

# **KARBOLYN<sup>®</sup>**

FUEL YOUR PERFORMANCE



ALL AMERICAN  
PHARMACEUTICAL

## WHAT IS A CARBOHYDRATE?

Carbohydrates or saccharides are simple organic compounds that are aldehydes or ketones with many hydroxyl groups. Carbohydrates are the most abundant of the four major classes of biomolecules. Most people think of carbohydrates as just energy, but they also play numerous roles in living things, such as the storage and transportation of energy and structural components. Besides this, carbohydrates also play a major role in the working process of the immune system, fertilization, pathogenesis, blood clotting, and development.

A carbohydrate in simplified terms is basically the energy component of the diet: a biological compound containing carbon, hydrogen and oxygen that is an important source of food and energy. Carbohydrates come in two forms, simple and complex.

Simple carbohydrates, or more commonly known as simple sugars, come from sucrose, dextrose, fructose, fresh fruit and milk. These are a few examples.

Complex carbohydrates, or more commonly known as starches, can be found in such foods as grain products, bread, pasta and rice.

## DO ATHLETES NEED CARBOHYDRATES?

Carbohydrates are the cornerstone of an athlete's diet. Have you ever experienced "hitting the wall" while lifting weights or running? One moment you are running comfortably, and the next minute you can hardly walk. This is an athlete's worst nightmare! When your body runs out of its carbohydrate or fuel supply, it goes into what I like to call survival mode. This survival mode greatly disables athletic performance.

Carbohydrates are essential fuel for every cell in the human body. According to most sports nutritionists, an athlete's diet should consist of 70-80% carbohydrates. For an athlete eating 5000 calories per day that equates to about 1000 grams of carbs.

So we can easily say that carbohydrates are one of the most important nutrients to athletic performance. Carbohydrates also play the major role in supplying your brain and body with power. The human body can not supply enough carbohydrates on its own, therefore making it essential to take in enough from foods. Working out with low levels of carbohydrates leads to fatigue. Fatigue is the enemy to an energetic body and a great workout.

Athletes who follow a high-carbohydrate diet can maintain high-intensity exercise for a longer period than those on a lower-carbohydrate diet.

## ARE LOW CARB DIETS GOOD FOR ATHLETES?

NO! Do I need to say anything else about this.

## HOW THE BODY USES CARBOHYDRATES

When you eat a carbohydrate, the body breaks it down into simple sugars. These simple sugars can now be absorbed into the blood stream. As the sugar level rises in your body, the pancreas releases a hormone called insulin. Insulin is needed to move sugar from the blood into the cells. The cells is where the sugar can be used as a source of energy.



# KARBOLYN® - THE NEXT GENERATION CARBOHYDRATE

## WHAT IS KARBOLYN®?

Karbolyln® is a homopolysaccharide. (relatively complex carbohydrate). Karbolyln® is made up of many monosaccharides joined together by glycosidic bonds. These are very large bonds that are branched macromolecules. The "Molecular Mass" has been precisely manipulated to create absorption through the stomach at a rate much greater than maltodextrin, dextrose, breads, pasta, rice or any other carb product on the market.

Karbolyln® is a patent pending carbohydrate that contains very unique properties. Because Karbolyln® passes through the stomach very quickly, it acts like a pump, pulling water and nutrients along with it. This high tech carbohydrates actually moves through the stomach 18.21% faster than dextrose or sugar. Karbolyln® also has a Higher Solution Osmolarity than Dextrose, Sucrose or other carb powder mixes on the market. This is due to the unique properties found in the patent pending process. Karbolyln® is completely sugar free.

Karbolyln®'s other main feature is its sustain energy levels.

Karbolyln® is produced using a newly developed "Enzymatic Milling Process". The food source to produce the Karbolyln® is corn, potato and rice. The finished product is a modified molecular mass polysaccharide that is absorbed very quickly with out any side effects, stomach bloating or discomfort plus it mixes instantly.

## WHAT IS KARBOLYN® USED FOR?

This product was invented for the sole purpose of carbohydrate loading. It was designed for Elite Athletes looking for a fast, safe and high performance way to easily load the muscle with accessible muscle energy (glycogen).

