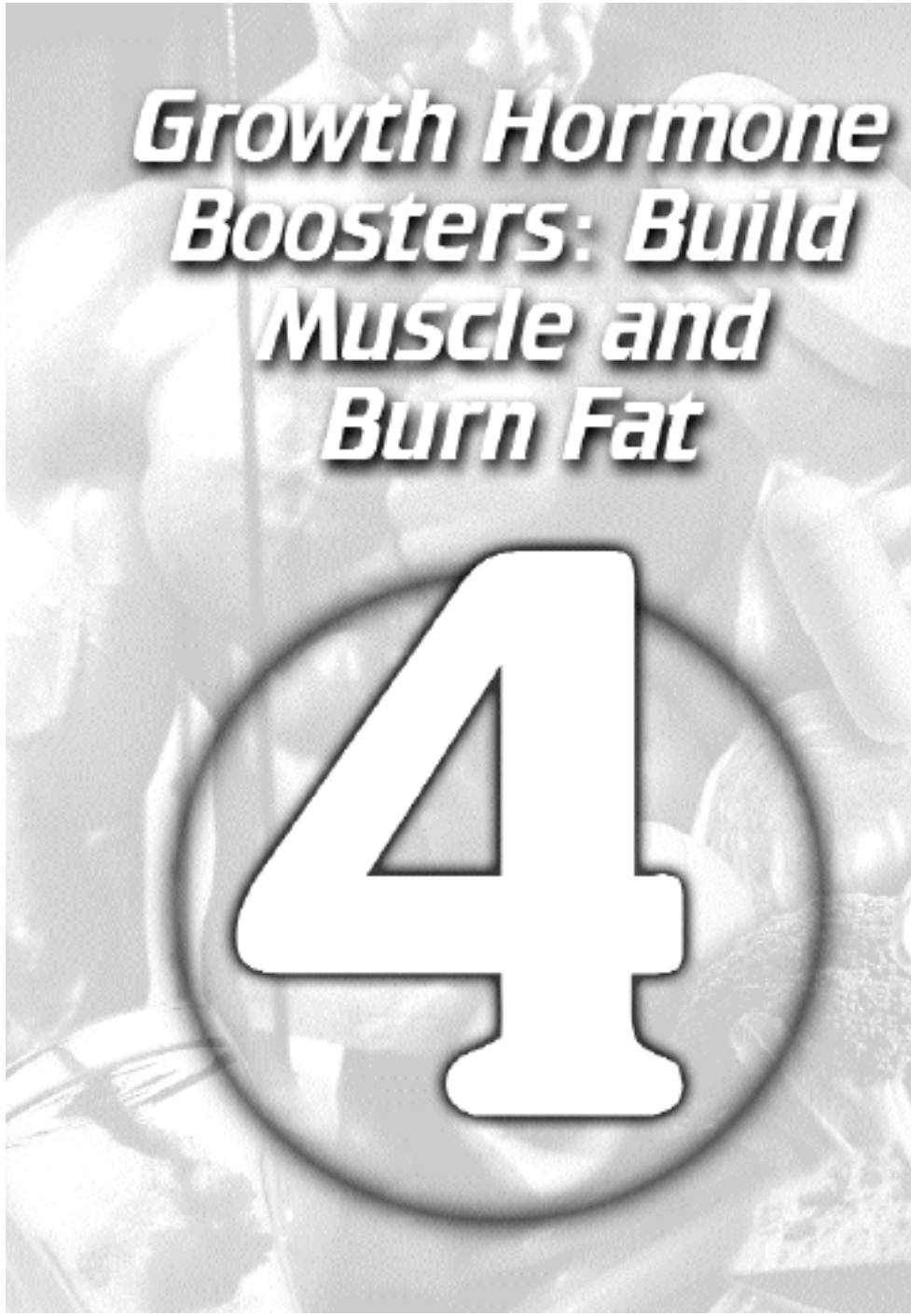
Growth Hormone Boosters: Build Muscle and Burn Fat
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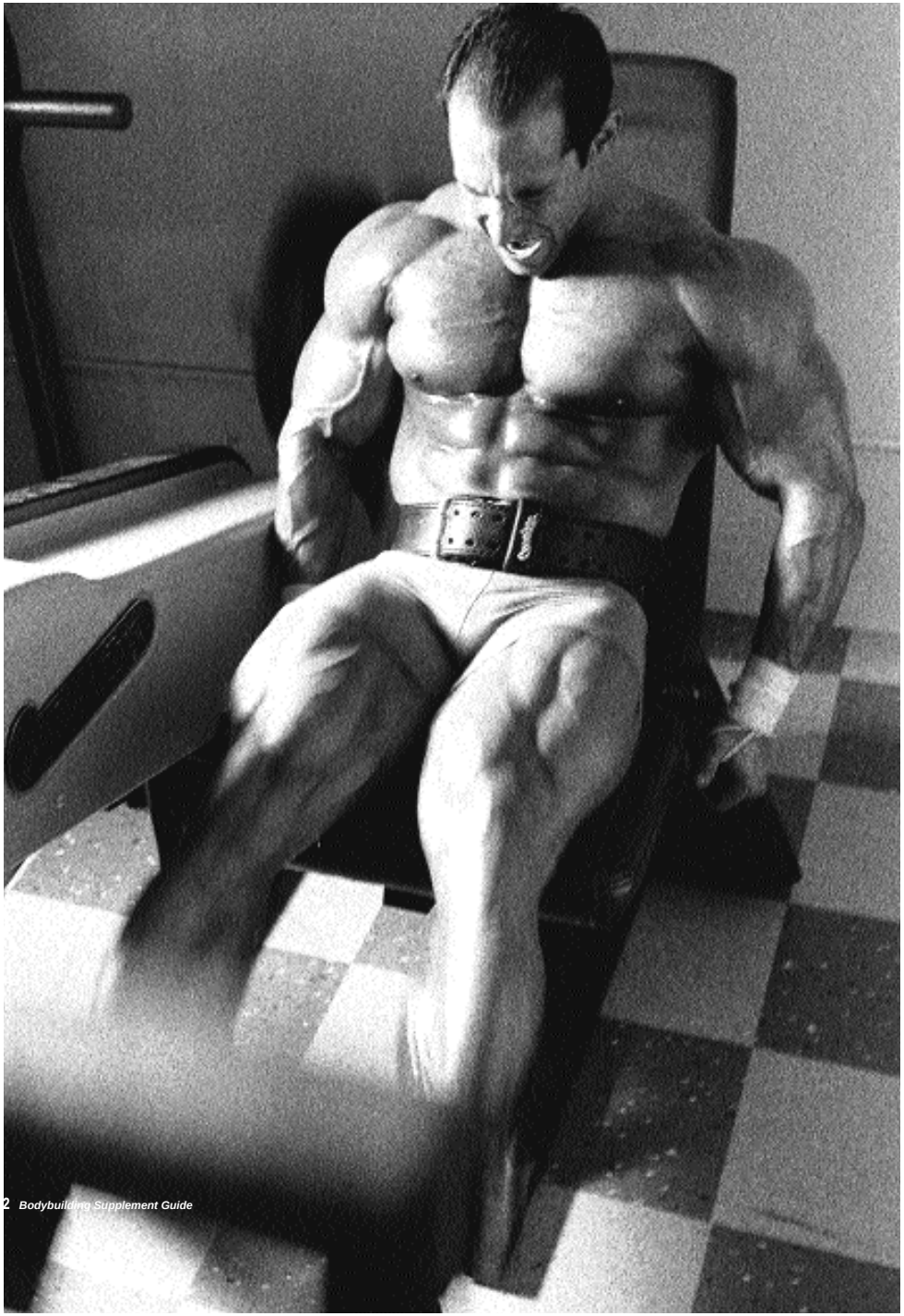


