than beta-alanine in the lower rep ranges. If anything, they should be taken together as the ultimate one-two punch.

Beta-Alanine buffers lactic acid

No, beta-alanine buffers H⁺, not lactic acid. It is the H⁺ that are released from our energy systems, AS WELL as being released from lactic acid that causes muscular fatigue and performance problems. It is not lactic acid itself, or the leftover lactate ions as many incorrectly believe.

Part II- IntraXCell research and Interviews

Chapter 5- IntraXCell research studies

Chapter 6- Interviews with beta-alanine researcher Ben Kern

Chapter 5- IntraXCell research studies

STUDY ONE- Double blind placebo controlled, peer reviewed and published.

Effects of beta-alanine supplementation on performance and body composition in collegiate wrestlers and football players

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Background-Supplementation with β -alanine has been associated with improved strength, anaerobic endurance, body composition and performance on tests of anaerobic power output following varying training protocols, including high intensity interval training (HIIT) and heavy resistance training. Early season training for collegiate wrestling includes repeated bouts of high intensity exercise with intermittent rest periods; this type of training parallels HIIT from a metabolic standpoint. Collegiate wrestlers also use moderate to high intensity resistance training with high work to rest ratios. In-season football training includes repeated bouts of short sprints and Olympic/ power lifting with low work to rest ratios.

Purpose -The purpose of this study was to examine the effectiveness of β -alanine(IntraXCell®) as an ergogenic aid in tests of anaerobic power output following 8 week high intensity interval, repeated sprint, and resistance training in previously trained collegiate wrestlers and football players.

Methods -Twenty-two Division II college wrestlers (19.9 ± 1.9 yr, age \pm SD) and 15 football players (18.6 ± 1.5 yr) completed this double-blind, placebo controlled study. Each subject ingested either 4 g/day β -alanine or placebo in powdered capsule form. Subjects were tested pre and post 8-week treatment in timed 300 yd. shuttle, 90° flexed arm hang (FAH), body composition, and blood lactate accumulation during 300 yd. shuttle. Wrestlers participated in 5 days per week training that included HIIT 3 days/ week and resistance training with high work: rest ratios 2 days/ week. Football players participated in 5 days/ week training that included repeated sprints with low work: rest ratios 3 times/ week and Olympic/ power lifting 4 times/ week.

Results -The subjects taking IntraXCell® achieved more desirable results on all tests compared to placebo (NS, $p>0.05$). Performance improvements were greatest in the football supplement group, decreasing 300 shuttle time by 1.1 sec (vs. 0.4 sec. placebo) and increasing FAH (3.0 vs. 0.39 sec.). The wrestlers, both placebo and supplement lost weight (as was the goal, i.e. weight bracket allowance); however, the supplement group increased lean mass by 1.1 lb., while the placebo group lost lean mass (-0.98 lb). Both football groups gained weight; however, the supplement group gained an average 2.1 lb lean mass compared to 1.1 lb for placebo.

Conclusions -Supplementation with IntraXCell® appears to have the ability to augment performance and stimulate lean mass accrual in a short amount of time (8 weeks) in previously trained athletes. IntraXCell® may magnify the expected performance outcomes of training programs with different metabolic demands.

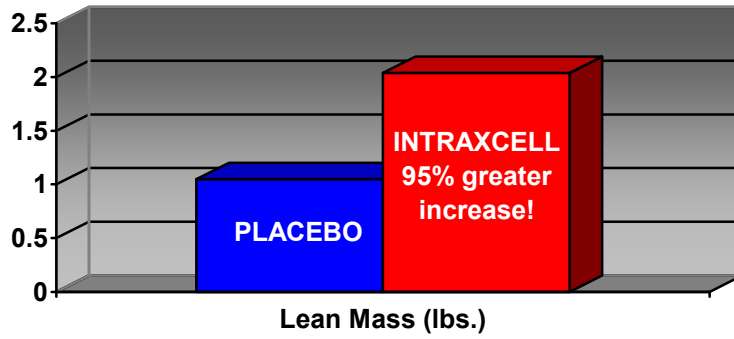
Acknowledgement

The products were donated by Athletic Edge Nutrition. No other funding was received. The authors declare that they have no competing interests.

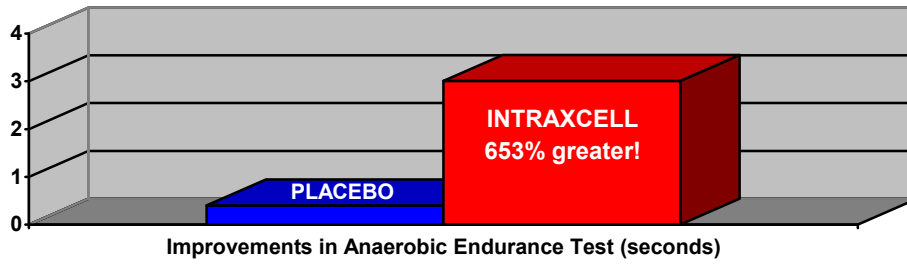
Summary of the study outcomes:

- The wrestler group gained on average 2 lbs of lean body mass (LBM) with some subjects gaining over 7 pounds of LBM!
- The Football group gained on average 2.04 lbs. lean body mass (LBM)
- Performance tests looking at anaerobic power and endurance in the football group showed a 653% and 170% INCREASE over the placebo group!
- Performance tests looking at anaerobic power and endurance in the wrestling group showed a 22% and 28% INCREASE over the placebo group!

