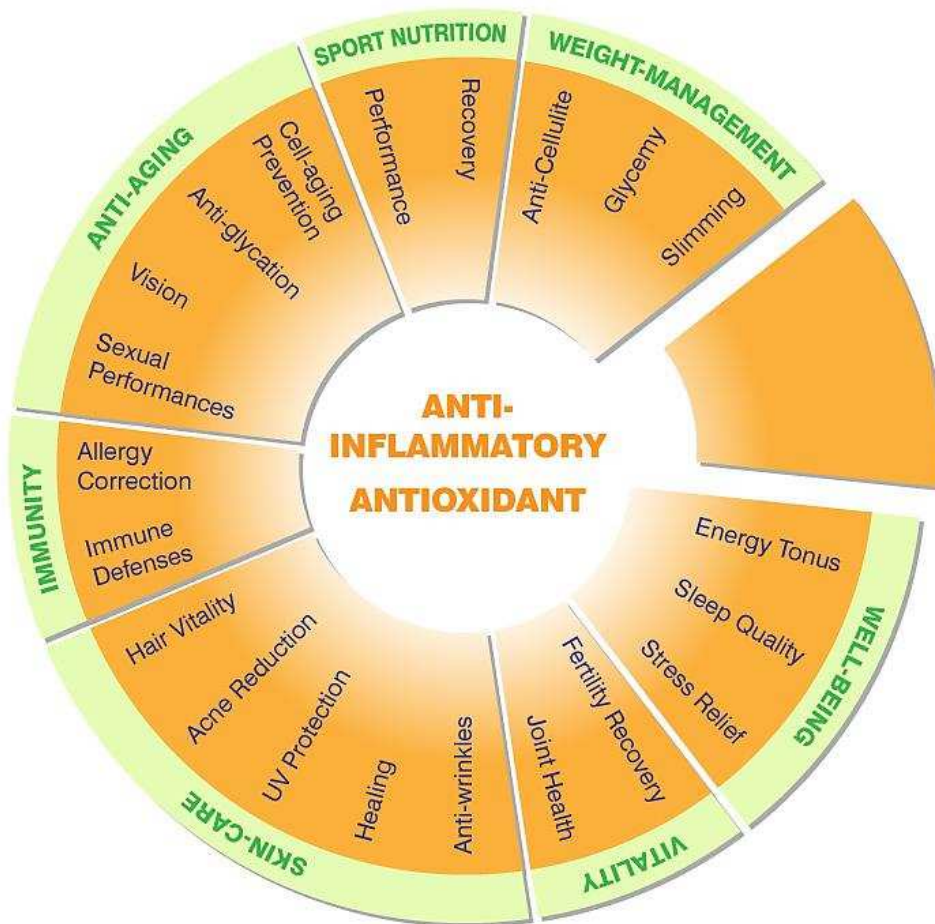


# SOD B®

## THE YOUTH CONCENTRATE

### BIBLIOGRAPHY - V08-2016



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## Note:

The publications mentioned in this document are mainly referred to Nutraceutical applications.  
The publications also adapted for cosmetics are indicated with (C)

## Cantaloup Melon Properties

### Mechanistic studies (C)

Lacan *et al.*, in the Journal of the American Society for Horticultural Science (1996), have linked the higher storage life of Clipper variety of Cantaloup melon (*Cucumis melo* L.) with the reduction of oxidative damages, especially phospholipid peroxidation.

**For more details:** <http://journal.ashspublications.org/content/121/3/554.short>

Lacan *et al.*, in Planta (1998), have demonstrated that the high SOD content found in Clipper Cantaloup Melon (*Cucumis melo* L.) is linked with a higher stress resistance. Authors reported high levels of two major antioxidant enzymes, Superoxide Dismutase (SOD) and Catalase (CAT), which are involved in delaying the senescence process. The increased SOD activity (7 times more compared to a classic melon variety) in this melon explains its longer storage life.

**For more details:** <http://link.springer.com/article/10.1007%2Fs004250050269>

## Safety

### Animal studies

Carillon *et al.*, in Food and Chemical Toxicology (2013), have highlighted the safety of an oral coated SOD B<sup>®</sup> supplementation. Healthy rats (n=8) were orally supplemented during 2 months with a dose of 160 IU SOD/day, that is to say 30 times more than the daily human recommended dosage of SOD B<sup>®</sup>. No side effects were reported, which highlights the safety of coated SOD B<sup>®</sup>. Corresponding human dose: 6000 IU SOD/day.