## IS IT BETTER THAN JUST EATING PASTA OR RICE?

What sporting event is complete without eating a big spaghetti dinner before the event? We already learned it is important for athletes to consume large amounts of complex carbohydrates but we forgot to discuss how long it takes for your body to be able to use these for fuel. Did you know that breads and starchy foods like pasta can take up to 24 hours to digest, making it completely useless to eat before a workout or big game. Karbolyln® is absorbed in less than two hours making it a superior carbohydrate to conventional carb meals and carb powders.

## AS A RAW MATERIAL

Karbolyln® has been "instantized". This process is what helps it go into solution very nicely. It can be mixed into any formula as a replacement for slow absorbing carbohydrates and sugars, or can be flavored and used as a stand along product. Karbolyln® is great for meal replacements, weight gains, energy drinks or anywhere a high end quick absorbing carbohydrate is needed.

## ADVANTAGES OF KARBOLYN® OVER FOODS OR OTHER CARBOHYDRATE LOADERS

KARBOLYN®	FOOD (PASTA, ETC)	OTHER CARB LOADER
Sugar Free	May Contain Sugar	May Contain Sugar
Quick Absorption	Slow Absorption	Slow Absorption
All Natural	May Contain Additives	Usually Contains Additives
Mixes Instantly	Have to Prepare	Does Not Mix Instant
Pharmaceutical Grade	Food Quality	Food Quality or Lower
Neutral Tasting	Distinct Flavor	Distinct Flavor
Sustained Energy Levels Quickly	Sustains Energy Levels Slowly	Usually Does Not Sustain Energy Levels
Caffeine Free	Caffeine Free	Usually Contains Caffeine

## IS KARBOLYN® A FORM OF WAXY MAIZE?

Karbolyln® takes waxy maize to a new level with AAP brand new patent pending process. Karbolyln® mixes instantly, tastes great and is absorbed very quickly compared to regular waxy maize. Plus, Karbolyln® is made in the USA by All American Pharmaceutical & Natural Foods Corporation in Billings, Montana.

### History

The exact history of waxy maize is unknown. The first mentions of it were found in the archives of the U.S. Department of Agriculture (USDA). In 1908, the Rev. J. M. W. Farnham, a Presbyterian missionary in Shanghai, sent a sample of seeds to the U.S. Office of Foreign Seed and Plant Introduction. A note with the seeds called it: "A peculiar kind of corn. There are several colors, but they are said to be all the same variety. The corn is much more glutinous than the other varieties, so far as I know, and may be found to be of some use, perhaps as porridge." These seeds were planted on May 9, 1908, near Washington, D.C., by a botanist named G.N. Collins. He was able to grow 53 plants to maturity and made a thorough characterisation of these plants, including photographs, which were published in a USDA bulletin issued in December of 1909.[1] In 1915, the plant was rediscovered in Upper Burma and in 1920 in the Philippines. Kuleshov[2], when screening the distribution of maize in Asia, found it in many other places.

