

Natural boost in a bowl to aid longevity

Science is proving more and more that blueberries deserve their reputation as a "superfruit". Interest in the little berries has been increasing since the first suggestion that they protect brain function and cognition some 10 years ago.

Multiple studies have since shown that blueberries slow age-related damage to brain cells and protect memory-associated brain regions from oxidant and inflammatory damage, all of which boosts cognitive function - and helps to keep dementia at bay.

Now researchers have uncovered new data showing that blueberries can delay ageing and promote longevity. They say this makes the fruit a critical component of any science-based longevity programme.

In laboratory experiments, blueberries and their extracts have extended the life span in two different models of ageing. Additionally, blueberries have been shown to fight DNA damage, metabolic syndrome, heart disease and even cancer.

In studying longevity benefits of various compounds, scientists often use fruit flies as a laboratory model of ageing. In a report in the journal *Experimental Gerontology* earlier this year, they show that fruit flies live 10% longer when fed a regular diet containing blueberry extract.

Not only do the fruit flies live longer, but they also show improved levels of physical activity. These enhancements arise both from increased tolerance of oxidant stress, and from beneficial changes in the way certain important genes are expressed.

Still more dramatic life span extension has been shown in another ageing model, a worm called *C. elegans*. After supplementation with blueberry extract, these organisms lived an average of 28% longer, and the maximum life span increased by 14%, according to a report in the journal, *Cell Ageing*, in 2006.

The worms that were supplemented showed a 20% reduction in an age-related protein that impairs function, and vastly improved tolerance of stress.

Mammals also experience increased longevity and slowed ageing processes when fed blueberry extracts, as shown by a study of mice on calorie restriction, published in the journal *Biochimica et Biophysica Acta - Molecular and Cell Biology of Lipids*, this year.

When the calorie-restricted mice had blueberry extracts added to their food ration, they not only outlived the normally-fed mice, but also the calorie-restricted mice who were not given the supplement as well.

In addition to extending the life span of whole organisms, blueberries and their extracts slow ageing in individual tissues, providing wide physiological benefits. Along with increasing all-around longevity, blueberries can specifically decrease the risk of various degenerative diseases that reduce the human life spans.

And while life expectancies are rising in some countries, that is likely to change, due to the increase in obesity rates, say medical specialists. SA is one of many countries facing what specialists say is an epidemic of obesity.

In 2005, members of an expert panel convened by the US National Institute on Ageing said the obesity rates would mean that the average life span may decrease by five years or more.

Blueberry extracts have many positive effects that may help you lose weight and keep it off, say experts. Studies have shown that animals fed blueberry extracts while on a high-fat diet had lower overall weight gain, and smaller accumulations of body fat, than control animals.

Importantly, the loss of body fat was especially prominent in the abdominal areas and the liver; fat in those areas poses the greatest risk of cardiovascular disease and other life-shortening complications of obesity, say specialists.

Obesity is the central component of metabolic syndrome, which includes insulin resistance (pre-diabetes), high blood pressure, and elevated blood lipid and cholesterol levels. Metabolic syndrome kills early: people younger than 65 who have are 35% more likely to die from all causes, and 78% more likely to die from cardiovascular causes, than those who have avoided the syndrome, say researchers in the *Journal of Nutrition* in 2010.

Blueberry extracts offer hope to combat the components of metabolic syndrome by:

- Fighting elevated blood sugar levels and reducing insulin resistance

In published studies, blueberries block carbohydrate metabolism in the intestine by up to 90% compared with the prescription drug acarbose. That can help prevent dangerous after-meal sugar spikes associated with metabolic syndrome increased heart attack risk. Blueberries have also been shown to lower baseline blood sugar levels in those diagnosed with type 2 diabetes by 37%.

- Lowering blood pressure

People with the highest regular intake of blueberries have up to an 8% reduction in their risk for developing hypertension compared with those having the lowest intake. Studies show that blueberry extracts lower both systolic (top number) blood pressure and diastolic (bottom number) blood pressure in people with metabolic syndrome. Naturally hypertensive rats, fed blueberry extract for eight weeks, showed a 30% lower systolic blood pressure level at six weeks. That can prevent kidney damage, a common consequence of hypertension.

