

Oregano Oil

TECHNICAL SUMMARY

Oregano (*Origanum vulgare*) is a perennial herb with a long history of traditional use. Oregano oil possesses powerful, free radical-neutralizing compounds, some of which support healthy, normal immune system responses.* Modern studies indicate that oregano oil may also help maintain healthy intestinal flora balance.* Protocol For Life Balance® Oregano Oil Softgels are standardized to ensure a minimum of 55% carvacrol, one of oregano's active constituents, and are enteric coated for release in the small intestine.

Structure formula:

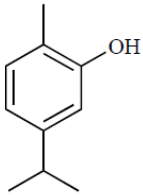


Figure 1: Carvacrol

Chemical name: 2-methyl-5-(1-methylethyl)-phenol.

Allergen and Additive Disclosure: Not manufactured with yeast, wheat, gluten, soy, milk, egg, fish or shellfish ingredients. Produced in a GMP facility that processes other ingredients containing these allergens.

Delivery Form: Enteric-coated softgels

ROLE AS NUTRIENT/FUNCTION

Carvacrol is known for its many biological properties, including free radical-neutralization.* In clinical studies, carvacrol supplementation helps modulate biological markers involved in the normal immune system response as well as biomarkers of oxidative stress.*

In laboratory settings, carvacrol has demonstrated powerful spasmolytic effects on ileal and tracheal tissues (animal studies).*

Data from *in vitro* laboratory experiments suggest that carvacrol and other bioactive compounds found in oregano essential oil can support the growth of bacteria known to be part of a healthy intestinal flora which may support intestinal health.*

NATUROKINETICS®

Liberation: Using USP disintegration tests, this product does not disintegrate in the gastric test and disintegrates within 60 minutes in the intestinal test.

Absorption: In a study performed on piglets, more than 95% of unencapsulated carvacrol was absorbed in the stomach and duodenum. Plasma levels peaked 1.39 h after ingestion. (Figure 2)

Distribution: After gavage, in animal studies, carvacrol was mainly found in the gastric and intestinal tissues with small amounts in lung, liver, and muscle tissues when measured 2-24 h after ingestion of carvacrol in sesame oil.

Supplement Facts

Serving Size 1 Softgel

Amount Per Serving

Oregano Oil (<i>Origanum vulgare</i>) (min. 55% Carvacrol)	0.2 mL / 181 mg*
Ginger Oil (<i>Zingiber officinale</i>)	0.02 mL / 17.6 mg*
Fennel Oil (<i>Foeniculum vulgare</i>)	0.02 mL / 19.3 mg*

* Daily Value not established.

Other ingredients: Softgel Capsule (bovine gelatin, glycerin, water, enteric coating, carob) and Extra Virgin Olive Oil.

- Intestinal Support*
- Min. 55% Carvacrol

SUGGESTED USAGE: Take 1 softgel 1 to 3 times daily with food, or as directed by your healthcare practitioner.