**For more details:** <http://www.ncbi.nlm.nih.gov/pubmed/23369932>

Carillon *et al.* have investigated a repeated-dose toxicity test on Sprague-Dawley rats orally supplemented with SOD B<sup>®</sup> (respectively at 0, 5, 10, 40, 80 and 160 IU SOD/day) for 4 weeks. The six SOD B<sup>®</sup> doses were well-tolerated by rats: no evidence for systemic and liver toxicity was observed, as well as any signs of oxidative stress and inflammation, even at the highest dose of 160 IU SOD /day. This dosage corresponds to 12 to 30 times more than the daily recommend dosages proposed by Bionov according the application.

### Unpublished work.

## Antioxidant Power

### Animal studies

Decorde *et al.*, in the *Journal of Agricultural and Food Chemistry* (2009), have demonstrated that an oral coated SOD B<sup>®</sup> supplementation (40 IU SOD/day), performed on a high-fat-fed hamster model (n=48), significantly reduces liver NADPH-dependent superoxide anions (O<sub>2</sub><sup>•-</sup>) production by 13%, and both liver lipid and protein oxidation by 35%.

**For more details:** <http://www.ncbi.nlm.nih.gov/pubmed/19601676>

Lalles *et al.*, in *Nutrition* (2010), have demonstrated that an oral coated SOD B<sup>®</sup> supplementation (50 IU SOD/day for 12 days) is effective in lowering the expression of the neuronal Nitric Oxide Synthase (nNOS) in the mid small intestine and in the colon of piglets (n=36). Such an effect prevents the production of Nitric Oxide (NO<sup>\*</sup>). Authors have further reported a significant decrease of stress proteins in the stomach, in the mid small intestine (HSP-27) and in the colon (HSP-70).

**Equivalent human dose:** 30 IU SOD/day.

**For more details:** <http://www.ncbi.nlm.nih.gov/pubmed/20558040>

Decorde *et al.*, in *Nutrition, Metabolism & Cardiovascular Diseases* (2010), have shown that a coated SOD B<sup>®</sup> oral supplementation significantly reduces the production of cardiac and liver superoxide anions (O<sub>2</sub><sup>•-</sup>) respectively by -45% and -67% in orally supplemented obese hamsters (80 IU SOD/day for 12 weeks, n=60) compared to those fed with a standard diet.

**For more details:** <http://www.ncbi.nlm.nih.gov/pubmed/19695852>

Carillon *et al.*, in *Free Radical Biology and Medicine* (2013), have shown that an oral SOD B<sup>®</sup> supplementation stimulates the expression of SOD (+70%), Glutathione Peroxidase (GPx, +50%), and Catalase (CAT, +50%) in the liver of orally supplemented obese hamsters at 10 IU SOD/day during 28 days. Authors have linked the induction of antioxidant enzymes expression with a decrease of the NADPH-dependent superoxide anions (O<sub>2</sub><sup>•-</sup>) liver production by 15%, and lipid peroxidation by 44%, in orally supplemented obese hamsters compared to non-treated ones.

**Equivalent human dose:** 400 IU SOD/day.

**For more details:** <http://www.ncbi.nlm.nih.gov/pubmed/23792771>

Carillon *et al.*, in *Molecular Nutrition and Food Research* (2014), have confirmed the induction of antioxidant enzymes expression following an oral coated SOD B<sup>®</sup> administration (10 IU SOD/day during 28 days), in the abdominal adipose tissue of obese hamsters. The endogenous expression of SOD, CAT and GPx were respectively increased by 36%, 28%, and 83% in orally supplemented obese animals compared to non-treated ones. Such an induction leads to the inhibition of NADPH-dependent O<sub>2</sub><sup>•-</sup> production in the adipose tissue by 67%.

**Equivalent human dose:** 400 IU SOD/day.

**For more details:** <http://www.ncbi.nlm.nih.gov/pubmed/24255021>

Carillon *et al.*, in *Food and Chemical Toxicology* (2013), have highlighted the induction of SOD expression, following an oral coated SOD B<sup>®</sup> supplementation (160 IU SOD/day during 28 days), in the liver of healthy rats (n=8). Authors reported a significant increase of both Cu,Zn-SOD and Mn-SOD expression respectively by 73% and 51%. These results suggest that coated SOD B<sup>®</sup> has a preventive effect by inducing a reserve of SOD before any pathological situation.

