

BEVERAGES ENRICHED WITH THE ANTIOXIDANT POWER OF HTEssence®

Hydroxytyrosol is the active ingredient of the olive, functioning as a highly potent antioxidant in the body. Antioxidants are bioactive molecules that are present in many plants, but not all of them show the same activity. Hydroxytyrosol is considered one of the most powerful antioxidants in nature and is seeing rapid growth in demand on the food and beverage market. Moreover, consumers' awareness of functional beverages is steadily increasing.

Hydroxytyrosol's oxygen radical absorbance capacity (ORAC) is about 45,000 µmolTE/g (see Figure 1). Due to its high antioxidant capacity, hydroxytyrosol can be beneficial to cardiovascular health. It has been shown to protect blood lipids, especially low density lipoprotein (LDL), from oxidative damage*.

Beverages with Functional Ingredients

With consumers becoming increasingly aware of the strong link between food and health, the role of functional food ingredients is becoming more and more important. Especially in beverages, enrichment with antioxidants is frequently difficult. Complicating factors here are solubility issues, poor stability, taste or odor problems and color impact.

HTEssence®: Highly Pure Hydroxytyrosol

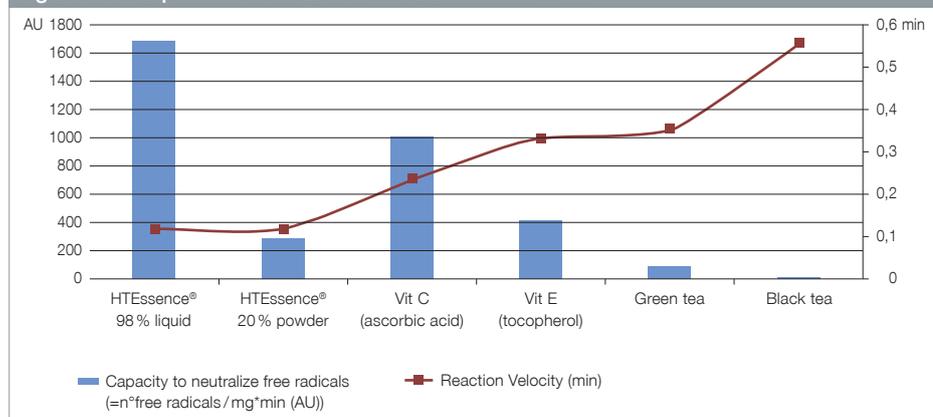
WACKER's HTEssence® is a well-defined, chemically pure substance with consistent technical properties. Due to WACKER's production process, there are no undefined byproducts that could interfere with your formulation. HTEssence® is readily soluble in water, stable to pasteurization and at low pH. It is a pure, white, odorless and taste-neutral product that can be used in many different formulations.

HTEssence® in Beverages: Potent and Stable

In a study conducted by WACKER, HTEssence® has been shown to be stable in different beverage formulations for up to 45 days.

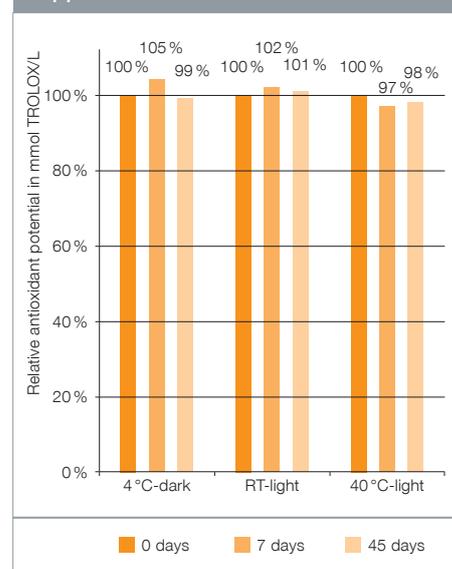
Orange juice (natural pH at 3.8) was spiked with 90 ppm HTEssence® in powdered form. The enriched juice formulation was stored at various temperatures (4 °C, 22 °C and 40 °C) under different light conditions (under light or in the dark). The antioxidant potential (in mmol TROLOX/L) was measured spectrometrically at different time intervals: immediately after addition of HTEssence®, after 7 days and after 45 days.

