Premium Pantethine

The Most Active, Effective Form of Vitamin B5

- Supports healthy cholesterol levels
- An essential factor for energy production
- Restores adrenal function after stress
- Helps with detoxification

Gluten Free  Vegan  Non-GMO  Cholesterol

AOR Code  Variant
AOR04027  90 VEGI-CAPS

Details
Pantethine is the active form of vitamin B5 or pantothenic acid. Supplementing with regular pantothenic acid will not necessarily increase the body’s levels of pantethine since this conversion process is tightly regulated. Pantethine is involved in hundreds of metabolic processes including energy production and fatty acid synthesis. It regulates the production of total cholesterol, triglycerides, LDL, and HDL, supporting healthy cholesterol balance, a role that is not shared by pantothenic acid. Pantethine is also required for the synthesis of stress hormones in the adrenal glands, therefore an inadequate supply may result in adrenal insufficiency, which compromises immunity, energy, metabolism and overall well-being. Lastly, it is also essential for phase II liver detoxification, and may protect against fatty liver degeneration and other types of liver damage better than regular vitamin B5.

In 1996, AOR released the first Canadian standalone vitamin B5 in the form of Pantethine. Unlike many others since, AOR's Pantethine provides a pure, effective form of this important nutrient at a research-supported dose. Pantethine is an excellent natural support for those with abnormal blood lipids, for those dealing with constant stress and for those with liver disorders.

Label Info

Discussion
Pantethine is the active form of vitamin B5. It is a critical factor in cellular energy production, phase II
detoxification, and the synthesis of numerous important sex and adrenal hormones, and neurotransmitters. Research shows that pantethine helps support healthy cholesterol levels.

**Product Variation**

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<th>Product Code</th>
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<td>AOR04027</td>
<td>90 VEGI-CAPS</td>
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**Supplements Facts**

**Serving Size:** 1 Capsule

<table>
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<td>Pantethine: 300 mg</td>
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Non-medical ingredients:

- microcrystalline cellulose, ascorbyl palmitate, silicon dioxide, sodium stearyl fumarate. Capsule: hypromellose.

**Guarantees**

AOR™ guarantees that all ingredients have been declared on the label. Contains no wheat, gluten, corn, nuts, peanuts, sesame seeds, sulphites, mustard, soy, dairy, eggs, fish, shellfish or any animal byproduct.

**Adult Dosage**

Take 3 capsules daily with/without food, or as directed by a qualified health care practitioner.

**Cautions**

Consult a health care practitioner prior to use if you are pregnant, breastfeeding, or if you are taking anticoagulant/antiplatelet drugs as they may increase the risk of bleeding.

**Source**

Pharmaceutical synthesis

**Main Application**

- Cholesterol
- Adrenal function
- Detoxification
- Energy

**Disclaimer**

The information and product descriptions appearing on this website are for information purposes only, and are not intended to provide or replace medical advice to individuals from a qualified health care professional. Consult with your physician if you have any health concerns, and before initiating any new diet, exercise, supplement, or other lifestyle changes.
Background

Pantethine is not to be confused with simple calcium pantothenate/pantothenic acid (vitamin B5). Rather, the making of Pantethine is the very reason the body needs B5 in the first place. That is, pantothenic acid’s whole purpose in the body is to serve as a raw material for the synthesis of Pantethine, which is the “business end” of the critical Coenzyme A (CoA). The real “work” done by CoA is accomplished by Pantethine as CoA’s active site. CoA, in turn, is used by the body in a wide variety of functions, including regulating cholesterol synthesis. Thus, optimal Pantethine levels are a key factor in maintaining optimal blood lipid balance.

Tightly Controlled Production of Pantethine

The key factor determining the body’s Pantethine levels is the conversion of pantothenic acid to Pantethine. Because making Pantethine takes up a lot of the body’s resources, the body’s Pantethine-making machinery is strictly controlled by negative feedback loops designed to prevent the body from taking up too many of its resources in making this compound. These feedback loops work like thermostats, turning the Pantethine-making machinery on when levels of its metabolite are low, and turning it off when levels are considered to be adequate.

