

## Powerful Enzyme Prevents Heart Attack and Stroke

### ***Cardiovascular disease is the leading cause of death for men and women***

According to the U.S. Centers for Disease Control, each year about 700,000 people suffer a stroke, the leading cause of serious, long-term disability in the United States. The American Heart Association estimates that nearly every year, about 1 million Americans will suffer a heart attack. About 700,000 of these will be first-time heart attack sufferers, while approximately 500,000 will be people who have previously had a heart attack. It all adds up to this: contrary to popular belief, heart attack and stroke account for more deaths than all cancers and injuries combined, and one out of every 2.4 deaths is attributable to cardiovascular disease. How is that possible in the richest, most highly educated country on earth?

Most of us all get too little exercise, accumulate too much stress, and eat a poor diet laden with saturated fat, refined sugar and too little fiber. Add to that list the habit of smoking and the answer is quite clear. (Although there is a considerably higher prevalence of cigarette smoking in Japan than in the U.S., mortality from CVD among men in Japan is still less than half of that in the U.S.) And to make matters worse, a study published in *The Journal of the American Medical Association* (3/6/2002) indicates that exposure to air pollution can cause some 10,000 fatal heart attacks a year in the U.S.!

Mainstream health care has banded together with the pharmaceutical industry to offer a temporary quick fix for the number one killer of our time. Statin drugs reduce cholesterol. Aspirin and warfarin thin the blood. Anti-hypertension medications reduce blood pressure. Bypass surgery, and angioplasty clear the arteries. Essentially, they all help prolong the life of a patient with ***Cardiovascular Disease (CVD)***. But none of these drugs or procedures is without risk or side effects. Well, we've got good news for you!

CVD risk can be greatly reduced by modifying lifestyle and adding nutritional supplements proven to support cardiovascular health. Most of us are aware that eating a lighter, more balanced diet, quitting tobacco and exercising regularly are enough to head off most cases of heart disease before they ever happen. Now there's something else you can do.

Nattokinase has been shown to support normal blood pressure, dissolve blood clots and prevent them from forming in the first place!

## **What Is Nattokinase?**

*Nattokinase* is a potent *fibrinolytic* (anti-clotting) enzyme complex extracted and highly purified from a traditional Japanese food called *Natto*. Natto is a fermented soybean that has been used in Japanese for more than 1,000 years for its popular taste, and as a folk remedy for heart and vascular diseases. Research has shown that Nattokinase supports the body in breaking up and dissolving the unhealthy coagulation of blood. In fact, it has been shown to have four times greater fibrinolytic activity than plasmin.<sup>4</sup>

## **How is it made?**

Natto is produced by a fermentation process by adding the bacteria *Bacillus subtilis* to boiled soybeans. The resulting Nattokinase enzyme is produced when *Bacillus subtilis* acts on the soybeans. While other soy foods contain enzymes, it is only the natto preparation that contains the specific Nattokinase enzyme. How was Nattokinase discovered? Japanese researcher Dr. Hiroyuki Sumi had spent many years searching for a natural thrombolytic agent that could successfully dissolve blood clots associated with heart attacks and stroke. Finally in 1980, after testing more than 173 natural foods, Sumi found what he was looking for.

Natto was dropped onto an artificial thrombus (fibrin) in a petri dish and allowed to stand at 37°C (approximately body temperature). Over the next 18 hours, the thrombus around the natto completely dissolved! Sumi named the newly discovered enzyme Nattokinase, which means "enzyme in natto." Dr. Sumi remarked that Nattokinase showed "a potency matched by no other enzyme."<sup>5, 6</sup>

## **How blood clots form**

Blood clotting is a natural process that allows the blood to thicken and form a clot or thrombus of blood cells. When a blood vessel is injured, platelets clump together and strands of the blood protein fibrin glue them together in order to stop the bleeding. Eventually the clot helps form a protective scab over a healing wound. If our bodies did not have the ability to clot blood, we would bleed to death after even a minor cut, which was often the case with hemophiliacs.

