BioTeSys

# Oxygen Radical Absorbance Capacity (ORAC)

Food, Cosmetics, Pharmaceuticals

## Oxygen Radical Absorbance Capacity (ORAC)

Fundamentally, the ORAC value serves as an indicator of the **antioxidant capacity** of a sample. In the past, attempts were made to use ORAC values as a grading system for the health benefits of foods and as an additional product label to help consumers make informed choices. However, from a scientific perspective, such statements are not permissible due to the wet-chemical nature of the ORAC assay.

BioTeSys believes that the ORAC value has been unfairly discredited. At BioTeSys, the method for determining the **ORAC value is validated**. This value represents the total antioxidant capacity of a sample as a **cumulative parameter**, making it a measure of all antioxidant-active substances present in a given raw material, extract, or mixed product. This property makes it an excellent tool for **quality assurance**.

## Evaluation of Quality and Supply or Storage Chains through ORAC

Products that consist of one or a defined mixture of various ORAC-active components are characterized by an **"individual" ORAC value**. This value is characteristic of the specific product.

If a mixed product consists of multiple starting materials, the **reference ORAC value** is determined as a result of interactions between all active components in the mixture. Any **change in the ORAC value** (relative to the initial value) indicates changes in the product (e.g., freshness), deviations in the mixture, or the addition of unknown substances.

Thus, the ORAC method is particularly suitable for:

- **Raw material testing** as a characteristic parameter for defined product quality.
- **Monitoring ripening processes.**
- **Assessing storage and transport conditions.**
- **Tracking the processing of sensitive products.**

## Method

The **ORAC assay** is a **recognized fluorescence spectrometric laboratory method** that determines the **inhibition of oxidative degradation** of a fluorescent dye (**fluorescein**) by antioxidants. The oxidative degradation is triggered by the addition of a **peroxyl radical generator**.

The antioxidant potential is determined by **integrating fluorescence quenching curves over time**. The quantification of the sample's **radical-binding capacity** is carried out by **calibration with the water-soluble tocopherol derivative TROLOX**, which serves as a **reference antioxidant**. These so-called **TROLOX equivalents** are expressed in **µmol TROLOX/100 g sample**.

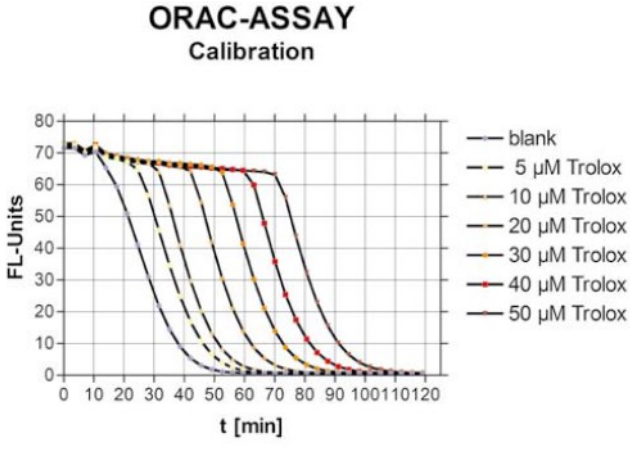


**Fig. 1: Fluorescence decay curves of TROLOX- calibration standards with concentrations between 0 and 50 µM.**

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## BioTeSys GmbH: Nutritional CRO & Testing Laboratory

**BioTeSys** operates as a Nutritional **CRO** (Contract Research Organization) & Testing Laboratory, offering extensive expertise and over 25 years of international experience in nutrition-related research and the analysis of bioactive ingredients.

As an efficient contract laboratory, we are your reliable partner for **R&D** and outsourcing projects. Whether you need:

- Simple **content analysis** of an ingredient
- **Stability testing** for product storage
- Support for **product development**
- A **bioavailability** study

## Scientific substantiation for a health claim

We provide tailor-made solutions for your specific needs.

Quality Control of Valuable Ingredients, Total Parameters, and Contaminants

High product quality and consumer trust are key to the ongoing success of your company. Valid assessments of quality and safety are becoming increasingly important—especially due to rising regulatory requirements.

We test raw materials, intermediates, and finished products according to current quality standards (**FCC**, **Ph. Eur.**, **USP**, **AOAC**, **DAB**, and validated methods).

## Analytical Methods

- **Identity** testing
- **Purity** testing
- **Content** analysis
- **Stability** testing (e.g., for vitamins, secondary plant compounds, and total parameters)

## Do you have further questions or are you interested in a collaboration?

**We look forward to advising you on your specific inquiry and finding the optimal solution for your needs.**

## Contact

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