Too Thrifty?

The problem: not everyone’s Pantethine “thermostats” are set high enough to ensure optimal health – in particular, to support healthy cholesterol balance. This is often the result of a Scrooge-like “thriftiness” about investing the energy needed to run the CoA-making machinery, which highlights the incredible adaptiveness of the human body. For our ancestors, keeping cholesterol in healthy balance was less of a concern because their food was more healthy and natural, they engaged in physical labour more often, and going longer lengths without food was more common.

The Culprit: Insulin Resistance?

But it can also be at once the cause and the result of the metabolic disturbances associated with insulin resistance, the process through which the body’s cells stop responding to the hormonal command to take up blood sugar, leading to “Syndrome X” and non-insulin-dependent (“type-2”) diabetes. In such people, taking more pantothenic acid does not lead to the body making more Pantethine, just as buying more fuel for a furnace will not lead to more heat production as long as the thermostat is stuck on a low setting.

Tackle the Problem Head On

You can overcome the problems associated with the low thermostat setting in a home by installing space heaters in cold rooms, thereby bypassing the thermostat setting. Likewise, you can make up for a Pantethine-making “deficiency” by supplementing with Pantethine itself, directly correcting for any internal unbalance. Restoring optimal Pantethine levels can have a wide-ranging positive impact on your health.

Lipoprotein Balance

The use of Pantethine to support healthy levels of blood lipids and lipoproteins – such as total cholesterol, triglycerides, low-density lipoprotein (LDL – the “bad” cholesterol), and high-density
Lipoprotein (HDL – the “good” cholesterol) – is backed by nearly two decades of controlled clinical trials.

**Adrenal Function**

The adrenal glands require CoA for the synthesis of the powerful hormones through which the body adapts to stress. Stress can therefore seriously deplete the body of vitamin B5, and supplemental pantothenic acid can help correct for this stress-induced deficiency. However, Pantethine provides much more powerful support for adrenal function than does pantothenic acid, more quickly restoring adrenal hormone production and normal biochemical function in the adrenal glands.

**Liver Detoxification**

The body uses two families of enzymes to transform toxins into less hazardous substances which it can more easily excrete through the kidneys or the bile. The first family – the Phase I enzymes – “priming” the toxic molecule so that it can be more easily acted upon by the second family: the Phase II enzymes. Phase II enzymes do the real work of detoxification, binding the “primed” toxin to a “conjugating” molecule which renders it less reactive and more easily dissolved.

One important subfamily of the Phase II enzyme family is the group that conjugates “primed” toxins using acetyl groups – a process which requires CoA. Toxins which are neutralized using these CoA-dependent reactions include aliphatic amines, aromatic amines such as sulfonamide drugs, and hydrazine. On the other hand, some toxic molecules – notably ethanol – are themselves rendered harmless by metabolizing them into acetyl groups, which are then taken up by CoA for use in other detoxification reactions or for use in the mitochondrial “power plants.”

It is therefore not surprising that Pantethine supplements, by boosting CoA levels, support the detoxification of a variety of noxious molecules and protect the liver from many damaging chemicals. For instance, Pantethine supplementation reduces the formation of the toxic alcohol byproduct acetaldehyde in healthy humans administered alcohol.

**Research**

**Cholesterol**

Scientific studies show that supplementing the diet with Pantethine supports healthy lipoprotein balance. The clear evidence, demonstrated in people with a wide variety of cholesterol concerns, is that Pantethine supplements support the healthy functioning of the body’s cholesterol-making equipment, and thus proper levels of total cholesterol, triglycerides, LDL, and HDL. On the other hand, pantothenic acid does not have these cholesterol-balancing effects.
A recent human study with 120 patients shows that the active form of vitamin B5 used by AOR in their product Panthetine, lowers both total cholesterol and the “bad” form called LDL cholesterol. The patients were given daily doses of either 600mg or 900mg of panthetine for 16 weeks. Total cholesterol was reduced by 6mg/dl and LDL by 4mg/dl. Previous research suggests that with each 1mg/dl decrease in LDL, there was a reduction in cardiovascular mortality risk of 1%. The study was published in Nutrition Research August 2011 volume 31, issue 8 p 608.

