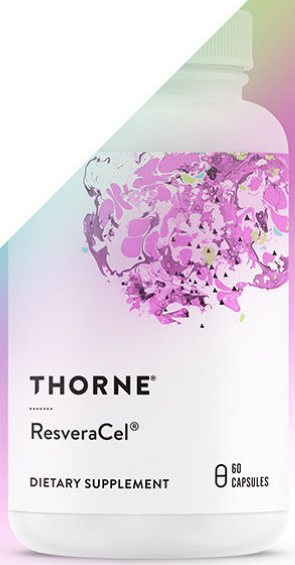
ResveraCel®

Target the effects of aging on a cellular level*

Nicotinamide Riboside
Quercetin Phytosome
Trans-Resveratrol
Betaine (Trimethylglycine)



What it is

ResveraCel combines nicotinamide riboside with resveratrol and cofactors to support healthy aging.* It provides support for metabolic syndrome and increases cellular energy production.*

Key benefits

- Supports healthy aging*
- Betaine provides important methylation factors*
- Resveratrol and quercetin increase activity of sirtuins*
- Contains nicotinamide riboside (NR) – the most efficient direct precursor to NAD+*
- Helps regulate metabolism for improved metabolic syndrome parameters*
- Quercetin is bound to sunflower-sourced phospholipids for enhanced absorption*

The science behind ResveraCel

Nicotinamide riboside (NR)

NR is the most direct precursor to nicotinamide adenine dinucleotide (NAD+). The mitochondria cannot perform their crucial cellular functions without a sufficient supply of NAD+.* By significantly increasing levels of NAD+, NR offers fundamental support for mitochondrial biogenesis, as well as all other mitochondrial activities – from energy production to the regulation of cellular aging.* Using an animal model, researchers found significant decreases in NAD+ by middle age, associated with increased oxidative stress and decreased SIRT1 levels.[1]*

NR provides support for metabolism.* NR prevented obesity in mice fed a high-fat, high-calorie diet.* It also prevented fat accumulation in the liver and improved insulin sensitivity and glucose disposal.* Other metabolic effects included improved thermogenesis, greater muscle endurance, and increased cristae density in brown adipose tissue.[2]*

Resveratrol

Calorie restriction has been shown to increase the lifespan of many species. Resveratrol mimics the effect of calorie restriction by activating the sirtuin group of proteins.* In a study, resveratrol was shown to be the most potent natural sirtuin activator.[3]* Resveratrol shows promise in helping to attenuate the effects of several age-related conditions.[4]*

Resveratrol increases activation of SIRT1 and SIRT3, both of which are important sirtuins in the maintenance of metabolic function.* In animals fed a high-calorie diet, resveratrol protected against obesity, improved metabolism, and supported insulin sensitivity.[5]* Resveratrol provides support for fatty liver,[6]* healthy blood pressure,[7]* and normal blood glucose levels.[8]*

*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.

The science behind ResveraCel® (cont.)

Quercetin phytosome

Research shows that quercetin not only acts as a potent antioxidant and is synergistic with the activities of resveratrol, it also slows the breakdown of resveratrol in the body.* Although resveratrol goes through extensive liver metabolism, researchers found quercetin inhibits duodenal and hepatic glucuronidation and sulfation of resveratrol, thus increasing its bioavailability.[9,10]*

Like resveratrol, quercetin also enhances sirtuin activity.[11]* A study in an animal model of metabolic syndrome found the combination of quercetin and resveratrol improved serum parameters associated with MetS by up-regulation of SIRT1 in white adipose tissue.[12]*

Quercetin has also been shown to provide support for fatty liver.[13]*

Betaine

Betaine – also known as trimethylglycine – is a premier methyl donor.* In addition to providing significant methylation support because it can donate three methyl groups, betaine provides support for important metabolic functions that are associated with metabolic syndrome.* It helps metabolize homocysteine, which is sometimes elevated in MetS.[14]* Betaine has also been shown to decrease infiltration of triglycerides into the liver, providing nutritional support for fatty liver.[15]*

