

# OvernightEnhance MJ + C

*Boosts night-time skin recovery*



NAOLYS ACTIVE SHELLS

# OvernightEnhance MJ + C

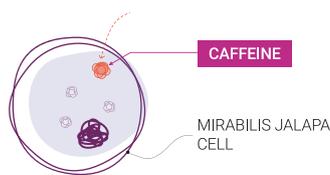
*Boosts night-time skin recovery*

The skin's regeneration and repair processes are most active during the night. They decrease with age and damage from the environment. However, they can be boosted by reinforcing certain key nocturnal metabolism mechanisms.

For more relaxed, radiant, skin and better resistance to external threats during the day.

## A VEGETAL STORY

### Four O'Clock + Caffeine inside



*During the night, the skin intensifies its vital renewal cycle; this process slows down with age and as a result of damage caused to the skin during the day; to revitalize this cycle, Naolys has created a new plant cell complex consisting of "four o'clock flower" (Mirabilis Jalapa) cells with integrated caffeine.*

*A multicoloured plant from subtropical America, belonging to the Nyctaginaceae family, four o'clocks only open their fragrant flowers to pollinating insects during the night. We don't need to present caffeine, a precious alkaloid. Enriched by the synergy with the caffeine, the plant cells increase the bioavailability of all the active ingredients that they deliver to the skin.*



## PRODUCT BENEFITS

### Radiance & Energizing

#### Radiance

Revive the complexion's radiance, enhances uniformity of skin colour.

#### Energizing

Restimulates internal metabolic mechanisms, boosts the overall activity of skin cells, reinforces energy production.

#### Repairing

Helps the skin to repair daytime damage.

#### Lightening, detoxifying

Promotes the elimination of toxins, increases micro-circulation in the skin.

#### Antioxidant

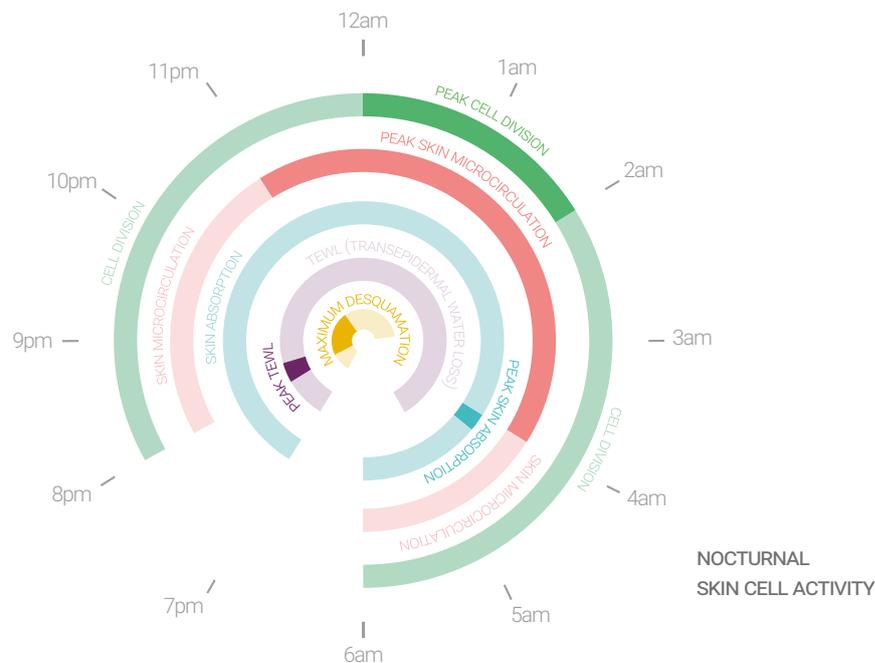
Slows down general cell oxidation, reduces the creation of free radicals.

NAOLYS

## HOW IT WORKS

### OvernightEnhance [MJ+C]: reinforced cellular metabolism

Several studies have recently highlighted the difference between night and daytime skin activity. During the day, skin cells protect themselves against oxidative stress and environmental damage, such as the formation of free radicals formed by UV and other harmful molecules such as pollutants and heavy metals. At night, regenerative and cellular nutrition mechanisms are activated to repair the damage sustained during the day. Unfortunately, ageing and over-exposure to daytime threats decreases the skin's night-time cellular repair capability. In the same way as a lack of sleep.



