

Pro-hormones and Body Image: How Much is *Too Much*?

A study of the health effects of excessive use of pro-hormones amongst athletes, young adults, and body builders

Tag Words: Prohormones, mechanisms of prohormones, testosterone, health risks of prohormones, side effects of the use of prohormones

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Summary

Prohormones are commonly used amongst athletes, body-builders, and youth in order to enhance body physique. Prohormones are anabolic steroids which can be converted to testosterone and then can be diverged into other hormones in the body. There are many health risks and side effects associated with the use of prohormones, such as baldness, enlarged breasts, and facial hair on females. Some of these substances are legal and for sale, while others are illegal. However, they are both easily accessible to the general public. Companies selling these products do not need to label the ingredients on their product, making the ability for them to add unknown and illegal compounds, fairly simple. Federal regulation needs to be strictly implemented to control prohormone distribution and manufacturing.

Video Link:

Prohormones Project: <http://www.youtube.com/watch?v=8PdufWdhoSU>

The Issue: Prohormones

Body Image and Prohormones: Introduction and History (NO)

For over many years, society has placed a significant influence on appearance and body image. There are many factors that influence the notion of continuously trying to adhere to body image and self-appearance, including the media, peers, and family. The tendency to increase individual self-esteem, which most generally includes reducing body fat or gaining muscle, is more prevalent amongst teenagers and young adults, however, this perception may be present for a longer period of time. Acknowledgement of dissatisfaction of one's body image is important in distinguishing between excessive and moderate weight loss or muscle gain. Females and males can be equally dissatisfied with their body image, however, it has been evident that males tend to want to gain muscle and females tend to want to lose weight. In moderation, exercise is extremely beneficial to one's health, however, in excess, there might be many risks involved. Excessive exercising may lead to body-building, which is the ultimate form of body image modification.

Body-building is an exercise that alters body modification and changes one's overall physique. Altering one's physique may take a long period of time and in the current fast-paced society, time is essential and can sometimes be made up for by using illegal and legal substances. Ever since the beginning of times, it was quickly discovered that males and females can be distinguished by many physical characteristics, but most distinctively, by chemical characteristics. Males have a hormone, testosterone, that is considered the first ever anabolic steroid. Through many simple experiments, testosterone has been the basis for all derivatives of anabolic steroids created up until the 21st century. Furthermore, this anabolic steroid has been used in many athletes to enhance their performance. Through the Olympics and other sporting competitions, it was apparent that the use of anabolic steroids was not allowing an equal opportunity amongst all athletes. Despite many experiments that were conducted and that disproved that steroid use does not enhance athletic ability, by the 1970's, anabolic steroids were banned from any sporting organization, including the Olympics. Prior to 1988, steroids could only be prescribed by physicians and soon after, buying or selling steroids was considered a felony due to the Anabolic Steroid Control Act of 1990. This act stigmatized steroid use and led to the formulation of pro-hormones by Patrick Arnold.

Since the middle of the 20th century, there has been evidence of the use of pro-hormones, or substances which are precursors to a hormone and that have minimal hormonal effect when by itself. When they are digested into the body, they can be converted to active anabolic hormones by a natural enzymatic process. The anabolic compounds that they are converted to would be considered anabolic steroids if they were taken in an already converted form. When pro-hormones are taken, they increase levels of anabolic hormones in the body, which stimulate androgen receptors to increase body strength and size. Unlike steroids, pro-hormones are legal substances that may be used as a body-building supplement. In essence, pro-hormones have the same exact effects of anabolic steroids when taken, without the cost of it being a felony. Body-builders turn to pro-hormones because they believe that they actually work and that they can modify their bodies through the aide of dietary supplements.

Like any supplement taken, there are no guarantees of the outcome and there are health risks associated with its use. Pro-hormones can be complicated substances since the body still needs to

convert it within the cell into the actual hormone that can then be used by the body and have some type of effect. Some pro-hormone conversion may require one step, however, others may require multiple steps. Within the multiple-step conversion, the risk of a negative side effect increases. However, it is the sole fact that pro-hormones are legal that makes it a popular supplement amongst body-builders and athletes.

References

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Why Do People Use Pro hormones? (KM)

Many people turn to pro-hormone use as a way to gain muscle and aid in bodybuilding. Many supplements including protein, creatine, and various blends have differing results with each individual, sometimes not in a positive manner. If these “lower-level” supplements do not cause a person to gain enough muscle, he or she may turn to pro-hormones for gains. In the sport of bodybuilding, muscle gain and appearance are very important. Many individuals get involved in bodybuilding because they feel as though they are too skinny or do not look good enough in their own mind.

In a sport that involves intense workouts and extreme strain on the human body, there comes a time when a person must provide an additive to be able to function day in and day out. The body requires a certain amount of down-time to recover from a day’s intense workout. While the body does an efficient and effective job of recovering after 8 hours of sleep, it is only acceptable for the average person. Anyone who is involved in bodybuilding needs to be in the best shape of his or her life, forcing supplements to be used. Pro-hormones allow the body to recover faster and utilize increased levels of androgen (most common). Having increased levels of androgen in the body allows a person to gain more muscle, strength, muscular endurance, and the ability to recover. Many of these benefits associated with pro-hormones are directly related to body image, which is the foremost important subject in bodybuilding. A bodybuilder must perfect every muscle on his or her body, considering in competition the winner has the most definition, symmetry, and composition (3 main judgment categories). The major issue surrounding pro-hormones in bodybuilding is that they are no longer an option, but a necessity. Bodybuilders continue to use the front-of-the-line supplements, most of the time illegal supplements. If a bodybuilder does not partake in usage, he or she will have little to no chance of winning any events. The trend in bodybuilding since 1901 and Eugen Sandow (Father of Modern Bodybuilding) has been an increased use of supplements to further the body’s muscular image. The early 1900s were the first time the body’s muscularity became top priority, inevitably leading to people wanting to expand and define the body as much as possible. The main way in the modern world to attain the best body is to use supplements such as pro-hormones.

Who Uses Prohormones? (KM)

There are a large number of people who use pro-hormones. Various athletes use pro-hormones for the strength and endurance gains in baseball, football, basketball, soccer, or any sport involving muscular strength. While pro-hormones are illegal within these professional sports, bodybuilding does not have such restrictions. Since bodybuilding is a sport that encompasses people throughout

the world, there is great diversity within the community. Both males, as well as females, partake in this activity and the ages vary with most bodybuilders being 18 or older (correct age is 21 but many bodybuilders tend to begin use earlier). Many of the people involved in bodybuilding as a profession are more susceptible to using pro-hormones at a younger age, whereas recreational bodybuilders will use them at an older age, if at all.

It is important to draw this distinction between professional and recreational bodybuilding. Professional bodybuilders are involved in an organization (most likely IFBB) and have an income associated with bodybuilding through endorsements and competition events. Recreational bodybuilders are any people who lift weights to increase body definition and symmetry outside of any formal organization without generating income. Professional bodybuilders have almost no chance of avoiding pro-hormone use this day in age due to the vast majority of bodybuilders who do use them. Without use, a bodybuilder will be unable to compete in events considering the dramatic effects they have on the body. Recreational bodybuilders, on the other hand, do not need to use strong supplements because they are not competing with anyone but themselves. Depending on what the person wants to look like, the use of supplements is optional. Many recreational bodybuilders also like to maintain a “natural” status, a term arising in the early 1990s. Natural bodybuilders do not take supplements such as pro-hormones or steroids, but instead draw the distinction at the use of creatine. Although this term varies throughout bodybuilders, in general “natural” can be applied to any bodybuilder using supplements which are not synthetically produced, but rather produced within the body (such as protein or creatine). There are a large number of natural bodybuilders and they tend to stay away from pro-hormone use.