References

1. Braidy N, Guillemin G, Mansour H, et al. Age related changes in NAD+ metabolism, oxidative stress and SIRT1 activity in Wistar rats. *PLoS One* 2011;6:e19194.
2. Canto C, Houtkooper R, Pirinen E, et al. The NAD(+) precursor nicotinamide riboside enhances oxidative metabolism and protects against high-fat diet-induced obesity. *Cell Metab* 2012;15:838-847.
3. Howitz K, Bitterman K, Cohen HY, et al. Small molecule activators of sirtuins extend *Saccharomyces cerevisiae* lifespan. *Nature* 2003;425:191-196.
4. Baur J, Sinclair D. Therapeutic potential of resveratrol: the *in vivo* evidence. *Nat Rev Drug Discov* 2006;5:493-506.
5. Baur J, Pearson K, Price N, et al. Resveratrol improves health and survival of mice on a high-calorie diet. *Nature* 2006;444:337-342.
6. Ji G, Wang Y, Deng Y, et al. Resveratrol ameliorates... through regulating autophagy. *Lipids Health Dis* 2015;14:134.
7. Liu Y, Ma W, Zhang P, et al. Effect of resveratrol on blood pressure: a meta-analysis of randomized controlled trials. *Clin Nutr* 2015;34(1):27-34.
8. Liu K, Zhou R, Wang B, Mi M. Effect of resveratrol on glucose control and insulin sensitivity: a meta-analysis of 11 randomized controlled trials. *Am J Clin Nutr* 2014;99(6):1510-1519.
9. De Santi C, Pietrabissa A, Mosca F, Pacici GM. Glucuronidation of resveratrol, a natural product present in grape and wine, in the human liver. *Xenobiotica* 2000;30:1047-1054.
10. De Santi C, Pietrabissa A, Spisni R, et al. Sulphation of resveratrol, a natural compound present in wine, and its inhibition by natural flavonoids. *Xenobiotica* 2000;30:857-866.
11. Hung C, Chan S, Chu P, Tsai K. Quercetin... by activiation of SIRT1 signaling under oxLDL stimulation. *Mol Nutr Food Res* 2015;59(10):1905-1917.
12. Peredo-Escarcega A, Guarner-Lans V, Perez-Torres I, et al. The combination of resveratrol and quercetin attenuates metabolic syndrome in rats by modifying the serum fatty acid composition and by upregulating SIRT 1 and SIRT 2 expression in white adipose tissue. *Evid Based Complement Alternat Med* 2015;2015:474032.
13. Ying H, Liu Y, Yu B, et al. Dietary quercetin... induced by a high-fat diet in gerbils. *Food Chem Toxicol* 2013;52:53-60.
14. Rajdl D, Racek J, Trel L, et al. Effect of folic acid, betaine, vitamin B6, and vitamin B12 on homocysteine and dimethylglycine levels in middle-aged men drinking white wine. *Nutrients* 2016;8(1). pii: E34. doi: 10.3390/nu8010034.
15. Abdelmalek M, Sanderson S, Angulo P, et al. Betaine... results of a randomized-controlled trial. *Hepatology* 2009;50:1818-1826.

ResveraCel

SUPPLEMENT FACTS

V09

Serving Size: Two Capsules
Servings Per Container: 30

Two Capsules Contain:		**%DV**
Nicotinamide Riboside Hydrogen Malate	415 mg	*
Quercetin Phytosome ((*Sophora japonica*) extract (flower) / Phospholipid complex from Sunflower)	250 mg	*
Trans-Resveratrol	150 mg	*
Betaine Anhydrous (Trimethylglycine)	85 mg	*

*Daily Value (DV) not established.

Other Ingredients
Hypromellose (derived from cellulose) capsule, Leucine, Calcium Laurate, Microcrystalline Cellulose.

Suggested Use
Take 2 capsules daily or as recommended by your health-care practitioner.

If pregnant, consult your health-care practitioner before using this product.

SKU	Unit Count	Benefits	Features
SB302	60 Capsules	Healthy Aging* Metabolism* Energy*	Thorne Exclusive Gluten Free Dairy Free Soy Free

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