### OvernightEnhance [MJ+C] strengthens the cellular metabolism processes necessary for healthy cell function.

Because it is aimed at cellular metabolism, OvernightEnhance [MJ+C] focuses on two main actions, within the mitochondria and on the microcirculation, while decreasing the formation of oxygenated free radicals that hinder these two mechanisms that are essential to cellular repair.

#### **Metabolism: acting on the sources of mitochondrial activity**

Mitochondria are double-membrane organelles in cells responsible for cellular respiration and the production of the cell's energy: using special enzymes, they convert glucose into ATP (the energy molecules that are essential for cell function).

**OvernightEnhance [MJ+C] increases mitochondrial activity, thereby enhancing cellular metabolism whatever the age of the cells.**

#### **Cellular oxidation: acting on the heart of the respiratory system**

At night, skin cells may no longer be at risk from UV, but they are at risk from other factors, including certain oxygenated free radicals formed by the mitochondrial respiratory chain, such as hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>). These can cause cell lesions at several levels and induce the creation of new free radicals.

**OvernightEnhance [MJ+C] reduces the formation of the free radicals responsible for cell damage.**

#### **Metabolism: transporting nutrients and facilitating cellular exchanges**

As the epidermis is not vascularised, the role of blood microcirculation is to bring nutrients to the keratinocytes and to facilitate their metabolic exchanges, which are also essential to their function. This microcirculation is also hindered by the free radicals generated by cellular respiration.

**OvernightEnhance [MJ+C] preserves microcirculation in the skin that has become hindered by endogenous oxidation.**

Thanks to its action on overall cell metabolism, OvernightEnhance [MJ+C] enhances the complexion's radiance and the general well-being of the skin.

### CLINICAL TEST RESULTS

Effect on well-being and radiance after one night and after 28 days

- **86%** of women reported that their skin was more unified
- **82%** of women reported that their complexion was homogeneous and unified
- **77%** of women reported that their complexion was fresh, radiant and bright

At a concentration of 0.5%

### IN VITRO TEST RESULTS

Overall increase in cellular metabolism

#### Energizing and anti-ageing effect

→ Due to an increase in malate/aspartate shuttle activity in epidermal cells following naturally induced ageing (62 year-old and 35 year-old donor)

#### Detoxifying effect

→ Due to an increase in microcirculation (**23%** decrease in nitric oxide)

#### Antioxidant effect

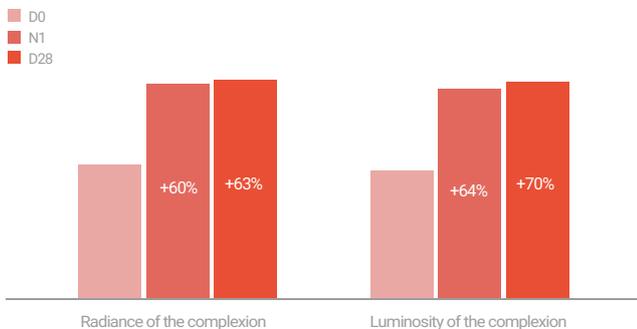
→ Due to a reduction in free radicals demonstrated by a reduction in MDA production induced by oxygenated water (**-27%**)

At a concentration of 0.5%

## Clinical test results

An increase in the radiance and brightness of the complexion after one night and after 28 days

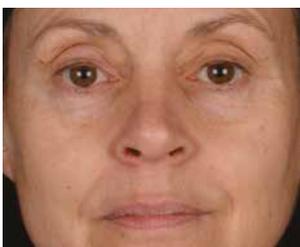
Effect on the radiance and luminosity complexion by clinical scoring



### After one night and after 28 days

An increase in the complexion's radiance of 60% and 63%

An increase in the complexion's brightness of 64% and 70%



DAY 0



DAY 28

#### Conditions of the study:

- Tests were carried out for 28 days on a sample of 22 women aged between 25 to 65 (average age: 55)
- Measurement performed by self-scoring
- Application once at night (at bedtime)
- Emulsion containing 0.5% of OvernightEnhance [MJ+C] (dispersion, 20% cells)

### Technical information on the formulation of OvernightEnhance [MJ+C]

#### INCI name of cells

Mirabilis jalapa callus extract

#### form

cells (20%) in glycerin or sunflower oil (80%)

#### aspect

liquid

#### concentration

starting at 0.5%

#### dispersible

in any formulation (emulsion, lotion, fluid)

