

CasePerformance

Aug/Sept Newsletter Part II



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Hello,

Glad to see that you're tuning into Part II of this month's newsletter! I hope you enjoyed [Part I](#) which featured an interview with powerlifter Corey Wyllie, who shared with us how he got involved in the sport as well as the positive impact training has had in his life. In addition, in the CP Community Member Discussion, Greg Luke shared with us some interesting food for thought in his piece, *Wealth Creation in the Information Age*.

In Part II of our newsletter, we take a quick peek at the news of note here at CasePerformance, then move to the SuppVersity Corner, before closing with our CasePerformance Performance Discussion – *Creatine – A Historical Look*.

Respectfully,

Sean Casey

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II. Donations for CasePerformance Are Welcomed

As you've probably noticed while surfing around the CasePerformance website, we do not litter our pages with advertisements or have "Members Only" sections that require a paid subscription.

Why do we do this?

My goal is to reach as many individuals as possible. If an individual truly wishes to improve their health and performance, I want them to succeed. This holds true regardless if they are a multi-millionaire or those pinching pennies.

A Potential Downside & What You Can Do To Help

The cost of running a website in conjunction with paying for full access to the various sport science and nutrition research journals I use is extremely expensive. Also, all of the authors at CasePerformance put considerable time into writing the articles for this site. If you enjoy the free information provided on this site, we humbly ask you to show your support by making a small donation. Thanks for your support!

[CLICK HERE](#) to make a donation. Please know that **ANY AMOUNT** is greatly appreciated!

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III. Article News at CasePerformance

One new article has been added to the CasePerformance library since the last newsletter was sent out:



1) [Interview with the Expert: Dr. Jose Antonio](#) with Sean Casey

In this "Interview with the Expert" we have the privilege of talking exercise, nutrition and supplement research with Jose Antonio, PhD, FNSCA, FISSN, CSCS. In our discussion, Dr. Antonio shares with us his background, the "dangers" faced by researchers interested in supplements and the events that led to the formation of the International Society of Sports Nutritionist (ISSN). Additionally, Dr. Antonio touches popular idiotic notions still held by many today such as "supplement sponsored studies are shady", "the nutraceutical field is an unregulated, out of control industry" and more!

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Top Read Article in Aug/Sept at CasePerformance...



[Mechanics of Squatting](#) by Sean Casey

The Mechanics of Squatting was one of the first articles I wrote. It was originally posted in 2010 at CasePerformance. Here is a quick summary of the article...

The squat is a favorite exercise for many hard core resistance athletes. Recent research has provided an interesting look at squat mechanics. It appears that it's OK if your knees extend over your toes during the movement (within reason of course). The key thing, with respect to preventing injuries, is weight distribution on the foot. Also, when squatting with the same relative loads (70% 1RM) front squats appear to reduce the compressive stresses on the knee vs. the back squat. As a final note, don't forget to consciously explode out of "the hole" while squatting. Even if the weight is heavy (ie 1RM or 3 RM) one should attempt to push the weight as fast as possible.

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V. SuppVersity Corner Report!



One of the things we do on the CasePerformance [FACEBOOK](#) page is highlight one of the posts in our SuppVersity Post of the Week, a website ran by my friend [Adel Moussa](#).

Week of Sept 1st

[Restore & Maintain Insulin Sensitivity - Basics: Turn Your Lifestyle Upside Down With These 5 "No-Quick-Fix" Tips](#)

CP Quick Thoughts

The month of September included a heavy dose of article focused on maintaining and restoring insulin sensitivity, a topic I find interesting on multiple levels. It got kicked off by exploring the basics.

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Week of Sept 8th

[Alpha Lipoic Acid, GABA, Taurine, Green Tea, Gooseberry & Fenugreek. Plus: Metformin the No.1 Drug? Supplements to Improve and Restore Insulin Sensitivity – Serving #1](#)

CP Quick Thoughts

The one supplement that I'd like to highlight on this list is Alpha Lipoic Acid. It's often stated that the costlier R-ALA form is superior to the regular ALA form. However, similar to Adel, I have yet to find a study which proves this benefit. Thus, if you're looking to use ALA, stick to the regular form and save yourself some money.