Psychological Contribution (KM)

Psychology plays a huge role in bodybuilding. Many people turn to bodybuilding to increase muscle size and improve upon his or her physique. Throughout the years many professional bodybuilders have openly admitted to a desire to inexplicably increase muscularity, mostly due to a feeling of inadequacy. Top bodybuilders such as Tom Platz, Lou Ferrigno, and Greg Valentino all referenced a desire to become bigger and more muscular. There is now a psychological term associated with bodybuilding called Muscle Dysmorphia. This term describes a person who feels as though they are physically inadequate and desire an almost endless increase in muscularity. People with this condition also like to be noticed in public, often wearing tight clothes portraying their muscularity. Many psychologists believe the condition is derivative of a person’s childhood, possibly being made fun of or excluded from activities due to a lack of muscular physique. Many recreational bodybuilders have this issue, whether or not it be clinically assigned. Each person lifts weights in order to gain definition and symmetry in order to improve upon his or her body image. There seems to be an internal struggle amongst bodybuilders, always wanting to improve their body and never being truly satisfied. Body image tends to be the most important factor influencing the decision to partake in bodybuilding and at times, leading to the use of pro-hormones or other strong supplements. In some cases, people become so entrenched in bodybuilding that they lose their social life and other aspects of their life to the desire to become bigger. The psychological component to bodybuilding is at the top of the list to reasons why people engage in the sport and become focused on body image.

The focus of our service project will aid in the prevention of people being able to use pro-

hormones. While there are beneficial aspects of pro-hormone use for bodybuilders, many people tend to abuse these supplements. Without pro-hormones being available to people, body image may not be such a major concern, considering that the option to take pro-hormones is taken off the table. Passing legislation which forces many major supplement companies to provide ALL information regarding the composition of their product will at the very least educate all those who are about to consumer the product. After knowing exactly what a pro-hormone is composed of, a person will be able to review the product in depth and make an informed decision whether or not to use. If pro-hormones cannot be made illegal, companies should still offer complete information about the product.

References

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Pro-hormones and Their Composition (JD)

What is the difference between prohormones and steroids? Prohormones are considered the precursors to hormones that become anabolic steroids, such as testosterone. Prohormones have sometimes been described as “legal steroids”. One might think that because some prohormones are legal, and others are not, that there are structural and functional differences between the two. In reality, if they are truly prohormones (i.e. able to convert to a hormone in the body) and are considered “legal”, they are likely to be somewhat structurally different and would not be recognized on tests able to detect known substances/anabolic steroids currently banned (see list of currently banned substances below, which includes the prohormone androstenedione). The development of “new” prohormones by companies have found ways to get around the ban by simply altering the structure of the prohormone slightly. The new prohormone is then technically not the same exact compound on the FDA banned list, and may be able to be marketed and consumed for a short time until the FDA adds it to the list.

Current List of Banned Substances

- (i) androstanediol--
 - `(I) 3b,17b-dihydroxy-5a-androstane; and
 - `(II) 3a,17b-dihydroxy-5a-androstane;
- (ii) androstenedione (5a-androstan-3,17-dione);
- (iii) androstenediol--
 - `(I) 1-androstenediol (3b,17b-dihydroxy-5a-androst-1-ene);
 - `(II) 1-androstenediol (3a,17b-dihydroxy-5a-androst-1-ene);
 - `(III) 4-androstenediol (3b,17b-dihydroxy-androst-4-ene); and
 - `(IV) 5-androstenediol (3b,17b-dihydroxy-androst-5-ene);
- (iv) androstenedione--
 - `(I) 1-androstenedione ([5a]-androst-1-en-3,17-dione);
 - `(II) 4-androstenedione (androst-4-en-3,17-dione); and
 - `(III) 5-androstenedione (androst-5-en-3,17-dione);

`(v) bolasterone (7a,17a-dimethyl-17b-hydroxyandrost-4-en-3-one);
` (vi) boldenone (17b-hydroxyandrost-1,4,-diene-3-one);
` (vii) calusterone (7b,17a-dimethyl-17b-hydroxyandrost-4-en-3-one);
` (viii) clostebol (4-chloro-17b-hydroxyandrost-4-en-3-one);
` (ix) dehydrochloromethyltestosterone
(4-chloro-17b-hydroxy-17a-methyl-androst-1,4-dien-3-one);
` (x) *1-dihydrotestosterone (a.k.a. `1-testosterone')
(17b-hydroxy-5a-androst-1-en-3-one);
` (xi) 4-dihydrotestosterone (17b-hydroxy-androstan-3-one);
` (xii) drostanolone (17b-hydroxy-2a-methyl-5a-androstan-3-one);
` (xiii) ethylestrenol (17a-ethyl-17b-hydroxyestr-4-ene);
` (xiv) fluoxymesterone
(9-fluoro-17a-methyl-11b,17b-dihydroxyandrost-4-en-3-one);
` (xv) formebolone
(2-formyl-17a-methyl-11a,17b-dihydroxyandrost-1,4-dien-3-one);
` (xvi) furazabol (17a-methyl-17b-hydroxyandrostan[2,3-c]-furazan);
` (xvii) 13a-ethyl-17a-hydroxygon-4-en-3-one;
` (xviii) 4-hydroxytestosterone (4,17b-dihydroxy-androst-4-en-3-one);
` (xix) 4-hydroxy-19-nortestosterone (4,17b-dihydroxy-estr-4-en-3-one);
` (xx) mestanolone (17a-methyl-17b-hydroxy-5a-androstan-3-one);
` (xxi) mesterolone (1a-methyl-17b-hydroxy-[5a]-androstan-3-one);
` (xxii) methandienone (17a-methyl-17b-hydroxyandrost-1,4-dien-3-one);
` (xxiii) methandriol (17a-methyl-3b,17b-dihydroxyandrost-5-ene);
` (xxiv) methenolone (1-methyl-17b-hydroxy-5a-androst-1-en-3-one);
` (xxv) methyltestosterone (17a-methyl-17b-hydroxyandrost-4-en-3-one);
` (xxvi) mibolerone (7a,17a-dimethyl-17b-hydroxyestr-4-en-3-one);
` (xxvii) 17a-methyl-*1-dihydrotestosterone
(17b-hydroxy-17a-methyl-5a-androst-1-en-3-one) (a.k.a.
`17-a-methyl-1-testosterone');
` (xxviii) nandrolone (17b-hydroxyestr-4-en-3-one);
` (xxix) norandrostenediol--
` (I) 19-nor-4-androstenediol (3b, 17b-dihydroxyestr-4-ene);
` (II) 19-nor-4-androstenediol (3a, 17b-dihydroxyestr-4-ene);
` (III) 19-nor-5-androstenediol (3b, 17b-dihydroxyestr-5-ene); and
` (IV) 19-nor-5-androstenediol (3a, 17b-dihydroxyestr-5-ene);
` (xxx) norandrostenedione--
` (I) 19-nor-4-androstenedione (estr-4-en-3,17-dione); and
` (II) 19-nor-5-androstenedione (estr-5-en-3,17-dione);
` (xxxii) norbolethone (13b,17a-diethyl-17b-hydroxygon-4-en-3-one);
` (xxxiii) norclostebol (4-chloro-17b-hydroxyestr-4-en-3-one);
` (xxxiv) norethandrolone (17a-ethyl-17b-hydroxyestr-4-en-3-one);
` (xxxv) oxandrolone (17a-methyl-17b-hydroxy-2-oxa-[5a]-androstan-3-one);
` (xxxvi) oxymesterone (17a-methyl-4,17b-dihydroxyandrost-4-en-3-one);
` (xxxvii) oxymetholone
(17a-methyl-2-hydroxymethylene-17b-hydroxy-[5a]-androstan-3-one);
` (xxxviii) stanozolol