GH: Blast Yours to New Levels

by Jerry Brainum

In this new age of natural bodybuilding many bodybuilders are putting their faith in growth hormone for druglike size-and-strength increases. This powerful hormone has proved itself as an anabolic agent by triggering enhanced muscle protein synthesis or reduced muscle protein catabolism. In other words, it can give your sluggish hypertrophy a high-voltage charge.

Athletes from all sports have been putting it to the test for years. For example, recently, several members of the Chinese swim team were caught with growth hormone in their possession while on their way to an international meet in Australia. GH is popular with athletes because, though it's officially banned by most international athletic governing bodies, it's presently undetectable by drug tests.

Rumors are rampant that GH is also a popular bodybuilding drug. Most top-level bodybuilders who've used it say that when taken alone, it helps preserve muscle during stringent dieting and speeds up fat loss. When combined with other anabolic substances, such as anabolic steroids (particularly testosterone injections) and insulin, GH has synergistic anabolic effects. Some bodybuilding observers even speculate that this combination of drugs explains the current spate of bodybuilding behemoths, with a few competitors walking on stage weighing 250 or more minus even a scintilla of apparent bodyfat.

While it seems as if the use of drugs such as GH is rampant in bodybuilding, the truth is that availability is often limited by cost. It's expensive to take the correct amount of GH, and if you take it for too long, the chances of side effects increase. Possible side effects include gynecomastia (male breasts); carpel tunnel syndrome (a painful nerve impingement of the hand that often requires surgery); and a facial disfigurement called prognathism, which is characterized by a protruding jaw and forehead that create an apelike appearance.

Recognition of these problems has led many athletes to investigate safer, more natural means of promoting GH release. Several amino acids are known to elicit a GH response, the most prominent being arginine and ornithine. One problem with that strategy is that the most reliable release of GH with amino acids occurs when the aminos are given intravenously, often in 30-gram or higher dosages.

An often-quoted 1981 Italian study of 15 healthy young men showed that providing them with only 1,200 milligrams each of arginine and another amino acid, lysine, led to GH blood levels eight times higher than baseline. Large doses of oral amino acids, however, may cause gastrointestinal distress because of a pronounced osmotic effect. In effect, they draw water into the intestine, leading to symptoms that can include gas, bloating and diarrhea. Even if you escape that uncomfortable fate, the aminos may be degraded by liver enzymes before reaching the blood.

Using various amino acids for eliciting GH release also depends on several other extenuating factors. For example, GH is released more reliably under conditions of low blood glucose and a low content of circulating free fatty acids in the blood. That means such aminos work best if taken on an empty stomach, which explains the frequent suggestion to take GH-promoting aminos before bedtime—assuming you haven't eaten anything for at least three to four hours. Taking them at bedtime is a way to augment the natural peak release of GH, which occurs during the initial 90 minutes of sleep.

Taking other amino acids in conjunction with GH releasers, such as a whole-protein supplement like whey, will completely negate any GH activity of the GH-releasing aminos due to competitive interference with brain uptake by other circulating amino acids.

Still another limiting factor that determines the efficacy of GH-releasing amino acids is acetylcholine production in the brain. Acetylcholine is a brain neurotransmitter synthesized from acetyl coenzyme-A and the nutrient choline. The significance of acetylcholine with regard to amino acid GH releasers is that the release of GH through

These peptides are available orally, unlike GH or IGF-1, which must be administered by injection. The general term for them is growth hormone secretagogues, since they work by augmenting both the amount and release of existing GH in the brain's pituitary gland.

amino acids is fostered by acetylcholine activity in the brain's pituitary gland. Thus, if your acetylcholine production isn't up to par, you'll get no benefits from any quantity of GH-releasing supplements.

The philosophy behind Symbiotropin is to take commonly available natural GH releasers to a higher, more effective level that compensates for the many problems associated with using oral amino acids for that purpose. Symbiotropin is based on the discovery in 1981 of peptides that are similar in structure to naturally occurring pain substances such as enkaphalin in the human brain. Enkaphalin acts like a natural form of morphine in lessening pain perception, and for some unknown reason it also boosts GH release.

The usual release of GH in the brain depends on the interplay between a substance that promotes GH release (growth-hormone-releasing hormone, or GHRH) and one that inhibits it (somatostatin). The interesting thing about GH-releasing peptides is that they act independently of both of the usual GH-limiting substances. The peptides themselves are just a chain of six or so amino acids in a specific sequence.

Several of those GH-releasing peptides have been, and still are, under continuous study. They're of extreme interest to researchers because they appear to increase the active anabolic factor of GH, insulinlike growth factor 1 (IGF-1). As such they have potential benefit in treating many catabolic diseases, such as those associated with HIV, cancer and aging. The advantage of these peptides is that they're available orally, unlike GH or IGF-1, which must be administered by injection. The general term for them is *growth hormone secretagogues*, since they work by augmenting both the amount and release of existing GH in the brain's pituitary gland.

The potency of a few of the synthetic secretagogues is impressive. For instance, in one study a GH peptide called MK-677 was given to 15 elderly women and 17 elderly men. Taking the drug orally for four weeks enhanced pulsatile GH release and restored IGF-1 levels to those found in young adults.

So what happens if you give an oral GH peptide to a younger person? In a 1996 study of young men, MK-677 given orally for one week resulted in an enhanced GH pulse activity without an elevation of GH secretion. IGF-1 levels also increased, as did the stages of deep sleep. That's significant and exciting for bodybuilders because most of the body recovery attributed to sleep takes place during those deep-sleep stages.

