

## YOUNG AT HEART— COMBAT BIOLOGICAL AGEING with OMEGA-3 & VITAMIN K2

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Everyone ages at a different rate. We've all experienced the surprise of meeting someone for the first time who appears to be much younger—or older—than they really are. As humans, we have two different ages: **chronological and biological.**

Chronological age refers to the number of years that one has been alive from birth. Biological age refers to how old the body functions compared to average fitness or health levels. People age biologically at different rates depending on genetics and on lifestyle factors such as diet, exercise and sleeping habits.

### Is your heart older than you are?



The human heart is about the size of a clenched fist, beats 100,000 times a day and over 2.5 billion times in the average lifetime. Together with a system of blood vessels—arteries, veins and capillaries—are central to life, transporting oxygen and nutrients to every corner of the body and returning waste products for elimination. This system is known as the cardiovascular transport system and is what keeps us alive.

The aorta is the largest blood artery in the body receiving oxygenated blood from the left ventricle of the heart at high pressure for distribution to the rest of the body. In addition to the conduit function, the aorta plays a pivotal role in regulating left ventricle performance, blood flow to the heart muscle and artery function in the cardiovascular system. Consequently, aortic compliance

or stiffness has emerged as an important, independent predictor of cardiovascular outcome.

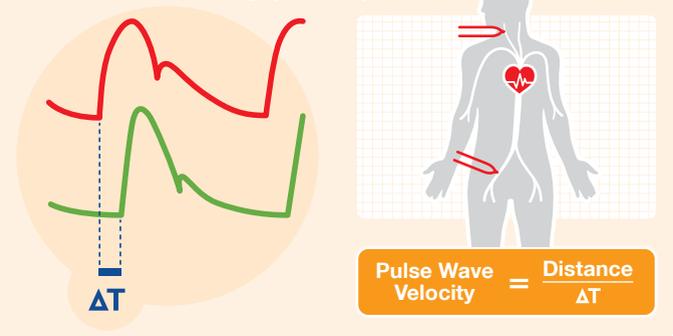
Aortic stiffness or arteriosclerosis occurs when the blood vessels (arteries) that carry oxygen and nutrients from the heart to the rest of the body become thick and stiff—sometimes restricting blood flow to the organs and tissues. In almost all populations, aortic stiffness is positively correlated with age, hence aortic stiffening is often considered to be inevitable.

Cardiovascular disease (CVD) risk factors such as hypertension, smoking, increased LDL-cholesterol, and diabetes accelerates this process. The presence of one or more of these risk factors accelerates arteriosclerosis, resulting in one's cardiovascular system becoming older than its chronological age.

## What are some ways to measure your biological age?

Healthy arteries are flexible and elastic, but as the body ages, the walls in the arteries become stiff and harden. With each heartbeat, a wave, or pulse, travels along arterial vessels. Aortic Pulse Wave Velocity (AoPWV) is the speed at which this arterial pulse transmits through the circulatory system. Carotid-femoral Pulse Wave Velocity (cfPWV) is considered the gold-standard measurement for arterial stiffness. The velocity of this pulse wave is related to the stiffness of the arteries; a higher PWV corresponds to lower arterial distensibility and compliance. In other words, the pulse wave travels faster if the arteries are stiffer.

### Pulse Wave Velocity (cfPWV)



## Keeping your arteries flexible and 'young' with omega-3

Nutrition is an important lever in keeping the cardiovascular system functioning optimally. Arterial stiffness is an independent predictor of cardiovascular disease events and may be differentially affected by dietary fatty acid (FA) intake. A higher intake and higher concentrations of circulating omega-3 fatty acids have a positive influence on lowering arterial stiffness, resulting in a better CVD risk profile. A comparison of omega-3 fatty acids and exercise show their effects to be similar and opposite of those of the effects of the aging process.

Data from five hundred adults with an average age of 75 from the Age, Gene / Environment Susceptibility - Reykjavik Study (AGES - Reykjavik) was used to investigate the association of omega-3 and omega-6 fatty acid and fish oil intake with arterial stiffness. Assessed at 3 time points: early life (14-19 years), midlife (40-50 years), and late life (66-96 years), researchers found that plasma total omega-3 PUFAs, eicosapentaenoic acid (EPA), and docosahexaenoic acid (DHA) were associated with lower pulse wave velocity and hence less arterial stiffness. In a meta-analysis including 10 intervention trials of omega-3 fatty acid supplementation, it was reported that Pulse Wave Velocity (PWV) and systemic arterial compliance were favourably affected by the intervention, providing strong support for omega-3 fatty acids in reducing arterial stiffness.

## NATTO for thought?

Another nutrient for consideration is vitamin K2 (menaquinone MK) found in fermented foods, like cheeses and natto (MK-7). Observational data suggest a link between vitamin K2 intake and cardiovascular health. Studies showed lower prevalence of arterial calcification and coronary heart disease mortality in subjects with the highest intake of menaquinones (MKs, vitamin K2). Arterial calcification causes stiffening of arterial walls, impairing cardiovascular function and increasing the risks of blood clots, heart attacks and strokes. MK-7 activates the matrix GLA protein in the blood vessels, binding the calcium in blood cells and transporting it back into the blood stream. Low MK-7 levels lead to calcium deposits in arterial walls i.e. arterial calcification. High MK-7 levels keep arterial walls smooth and help safeguard optimum cardiovascular function.

In a 2015 research study by Knapen et al., 244 healthy postmenopausal women were randomised to supplement daily with 180 µg vitamin K2 (MK-7) supplement or a placebo over a period of 36 months. The researchers found that long-term use of vitamin K2 (MK-7) supplement improved arterial stiffness in the women, especially amongst those with high arterial stiffness.

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## Heart first towards a lower biological age

The attempts at identifying and reducing biological age is not a simple task, bedevilled by the difficulty of accounting for the many different biological processes at work. However, the heart is a good place to start since 75 percent of premature cardiovascular disease can be prevented via diet and lifestyle changes. With more than 150 years of experience in the human nutrition industry, BASF is a trusted partner that offers a comprehensive and complementary portfolio of health ingredients for cardiovascular support and other health concerns. BASF offers a wide range of omega-3 products such as deodourised fish oil with superior sensory profile in the Omevital TG Gold range; high concentrate purified fish oil rich in EPA or DHA in the PronovaPure range, as well as an algal source omega-3 in a microencapsulated powder or oil form suitable for vegetarians and vegans respectively. Vitamin K2 as menaquinone-7 (MK-7) is a product range offering stability in a wider range of product applications within dietary supplements, food and beverages ■

