

# How To Build Bigger, Leaner Muscles In Faster Time Using Synergistic Supplement Stacking.

by Richard Hargreaves 1984 Mr Australia

I have had a number of people ask me lately about how to stack supplements effectively.

Which ones work well together – which ones don't...

Are there any that shouldn't be taken together?

The best way to design a 'stack' is to first have a clear goal in mind as to the type of result you want from the stack, i.e. Are you primarily after (a combination of substances that will aid), fat loss and definition, gaining muscle, or do you want to increase your energy and endurance (over what time-one hour or three)?

What of mental alertness?

Do you want to be able to think clearer and concentrate better – to remain focused on what you are training for your whole workout, without drifting off or being distracted by any outside events or people?

Or do you want an antioxidant stack that will eliminate free radicals for cell protection.

Next step is to select the various components (Nutraceuticals) which will work synergistically (enhance the effects of each other) so that the end result is greater than any one supplement used singularly or on its own.

This may be achieved by reinforcing pathways in the body, which are not at their maximum limit or via completely different pathways not yet stimulated.

O.K; Enough talk about stacking. Let's get something practical happening. Let us set a Goal to achieve greater size, strength, power and recovery.

## **BEWARE**

Kitchen Sink Approach;

Some manufacturers take this approach and it is purely done from a marketing angle.

They think that the more ingredients they can list on the product – the more customers will be impressed.

Unfortunately for many people, this is true. Most people are impressed when they see just about every fat burning compound known to man listed on the ingredients.

What the naïve customer does not realize is that the amounts of substances required to get a positive effect far exceed (perhaps by 100 x or more) what is being put into this "Kitchen Sink" supplement.

Not only that, quite often, not all ingredients work synergistically. By putting in everything – you are very likely to undo or neutralize any good you may have derived from these supplements (Some supplements actually work against each other).

Use common sense. If you see a product being promoted as Thermogenic or fat reducing, and yet contains copious amounts of Carbohydrates – ask how is this possible – since Carbohydrates inhibit fat burning.

## Tip

Due to the complexity of interactions within the body, it is not possible for anyone to know exactly what happens when many substances are combined at once. For this reason, I believe it is best to keep things simple when stacking.

Keep things to the bare minimum, this gives maximum **proven** effects. Anything, which cannot be proven or demonstrated, can be regarded as (advertising) hype.

If you stick to this rule, your results will always be guaranteed and as a bonus you **save** Money.

What supplements can we select that will enable us to achieve the above goal. In this case it's easy. [Creatine Monohydrate](#) will achieve all of the above and more (endurance) on its own, especially when taken with a high Glycemic Carbohydrate to elevate Insulin and drive more Creatine into the muscles.

So, the first thing to stack with Creatine is sugar.

To get a really good “spike” of Insulin, take;

|                   |
|-------------------|
| 60 grams glucose  |
| 15 grams fructose |

This is a ‘mini’ – stack, combining two different type of sugars that give a bigger Insulin burst than using just glucose on its own.

Here is the Total stack; I call this my “Power Stack”

Load with the following (Power Stack) 5 times per day for 5 days:

|                              |     |
|------------------------------|-----|
| Creatine Monohydrate         | 5g  |
| Glucose                      | 60g |
| Fructose                     | 15g |
| Potassium Phosphate          | 2g  |
| Sodium Bicarbonate           | 2g  |
| Orange Cordial (for flavour) |     |

For on-going maintenance repeat the above only 2 times per day.

**WARNING: Too Much Bicarb May Result In' Explosive' Diarrhoea !**

Here is where you can obtain the necessary ingredients;

|                    |                           |
|--------------------|---------------------------|
| Creatine           | - Gyms, Health food shops |
| Sodium Bicarbonate | - Supermarket             |

|                     |                                 |
|---------------------|---------------------------------|
| Glucose             | - Health food shop              |
| Fructose            | - Supermarket, Health Food shop |
| Potassium Phosphate | - Laboratory or Baker's supply  |
| Orange Cordial      | - Supermarket                   |

Now you know what to take and how much, here is the theory on why this stack is so effective...