(17a-methyl-17b-hydroxy-[5a]-androst-2-eno[3,2-c]-pyrazole);
` (xxxviii) stenbolone (17b-hydroxy-2-methyl-[5a]-androst-1-en-3-one);
` (xxxix) testolactone (13-hydroxy-3-oxo-13,17-secoandrosta-1,4-dien-17-oic acid lactone);
` (xl) testosterone (17b-hydroxyandrost-4-en-3-one);
` (xli) tetrahydrogestrinone
(13b,17a-diethyl-17b-hydroxygon-4,9,11-trien-3-one);
` (xlii) trenbolone (17b-hydroxyestr-4,9,11-trien-3-one); and
` (xliii) any salt, ester, or ether of a drug or substance described in this paragraph

Prohormones are not Testosterone Boosters. Supplements which claim to be “prohormones” can be purchased at a local GNC or other health food establishment along with something called “testosterone boosters”. Testosterone boosters are not prohormones. Testosterone boosters are an entirely different category of exercise supplements. As stated previously, prohormones are precursors to hormones that become anabolic steroids, while testosterone boosters are natural chemical compounds that increase the testosterone production in humans. Testosterone boosters claim to be “natural” because they use herbs and natural botanics to support the body’s testosterone production. Some of the popular testosterone boosters supposedly contain: tribulus terrestris, ZMA (Zinc, Magnesium, Aspartate), long jack extract, and epimedium. These products claim to raise the levels of testosterone in the body, however, these claims are often exaggerated or bogus, as there is very little scientific evidence to support such claims.

Because prohormones are the precursors to anabolic steroids, they often have the same side effects of anabolic steroids. This includes hair loss, cardiovascular disease, lower sex drive, and the loss of the body’s ability to produce testosterone on its own. The reason for this is because once a person starts taking prohormones, it increases their body’s testosterone levels above normal, and the body adjusts to this increase by producing less testosterone on its own. High levels of testosterone in the body will result in a reduction of luteinizing hormone that is secreted by the pituitary gland (Luteinizing hormone stimulates Leydig cells in the testes to produce natural testosterone). When an individual stops taking anabolic steroids or prohormones that get converted to anabolic steroids, the level of body’s testosterone production might be diminished or lowered. This is called anabolic steroid-induced hypogonadism (ASIH), which leads to, among other problems, testicular atrophy.

Some people have advocated for the “safe” use of prohormones. This would include cycling on and off of prohormones for a period of time. Another issue with prohormones is that they are very toxic to the liver, ultimately causing liver damage. The toxicity of prohormones is because they are often methylated. In order to reduce liver damage, liver supplements are often taken with prohormones in order to protect it from toxins. There is no way to be “safe” about prohormones. Many people live busy lives and can often forget to take medication. The failure to follow such procedures exactly, would have an extremely bad effect on the human body. For these reasons alone there are no blends of prohormones that are safe. Prohormones are extremely dangerous to one’s body and should be ultimately banned by the FDA.

It is possible to detect for specific steroids however testing for prohormones can often be difficult. The reason for this is because there is no absolute positive test for prohormones

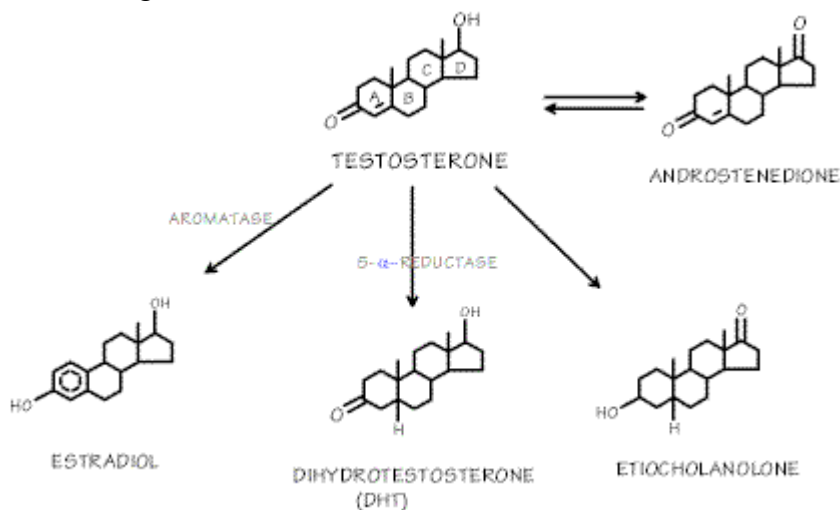
specifically. The way a typical steroid test is done is to measure the amount of testosterone that is in one's body. Usually if a person is taking steroids their body will show an abnormally high amount of testosterone and ultimately lead to a "positive" test result. However with prohormones, the level of testosterone raises, but not to the level that anabolic steroids produce. This may or may not result in a positive steroid test.

Companies often claim that their products help in building muscle. While creatine and protein supplements can be considered ways to gain muscle mass, there is another way that does not involve either protein or creatine. These are prohormones; we will look at the composition of prohormones further. Prohormones are the precursors to anabolic steroids. Prohormones are usually supplements that can be enzymatically converted into the male testosterone. In order to understand prohormones and how they work, one must first be able to understand steroids and the purpose of testosterone in bodybuilding. Testosterone is an anabolic steroid that is used to help promote muscle growth. Most prohormones are made to be converted to testosterone for this very reason. Testosterone has two types of effects on the human body. It has both androgenic effects and anabolic effects. Androgenic effects can be classified as growth of testes, external genitalia, male reproductive organs, and secondary sex characteristics. The anabolic effects of testosterone are widely known for its effects on stimulating the growth of skeletal muscle and bone. The way this happens is by activation of the androgen receptor. The androgen receptor is activated by testosterone binding directly to it, or by binding to dihydrotestosterone (DHT). The androgen receptor is responsible for the expression of both primary and secondary sex characteristics which in turn have a direct effect on muscle enlargement. This is why many bodybuilders use anabolic steroids such as testosterone to help with muscle growth and development. However due to the serious adverse side effects that are known to accompany steroids, many bodybuilders have looked to an alternative way to help promote muscle growth. Because prohormones are a precursor to androgen hormones such as testosterone they are commonly used as supplements in the bodybuilding world.

