

Blood Glucose

In 2018, 34.2 million Americans lived with imbalanced blood glucose levels, with a total of 26.8% of the population aged 65 or older impacted.¹

Resveratrol supports maintaining a healthy blood glucose level and helps protect tissues sensitive to the effects of imbalanced blood glucose levels.

Glucose homeostasis, a tightly regulated balance

The levels of blood sugar must be kept within a narrow range. Insulin and glucagon are the hormones allowing this regulation. Aging and other factors can cause the body to stop using insulin properly, leading to the increase of blood glucose levels. Prolonged unchecked glucose levels can dramatically reduce one's quality of life. Resveratrol can be key to supporting healthy blood glucose levels.



Resveratrol supports maintaining healthy blood glucose, blood pressure and insulin levels

Three meta-analyses²⁻⁴ individually highlighted the beneficial effects of resveratrol in people with imbalanced blood glucose levels. Subgroup analysis indicated that doses equal to or higher than 100 mg of resveratrol per day resulted in positive outcomes. Furthermore, resveratrol appears not to affect blood glucose levels in healthy individuals. Main conclusions from the meta-analyses were that resveratrol may:

- Significantly lower fasting glucose, insulin levels and insulin resistance
- Improve cardiovascular parameters and maintain healthy systolic and diastolic blood pressure

9 studies, 283 individuals, 4 weeks – 12 months (median 45 d.), median 250 mg resveratrol daily
11 studies, 388 individuals, 2 weeks – 6 months (median 12 w.), median 100 mg resveratrol daily
17 studies, 681 individuals, 4 weeks – 6 months (median 12 w.), median 300 mg resveratrol daily

Resveratrol can improve glycemic control and energy metabolism

A clinical trial⁵ investigated resveratrol's calorie-restriction mimicking effect and documented that resveratrol can activate AMPK, the main cellular regulator of energy and glucose uptake, and also SIRT1 which is known as a regulator protein for stressors associated with longevity as well as healthy aging. The study documented that resveratrol may:

- Lead to balanced glucose, lipid and triglyceride levels
- Reduce oxidative stress biomarkers and improve insulin sensitivity
- Improve muscle mitochondrial activity, and balanced basal and after-meal energy expenditure
- Stimulate metabolic changes mimicking the effects of calorie restriction

11 healthy overweight men, 4 weeks, 150 mg resveratrol daily, biochemical measurements as molecular and protein expression, micro-array data, muscle biopsy, analysis of muscle fibers

Resveratrol supports lipid breakdown by autophagy and may thereby improve insulin sensitivity

Adipose tissue dysfunction may play a prominent role in the development of insulin resistance,⁶ similar to reduced buffering capacity for lipid storage. A clinical trial⁷ investigated the adipose tissue morphology and gene expression using micro-array analysis and revealed resveratrol supplementation may:

- Reduce the overall size of fat cells, from large and very-large to small adipocytes
- Support pathways involved in cell cycle regulation, glucose uptake and lipid breakdown by autophagy

11 healthy overweight participants, 150 mg resveratrol daily, investigations of adipose tissue morphology and underlying processes

References

1. National Diabetes Statistics Report, 2020; CDC.
2. Zhu X *et al.* Effects of resveratrol on glucose control and insulin sensitivity in subjects with type 2 diabetes: systematic review and meta-analysis. *Nutr Metab.* 2017; 14: 60.
3. Liu K, Zhou R, Wang B & Mi MT. Effect of resveratrol on glucose control and insulin sensitivity: a meta-analysis of 11 randomized controlled trials. *Am J Clin Nutr.* 2014; 99: 1510–9.
4. Fogacci F. *et al.* Effect of resveratrol on blood pressure: A systematic review and meta-analysis of randomized, controlled, clinical trials. *Crit Rev Food Sci Nutr.* 2018; 0: 1–14.
5. Timmers S *et al.* Calorie restriction-like effects of 30 days of resveratrol supplementation on energy metabolism and metabolic profile in obese humans. *Cell Metab.* 2011; 14(5): 612–22.
6. Goossens GH. The role of adipose tissue dysfunction in the pathogenesis of obesity-related insulin resistance. *Physiol Behav* 2008; 94: 206–218.
7. Konings E *et al.* The effects of 30 days resveratrol supplementation on adipose tissue morphology and gene expression patterns in obese men. *Int J Obes.* 2014; 38: 470–473

resveratrol re-imagined™

Veri-te™ resveratrol is produced using an innovative yeast fermentation process.

This means our resveratrol is:

PURE: >98% pure *trans*-resveratrol

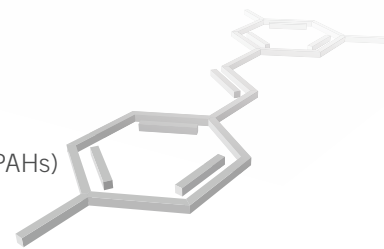
SAFE: free of contaminants (e.g. pesticides, emodin & PAHs)

RELIABLE: consistent batch to batch

VERSATILE: off-white, odorless and neutral taste

SCALABLE: large cGMP production capacity

Veri-te™
RESVERATROL



Our Products:

- Veri-te™ Food Grade 98% purity for dietary supplements and foods and beverages*
- Veri-Sperse™ 90% for when increased bioavailability and CWD are important
- Veri-te™ Aqua for liquid applications
- Cosmetic-Grade resveratrol
- API Grade resveratrol product with DMF available

Regulatory & Quality Status:

- Food Grade 98% purity for dietary supplements and foods and beverages*
- Made under cGMP and HACCP based food safety conditions
- Halal and Kosher certified resveratrol available

Evolve is committed to supporting clinical trials and research studies to further understand the important benefits of resveratrol on healthy living and aging.

About Evolve:

Veri-te™ resveratrol is produced by Evolve, a Swiss biotech company focused on the research, development and commercialization of products based on nature. We have leading businesses in Flavors and Fragrances, Health Ingredients and Health Protection. Evolve's employees, half of which are women, are dedicated to make the best products that can contribute to health, wellbeing and sensory enjoyment. Find out more at www.evolve.com.

For more information:

We have sales offices in the US and Europe, with distribution and regulatory approvals worldwide.* Our technical team can advise on formulations and ideal combinations. Additionally, our marketing team can help you plan your marketing strategy for Veri-te™ resveratrol. Contact us to order free samples for evaluation.

Evolve's website: www.evolve.com

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For general inquiries and customer service inquiries please email: res@veriteresveratrol.com

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Or phone us at:

Evolve (U.S.A./R.O.W.): +1.800.250.1032

Evolve (Europe/R.O.W.): +41.61.485.2000

*Contact Evolve for a full list of countries where approved by regulation

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