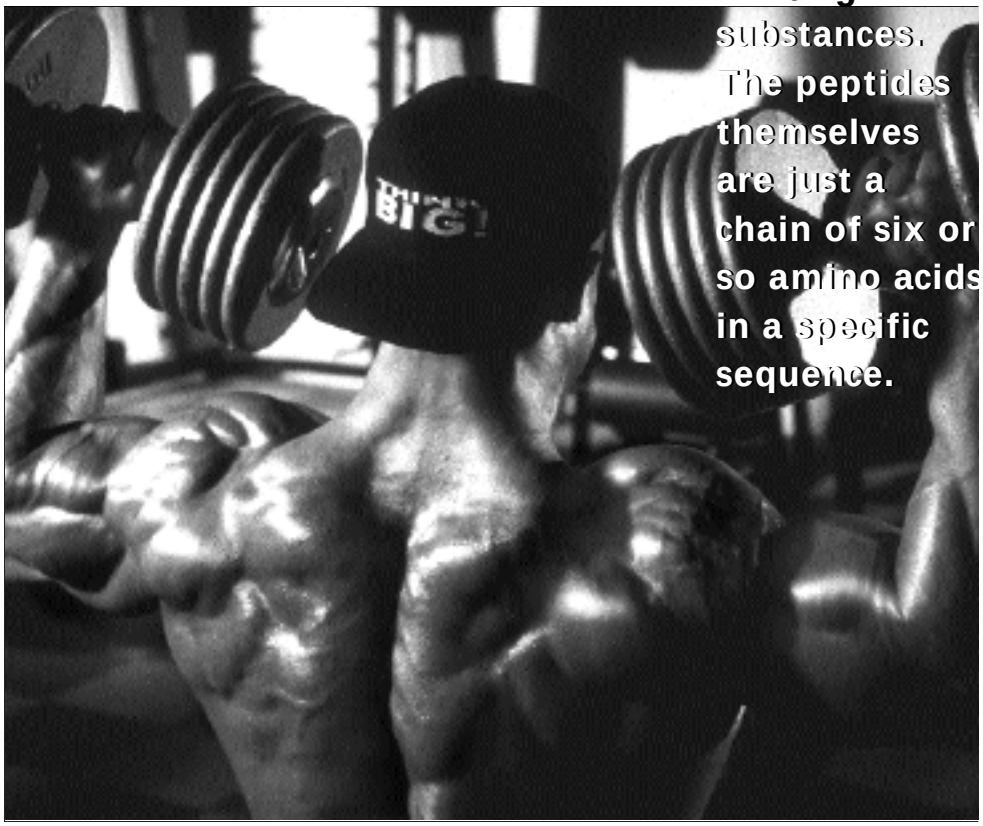
Based on the findings of studies involving drug versions of oral GH secretagogues, a pharmacologist decided to develop a natural form, which he called Symbiotropin. In the bodybuilding world it's known as GH Stak. The primary ingredient in Symbiotropin is pituitary peptides, similar in structure to the drug versions; however, the supplement contains other ingredients as well, including what the developer calls chaperon molecules, which enhance its effectiveness and delivery.

Symbiotropin also contains several known GH-releasing amino acids, such as arginine, glutamine, GABA, glycine, lysine and tyrosine. It's a very powerful combination. The developer says that because of the superior delivery system incorporated into Symbiotropin—i.e., the chaperon molecules—the amino acids contained in the product are far more efficient in promoting GH release than if you took the same aminos independently.

The brain chemical L-dopa is also a known GH releaser. L-dopa is made in the body from the amino acid L-tyrosine and is used medically to treat Parkinson's disease. Symbiotropin contains a legume called the Lacuna bean that's found in the rain forest and is naturally high in L-dopa. While the developer of Symbiotropin indicates that the bean is one of the primary ingredients, the amount of the L-dopa that gets past the protective blood-brain barrier is open to question. I imagine the so-called chaperon molecules are involved in that activity.

As with GH-releasing aminos, Symbiotropin is best taken on an empty stomach, either right before bed at night or in the morning as soon as you get up. The latter technique may be best, since studies done with the drug versions of GH peptides show that you get a more reliable GH release if you take the drugs first thing in the morning on an empty

The interesting thing about GH-releasing peptides is that they act independently of both of the usual GH-limiting substances. The peptides themselves are just a chain of six or so amino acids in a specific sequence.



Symbiotropin, or GH Stak, has demonstrated its ability to significantly boost anabolism and recovery, which makes it a boon to many drug-free bodybuilders looking for that all-natural increase in mass and strength.

stomach. To facilitate uptake, Symbiotropin is provided in an effervescent tablet that you dissolve in water because, as the developer notes, studies show a 15 percent increase in GH release from oral glutamine when the amino is provided in an effervescent form.

You're also advised to exercise within an hour of taking Symbiotropin, again on an empty stomach. That gives you a synergistic effect between the known GH-releasing effects of exercise and the GH enhancement induced by Symbiotropin. Training with a high level of intensity, focusing on working larger muscle areas, also adds to the effect.

The suggested dosage schedule for Symbiotropin is to take it for five consecutive days, followed by a two-day break and then repeat the cycle. While Symbiotropin is generally suggested for people over 40 who show a decline in IGF-1 levels (80 percent of people over 40), in an unpublished study of Symbiotropin that included both elderly people and three young, healthy bodybuilders, one bodybuilder had an 8.5 percent increase in measured IGF-1 levels after just one day of using the supplement. Another bodybuilder in the study had a 12.5 percent rise in IGF-1 after a day, while the third showed a 36.6 percent increase after six days of taking Symbiotropin.

That contrasts with the results for the older people in the study, who started with low levels of IGF-1. Their levels increased anywhere from 7 to 229 percent after they used Symbiotropin for varying time periods. Obviously, the lower your baseline IGF-1 level, the higher it will be after you take something known to increase it. IGF-1 levels are measured based on the ephemeral blood levels of GH. While GH is broken down in the liver about an hour after being released into the blood, IGF-1 levels—which are directly stimulated by GH—last for up to 18 hours.

Also noteworthy is the fact that one clinic in California that dispenses GH as a means of youth restoration offers Symbiotropin as an alternative for needle-shy patients. According to the professionals at that clinic, the results seen with Symbiotropin show that it's about 65 percent as effective as actual growth hormone injections. In fact, many doctors are using Symbiotropin exclusively.