Prohormones such as androstenedione, androstenediol, and dehydroepiandrosterone (DHEA) and are usually noted for their abilities to pack on pounds of muscle to athletes and body builders. These three prohormones are often referred to as the "andro" supplements and are quite popular in the bodybuilding community. The difference between these prohormones and testosterone is that these prohormones are the precursors to testosterone. The way prohormones work is that once they are converted into the hormone testosterone they work exactly like anabolic steroids. A prohormone ceases to be a prohormone the second it is converted into testosterone. The whole reason why people take prohormones is to have them converted to testosterone because of the muscle building properties testosterone has. We will look how prohormones such as DHEA, androstenedione, and androstenediol are converted to testosterone. DHEA is a prohormone that can turn into either the anabolic steroid testosterone, or the prohormones androstenedione, and androstenediol. This is another reason why a lot of body builders take this prohormone and why it is commonly referred to as the "master hormone". DHEA is a hormone that is secreted by the adrenal cortex, however it can be taken in prohormone supplements. DHEA has been banned recently in 2009, and has been added to the controlled substance list. However it is still possible to obtain this supplement through illegal means. We will look at the pathway of DHEA once it has turned into androstenedione, and androstenediol. The reason for this is because these are known prohormones that are known to work on the human body in building muscle.

The body uses enzymes to break down prohormones into testosterone. These enzymes are found endogenously in the human body. There are no specific complexes that must be in a prohormonal blend in order to be considered a prohormone. As long as it fits the criteria of being a precursor to hormones like testosterone. When looking at the ingredients of prohormone supplements it is important to look for andro, methyl, nardiol, or test supplements. These names are referring to the prohormone structural complex. Prohormone supplements containing these ingredients will likely induce the “desired” effects that one would look for in taking such supplements. Products that do not contain these can be considered scams and would not likely produce muscle building effects.

The prohormone such as androstenedione is converted into testosterone by the reduction of the 17-keto group. The pathway that converts androstenediol into testosterone involves the oxidation of the 3-beta hydroxyl group to a 3-keto group. However once these prohormones are converted to testosterone sometimes it will undergo another step to convert testosterone into DHT. The reduction of testosterone is performed by by 5 α -reductase. The reason why this happens is because DHT has a much higher affinity for the androgen receptor which will help promote muscle growth. Once these compounds have been converted to either testosterone or DHT they act on the cells of the body to go inside the nucleus and act with the hormone receptor to induce transcription in the cell DNA. This is how muscle growth is done.



The prohormones that were mentioned above are all banned and are on the FDA controlled substance list. Currently the only prohormone that is banned is androstenedione along with its derivatives. The prohormones listed above are derivatives of androstenedione. The FDA cites that this prohormone poses a high health risk that is too closely associated with steroids. However just because it is on the controlled substance list, does not mean that it is a steroid. It is still considered a prohormone, but due to the health risk it poses the FDA has decided to ban it. We believe that ALL prohormones pose health risks to everyone and are not to be trusted. This is why we are strongly encouraging the ban and sale of all prehormonal complexes or any supplement that advertises being a precursor to testosterone.

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Prohormone Products: Bogus or Real?

In the search for prohormone products using Google, there automatically triggers a massive amount of results. However, in light of the lack of regulation on ingredients that manufacturer's use, there is no one way to know that these products are actual prohormones, except if they are scientifically proven in some way. A few products that were found included:

1. Anabolic Innovations- HGHPPro consists of: AlphaSize Alpha-Glycerol Phosphoryl Choline (Alpha-GPC), Gamma-Aminobutyric Acid (GABA), Human Growth Hormone potentiator Complex, Mucuna Puriens, Green Tea, Shilajit

This company claims that it is a product that actually works. However, how exactly does it work? Instead of converting the ingested product to testosterone, which what a prohormone should essentially do, it increases the levels of Human Growth Hormone in the body so that it “promotes healthy HGH level, promotes deeper and more restful sleep, increases appetite, increases strength, increases recovery, promotes clear skin, supports optimal acetyl-choline production, controls prolactin, controls somatostatin, and increases fat loss.” All of these functions are not what a prohormone is supposed to do, yet it is listed under being a “prohormone.”

2. Applied Nutraceuticals- IGF-2: Chlorophytum Borivilanium, Mucuna Pruriens (standardised to 75% L-Dopa), Rhodiola Rosea, Dodder Seed Extract, Bioperine

Applied Nutraceutical claims that IGF-2 is “a Synergistic Combination of GH and Testosterone Agonists that Promotes Dramatic Immediate Growth. Maximizes muscle hardness and fullness. Increases strength and endurance. Accelerates recovery time.” They also claim that it increases libido and virility. How does it do this? Chlorophytum Borivilanium, the third largest ingredient in this supplement is a plant-based aphrodisiac. Mucuna Pruriens is also plant-based and is also an aphrodisiac agent. It is most commonly known to have high concentrations of levodopa, which is the direct precursor of dopamine. Rhodiola Rosea is another plant-based substance that has not been scientifically proven to have any effects, except that it may improve physical and mental performance. Knowledgeable users of prohormone supplements realize that Proinsulin is a naturally occurring prohormone that already exists within the body, therefore, by naming a product, “Insulin-Like Growth Factor,” the consumer is immediately fooled into thinking that it is a prohormone, when in fact, it is not.

3. ASN- Xomatropin: Revostatin, Micro-Activated Bi and Tri GHRP Fractions of N-Acetyl Car, Arg.Lys, Gly, Orn, Val, Glu. Tyr, Leu, Tau, Cys, Betaine, Choline, Phos.Ser 5HTP, Fer.Acid, Colloidal Mineral Complex

4. BioRhythm- ReGenerate: Bovine Colostrum, Mucuna Pruriens, Cissus Quadrangularis

5. Muscle-Link- GH Stak: Glycoamino Acid Complex (Proprietary) 4200 mg
Aminotrope-7 Anterior Pituitary Peptides (Porcine) Novel Polyose Complex (Proprietary)

6. Nutraceuticals- Symbiotropin: Glycoamino Acid Complex (Proprietary)
-Aminotrope-7 Anterior Pituitary,-Peptides (Porcine)

7. VPX- Hemogex: VPX Hemogex Proprietary Blend, a-Glycerol Phosphoryl Choline (a-GPC), Arginine Ethyl Ester HCl, Niacin, Magnesium (as buffered glycinate chelate), GHRP-2 (Growth Hormone Releasing Peptide-2 [D-Ala-D-b-Nal-Ala-Trp-D-Phe-Lys-OCH₃]), Zinc (as arginine chelate), Glycine, Chromium (as nicotinate-glycinate chelate), Phospholipids

8. Halotest-25: 4-Chloro-17a-Methyl-Andro-4-Ene-3,17b-Diol

9. Primabol: 2a-17a-dimethyl-17b-hydroxy-5a-androstan-3-one.

10. Androdrol : 4-chloro-17a-methyl-androst-1,4-diene-3-17b-diol 20mg
2a,3a-epithio-17a-methyl-5a-androstan-17b-ol 15mg
13-ethyl-3-methoxy-gona-2,5(10)dien-17-one 15mg
2a-17a-dimethyl-17b-hydroxy-5a-androstan-3-one 10mg
6 bromoandrostenedione 50mg
ABSORBTECH Delivery System 10mg
Bioprene, Vanadyl Sulfate

11. Myogenix- Spawn: - Estra-4,9-diene-3,17-dione 30mg
- 2a,3a-epithio-17a-methyletioallocholanol 8mg

12. Nutra Clipse- Raptor: 2a, 17a-dimethyl-5a-androst-3-one, 17b-ol
2-Cyano-17a-methyl-17b-hydroxy-androst-3-one

13. Gaspari Nutrition- Viridex XT: Dicalcium Phosphate, Stearic Acid, Magnesium Stearate, Croscarmellose Sodium Silicon Dioxide, Polyethylene Glycol, FD&C Blue No.2.