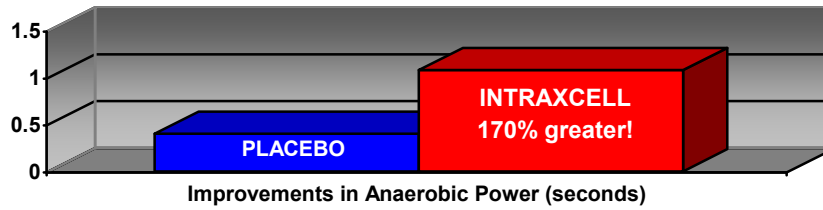
Football Group Body Composition



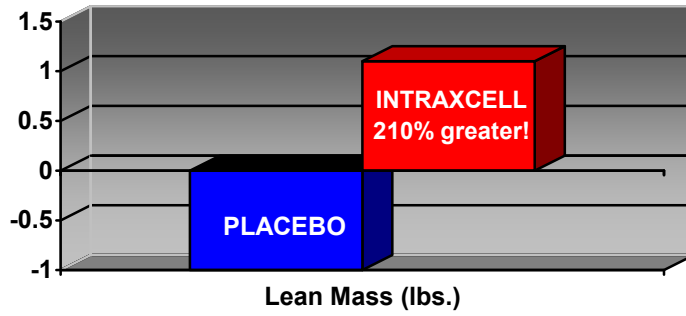
Football Group



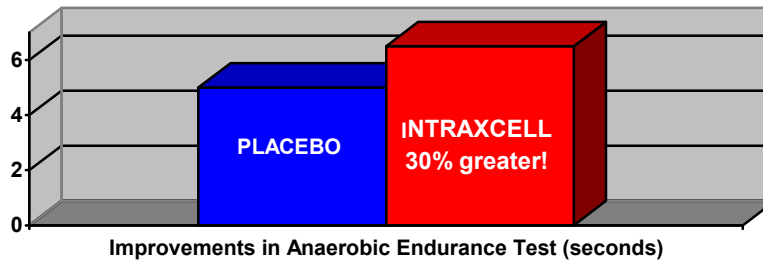
Football Group



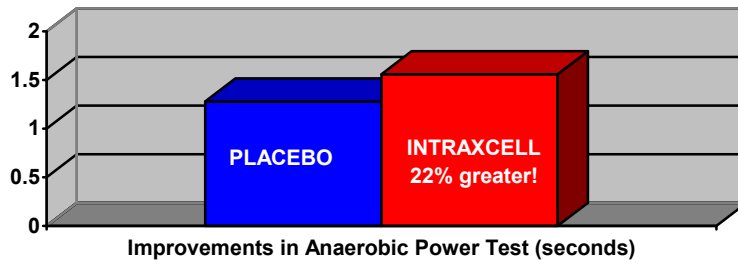
Wrestling Group Body Composition



Wrestling Group



Wrestling Group



STUDY TWO- Double blind placebo controlled, peer reviewed and published.

Effect of beta-alanine supplementation on the onset of blood lactate accumulation (OBLA) during treadmill running: Pre/post 2 treatment experimental design

Thomas Jordan¹, Judith Lukaszuk¹, Mark Mistic² and Josephine Umoren¹

¹ School of Family, Consumer, and Nutrition Sciences. Northern Illinois University, DeKalb, IL, USA ² Department of Kinesiology and Physical Education, Northern Illinois University, DeKalb, IL, USA. Journal of the International Society of Sports Nutrition 2010, 7:20doi:10.1186/1550-2783-7-20 Published: 19 May 2010

Abstract

Background-β-Alanine (βA) has been shown to improve performance during cycling. This study was the first to examine the effects of βA supplementation on the onset of blood lactate accumulation (OBLA) during incremental treadmill running.

Methods-Seventeen recreationally-active men (mean ± SE 24.9 ± 4.7 yrs, 180.6 ± 8.9 cm, 79.25 ± 9.0 kg) participated in this randomized, double-blind, placebo-controlled pre/post test 2-treatment experimental design. Subjects participated in two incremental treadmill tests before and after 28 days of supplementation with either βA (6.0 g·d⁻¹)(βA, n = 8) or an equivalent dose of Maltodextrin as the Placebo (PL, n = 9). Heart rate, percent heart rate maximum (%HRmax), %VO_{2max}@OBLA (4.0 mmol.L⁻¹ blood lactate concentration) and VO_{2max} (L.min⁻¹) were determined for each treadmill test. Friedman test was used to determine within group differences; and Mann-Whitney was used to determine between group differences for pre and post values (p < 0.05).

