

## **Resveratrol and Red Wine Grape Polyphenols: *Nature's Longevity and Healing Compounds***



### **Mark Juliano**

President

Vinomis Laboratories

[www.Vinomis.com](http://www.Vinomis.com)

September, 2009

**Mark Juliano** is an Adjunct Professor at Carnegie Mellon University, and President, CEO, and Founder of Vinomis Laboratories, a nutraceutical company that manufactures supplements based on Resveratrol, Quercetin and Red Wine Grape extracts. He holds a BSE from Princeton, and an MBA from Stanford, and has authored numerous scientific and technical papers.

**Table of Contents** **Page**

---

Introduction	3
Calorie Restriction and Longevity	3
Resveratrol Dosage	5
Types of Resveratrol Supplements	7
Recommendations for Supplements	8
Conclusion	10

**Appendix**

---

Resveratrol Safety	11
Human Clinical Trials	12
Consumer Testimonials	13

## **Introduction**

Age eventually conquers all. As our bodies age, we undergo a significant transformation in cell structure, bone and muscle mass, hormones, immunities, and cognitive abilities. This deterioration is compounded by cumulative stress, and the potential for heart disease, diabetes, neurological disorders such as Alzheimer's, and cancer. All in all, it is not a pretty picture.

Yet, some people do age better than others, and live long healthy lives. A growing number of people are living into their nineties and even past the century mark. While heredity and DNA markers surely contribute to our eventual lifespan, scientists have proven over decades of research that in addition to exercise and mental activity, diet and nutraceutical supplementation can not only prolong life, but can also allow us to lead healthier lives. Proof that people have accepted these discoveries is evidenced by the explosive growth in health foods, organic foods, and nutritional supplements.



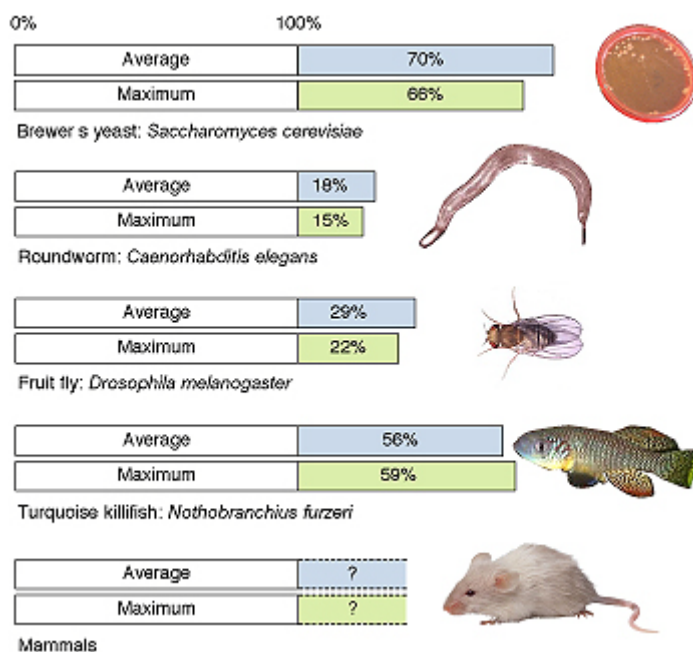
## **Calorie Restriction and Longevity**

Researchers have known since the 1930s that organisms, animals, and even humans can live longer, healthier lives through [calorie restriction](#), which activates “survival genes” later discovered to be *sirtuin* (SIRT) genes and enzymes. Unfortunately, in order to achieve these significant increases in lifespan, humans would need to eat a near-starvation diet, which is not only virtually impossible, but unpleasant and frankly dangerous. Decades ago, scientists also discovered the [French Paradox](#), and determined that despite a high fat diet, the French lived longer and healthier, and have concluded that the causes had largely to do with their daily dose of red wine.