14. Genetyx Labs- Mutate: 13-ethyl-3-methoxy-gona-2,5-diene-17-one 20mg
4-chloro-17a-methyl-androst-1,4-diene-3-17b-diol 15mg
17b-hydroxy-2a,17b-dimethyl-5a-androstan-3-one-azine 7.5mg 2a-17a-dimethyl-etiocholol-3-one-17b-ol

15. Muscle Science- Decavol XD: Pyrolysate, gelatin, magnesium stearate, silica

16. Hardrock Supplements- HaloPlex: 4-chloro-17a-methyl-androst-1,4-diene-3-17b-diol 25mg

17. Nutrabolics- HemoTest: Microcrystalline Cellulose, Croscarmellose Sodium, Silicon Dioxide, Magnesium Stearate, Hydroxypropyl Methylcellulose, Propylene Glycol, FD&C Yellow #5 Lake, FD&C Yellow #6 Lake, Titanium Dioxide, Polysorbate 80

18. RD Labs- FinaFlex: FinaFlex V2.0 Blend
13-Ethyl-3-Methoxy-Gona-2,5(10)-Diene-17-one
Estra-4,9-Diene-3,17-Dione
3,17 Ketoetiochol-triene
Milk Thistle (80% Silymarin)
NAC (N-Acetyl Cysteine)

Vitamin C (Ascorbic Acid)

19. HiTech- Anavar: S-(2 Boronethyl) L-Cysteine HCL, 2-(S)-Amino-6-Boronhexanoic acid, Creatine Ethyl Ester, Creatin Monohydrate, L-Arginine HCL, Inosine Ethyl Ester, Adenosine Triphosphate, 25-R-Spirostan-5A-Diol-6-one-3-one, Dehydroepiandrosterone Acetate, Dehydroepiandrosterone Cypionate, Dehydroepiandrosterone Propionate, Dehydroepiandrosterone Enanthate, Smilagenin, Hecogenin Acetate, 6-Keto-Diosgenin Cypionate, 6-keto Diosgenin Propionate, 6-Keto Diosgenin Acetate 20-HydroxyExdysone Deconate, Naringen, 6,7 Dihydroxy Bergamoth, Quebracho Blanco HCL

Most of the above products are not what they claim to be, which are prohormones. However, a select few contain ingredients that need to undergo several conversions to reach the conversion to testosterone, or a lesser form of it. According to Wikipedia, the most commonly used prohormones that are on the market are:

1. 4-androstenedione

- Converts to: testosterone
- Characteristics:
 - Research indicates a conversion rate of about 5.9%, which means that of the amount taken orally, 5.9% is converted to testosterone.
 - Relatively high rate of aromatization to estrogens, and consequently higher risk of side-effects such as gynecomastia brought on by excessive estrogen formation.
 - Exhibits significant androgenic properties, which may result in side effects such as male pattern baldness, acne, and enlarged prostate.

2. 4-androstenediol (4-AD)

- Converts to: testosterone
- Characteristics:
 - Conversion rate of about 15.76%, almost triple that of androstenedione, due to utilization of a different enzymatic pathway.
 - No direct conversion to estrogen, though some secondary aromatization does occur through metabolism.
 - Appears to be less androgenic than its cousin, since it does not metabolize into the potent androgen dihydrotestosterone (DHT).

3. 19-norandrostenedione

- Converts to: nortestosterone (also called nandrolone)
- Characteristics:
 - Only slightly less anabolic than testosterone.
 - Low rate of aromatization to estrogens.
 - Low occurrence of androgenic side effects.

4. 19-norandrostenediol

- Converts to: nortestosterone
- Characteristics:
 - Same as -dione, except (as with the andros), the conversion rate is higher.

5. 1-androstenediol (1-AD)

- Converts to: 1-testosterone, a 5-alpha reduced steroid reported to be 700% more anabolic and 200% more androgenic than testosterone; 1-testosterone is better (although rarely) described as dihydroboldenone, the 5-alpha reduced version of the veterinary steroid boldenone
- Characteristics:
 - Very high conversion rate, because the liver serves primarily to "activate" the compound as it passes through rather than to break it down and excrete it, as is the case with other prohormones.
 - Cannot aromatize to estrogen either directly or through any of its metabolic products. However, 1-Testosterone, being a 5-alpha reduced steroid, is highly androgenic; it is very similar to Dihydrotestosterone (DHT). Many side effects associated with excessive levels of DHT, including male pattern baldness, testicular shrinkage, benign prostate hypertrophy and acne can occur with 1-AD usage. (Journal of Organic chem. vol, 27 1962 iss.1)
 - As with other -diols, 1-AD cannot convert directly to estrogen.

6. 1,4-androstadienedione (1,4 AD)

- Converts to: boldenone
- Characteristics:
 - High level of oral bioavailability.
 - Low rate of aromatization to estrogens (approximately half that of testosterone).
 - Low occurrence of androgenic side effects.

7. 1-testosterone (1-T)

- Characteristics:
 - similar to testosterone except instead of a 4,5-double bond it has a 1,2-double bond.
 - has about 20% oral bioavailability compared with less than 5% for testosterone
 - non-aromatizing to estrogen or DHT
 - has irritative properties making it too painful to inject, and has extremely bitter taste, making transcutaneous topical solutions the only practical human delivery method. It was commercialized this way in the United States before 2005, when it became illegal together with all other prohormones.

- History: 1-T was discovered in the 1950s, explored as a potential anabolic product by the pharmaceutical company G.D. Searle, but not commercialized at the time due to difficulty in delivery.
- Also considered a steroid

8. Ostarine - Medically Beneficial

In its recent discovery in 2009, the usefulness of Ostarine has been controversial, yet proven to be effective in managing muscle wasting in end-stage of cancer patient and skeletal structure loss, or osteoporosis. In a scientific study, it has been proven to increase muscle, or lean body mass in patients who received a high dose of this product. Muscle wasting is a very common condition amongst ill patients and Ostarine may help improve muscle, which may ultimately help improve health.

In conclusion, the majority of the claimed prohormone products are not really what they are and in no way actually do what prohormones scientifically should do. By definition, prohormones are precursors to a hormone, and do not have a substantial effect when used by itself. By taking this broad definition of a prohormone, many manufacturer's can claim that their product is such, but when it comes to body-building supplements, it is important to note that not all manufacturer's are trustworthy in their product claim. On the contrary, when looking at the "real" prohormone products, their bioavailability is extremely low and their side effects are wide and various. This emphasizes the importance of prohormone regulation and the increasing negative health affects that are associated with them.