## In vitro tests results

### Strengthening cellular metabolism

#### Increasing mitochondrial activity

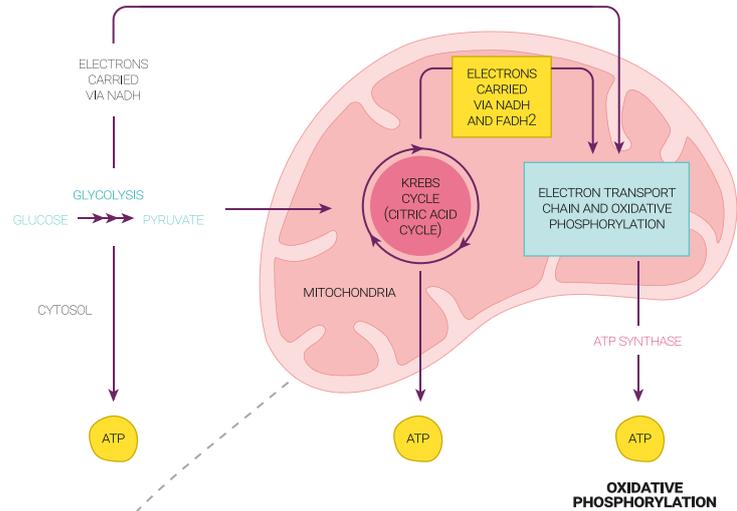
##### Cellular metabolism study

To produce energy, our cells need carbohydrates, which we mainly absorb through our food.

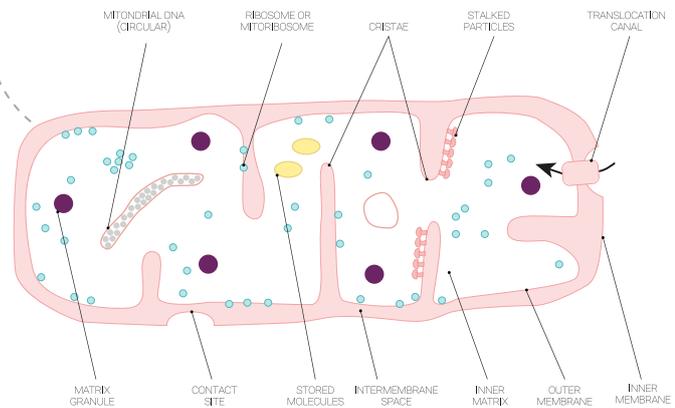
Carbohydrates are broken down in the cells' cytosol (or cytoplasm) in a process called glycolysis, which provides energy. Due to the action of specific enzymes, the carbohydrates undergo several changes that produce oxidizable substrates such as pyruvate, and coenzymes such as NADH (Nicotinamide adenine dinucleotide in a reduced form).

This gradual breaking down is continued in the mitochondria, more precisely in the inner membrane where the respiratory chain is located, which continues the process, resulting in the creation of ATP.

But NADH is too big to penetrate the mitochondrial inner membrane; it therefore uses the malate/aspartate shuttle system and an exchange of electrons to enter. Through its effect on the malate/aspartate shuttle, OvernightEnhance [MJ+C] activates the entry of the coenzyme NADH into the mitochondria, thereby enhancing energy production in the cells.



THE ENERGY PRODUCTION IN CELLS



MITOCHONDRIA

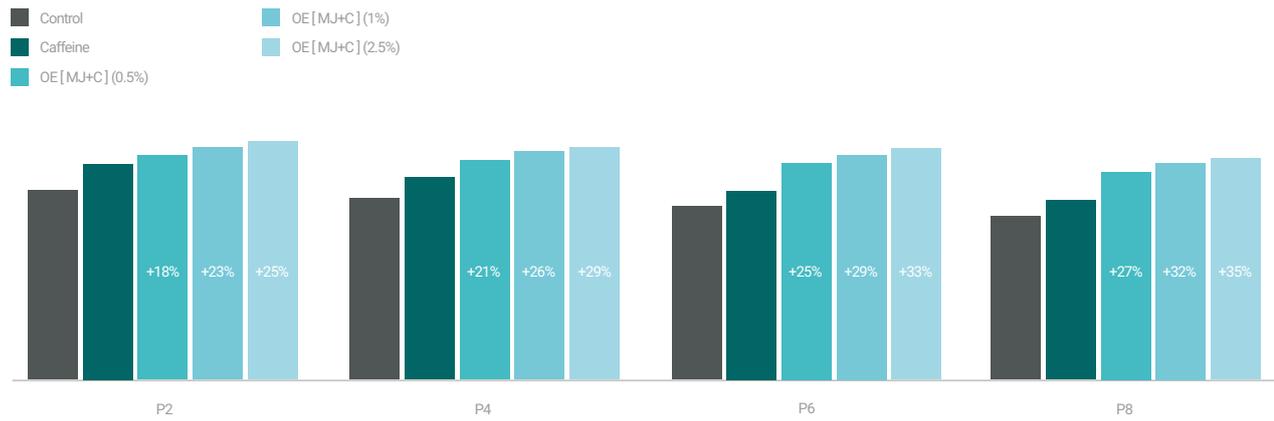
## Study of malate/aspartate shuttle activity