Results-The βA group experienced a significant rightward shift in HR@OBLA beats.min⁻¹ (p < 0.01) pre/post (161.6 ± 19.2 to 173.6 ± 9.9) but remained unchanged in the PL group (166.8 ± 15.8 to 169.6 ± 16.1). The %HRmax@OBLA increased (p < 0.05) pre/post in the βA group (83.0% ± 9.7 to 88.6% ± 3.7) versus no change in the PL group (86.3 ± 4.8 to 87.9% ± 7.2). The %VO_{2max}@OBLA increased (p < 0.05) in the βA group pre/post (69.1 ± 11.0 to 75.6 ± 10.7) but remained unchanged in the PL group (73.3 ± 7.3 to 74.3 ± 7.3). VO_{2max} (L.min⁻¹) decreased (p < 0.01) in the βA group pre/post (4.57 ± 0.8 to 4.31 ± 0.8) versus no change in the PL group (4.04 ± 0.7 to 4.18 ± 0.8). Body mass kg increased (p < 0.05) in the βA group pre/post (77.9 ± 9.0 to 78.3 ± 9.3) while the PL group was unchanged (80.6 ± 9.1 to 80.4 ± 9.0).

Conclusions-βA supplementation for 28 days enhanced sub-maximal endurance performance by delaying OBLA. However, βA supplemented individuals had a reduced aerobic capacity as evidenced by the decrease in VO_{2max} values post supplementation.

Summary of the study outcomes:

- The IntraXCell group increased their %VO₂max@OBLA(onset of blood lactate) by 8% over the placebo group.
- Highly relevant for High Intensity Cross Trained Athletes, Military personnel, Runners, Cyclists, MMA Fighters and sport specific training that require both strength and endurance strength.

STUDY THREE-Pilot study

Effects of beta-alanine supplementation (IntraXCell®) on exercise performance during a competitive wrestling season: An 8-week open label study.

Kern BD, Robinson TL, Manninen AH. Physical Education Department, Center High School, 500 S. Broadway Center, Colorado 81125, USA. Email: bkern@center.k12.co.us

Abstract

Background: The goal of wrestlers during a competitive season is to maintain or lose body weight without compromising athletic performance. However, some studies have reported decrements in exercise performance associated with weight loss and/or the strain of a competitive season. The purpose of this study, therefore, was to examine the effects of 8 week beta-alanine (β -ala) supplementation (IntraXCell®) on exercise performance in Division II collegiate wrestlers during a competitive season.

Methods: 25 college wrestlers (age 18 to 22 y) volunteered to participate in this study, and 18 subjects (mean BMI 24.7 ± 3.7) completed the study. Each participant ingested 4 g/d of β -ala, being supplied from IntraXCell® in an open-label manner during the final eight weeks of their competitive season. The subjects followed a standard training protocol for collegiate wrestling as dictated by the head coach. They were also required to maintain uniform body mass during the entire eight weeks, as per weight bracket allowance during the competitive season. Before and after supplementation, subjects performed a 400 m sprint and 90 degree flexed-arm hang to exhaustion. Immediately prior to and following the pre treatment and post treatment 400 m sprint, subjects blood lactate was taken via finger stick and analyzed to determine lactate increase during the 400 m sprint.

Results: The subjects showed significant decrease ($p < 0.01$) in 400 m sprint time ($- 3.5 \text{ s} \pm 2.4 \text{ s}$, mean \pm SD) and significant increase ($p < 0.01$) in 90 degree flexed-arm hang ($+ 8.5 \text{ s} \pm 8.35 \text{ s}$, mean \pm SD). No significant change ($p > 0.05$) in blood lactate values were observed.

Conclusion: The results of our study suggest that supplementation of β -ala (IntraXCell®) may improve exercise performance in wrestlers during a competitive season. Because of the design of this experiment, it is impossible to identify exactly how much of the positive effects experienced by the subjects was a direct result of the supplementation. However, due to the large increase in performance and the similarity of results in comparison to other β -ala studies, we feel our study strongly suggests efficacy of β -ala supplementation. The ergogenic effects of β -ala supplementation during a competitive wrestling season needs to be confirmed in placebo-controlled trials.

Chapter 6- Interview with Ben Kern, leading researcher of two IntraXCell studies

Ben Kern, MA, CSCS

Ben Kern earned his Bachelor's degree in Kinesiology from Western State College (Gunnison, CO) in 1999, while also receiving All-American honors in football. He then completed his master's degree in health, physical education and recreation, the predecessor to today's human performance and physical education degree from Adams State College (Alamosa, CO) in 2002, the same year that he earned Certified Strength & Conditioning Specialist status through the National Strength & Conditioning Association.

AEN- Ben it's great to have you with us, thank you for taking the time to sit down and get into the trenches on your two studies that you headed up using our IntraXCell supplement.

Ben – Thanks Sebastian, I am so excited about what I have discovered about beta-alanine! There are so few supplements out there that really work, and I believe IntraXCell is moving to the forefront in that category.

AEN: Let's start from the beginning, what first spiked your interest in wanting to study beta-alanine?