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Conclusion (All)

The use of pro-hormones is quite evident and its popularity is continuously on the rise. Being the legal form of anabolic steroids, it has become more common than ever before. Pro-hormones are quick and easy to take, however, with anything that is supplementary to normal bodily substances, there are many risks associated with them. Due to the chemical conformational changes that these substances have to undergo, the risk varies, as well as the side effects. The legality of pro-hormones attracts young adults, athletes, and body builders to use these supplementary substances. Body image has become second nature to these individuals, without realizing or caring what the side effects might be of taking these substances. Shaping and forming the body in order to achieve a certain

image is due to many factors, but in the end, it's ultimately due to the high importance that is placed on how one looks. Society, peers, and the legality of pro-hormones, all contribute to the use of pro-hormones in body builders.

Throughout the years the use of pro hormones and other supplements have been on the rise. Many people in today's society care so much about their image they will do anything to improve it. They will even risk their health just to look like their idols in magazines and in the movies. The fact is we have to make it more known that these hormones can be very bad for you especially if one has none to little knowledge about them. We have to ensure that all of the ingredients on the labels of supplements are shown so people can have some knowledge and awareness to what they are consuming. We have to also realize that hard work pays off and sometimes the correct diet and exercise are the safest ways to get the body one desires.

The vast number of people who take part in weightlifting causes one to take interest in the activity. There are people across the world of all races and genders who want to become more muscular or improve upon their physique. Bodybuilders specifically are forced into using these substances because they need to increase definition and size as much as possible. Pro-hormone use is so prevalent that bodybuilders cannot even contemplate avoidance. Being entrenched in an environment that causes people to judge themselves to extremes has a major influence on their psyche as well. There have been people diagnosed with real diseases almost completely due to the desire to be bigger or "more ripped", directly associated with bodybuilding and using supplements. Pro-hormones need to be more strongly regulated and companies need to include extensive labeling of composition. This will allow a person to make an educated decision on whether or not to use pro-hormones and possibly save him or her from health hazards.

Many people try to use pro-hormones for their ability to convert to testosterone. This is because pro-hormones are the precursors to the androgenic steroid. DHEA, androstenedione, and androstenediol are some popular pro-hormone choices because of their abilities to convert to testosterone. DHEA is commonly referred to as the "master hormone" because of its ability to convert to all three hormones. Even though these hormones convert to an androgen that our bodies already produce does not mean they are necessarily safe.

The Service Project: Survey (All)

The body is a natural phenomenon and works wonders all by itself. In essence, it can be said that the body functions as its own entity, by metabolizing, synthesizing, and removing substances within the body without anyone telling it how to do it. Bodily functions are engaging and surprising all in one, however, when these normal bodily functions are disrupted by an external means, problems arise. Dietary supplements are known to have more side effects than physically eating foods that are high in the vitamins and nutrients that the body needs. Prohormones function in the same fashion as dietary supplements, or any external supplement taken, for that matter. The body works to provide a balance of hormones that is catered to the individual body type and need.

Through research, our group has found that prohormone supplements are generally not labeled as so and are legally sold in stores and through the internet. Internet access to the purchase of prohormones leaves it to be open game. In other words, anyone with internet access and a credit

card, regardless of age may purchase these supplements. Currently, there is no regulation on the purchasing of prohormones and this is the essential problem. There are regulations only on *some* prohormones as set forth by the Food and Drug Administration, however, there needs to be a ban on *all* prohormones. These substances are generally taken with other various dietary supplements to enhance physique, which may be very detrimental to the human body.

Through the search for legislation in regards to pro-hormones, whether they are legalized or illegal, we have found out the substances and composition of what they are really made of and tried to spread the word about what consumers are really buying. Proprietors do not need to list ingredients on their product, so finding a way to make mandatory labeling of ingredients is essential towards the reduction of the use of pro-hormones and the risks associated with them. According to the Anabolic Steroid Control Act of 2004, an anabolic steroid is defined as “any drug or hormonal substance, chemically and pharmacologically related to testosterone (other than estrogens, progestins, corticosteroids, and dehydroepiandrosterone).” There are a number of anabolic steroids that are considered illegal, however, there are still a few out there that are sold in stores and online. Prohormones can in many ways be considered pre-anabolic steroids, since they are converted within the body to testosterone, and do not directly contain testosterone, but function in the same exact manner as an anabolic steroid. However, some prohormones contain ephedrine, pseudoephedrine, phenylpropanolamine, which under this act are not considered illegal and may be distributed lawfully in the United States under the Federal, Food, Drug, and Cosmetic Act. These legislation's only regulate possession, distribution, and international distribution of these illegal substances. There is some regulation if these drugs are bought online, however, like many other things, there are many ways around getting caught. Using a different address, using a decoy, or purchasing through a stolen credit card are all ways that illegal drugs may be bought without prosecution of the buyer.

Why are some prohormones illegal and others not? The government classifies illegal prohormones by certain substances within them, however, some of the legal prohormones contain ephedrine, pseudoephedrine, and phenylpropanolamine, which under federal law are illegal. Companies who manufacture these dietary supplements, do not need to list all of the ingredients that is within their product, making it reasonable for sale to the general public. We decided to ask the main customers, or the general public what they think of prohormones.

Companies who sell prohormones have recognized the ban on some prohormones and have effectively produced products that are within legal limitations. Their products, amongst many others, are sold at GNC stores, which are open to the general public. An interview conducted with a staff member at GNC, concluded that prohormones can be harmful and sometimes there is no means of knowing what they are doing to your body. This leaves a puzzling question of the true effectiveness of prohormones. Are they just psychological? Do they cause harmful side effects more than they do positive effects? The answer comes from the users themselves. Through a survey completed at the Cook Campus Recreation Center at Rutgers University, it was found that a total of 18 individuals used prohormones and all concluded that they did not like the usage of them because of their side effects. One individual who was using prohormones for some time experienced health risks such as nose bleeding and nausea and said that they would never go back to using them again.

Our survey consisted of four questions:

1. What is your age?
 - a. 17-25
 - b. 26-50
 - c. 50+
2. What is your gender?
 - a. Male
 - b. Female
3. Do you take any supplements?
 - a. Yes
 - b. No
4. Are you currently using prohormones as a supplement?
 - a. Yes
 - b. No

The results of our survey were as follows:

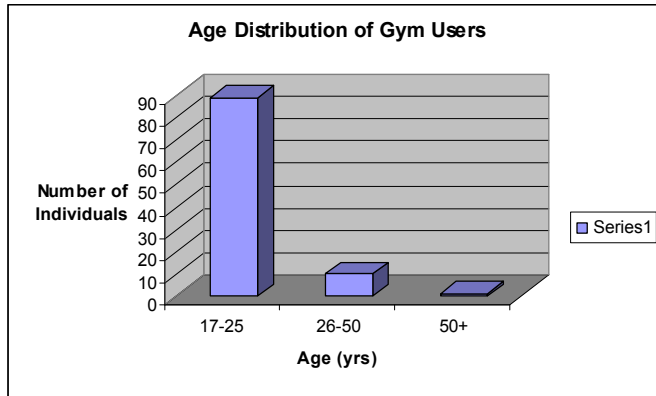


Figure 1. Age distribution of surveyed users.