Week of Sept 15th

[Berberine, Banaba \(Corosolic Acid\), Rauwolfia Serpentina, \(Apple Cider\) Vinegar, Chromium. Supplements to Improve and Restore Insulin Sensitivity - Serving #2](#)

CP Quick Thoughts

On this list Apple Cider Vinegar probably is the "trendiest" one. Its use is probably questionable unless you're trying to cheat your way through a carbohydrate stacked meal.

Week of Sept 22nd

[Cinnamon, Curcumin \(Turmeric\), Licorice \(Glycyrrhizin\), Melatonin, Milk Thistle \(Silymarin\). Supplements to Improve and Restore Insulin Sensitivity - Serving #3](#)

CP Quick Thoughts

The use of Silymarin (milk thistle) to improve insulin sensitivity really surprised me. I had never heard of it being used for this reason. I was more familiar with its beneficial role in protecting the liver.

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Week of Sept 29th

[SuppVersity Olympia Special: Maniac or Focused, Freakish or Extraordinary - What's the True Nature of a Bodybuilder? Plus: Cortisol & Immune Response to AM vs. PM Training](#)

CP Quick Thoughts

Although I was tempted to continue with my Adel's "maintaining and restoring insulin sensitivity" article series, it was Olympia weekend. Being that it's the largest bodybuilding event here in the USA, outside of maybe the Arnold Classic, I couldn't go against Adel's feature on it.

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VI. CP Performance Discussion: Creatine – A Historical Look

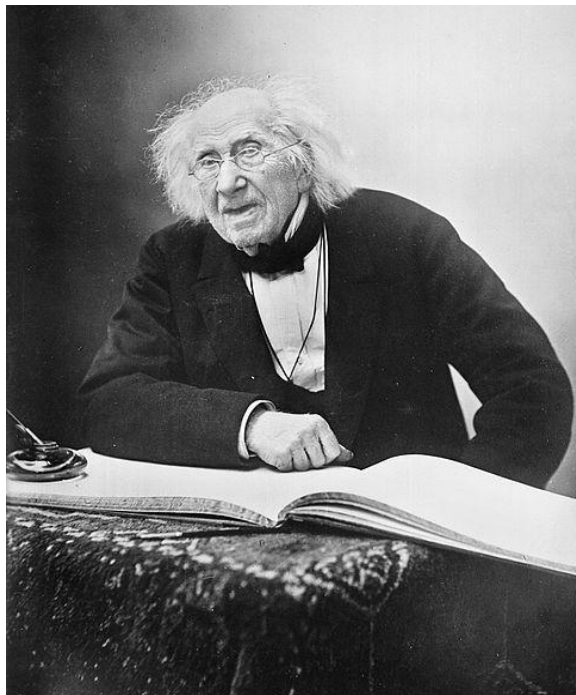


Figure 1. Michel-Eugene Chevreul. ¹

In 1832 a French researcher by the name of Michel-Eugene Chevreul, a man already famous for his groundbreaking 1823 publication, *A Chemical Study of Oils and Fats of Animal Origin*, stumbled upon a new molecule that differed considerably in structure to that of the lipids he had studied in the past. ²⁻⁴ Coming directly from the meat of animals, he named this new molecule creatine, which can be traced back to the Greek word *kreas* which means "flesh". ⁵

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Figure 2. Otto Folin's biochemistry Lab.⁶

After its initial discovery little research is noted on creatine until the early 1900's at which time, two researchers, by the names of Otto Folin and W. Denis, assessed creatine and creatinine absorption in cats.⁷ In their study, the researchers injected creatine (3.6g dissolved in 75 ml water) into the small intestines of a cat and found that it was absorbed into circulation. They also noted that during the 189 minute follow-up period, there was a lack of evidence to indicate that the majority of it was "destroyed" and eliminated as urea or creatinine. Rather it simply "disappeared", leading them to believe that creatine and creatinine metabolism were independent of each other. This was in agreement with earlier research conducted by Folin.