**Equivalent human dose:** 6000 IU SOD/day.

**For more details:** <http://www.ncbi.nlm.nih.gov/pubmed/23369932>

Carillon *et al.*, in the *International Journal of Food Sciences and Nutrition* (2014), brings new data to the innovative mechanism of action of coated SOD B<sup>®</sup> by oral route. Authors reported an increase of 30% to 40% of SOD and GPx cardiac expression in orally supplemented hypertensive rats (n=72) at 4 IU SOD/day during 28 days. This induction has been associated with the reduction of the cardiac superoxide anion (O<sub>2</sub><sup>•-</sup>) of 13% production in orally supplemented hypertensive rats compared to non-treated animals.

**Equivalent human dose:** 140 IU SOD/day.

**For more details:** <http://www.ncbi.nlm.nih.gov/pubmed/24601674>

Carillon *et al.*, in *Food & Nutrition Research* (2016), have confirmed the stimulation of SOD (+16%) and GPx (+15%) expression in the cardiac tissue after an oral SOD B<sup>®</sup> administration (4 IU for 4 days) on Spontaneous Hypertensive Rats (SHR). This induction is closely related to the decrease of nitrotyrosine (a product of tyrosine levels mediates by free radicals) levels by -45% and the subsequent correction of oxidative stress.

**Equivalent human dose:** 140 IU SOD/day.

**For more details:** <http://www.foodandnutritionresearch.net/index.php/fnr/article/view/30985>

## Mechanistic studies (C)

Decorde *et al.* (2008) have evaluated the SOD B<sup>®</sup> antioxidant properties on superoxide anions (O<sub>2</sub><sup>•-</sup>) production by NADPH oxidase using a monocyte macrophage cell line. Results have clearly shown that SOD B<sup>®</sup> inhibits the O<sub>2</sub><sup>•-</sup> production, with a maximum inhibition after 24h of pre-incubation at 50 IU SOD/ml.

### Unpublished work.

Carillon *et al.* published in *Food Chemistry* (2012) a scientific paper demonstrating for the first time the antioxidant capacity of SOD B<sup>®</sup> [internally name is SOD-MC for SOD Melon Concentrate] *in vitro*. Especially, this publication confirms the high SOD content of SOD B<sup>®</sup>, by demonstrating the antioxidant activity of this melon juice concentrate against the production of Reactive Oxygen Species (ROS). Results reported a significant inhibition of O<sub>2</sub><sup>•-</sup> which is regarded as the most toxic free radical.

**For more details:** <http://www.ncbi.nlm.nih.gov/pubmed/22953857>

## Review articles (C)

Carillon *et al.* have published an expert review in *Pharmaceutical Research* (2013), in which they expose a new mechanism of action of SOD by oral route. Authors reviewed how an oral SOD supplementation, although poor bioavailable, contributes to several health benefits. Several reports have already shown that an oral administration with encapsulated SOD leads to the induction of antioxidant enzymes expression. Such an induction could explain the health benefits obtained.

**For more details:** <http://www.ncbi.nlm.nih.gov/pubmed/23793992>

Carillon *et al.* have reviewed, in *Agro Food Industry High Tech* (2014), the induction of endogenous primary antioxidant defenses in targeted tissues induced by a coated SOD B<sup>®</sup> oral administration in obese hamsters. The stimulation of SOD, CAT, and GPx expression is linked with the reduction of DNA oxidative damages, as reported by the significant decrease of isoprostanes (F(8)-IsoP) levels.

**For more details:** Contact us for full publication.

## Anti-inflammatory Action

### Animal studies

Carillon *et al.*, in *Free Radical Biology and Medicine* (2013), have linked the induction of antioxidant enzymes expression, following a coated SOD B<sup>®</sup> oral supplementation, with the inhibition of several pro-inflammatory mediators. Authors have reported a significant decrease in the liver levels of IL-6 and TNF- $\alpha$ , by 45% and 28% respectively, in orally supplemented obese hamsters with coated SOD B<sup>®</sup> (10 IU SOD/day during 28 days.), compared to non-treated ones. These results have been associated with the inhibition of the transcription factor NF- $\kappa$ B by 5% in animals dietary supplemented with coated SOD B<sup>®</sup>. As oxidative stress and inflammation are closely linked, coated SOD B<sup>®</sup> represents an efficient anti-inflammatory agent.