Most recently, discoveries by Dr. Joseph Baur and Dr. David Sinclair at Harvard Medical School in 2006, coupled with many follow-on university and research laboratory studies (including University of Pennsylvania, Marywood University, Yale, University of Michigan, University of Connecticut, Wake Forest, Oregon State, University of South Carolina, Ohio State, and many more), have shown that there are natural plant extracts that can activate sirtuins and mimic the longevity effects of calorie restriction, without having to dramatically restrict calorie intake.

These natural plant extracts were discovered after investigating over 20,000 compounds. Nineteen (19) of these compounds were identified, and 17 (all polyphenols with strong [antioxidant](#) properties) are found in red wine grapes, including [Resveratrol](#) and [Quercetin](#). Furthermore, it has been proven that a combination of these polyphenols is more effective, remains in the blood stream longer (bioavailability), and stays in contact with cells longer after being ingested.

Studies on fish, mice, worms, and flies have shown that lifespan, and healthy lifespan, can be prolonged by 56%, 25%, 18%, and 29% respectively using Resveratrol and a normal calorie diet. Even more impressive is that these studies have shown that 1) animals also lived healthier lives due to the prevention and/or delay of the onset of age-related diseases such as diabetes, neurological disorders, heart disease, and cancer, and 2) even obese animals, which would normally experience many problems and a shortened lifespan, lived normal-aged lives.



[Resveratrol](#) and red grape polyphenols are “all the rage” these days, and demand is growing in leaps and bounds due to its inclusion in supplements, foods, drinks, etc. However, it should again be noted that while Resveratrol has the highest SIRT gene activation, other polyphenols found in red wine grapes such as Quercetin and Catechins, are not far behind, and work in concert with Resveratrol.

## **Latest Medical Research**

Extensive medical research has been conducted by university professors, pharmaceutical companies, and nutraceutical companies on the medical benefits of red wine extracts, Quercetin, and Resveratrol ingredients.

These studies have shown many health benefits including: anti-inflammatory, blood thinning and reduced risk for artery clotting (anti-coagulant), normalization of blood sugar (for diabetes), increase mental sharpness and memory, increase in strength and endurance, removal of amyloid-beta proteins that may cause brain damage associated with Alzheimer's, and even the inhibition of many types of cancers (lung, colon, skin, liver and pancreatic).

Can it really be that all of these age-related issues may be dealt with using simply plant polyphenols compounds? Quite possibly, the answer is yes.

## **Resveratrol Dosage**

The dosage associated with nutraceuticals and pharmaceuticals is always an important consideration. Dosage contributes to both the efficacy and the potential-side effects. The best way, of course, to determine the dosage is through human clinical trials, though other methods are also used in laboratories.

In order to get a general idea of dosage, scientists first conduct trials on animals – typically mice, rats, primates, etc. For an 80 kg (176 lb) person, the 200-400mg/kg of body weight amount was used in Auwerx's mouse study. Another researcher at Harvard used 5-30mg/kg. Subscribing to the “allometric scaling” by body surface area method, you divide by 12 to go from mouse to human, yielding ~150mg to ~2,000mg of Resveratrol as the respective human-equivalent doses.

In human studies, the first thing to test for is potential toxicity. [Human clinical trials](#) have been shown to have few if any side effects at very high dosages, and no toxicity even at extremely high dosages of 5g (5,000mg). Sirtris Pharmaceuticals is currently conducting human trials with dosages in this range.

In 2006, Xenomis, LLC. conducted a study on [humans](#) in conjunction with Dr. James Smoliga of Marywood University using the formulation:

- 400mg [98% pure Resveratrol](#)
- 400mg [Red Wine Grape extract](#)
- 100mg [Quercetin](#)

Red Wine Grape extract and Quercetin were added to increase the polyphenol level, and to improve the bioavailability of Resveratrol. This is the same combination of ingredients found in [Vindure 900 by Vinomis Laboratories](#).

