

# Growth performance and reproductive function impairment of glyphosate-based herbicide in male guinea pig (*Cavia porcellus*)

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## Abstract

Glyphosate formulations, widely applied non-selective systemic herbicides, are progressively becoming the most controversial pesticides on the market due the adverse effects they pose to humans and environment. The information on these potential hazardous effects to the handlers of the pesticide remains obscure. This study investigated effects of glyphosate-based herbicide on growth performance, seminal parameters and hemato-biochemical profiles in male guinea pig. Forty sexually mature male guinea pigs weighing between 393.3 and 418.4 g were divided into four groups of 10 animals each and orally administered 0, 186, 280 and 560 mg/kg body weight of WILLOSATE daily for 60 days. Daily feed intake and body weight gain were recorded. At the end of experimental period all animals were humanely sacrificed; and blood samples and vital organs were collected for appropriate analysis. Results showed a significant decrease ( $p < 0.05$ ) in body weight gain (-102.2%), final body weight (-9.8%) and feed intake (-13.1%) of animals following sub-chronic exposure of WILLOSATE. The weights of the liver and kidney increased significantly ( $p < 0.05$ ) by 25.4% and 28.8%, respectively, while testicular weights decreased ( $p < 0.05$ ) by 24% with increasing doses of WILLOSATE. A decrease in sperm motility (-67.9%), viability (-52.7%) and concentration per vas deferens (-40.7%), and an increase in sperm major (28.1%) and minor (45.3%) morphological aberrations were recorded in WILLOSATE - exposed guinea pigs when compared to controls. There was a dose-dependent increase ( $p < 0.05$ ) in MCV and WBC and a decrease in Hb content and RBC, as well as serum content in total protein (-11.8%). The serum content of cholesterol (37.8%), urea (87.1%), creatinine (22.4%), ALAT (74.2%) and ASAT (88.7%) were significantly higher in treated groups compared to controls. These results point toward the toxic effects of WILLOSATE on vital organs and reproductive function of the body at high doses and long-term exposure.

## KEYWORDS

guinea pig, oxidative stress, seminal parameters, toxicity, WILLOSATE

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