**Equivalent human dose:** 400 IU SOD/day.

**For more details:** <http://www.ncbi.nlm.nih.gov/pubmed/23792771>

Carillon *et al.*, in *Food and Chemical Toxicology* (2013), have confirmed the anti-inflammatory properties of coated SOD B<sup>®</sup> in orally supplemented healthy rats (160 IU SOD/day during 28 days). Authors have shown a significant decrease of the pro-inflammatory cytokine IL-6 levels by 39% in the liver of orally supplemented healthy rats compared to non-treated ones. Authors concluded that the induction of endogenous SOD expression leads to the inhibition of inflammation.

**Equivalent human dose:** 6000 IU SOD/day

**For more details:** <http://www.ncbi.nlm.nih.gov/pubmed/23369932>

Carillon *et al.*, in *Molecular Nutrition and Food Research* (2014), have linked the induction of antioxidant enzymes expression with the obtained reduction of adipose tissue fibrosis by 42%, confirming the anti-inflammatory properties of SOD and its anti-fibrotic activity.

**Equivalent human dose:** 400 IU SOD/day.

**For more details:** <http://www.ncbi.nlm.nih.gov/pubmed/24255021>

## Cognition

### Concentration

#### Clinical study

Milesi *et al.*, in the *Nutrition Journal* (2009), have investigated, in a double-blind randomized placebo controlled clinical study whether an oral supplementation with protected SOD B<sup>®</sup> (140 IU SOD/day during 4 weeks) could improve concentration. 70 active people, who feel mental fatigue and concentration issue, were enrolled in this clinical trial. Authors have reported a significant improvement of concentration (+64.6%) evaluated through well-known and validated Ferreri Anxiety Rating Diagram (FARD) scale.

**For more details:** <http://www.ncbi.nlm.nih.gov/pubmed/19754931>

### Memory

#### Clinical study

Carillon *et al.* in *Nutrients* (2014) have aimed to investigate whether a coated SOD B<sup>®</sup> oral supplementation (140 IU SOD/day) could reduce mental fatigue. 61 active volunteers who feel daily stress were enrolled, and mental fatigue was measured with the Stroop and reverse Stroop tests. Authors have reported a significant improvement of cognitive abilities of 13.9% after 28 days and 20.8% after 84 days of supplementation compared to the placebo group. Coated SOD B<sup>®</sup> therefore provides a quick and lasting action in the improvement of cognitive performances.

**For more details:** <http://www.mdpi.com/2072-6643/6/6/2348>



## Well-Being

### Sleep Quality

#### Clinical study

Milesi *et al.*, in the *Nutrition Journal* (2009), have investigated, in a double-blind randomized placebo controlled clinical study whether an oral supplementation with coated SOD B<sup>®</sup> (140 IU SOD/day during 4 weeks) could reduce sleep troubles. 70 active people, who feel daily fatigue, were enrolled in this clinical trial. Authors have reported a significant reduction of sleep troubles (-70.7%,  $P < 0.05$ ) evaluated through the well-known and validated Ferreri Anxiety Rating Diagram (FARD) scale.

For more details: <http://www.ncbi.nlm.nih.gov/pubmed/19754931>

### Stress Relief

#### Clinical study

Milesi *et al.*, in the *Nutrition Journal* (2009), have investigated, in a double-blind randomized placebo controlled clinical study whether an oral supplementation with protected SOD B<sup>®</sup> (140 IU SOD/day during 4 weeks) could reduce perceived stress. 70 active people, who feel daily fatigue, were enrolled in this clinical trial. Authors have reported a significant reduction of perceived stress (-21.7%,  $P < 0.05$ ) evaluated through the validated and well-known psychological Cohen scale.

For more details: <http://www.ncbi.nlm.nih.gov/pubmed/19754931>

Carillon *et al.* in *Nutrients* (2014) have aimed to investigate whether a coated SOD B<sup>®</sup> oral supplementation (140 IU SOD/day) could reduce daily stress. 61 active volunteers who feel daily stress were enrolled, and stress scores were obtained from the validated Perceived Stress Scale (PSS-14). Authors have reported a significant reduction of stress by 8.8% after 28 days and -7.2% after 84 days of supplementation compared to the placebo group. Coated SOD B<sup>®</sup> therefore provides a quick and lasting action in the elimination of daily stress.

For more details: <http://www.mdpi.com/2072-6643/6/6/2348>

### Self-control

#### Clinical study

Milesi *et al.*, in the *Nutrition Journal* (2009), have investigated, in a double-blind randomized placebo controlled clinical study whether an oral supplementation with coated SOD B<sup>®</sup> (140 IU SOD/day during 4 weeks) could reduce irritability. 70 active people, who feel daily stress and fatigue, were enrolled in this clinical trial. Authors have reported a significant reduction of irritability (-66%,  $P < 0.05$ ) evaluated through the well-known and validated Ferreri Anxiety Rating Diagram (FARD) scale.