The Smoliga study showed significant improvements in energy level, [strength](#), [endurance](#), and verbal memory. A second study is underway with 400mg of pure red wine grape extract.

In a recent email exchange, Dr. Smoliga commented on Resveratrol dosage as follows:

“There are one or two articles examining the pharmacokinetics of dosage (combined with safety) which found it to be safe in up to 5g [5,000mg] doses. It appears that with dosages in the 400mg range, it reaches a peak and then subsides, whereas in the 1g (1,000mg) or more range, higher blood concentrations are maintained. However, I believe it is not yet certain which would be more advantageous – to have a rise and fall in Resveratrol concentration or a steady level of Resveratrol. Based on some of the physiology, I would think a rise and fall mechanism would actually be more beneficial, and if this is the case the 400mg dosage should work quite nicely.”

The higher dosage nutraceutical products naturally cost more and contain 400 – 500 mg of Resveratrol, as well as the addition of red wine grape polyphenols, Quercetin, etc. These products generally use the highest quality [98% pure Resveratrol](#) (be sure the purity is on the [Supplement Label](#)). NOTE: There are some products that *seem* to offer dosages in the 800 – 1000 mg range, but they are simply a two-tablet/capsule dosage.

The ingredient cost of this high quantity and high quality Resveratrol is \$600 – \$800 per kg! (or \$300 - \$400 per pound) So naturally, these products carry a higher price, because the ingredients cost more.



Whatever you buy, make sure to read the product [Supplement Facts](#). It's the only way to be sure what you're getting. Please remember, if you can't find the dosage on the company's website or label, I sincerely recommend avoiding that supplement. Here's an example Supplement Facts from [Vindure 900](#).

Hundreds of disease-preventing, anti-aging compounds including Resveratrol have been found in red wine. Vinomis packs the Resveratrol-equivalent of over 100 bottles of red wine (without the alcohol or calories) into each Vindure 900 tablet. Visit our website for the latest research on the health benefits of Resveratrol and many other polyphenols extracted from red wine grapes.

*Vindure™ is based upon an exclusive licensing agreement with Harvard Medical School for proprietary science.*

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.



**VINDURE™ 900**  
Dietary Supplement - 30 Tablets

*A unique blend of Vinomis™ Red Wine Grape Extract, Pure Resveratrol, and Quercetin, to promote health and longevity.*

Suggested use: One tablet per day with food

<b>Supplement Facts</b>	
Serving Size: 1 Tablet	
Amount Per Tablet	%DV
Vinomis™ Red Wine Grape Extract with over 90% Polyphenols**	400mg *
98% Pure Resveratrol	400mg *
Quercetin	100mg *
<small>* Daily value not established</small>	

Other Ingredients: Cellulose, Titanium Dioxide (Natural Mineral Whitener) and Chlorophyll Coloring from vegetable sources.  
\*\*Contains PowerGrape® from Naturex

**Warning:** Keep out of reach of children. Please consult your healthcare provider prior to use if you are pregnant, nursing, or taking any medications. Do not use if you are allergic to any of the ingredients. Do not use this product if the safety seal has been tampered with. Store at room temperature. Keep bottle tightly capped. Protect from moisture.

Manufactured by:  
Vinomis Laboratories  
210 Orchard Place • Sewickley, PA 15143  
www.Vinomis.com

## Types of Resveratrol Products

I recently had a long discussion with a general manager from a major national nutritional supplement store chain, who is interested in selling Vindure 900. The chain currently sells different varieties of Resveratrol-based products, and he informed me as to why he sells different products. Overall, he saw four (4) different categories.

First, he gave me a warning for consumers: “If the product and/or website doesn’t have a Supplement Facts listing the number of milligrams (mg) of Resveratrol, the purity (50%, 98%, etc.), we don’t sell it.”

Here are the four (4) types of Resveratrol supplements we discussed.

