Analyses & Recherche
NUTRINOV

To contact us : contact@labo-nutrinov.com
Tel 33 (0) 2-99-14-70-50 / Fax 33 (0) 2-99-14-70-51

september 2003

Our Lab Book

THE MEASUREMENT OF THE ANTIOXIDANT POTENCY WITH THE ORAC METHOD

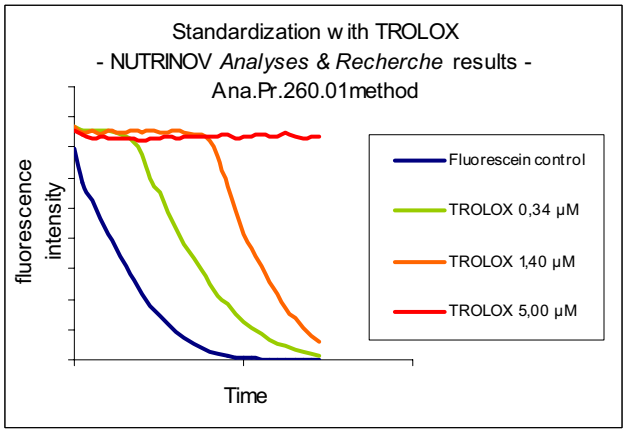
One of the relevant factors of aging is the progressive regression of the cellular antioxidant defenses. Natural physiological defenses exist to face free radical damages and a significant part of these defenses is provided by food.

The nutritional constituants exhibiting antioxydant properties are usually from vegetal origin. They are for example polyphenolic substances or A and C vitamins. Many other nutrients exist with known antioxidant properties, like tocotrienols, Q10 coenzyme, lipoic acid or flavonoids which react with free radicals. Components with enzymatic activities like SOD may also be considered as antioxidants. Finally, some metal chelating molecules have antioxidative properties, preventing metallic ions to initiate oxidative reactions.

The ORAC (Oxygen Radical Absorbance Capacity) assay is used by the United States Department of Agriculture (USDA) to measure an antioxidant potency of foods called ORAC Value. Foods having high ORAC values are recommended to reinforce antioxidative defenses *in vivo* by a nutrional way. The daily intake recommended by US nutritionists is comprised between 3000 et 5000 ORAC units per day.
These recommandations lead to the publication of tables ranking food nutrients with high ORAC values. Here are some examples of this antioxidative food " top-ten " (internet site http://www.ars.usda.gov/is/pr/1999/990208.htm).

Food	ORAC value per gram of fresh weight
Prune	58
Raisin	28
Blueberry	24
Strawberry	15
Kale	18
Spinach	13
Broccoli	9

The ORAC assay allows a global measurement of the antioxidative potency of pure molecules or complex formulations like commercial products. The first step of the method consists in the extraction of the active components by an acetone / water solvant mix. Lipidic components are not soluble in this solvant system and will not be included in the test.



The assay is done with a spectrofluorimetric equipment. It is a measurement of the ability of an extract to protect fluorescein against the oxydative degradation mediated by a stable free radical. In a strict scientific sense, this test thus measures antiradicalar properties.
Results are expressed by comparison with the antiradicalar protection exerted by the reference antioxidant Trolox®, a hydrosoluble E vitamin analogue. The results are calculated for one gram of the product tested.
The main advantage of the ORAC assay is to propose a standardized and largely accepted method for the evaluation of an antioxidant potency, on the contrary of the numerous other *in vitro* existing methods.

The ORAC value can also be used by marketing departments as an expression of the antioxidative properties of commercial extracts, compared to competiting products (NUTRINOV results).

The ORAC assay had just been adaptated in the laboratory to allow the measurement of the antioxidative protection supported by lipidic components.

Soya isoflavone concentrated extracts	ORAC value (µmoles TROLOX® / g)
Product A - 15%	3261
Product B - 20 %	1720
Product C - 40 %	3170