Within the decade that followed, many individuals began to question Folin's hypothesis that no "biological relationship" existed between creatine and creatinine.⁸ Included in these skeptics was Stanley Benedict, a researcher at Cornell Medical College. In a 1923 research paper co-authored with Emil Osterberg, he states:

"Obviously if metabolized at all, the creatine must ultimately give rise to something. Then so long as it remains wholly unaccounted for, there is no justification for the conclusion that it may not give rise to creatinine."

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To study the effects of what creatine was metabolized into, Stanley Benedict and Emil Osterberg gave dogs various doses of oral creatine for 70 days. During this time period, urinary products were measured. Based off the results of their study, the research team concluded that creatine was indeed converted to creatinine. Additionally, Benedict and Osterberg found that supplementing with as little as 500-620 mg/d led to a "*marked nitrogen retention and the tendency to increase in weight*" in the two dogs. In the case of the dog receiving 620 mg/d, it was noted that it was weight stable at 14.4 kg for 33 days prior to experimentation. At the end of the seventy days, it weighed 15.7 kg.

The first study examining the effects of creatine supplementation in man was published in 1925 by two researchers from the University of Virginia, Alfred Chanutin and Loren P. Guy.⁹ Prior to the start of the creatine supplementation time period, the researchers followed a relatively creatine free diet that consisted of "*shredded wheat, bananas, bread, butter, strawberry preserves, sugar, and milk, represented an intake of approximately 3400 calories*" for 6-8 weeks. Following this period, Alfred Chanutin supplemented his diet with 10g creatine/day for 10 day, followed by 8 days of 20g/day, before returning to 10g/day for the remaining 2 days of the study. During this time period, he saw his weight increase from 72 kg up to 75.2 kg. Similarly, Loren P Guy saw his weight increase from 69.5 kg to 72.0 kg during the thirty days in which he took 10g/day.

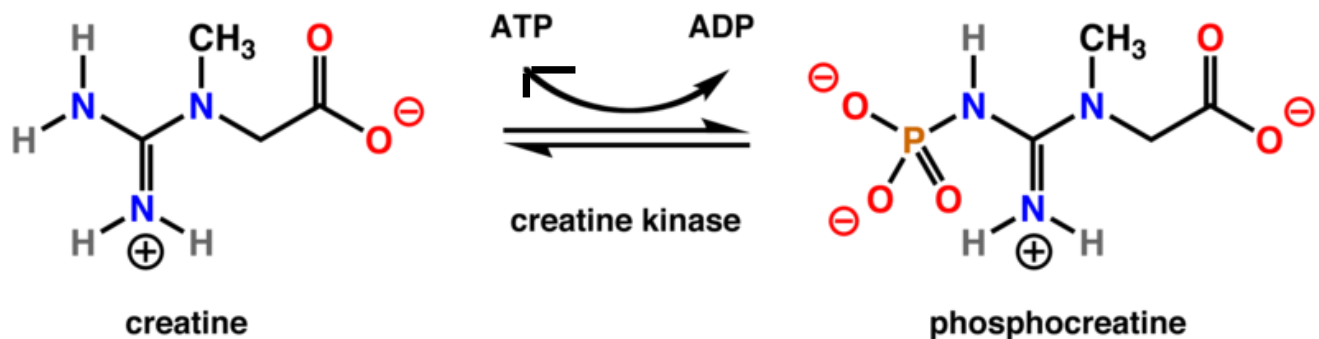


Figure 4. The recycling of ATP via creatine kinase.¹⁰

The next important step in creatine research was identifying the phosphorylated version of the molecule which is responsible for many of the ergogenic effects brought about from creatine supplementation. [Dietary creatine gets converted into phosphocreatine. Once in the phosphorylated state, it works by donating "high" energy phosphate groups to other molecules. For instance, it assists anaerobic athletes by converting ADP (adenosine di-phosphate) into ATP (adenosine tri-phosphate); the former which is

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believed to induce fatigue, the latter which supplies the energy for contraction.¹¹ Refer to Figure 4.]