From all indications the next level of muscle-building supplementation has arrived. Symbiotropin has demonstrated its ability to significantly boost anabolism and recovery, which makes it a boon to many drug-free bodybuilders looking for that all-natural increase in mass and strength.

Natural GH Surge

Interview by Jerry Brainum

Growth hormone has long intrigued bodybuilders and other athletes. The perception is that it will promote muscular size while fostering a loss of bodyfat—a holy grail combination for physical enhancement and athletic performance. Other desirable aspects of growth hormone include its much publicized anti-aging benefits and various possible health-enhancing properties associated with maintaining optimal levels of it.

The two most common approaches to modulating growth hormone in the body have involved either pharmaceutical or natural methods. The pharmaceutical approach consists of synthetic growth hormone injections and the still experimental oral secretagogue drugs. Injections do work but are expensive for long-term usage. They may also have side effects, depending on the dosages and the length of time the drug is used.

The natural approaches, while safer and cheaper, have not generally proved as effective. Natural methods of increasing the body's GH output include taking various amino acids, such as arginine, ornithine and glutamine, as well as various amino acid by-products, such as GABA and its analog, GHB.

Why don't the safer, natural versions of GH stimulators work? A primary problem is getting the required nutrients to the active areas of GH secretion; i.e., the brain. The body has a number of built-in barriers to prevent the entry of substances into the brain. For example, large doses of amino acids—such as those required to effectively elicit a GH response—are often degraded by liver enzymes.

That such natural substances can stimulate an effective GH response is proven when the same substances are allowed to bypass barriers, as in intravenous administration. Providing 30 grams of the amino acid arginine intravenously is so effective at inducing GH secretion from the pituitary gland that it was formerly used as a provocative test for pituitary GH release.

Drug companies have developed drugs called GH secretagogues based on the discovery that small amino acid linkages called peptides can elicit a significant GH release. Most of the drugs are still considered experimental, but the exciting aspect is that they're effective orally.

A natural product called GH Stak is also a potent GH secretagogue, according to its developers. Since growth hormone itself is degraded within an hour after reaching the blood, the level of a primary GH product, insulinlike growth factor 1 (IGF-1)—which circulates in the body far longer thanks to protective binding proteins—is considered an accurate measure of GH output. From a bodybuilding perspective, that's important because IGF-1 is also considered the active anabolic component of growth hormone. Preliminary studies show that GH Stak increases IGF-1 in various populations.

To find out more about the possible benefits of using GH Stak, I interviewed Lawrence E. Dorman, M.D., who has practiced osteopathic medicine for more than 30 years in Independence, Missouri. Dorman specializes in nutritional and preventive medicine and has worked with several professional athletic teams. He has also researched the supplement and administered it to his patients and has a thorough knowledge of its potential benefits.

Q: A recent widely publicized study implicated high levels of IGF-1 as a promoter of prostate cancer. Does IGF-1 promote cancer?

LD: That study was extremely flawed. If high levels of IGF-1 actually promoted cancer, then people would have to stop exercising immediately because exercise is a potent IGF-1 stimulus. Other physicians and I have examined this purported IGF-1/cancer connection, and we've all agreed that the study was likely funded by pharmaceutical companies that had their own agendas.

In reality, the opposite is true. Since most types of cancer result from a failure of the immune system to curtail incipient tumors, IGF-1, as a potent immunostimulant, would serve to have a preventive effect against cancer.

By stimulating the immune system, higher IGF-1 levels protect the body against the onslaughts of various stresses and associated diseases.

Q: How would maintaining higher IGF-1 levels help to prevent diseases?

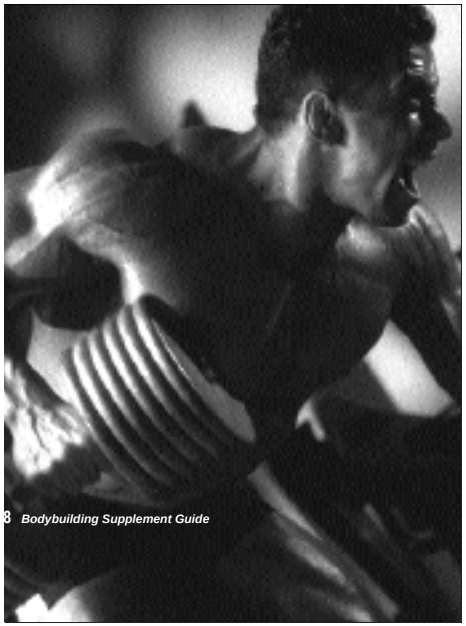
LD: Maintaining an optimal IGF-1 level throughout life would help prevent virtually any type of disease. A primary reason that older people show higher rates of various degenerative diseases is that the body gradually loses the ability to ward off such diseases. This loss is related to a lifetime of poor health habits, such as lack of exercise, obesity, lack of sufficient nutrients and chronic exposure to environmental toxins, as well as unbridled stress.

By stimulating the immune system, higher IGF-1 levels protect the body against the onslaughts of various stresses and associated diseases. When you examine chronically ill people, you always find below-normal IGF-1 levels. A study published in a major journal found that patients who had suffered heart attacks showed the highest death rates if they also had low IGF-1 levels.

Q: Assuming that GH Stak is effective in increasing IGF-1 levels, do you expect a market flooded with imitation products?

LD: [GH Stak] isn't easily duplicated for at least two reasons. The first is that duplication of the product requires an extensive knowledge of anterior-pituitary peptides. Only a few chemists in the world know how to produce those special peptides.

The second reason involves the delivery of the special peptides to target areas. Anyone attempting to duplicate [GH Stak] would have to devise a way to successfully transport them across such hostile environments as the acidic gastric mucosa and get them into the blood without being destroyed. This process requires special "chaperon" molecules, for which the chemistry is extremely obscure.



I expect that many companies will claim to have an equally effective knockoff version of [GH Stak], but they won't work as well. We've already tested a few products, and they didn't live up to hype.

Q: Obese people are often insulin-resistant and also show blunted growth-hormone-releasing patterns. Would using GH Stak have any benefits for such people?

LD: If you administer GH injections, the drug will initially produce insulin resistance and subsequent glucose intolerance. However, the opposite is true with a growth hormone secretagogue such as [GH Stak]. We've found the product is so effective at increasing insulin sensitivity that elevated blood glucose levels rapidly decline. When we give it to insulin-dependent diabetics, we always warn them to closely monitor their blood glucose levels. We've taken a few diabetics off insulin therapy when they began using [GH Stak] because of improved glucose control.

Q: Since a high blood glucose level is known to blunt GH release, would a lower-carbohydrate intake while using GH Stak offer any advantages?