**Fatty Liver and Detoxification**

Likewise, laboratory animals administered the liver toxin carbon tetrachloride suffer less fatty liver degeneration, have more normal liver enzyme levels, and suffer less free radical damage to their cellular membranes – with the protection exceeding that provided by large doses of pantothenic acid. Pantethine has also been shown to protect animals’ livers from the damaging effects of diets corrupted with peroxidized fats, reducing the overactivation of liver enzymes and improving the animals’ chances of survival.

Preliminary studies in humans also suggest that Pantethine may provide considerable support in fatty liver and hepatitis A.

**Market Trends**

Consumers that are unaware of the benefits of taking pantethine are most likely to purchase pantothenic acid. More recently, the more effective bioactive form of Vitamin B5 known as pantethine has become more readily available on the consumer market. However, many pantethine products contain far too little pantethine to be effective. Also, some products contain pantethine which has been “cut” with pantothenic acid which must be converted in panthenine by the body.

**Know How Much You’re Getting**

It’s important to note that these effects are achieved at dosages of at least 600 milligrams per day of active Pantethine ion. Most trials, in fact, have used 900 milligrams, although persons choosing to take more than one lipid-balancing nutrient may find that they get good results at the lower dose. But health-conscious persons should be careful in selecting a Pantethine product, making sure that they know what they’re getting. While Pantethine is still uncommon on the shelves of North American health food stores, some companies are selling it, and many Pantethine products contain far too little Pantethine to be effective.

**Mixed with Cheaper Versions**

Further, some products are confusingly labeled, making it difficult for consumers to tell how much active Pantethine ion is really in them. Some products, for instance, contain Pantethine which has been “cut” with pantothenic acid. Some people who are concerned about their health, and have heard about Pantethine, are not familiar with the difference between it and pantothenic acid, and may confuse the two.
Elemental Pantethine

The labels on some other products provide the amount of Pantethine complex on the label, rather than the amount of active Pantethine ion: this is essentially the same difference as exists between the amount of calcium compound and the elemental calcium content in calcium supplements. This again can lead consumers to believe that there is much more true Pantethine in the product than there really is. Look for a label which clearly indicates both how much Pantethine complex, and how much Pantethine ion, the product contains. Some products use a complex which contains as little as 20% active Pantethine ion. Thus, a product labeled “300 mg Pantethine (20%)” actually delivers just 60 mg of “elemental” Pantethine! Be sure that you know what you’re buying.

AOR Advantage

In 1996, AOR released the first Canadian standalone vitamin B5 in the form of Pantethine. AOR’s Pantethine highlights the benefits of this single vitamin, providing a pure form of this important nutrient in an efficient form and at an effective dosage.

References


Abstract
Pantethine, a derivative of vitamin B5, favorably alters total, LDL and non-HDL cholesterol in low to moderate cardiovascular risk subjects eligible for statin therapy: a triple-blinded placebo and diet-controlled investigation.


Evans M, Rumberger JA, Azumano I, Napolitano JJ, Citrolo D, Kamiya T.