For more details: <http://www.ncbi.nlm.nih.gov/pubmed/19754931>

## Energy Boost

### Clinical studies

Milesi *et al.*, in the *Nutrition Journal* (2009), have investigated, in a double-blind randomized placebo controlled clinical study whether an oral supplementation with protected SOD B<sup>®</sup> (140 IU SOD/day during 4 weeks) could reduce weariness. Authors have reported a significant reduction of weariness (-77.3%) evaluated through the well-known and validated Ferreri Anxiety Rating Diagram (FARD) scale.

**For more details:** <http://www.ncbi.nlm.nih.gov/pubmed/19754931>

Jacquet *et al.*, in the *Journal of International Medical Research* (2014), have studied the impact of a 12 weeks-supplementation with a dietary supplement formulated with SOD B<sup>®</sup> (140 IU SOD/day) and additional ingredients on burnout symptomatology. Results have shown a significant reduction of burnout scores in the supplemented group (n=44) compared to the placebo group (n=43).

**For more details:** <http://www.ncbi.nlm.nih.gov/pubmed/25537278>

## Life Quality

### Clinical studies

Milesi *et al.*, in the *Nutrition Journal* (2009), have investigated, in a double-blind randomized placebo controlled clinical study whether an oral supplementation with protected SOD B<sup>®</sup> (140 IU SOD/day during 4 weeks) could improve the quality of life. Authors have reported a significant improvement of life quality (+22.8%, P< 0.05) evaluated through well-known and validated the SF-12<sup>®</sup> health survey.

**For more details:** <http://www.ncbi.nlm.nih.gov/pubmed/19754931>

Carillon *et al.* in *Nutrients* (2014) have aimed to investigate whether a coated SOD B<sup>®</sup> oral supplementation (140 IU SOD/day) performed on 61 people could improve the quality of life. Life quality scores were obtained from the validated SF-36 Health Survey scale. Authors have reported a significant reduction of cognitive fatigue by 6.4% after 84 days of supplementation compared to the placebo group.

**For more details:** <http://www.mdpi.com/2072-6643/6/6/2348>

## Skin Care

### Review article (C)

Le Quere *et al.*, in *Nutrafoods* (2014), have investigated, through a scientific review, the mechanism of SOD in skin disorders. This paper detailed the mechanism of action of SOD in photoaging, acne, vitiligo, psoriasis, fibrosis, wound healing, and atopic dermatitis. Numerous studies which have reported the efficiency of SOD in these skin alterations have been detailed. Authors have discussed whether a coated SOD B<sup>®</sup> could be efficient in all these skin alterations. Authors conclude that thanks to the induction of endogenous antioxidant defenses, SOD B<sup>®</sup> could be helpful in providing skin health.

**For more details:** <http://link.springer.com/article/10.1007%2Fs13749-014-0001-x>

## UV Protection

### Clinical study

Iacovelli *et al.*, in *Dermatological Experiences* (2006), have investigated whether an oral supplementation with coated SOD B<sup>®</sup> (300 IU SOD/day during one month) could be efficient in reducing Polymorphic Light Eruption (PLE), which is the most common UV-induced dermatosis. 10 patients were orally supplemented with coated SOD B<sup>®</sup> and other antioxidants (vitamin C, vitamin E, beta-carotene, co-enzyme Q10 and astaxanthin). Authors reported a significant reduction of the clinical manifestations of PLE in 70% of patients.

**For more details:** Ask us for the full publication

### Animal study

Le Quéré *et al.* (2000) have investigated whether an oral SOD B<sup>®</sup> supplementation (10 IU SOD/day during 2 weeks) on mice bearing human skin could prevent skin inflammation associated with UV exposure. Authors have reported a significant reduction (-42%) of the production of the pro-inflammatory cytokine TNF- $\alpha$  in the skin of UV-irradiated mice orally supplemented with SOD B<sup>®</sup> compared to non-treated ones. These results suggest that an oral coated SOD B<sup>®</sup> supplementation could represent an efficient strategy in order to prevent UV alterations to the skin.

