

food&health

 **EnduBerry™ Nu**

Endurance and
fitness booster



EnduBerry™ Nu

Biological Source

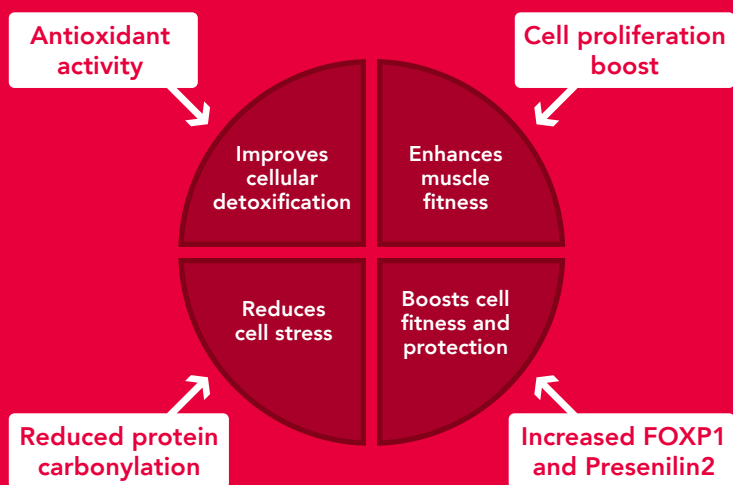


EnduBerry™ Nu is a unique, natural, polyphenol-rich, and high quality Haskap berry extract powder. Haskap berry (*Lonicera caerulea*) is a member of the honeysuckle family (Caprifoliaceae) and is native to Asia and North America. In Japan, this fruit is also known as the “fruit of longevity”. It grows on bushes able to survive freezing northern winters. It is also called blue honeysuckle and contains especially high amount of cyanidin-3-glucoside. This major anthocyanin is known not only for its high antioxidant activity, but also anti-inflammation, anti-hypertension and cognition enhancement. Haskap berry has a deep blue color thanks to the high amount of anthocyanins. This antioxidant is reported to improve physical performance and recovery.

Mode of Action



Physical activity such as sports is important for a healthy life. During the aging process endurance, strength, and flexibility gradually decrease. Regular exercise can help to enhance endurance. But exercise generates free radicals leading to increased lipid oxidation and oxidative protein damage. There is growing evidence showing that free radical production in muscles contributes to fatigue during prolonged exercise. Combating cell oxidative stress and therefore improving cell fitness can help improving physical fitness and endurance. Indeed, scientific data show that polyphenols, such as anthocyanins can enhance physical performance and support recovery after training. EnduBerry™ Nu improves cell fitness by upregulating genes involved in cell defense, cell protection and mitochondrial function. Further, its antioxidant activity and boost of cell proliferation results in detoxification and cellular protection. Overall, this reduces cell stress and inflammation in the tissue, which essentially improves physical fitness and endurance.



Bioassay Study Results



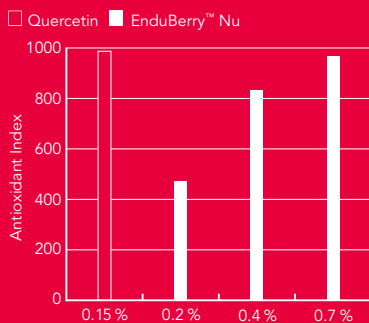
Free radicals are highly reactive and unstable molecules. They are naturally formed in the body as a byproduct of normal metabolism, for example also during exercise. Plant-derived phytochemicals can function as antioxidants, thereby neutralizing the free radicals and reducing the risk of cell damage. In this study, the antioxidant profile of EnduBerry™ Nu was investigated in human keratinocytes.

Our *in vitro* results showed, that EnduBerry™ Nu functions as a potent antioxidant, as given by the dose-dependent increase in the antioxidant index.

Importantly, treatment with EnduBerry™ Nu improved cell fitness by upregulating the levels of FOXP1 and presenilin 2, which are important factors involved in cell defense, cell protection and improved mitochondrial function.

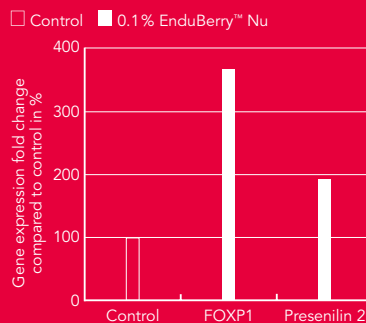
In a further study, treatment with EnduBerry™ Nu significantly decreased H₂O₂-induced protein oxidation (a marker for cell stress and protein damage) in human dermal fibroblasts.

