



T. Schultis, J.W. Metzger

Institute for Sanitary Engineering, Water Quality and Solid Waste Management (ISWA), Universität Stuttgart, Germany

Introduction

Natural estrogens, such as phytoestrogens, can also occur in food. Because of their structure we suspected also natural flavours to have estrogenic activity.

Main use of natural flavours:

- Bakery products
- Chocolate products
- Sweets
- Ice
- Coffee

Methods

	LYES-Assay*	E-Screen-Assay
Yeast / Cells	Recombinant Sacch. cerev.	MCF-7 breast tumor
Sensitivity (IC ₅₀ E2) [M] [#]	5,11 ± 1,26 · 10 ⁻¹¹ (n=34)	4,38 ± 1,37 · 10 ⁻¹² (n=21)
Working time [h]	2	4
Incubation time [h]	7	144
Cost	+	++
Endpoint	Absorption reading	Cell proliferation

LYES-Assay*: Lyticase-based Yeast-Estrogen-Screen-Assay; E2: 17β-Estradiol; # Average value, 1-fold standard deviation

Eugenol

Taste of carnation;
Use: Dental medicine

Maltol

Caramellic, sweet, fruity;
Use: coffee, chocolate, sweets

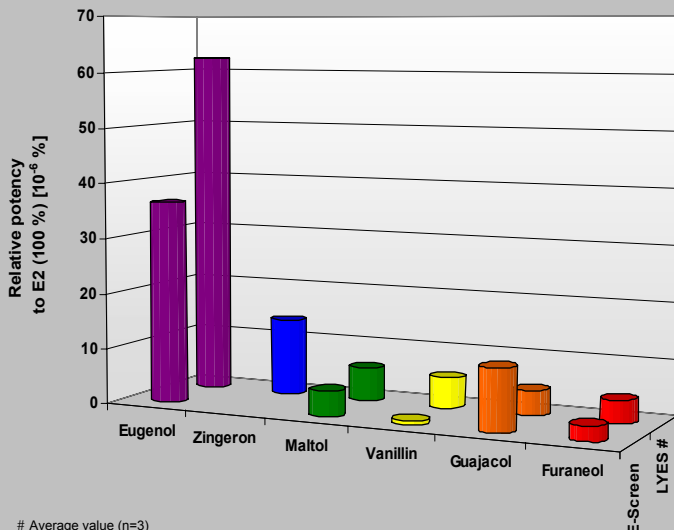
Zingeron

Taste of Ginger

Discussion

- **Almost all tested flavor chemicals show weak estrogenic potency, with exception of Zingeron in the E-Screen-Assay.**
- **LYES-Assay IC₅₀-values: 8,20 · 10⁻⁵ – 1,24 · 10⁻³ M**
- **E-Screen-Assay IC₅₀-values: 1,20 · 10⁻⁵ – 1,67 · 10⁻³ M**

Results



Vanillin

Taste of vanilla, caramel;
Use: Food, medicament

Guajacol

Caramellic, roasted malt;
Use: coffee

Furaneol

Fruity, pineapple, strawberry