### **1. Polyphenol and Antioxidant Cocktails**

Products with many different polyphenols and antioxidants, which include a small amount of Resveratrol (~50mg) in their combination blends. They may also include Acai and other berry extracts, cocoa and green tea extracts, etc., all in low dosages. These are akin to multivitamins with an emphasis on certain ingredients with similar properties (i.e. antioxidants), and do not provide all the benefits of Resveratrol because of the low dosages. They may be perfectly healthy for you, but you’d be better off taking a higher quality Resveratrol supplement, and a strong, high-quality multi-vitamin.

### **2. Low level Resveratrol “Vitamins”**

Products that contain Resveratrol, but at low dosages (50 - 125mg), and generally use 50% purity Resveratrol. These are akin to taking a basic minimum dosage vitamin C tablet. They have some health effects, but overall very minor health benefits. Also, the “other 50%” are impurities such as Emodin, which can cause diarrhea at a dosage as low as 10mg per day. Examples of these are ResV, Resvert, and “house brand” products at

suppliers such as GNC, Rite Aid, etc. If you're interested in taking this type of supplement, I highly recommend taking the brand-name ones.

Beware that some of these types of products are used in Resveratrol scams, and there is even an outstanding lawsuit filed by Ms. Oprah Winfrey and Dr. Mehmet Oz against companies who are allegedly misusing their names, and falsely claiming endorsements in their marketing programs. These products put very small amounts of Resveratrol of low quality, and incredibly charge as much as double the cost of the quality brands. Unfortunately, these scams hurt all high quality manufacturers. The scams hide the dosages, and even hide the price (offering only a free bottle) and get consumers to sign up for a subscription, enter their credit card, and make it virtually impossible to cancel. One of these companies even sells the same product with dozens of different brand names, and has many web pages that talk about the scams themselves, and naturally claim they're the only brand that doesn't scam! It's a shame that these people can't use their talent to make an honest buck.

### **3. High Level Pure Resveratrol**

These products generally contain 300-500mg of high-quality 98%+ pure trans-Resveratrol (again, check the Supplement Facts). Most of these products are expensive, niche products. They provide the health benefits, but only from Resveratrol (remember, 17 different compounds were found to activate SIRT genes), and do not include the bioavailability and activators from red wine polyphenols and Quercetin, which keep the Resveratrol in the blood stream longer. Examples of these products are Biotivia Transmax, and RevGenetics.



### **4. Resveratrol Formulations**

These products contain 300-500mg of high-quality 98%+ pure trans-Resveratrol in combination with other red wine grape polyphenols, Quercetin, etc., which add their own polyphenol health benefits, and contribute to the bioavailability (blood stream availability) of the Resveratrol. These products will have the highest amount of health benefits. [Vindure 900](#) and Resmedin are two of these products.

## **Red Wine Polyphenols and Resveratrol Supplement Recommendations**

So which type of Resveratrol product should you take? There are hundreds of Resveratrol and red wine grape polyphenol supplements on the market today, but it should be remembered that they are not all created equal. Three (3) things are very important to consider when choosing a red wine grape, or Resveratrol-containing supplement.

1. **Mixed-polyphenols.** Resveratrol supplements should also include a healthy dose of Quercetin and red wine grape extracts (remember again that 17 polyphenols in red wine grapes were found to activate SIRT survival genes).

According to Dr. Joseph Maroon in an article published by Bottom Line Health, in September 2009 ([The Simple Supplement that May Prevent killer Diseases – All about resveratrol](#)), “because Resveratrol absorption is thought to be enhanced when combined with other natural polyphenols, a mixed-polyphenol supplement is best.” [Dr. Maroon is a professor of neurological surgery at the University of Pittsburgh Medical Center (UPMC) and author of [The Longevity Factor: How Resveratrol and Red Wine Activate Genes for a Longer and Healthier Life](#)]

2. **High Resveratrol Dosage.** Scientific studies in both animals and humans have shown that a high Resveratrol dosage is required to activate the SIRT genes and produce sirtuins. A daily dosage of 300-500mg is recommended from data in both human studies, and animal studies (which calculate equivalent human dosages). Furthermore, studies reviewed by the FDA have shown no toxicity to humans even at dosages in the 5,000-10,000mg range and beyond.