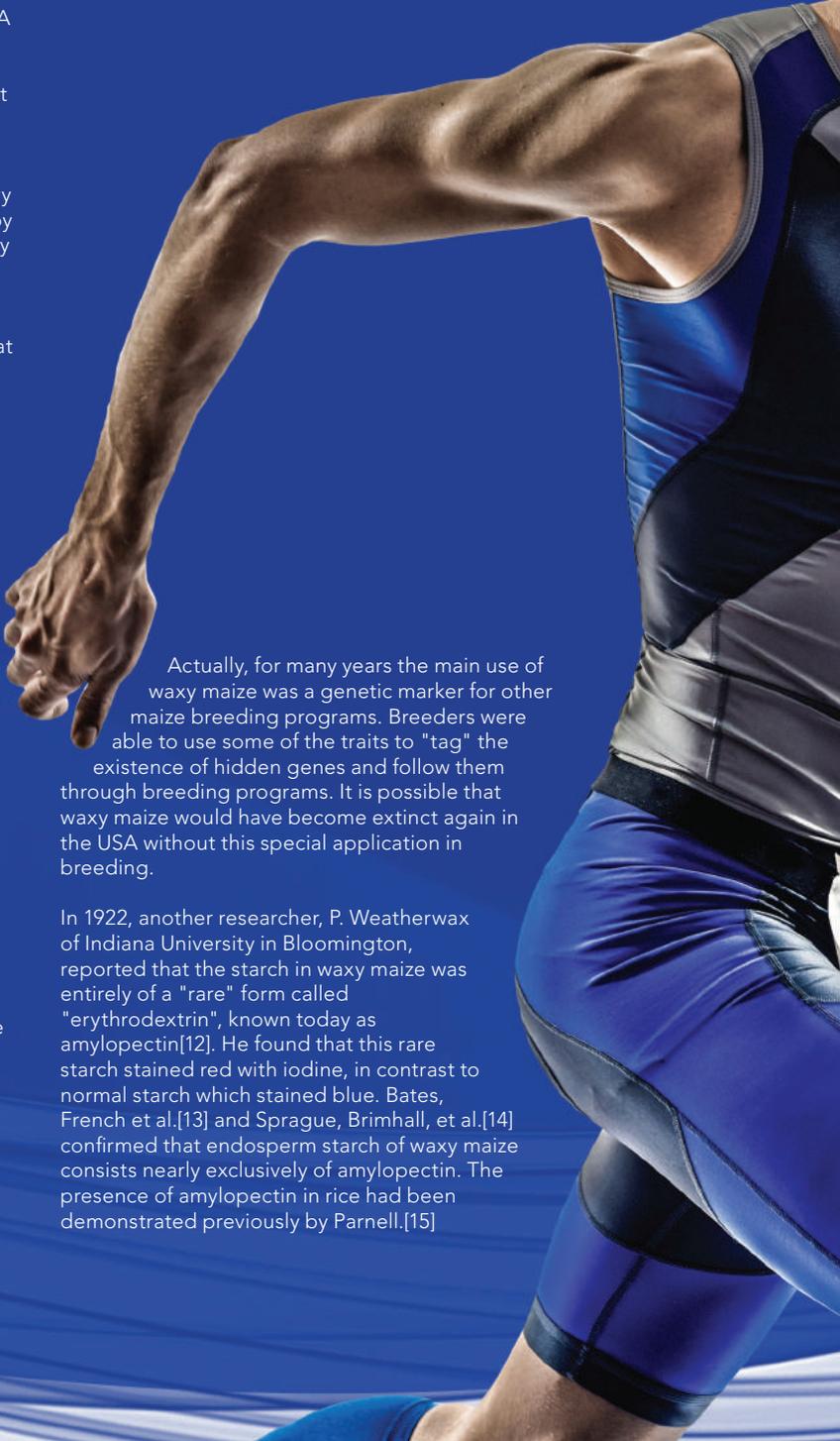
The discovery in China of a distinct type of maize bears the historical question whether maize was known in the Orient before the discovery of America. The question was closed at the end of the 19th century by De Candolle[3] who stated: "Maize is of American origin, and has only been introduced into the old world since the discovery of the new. I consider these two assertions as positive, in spite of the contrary opinion of some authors." But the finding of this unique variety of maize suggested a re-examination of the question. He also states that Portuguese arrived in China in 1516, simultaneously introducing maize.

Collins supposed that waxy maize has arisen by a way of mutation in Upper Burma [4]. In this case, it was difficult to conceive that from 1516 on the American plant had time to penetrate into a wild country inaccessible to foreigners, to produce a mutation, and as such a mutant to spread from the Philippines to Northern Manchuria and the Primorsky region within three to four hundred years.[5] We are able to counterpart both of these arguments nowadays. At first we know that the waxy mutation is quite common (see #Genetics). Secondly, the fact that maize, if introduced into Asia in Post-Columbian times, must have been rapidly accepted merely indicates that, like the potato in Ireland, it met an acute and pressing need.[6] Goodrich[7] states that there are now in China some 6000 local histories called gazetteers written from A.D. 347 on. Maize was first accurately described in one of them, published in the sixteenth century.