But sometimes blood clots form even when a person has not been wounded or cut. Although most blood clots naturally dissolve on their own without complications, there are two situations in which they can wreak havoc before they are reabsorbed by the body.

1. A thrombus can form in an artery which could block the flow of blood and cut off oxygen supply. This can trigger a heart attack and result in damage, destruction (infarction), or even death of the tissues (necrosis) in the heart. In the brain, blood clots also block blood and oxygen from reaching necessary areas, which can result in senility and/or stroke.<sup>5</sup>

2. A piece of the blood clot could form in one of the heart's chambers and then travel through the bloodstream, lodging in either an organ or an artery and cutting off the blood supply from that point, causing an embolism. An embolism is especially dangerous when it ends up in a lung.

The most common cause of these *emboli* are blood clots that form during atrial fibrillation. This is a disorder found in about 2 million Americans. In atrial fibrillation the heart's two small upper chambers (the atria) quiver instead of beating effectively. Some blood isn't pumped completely out of them when the heart beats, so it pools and clots. When a blood clot enters the circulation and lodges in a narrowed artery of the brain, a stroke occurs.

### **The chances of developing thrombi increase as we age**

Although the human body produces more than 20 enzymes for making blood clots, it produces only one enzyme—*plasmin*—for dissolving them. The problem is, as we age the production of plasmin slows down, making the blood more prone to coagulation. And since plasmin is produced by endothelial cells throughout the body, it is possible to develop blood clots anywhere in the body.

To make matters worse, fibrinogen levels rise as we age.<sup>7</sup> And high levels of fibrinogen levels usually lead to increased platelet aggregation, blood clots, and eventually heart attack or stroke. In fact, high fibrinogen levels are considered a more dangerous risk factor for heart attack and stroke than high cholesterol. A study of 2,116 men found that those with high LDL (bad) cholesterol but low fibrinogen levels had only one sixth the risk for heart attack than the men with low LDL and high fibrinogen.<sup>8</sup>

### **How does it work**

Nattokinase enhances the body's natural ability to fight blood clots, and has an advantage over blood thinners because it has a prolonged effect without side effects.

Nattokinase:

- Supports normal blood pressure
- Prevents blood clots from forming
- Dissolves existing blood clots
- Dissolves fibrin
- Enhances the body's production of plasmin and other clot-dissolving agents, including *urokinase*

### **Research studies**

Nattokinase has been the subject of 17 studies, including two small human trials. In 1990, Dr. Sumi's research team published a series of studies demonstrating the fibrinolytic effects of Nattokinase.<sup>9</sup> Here are some of them:

## **Dissolves blood clots**

Researchers from JCR Pharmaceuticals, Oklahoma State University, and Miyazaki Medical College, tested Nattokinase on 12 healthy Japanese volunteers (6 men and 6 women, between the ages of 21 and 55). The researchers gave the volunteers 7 ounces of natto (the food) before breakfast, and then tracked fibrinolytic activity through a series of blood plasma tests.

In one test, a blood sample was taken and a thrombus (clot) was artificially induced. The amount of time needed to dissolve the clot was cut in half within 2 hours of treatment, compared to the control group. Additionally, the volunteers retained an enhanced ability to dissolve blood clots for up to 8 hours.<sup>9</sup>

Dr. Sumi's team also induced blood clots in a major leg vein in male dogs that had been given either four capsules of Nattokinase (250 mg per capsule) or four placebo capsules. Angiograms (x-rays of blood vessels) showed that the blood clots in the dogs that received Nattokinase had completely dissolved within 5 hours of treatment, and that normal blood circulation had been restored. Blood clots in the dogs who received the placebo showed no sign of dissolving 18 hours after the treatment.<sup>9</sup>

Researchers from Biotechnology Research Laboratories and JCR Pharmaceuticals Co. of Kobe, Japan, tested Nattokinase's ability to dissolve a blood clot in the carotid arteries of rats. Animals treated with Nattokinase regained 62 percent of blood flow, whereas those treated with plasmin regained just 15.8 percent of blood flow.<sup>1,9</sup>