Dr. James Smoliga studied humans in 2006, giving them a dosage of 400mg of Resveratrol along with red wine grape extracts. His studies showed a marked improvement in strength, memory, and endurance.

3. **Resveratrol Quality.** Not all Resveratrol ingredients are the same. The best Resveratrol is from *polygonum cuspidatum* (Japanese Knotweed plant), and is at



least 98% pure trans-Resveratrol. Many products use only 20% or 50% purity ingredients. Supplements claims of “pure resveratrol” are meaningless without the percentage of purity. If the label doesn't list the purity, you simply don't know what you're getting. Read the supplement labels and website specifications of products.

Equally important, the nutraceutical supplement should be manufactured in a processing plant that has important certifications including FDA, TGA, and GMP

(Good Manufacturing Practices), which ensure the supplement contains no contaminants and undergoes extensive testing. Again, check the websites.



### Conclusion

Surely, taking nutraceutical supplements will not in and of itself guarantee a long healthy life. In addition to supplements, doctors highly recommend that people: 1) maintain a balanced diet, 2) avoid certain poor-quality foods (i.e. trans fats, fast foods, etc.), 3) maintain an average weight and exercise, 4) avoid smoking and excessive alcohol consumption, 5) take a daily high quality multivitamin, and 6) eat foods rich in antioxidant polyphenols including red wine, grape juice, dark chocolate, green tea, blueberries and fish oil supplements.

Medical science has grown exponentially since the early 1900s. During that same period, the average lifespan of humans has increased an average of 3 months each year, or a total of 30 years! Current advancements in nutrition have spawned a large nutraceutical supplement industry, and ingredients such as Resveratrol, Quercetin, and red wine grape polyphenols may be key ingredients to continued advancements in longevity research leading people to live longer, and live longer healthier.

## APPENDIX

### Resveratrol and Red Wine Grape Extract Safety

When polyphenols including [Resveratrol](#), [Quercetin](#), and [red wine grape extracts](#) are concentrated into a daily tablet equivalent to over 100 Bottles of red wine (400 – 1000 mg) or more, there is one immediate question:

#### Is It Safe?

Indeed, scientists who study these nutraceutical supplements have, and are continuing to use similar scientific research techniques to those used in the pharmaceutical industry to evaluate their potential health benefits and safety.

In 2002, the National Institute of Environmental Health Sciences commissioned a report entitled, “[Trans-resveratrol Review of Toxicological Literature](#).” A review of more than 200 referenced scientific studies were included, and the report stated that there were no reported adverse effects from [Resveratrol](#) on humans.

Animal studies have used the human-equivalent of over 1,000 mg (10 mg/kg of bodyweight) of Resveratrol, and have shown no toxic effects. Massive dosage studies were also performed on animals. “The no observed adverse affect level (NOAEL) was 300 mg/kg/day,” which would be a human equivalent dosage of 30,000 mg or 10 – 100 times the maximum concentrations contained in human high-concentration oral nutraceutical dosages, such as in [Vinomis’ Vindure 900](#) and others.

Human studies also confirm the safety of Resveratrol in highly concentrated forms. Studies including those at Marywood University, University of Leicester (UK) and University of Michigan, etc. all found no significant side effects and no evidence of toxicity.

#### Manufacturing Safety and Quality

Many nutraceutical manufacturing plants are certified by the FDA (US Food and Drug Administration), TGA (Australia’s FDA Certification), GMP (Good Manufacturing Practices), USP (US Pharmacopeia), etc. (Be sure to check company’s websites for such information).