Ben – A few years ago, I heard Dr. Jeff Stout speak about one of his early studies on beta-alanine, and it intrigued me because I was looking for a

supplement that would improve the quality of workouts for my athletes. At the time I was training many 3 sport athletes, and finding that with limited time, every minute counted. So I added beta-alanine to the equation, and I noticed that over a short period of time these athletes were working out at a higher intensity, gaining strength, and performing at a higher level.

AEN: With many of the beta-alanine studies, using stationary bicycles or other lab type testing protocols, why did you decide to choose some of the performance tests utilized in these two studies, instead of the more traditional ones?

Ben – The most obvious answer to that question is this: My athletes do not work out in laboratories! I have always been frustrated with clinical studies that use untrained subjects, and specialized equipment to test real world phenomenon. I was interested in knowing whether IntraXCell could help an athlete perform better in an athletic setting. This is why I chose to test highly trained athletes in tests of anaerobic output that mimic the physical conditions they typically experience.

AEN: Can you please tell us about the design of your latest IntraXCell study.

Ben – I selected 2 separate groups of athletes, collegiate wrestlers, and collegiate football players. Each group was then split in half, one would receive IntraXCell, one a placebo (sugar pill that looks identical). Both groups were tested in 300 yard shuttle (25 yards x 12), 90° flexed arm hang (hang with elbows bent at 90° for as long as possible), and body composition (fat % & lean mass). The athletes taking IntraXCell outperformed their placebo counterparts by an astonishing margin on the physical tests, and gained lean mass at a much faster rate!

AEN: Why do you believe your latest study to be one of the most relevant beta-alanine studies to date, in terms of its outcomes translating to REAL world results for both gym rats and athletes?

Ben – I believe my latest study to have great merit because it uses practical testing which can then be used in practical settings. If IntraXCell can improve your ability to “go all out” for a longer period of time and can allow you to gain lean mass (muscle) faster, then it becomes an essential component for anyone looking to boost their performance both in and out of the gym.

AEN: Can you go into detail on exactly what kind of results did the subjects taking IntraXCell receive?

Ben – The subjects taking IntraXCell performed much better on the sprint test and the flexed arm hang (about 20% better). What was most impressive to me was the fact that the subjects taking IntraXCell gained muscle at a much faster rate. Within the wrestling group, all subjects lost bodyweight, as they were cutting weight to get to their weight bracket allowance.

Interestingly, though, the subjects taking IntraXCell actually gained lean mass, (one subject gained 9.6 pounds of lean muscle) while the placebo group lost lean mass. This is amazing because throughout wrestling training, most wrestlers typically lose muscle and fat. The wrestlers in this study became much leaner and increased the amount of muscle on their frame, while losing overall bodyweight in the process. This simply does not happen under normal circumstances! The football players also experienced unbelievable effects. The group of football players taking IntraXCell gained a whopping 100% greater amount of lean mass compared to the placebo group (**Some subjects gained over 7 pounds of lean mass**). **There were several other subjects that gained between 4 and 6 pounds of lean mass during the 8 week study. This was accomplished in just 8 weeks! Just think, what if you could double, triple, or even quadruple your results in just 8 weeks?**

AEN: Very impressive indeed. What was most surprising to you about some of the outcomes of this study?

Ben – The differences in lean mass gain were extremely impressive and the fact that subjects taking IntraXCell could leave their placebo counterparts in the dust. But I would have to say that I did not expect two completely different types of training (wrestling and football) to produce extremely

similar results. What the two types of training had in common was that they trained extremely hard. To me this means that if you are interested in getting stronger, faster, then you need to look no further than IntraXCell to help you achieve your goals regardless of the type of training you do.

AEN: Based off your findings, what types of active individuals and athletes could greatly benefit from IntraXCell?

Ben – Well to say the least, the range is very wide. Because IntraXCell has the ability to delay fatigue under conditions of high intensity exercise, it becomes a very versatile supplement. My study showed that football players who train repeated sprints and powerlifting could benefit as much as wrestlers who train longer duration activities. This means that the common denominator is your desire to train at a high level. From bodybuilders, to adventure seekers, to highly trained athletes, anyone who pushes the envelope and expects to get maximal results from their dollars spent on supplements will enjoy adding IntraXCell to their routine.

AEN: In the next 1-3 years what do you see happening to IntraXCell and the beta-alanine category?

Ben – What I love about IntraXCell is that it is the first product to my knowledge that was exclusively a “beta-alanine” product and that it was formulated based on original research. When beta-alanine first came on the market, some products had it as an extra ingredient, and they had nowhere near the necessary dosage (4 grams / day) to promote a physiological change. Athletic Edge Nutrition is truly the pioneer in beta-alanine supplementation. When I searched for a product to use in my research, I realized that there was only one product on the market that met these criteria, IntraXCell. I have noticed lately that many other products now contain nominal amounts of beta-alanine, usually claiming a “proprietary blend.” I think it is important to check the label; it takes at least 3 grams per day of beta-alanine to experience effects from beta-alanine, and up to 6 grams per day has been used by some of my fellow researchers in recent

studies. In my opinion, IntraXCell is clearly the most complete beta-alanine product on the market, and its sister product IntrAbolic make an excellent combination for active people looking to gain an edge while training.