LD: You do want to limit carbohydrate intake a few hours before using [GH Stak] to elicit a maximal effect from it. You should also not consume any protein foods for at least three to four hours before using [GH Stak]. Amino acids will compete with some of the components found in the supplement for uptake into the body.

Q: What's the best way to use GH Stak?

LD: I'd recommend waiting at least an hour to eat anything after using it. It's not advisable to combine [GH Stak] with food or supplements that would decrease the effectiveness of the product. That includes any type of protein or creatine supplement.

Q: Do you suggest consuming more protein while using GH Stak?

LD: Most active people already consume high-protein diets, and using [GH Stak] with such diets produces a synergistic effect. On the other hand, I think that even active people shouldn't ingest too much protein and they should consider mixing protein sources. That would involve consuming both animal and plant-derived proteins.

Most active people already consume high-protein diets, and using [GH Stak] with such diets produces a synergistic effect.

Q: Is there any type of dietary fat that people should emphasize while using GH Stak?

LD: Monounsaturated fat, such as that contained in olive and canola oils, is a good type of fat to eat. It's less subject to oxidation and helps to maintain higher levels of protective high-density-lipoprotein cholesterol in the body.

Q: Should the focus be on lower-glycemic-index carbohydrates, which promote less insulin release?

LD: The type of carbohydrate is more of an issue with people who are just beginning to exercise. Regular exercise promotes more efficient usage of ingested carbohydrates, such as a greater glycogen storage capacity. Thus, most people have an enhanced carbohydrate uptake after exercise.

Q: What about using supplements that increase insulin effectiveness, such as chromium or vanadyl sulfate. Would they enhance GH Stak's effects?

LD: Those supplements are fine; however, vanadyl is toxic to the kidneys after long-term use. I'd suggest using a safer vanadyl complex

Androgen precursors are converted by liver enzymes into testosterone, while [GH Stak] promotes peripheral IGF-1 synthesis and release, as in muscle. One touted androgen precursor, however, does increase IGF-1, and that's DHEA.

instead. Several of them are available.

Q: What's the purpose of the special legume contained in GH Stak?

LD: The legume used is a product of the rain forest. It contains an amino acid by-product called L-dopa that's a recognized GH releaser in the brain. Normally, the L-dopa would be destroyed in the gut before it got to the brain, but the chaperon molecules in GH Stak can successfully shield it from being prematurely degraded.

Q: Why is the effervescence factor contained in GH Stak so important to the product's effectiveness?

LD: The effervescence promotes rapid assimilation of the factors contained in [GH Stak]. Those active factors, such as the anterior pituitary peptides, are fragile, and the longer they're exposed to hostile environments such as stomach acidity, the greater the risk of degradation. The effervesence helps to neutralize some of the potentially hostile exposures.

Q: Are there interactions between GH Stak and any of the popular testosterone precursors now on the market?

LD: Androgen precursors, such as androstenedione, take totally different biochemical pathways than does [GH Stak]. Androgen precursors are converted by liver enzymes into testosterone, while [GH Stak] promotes peripheral IGF-1 synthesis and release, as in muscle. One touted androgen precursor, however, does increase IGF-1, and that's DHEA.

Q: What results can a bodybuilder expect after beginning to use GH Stak?

LD: An initial effect would be increased exercise tolerance. That would translate into more intense workouts and better post-training recuperation. A person using it might be able to train faster, with less rest between sets, but that depends on prior physical condition.

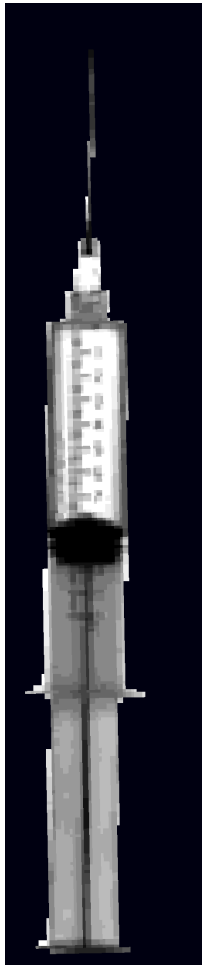
Q: Since GH Stak increases exercise recovery, would a person taking it be able to train more frequently or for longer sessions?

LD: While the product does promote greater recovery capacity, it doesn't give you a license to purposely overtrain, either. You still have to use common sense. [GH Stak] will, however, partially compensate for the blunted GH release that occurs with overtraining through an upgraded peripheral IGF-1 synthesis. The localized IGF-1 will serve to maximize muscle repair processes after training.

Q: Since younger people usually have higher IGF-1 levels than older people, what's the advantage for them of using a product such as GH Stak?

LD: Even younger people will show improvements in muscle strength and endurance. Since IGF-1 also strengthens connective tissue, such as that found in joints and ligaments, using the product will offer a degree of protection from injury.

Q: You mentioned earlier that DHEA can also raise IGF-1 levels. Does that mean GH Stak and DHEA are a synergistic combination?



LD: Older people using both show higher IGF-1 levels; however, I believe DHEA use should be reserved for people over age 40. Younger people have higher DHEA levels, making use of this hormone superfluous. I suggest that anyone contemplating using DHEA should have his or her DHEA level measured by lab analysis. That will provide information concerning the proper dose of DHEA to use.

Q: Can using GH Stak lead to a side effect profile similar to that of injected GH?

LD: Carpal tunnel syndrome, a painful wrist impingement, is often a common side effect of GH-injection therapy. With [GH Stak] we've seen this side effect only when people take too great a dose and then only in women. As to the reason the effect occurs only in women, we haven't yet determined it. But the effect is extremely rare and only happens if the product is misused.

Q: Should someone considering GH Stak undergo any prior medical tests?

LD: I'd suggest getting a lab measurement of endogenous IGF-1 levels before using the product so you can see your baseline value of GH response.

Q: Would increasing the recommended dose of GH Stak produce greater effects?

LD: [GH Stak] is a growth hormone modulator. It doesn't give you the constant stimulation associated with GH injections. However, the constant bombardment of GH cell receptor sites that occurs with injections makes the drugs less effective over time. [GH Stak] is more of a gentle stimulus to GH release, but any product that works can be abused.

Q: Is that the reason you suggest cycling and not taking GH Stak every day?

LD: Taking breaks from using the product every few days maintains its effectiveness while also preventing any side effects from occurring. The brief rest periods also maintain receptor efficiency, thus preventing the receptor downgrade that commonly occurs with growth hormone injections.

Q: Are there any known contraindications to GH Stak use?