According to Dr. Joseph Maroon, in his recent book, [The Longevity Factor, How Resveratrol and Red Wine Activate Genes for a Longer and Healthier Life](#) (page 198)

“Having seen both a pharmaceutical manufacturing plant as a board member of

Mylan Laboratories, one of the largest generic drug manufacturers in the world, and a dietary supplement facility used by General Nutrition Corporation (GNC), with whom I participate as a medical advisor, I am assured that the manufacturing standards are virtually identical.”

*[It should be noted that many high quality nutraceutical supplement companies manufacture at the GNC facility ([Nutra Manufacturing](#)) including [Vinomis Laboratories](#), with its [Vindure 900](#) product.]*

*[NOTE: Of course, any side-effects experienced as a result of taking Resveratrol, Quercetin, red wine grape extracts, or any other nutraceutical supplements should be reported to the manufacturer, and to your doctor.]*

### **Human Studies and Consumer Testimonials**

The most frequent questions we receive from our potential users of red wine grape extracts (polyphenols), Resveratrol and Quercetin, are related to results in humans. We consider two important means of obtaining these answers: 1) human clinical trials, and 2) consumer testimonials. While human studies are of the utmost importance, people still put a great deal of faith in actual results from “real people” who have had positive results from taking any supplement.

### **Human Clinical Trials**

There have been a number of clinical trials at leading universities over the most recent decade conducted on human subjects for nutraceutical supplements based on Resveratrol and red wine grape polyphenols, including Quercetin. While there have been countless animal studies conducted on these substances and compounds, naturally people tend to put more faith in actual human studies – though both human and animal studies are quite relevant:

**Grape extract increases energy production in cells** - In a 2006 study, a group of athletes in Belgium was given 400mg of Bordeaux grape extract per day. Results included a 14% increase in lipophile antioxidant capacity, a 60% increase in vitamin C, and a 96% increase in ubiquione, an antioxidant involved in energy production in cells.

**Grape extract improves athletic performance and recovery.** A group of twenty athletes, aged between 18 and 34 took part in the study in 2005, a collaboration between researchers from Avantage Nutrition and the French Agronomic Research Institute (INRA). The athletes were given 400mg of Bordeaux extract per day. Results indicate that the grape extract could reduce the risk of muscular damage, improve the explosive

sports performance during effort, improve recovery capacity after effort, and improve the antioxidant status in athletes.

**Red wine grape extract and Resveratrol combination benefits heart and brain.** In 2006, 54 sedentary adults were given a mixture of 400mg red wine grape extract, 400mg of Resveratrol, and 100mg of Quercetin. Results included improved (decreased) submaximal heart rate, improved neurocognitive performance, and improved memory. By Dr. James Smoliga of Marywood University.

**Grape extract reduces heart disease risk.** Conducted by UC Davis cardiovascular researchers in 2006, the study was the first human clinical trial to assess the effect of grape extract on people with metabolic syndrome, a combination of risk factors that increase the risk for heart disease, including high blood pressure, excess abdominal body weight, high blood cholesterol fats and high blood sugar. In 24 patients, the extract lowered blood pressure by 8-12 points.

**Grape extract reduces incidence of heart attacks.** A study at the University of Wisconsin of 15 adults with coronary artery disease discovered that the flavenoids in red grapes may prevent cardiovascular events. A 14 day supplementation improved endothelial function and reduced the susceptibility of LDL cholesterol to oxidation.

**Beneficial Effects of Quercetin.** At the University of Western Australia, in Perth, a study using 200mg of Quercetin found that dietary flavonoids may improve endothelial function and ultimately lead to beneficial cardiovascular effects.

**Resveratrol may block colon cancer.** Dr. Randall Holcombe, director of clinical research at the Cancer Center at UC Irvine, followed up on previous in vitro studies showing that Resveratrol blocks a cellular signaling pathway known as the WNT pathway. The WNT pathway has been linked to more than 85 percent of sporadic colon cancers, which is the most common form of colon cancer.