Q: How to stack AEN products?

Stack 1-IntraXCell with IntrAbolic:

Training Days- 1-2 servings of IntrAbolic & 1 serving of IntraXCell, post-workout or later on in the day

Non-Training Days- Take 2 servings of IntraXCell

Stack 2- IntraXCell, IntrAbolic+ Creatine RT - *The most powerful **STIMULANT FREE** Performance, Muscle Build, Recovery stack in sports nutrition.*

Training Days- Simply mix 1 serving of Creatine RT into your IntrAbolic, or take 1 serving post-workout. Take 1 serving of IntraXCell

Non-Training Days- Take 1 serving of Creatine RT and 2 servings of IntraXCell.

Stack Three- IntraXCell, PreSurge Unleashed, IntrAbolic & Creatine RT- *Our **COMPLETE Nutrient Timing Stack**. It doesn't get any better than this.*

Training Days- Take 1-2 servings of PreSurge Unleashed. It is NOT necessary to take Creatine RT on days you take PreSurge Unleashed. Take 1-2 servings of IntrAbolic and 1 serving of IntraXCell

Non-Training Days- Take one serving of Creatine RT and two servings of IntraXCell.

Chapter 8- Strength training

Chapter 9- High intensity interval training (HIIT)

Chapter 8- Strength Training

Exercise Training with IntraXCell

By James Brown, BS Exercise Physiology, Cooper Institute Certified Personal Trainer (CI-CPT)

James E. Brown IV, holds a Bachelor of Science in Exercise Physiology from East Carolina University; College of Health and Human Performance. He is a Certified Personal Trainer from The Cooper Institute (CI-CPT), and currently works as an Aerospace & Operational Physiologist/Human Factors specialist. Working as a consultant to Athletic Edge Nutrition, he has helped propel the company to new heights, working not only behind the scenes with the company, but at the forefront, helping customers reach their fitness goals.

Muscle Hypertrophy

Muscular hypertrophy is the scientific way to say an increase in the size of the muscle. Muscle itself can grow many different ways, including satellite cell fusion to the existing muscle fibers, cell volumization, and an increase in protein synthesis in which the actin and myosin fibers increase in size. These cascades can be initiated numerous different ways, such as through exercise.

The muscle hypertrophy range of repetitions (reps) during exercise has been shown to be about 6 – 12 reps. This rep range targets type II muscle fibers, the one's that are most responsive to muscular hypertrophy, or growth. In this rep range, the main energy systems being kicked into high gear are the

phosphagen and the glycolytic systems. These two energy systems are the main suppliers of ATP during resistance exercise. Lactic acid is the main organic end product of fast glycolysis, and is responsible for releasing those hydrogen ions which contribute to fatigue. As mentioned above, many believe lactic acid is what is responsible for the fatigue we experience during exercise, however this is not the case. You see we mentioned H⁺ ions being responsible for the drop in pH within the muscle, which increases fatigue and decreases performance. Lowered pH within the muscle is one of the main limiting factors of maximal exercise performance. With IntraXCell, we can go even HARDER and LONGER due to raising muscle carnosine levels which buffers these hydrogen ions. What this means is more weight being lifted, more reps being pushed out, shorter recovery time, full muscle pumps / vascularity, and increased endurance!

With IntraXCell, you should notice FAST progression through your training routine, with more weight and reps being blasted through, you will end up doing more total work by the end of your routine, accelerating muscular gains in lean mass and strength!

Seeing how the 6–12 rep range is the muscle hypertrophy rep range, lets look at an example routine we could use while taking IntraXCell, since IntraXCell works perfect in this rep range!

First let's look at a beginner routine, and from there look at what we can do to progress the routine to a more intermediate / advanced lifter's routine.

Push / Pull Hypertrophy

One method of arranging a training routine is Push / Pull alternations. This will ensure that the same muscle group is not used consecutively, reducing fatigue and enhancing recovery between sets.

Frequency – 4 times per week

Rep range – 6-12

Sets – 2-3 sets per exercise set

Rest – 1 minute between sets

Warm-up

A general warm up consisting of a light walk / jog or light resistance exercise of 2 sets of 15 reps of the muscle group being worked that day, will help increase heart rate, blood flow, respiration, and loosen up the joint fluids, allowing for more flexibility and decreasing the chance of injury. The warm-up period is ~5-10 minutes in length.

SuperSet – Exercises of different muscle groups done directly after the other, little to no rest.

Compound Set – Exercises of the same muscle groups done directly after the other, little to no rest.

MONDAY – Chest / Back

-Flat Bench Press

-Barbell Bent Over Row

-1 minute rest

-Incline Bench Press

-Stiff Legged Barbell Good Morning

-1 minute rest

-Dips (focus on leaning forward to really target the chest muscles)

-Lateral Pulldown (pronated grip)

The exercises coupled together are done as supersets. Supersets involve two different muscle groups, in this case chest and back. These exercises are done with little to no rest between them. So for example at the beginning of this exercise, one would perform the flat bench press, finish it up, and immediately begin on the barbell bent over row exercise. Then you would take 1 minute of rest, and then hit the next superset hard again, doing this a total of 2-3 times (2-3 sets). This exercise routine setup takes full advantage of the enhanced strength, recovery, and endurance properties of IntraXCell.

