

Oats and Hypertension:

The Mechanism by which Oat Bioactives work to Improve Blood Pressure Health



Study: Narrative Review on the Effects of Oat and Sprouted Oat Components on Blood Pressure¹

What is Hypertension (HTN)?

HTN, commonly known as high blood pressure (HBP), is a leading cause of death and morbidity worldwide². HBP is more prevalent in older adults and is a major risk factor for cardiovascular disease (CVD) and cognitive decline. It is often undiagnosed HTN due to the lack of visible symptoms, which is why it is called the silent killer³.

How do oats work to improve HBP?

A healthy diet with whole grains like oats, rich in dietary fibers, can help lower blood pressure⁴. Oats contain other components called bioactives like phenolic acids (PA), Avenanthramides (AVA), and γ -Aminobutyric Acid (GABA). These components can individually **lower HBP via numerous mechanisms**¹. Sprouting can significantly increase GABA, AVA, and PA content in Oats.

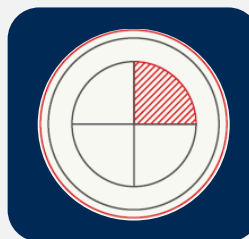
The Impacts of HBP



HBP is a major risk factor for **heart disease and stroke**, which are leading causes of death and severe, long-term disability in the United States².



Nearly half of adults in the United States (47% or 116 million) have hypertension and most are undiagnosed³.



Only about 1 in 4 adults (24%) with HBP have their condition under control^{3,4}. Managing HBP is a lifelong commitment. While medication is an option, diet, and exercise are crucial to managing BP.

References:

- Liska, D. J., Dioum, E., Chu, Y., & Mah, E. (2022). Narrative Review on the Effects of Oat and Sprouted Oat Components on Blood Pressure. *Nutrients*, 14(22), 4772. <https://doi.org/10.3390/nu14224772>.
- Centers for Disease Control and Prevention, National Center for Health Statistics. About Multiple Cause of Death, 1999–2020. CDC WONDER Online Database website. Atlanta, GA: Centers for Disease Control and Prevention; 2022.
- Centers for Disease Control and Prevention. Hypertension Cascade: Hypertension Prevalence, Treatment and Control Estimates Among U.S. Adults Aged 18 Years and Older Applying the Criteria from the American College of Cardiology and American Heart Association's 2017 Hypertension Guideline—NHANES 2015–2018. Atlanta, GA: U.S. Department of Health and Human Services; 2021.
- Bouchard, J.; Valookaran, A.F.; Aloud, B.M.; Raj, P.; Malunga, L.N.; Thandapilly, S.J.; Netticadan, T. Impact of oats in the prevention/management of hypertension. *Food Chem.* 2022, 381, 132198
- Evans C.E.L., Greenwood D.C., Threapleton D.E., Cleghorn C.L., Nykjaer C., Woodhead C.E., Gale C.P., Burley V.J.J. (2015). Effects of dietary fibre type on blood pressure: a systematic review and meta-analysis of randomized controlled trials of healthy individuals. *Journal of Hypertension*, 33, 897–911
- Meydani, M. Potential health benefits of avenanthramides of oats. *Nutr. Rev.* 2009, 67, 731–735..
- Xie, W.; Ashraf, U.; Zhong, D.; Lin, R.; Xian, P.; Zhao, T.; Feng, H.; Wang, S.; Duan, M.; Tang, X.; et al. Application of γ -aminobutyric acid (GABA) and nitrogen regulates aroma biochemistry in fragrant rice. *Food Sci. Nutr.* 2019, 7, 3784–3796.

Whole grains and oats in a healthy diet can help lower blood pressure

The bioactives in oats can help lower blood pressure, by regulating biological pathways involved in HTN.

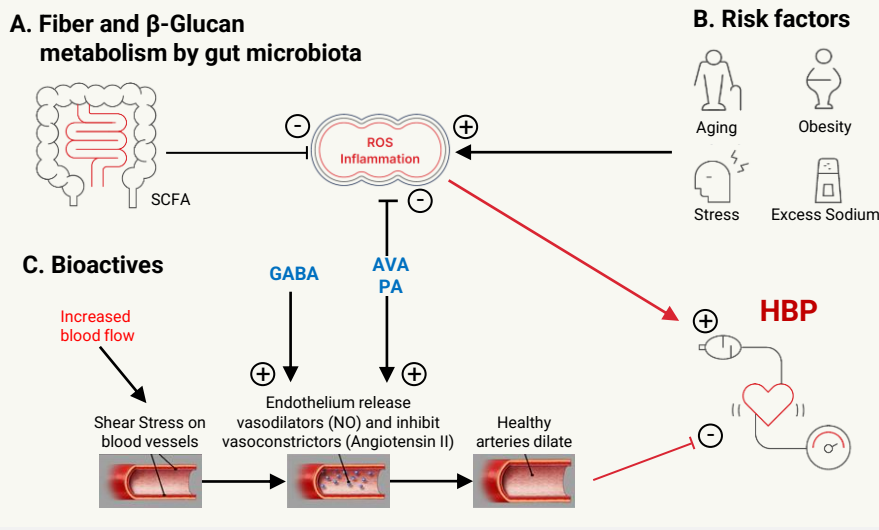
A. Beta-Glucans and Dietary Fibers

The contribution of oats' dietary fibers, particularly β -Glucans, to lower cholesterol and help maintain a healthy cardiovascular system is already established. Emerging clinical data show a strong association between oat β -Glucans and lower blood pressure⁵, suggesting that the gut microbiome-mediated metabolism of fibers like β -Glucans increases circulating short-chain fatty acids (SCFA), which helps reduce HBP risk by reducing the narrowing of blood vessels (vasoconstriction) and oxidative damage⁶.



B. Risk factors

Aging and other risk factors partly contribute to HBP onset by rising oxidative stress or ROS (reactive oxygen species) and inflammation⁴. While oats can be a part of a heart-healthy diet, a broad lifestyle approach (managing stress, body weight, and lowering sodium intake) can help lower HBP^{3,4}. PA and AVA in oat are antioxidants compounds with anti-inflammatory and vasodilatory effects⁶.



C. Oat bioactive improve endothelial function to lower HBP

The endothelium in the arteries responds to blood flow and pressure by releasing the vasodilator molecule Nitric Oxide (NO) and inhibiting vasoconstrictors like Angiotensin II. This normal reaction allows the artery to relax and widen, to maintain a healthy BP. Oats' components, GABA, AVA, and PA, can prevent and control HBP by activating pathways involved in the production and release of NO^{6,7}. GABA can inhibit Angiotensin II, a major contributor of HBP⁷. These bioactives are highly enriched in sprouted oats, and they can collectively promote endothelium health and function and contribute to lower HBP.

While data suggest beneficial effects of oat bioactives on blood pressure, the substantiation of the benefit is still evolving and more clinical studies are needed, especially with sprouted oats.