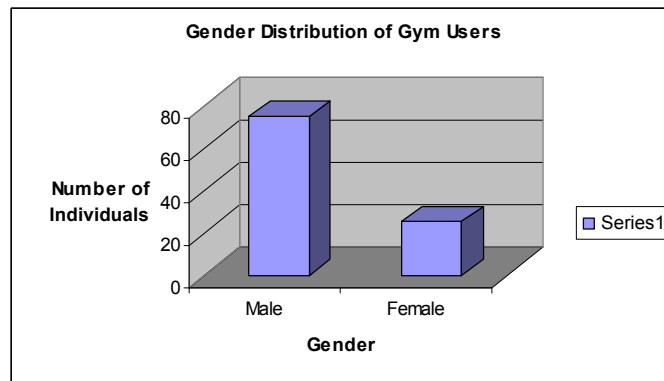


Figure 2. Gender distribution of surveyed gym users.

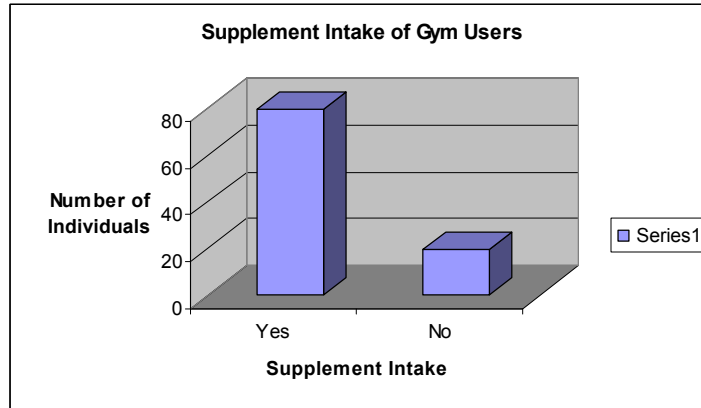


Figure 3. Supplement intake of surveyed gym users. Individuals were asked whether they took any type of supplement or not.

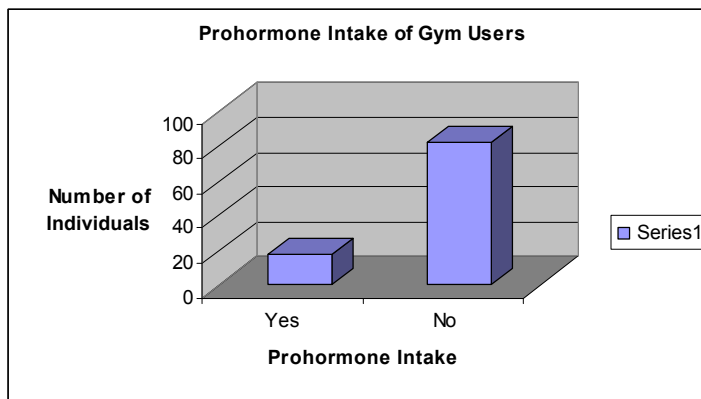


Figure 4. Prohormone intake of surveyed gym users. Individuals were asked whether they are currently using prohormones as a supplement.

It was a fascinating discovery to see the dominant age group of gym users to be between the ages of 17 and 25. This leads to the conclusion that most users of prohormones are youth.

Furthermore, we tried spreading awareness of the negative effects of prohormones through several newspapers, which included The New York Times, The Star Ledger, and the Asbury Park Press. The illegalization of all prohormones (except for medical use) is necessary and demanding. Simple health risks and side effects can be avoided simply by prohibiting the use of supplements such as prohormones. Newer and stricter laws need to be reinforced to make conventional prohormone use illegal. A letter to Senator Frank Lautenberg was sent to him in order to raise awareness of this issue and try to get a stricter enforcement on prohormones.

Letter Sent to Senator Frank Lautenberg

April 24, 2011

The Honorable Frank Lautenberg
 1 Gateway Center #23
 Newark, New Jersey 07102

RE: Urging the Legislature to Immediately Address Ban of Conventional Use of Pro-hormones

Dear Senator Lautenberg:

We are writing to urge the state Legislature act immediately on the issue of the ban on the buying, selling, and using of pro-hormones, other than for medical purposes, in the state of New Jersey. Pro-hormones are substances that are precursors to a hormone and function to enhance the strength of a hormone that already exists within the body. This is a fact that many producers of pro-hormones utilize, allowing them to be somewhat legal. Because a pro-hormone is only a precursor to the formation of certain active hormones, it is not the same as a steroid. This fine-line difference is not enough to allow any pro-hormones to be legal, mainly due to the fact that the end product is *exactly* the same.

Pro-hormones are legal substances that may be bought online and in stores by any individual of any age. The use of steroids has long been banned due to its detrimental effects that it has shown to place on the human body, as well as the unfairness of body strength that it has provided amongst athletic competitions. New Jersey's over-use of pro-hormone amongst athletes, body builders, and youth in order to enhance body physique has grown exponentially. Why do we have to wait for a famous athlete to start using an enhancing substance in order to pay really close attention to it?

There are many dangers and health risks associated with the use of pro-hormones, such as, but not limited to, prostate issues, high blood pressure, increased total cholesterol levels, increased acne, gynecomastia, cardiovascular problems, hormonal imbalances, liver damage, and enlarged breasts. While these health risks are associated with the physical body, people have a tendency to develop psychological problems as well, such as Muscle Dysmorphia or "small-man disorder", which causes a person to feel inferior physically and forces reliance upon pro-hormones. Once reliance occurs, it often leads to abuse, causing a person to ingest the improper amount over a period of time and destroy the hormonal balance within the body. These anabolic steroids can be purchased through the internet or in stores. Most companies do not even need to label pro-hormones as such. Due to the lack of security on internet purchases, anyone of any age can purchase these harmful substances, including youth under the age of 21. In a survey I conducted on our college campus (Cook Campus, Rutgers University), I discovered that many recreational weight-lifters use supplements to increase their strength and body image. After surveying around 100 students between the ages of 18-21(male and female), I discovered that around 80% of students use supplements and 18% use or have used pro-hormones. While this survey may appear to have a small pool of students, many of the students were from different campuses. This, as well as personal experience in weight-rooms, gives me reason to believe the numbers can apply to a much larger group of individuals. This number, 18%, is rather staggering, especially given the fact that it is amongst people of our future.

Pro-hormones are substances that appear in everyday life and are not easily avoided. I have personal experience with the supplements and know many friends who take them. Stopping the use of pro-hormones is the most important in order to maintain positive hormonal balance and to avoid any side effects associated with use. Many of the effects of use cannot be seen immediately, but will certainly appear years from now; consequences that can be avoided with proper legislation. Similar

to any other drug ingested, dependence may occur for the individual. Achieving a decrease or elimination in use of pro-hormones amongst adolescents, athletes, and body-builders will decrease the overall dependence of pro-hormone use and withdrawal symptoms that may occur because of them.

New Jersey needs to employ a ban on all buying, selling, and using of anabolic steroids, except that for medical use. Anabolic steroids were first synthesized around the 1930s and were used for therapeutic purposes, such as, stimulating bone growth and appetite, inducing male puberty, and treating chronic wasting syndromes (such as Cancer and AIDS). However, in the cases of body-builders and athletes, long-term use *will* increase health risk and damage. The Anabolic Steroid Acts of 1990 and 2004, recognized the use of pro-hormones for medical reasons only and listed it under a Schedule III restriction, which deemed some pro-hormones to be used for medical purposes and that they are less abusive than Schedule I and II drugs (Marijuana, Cocaine, Heroin). Furthermore, in accordance to the Drug Enforcement Agency, there are 59 anabolic steroids under this act. These anabolic steroids are all closely related to the final products of pro-hormone use, creating a link that should cause most, if not all, pro-hormones to be banned.