## CREATINE

|                   |  |
|-------------------|--|
| Scientific Name:  | Creatine Monohydrate   |
| Type of Nutrient: | Found in food (especially red meat)  |
| History:          | Used successfully by British track and field athletes at 1992 Olympics in Barcelona  |
| How Supplied:     | Powder, Tablet, Capsules, Liquid   |
| Natural Sources:  | High in red meat. Also formed in liver from the amino acids Arginine, Glycine and Methionine.  |
| Benefits:         | Increased strength, Power, Mass, Delays fatigue (buffers hydrogen ions), Improves recovery   |
| Safety:           | Appears to be good - still a relatively new supplement   |
| Precautions:      | No negative complications in medical literature. However, some athletes report mild diarrhea during loading phase. Will not improve endurance exercise performance nor sub maximal exercise. |

Creatine is taken up by skeletal muscle where it forms Phosphocreatine, the high energy phosphate compound. The immediate source of energy for muscular contraction is ATP with Phosphocreatine serving as a back-up source of energy.

The length of time that maximum muscle work can be maintained is partially determined by the amount of Phosphocreatine present in skeletal muscle. ATP must be regenerated through the metabolism of Glycogen, Glucose, fatty acids, ketones and amino acids - once the Phosphocreatine is used up.

Of the many causes of fatigue, one of the more important is the decrease in Phosphocreatine in muscle. Subsequently some athletes use Creatine supplements to try to increase Phosphocreatine in muscle and thus increase intensity and the length of muscular contraction during short term, high intensity work.

## **Theory Behind Creatine Supplementation**

The possible mechanisms by which Creatine supplementation may be effective during exercise are by:

1. Providing a transport mechanism to take the ATP generated inside the Mitochondria out to the working muscle fibres.
2. Delaying the slowing of effort caused by the depletion of Phosphocreatine stores in the muscle since total stores are augmented.
3. Enabling a greater supply of "instant energy" by improving the capacity to regenerate ATP.

4. Buffering (Neutralising) Hydrogen Ions produced during anaerobic exercise, thereby delaying fatigue. Potentially improves buffering capacity by 7%. (See Sodium Bicarbonate for full explanation of Lactic Acid Buffers).

If anyone attempts to convince you that micro-ionized Creatine is better than normal Creatine Monohydrate – Think about this.

Once Creatine or any other soluble substance is dissolved into solution, you cannot get any finer particles. Anyone with a basic knowledge of chemistry, knows that the ions are in solution...so how do you get something smaller when you already have the smallest?

Now maybe micro-ionized Creatine dissolves a bit easier, but an extra stir or shake of normal Creatine gives the same result. In other words, once Creatine has been dissolved into solution, that's it. The Creatine cannot become any smaller in particle size. So it doesn't really matter if it is micro-ionized or normal Creatine – they both give the same end result.

### **Research Findings - Delayed Fatigue; Improved Recovery, Increased Muscle Torque**

Recent research has revealed that oral Creatine supplements not only increase Creatine content in muscle (the increase is greatest in exercised muscles) (*Harris et al, Clin Sci 1992; 83(3): 367-374*) but delays fatigue (*Balsom PD et al Scan J Med Sci Spor 1993; 3: 143-9*), it improves recovery (by increasing the rate of PhosphoCreatine resynthesis in muscle) (*Greenhaft PL et al Am J Phys 1994; 266 (5 Pt 1): E725-30*), and increases muscle torque during repeated bouts of maximal exercise. (*Greenhaft et al Clin Sci 1993; 84(5): 565-71*).

### **Increased Power And Work**

Other studies show that Creatine Monohydrate increases both power output and the total amount of short term work (*Birch R Eur J Appl Physiol Occup Physiol 1994; 69: 268-70*).

### **Increased Body Mass**

Oral Creatine supplementation may also independently result in increased body mass (*Balsom PD et al Acta Phys Scand 1993; 149(4): 521-3*), although much of this increase may be due to increased water retention. The water retention is a phenomenon known as “cell volumizing” or “cellular hydration”.

A “hydrated” muscle cell (holding more water) is bigger, fuller and rounder. The cell is literally blown up like a balloon. This is a great look for bodybuilders, cell volumizing means more water inside muscle cells (not the unwanted type of water retention which occurs outside muscle cells and under the skin - giving the appearance of puffiness).