To examine the extent of OvernightEnhance [MJ+C]'s effect, we tested it both on older cells (with slower mitochondrial activity) and young cells (with optimal activity).

Different cellular subcultures that induced ageing of cells were labelled: P2, P4, P6, P8.

### On young cells (35 year-old donor)

Activity of the malate-aspartate shuttle (nM/min/mg)

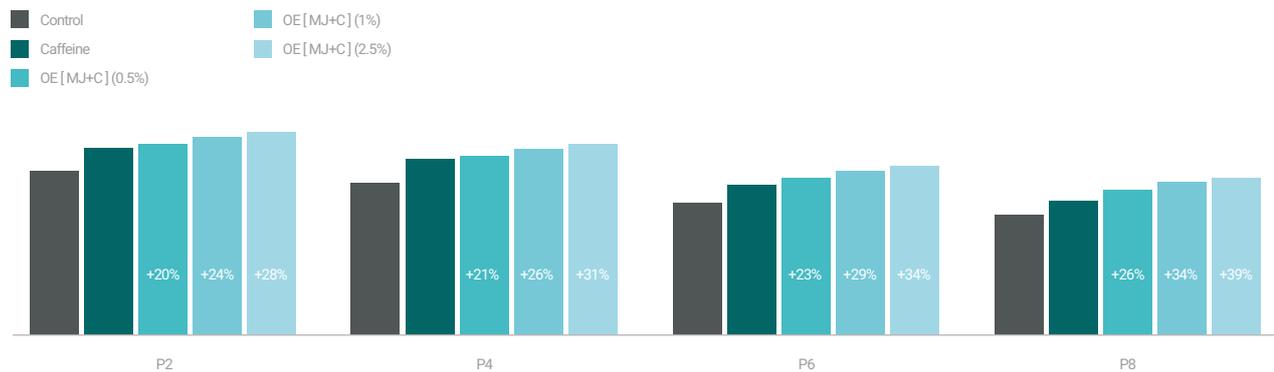


#### Increase in malate/aspartate shuttle activity

- At concentrations of 0.5%, there was an increase in malate/aspartate shuttle activity of 18%, 21%, 25% and 27% respectively.
- At concentrations of 1%, there was an increase in malate/aspartate shuttle activity of 23%, 26%, 29% and 32% respectively.
- At concentrations of 2.5%, there was an increase in malate/aspartate shuttle activity of 25%, 29%, 33% and 35% respectively.

### On ageing cells (62 year-old donor)

Activity of the malate-aspartate shuttle (nM/min/mg)



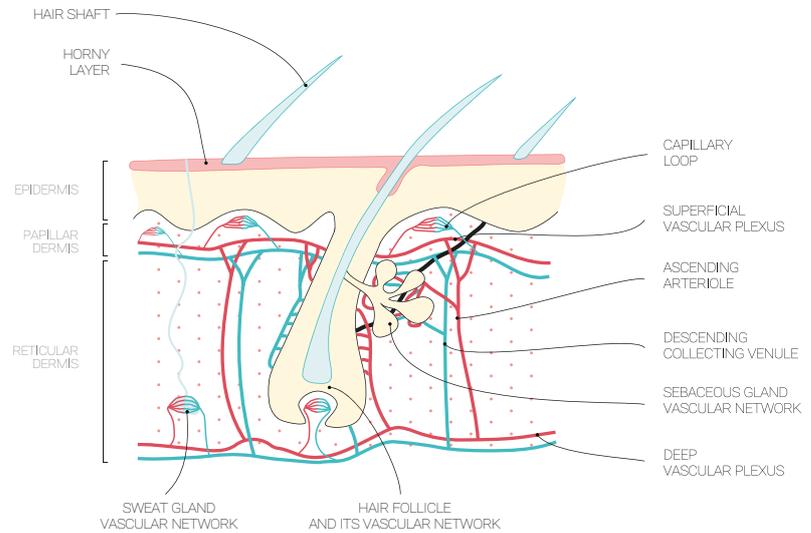
#### Increase in malate/aspartate shuttle activity

- At concentrations of 0.5%, there was an increase in malate/aspartate shuttle activity of 20%, 21%, 23% and 26% respectively.
- At concentrations of 1%, there was an increase in malate/aspartate shuttle activity of 24%, 26%, 29% and 34% respectively.
- At concentrations of 2.5%, there was an increase in malate/aspartate shuttle activity of 28%, 31%, 34% and 39% respectively.