The first research group to note the presence of a phosphorylated version of creatine was Phillip and Grace Eggleton, researchers at University College, London.¹² In their 1927 paper, they describe coming across an unidentifiable phosphorylated molecule while studying the gastrocnemius (calf) muscle of frogs. Not being exactly sure what it was, they simply identified it as a "phosphagen." They hypothesized that phosphagen molecules might be "*a phosphoric ester of glycogen*" or a precursor to lactic acid. Shortly thereafter, Harvard researchers Cyrus Fiske and Yellapragada Subbarow discovered that "phosphagens" were in fact phosphocreatine molecules.¹³ Additionally, Fisk and Subbarow noted that upon continuous muscular contractions, the amount of phosphocreatine decreased in muscles.

Although Fiske and Subbarow demonstrated that phosphocreatine content decreased in contracting muscles, the exact role that this molecule played in the process wasn't fully understood till the late 1920's/ 1930's. It was at this time that ground breaking research was being performed by Otto Fritz Meyerhof and his research team at the Kaiser Wilhelm Institute in Dahlem, Berlin. Amongst other discoveries, they found that phosphocreatine played a key role in resynthesizing ATP molecules.¹³

During the 1920's and 30's, creatine research was pushing forward in eastern bloc countries as well. In his review, *State-sponsored research on creatine supplements and blood doping in elite Soviet sport*, Kalinski notes that Olexander Palladin was also doing extensive research on creatine during these years at the Ukrainian Academy of Sciences.¹⁵ Palladin's work showed that creatine content differed between fast and slow twitch muscles. Additionally his research team found that exercise increased the amount of creatine and phosphocreatine present within muscle cells.

A look into the potential ergogenic role of creatine in elite athletic performance was taken up by the USSR during the 1970's and 80's.¹⁵ Early studies showed that supplementing with 125 mg/kg of body weight per day increased sprint performance by 1% in the 100 meter dash and 1.7% in the 200 meter dash. These discoveries led to the routine use of creatine by USSR national athletes. In their 1990 book, *Soviet Training and Recovery Methods*, Dr. Ben Tabachnik, the former head of the scientific research group for Soviet sprinters (track and field), and Rick Brunner note that creatine was "*one of the most popular substances in Soviet sport pharmacology*" and was particularly effective when stacked with amino acids.¹⁶

With respect to creatine use for ergogenic purposes, 1992 turned out to be a banner year on multiple fronts. Following the Barcelona Olympics that summer, various high profile British sprint and power athletes stated that creatine supplementation helped their performance.¹⁷ Additionally, a research team led by Roger C. Harris, performed the

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first contemporary study on creatine supplementation in western literature.¹⁸ In it, the research team demonstrated that oral creatine supplementation significantly increased muscular creatine and phosphocreatine stores in healthy subjects. Shortly thereafter a supplement company founded by Anthony Almada and Ed Byrd produced the first commercial creatine supplement (in the USA).

The monumental events that took place during 1992-93 ushered in a "new era" for creatine. During the 20 years that have elapsed since then, numerous studies as well as infinite amount of personal anecdotes have attested to the "magic" of creatine supplementation; thus, making it a favorite for anaerobic athletes around the world.

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That wraps up this CasePerformance newsletter. Thanks for being a part of the team. We look forward to hearing your feedback on anything and everything so drop us a note on [FACEBOOK](#).

And as always... Train smart, train hard and leave the excuses to someone else!

Sincerely,

[The CasePerformance Team](#)