## Phosphate Salts

|                                 |  |
|---------------------------------|--|
| Scientific Name:                | Sodium Phosphate and Potassium Phosphate   |
| Type of Nutrient:               | Mineral salt of Phosphorus (essential nutrient)  |
| History:                        | Popular with European athletes<br>Used as an Ergogenic aid for over 60 years<br>German soldiers reportedly used them in World War I to relieve fatigue   |
| How Supplied:                   | Crystalline Salt   |
| Natural Source:<br>(PHOSPHORUS) | Cod, Beef, Milk, Yogurt, Chicken, Rice, Bread  |
| Used for:                       | Lactic Acid buffer. Increasing 2,3 – Diphosphoglycerate (the enzyme that unloads oxygen into muscle). Improving production and use of glycogen for fuel. Improving both Endurance and Anaerobic performance. |
| Safety:                         | Potassium Phosphate - Excellent<br>Sodium Phosphate - Good (used extensively in the meat and baking industries)<br>Excess of Phosphorus excreted in urine.   |
| PRECAUTIONS:                    | Excesses of phosphorus combined with low levels of dietary calcium may contribute to a calcium deficiency. Ensure adequate calcium in diet.  |

## BOOSTING PERFORMANCE

Research has indicated that Phosphate salts can boost performance in track athletes in events ranging in distance from the 100 metre sprint to the 26 mile marathon. To be effective over this wide range, the Phosphate salts would have to have the potential to improve energy production in all three human energy systems - the ATP-CP, Lactic Acid, and oxygen systems - which they do.

Relative to the ATP-CP energy system, Phosphates form high-energy bonds when attached to the organic compounds Adenosine (ATP) and Creatine (CP). There is evidence that supplemented Phosphate improves the production and use of Glycogen for fuel through its incorporation into numerous enzymes in energy production (*Chasiotis D Med Sci Sports Exer 1988;20:545-550*). Phosphates are necessary for optimal functioning of several B Vitamins, such as B1 (Thiamine), which is involved in aerobic energy production from carbohydrates and fats.

Sodium and Potassium Phosphate serve as buffers in the body and may function similarly to Alkaline salts in improving the lactic acid energy system. Recently, Dr Richard Kreider and his colleagues at Old Dominion University, Virginia have, in repeated studies of Phosphate

supplementation, demonstrated it to buffer Lactic Acid (*Kreider RB, et al. Med Sci Sports Exer 1990;22:250-255. Miller GW, et al Med Sci Sports Exer 1991;23:535*).

Studies from various laboratories have repeatedly shown that Phosphate supplementation raises blood levels of 2,3 - Diphosphoglycerate (2,3 - DPG), the enzyme that deposits oxygen from haemoglobin into muscle cells (*Farber M, et al. J Lab Clin Med 1984;104:166-175. CADE R et al. Med Sci Sports Exer 1984;16:263-268. STEWART I, McNAUGHTON L Res Quart 1990;61:80-84*).

Phosphate is a far safer but effective alternative to Erythropoietin (EPO) - the real heart stopper. Slightly recapping, all three energy systems, ATP-CP, Lactic Acid and Oxygen are improved. To what extent the following studies will indicate.

One of the recent and best studies (*KREIDER RB, et al Int J Sports Nutr 1992;2:20-47*) which tested both anaerobic and endurance exercise, gave trained cyclists 4 grams of Sodium Phosphate per day or a Placebo, for 3 days prior to a maximal exercise test and a 40km time trial on the ergometer bicycle.

During the anaerobic Phosphate trials, maximal power output increased by 17%.

As Dr Michael Colgin points out in his excellent book 'Optimum Sports Nutrition', this is the equivalent to **adding 51 lbs to a 300 lb maximum bench press!**

## ALKALINE SALT

|                   |   |
|-------------------|---|
| Scientific Name:  | Sodium Bicarbonate  |
| Type of Nutrient: | Alkaline Salt   |
| History:          | First research regarding performance enhancement over 60 years ago. Little research however in following 45 years.  |
| How Supplied:     | Powder  |
| Usual Source:     | Baking Soda   |
| Used for:         | Reducing muscle and blood acidity (Lactic Acid buffer).<br>Improving anaerobic performance (power and endurance)  |
| Safety:           | 20 grams of Sodium Bicarbonate contains 5 grams of Sodium.<br>Very unhealthy nutrition. Ten times more sodium than you need (Recommended Dietary Allowances 10th Edition 1989). Can send blood pressure sky high. |
| PRECAUTIONS:      | Can cause explosive Diarrhoea. Use only for big events.   |

## THEORY

If you studied chemistry at school, you may recall that strong acids such as Hydrochloric Acid had the capacity to severely burn your skin. If such an accident occurred, the immediate response was to wash the acid off, preferably with a neutralising solution.

It probably is of little surprise to you that certain cells in your stomach produce Hydrochloric Acid to aid in the digestion of dietary protein. Also, many physiological reactions in your body result in the formation of acids that could have serious consequences if not neutralised.