## Preserving cellular exchanges and nutrition

### Microcirculation study

Microcirculation is the blood circulation system within which gas exchanges (oxygen/carbon dioxide) take place. Its function is to filter molecules and nutrients, which it accomplishes through a network of arterioles, capillaries, veinlets and a parallel network of tiny lymphatic vessels (lymphangions). Present in all tissue, these small vessels provide the link between the blood in the general circulation and the body's cells. This network enables the nourishment of cells and the removal of break-down products, it also maintains blood pressure and ensures the vasomotor reactivity necessary for regulating blood flow, in addition to the usual endothelial functions (coagulation, etc.).

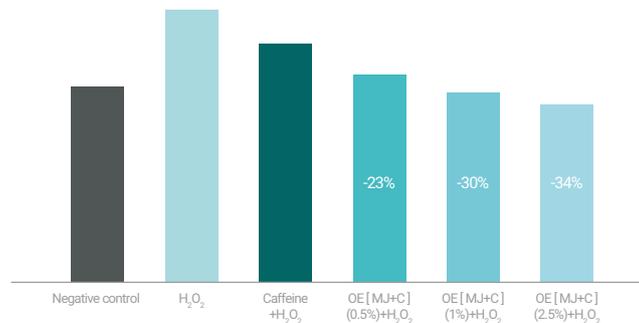


CUTANEOUS MICROCIRCULATION

### Study of nitric oxide (EDRF) exposed to hydrogen peroxide

Blood vessels are made up of several layers of fibrous cells, one of which, known as the endothelium, is in direct contact with the blood. These cells ensure various functions, from haemostasis to vascular tone, for which they release factors that trigger vasodilation and vasoconstriction. Among the vasodilators is nitric oxide (NO), which has been identified as EDRF (endothelium-derived relaxing factor). This fat-soluble gas activates a chemical reaction causing the relaxation of blood vessels or vasodilation. Our study demonstrates that OvernightEnhance [MJ+C] eliminates the vasodilating, free radical effect of nitric oxide because it results in a decrease in its release. The nitric oxide released after exposure of cells to hydrogen peroxide ( $H_2O_2$ ) can react with superoxide anions ( $O_2^-$ ), to form peroxynitrites ( $ONOO^-$ ), which are unstable anions that can damage endothelial cells and consequently the skin microcirculation.

Nitric oxide exposed to hydrogen peroxide ( $\mu M/mg$  of proteins)



#### Decrease of nitric oxide

→ At concentrations of 0.5%, 1% and 2.5%, there was a significant decrease in the release of nitric oxide in the cultured endothelial cells exposed to hydrogen peroxide at 23%, 30%, and 34% respectively (compared to untreated cells /+39%), with caffeine only -12%.

## Reducing oxidation

### Study of lipid peroxidation

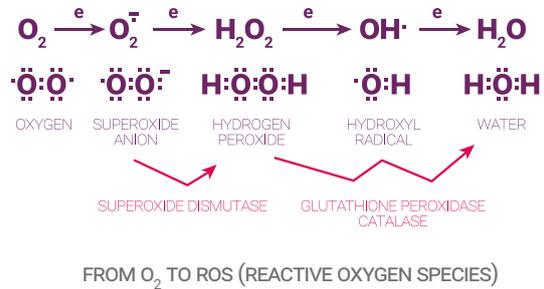
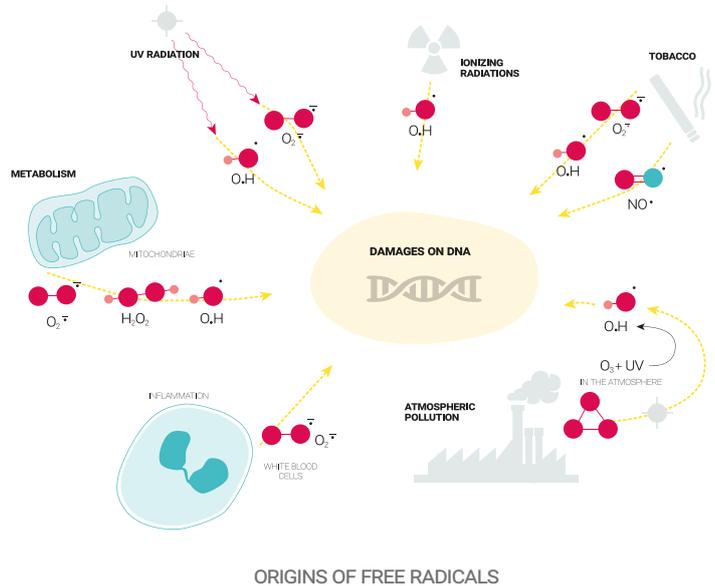
Because it is a reaction demonstrating oxidative stress, Naolys chose to study the release of MDA (malondialdehyde), a product that is formed during physiological and induced lipid peroxidation.