Ho[8], an eminent Chinese historian, stated: "Summing up the introduction of maize into China, we may say that maize was introduced into China two or three decades before 1550 ..." It might be, as various students concluded, that maize reached Asia before 1492, but currently we are not aware of a single plant fragment, artifact, illustration, or written record to prove it. Therefore, any undocumented statement about its occurrence there in earlier times is to be regarded with scepticism until substantiated.[9],[10] Thus, the two assertions of De Candolle are still valid.

In his publication, Collins characterized the new plants as possessing a number of unique characters. No indications of these characters in any recorded form of *Zea mays* had thus far been found. Several of the unique features combine to enable the plant to resist the drying out of the silks by dry, hot winds at the time of flowering. Although the plants produced such small ears that they could find no place in direct competition with the improved varieties, the possession of this adaptation gave the new type an economic interest, particularly in some parts of the semiarid Southwest. Consequently, the effort has been made to combine by hybridizing the desirable characters of this small variety with those of larger and more productive types.[11]

When Collins found such a distinct difference in the appearance of normal and waxy maize endosperm, he suspected a difference in chemical composition, but the analysis did not yield any unusual results. The percentages of starch, oil, and protein were all within the normal range. Yet, he was intrigued by the physical nature of the starch, and wrote: "In view of the recent development of specialized maize products as human food, the unique type of starch may be of some economic importance."



Actually, for many years the main use of waxy maize was a genetic marker for other maize breeding programs. Breeders were able to use some of the traits to "tag" the existence of hidden genes and follow them through breeding programs. It is possible that waxy maize would have become extinct again in the USA without this special application in breeding.

In 1922, another researcher, P. Weatherwax of Indiana University in Bloomington, reported that the starch in waxy maize was entirely of a "rare" form called "erythroextrin", known today as amylopectin[12]. He found that this rare starch stained red with iodine, in contrast to normal starch which stained blue. Bates, French et al.[13] and Sprague, Brimhall, et al.[14] confirmed that endosperm starch of waxy maize consists nearly exclusively of amylopectin. The presence of amylopectin in rice had been demonstrated previously by Parnell.[15]



In 1937, just before World War II, G.F. Sprague and other plant breeders at what was then called Iowa State College had begun a crossbreeding program to attempt to introduce the waxy trait into a regular high-yielding hybrid maize. By this time, the waxy plant no longer had the peculiar structural traits noted by Collins, probably due to years of crossing into various genetic stocks. Only the unique endosperm had been retained.

At this time, waxy maize was not so important because the main source of pure amylopectin still was the cassava plant, a tropical shrub with a large underground tuber.[16] This situation maintained until World War II, when the Japanese severed the supply lines of the States and forced processors to turn to waxy maize.[17] Waxy maize appeared to be especially suitable for this purpose because it could be milled with the same equipment already extensively used for ordinary maize.[18]

H. H. Schopmeyer has advised that the production of waxy maize in Iowa for industrial use amounted to approximately 356 metric tons in 1942 and 2540 tons in 1943.[19] In 1944, there were only 5 varieties of waxy maize available for waxy starch production. In 1943, to cover all the special requirements for amylopectin, approximately 81650 tons of grains were produced. From World War II until 1971, all the waxy maize produced in the U.S. was grown under contract for food or industrial processors. In fact, most of the maize was grown in only a few counties in Iowa, Illinois, and Indiana.[20] But in 1970, as most maize growers remember well, the Southern corn leaf blight epidemic (*Helminthosporium maydis* Nisik. and Miyake) swept the U.S. corn belt.

At the same time, at least 80% of the maize being grown in the U.S. was susceptible to the blight because this maize contained the "Texas type" male-sterile cytoplasm, which allowed production of hybrid seed without mechanical or hand detasseling. So quite naturally, there was a mad scramble in 1971 to find any kind of maize that had normal cytoplasm – cytoplasm that would resist the blight. Consequently, some seed of waxy maize worked its way into the market.