In another laboratory study, endothelial damage was induced in the femoral arteries of rats that had been given Nattokinase. In normal circumstances, a thickening of the artery walls and blood clotting would occur, but they were both suppressed because of Nattokinase's fibrinolytic activity.<sup>10</sup>

## **Helps reduce high blood pressure**

Human volunteers with high blood pressure were given 30 grams of natto extract (equivalent to 7 ounces of natto food), orally for 4 consecutive days. In 4 out of 5 volunteers, the systolic blood pressure decreased on average from 173.8 to 154.8. Diastolic blood pressure decreased on average from 101.0 to 91.2. This data represents about a 10.9 percent drop in systolic blood pressure and a 9.7 percent drop in diastolic blood pressure.<sup>5,9,11</sup>

Wistar rats that were given natto extract showed a significant drop in systolic blood pressure also, from an average of 166 to 145 in just two hours, which further decreased to an average of 144 in 3 hours. This data represents an approximate 12.7 percent drop in systolic blood pressure also, from an average of 166 to 145 in just two hours, which further decreased to an average of 144 in three hours. This data represents an approximate 12.7 percent drop in systolic blood pressure within two hours.<sup>5,9,11</sup>

These tests all indicate that Nattokinase generates a heightened ability in the body to dissolve blood clots.

### **Restores blood circulation**

This is one of the most dramatic, documented stories about the effects of Nattokinase. A 58-year-old man had a blood clot in the retina of his right eye that caused fluid buildup and bleeding. He started losing his vision in that eye and was admitted to a university hospital, where researchers prescribed a 3-ounce dose of natto to be taken before bed every night, in order to get the benefit of Nattokinase.

The man's bleeding completely stopped by the tenth day, and by the 20th day, his vision returned and he was released from the hospital. He continued to eat natto twice a week. When he had a retinal angiogram two months later, it showed that the blood clot was completely gone.<sup>12</sup>

### **Is Nattokinase for everyone?**

This soy extract is considered extremely useful for those wanting a safe, drugless, non-aspirin alternative for healthy blood flow. Nattokinase is also a safe alternative for those who are off their feet because of illness, injury (including paralysis), or surgery.

### **Excellent for periods of inactivity**

In the past few years, medical professionals began alerting the public about the increasing evidence that long flights and car trips put people at risk for deep vein thrombosis (DVT)—a blood clot that develops in a deep vein, usually in the leg. DVT is more common in women than in men, and in those over 40 years of age.

### **Deep vein thrombosis**

DVT—blood clots inside veins found deep in extremities or body cavities—is a common disorder. A venous thrombus is a clump of blood cells, platelets, and fibrin (clot) which attaches to the inside walls of veins, can grow in size, and break off to travel downstream from the clot. If the clot stays localized, it can cause swelling and vein irritation. If part of it breaks off, it can cause blockage downstream, or become an embolus and result in a pulmonary embolus. In some instances, deep vein thrombosis may also contribute to other serious medical problems such as heart attack and stroke.

### **How safe is Nattokinase?**

It is very safe when used according to the recommended dosage. People with ulcers, recent or pending surgery, or recent major trauma should not take Nattokinase. Anyone who has ever had neurosurgery or ischemic stroke in the previous six months should not take Nattokinase, as well as those who have had intracranial bleeding. Generally, people with bleeding disorders, or taking anti-clotting medication, should use this product only under the close supervision of a medical doctor.

Researchers have found that Nattokinase is four times more potent than plasmin, and works even *more effectively than warfarin* drugs because it continues to work for long periods of time, and it doesn't produce any side effects.

## Conclusion

The traditional Japanese food Natto has been used safely for more than 1,000 years. The safety record of its potent fibrinolytic enzyme, Nattokinase, is based upon the long-term traditional use of the food and recent scientific studies.

Nattokinase has many benefits including its prolonged effects, cost effectiveness, and its ability to be used preventatively. It is a naturally occurring, food-based dietary supplement that has demonstrated stability in the gastrointestinal tract, as well as to changes in pH and temperature. It is definitely a nutritional supplement to consider adding to a cardiovascular health maintenance plan.

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