Endogenous production of free radicals is usually counterbalanced by all of the defence mechanisms, such as the natural enzymatic antioxidant regulation and protection systems (superoxide dismutase (SOD), catalase, and peroxidase) and non-enzymatic systems (vitamins C and E, reduced glutathione).

But when there is an excess of oxygenated free radicals (ROS), which can occur when there is high respiratory or metabolic activity, or during intense exposure to the sun, intoxication by certain chemical products, contamination by toxins, intense inflammatory reactions, etc.

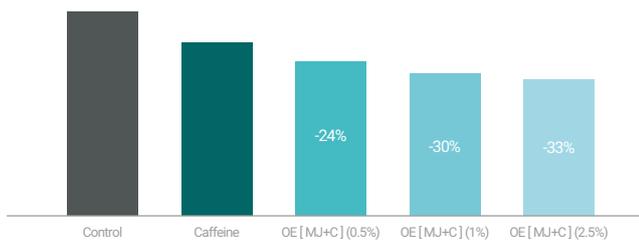
Many derivatives are produced during lipid peroxidation: conjugated dienes, peroxides, aldehydes, alkanes, most of which are cytotoxic, atherogenic and mutagenic. The formation of oxidation derivatives in lipid bilayers disrupts the membrane microarchitecture and impairs the functioning of enzymes, membrane carriers and membrane permeability.

In this study, instead of UVB, a classic skin cell threat, Naolys chose to use hydrogen peroxide ( $H_2O_2$ ), a reactive product of cellular respiration. It is highly soluble in water, easily penetrates biological membranes, and can cause the breakdown of proteins, the oxidation of DNA, lipids, and the deactivation of enzymes. In low concentrations, it does not present any toxicity to cells. However, in high concentrations, it induces cytotoxicity as a result of the high ROS levels that it generates. In this way our study reproduces the skin's biochemical characteristics more closely.



### Lipid peroxidation in physiological conditions

MDA ( $\mu M$ /mg of proteins)

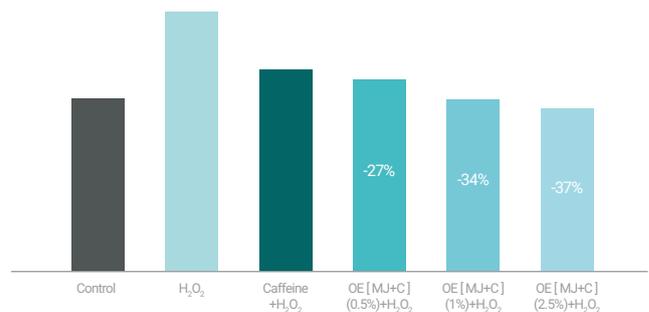


#### Decrease of MDA

→ At concentrations of 0.5%, 1%, 2.5%, decrease of the physiological lipid peroxidation, which was translated by a decrease of MDA respectively of 24%, 30% and 33% VS caffeine at 1%, decrease of MDA of 16%.

### Lipid peroxidation induced by hydrogen peroxide

MDA ( $\mu M$ /mg of proteins)



#### Decrease of MDA

→ At concentrations of 0.5%, 1%, 2.5%, decrease of the lipid peroxidation induced by hydrogen peroxide ( $H_2O_2$ ) which was translated by a decrease of MDA respectively of 27%, 34% and 37% VS caffeine at 1%, decrease of MDA of 23%.



## See also

Balancing Energy Asian ginseng

Full Energy Vanilla

Light&Energy Coffee & Saffron

Light&Energy Ginkgo

Light&Energy Rose root