LD: The only problem we've noticed thus far has to do with the citrus naturally contained in [GH Stak]. People allergic to citrus should not use the product. We do, however, have a citrus-free version coming out soon.

Q: Would GH Stak affect the activity of other hormones, such as

The constant bombardment of GH cell receptor sites that occurs with injections makes the drugs less effective over time. [GH Stak] is more of a gentle stimulus to GH release, but any product that works can be abused.

The greatest physiological GH release occurs during the initial stages of deep sleep, and [GH Stak] will aid the deep-sleep stage as well as provide a synergistic boost to the naturally occurring GH peak at that time.

thyroid output?

LD: We have some evidence that it enhances thyroid output.

Q: Synthetic GH secretagogues often also increase cortisol and prolactin levels. Would GH Stak share that effect?

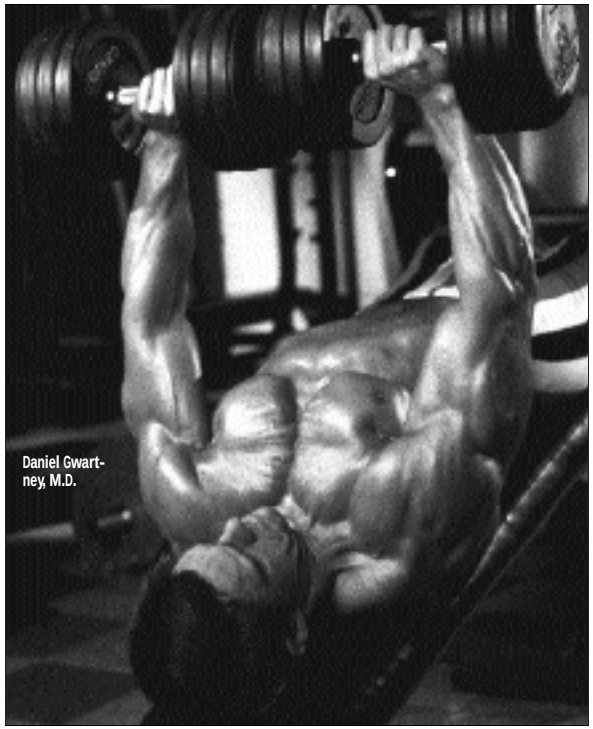
LD: An increased cortisol level would be of concern to athletes because of the established catabolic effects associated with that adrenal hormone. We haven't seen any increases in cortisol levels with [GH Stak] in any age group.

Q: Why do you recommend against people using artificial sweeteners when they take GH Stak?

LD: The supplement contains special pharmaceutical sugars that are part of its proprietary chaperon delivery system. Artificial sweeteners interfere with the function of those special sugars, and that could potentially decrease the product's effectiveness.

Q: Given a choice, is it better to take GH Stak first thing in the morning before eating or at night before bed?

LD: For most people the better choice is at night. The reasoning here is that in most cases meal consumption has occurred several hours earlier, thus allowing the active elements in [GH Stak] to have a clear pathway to target tissues. In addition, the greatest physiological GH release occurs during the initial stages of deep sleep, and [GH Stak] will aid the deep-sleep stage as well as provide a synergistic boost to the naturally occurring GH peak at that time.



Daniel Gwartney, M.D.

The Growth Hormone Phenomenon

by Steve Holman

Hormone manipulation may sound like some futuristic concept, but it's here—and it's achieving spectacular results in medicine and athletics. In terms of muscle growth, the technique of boosting testosterone, growth hormone and insulin levels at specific times is becoming the great bodybuilding equalizer. Thanks in part to hormone manipulation, we're now seeing some of the most impressive drug-free bodybuilders that ever walked planet earth. Studies show over and over again that boosting certain hormones can produce results similar to those that occur with anabolic steroid use.

Is hormone manipulation as dangerous as steroid use? Not in most cases. In fact, if you train intensely with weights, you already manipulate your hormones to a degree. Intense weight training increases both testosterone and growth hormone output, which is one reason you get results. If you're like most mass-hungry bodybuilders, however, you're looking to kick up those results a few notches—and perhaps uncover the key to ultimate size and strength.

Your growth hormone level is critical to your getting spectacular results with hormone manipulation. It's the orchestra leader that conducts the other hormones, the quarterback leading the anabolic drive.

For example, a high GH level helps amplify the anabolic response of testosterone, and it can help smother many of the anticatabolic, or anti-muscle-wasting, effects of cortisol. When GH is high, cortisol is low. The anabolic/anticatabolic power of GH makes it the premier bodybuilding hormone, and you should attempt to boost it as often as possible.

How do you up your GH and increase the power of your other anabolic hormones without having to resort to injections? Proper training is the place to start.

Boost Your GH in the Gym

Three training variables have a direct impact on growth hormone and its positive effects on muscle hypertrophy: intensity, muscle stretch and muscle burn. When you combine them during your workouts, you create an extreme anabolic environment.

Intensity. As James Jamieson, noted pharmacologist and developer of the growth-hormone-boosting supplement GH Stak, and Dr. Lawrence Dorman, a leader in the field of natural medicine, write in their book *Growth Hormone: The Methuselah Factor*, "Sustained high-intensity exercise increases the quantity and number of pulses of GH release. *Intense* is the key word here; garden-variety jogging won't do it." That means you need focused effort on the big compound weight-training movements to affect your GH levels.

Intense effort on the big exercises is vital—for example, squats for your quads, bench presses for your chest, overhead presses for your delts and rows and chins for your back. If you want an increase in GH, use the core movements in the majority of your bodypart programs.

Muscle stretch. Stretch-position movements—such as stiff-legged deadlifts for hamstrings and flyes for pecs—can increase the IGF-1 receptors on the muscles. IGF-1, or insulin-like growth factor 1, is a highly anabolic metabolite that can occur as a direct result of higher GH output, and it can have a tremendous positive impact on muscle growth. Here's a list of stretch-position movements for each bodypart. Seriously consider incorporating them all into your program for maximum growth response from your higher GH level.

Quads: Sissy squats
Hamstrings: Stiff-legged deadlifts
Calves: Donkey calf raises, leg press calf raises
Chest: Flyes
Lats: Pullovers
Midback: Close-grip cable rows
Delts: One-arm incline laterals
Biceps: Incline dumbbell curls
Triceps: Overhead extensions
Abs: Full-range crunches, Ab Bench crunch pulls

One highly effective way to use these exercises is to do a few sets of the corresponding stretch-posi-

In a study published in the Canadian Journal of Applied Physiology (22:244-255; 1997), researchers showed that there's a direct correlation between higher blood lactic acid levels and GH release from the pituitary gland.

tion exercise at the end of each bodypart routine. For example, end your chest workout with two sets of flyes, and on your last set emphasize a stretch-pause on each rep, holding for a four-count in the stretch position before continuing the movement. Stretch-pauses can increase the IGF-1 receptor development and stimulate an even greater anabolic response.