What about the rest? The answer lies within companies and manufacturers of pro-hormones who have found ways around labeling and legislation in order to sell their products. The current legislation against these 59 anabolic steroids is solely because the ingredients of those select few have been *known* and figured out. However, the remaining pro-hormone substances are unknown combinations and blends of all different types of substances.

Manufacturers of these products have discovered loop-holes to sell their products by avoiding their correct labeling. The first step to reach this goal would be for the state Legislature to meet to address this issue. The ban on pro-hormone selling, buying, or using, by manufacturer's and individuals should not be delayed any longer.

Thank you for your attention to this critical issue. New Jersey's citizens need immediate action on this matter.

Sincerely,

Kyle Magdziak
Niara Osman
Alex Tvaroha
James Ding

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Editorials

Niara Osman

The Star Ledger

Body Image: Why is it so important?

Rarely is it ever verbally stated, but it is more commonly visible everywhere. Body image is incredibly significant to some people and extreme measures are taken many times to achieve a certain look. In our fast-paced society, it can be tempting to use substances that can facilitate and add on time we don't really have. Alternating one's physique, especially, is very time consuming and athletes and body-builders turn to supplements to aide in the process. Steroids are more commonly known to be illegal supplements used to build physique. On the contrary, there are prohormones which are legal, precursors to a hormone and have minimal hormonal effect when used by itself. Like any substance consumed into the body, prohormones have many side effects that may be irreversible. Individuals under the age of 21 who take prohormones are at risk of ceasing their growth. Excess facial hair, acne, and deepening of the voice can occur in both male and females using this substance. Using prohormones to alternate body image comes with many consequences and should not be allowed to be used by any one.

Kyle Magdziak

The New York Times

oped@nytimes.com

Pro-Hormones: Good or Bad?

I am a senior student at Rutgers University performing research into pro-hormones and the effects associated with their use. The purpose of writing to your paper is to hopefully increase awareness about using supplements when weightlifting or bodybuilding. It is also a call to ask people to research these products before labeling them as "dangerous". The sport of bodybuilding has been steadily progressing through society and the supplement industry is expanding. Raising awareness about pro-hormones must happen to increase peoples' knowledge of the subject.

Weightlifting is a sport which has been around since the later 1800s. It continuously grew in popularity throughout the 1900s, eventually becoming a professional sport, as well as dispersing amongst the public. Recreational weightlifting encompasses such a wide range of individuals, many taking part in bodybuilding. It is important to distinguish that weightlifting is not the same as bodybuilding. Bodybuilding involves toning the body, focusing on muscularity, symmetry, and definition. Weightlifting, on the other hand, may be for strength gains or simply to get in shape. Both of these activities are exposed to supplements, with the focus on pro-hormones. It is evident that many people feel as though supplements always have a negative impact on the body. Pro-hormones work by increasing levels of certain hormones in the body such as androgen. With this hormonal increase, the body is capable of building more muscle, in turn enlarging an individual and increasing strength. The potential health risks of manipulating one's hormones can be serious, in extreme cases liver damage may occur. The body may also stop production of these hormones if the use is excessive. The fact is that this single type of pro-hormone

is not considered effective and is somewhat “frowned upon” within the bodybuilding community. These serious side effects also tend to only occur if the user abuses the pro-hormone, a fact which many people overlook. The basic side effects of correctly using or cycling pro-hormones include hair loss, acne, and/or a discoloration of urine (depending on the pro-hormone used). Many of these side-effects are completely reversible, disappearing after usage is stopped. Also, taking various supplements while being dedicated to weightlifting and working hard will aid in muscle growth and strength. Remaining active and physically working your body will allow the hormonal increase to be “used,” resulting in less risk of harm.

Many people in our current society tend to label supplements with a negative stigma or aura. The problem is that until one physically becomes involved in weightlifting and/or bodybuilding, many of the facts are overlooked. People seem to generalize all supplements without doing research for themselves. An issue that forces people to perceive supplements in a negative manner has to do with the fact that there have not been any major long-term studies done regarding usage. If people harp on the few times they hear a bad story of a weightlifter or athlete being harmed by supplement use, their misconception of the products will never be open to change. By this reasoning, people should be overwhelmed with negative notions of alcohol, which has consequences associated with consumption more extreme than supplements. Also, alcohol, which we all know is a drug, is responsible for illnesses and deaths of thousands of people. This example illustrates the fact that people need to research pro-hormones before concluding that their usage is automatically dangerous, especially when put into terms of other drugs.

To conclude, pro-hormones are only dangerous if a person abuses use and does not follow simple instructions. People should research this topic and become informed about supplements, deciding on their stance with sufficient knowledge. Once all supplements have been properly researched and allow a person to see what they are composed of, this negative perspective may be relieved.

Source:

http://www.nscs-lift.org/HotTopic/download/Muscle_Dysmorphia.pdf

Alex Tvaroha

Asbury Park Press

Body Image: Health Risk of Pro-Hormones

There is no question that adding one to your training and supplement regimen is going to result in you packing on muscle much faster. They do allow you to gain muscle and strength, while losing fat. But one who uses them must also train harder than someone not using them. And unfortunately, they also come with a set of drawbacks, including prostate issues, gynecomastia, cardiovascular problems and acne, and even stunted growth in teens. Many bodybuilders can receive many benefits from pro-Hormones but they have to be very strict in everything they do such as training much harder and taking care of their body much more. Many people should be aware such as athletes and bodybuilders that if you train right and eat right you can and will reach your goals. Also many people that just want to look better should not take them due to the heavy risk.

James Ding
New York Times
Risk of Prohormones

The society we live in today places a strong emphasis on developing the perfect body. It can even be seen in sports with the emphasis of becoming bigger faster and stronger. One of the latest rages in the weight lifting world is the use of prohormones. Prohormones are precursors to hormones. These are used by athletes and body builders because of their legal and “safe” status. But are prohormones really safe? How can something that increases the production of testosterone in the body be deemed safe? After all we have heard about how dangerous testosterone is and how affecting the body’s natural production of testosterone can have serious detrimental effects. Typically prohormones are designed to be precursors to anabolic steroids. In other words, prohormones are a very weak version of steroids. Because prohormones work the same that steroids, do they often carry the same risk. Just like steroids it is possible for prohormones to be converted into estrogen. Once converted into estrogen they carry the same negative side effects that steroids can produce. These side effects include male pattern baldness, increased aggression, infertility, mood swings, increased acne, and may even lead to liver damage.

Currently most prohormones are legal in the United States. In 2004 George W. Bush signed The Anabolic Steroid Control Act of 2004, which bans the use of some prohormones. However even with this law signed into place, there are many untested and dangerous prohormone supplements circulating the shelves of health stores. Because of the dangerous side effects of prohormones it is often recommended that no one under the age of 21 start taking them. However because of their over the counter nature it is very possible for somebody under this age to get their hands on them. Due to the competitive nature of school sports this can pose a serious health risk to high school kids whose bodies are still developing. With such little information about the long term effects of prohormone usage, one must ask is a perfect body really worth it?