Backcrossing also has been used extensively to transfer individual genes such as wx (waxy), o2 and the Ht gene for resistance to the leaf blight.[21] Some farmers who fed this waxy grain to their beef cattle observed that animals thrived on it. Feeding trials were set up which suggested that the waxy maize produced more efficient weight gains than normal dent. Interest in waxy maize suddenly mushroomed, and this maize type abandoned the status of botanical curiosity and specialty product to become the subject of major research importance.[22] In 2002, an estimated 1,200,000 to 1,300,000 tonnes of waxy maize was produced in the United States on about 2,000 km<sup>2</sup>, representing only 0,5% of the total maize production.[23]

In 1999, All American Pharmaceutical began working on a new breed of waxy maize that would taste great, mix well in water and out perform all old ways of processing. In 2006, All American Pharmaceutical released Karbolyn<sup>®</sup>, the new patent pending waxy maize type product that is revolutionizing the athletic world.



## KARBOLYN® - TURBOCHARGED CARBOHYDRATE TECHNOLOGY FOR SERIOUS ATHLETES

### ENERGY

en•er•gy noun \ˈe-nər-jē\  
: available power, or the capacity to perform vigorous activity.

Energy. Hard training athletes expend incredible amounts of it. Their bodies require greater reserves of it. Without access to readily available sources of it, their performance suffers. During training, this can occur at an exponential rate.

Without question, a focus on energy intake is critical for serious, goal-oriented athletes.

### PURE ENERGY

During rigorous exercise, the “reactor core” of hard-training athletes’ metabolisms can be thrust into overdrive, and the energy demands to support rigorous workouts can skyrocket. Therefore, the importance for a source of pure energy during this period of time cannot be overstated.

The body’s preferred source of pure energy comes from carbohydrates.

Because every cell in the body requires it for metabolic fuel, cellular demands for carbohydrate fuel become exponential during training. This is why most sport nutritionists agree that an athlete’s diet should consist of 70% to 80% carbohydrate. This equates to a whopping 1,000 grams of carbohydrates for an athlete that consumes 5,000 calories per day!

### DEPLETION DANGER

Unfortunately, some athletes skimp on carbohydrates, or even worse, follow lowcarb dietary regimens. As a result, their bodies may become substantially depleted of carbohydrate fuel. This poses some real problems for performance - on many fronts.

What happens when available reserves of carbohydrate fuel runs too low?

Nothing beneficial. In fact, it can be downright destructive to the body...literally. If energy demands outpace carbohydrate availability, the body will turn to noncarbohydrate sources in order to “make more.” This is called, gluconeogenesis.

These “non-carbohydrate” sources can include certain amino acids from muscle tissue. In other words, during periods of carbohydrate depletion, lean muscle protein itself can be “chewed up” for energy. In essence, the body “cannibalizes” itself in order to generate adequate carbohydrate for energy. For serious athletes, such tissue depletion can be catastrophic on performance, recovery, new growth, and muscle preservation.

### CARBOHYDRATES DEFINED

Now that we’ve made a case for the importance of dietary carbohydrate, we should take just a moment to define what they are.

Carbohydrates, aka saccharides, are simple organic compounds that are aldehydes or ketones with many hydroxyl groups. Clear enough? Probably not, that is unless you are a nutritionist or biology student. Why don't we step it down a notch with an explanation for the rest of us?

Here we go. Carbohydrates are one of the four macronutrients (primary) we consume in the diet (the others are protein, fat, and water). On a molecular level, carbohydrates are comprised of carbon, hydrogen, and oxygen. Therefore, the abbreviation for carbohydrate is CHO.

The simplest form of carbohydrate is called a monosaccharide (one carbohydrate molecule). Monosaccharides are the foundational building blocks for other carbohydrates such as disaccharides (two carbohydrate molecules) and polysaccharides (many carbohydrate molecules).

Based upon their number of linked monosaccharides, dietary carbohydrates are generally classified as being either simple, or complex. Both types supply 4 calories per gram.

Simple carbohydrates are commonly known as sugars. They are generally comprised of only one or two combined molecules of carbohydrate (monosaccharides and disaccharides). Examples include sucrose (table sugar), dextrose, maltose, fructose (from fruit), and lactose (from milk). Due to their short molecular length, simple carbohydrates are generally fast digesting.

Complex carbohydrates, otherwise known as starches, are comprised of many linked monosaccharides (polysaccharides). Examples of complex carbohydrate include breads, pastas, grains, lentils, and rice. Due, in part, to their molecular length, complex carbohydrates are generally slow digesting.