Muscle burn. In a study published in the *Canadian Journal of Applied Physiology* (22:244-255; 1997), researchers showed that there's a direct correlation between higher blood lactic acid levels and GH release from the pituitary gland. That means the more muscle burn you induce, the more growth hormone you can stimulate. To attain the searing effect efficiently, superset two exercises in each bodypart routine. For example, use a multijoint exercise, such as bench presses, followed immediately by a lighter, single-joint, or contracted-position, movement, such as cable crossovers. That superset, a variation of the Aftershock technique, will trigger the higher lactic acid levels you're after.

Put those three variables together, and your GH-boosting quad routine might look like the following:

Squats (warmup)	2 x 15
	2 x 6-9
Aftershock superset	
Leg presses	1-2 x 7
Leg extensions	1-2 x 7
Sissy squats	1 x 12
Sissy squats (stretch-pause)	1 x 6

Here's a sample arm routine:

Triceps	
Decline extensions	2 x 6-9
Aftershock superset	
Close-grip bench presses	1 x 7
Dumbbell kickbacks	1 x 7
Overhead extensions	1 x 9
Overhead extensions (stretch-pause)	1 x 6
Biceps	
Barbell curls	2 x 6-9
Aftershock superset	
Undergrip pulldowns	1 x 7
Spider curls*	1 x 7
Incline curls	1 x 9
Incline curls (stretch-pause)	1 x 6

*Performed on the vertical side of a preacher bench.

You can construct your own bodypart routines, or consult *Compound Aftershock* for more specific GH-boosting programs. See the ad at the back of this book for information.

Supplements to Ramp Up GH: No Injections Necessary

There have been a number of studies showing that specific amino acids, such as glutamine, can boost GH output. One supplement that incorporates the known GH releasers in a powerful compound is GH Stak.

Bodybuilders at the *IRONMAN* Training & Research Center have been experimenting with it—effervescent tablets like Alka Seltzer that you dissolve in water and drink on an empty stomach either before you train or at bedtime. Drug-free bodybuilder Jonathan Lawson made some spectacular gains using GH Stak, adding more than 10 pounds of muscle to his ripped competition weight [see Growth Hormone Q&A]. He competed in 1997 at a bodyweight of just over 180 pounds, and with his first eight-week cycle of GH Stak he boosted that to a ripped-and-ready 195 in early 1998. He got that amazing result due to a number of factors, including the supplement and his high-intensity, full-range training protocol, which incorporated the above concepts. Jamieson has said on many occasions that you get a synergistic effect from the combination of the compounds in the effervescent supplement and the GH-releasing effects of high-intensity exercise. Lawson certainly did.

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Why does GH Stak come in an effervescent form? Studies show that there's a significant increase in GH from oral glutamine when the glutamine is in that form—due to pH manipulation in the stomach—and significantly better absorption. The effervescent action also enhances the delivery of the other growth hormone precursors in GH Stak, such as L-arginine, which is included in a more bioactive pyroglutamate form than what you get from standard L-arginine supplements. Other GH Stak ingredients include glycine; tyrosine; Aminotrope 7, a sequenced glycoamino acid complex; and compounds from a legume called the Lacuna bean that's naturally high in L-dopa, a renowned GH-stimulating amino acid compound.


Steve Holman, editor in chief IRONMAN.

GH Stak also contains anterior pituitary peptides that normalize somatostatin, a hormone that can shut down GH and IGF-1 receptors. That's critically important because when you elevate GH and IGF-1, you don't want somatostatin to smother their effects. GH Stak's anterior pituitary peptides prevent the shutdown, which drastically increases the effects.

As for the research, Jamieson and Dorman presented a study to the American College for Advancement in Medicine, "The Role of Somatotroph-Specific Peptides and IGF-1 Intermediates as an Alternative to hGH Injections." In the 1997 study a group of subjects took the supplement for 12 weeks, and while many were older individuals, there were young bodybuilders as well. Even though body-

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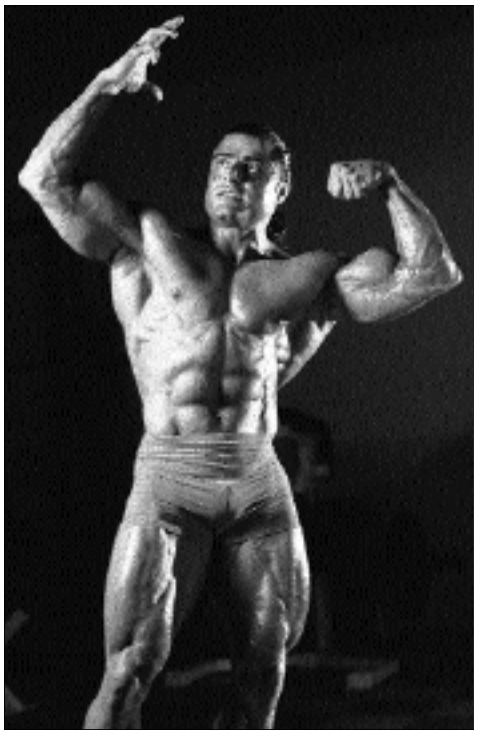
builders usually have higher-than-normal IGF-1 levels, the ones in the study still showed anywhere from a 12 percent increase in IGF-1 levels after just one day of using the supplement all the way to a 36.6 percent increase after only six days. Those are some incredible numbers, especially when you realize there was no IGF-1 deficit to begin with. Most of the subjects who had low IGF-1 levels got even better results, with one showing almost a 230 percent increase in only 22 days.

Results with GH Stak have been so spectacular that doctors at anti-aging clinics are using it in place of GH injections. That indicates that the medical community is embracing this supplement as a true alternative. In other words, it works.

Here's the bottom line for bodybuilders. Most pros inject GH, and many experts believe it's the very reason we see such incredibly massive competitors in the sport. It's believed that in combination with testosterone and other anabolic, anticatabolic compounds, the muscle-building power of GH is significantly increased along with its fat-burning effects. GH also amplifies the power of many supplements—even protein powders. It's not hard to see why so many drug-using bodybuilders spend so much money on synthetic GH. If natural bodybuilders are going to come close to mimicking the powerful anabolic effect the pros get with synthetic GH injections and steroids, they'll do it by combining growth hormone boosters, such as GH Stak, with testosterone boosters, scientifically designed protein powders and cortisol suppressors. Hormone manipulation is the key to rapid drug-free muscle growth, and it's here in full force. It appears to be the anabolic trigger for which natural bodybuilders have been frantically searching.