TUESDAY – Quad / Hamstring / Calf

-Barbell Squats (all the way down till your butt almost touches the floor, this brings more hamstring activity into the picture)

-Leg Curls

-1 minute rest

-Leg Extension

-Barbell or Free weight Lunges

-1 minute rest

-Barbell Deadlift

-1 minute rest

-Seated Calf Raises

-Standing Calf Raises

The barbell deadlift is done for 3 sets like the other exercises, except it is done by itself, so allow for a minute of rest between the sets done for this exercise.

For the calf exercises focus on range of motion (ROM), going all the way down on the eccentric phase of movement, and all the way up on the concentric phase of movement, going slow and controlled.

WEDNESDAY – Rest Day

Focus on proper nutrition, hydration, and rest this day. Remember IntraXCell is taken on off days from the gym as well.

THURSDAY – Shoulders / Traps

-Barbell Military Press

-1 minute rest

-Barbell Shrugs

-1 minute rest

-Upright Row

-1 minute rest

-Cable Front Raises

-Cable Lateral Raises

No supersets this workout, however at the end of this workout, your shoulders and traps should be thoroughly fatigued from the last exercises being done as compound sets.

FRIDAY – Biceps / Triceps

-Free weight Bicep Curl

-Overhead Tricep Extension

-1 minute rest

-Cable Curls

-Cable Tricep Pushdown

-1 minute rest

-EZ Bar Bicep Curls

-EZ Bar Skull Crushers

Abdominal / Core Work

Abdominal and core work should be added in 2-3 times a week on your exercise days of choice. Make sure there is at least a day between your abdominal / core work. A mix up of resistance, static, and plyometric core work not only keeps things interesting, but also makes sure that beginner's to the exercise routine are able to do abdominal / core work. Some may not be able to complete repetitions of abdominal / core work, but are able to hold static contractions. And some who are use to nothing but monotonous repetitions of ab exercises can mix in plyometric trunk exercises to liven things up. Below I will list some examples of different abdominal / core exercises you can choose to do. There are certainly many more than this, however these may provide a good starting point in choosing exercises.

Pick at least 3 of these exercises to do for your abdominal / core work, and add them in at the end of your exercise session.

Resistance Exercises

- Machine crunches
- Cable wood chops
- Cable Push Pull
- Cable crunches
- Ab twist

Floor Exercises

- Bicycle
- Sit Ups
- Crunches
- Russian Twist
- Toe Raises
- Toe Touches
- Medicine ball sit ups
- Standing medicine ball wood chops

Remember standard repetitions are not the only way to perform these exercises. Static contractions can be done, holding the contraction phase of the exercise movement from anywhere between 10 seconds to a minute in length. If you are unable to perform standard repetitions, this is a perfect way to build up your abdominal / core strength. You can add in a plyometric aspect as well, such as with medicine ball throws while doing sit ups, focusing on maximal muscle contraction in the shortest amount of time.

Two for Two Rule and Progression

When you are able to do 2 reps above the recommended rep range, for 2 consecutive workouts, increase the weight by 5lbs for upper body exercises, and 10lbs for lower body exercises.

Intermediate / Advanced Progression

To take this exercise routine to the next level, many different changes to the routine can be made. After about 4 weeks of doing the exercise routine as listed above, you can do 3-4 week periods of changing schemes.

Volume – Volume basically is the total amount of weight lifted in an exercise session. We can manipulate the volume of an exercise routine by changing the number of sets done. We will say a phase is 3-4 weeks long.

Phase 1 – 3 sets per exercise

Phase 2 – 4 sets per exercise

Phase 3 – 5 sets per exercise

Strength Phase – The optimal number of repetitions per exercise for strength gains has been shown to be six or fewer repetitions. A strength phase of training could be to have a target rep range of 4-6 reps per exercise, 2-6 sets. Optimal rest periods lengths have been shown to be 2-5 minutes.

Power Phase – The optimal number of repetitions per exercise for power gains has been shown to be about 3-5 repetitions, of 3-5 sets. Optimal rest periods have been shown to be 2-5 minutes in length.

Hypertrophy Phase – Again as mentioned above, the ideal rep range for muscle hypertrophy has been shown to be about 6-12 reps, 3-6 sets per exercise. Rest period length should be 30 seconds to 1.5 minutes.

Muscular Endurance Phase – Muscular endurance is most enhanced by high repetitions, focusing on a rep range of 12 or reps per set, of 2-3 sets.

Rest period length should generally be less than 30 seconds.

Exercise Additions – You can add additional exercises for each muscle group as your training progresses. 3 exercises per muscle group is a great starting point for beginner's, but intermediate / advanced lifters may want additional exercises to further hit and target their muscle groups. Exercises that hit the muscle from different angles are recommended, alongside as always, keeping strict form.

