

**PENGARUH SUPLEMENTASI VITAMIN E (*α*-tokoferol)  
TERHADAP KADAR GAMMA GLUTAMIL TRANSFERASE  
(GGT) DAN KADAR NITRIC OXIDE (NO) PADA TIKUS**

**Studi pada Tikus *Rattus Novergicus* Strain Wistar Jantan  
Terpapar Inhalasi Uap Benzene**

***THE EFFECT OF VITAMIN E (*α*-tokoferol) SUPPLEMENTATION ON  
GAMMA GLUTAMYL TRANSFERASE (GGT) LEVELS AND NITRIC  
OXIDE (NO) LEVELS IN RATS***

***Studies in Male *Rattus Novergicus* Rats Wistar Strain  
Exposed to Benzene Vapor Inhalation***



**Tesis**

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## ABSTRAK

### PENGARUH SUPLEMENTASI VITAMIN E (*α-tokoferol*) TERHADAP KADAR GAMMA GLUTAMIL TRANSFERASE (GGT) DAN KADAR NITRIC OXIDE (NO) PADA TIKUS

Studi pada Tikus *Rattus Novergicus* Strain Wistar Jantan Terpapar Inhalasi Uap Benzene

#### ROZIANA

**Latar Belakang :** Paparan benzene dapat menyebabkan stres oksidatif, diantaranya ditandai dengan peningkatan kadar GGT dan kadar NO. Vitamin E dapat mengurangi dan mencegah produksi radikal bebas. Reaktivitas hidrogen fenolik pada kelompok hidroksil *α*-tokoferol akan menstabilkan elektron tidak berpasangan pada radikal bebas.

**Tujuan :** Membuktikan pengaruh suplementasi vitamin E terhadap kadar GGT dan kadar NO pada tikus jantan terpapar uap benzene.

**Metode :** Penelitian ini adalah penelitian eksperimen pada binatang coba dengan rancangan *post test only controlled group design*. Sampel 35 ekor tikus *strain wistar* jantan dibagi secara random dalam enam kelompok yaitu kontrol negatif, kontrol positif dan empat kelompok perlakuan suplementasi vitamin E dosis bertingkat (X1 = 1,8 IU; X2 = 3,6 IU; X3 = 7,2 IU; dan X4 = 14,4 IU per hari untuk setiap 200 gram berat badan tikus). Setiap kelompok kecuali kontrol negatif dipapar 300 ppm uap benzene selama 2 minggu (6 hari/minggu, 6 jam/hari). Pengukuran kadar GGT menggunakan metoda Kinetik *Colorimetric* dan kadar NO menggunakan metoda *Colorimetric Gries* dilakukan pada setiap kelompok.

**Hasil :** Suplementasi vitamin E berpengaruh menurunkan kadar GGT ( $p=0,0001$ ). Pengaruh paparan benzene terhadap peningkatan kadar GGT dapat dicegah dengan baik pada dosis suplementasi vitamin E 14,4 IU/200gr BB tikus/hari. Suplementasi vitamin E tidak berpengaruh terhadap kadar NO.

**Simpulan :** Ada pengaruh suplementasi vitamin E terhadap penurunan kadar GGT dan tidak ada pengaruh suplementasi vitamin E terhadap penurunan kadar NO.

**Kata kunci :** Benzene, vitamin E (*α*-tokoferol), kadar GGT, kadar NO

## ABSTRACT

### THE EFFECT OF VITAMIN E ( $\alpha$ -tokoferol) SUPPLEMENTATION ON GAMMA GLUTAMYL TRANSFERASE (GGT) LEVELS AND NITRIC OXIDE (NO) LEVELS IN RATS EXPOSED

Studies in Male *Rattus Novergicus* Rats Wistar Strain Exposed to Benzene Vapor Inhalation

#### ROZIANA

**Background :** Exposure to benzene may cause oxidative stress, one is known as the elevation of GGT and NO levels. Vitamin E can reduce and prevent the products of free radicals. Hydrogen phenolic reactivities to hydroxyl  $\alpha$ -tocopherol groups be stabilize the uncouples electron in free radicals.

**Objective :** To prove the effects of vitamin E supplementation on GGT levels and NO levels male rats exposed to benzene vapor

**Method :** Experimental research on animal with controlled group post test only design. Samples were 35 male wistar rats. Samples divided randomly into six groups, consisted of negative control group, positive control group and four groups of gradual doses of vitamin E supplementation (X1 = 1.8 IU; X2 = 3.6 IU; X3 = 7.2 IU and X4 = 14.4 IU per day for each of 200 gram of body weight of rats). Each of group except negative control group was exposed to 300 ppm of benzene vapor for two weeks (six days on a week and six hours on a day). The measurement of GGT level used Colorimetric Kinetic and Colorimetric Gries method for NO level in each group.

**Result :** Vitamin E supplementation reduced the level of GGT significantly ( $p=0.0001$ ). The effect of benzene exposure to elevated levels of GGT can be well prevented by using 14.4 IU for 200 gram body weight per day of vitamin E. Vitamin E supplementation had no reducing levels of NO.

**Conclusion :** There was effect of vitamin E supplementation to reduce of GGT level but not to the level of NO.

**Keywords:** Benzene, vitamin E ( $\alpha$ -tokoferol), GGT level, NO level