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IGF-1

By Andy Cowan

An article entitled “Are deer antlers the next HGH (Human Growth Hormone) problem?” written by Dan Wetzel of YAHOO! SPORTS, appeared on the internet on January 20, 2011. Sadly, he describes the velvet antler as a “soft coating that covers deer antlers”, which is grown and processed in New Zealand by grinding it into a powder. He goes on to say that it then gets shipped to the United States, where it is further processed into either capsules or liquid extracts that can become a simple mouth spray. You can buy it online for about US$60 a 1 oz (28 gm) bottle.

There are many companies promoting such a product in the United States. The product they promote is an Insulin-like Growth Factor (IGF-1), a “naturally” occurring growth factor or hormone that stimulates many processes in the body. In the advertising, it is described as “… the new generation of growth factor – anti-aging – dietary supplements”. One of these products is marketed under the name of “IGF-1 Velvet Antler Extreme”. The advertising suggests that that those that use this product will experience the “powerful strengthening and energizing qualities of Deer Antler Velvet Extract” and this has been supplied in a spray for “maximum potency and effectiveness”. They claim it can be “taken before and after training – safe, natural and legal. It enables athletes to recover faster from training and injury by helping repair peripheral nerve tissue”. Of course, there are many other benefits gained from using the product – just read the blurb.

Marketers are trying to legitimise their product by stressing that deer antlers are “natural” and not synthetic. Not surprisingly, although the source of the IGF-1 is natural, the finished product is not. Experts agree that it is essentially a human growth hormone (HGH). Sporting organisations are trying to eliminate the use of HGH by athletes. In Australia it is illegal to use IGF-1 without a prescription. IGF-1 is banned under the Olympic Movement’s World Anti-Doping Code Prohibited Classes of Substances and Prohibited Methods.

Dan Wetzel writes that the benefits of IGF-1 are clear. “It’s similar to HGH in that it aids in recovery. It helps build and strengthen tissue – more than you can ever do by training alone”. But, as IGF-1 is considered performance-enhancing, it is banned by everyone.

Those sportsmen in the United States who have admitted using this product say it is “natural”, easy to use as there are no messy needles and it is unobtrusive. They claim that it is very effective. They feel that it is essentially HGH wit the reduced risk of being caught. To be caught you have to have a blood test at a specific time after taking the drug. It is evidently only detectable in the blood but most anti-doping tests in America are done using urine. One of the players cited in the article admitted to using the spray two or three times daily but had never failed a drug/doping test.

Considering that various National Football League (NFL) assistant coaches and some head coaches have been associated with a company that admits shipping it to NFL players, it stands to reason that the product could be all over the league.

In the Spring 2010 edition of the ADF, Part 2 of the story on Traditional Chinese Medicine (TCM) made the statement that “…that much of the literature on the internet equates to some sort of advertising pushing a particular angle. In some cases, the information can be taken out of context and be quite misleading”. Interestingly, in 2000, Dr James Suttie wrote “As deer velvet has a wide spectrum of human benefits it is very unlikely that there is one single active ingredient. Rather there are likely to be several which may interact with each other in a complex way as is often the case with natural health promoting agents”. At that stage, not a lot of research had been done on the active ingredients found in deer velvet although insulin like growth factors and transforming growth factors were known to exist.

Wikipedia defines insulin as “a hormone that is central to regulating carbohydrate and fat metabolism in the body”. It is produced in the pancreas and released when the necessary stimuli are detected. These stimuli include protein and carbohydrates in the blood produced from digested food. If a carbohydrate includes glucose, then that glucose will be absorbed into the bloodstream and blood glucose level with begin to rise. Insulin initiates an increase in the uptake and storage of glucose by causing the cells in the liver, muscle and fat tissues to take up glucose from the blood, storing it as glycogen in the liver and muscles.

Apart from the fact that insulin forces the storage of glucose in the liver and muscle cells in the form of glycogen, if the levels of insulin drop significantly it causes the liver cells to convert glycogen to glucose and excrete it into the blood. This is the clinical action of insulin. It is directly useful in reducing high blood glucose levels – as in diabetes. Insulin also forces the arterial wall muscle to relax, increasing blood flow, especially in micro arteries. Conversely, the lack of insulin reduces flow by allowing these muscles to contract. It also stops the use of fat as an energy source by inhibiting the release of glucagon. When insulin is absent, glucose is not taken up by body cells and the body begins to use fat as an energy source.

Glycogen is the molecule that functions as the secondary long-term energy storage in cells. It is made primarily by the liver and the muscles and plays an important role in the glucose cycle. Glycogen forms an energy reserve that can be quickly mobilized to met a sudden need for glucose. Only the glycogen stored in the liver can be made accessible to other organs. In the muscles, glycogen is found in low concentrations. Muscle cell glycogen appears to function as an immediate reserve source of available glucose for muscle cells. The glycogen they store is basically used within that cell and is not shared with other cells. This is in contrast to liver cells which, on demand, readily break down their stored glycogen into glucose and send it through the blood stream as fuel for the brain or muscles. The amount of glycogen stored in the body – especially within the red blood cells, liver and muscles is mostly dependant on physical training, basal metabolic rate and eating habits.

Glucagon is another hormone produced by the pancreas. It serves as a counter-signal to insulin. When secreted by the pancreas, glucagons raises blood glucose leels, whereas insulin lowers blood glucose levels. When the blood sugar begins to fall below normal, glucagons is secreted by the pancreas, causing the liver to convert stored glycogen into glucose, which is then released into the bloodstream. It stimulates glycogen breakdown into glucose.

After a meal ahs been digested and glucose levels begin to fall, insulin secretion is reduced, and glycogen synthesis stops. When it is needed for energy, glycogen is broken down and converted again into glucose.

Given the right situation, glucagons initiates a process which causes the liver cells to convert the glycogen polymer into individual glucose molecules and then releases them into the bloodstream. As the store becomes depleted, glucagons then encourages the liver to synthesize additional glucose. Long-distance athletes such as marathon runners, cross-country skiers, and cyclists often go into glycogen debt. This is where almost all of an athlete’s glycogen stores are depleted after long periods of exertion without enough energy consumption. This phenomenon is referred to as “hitting the wall”. In marathon runners, it normally happens around the 20 mile (32 km) point of a marathon, depending on the size of the runner and the race course. However, it can be delayed by a carbohydrate loading before the race.

In a nut shell, from a layman’s point of view, it would appear that putting an unnatural amount of insulin in our bodies causes us to store more energy than is natural. It also artificially raises the efficiency of our circulatory system so that more blood/glucose is made available to our muscles. The question that concerns me is when does a “natural” product become “un-natural” in its performance enhancing qualities?

But be warned – just because something has a natural source does not mean it is safe in isolation. The National Drug and Alcohol Research Centre (NDARC) says in its Fact Sheet “IGF-1 is legitimately produced for research purposes and is used by pharmaceutical companies to stimulate cell growth in cell cultures. Some overseas pharmaceutical companies hae also been trialling the use of IGF-1 for human therapeutic purposes, however some clinical trials have been discontinued because of significant side effects”. “There is no evidence to support the belief that IGF-1 produces performance or image enhancing effects. Due to its insulin-like properties, IGF-1 can have serious and potentially fatal health effects including:

- Diabetic (hypoglycaemic) coma
- Facial nerve pain or paralysis (Bells Palsy)
- Swelling of the hands

References

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