#### ENERGY CONVERSION and STORAGE

When dietary carbohydrates are consumed, they are digested into their simplest form – a monosaccharide called glucose. Glucose, aka "blood sugar", is then absorbed into the circulation for transport throughout the body. The subsequent rise in blood sugar triggers the pancreas to secrete a hormone called insulin. Insulin's role is to "open the cellular doors" that accept glucose.

Once inside a cell, glucose is either stored for later use, or consumed immediately for energy production. In muscle cells, stored glucose is called glycogen; the primary fuel source used during intense training. Glucose that is needed for immediate energy is converted into usable fuel called ATP (adenosine tri phosphate).

#### THE TRUTH ABOUT CARBOHYDRATE LOADING

Traditionally, athletes have practiced the art of carb loading; the consumption of starchy carbohydrates, like pastas, leading up to a sport event. As the theory goes, a meal of complex carbs a couple of hours before an event will pre-load muscles with ample glycogen stores.

Here's the problem with that logic; breads and pastas can take up to 24 hours to digest.

Another line of thought is to consume a source of simple sugars pre-workout. Again, this poses a problem; simple sugars tend to cause a rapid rise in blood sugar followed by a period of low blood sugar. This is known as "the crash."

#### KARBOLYN® – THE ULTIMATE CARB FOR ATHLETES

The industry – leading team of All American EFX formulators and research scientists were compelled to engineer a better carb. The end result of their groundbreaking work is KARBOLYN® – the ultimate carbohydrate for athletes.

Patent pending KARBOLYN® was expressly developed for the purpose of carbohydrate loading. It was designed for athletes seeking maximum performance potential, to efficiently and safely load muscles with glycogen stores. In fact, KARBOLYN® is absorbed in less than two hours! That's efficient! For the purpose of pre-exercise loading, this makes KARBOLYN® vastly superior to both dietary and supplemental carbohydrates.

#### KARBOLYN® - TURBOCHARGED NUTRIENT LOADING

KARBOLYN® is a uniquely engineered homopolysaccharide (relatively complex carbohydrate) with a precisely manipulated "molecular mass." This molecular mass is what enables KARBOLYN® to absorb through the digestive track at a substantially faster rate than most other dietary or supplemental carb on the market.

Even at this hyper-fast rate of absorption, KarboLyn® is completely sugar free yet still provides the sustained energy of complex carbohydrates. Think about the implications of that last statement...KarboLyn® delivers the best qualities of both simple and complex carbohydrates!

Here's where things get really exciting. Because KarboLyn® passes so quickly into circulation; it functions as a sort of "pump" that draws water and nutrients along for the ride. Translation: KarboLyn® may help to drive key ingredients from other products into the bloodstream. This factor makes KarboLyn® a perfect addition to creatine products, pre-workout amplifiers, endurance formulation, and post-workout shakes.

#### KARBOLYN® - IT'S ALL ABOUT PRECISION

Contrary to all the marketing hype, carbohydrate sources such as unprocessed waxy maize starches are inferior for rapid glycogen loading and nutrient absorption. These starches have not been accurately processed to attain rapid absorption into the bloodstream.

In stark contrast, KarboLyn® uses a proprietary, multi-stage "Enzymatic Milling Process" to achieve optimal molecular size. This yields a superior, bioengineered carbohydrate for quick gastric emptying without any side effects (such as stomach bloating or cramping) and is rapidly absorbed into the bloodstream.

#### THE BIG QUESTION

Along about now, the question you should be asking yourself is, "Why aren't I using KarboLyn®?"

If you are still unclear, or haven't been paying attention, here's the rundown. KarboLyn® is a bio-engineered, high-performance carbohydrate that absorbs faster than a simple carb, yet provides the sustained energy of a complex carb.