For example, uncontrolled diabetes can lead to the formation of excessive amounts of acids from fat metabolism, which may lead to a series of events involving acidosis, diabetic coma, and death (rather serious, don't you think?).

In sports, Lactic Acid is related to the onset of fatigue in anaerobic events.

Certain proteins in your body cells and blood, your lungs (blowing off acid in the form of excess carbon dioxide) and your kidneys (which excrete acid salts) are amongst the numerous systems controlling the acid-base balance in your blood. Additionally, the blood contains a number of Alkaline Salts (notably Sodium Bicarbonate), which can be used to rapidly buffer acids secreted into the blood.

## **SPORTS PERFORMANCE**

The pH in the muscle cells is slightly alkaline while at rest. Normally, it is at this level that enzymes that produce energy via the Lactic Acid and oxygen energy systems perform at their optimum.

Experts believe that if the concentration of Hydrogen ions and acidity increases in the muscle cell, then the optimal functioning of these enzymes will be disturbed and energy production will decrease.

Fatigue may result because of increased acid production within the muscle cell when the Lactic Acid energy system is used during high intensity exercise.

During rest and exercise, proteins within the muscle cell help to buffer metabolic acids. But beyond the initial buffering in the cell, during exercise, the Lactic Acid produced appears to be buffered almost entirely by the Sodium Bicarbonate in the blood.

Your body produces and uses plain old baking soda to protect its blood from acidity (*Danforth WH. Control of Energy Metabolism, New York: Academic Press, 1965:287-298*). Armed with this knowledge, for more than 40 years, coaches have sought to use Bicarbonate supplements to reduce muscle acidity and improve performance (*Miller R, et al J Clin Invest 1988;81:1190-1196*).

In one study... Dr David Costill and colleagues at the Human Performance Laboratory at Ball State University, Indiana gave athletes a dose of Sodium Bicarbonate. The athletes then performed five, one minute sprints on an ergometer bicycle, the last sprint was performed to absolute exhaustion.

**The Soda loading, improved the time to exhaustion of the last sprint by an incredible 42%! (*Costill DL et al Int J Sports Med 1984;5:225-231*).**

A fairly recent study completed here in Australia, at the Tasmanian Institute of Technology, (*McNaughton LR, Cedaro R The Aust Journal of Sci and Med in Sport 1991;23(3):66-69*) gave elite class rowers 300 mg/kg bodyweight of Bicarbonate or Placebo.

Ninety-five minutes later, subjects made a maximal effort for six minutes on a rowing ergometer. Compared with Placebo, the subjects rowed almost 50 metres further in the same time when receiving Sodium Bicarbonate.

This was greater than the difference between first and last place at the 1991 World Rowing Championships.

***In a nutshell, the theory behind Soda loading is that by neutralising the acid (Lactic) produced by muscle cells during anaerobic exercise, the pH level of the working muscle will be kept in an optimal range for peak performance longer.***

## **SYNERGY**

On paper it looks good, but it gets even better.

So far we have 3 university tested and proven ergogens which all help achieve our goal of strength, size, power and recovery in slightly different pathways.

None of them interfere with each other in a negative way. In fact, it's quite the reverse. This is where the 'magic' of the Power Stack really shines through.

Sodium Bicarbonate not only neutralizes the acidity of your blood – it also neutralizes the acidity in your stomach. This is how an antacid such as 'Alka-Seltzer' works. The antacid (anti-acid) neutralizes stomach acids. Why is this of benefit? Because the minute Creatine enters your stomach, the Hydrochloric acid in your stomach immediately starts breaking down valuable Creatine into useless Creatinine – a waste product of your body.

By neutralizing, the acidity in your stomach, less Creatine is broken down into worthless Creatinine before it can get to the working muscles.

I think you will agree that this is a pretty neat synergy so far, but it gets even better.

Potassium Phosphate helps drive the conversion of Creatine Monohydrate into Phospho Creatine which your muscle utilizes in the ATP-ADP energy cycle.

In a nutshell, what we have created is a Power Stack which delivers more Creatine into muscles and contains two other ergogens which have both been university proven to increase power. If you don't have time to make your own Power stack...[Ironpower](http://ironpower.biz/products_powerstack.htm) has done it for you. Visit [http://ironpower.biz/products\\_powerstack.htm](http://ironpower.biz/products_powerstack.htm) for more information.

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