High serum concentration of low-density lipoprotein cholesterol (LDL-C) is a major risk factor for coronary heart disease. The efficacy of pantethine treatment on cardiovascular risk markers was investigated in a randomized, triple-blinded, placebo-controlled study, in a low to moderate cardiovascular disease (CVD) risk North American population eligible for statin therapy, using the National Cholesterol Education Program (NCEP) guidelines. A total of 32 subjects were randomized to pantethine (600 mg/day from weeks 1 to 8 and 900 mg/day from weeks 9 to 16) or placebo. Compared with placebo, the participants on pantethine showed a significant decrease in total cholesterol at 16 weeks (P=0.040) and LDL-C at 8 and 16 weeks (P=0.020 and P=0.006, respectively), and decreasing trends in non-high-density lipoprotein cholesterol at week 8 and week 12 (P=0.102 and P=0.145, respectively) that reached significance by week 16 (P=0.042). An 11% decrease in LDL-C from baseline was seen in participants on pantethine, at weeks 4, 8, 12, and 16, while participants on placebo showed a 3% increase at week 16. This decrease was significant between groups at weeks 8 (P=0.027) and 16 (P=0.010). The homocysteine levels for both groups did not change significantly from baseline to week 16. Coenzyme Q10 significantly increased from baseline to week 4 and remained elevated until week 16, in both the pantethine and placebo groups. After 16 weeks, the participants on placebo did not show significant improvement in any CVD risk end points. This study confirms that pantethine lowers cardiovascular risk markers in low to moderate CVD risk participants eligible for statins according to NCEP guidelines.

Pantethine, a derivative of vitamin B(5) used as a nutritional supplement, favorably alters low-density lipoprotein cholesterol metabolism in low- to moderate-cardiovascular risk North American subjects: a triple-blinded placebo and diet-controlled investigation.


Rumberger JA, Napolitano J, Azumano I, Kamiya T, Evans M.

Safety and efficacy of a biologically active derivative of vitamin B(5) (pantethine) on total cholesterol (TC) and low-density lipoprotein cholesterol (LDL-C) metabolism was studied in North American subjects at conventional low to moderate cardiovascular disease (CVD) risk. A total of 120 subjects initiated a therapeutic lifestyle change (TLC) diet 4 weeks before randomization (baseline) and maintained the diet throughout a 16-week study period; at baseline, subjects were randomized in a triple-blinded manner to either pantethine (600 mg/d, baseline to week 8, and 900 mg/d, weeks 9-16) or identically labeled, nonbiologically active placebo (n = 60 per group). We hypothesized that pantethine would lower TC and low-density lipoprotein in low-CVD-risk North American subjects in a similar manner as reported in high-CVD-risk subjects studied mainly in Italy and Japan. While sustaining a TLC diet and in comparison with placebo, pantethine demonstrated significant (P < .005) and sustained reductions (from baseline to week 16) in TC (6 mg/dL, 0.16 mmol/L, 3%), LDL-C (4
mg/dL, 0.10 mmol/L, 4%), and apolipoprotein B (4 mg/dL, 0.04 g/L, 5%). Our data suggest that pantethine supplementation for 16 weeks (600 mg/d for weeks 1-8 then 900 mg/d for weeks 9-16) is safe and significantly lowers TC and LDL-C over and above the effect of TLC diet alone. Although the absolute magnitude of these effects was small in these low- to moderate-risk North Americans (4-6 mg/dL), the results are noteworthy as prior studies have shown that, for each 1 mg/dL (0.026 mmol/L) reduction in LDL-C, there is a concomitant 1% reduction in overall future CVD risk.

The effects of pantethine on fatty liver and fat distribution.


Osono Y, Hirose N, Nakajima K, Hata Y.

Although the prognosis of fatty liver depends on its causes, we feel from our clinical experience that fatty liver with hypertriglyceridemia has a good prognosis and responds well to treatment. In this study, 600 mg/day of pantethine was administered to 16 outpatients with fatty liver and hypertriglyceridemia for six months or longer to examine whether the drug improved fatty liver using abdominal plain computed tomography (CT). Nine of the 16-pantethine patients were no longer diagnosed as having fatty liver after the study period. An chi2 test indicated the significant disappearance of fatty liver. At the same time, the visceral fat calculated from the CT image passing the umbilical region was also significantly reduced. On the contrary, the subcutaneous fat area tended to increase, so the ratio of the visceral-to-subcutaneous fat area was reduced significantly. This indicates triglycerides may be pooled in the body as hepato-visceral fat and subcutaneous fat, and that pantethine may transfer fat from the liver and viscera to the subcutaneous tissue. This suggests that visceral fat deposition and fatty liver occurring with hypertriglyceridemia may have a common basis, probably excessive matrixes, and that pantethine may simultaneously improve the two conditions.