- KarboLyn® quickly loads muscle tissue with glycogen for optimum performance, endurance and recovery.
- KarboLyn® is designed with a "sustained – release" mechanism for over 2 hours of stimulant-free energy.
- KarboLyn® may "pump" other nutrients and water into the bloodstream as it is being absorbed
- KarboLyn® is 100% sugar free and gluten free.
- KarboLyn® mixes instantly: no clumping or gelling

#### Any questions?

Look, as a serious athlete, you demand the most out of your performance potential, each and every workout. Therefore, it only makes sense to do everything in your power to ensure optimal glycogen loading. The way we see it, the most efficient way to quickly and safely load, or reload glycogen stores is with the one and only, KarboLyn®

KarboLyn® - you owe it to yourself to help ensure maximum performance.

# A PLACEBO-CONTROLLED DOUBLE-BLIND PILOT STUDY: BLOOD SUGAR RESPONSE TO KARBOLYN® OR A GLUCOSE DRINK DURING AEROBIC ACTIVITY

Re: IRB No.: 29443/1; KL-001  
Study: July 2014 – March 2015  
Report generated: 3/25/2015  
Summary Report

## Introduction

All American Pharmaceutical, in Billings Montana, has developed KarboLyn® – a homopolysaccharide mixture, for the sole purpose of carbohydrate loading. Across the field of athletics (commercial and amateur) there is a demand for carbohydrate replacers to sustained performance. KarboLyn® was designed for elite athletes looking for a fast and safe way to easily load muscles with accessible muscle glycogen.

This homopolysaccharide is a patent pending process with specific branch-chain structures in the molecular make up. These homopolysaccharides are found naturally in the plant-based food chain. KarboLyn® is considered a nutritional supplement (of plant-based origin) as defined under the Dietary Supplement Health and Education Act (DSHEA) of 1994.

The finished product is a modified molecular mass of homopolysaccharides that is absorbed very quickly without side effects.

## Purpose of the study

This Clinical Study sought to document whether or not KarboLyn® has a positive and sustainable impact on blood sugar level during light aerobic activity compared to a simple glucose solution along with evaluating if KarboLyn® was absorbed as quick as a simple sugar. In addition, the company is interested in learning the effect KarboLyn® has on pre-diabetic individuals – whether or not their physiology will show the same glucose utilization curve during sustained, light aerobic exercise.

## Experimental protocol

A total of 36 – adults, ages 21 or older, of either gender, were recruited from the Missoula Montana area. All volunteers fulfilled the entrance requirements for their group: 'Normal' and 'Pre-diabetic'. Each individual was randomized to receive either 50 grams of KarboLyn® or an equal gram amount of a sugar drink. Blood was drawn before and during the two hour study, according to the protocol. Volunteers were on a treadmill any time their blood was not being drawn.

## Data

At the close of the study the data was reviewed.

KarboLyn® elevated the blood glucose of 'Normal' volunteers to a slightly greater extent than the simple glucose drink did at: 15 minute, 30 minute, and 45 minute marks. Approximately 60 minutes after ingestion, and certainly before 75 minutes for all participants, the KarboLyn® blood sugar spike had returned to normal, and in some cases, below the starting value. Blood sugar averages remained between 8 to 14 mg/dl lower than when the participant began.

## Glucose placebo

The glucose group showed a spike as well, at the same times that the KarboLyn® did. Between '0' time and 45 minutes, the KarboLyn® spikes were all slightly higher at their respective times. At the 60 and 75 minute marks, the glucose solution gave slightly higher peaks (6 mg/dl and 5 mg/dl, respectively) than the KarboLyn® did.

## In general

The normal volunteers exhibited a 'tighter' glucose control on 'spiking', with most of the reading remaining at, or near, the 100-110 mg/dl mark. Blood glucose usually quickly dipped below 100 mg/dl before the 45 minute mark.

## Pre-diabetics

Instead of simply 'spiking' their blood glucose level, and fostering a generally high blood glucose level throughout the study, the KarboLyn® pre-diabetic group exhibited a very tight 'spike' in a bell curve fashion, with almost everyone dropping below 100 mg/dl by the 60 min mark. Before 75 minutes, blood glucoses were below 96 mg/dl. The average blood glucose reading after 75 min – until 120 min (which is the end of the study) was: 81 mg/dl, 78 mg/dl, 79 mg/dl, respectively. This represents a blood glucose that is between 9 – 12 mg/dl lower than their starting glucose levels for KarboLyn® group.