Figure 1: Comparison of HTEssence® Antioxidant Power



Comparison of the antioxidant power of HTEssence® with other commonly used antioxidants. Antioxidant power determined by electron spin resonance spectrometry; measured by an independent test institute.

Figure 2: Antioxidant Potential of Orange Juice when Enriched with 90 ppm HTEssence®



Relative antioxidant potential of orange juice enriched with 90 ppm HTEssence® measured at different temperatures (RT = room temperature) and light conditions.

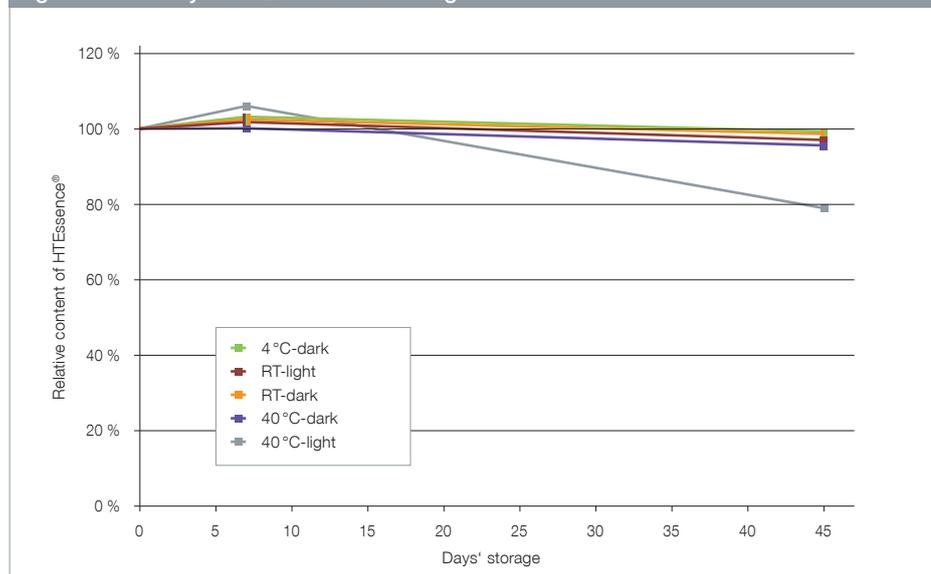
*Olga Castañer et al., Protection of LDL from oxidation by olive oil polyphenols is associated with a downregulation of CD40-ligand expression and its downstream products *in vivo* in humans. Am J Clin Nutr 2012; 95: 1238 – 44.

Even after 45 days' storage at room temperature and daylight exposure, the antioxidant potential of HTEssence® in orange juice remains stable (Figure 2). The stability of HTEssence® over time was analyzed by means of HPLC. The HTEssence® content was also found to

be stable for up to 45 days at room temperature (Figure 3). These results demonstrate that the high antioxidant capacity of HTEssence® can be maintained for an extended period of time even under high stress conditions.



Figure 3: Stability of HTEssence® in Orange Juice



Stability of HTEssence® in orange juice enriched with 90 ppm HTEssence® measured at different temperatures (RT = room temperature) and light conditions.

HTEssence® Product Forms

- Spray-dried powder with 20% hydroxytyrosol content on maltodextrin, available in 5 kg & 20 kg packaging.
- Liquid form with highly pure 98% hydroxytyrosol content, available in 5 kg and 20 kg packaging.

Key Benefits of HTEssence® in Functional Beverage Formulations

- High oxygen radical absorbance capacity (ORAC)
- Stable in low-pH beverage formulations
- Stable antioxidant potential even at elevated temperatures and in strong light conditions
- No dependence on raw material supply and constant high quality
- No undefined byproducts
- Easily soluble in aqueous systems
- No impact on taste, odor or color

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