[Pantethine, diabetes mellitus and atherosclerosis. Clinical study of 1045 patients]


[Article in Italian. Donati C, Bertieri RS, Barbi G.

After a review of the clinical studies on the treatment of diabetic patients with pantethine, the authors discuss the results obtained in a postmarketing surveillance (PMS) study on 1045 hyperlipidemic patients receiving pantethine (900 mg/day on average). Of these patients, 57 were insulin-dependent (Type I) and 241 were non insulin-dependent (Type II) diabetics. Beyond the epidemiological considerations made possible by a PMS study, the authors show that pantethine brought about a statistically significant and comparable improvement of lipid metabolism in the three groups of patients, with very good tolerability. Pantethine should therefore be considered for the treatment of lipid abnormalities also in patients at risk such as those with diabetes mellitus.
Pantethine lipomodulation: evidence for cysteamine mediation in vitro and in vivo.


Recent human studies suggest rapid in vivo hydrolysis of the lipid-lowering drug, pantethine, to the vitamin pantothenic acid and the small aminothiol compound, cysteamine. To test whether the active agent is a hydrolysis product, we repeated three experimental models of pantethine’s effect with pantothenate and cysteamine. In vitro experiments with human fetal fibroblasts showed equivalent modulation of cholesterol and methyl sterol synthesis by pantethine, cysteamine, or cystamine (the disulfide of cysteamine), but pantothenate had no effect. Similarly, in vivo experiments with 0.5% cholesterol-fed rabbits showed oral pantethine or equimolar cystamine significantly lowered plasma cholesterol, while pantothenate, cystine, and 2-hydroxyethyl disulfide did not. Lastly, diabetic male rats (40 mg/kg streptozotocin) fed 0.1% pantethine and lower plasma free fatty acids after 2 weeks than controls, an effect not seen with pantothenate and largely duplicated by cystamine. The efficacy of pantethine has previously been attributed to altered vitamin metabolism and increased coenzyme A concentration. Pantethine did increase CoA levels 45% in rat liver homogenates while equivalent amounts of cystamine or pantothenate did not. However, a causal relationship between CoA levels and pantethine’s action as a hypolipemic agent has never been shown. At least in 3 independent experimental models, the lipomodulating effect of pantethine appears instead to be mediated by the hydrolysis product cysteamine.

Lipoprotein changes induced by pantethine in hyperlipoproteinemic patients: adults and children.


Bertolini S, Donati C, Elicio N, Daga A, Cuzzolaro S, Marcenaro A, Saturnino M, Balestreri R.

Following a brief outline of current knowledge concerning atherosclerosis and its treatment, the authors describe the results obtained by treating with pantethine (900-1200 mg daily for 3 to 6 months) a series of 7 children and 65 adults suffering from hypercholesterolemia alone or associated with hypertriglyceridemia (types IIa and IIb of Fredrickson’s classification). Pantethine treatment produced significant reduction of the better known risk factors (total cholesterol, LDL-cholesterol, triglycerides, and apo-B) and a significant increase of HDL-cholesterol (signally HDL2) and apolipoprotein A-I. The authors conclude with a discussion of these results and of the possible role of pantethine in the treatment of hyperlipoproteinemia, in view of its perfect tolerability and demonstrated therapeutic effectiveness.

Study of the corticosteroid content in the adrenals and blood of rats under pantothenate deficiency has demonstrated a decrease in adrenocortical function. A single administration of pantothenate in a dose of 3.3 mg/kg reduced the influence of hypovitaminosis on the adrenals. The pantothenate derivatives (pantethine, 4′-phosphopantothenate and CoA in particular) injected to intact animals in a single dose equimolar to 3.3 mg/kg calcium pantothenate per kg bw had a marked steroidogenous effect.