Blueberries' blood pressure-lowering effects are the result of multiple mechanisms of action: they help blood vessels to relax, reducing the resistance to blood flow that produces high pressure (think of your finger on the end of a garden hose). And blueberry extracts inhibit a protein called angiotensin converting enzyme (ACE) that your body uses to keep blood pressure elevated; prescription drugs such as enalapril and lisinopril work in the same way, but have side effects, say researchers in a study reported in the *Canadian Journal of Physiology and Pharmacology* in 2011.

- Reducing blood levels of total and low-density lipoprotein (LDL) cholesterol

Research shows this reduction can be as much as 12% and 15% respectively. Triglyceride levels (a potentially dangerous form of fat in the body) are lowered in the blood of blueberry-supplemented animals. Supplemented animals on a high-fat diet showed reduced triglyceride accumulation in the liver, one of the hallmarks of the metabolic syndrome.

In one particularly study in the *Molecular and Nutritional Food Research* journal in 2009, animals fed a high-fat diet (60% of calories from fat) had marked elevations in serum cholesterol and triglyceride levels, but the levels decreased to normal when blueberry extracts were added to the diet. Blueberry extracts are also shown to reduce cholesterol production in the liver, and enhance excretion of cholesterol in the faeces.

- Enhancing exercise effects

Regular moderate exercise is one of the most important ways for you to combat metabolic syndrome. Most people, however, fall far short of getting sufficient exercise. Blueberries reduce the oxidant stress of exercise, which in turn can limit the duration and intensity of your workouts. Blueberry extracts prevent exercise-induced muscle damage that can leave you sore and aching and disinterested in future workouts. And supplementing with blueberry extracts adds to the immune-system boost that regular workouts can provide, helping to keep you vigorous both inside and out.

Heart disease is a leading killer of South Africans, as it is in other parts of the world. Blueberries can combat heart disease by reducing your likelihood of developing major risk factors such as obesity, diabetes, lipid disorders and the metabolic syndrome. They directly address some of the major biological changes in your body that lead to atherosclerosis, or "hardening of the arteries", say Dr Thomas Badger and colleagues from the University of Arkansas for Medical Sciences

Children's Nutrition Centre, in a study in the Journal of Agricultural and Food Chemistry in 2011.

Other research shows that blueberry extracts help your blood vessels regulate themselves by tightening up or relaxing in response to blood flow. Loss of this control is an early feature of atherosclerosis; left unchecked, it produces undesirable thickening of arterial walls and a reduction in blood flow to vital tissues that ultimately produces a heart attack or stroke.

Last but not least, blueberries, with their rich supplies of flavonoids and other biologically active molecules, are shown to be uniquely equipped to block many of the complex processes that lead to cancer - and they do so through multiple mechanisms. Blueberry extracts are shown, among other things, to:

- Block DNA damage

Damage to DNA, the universal cellular blueprint for reproduction, underlies every cancer. By preventing such damage, blueberry extracts can block the malignant transformation of healthy cells, say scientists in the journal, *Nutrition and Cancer* in 2008.

- Stop excessive proliferation

Uncontrolled cell reproduction results in formation of dangerous tumours, as cells ignore the normal signals to stop growing. By restoring normal cellular signalling, blueberry extracts stop such out-of-control proliferation.

- Prevent development of precancerous lesions

Many cancers, such as those of the colon and cervix, begin as so-called pre-cancerous lesions, or areas of abnormal, but not yet malignant, cell growth. Blueberry compounds sharply reduce the number of such abnormal tissues, by as much as 94% in the case of colon cancer.

- Stop tumours' blood supply

Rapidly growing cancers recruit new blood vessels to meet their ravenous appetites for nutrients and oxygen. Blueberry compounds can shut down that new vessel growth, or angiogenesis, and enhance survival rates.

Blueberry extracts slow tumour spread by invasion and metastasis. Solid cancers produce "protein-melting" enzymes that help them invade adjacent tissues and that enables them to metastasise. Blueberry flavonoids block those enzymes, helping to control cancer's aggressive spread.

Before you rush out to the greengrocer or supermarket to stock up, whole blueberry fruit are shown to be both impractical and less effective at delivering all of these health benefits, say scientists. Standardised blueberry extracts provide the most reliable means of delivering the vital flavonoid components to your body, they say. Life Extension Foundation with Health News.

- A full version of this article appears in the latest Life Extension Foundation magazine (www.lef.org).

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Source: *Business Day* via I-NET Bridge