**Equivalent human dose:** 1776 IU SOD/day

### Unpublished work.

## Mechanistic study (C)

Le Quéré *et al.* (2000) have investigated the time-dependent effect of SOD B<sup>®</sup> administration (30 IU SOD/ml) in the inhibition of keratinocyte apoptosis induced by UV irradiation and the recruitment of inflammatory cytokines. Results reported a significant reduction of keratinocytes apoptosis with a maximal protective effect with SOD B<sup>®</sup> administrated 24h before UV exposure. The inhibition of apoptosis has been linked to the decrease of inflammatory cytokines TNF- $\alpha$  (-70%) and IL-6 (-60%) production induced by UV irradiation. This study highlights both the antioxidant and anti-inflammatory action of coated SOD B<sup>®</sup> against UV-induced skin alterations.

**Unpublished work.**

## Pigmentation

### Clinical studies (C)

Khemis *et al.*, in *Dermatology* (2004), have studied, in a randomized double blind placebo controlled clinical study, the effect of a topical coated SOD B<sup>®</sup> application (0.25 mg/6cm<sup>2</sup>, twice a day during 6 months) in the correction of vitiligo. 17 patients were treated with coated SOD B<sup>®</sup> associated with UVB phototherapy. Authors reported a significant reduction of vitiligo in 60% of patients and added that the repigmentation was higher with the association of UVB and coated SOD B<sup>®</sup> than UVB alone.

**For more details:** Ask us for full publication

Faria *et al.*, in *Dermatologia Venezolana* (2006), have investigated the efficiency of an SOD B<sup>®</sup> topical application in the prevention and correction of vitiligo. 45 patients separated according to their age and disease progression, were topically applied with coated SOD B<sup>®</sup>. Authors reported a significant skin repigmentation in 60% of patients treated with coated SOD B<sup>®</sup>. Authors concluded that a topical application of protected SOD B<sup>®</sup> is efficient solution against vitiligo.

**For more details:** <http://revista.svderma.org/index.php/ojs/article/view/168>

## Weight-Management

### Slimming

#### Animal studies

Decorde *et al.*, in the *Journal of Agricultural and Food Chemistry* (2009) have demonstrated that a 12-week coated SOD B<sup>®</sup> oral supplementation (10 IU SOD/day) leads to a significant reduction of leptinemia by 13% in a high-fat-fed hamster's model (n=48). In addition, a significant improvement of adiponectinemia (+13%) was obtained, associated with a concomitant reduction of abdominal lipids (-17%). Overall, a significant reduction of body weight (-8,3%) was observed in supplemented hamsters.

**Equivalent human dose:** 400 IU SOD/day.

**For more details:** <http://www.ncbi.nlm.nih.gov/pubmed/19601676>

Carillon *et al.*, in *Molecular Nutrition and Food Research* (2014), have linked the induction of antioxidant enzymes expression with the significant decrease of body weight. Authors have reported a 6% lower body weight in obese hamsters orally supplemented with coated SOD B<sup>®</sup> (10 IU SOD/day during 28 days) compared to non-treated obese animals. This result is explained by the significant decrease of adipose tissue weight (-22%) and adipocytes size (-54%) obtained in orally supplemented animals.

**Equivalent human dose:** 400 IU SOD/day.

**For more details:** <http://www.ncbi.nlm.nih.gov/pubmed/24255021>

#### Review article

Carillon *et al.* have reviewed, in *Agro Food Industry High Tech* (2014), whether a coated SOD B<sup>®</sup> dietary supplementation reduces obesity markers in overweight hamsters. Coated SOD B<sup>®</sup> stimulates the endogenous primary antioxidant defenses in the adipose tissue, resulting in a significant reduction of several obesity markers such as the adipocyte weight and size. Coated SOD B<sup>®</sup> also acts by increasing lipolysis, which finally results in body weight reduction (-4%).

**For more details:** Ask us for full publication

## Cellulite Reduction

### Clinical study

Lemaire *et al.* (2015) have demonstrated that an oral supplementation with coated SOD B<sup>®</sup> (480 IU SOD) during 56 days significantly reduced cellulite on thighs on 21 women compared to placebo. Authors have reported a significant reduction of visible cellulite 9.5% after 28 days of supplementation. This reduction was amplified after 56 days of supplementation by reaching 11.3%.

For more details: <http://link.springer.com/article/10.1007%2Fs10298-015-0977-4>

### Mechanistic study (C)

Lemaire *et al.* (2012) have investigated the mechanism of action of SOD B<sup>®</sup> (100 IU SOD/ml) against cellulite *in vitro*. Authors have reported a significant increase of adipocyte lipolysis (+94%), as well as a significant reduction of adipocytes hypertrophy (-7.5%). Associated with the largely documented anti-fibrotic action of SOD, it has been concluded that SOD B<sup>®</sup> could represent an efficient natural agent against cellulite.