**Quercetin prevents illness in stressed subjects.** In 2007 researchers at Appalachian State University proved in a double blind DARPA funded study that Quercetin is able to reduce illness and maintain mental performance in physically stressed test subjects.

### **Consumer Testimonials**

Equally important are real-world testimonials from people who have taken nutraceutical supplements. While these studies are by no means scientific in the sense of including double-blind studies, advanced statistical analysis, in-depth blood analysis, etc., they are nonetheless important and relevant to the overall scientific body-of-knowledge about

Resveratrol, Quercetin and red wine grape extracts. Below are some of the testimonials reported by people taking Vindure 900 (400mg Resveratrol, 400mg Vinomis™ red wine grape extract, and 100mg Quercetin).

These anecdotal testimonials were taken from blog comments, forum comments, and phone interviews, and are all in the words of the consumers themselves. What is most important is the similarity and consistency of results reported after taking the supplements for 2-to-6 weeks. In addition, these results are consistent with the human trials, and biological laboratory analysis in human cells and animal studies:

- Increased endurance
- Increased energy level and mood
- Weight loss
- Lower blood pressure
- Lower blood sugar levels

**“My recovery rate is surprising everyone.” - Lynn G., Mammoth Lakes, CA**

“Four weeks ago, I had a lung removed at Stanford Medical Center. Coming back up to 8000 feet from sea level always makes breathing more difficult, but with one lung, it's a lot worse. Since starting on Vindure a few weeks ago, my strength has increased remarkably, and my recovery rate is surprising everyone. I'm now out walking again, and hope to resume hiking in the Sierras soon.”

**“My wife said to me – what’s with you?” - Harvey K., Atlanta, GA**

“After 30 days on Vindure, I am full of energy, and waking up an hour earlier. That extra hour a day of activity has translated to an 8 lb. weight loss. This stuff really works! I'm having my blood work done next month and looking forward to the results.”

**“My blood pressure and blood sugar are finally under control.” - Amon T., Washington, PA**

“My doctor recommended Vindure 900. After one month, my blood pressure and sugar are finally under control.”

**“Vindure has nearly doubled my endurance.” - Brian D., Waynesburg, PA**

“I am a 45 year old triathlete, and alternate my training between biking, swimming, and running. In April, I participated in a 48 mile bike race. By the end of the race, I was suffering from severe cramping and muscle lock up. In May, I began taking Vindure, and after only three weeks, the results I experienced were remarkable. While biking, my heart rate is lower, the cramps have nearly disappeared, and my recovery time is faster. In June, I participated in the MS150 event, and cycled 88 miles, the farthest I have ever achieved. I experienced virtually no cramping despite going twice as far, and my

recovery time was dramatically reduced. I heartily recommend Vindure to every athlete!"

**"I've lost 12 lbs in 3-1/2 Weeks." - Ed Z., Clarksville, PA**

"I started taking Vindure about 3-1/2 weeks ago, and I'm down 12 lbs. I have found that as long as I don't eat out of habit, and only eat when I'm hungry, I will continue to shed pounds, and Vindure has definitely reduced my appetite. My energy level is up, too!"

**"So far I've lost 7 lbs in just 4 weeks, I'm happy with that." – Marci S., Washington, PA**

"I started Weight Watchers (WW) a month ago. I've been taking Vindure 900 for two months. I'm following WW by the letter which I've not been able to do in the past due to hunger issues. My appetite has always been an issue with my weight increases and decreases. I've been able to control my eating because the Vindure 900 is decreasing that "have to eat" feeling I get."

**"I as well have been taking Vindure for about three weeks now - I cannot imagine ever not taking it again." – Tao, New York.**

"I have more energy, I feel that I have lost a little weight and excited about losing more. However the best benefit is that I suffer from low-blood sugar and when I don't have time to eat - my blood sugar plummets. These episodes would happen a few times a week as well as I would have to be aware of eating and drinking the right things to avoid the issues. For three weeks, since I have been taking the Vindure - not one low blood sugar episode!"