Chapter 9- High Intensity Interval Training (HIIT)

Aerobic Exercise Training

Muscular endurance training primarily targets an entire different muscle fiber set, the type I or slow twitch muscle fibers. These type I muscle fibers differ from type II muscle fibers in that they have the ability to sustain longer endurance periods, but are not as powerful as the type I muscle fibers. As mentioned above, type II muscle fibers are recruited when movements that require a lot of muscular strength or power are needed.

One effective method of enhancing your aerobic endurance, conditioning, strength, and more is done by a method called High Intensity Interval Training (HIIT). HIIT focuses on alternating periods of high intensity and low intensity. These alternating periods of intensity targets both type I and type II muscle fibers, enhancing not only overall aerobic conditioning, but muscular strength and power as well.

A few advantages of HIIT over regular cardio work, which often consists of only long distance walking, jogging, or running, includes **greater fat**

burning, more muscle fiber type recruitment, all geared towards greater lean mass acquisition and stripping of bodyfat. With HIIT, the duration of the training is often much lower than regular cardio work, but it's much more intense, again alternating periods of high and low intensity. With this higher overall intensity, your body will be in a fat burning state for a much longer time frame than a normal cardio workout. **Not only will you end up burning more fat, but you will spare more muscle, as you will be spending less time in a catabolic exercise state.**

Where IntraXCell comes in, is again the increased buffering of hydrogen ions from raising muscle carnosine levels, allowing you to go harder and longer, allowing you to tear up that HIIT session! We even go much further than just offering claims, as our second IntraXCell study not only showed lean mass gains, but increased sprint times as well, making IntraXCell not only just suited for resistance exercise, but cardio sessions as well.

Beginner's HIIT

Frequency – 1-2 times per week

Duration – 5 minutes total HIIT

-5 minute warm-up

-5 Minutes HIIT

-15 seconds HIGH intensity

-45 seconds LOW intensity

-Alternate until you hit the desired time period

-5 minute cool-down

Intermediate / Advanced HIIT

Frequency – 1-2 times per week

Duration – 15-30 minutes HIIT

-5 minute warm-up

-15-30 minutes HIIT

-30 seconds - 1 minute HIGH intensity

-1 minute – 30 seconds LOW intensity

-Alternate until you hit the desired time period

-5 minute cool-down

Switching up your HIIT!

Doing the same routine over and over again not only doesn't progressively overload the body, which is needed for increased muscle, strength, fitness, etc, but it gets boring! Here are some ideas whether in the gym or outside to keep your routine fresh.

Inside the Gym:

-Warm-up 5 minutes on treadmill at a walking pace. Speed up and begin your high / low intensity intervals. Follow up with a 5 minute cool-down on the treadmill. Remember you can not only just increase the speed of the treadmill, but you can increase the incline on the machine you are on, further increasing the difficulty of your session.

-The treadmill isn't the only piece of aerobic exercise equipment in your gym (hopefully!), so feel free to use the bike, elliptical, stairclimber, or track if your gym has one. Be creative and try to keep your cardio routine fresh and progressive.

Outside:

-At a track, or even around your own neighborhood, you can alternate periods of high intensity jogging or running with low intensity periods of walking, aiming for your desired time periods.

-Jump Rope, alternating periods of normal jump roping with periods of high intensity fast jump rope hopping or double hops

Chapter 10- Safety and Efficacy Research Program (SERP)

By Michael Janovick Pharm.D., R.Ph.

Michael Janovick holds a Doctor of Pharmacy from Ohio Northern University. He is a registered pharmacist who works with the general public on a daily basis to promote an active and healthy lifestyle. With Athletic Edge Nutrition, he is the Director of the Safety and Efficacy Research Program and is also involved in research and product development.

As many of you know, AEN is truly DEDICATED to research! From the start, we have had our EXACT formula's put through research studies and at this point, we have had THREE research studies already completed on IntraXCell.

Well beside research studies, we are excited to be taking things in a different direction. A NEW direction, that will further strengthen the efficacy and safety of our products from an anecdotal perspective. Third party research studies will always be the true test of a products efficacy and what AEN is all about and will continue to be, we do feel anecdotal evidence can also be

quite useful in giving us REAL WORLD feedback. **It is our belief, that the combination of research studies in clinical settings, combined with the structured gathering of anecdotal feedback is the MOST powerful combination there is in proving data on a products safety and efficacy.**

As a result, I have designed the Athletic Edge Nutrition Safety and Efficacy Research Program or (S.E.R.P.)

The Athletic Edge Nutrition Safety and Efficacy Research Program is designed to gather customer feedback and monitor adverse effects of the products. We are going to have thousands upon thousands of customers' feedback analyzed instead of a few dozen.

The key areas of interest will be the length of time the user was on a particular supplement. Within that length of time, what types of body composition changes occurred i.e. muscle gains, reduction in body fat, etc. What types of performance changes were brought about, be it anaerobic, aerobic performance, or mental/focus increases, etc. Lastly, we are interested in hearing about any adverse reactions you may have had. All of this and MORE is laid out on this template, with the proper ways we would like you to gauge your progress.

There is an example of the template below. This template is VERY easy to fill out and won't take much time at all.