Growth Hormone Q&A

Q: I've heard that muscle fibers can split, creating more and more fibers in a given bodypart. That would be one reason bodybuilders get so huge—their fibers are multiplying. I also heard that GH may help it occur. How do I make my muscle fibers split?

A: While research hasn't shown conclusively that muscle fiber splitting, or hyperplasia, occurs in humans, animal studies have proved that it does happen within muscle structures. For example, in one study the hyperplasia in rats was the result of stretch overload, which leads me to believe that if it does occur in humans, stretching and stretch-position exercises—like stiff-legged deadlifts for hamstrings, flyes for pecs and incline curls for biceps—can contribute to the fiber-splitting phenomenon, resulting in the potential for larger and larger muscles. We already know that stretch-position movements can increase the anabolic receptors on muscle tissue, so the possibility of fiber splitting is yet another reason to use stretch-position exercises for each bodypart.

Other animal-based studies show that the main hormonal stimulus for hyperplasia is IGF-1, which is produced from growth hormone. In *Applied Metabolics #13* Jerry Brainum discusses hyperplasia. He writes that the process "centers on immature, dormant muscle cells termed satellite cells, a reference to their location outside the primary muscle cells. The current theory about hyperplasia is that under intensive exercise conditions satellite cells may fuse with existing muscle fibers and differentiate into new muscle cells or fibers."

Brainum also discusses a new study that points to the IGF-1-hypertrophy-hyperplasia connection. He states that the difference between this study and others is that the doses of IGF-1 used were far lower than what was used in other studies in order to avoid the systemic effects of IGF-1, such as organ growth. You've probably noticed that a lot of pro bodybuilders have distended bellies. Injecting high doses of IGF-1 is probably the reason in most cases.

Here's Brainum's report on the new study:

[The researchers] used doses of the hormone that approximated the one produced directly in muscle tissue during the hypertrophy process. This dose produced muscle-size increases in

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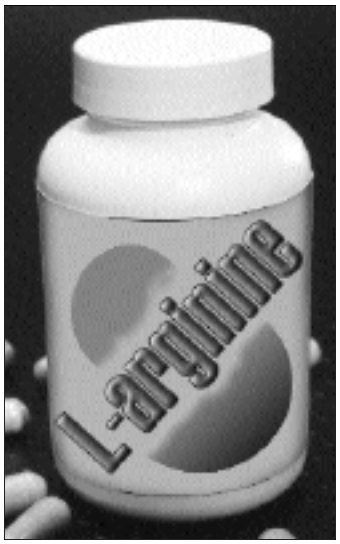
Arginine increases the production of nitric oxide, which can relax and help dilate blood vessels. In other words, with more nitric oxide you get better pumps in all of your bodyparts, even the ones you train in the bedroom.

the specific muscle of the rat that the hormone was infused into. The main point of the study is that IGF-1 works to increase muscle growth most efficiently when it's produced locally in the muscle rather than injected systemically. A high-protein diet and possibly certain GH-stimulating amino acids combined with heavy-load weight training are probably the best way to increase localized IGF-1 synthesis in the muscle.

Those conculsions suggest that taking a growth hormone booster prior to high-intensity workouts is best. While it's somewhat uncomfortable if you don't eat for two hours prior to a workout so you can take the GH Stak on an empty stomach, the results will probably be worth the hunger pains. The difference is that using the supplement right before a heavy weight-training session helps increase localized IGF-1 synthesis in the muscles being trained in the workout, which is how the researchers triggered muscle growth in the rats in the study. Taking GH Stak before bed doesn't produce those effects.



—Steve Holman, editor in chief, IRONMAN

Q: I'm 45 years old and have been using GH Stak for about four weeks. I'm making some great gains in the gym, but I've also noticed an increase in the number of erections I'm getting. Is GH Stak the natural answer to Viagra?

A: Maybe so. There have been a number of reports tying GH Stak to new hardness in that undertrained area (at least most men feel it's undertrained). It may be because the supplement contains pyroglutamate arginine, which is a potent form of L-arginine that's made even more effective by the effervescent delivery system.

Arginine increases the production of nitric oxide, which can relax and help dilate blood vessels. In other words, with more nitric oxide, you get better pumps in all of your bodyparts, even the ones you train in the bedroom. Of course arginine also helps increase growth hormone output, but us older guys can appreciate the increase in hardness everywhere. Who needs Viagra?

Incidentally, foods that are rich in arginine include most seeds, nuts and legumes, but the arginine in plants is contained within the protein structures, so you probably won't get quite the same effect as you do when supplementing with the free amino acid, and taking L-arginine capsules probably won't be as effective as the pyroglutamate arginine in GH Stak.

—Steve Holman, editor in chief, IRONMAN

Q: You've written that the trainees at the* IRONMAN *Training & Research Center use GH Stak and have gotten great results, but I've seen some other GH releasers advertised that are less expensive. Are they the same thing?

A: I've tried GH Stak, a.k.a. Pro hGH, and gotten some very good gains, especially for someone my age, 39, and training level. Jonathan Lawson, one of the trainees at the *IRONMAN* Training & Research Center, has also been using it, and he achieved almost a 15-pound bodyweight increase from his first eight-week cycle with noticeably more cuts and striations, which means he was losing fat as he gained muscle (see his before and after shots below).

I also know that GH Stak has a patented delivery system that makes it superior to any other GH booster around, and it also contains compounds that suppress somatostatin, a hormone that can hinder the anabolic effects of GH.

Finally, I know that the developer of GH Stak, noted pharmacologist James Jamieson, who also developed the patch-delivery system for drugs, is filing lawsuits against a number of companies that advertise their product as having the same delivery system as GH Stak when they actually don't.

After considering the above facts, you may or may not want to try one of the cheaper knockoff products. The choice is yours. From what I understand, most of them are simple mixtures of a few specific amino acids, concoctions that get severely degraded by stomach acid because they don't have a protective delivery system.

—Steve Holman, editor in chief, IRONMAN

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Before and after GH Stak. The photo of IRONMAN Training & Research Center member Jonathan Lawson at right was taken after he competed at a bodyweight of under 185. The photo at the far right was taken a few months later, after his first eight-week cycle of GH Stak. He weighed around 200 pounds—about a 15-pound gain. Notice that he's just as ripped and vascular but much fuller. Also keep in mind that the after photo was taken with no tanning preparation, no oil and with only available light, not the flattering studio lighting used for the other photo.