

Oats May Keep Arteries Out of Sticky Situations

Scientists funded by ARS have discovered that certain compounds in oats hinder the ability of blood cells to stick to artery walls.

The findings were reported by nutritionist Mohsen Meydani and fellow scientists at the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University, Boston, Massachusetts. Meydani is director of the center's Vascular Biology Laboratory.

The oat compounds are called avenanthramides. The research team recently found that they significantly suppressed adhesive molecules that “glue” blood cells to artery walls. When blood cells stick to—and cause inflammation of—the artery wall, plaques build up. That accumulation—called atherosclerosis—can eventually block the blood vessel. The suppression provided by avenanthramides in oats may prevent this narrowing of the passageways through which blood flows.

To test the compounds' antiatherosclerotic activity, the scientists purified avenanthramides from oats and exposed them to human arterial wall cells over a 24-hour period. After observing the mixture under incubation, Meydani found significant reductions in both the expression of adhesion molecules and the sticking of blood cells to arterial wall cells.

A Double Benefit

The research findings ramp up oats' already heart-healthy reputation—earned because of their high fiber content. Fiber washes cholesterol from the digestive system that would otherwise be released into the bloodstream. Cholesterol is a waxy substance, 85 percent of which is produced by the body—mainly in the liver and small intestine. That 85 percent provides the essential cholesterol the body needs, for example, to produce sex hormones and protect nerve fibers.

The sticking point is that when carrier molecules, called apoproteins, combine with non-water-soluble cholesterol (meaning it doesn't dissolve in blood), they form lipoproteins. Low-density lipoprotein (LDL) is considered “bad” cholesterol that accumulates as it travels throughout the body. High-density lipoprotein (HDL) actually washes excess cholesterol

from arteries and then ferries it to the liver so it can be eliminated. Water-soluble fiber in oats is believed to help reduce the amount of LDL cholesterol circulating in blood.

“Adding oat products as part of an overall healthy diet and cutting down on high-fat, high-cholesterol foods are important to gaining these benefits,” says Meydani.

His group filed a patent on the function of avenanthramides present in oats, based on their anti-inflammatory and antiatherogenic effects.

As a grain, oats can be found in foods such as enriched cereals and breads; as rolled oats, in oatmeal; and as oat bran, in muffins or other baked foods. Meydani hopes a plant breeder or genetic engineer will create oats with high levels of avenanthramides.—By **Rosalie Marion Bliss**, ARS.

This research is part of Human Nutrition, an ARS National Program (#107) described on the World Wide Web at www.nps.ars.usda.gov.

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A compound in oats has been found to keep blood cells from sticking to artery walls.