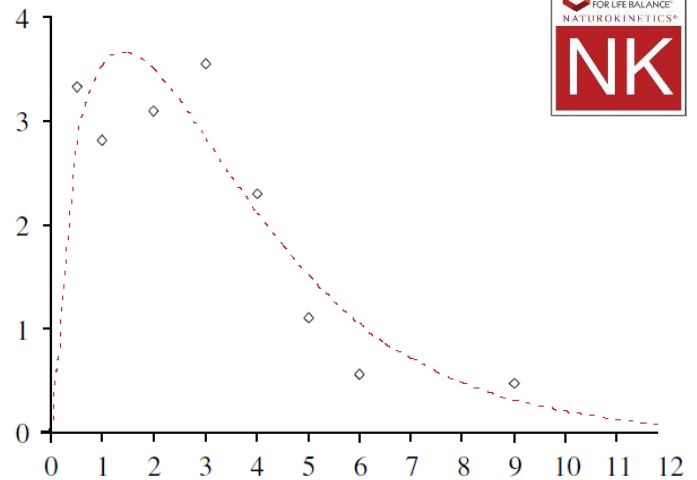


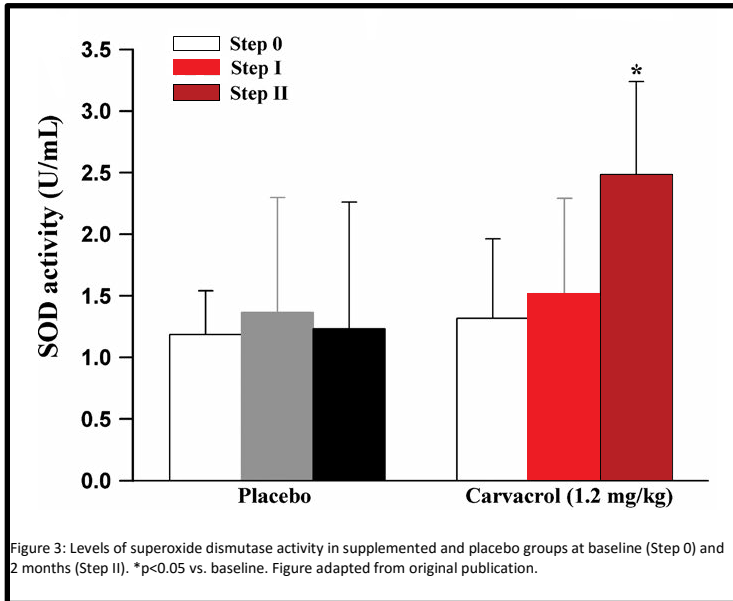
Figure 2: Concentration in plasma for free carvacrol and conjugated compounds in relation to time after oral administration of carvacrol to piglets.

Metabolism: The metabolic pathway of carvacrol in the body has not been completely elucidated; however data from animal studies and *in vitro* experiments suggest that the main metabolic route for carvacrol is the conjugation of the phenolic group with glucuronic acid and sulphate via UDP-glucuronosyltransferase (isoform 1A4). However, when administered at low levels, its metabolism includes the oxidation of the methyl and isopropyl groups to alcohols such as benzyl alcohol and 2-phenylpropanol with their corresponding carboxylic acids. A minor metabolite produced by ring hydroxylation has also been described. Others have investigated the role of cytochrome P450 in the metabolism of carvacrol using human liver microsomes. It was found that CYP2A6 was the main drug-metabolizing enzyme for carvacrol.

Elimination: In animals, carvacrol is excreted in urine intact or as its glucuronide and sulphate conjugates. In the same experiment, the author observed that the urinary excretion of metabolites was rapid with only very small amounts being excreted after 24 h and no metabolites detected in the 48- to 72-h post-treatment urine sample.

CLINICAL VALIDATION

- In a double-blind, randomized, placebo controlled study on 20 men receiving 1.2 mg/Kg/day carvacrol (equivalent to 84 mg/d) in three divided doses for two months, supplementation with carvacrol resulted in significant increase of thiol levels, superoxide dismutase activity (figure 3) and catalase activity after one month ($p < 0.05$) and confirmed after two months of supplementation ($p < 0.001$) vs. baseline. Authors also observed a significant decrease in malondialdehyde at 2 months vs baseline. ($p < 0.01$)



SAFETY INFORMATION

Tolerability: This product is generally well tolerated.

Contraindications: Known allergy to oregano, fennel and ginger.

As a precaution, this product is not recommended for pregnant, lactating women.

INTERACTIONS

Drug Interactions: *In vitro* data suggest that carvacrol can competitively inhibit the activity of UGT1A9-mediated glucuronidation. UGT1A9 is one of the most important UGT isoforms in humans and is involved in the metabolism of many drugs. These results have not been confirmed *in vivo* therefore the interactions between carvacrol and drugs metabolized via UGT1A9 are only theoretical. Animal data suggest that oregano oil, and to a lesser extent fennel and ginger oils, have antiplatelet aggregation activity, though results have not been clinically confirmed. Therefore the interaction between these essential oils and anticoagulating medication is only theoretical.

Supplement Interactions: Theoretically, concomitant use of oregano, fennel and ginger oils and herbs that may affect platelet aggregation could increase the risk of bleeding.

Theoretically, concomitant use of carvacrol and supplements metabolized via UGT1A9-mediated glucuronidation such as phenols and flavonoids may affect the metabolism of said compounds. The clinical significance of these interactions has not been evaluated.

Interaction with Lab Tests: None known

STORAGE

Store at ambient warehouse conditions in tightly sealed container.