SAMPLE TEMPLATE:

Athletic Edge Nutrition Safety and Efficacy Research Program (AEN SERP)

Name

Age

Length of time on supplement days

Starting weight lbs

Ending weight lbs

<http://www.healthstatus.com/calculate/bfb>

Starting bodyfat % %

Ending bodyfat % %

Estimated 1-rep (beginning) <http://www.bodybuilding.com/fun/1rm.htm>

bench press lbs

max reps on pullups lbs

Estimated 1-rep (ending) <http://www.bodybuilding.com/fun/1rm.htm>

bench press lbs

max reps on pullups lbs

Only complete the product(s) used

INTRAXCELL

Positive effects of supplement

At what time did you begin to
Scale: 1-10 (10 best)experience the effects?

Increase strength week _____

Increase muscle mass week _____

Increase anaerobic endurance week _____

Increase aerobic endurance week _____

Increase muscle fullness week _____

Increase vascularity week _____

Delay in muscular fatigue week _____

Increase in mental alertness week _____

Other, please state week _____

Would you buy again? (yes or no)

<u>Adverse reactions</u>	<u>yes/no</u>	<u>At what time did you begin to experience the effects?</u>
Parathesia (prickling)		week _____
Upset stomach		week _____
Nausea		week _____
Vomiting		week _____
Diarrhea		week _____
Other, please state		week _____
Did you have to stop the product?		
If above is YES, at what time		week _____

SNEAK PEEK: Our data collection is in its infancy but we wanted to give people an idea of how IntraXCell is performing. **Under “Increase anaerobic endurance” the average customer rating has been 8.8 out of 10. Even more impressively is the “Delay in muscular fatigue” which has been rated a whopping 9.4 out of 10!**

You can email mikej@aenutrition.com YOUR email address and we will email you back the template of your choice of EXCEL or WORD, PLEASE specify.

Once you are finished with it, we would like you again to email it back to me to be including in the drawing for a chance to win!

For every 100 forms we get emailed to us, we will offer FREE product to THREE winners. The first winner will receive the FULL AEN stack, and the second and third winner will receive their choose of ONE AEN product. Only winners will be removed from the drawing, which means you will have MANY chances to win at each drawing.

Part VI- Testimonials

*Like many, I love to train and eat in order to improve my physique day in and day out. I knew I had my workout and diet in order but I still wanted to accelerate my gains without the use of anabolic substances. This is why I turned to **IntraXCell**, a real product backed by real science. In just 30 days I was able to increase my lean muscle mass (see pics) as well as increase my bench from 220 to 260. My strength went through the roof and I needed less rest time between sets. My muscle overall looked much more full and pumped 24/7. **IntraXCell** blew away any NO product I have tried for incredible vascularity and pumps during my workouts. I recommend this product as a staple supplement for anyone looking to build lean muscle, gain strength and increase their endurance.*

Matt S., Dayton, Ohio

***IntraXCell** is literally the most amazing supplement I have used in boosting my strength in the gym since creatine. Just to let you know, I have been seriously lifting for over 12 years and this type of jump and strength has only*

ever happned to me ONCE before when I first started using creatine. I didn't notice any improvements until about a week, when all of sudden I started to be able to crank out extra reps and noticed my performance wasn't decreasing between sets at the rate it usually would. That was just the beginning though, three quarters the way through the bottle I was able to increase the weight on my squats and bench presses significantly and my overall workouts have gone up to the next level, this stuff is amazing. You don't feel anything like a caffeine stimulant rush would give you, but when you are in the gym look out, you will feel unstoppable and you will be able to lift more weight for more reps with less down time between sets.

Seriously absolutely incredible product.

Kevin D., **Miami, FL**

*The combination of **IntraXCell** and **PreSurge Unleashed** is by far the best performance enhancing supplements I have ever used. There is nothing like this combination for increasing strength, power, endurance, energy, intensity and focus. **IntraXCell** is the first supplement since creatine, that actually did increase my strenght and, power, but it didn't bloat me or cause any water retention like creatine always did. **PreSurge Unleashed** gets me motivated and jacks up my intensity and focus, helping me blast through my workouts like nothing else. In my opinion this combination of supplements should be included in any athlete's diet.*

Andy H., **Reno, NV**

PreSurge Unleashed** is hands down the best pre-workout drink I've ever taken. It has greatly improved my overall strength and endurance, helped elevate my training sessions and cut seconds off my time. I love **PreSurge Unleashed!

Michael J.(middle- distance runner), **Chapel Hill, NC**

*used this product until I was tapping the bottom for the last bit into my shaker. I've used numerous other pre-workout boosters, but none that gave me the intensity in my workouts that **PreSurge Unleashed** did. I'm not one*

*for running, but even on my cardio days I had enough focus to blow through my workout and even wanted more after I was finished. This product is by far the most effective supplement I've ever used in the gym. Great work, **PreSurge Unleashed.***

Bryan G., Laurel, MD

Closing Remarks

We hope this booklet has given you a much better understanding of how IntraXCell/beta-alanine works and how to utilize it to maximize your results.

***Athletic Edge Nutrition** (www.aenutrition.com)*

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