This action was unexpected and has prompted further investigation into the components of KarboLyn® and their potential impact on the pre-diabetic physiology.

## SUMMARY:

### Normal group

Based on the data so far, KarboLyn® appears to get into the blood stream at least as fast as simple glucose, causing a slightly higher 'spike' than that produced by glucose, in normal volunteers, during the first 15 – 45 minute, and lasts between 60 – 75 minutes. Since glucose levels were already spiked at 15 minutes, this suggests that KarboLyn® was in the blood stream in about 6-7 minutes.

Simple sugar causes a corresponding spike in normal individuals, but to a slightly lesser degree during the same time frame.

By 75 minutes, both the KarboLyn® and the simple glucose are exhausted during light aerobic exercise.

#### Pre-diabetics

With KarboLyn, the pre-diabetics behaved as if they were 'Normal' volunteers. The blood glucose pattern produced was a tight bell-shape curve, ending with all blood glucose levels below the 100 mg/dl mark by 60 minutes. After this point, the line virtually flattened out and remained between 81 mg/dl to 78 mg/dl for the rest of the two hour test. This was unexpected.

With the simple glucose placebo, the blood sugars spiked higher and remained abnormally high longer, before dipping below 100 mg/dl. There was no tight bell curve, rather a 'peak' with several 'slopes', indicating a poorer glucose control response. Eventually the placebo pre-diabetics did fall into the average 80 mg/dl to 86 mg/dl range by the end of the study.

There were no protocol deviations or adverse events during the study.

This study was funded by a Grant from the Montana Board of research and Commercialization Technology.



## PRODUCT SPECIFICATION

### Features/Benefits:

- is a homopolysaccharide. (relatively complex carbohydrate)
- made up of many monosaccharides joined together by glycosidic bonds.
- The "Molecular Mass" has been precisely manipulated to create absorption through the stomach at a rate much greater than maltodextrin, dextrose, breads, pasta, rice or any other carb product on the market..
- Karbolyn® is a patent pending carbohydrate that contains very unique properties. Because Karbolyn® passes through the stomach very quickly, it acts like a pump, pulling water and nutrients along with it. This high tech carbohydrates actually moves through the stomach 18.21% faster than dextrose or sugar. Karbolyn® also has a Higher Solution Osmolality than Dextrose, Sucrose or other carb powder mixes on the market.
- Sugar Free
- Completely Instant (goes into solution without a blender)

### Applications:

- Dry Blends
- Sports Drinks
- Carbohydrate Loading
- Liquid Concentrates
- Nutrition Bars
- Meal Replacement Drinks
- Baking

### Ingredient Declaration:

Karbolyn® (Homopolysaccharide)

### Physical Attributes:

White Powder  
Osmolality 5 grams/5cc  
(1 mole equiv to 1 osmole)  
MM (molar mass) 10,500,000

### Ordering Information:

FCA Billings, Montana USA

### SKU Packaging

RM38-20kg 20 kg bags

### Packaging:

High Density box with an inner poly bag sealed with a plastic bag tie. 100 kg per box.

### Storage/Shelf Life:

Rotation of stock recommended. Shelf life is 60 months from date of manufacture. Keep stored in a cool, dry environment.

## TYPICAL SUPPLEMENT FACTS

Serving Size	1 gram	
Calories		4
Calories from fat		0
%Daily Values		
Total Fat	0 g	0
Saturated Fat	0 g	0
Cholesterol	0 g	0
Trans Fats	0 g	0
Sodium	0 g	0
Total Carbs	1 g	0.332
Dietary Fiber	0 g	0
Sugars	0 g	0
Protein	0 g	0

### Contaminant Testing:

Steroids	0/g
Stimulants	0/g
IOC band substances	0/g

### EU Information:

Milk Fat	0%
Milk Protein	0%
Starch	100%
Sucrose/invert/isoglucose	0%
Lactose	0%

### Microbiological:

Standard Plate Count	5,000/g max
Yeast/Mold	50/g max
Coliform	10/g max
E. Coli	Negative/g
Salmonella	Negative

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