Unpublished work.

## Glycemy Improvement

### Animal studies

Decorde *et al.*, in the *Journal of Agricultural and Food Chemistry* (2009), have shown that an oral coated SOD B<sup>®</sup> supplementation (10 IU SOD/day during 12 weeks), leads to a significant reduction of insulin resistance (-28%) in a high-fat-fed hamster model (n=48). This result is associated with a decrease of 10% of the glycemy.

**Equivalent human dose:** 400 IU SOD/day

For more details: <http://www.ncbi.nlm.nih.gov/pubmed/19601676>

Carillon *et al.*, in *Free Radical Biology and Medicine* (2013), have reported a significant reduction of plasma glucose levels by 35% in obese hamsters orally supplemented with coated SOD B<sup>®</sup> (10 IU SOD/day during 28 days). Authors have further reported a significant attenuation of insulinemia and insulin resistance, respectively by 25% and 48% in obese treated animals compared to non-supplemented ones.

**Equivalent human dose:** 400 IU SOD/day.

For more details: <http://www.ncbi.nlm.nih.gov/pubmed/23792771>

Carillon *et al.*, in *Molecular Nutrition and Food Research* (2014), have highlighted that the increase of SOD, CAT and GPx expression in the adipose tissue following a coated SOD B<sup>®</sup> oral administration (10 IU SOD/day during 28 days) was linked with the significant improvement of insulin sensitivity. Authors have reported a significant reduction of insulinemia (-25%) and insulin resistance (-48%) in orally supplemented obese hamsters compared to non-treated ones.

**Equivalent human dose:** 400 IU SOD/day.

**For more details:** <http://www.ncbi.nlm.nih.gov/pubmed/24255021>

## Review article

Carillon *et al.* have reviewed, in *Agro Food Industry High Tech* (2014), whether a coated SOD B<sup>®</sup> dietary supplementation reduces insulin resistance in orally supplemented obese hamsters. Authors reported that insulin sensitivity is closely linked to the adipocytes metabolism. Through the stimulation of lipolysis, coated SOD B<sup>®</sup> contributes to inhibit insulin resistance and improve insulin sensitivity.

**For more details:** Ask us for full publication

## Circulation

### Cholesterol regulation

#### Animal studies

Decorde *et al.*, in *Nutrition, Metabolism & Cardiovascular Diseases* (2010), have demonstrated that a 12-weeks oral supplementation with coated SOD B<sup>®</sup> (10 IU SOD/day) prevents the development of atherosclerosis in a high-fat-fed hamster model (n=60). Authors have reported a significant decrease of the total plasma cholesterol level by -21%, and of the non-HDL cholesterol by -31% in orally supplemented obese animals compared to non-treated ones. The average Aortic Fatty Streak Accumulation (AFSA) was also reported to be gradually decreased (-55%) in orally supplemented hamsters. Consequently, aortic cholesterol was reduced by -49%.

**Equivalent human dose:** 400 IU SOD/day.

**For more details:** <http://www.ncbi.nlm.nih.gov/pubmed/19695852>

Carillon *et al.*, in *Free Radical Biology and Medicine* (2013), have demonstrated that an oral coated SOD B<sup>®</sup> supplementation prevents the increase in plasma LDL-cholesterol levels observed in hamsters fed with a high fat diet. A significant reduction of -55% of plasma LDL levels has been reported in orally supplemented hamsters (10 IU SOD/day during 28 days) compared to non-treated ones. This reduction of plasmatic cholesterol is linked to a reduction of liver cholesterol levels.

**Equivalent human dose:** 400 IU SOD/day.

**For more details:** <http://www.ncbi.nlm.nih.gov/pubmed/23792771>

## Review article

Carillon *et al.* have reviewed, in *Agro Food Industry High Tech* (2014), whether a coated SOD B<sup>®</sup> dietary supplementation reduces cholesterol levels in orally supplemented obese hamsters. Authors reported that coated SOD B<sup>®</sup> significantly corrects the increase in LDL-cholesterol levels by -55%, preventing cardiovascular alterations.

**For more details:** Ask us for full publication

## Normal Blood Pressure

### Mechanistic study

Carillon *et al.*, in *Food Chemistry* (2012), have reported that SOD B<sup>®</sup> [internally name is SOD-MC for SOD Melon Concentrate] significantly inhibits in a dose-dependent manner, the Angiotensin 1-Converting Enzyme *in vitro*. SOD B<sup>®</sup> therefore provides potential preventive benefits against the development of hypertension by preventing the conversion of angiotensin I to angiotensin II, which is a powerful vasoconstrictor.