Antioxidant capacity



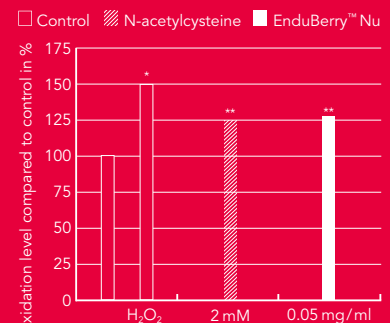
S-901 / © Mibelle Biochemistry

FOXP1 and presenilin 2 expression



S-940 / © Mibelle Biochemistry

Protection against oxidative stress



* p<0.001 versus untreated control
** p<0.001 versus H₂O₂-stressed control

S-980 / © Mibelle Biochemistry

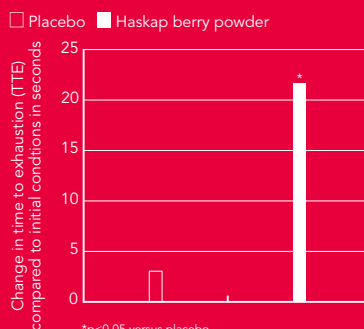
Clinical Study Results



The effects of a Haskap berry powder (HBP) on running performance and endurance were evaluated in a randomized, double blind, and placebo-controlled study. 30 healthy male recreational runners (average age 32.5 years), that can complete a 5 km run in under 25 minutes, were recruited. They were split into two groups. One group ingested 6 g HBP daily over 7 days, whereas the other group received a calorie-matched placebo product.

Supplementation with HBP led to an endurance-enhancing effect. The runners increased their time to exhaustion significantly by 20 seconds. Importantly, they were also able to improve their running speed and running time: the HBP supplementation group ran on average 25 seconds faster than the placebo group. The runners also demonstrated a decreased heart rate at critical timepoints in endurance training, which indicates improved blood flow and oxygen use.

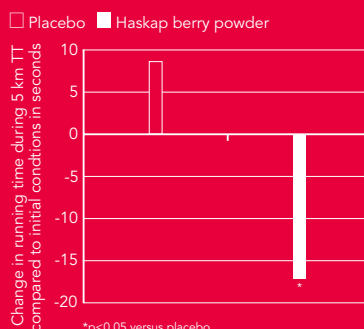
Longer time to exhaustion



*p<0.05 versus placebo

S-934 / © Mibelle Biochemistry

Improved running speed and time



*p<0.05 versus placebo

S-934 / © Mibelle Biochemistry



Suitable Product Applications

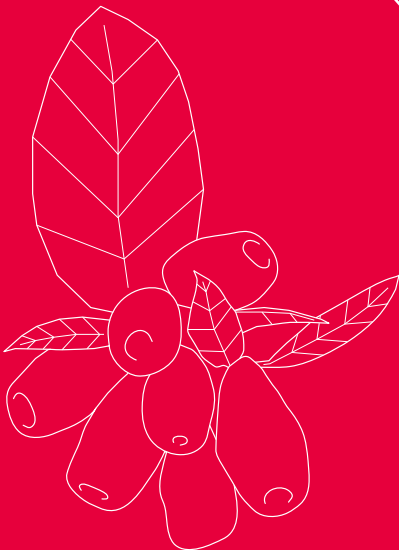
- Endurance boosters
- Exercise and recovery supplements
- Pre-workout formulas
- Electrolyte drinks
- Sport powder beverages
- Anti-oxidative and wellbeing supplements

Product Attributes

- Extract especially rich in antioxidative anthocyanins
- Dark purple water-soluble powder
- A pleasant taste similar to mix of raspberry and blueberry
- Recommended daily dosage of 120 mg

Benefits

- EnduBerry™ Nu improves cell fitness by upregulating genes involved in cell defense, cell protection and mitochondrial function
- Proven high antioxidative capacity and protection from oxidative stress
- Extends endurance performance
- Optimizes heart rate, blood flow and oxygen use for endurance training
- Leads to faster running speed after only 7 days of consumption
- Winner of the Ringier Technology Innovation Award 2023 in the category "Food & Beverage Ingredients"



Developed in Switzerland

The information contained in this publication is provided in good faith and is based on our current knowledge. No legally binding promise or warranty regarding the suitability of our products for any specific use is made. These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease. Mibelle Biochemistry will not assume any expressed or implied liability in connection with any use of this information.

www.mibellebiochemistry.com

Mibelle AG Biochemistry, 5033 Buchs/Switzerland, Phone +41 62 836 17 31, food@mibellebiochemistry.com
Mibelle AG Biochemistry, Mahwah, NJ 07430/USA, Phone 1-844-MIBELLE