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The Effect of Orange Water Kefir on Malondialdehyde (MDA) Level and Superoxide Dismutase (SOD) Activity in The Kidney Tissue of The Hyperlipidemic Rats (*Rattus Norvegicus*)

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Objectives: Hyperlipidemia can cause kidney tissue injury due to high oxidative stress. One of oxidative stress signs is the increase of malondialdehyde level (MDA) and the decrease of superoxide dismutase activity (SOD). Previous research has shown that probiotics (water kefir) may contribute to improving lipid profile and oxidative stress in the kidney tissue. This research aims to know the effect of orange water kefir on MDA level and SOD activity in the kidney tissue of hyperlipidemic rats.

Methods: This research design is quasi-experimental. Three groups (K+, K-, P) each consist of 5 rats. All intervention was given by the sonde method. All groups were given fed ad libitum until the end of this research. The first 4 weeks, K+ and P groups were induced by quail egg yolk with the dosage is 5 ml/200 gram body weight (grBW). In the second 4 weeks, group of P was given orange water kefir with the dosage is 5 ml/ 200 grBW. orange water kefir was made in accordance with good manufacturing product (GMP) standards procedure to making probiotic beverage. All rats are terminated by anesthesia and decapitation to take the kidney. Then, the kidney tissue will be examined for MDA level and SOD activity.

Results: Mean of MDA (mg/dl) levels were 10.17±0.11 (K+), 0.79±0.09 (K-), 2.78±0.12 (P). Mean of SOD activity (%) were 43.21±3,45 (K+), 83,57±2,48 (K-), 73,92±1,65 (P). The results showed significant differences in MDA level and SOD activity in kidney tissue between all groups after the intervention of orange water kefir ($p < 0.001$). There is a significant difference between all groups ($p < 0.0001$).

Conclusions: the intervention of orange water kefir has an effect to improve the MDA level and SOD activity in the kidney tissue of the hyperlipidemic rats with a significant difference $p < 0.0001$.