**For more details:** <http://www.ncbi.nlm.nih.gov/pubmed/22953857>

### Animal study

Carillon *et al.*, in *the International Journal of Food Sciences and Nutrition* (2014), have linked the induction of endogenous antioxidant defenses in the heart of hypertensive rats (n=72), orally supplemented with coated SOD B<sup>®</sup> (4 IU SOD/day during 28 days), with the prevention of hypertension. Authors have reported a significant decrease of arterial pressure (-9%) in orally supplemented rats compared to non-treated animals. Coated SOD B<sup>®</sup> plays an important role in the prevention of hypertension.

**Equivalent human dose:** 140 IU SOD/day.

**For more details:** <http://www.ncbi.nlm.nih.gov/pubmed/24601674>



## Cardiac Functions

### Animal study

Carillon *et al.*, in the *International Journal of Food Sciences and Nutrition* (2014), reported a significant decrease of cardiac hypertrophy (-20%) in orally supplemented hypertensive rats compared to non-treated ones. This diminution of cardiac mass is related to the stimulation of endogenous antioxidant defenses following the coated SOD B<sup>®</sup> oral supplementation (4 IU SOD/day during 28 days).

**Equivalent human dose:** 140 IU SOD/day.

**For more details:** <http://www.ncbi.nlm.nih.gov/pubmed/24601674>

Carillon *et al.*, in *Food & Nutrition Research* (2016), have demonstrated that an oral SOD B<sup>®</sup> supplementation (4 IU SOD for 4 days) fully reverses and corrects cardiac hypertrophy and fibrosis on Spontaneously Hypertensive Rats (SHR). SOD B<sup>®</sup> acts by restoring relaxin and Atrial Natriuretic Peptide (ANP) pathways, and by increasing relaxin receptor expression.

**Equivalent human dose:** 140 IU SOD/day.

**For more details:** <http://www.foodandnutritionresearch.net/index.php/fnr/article/view/30985>

## Sport

### Recovery

### Clinical studies

Cavallini *et al.*, in the *Journal of Molecular and Clinical Pathology* (2007), have investigated whether an oral SOD B<sup>®</sup> supplementation could improve the oxidative balance of athletes after training. 10 professional players of martial arts (kickboxing) were orally supplemented with protected SOD B<sup>®</sup> (500 IU/day for one month). Results reported a significant improvement of the oxidative balance following the SOD B<sup>®</sup> supplementation, probably due to the activation of the endogenous antioxidant system.

**For more details:** Ask us for full publication

Carillon *et al.* in *Nutrients* (2014) have evaluated the effect of an oral coated SOD B<sup>®</sup> supplementation (140 IU SOD/day) on physical tonus. Authors have conducted a double-blind placebo controlled clinical study, performed on 61 active urban people. The physical fatigue has been determined by using the validated Prevoist Subjective Fatigue scale. Results reported a significant reduction of physical fatigue by -9.4% after 84 days of supplementation.

**For more details:** <http://www.mdpi.com/2072-6643/6/6/2348>

## Animal study

Notin *et al.*, in *the Equine Veterinary Journal Supplement* (2010), have investigated whether an oral protected SOD B<sup>®</sup> supplementation (520 IU/day) could influence the muscular variables in a population of horses in training (n=24). Authors have reported a significant increase in the plasma resistance to hemolysis in orally supplemented animals after 60 days of supplementation (P< 0.05). In addition, a significant decrease of the Creatine Kinase (CK) plasma levels was observed in the SOD B<sup>®</sup> supplemented group compared to animals treated with the placebo (P< 0.05). Authors concluded that an oral coated SOD B<sup>®</sup> supplementation could increase blood resistance to hemolysis and reduce the increase in muscular membrane permeability induced by training.

**Equivalent human dose:** 150 IU SOD/day

**For more details:** <http://www.ncbi.nlm.nih.gov/pubmed/21059033>

## Performances

### Animal study

Chabi *et al* have assessed the effect of a 12 weeks-oral supplementation with SOD B<sup>®</sup> (40 IU SOD/day) in myostatin KO (n=16) and wild type (n=17) aged mice. Results obtained demonstrate that SOD B<sup>®</sup> reduces negative effect of aging on running performance outcomes in both groups of mice, independently of genotype.

**For more details:** <http://www.ncbi.nlm.nih.gov/pubmed/26944368>