



DUODENAL HISTOPATHOLOGY OF PEDIATRIC RAT (*Rattus norvergicus*) FED WITH ORANGE JUICE (*Citrus sinensis*)

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STUDY PROGRAM OF VETERINARY MEDICINE
SCHOOL OF VETERINARY MEDICINE AND
BIOMEDICAL SCIENCES
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ABSTRACT

TEO QIN YAN. Duodenal Histopathology of Pediatric Rat (*Rattus norvergicus*) Fed with Orange Juice (*Citrus sinensis*). Dibimbing oleh AGUS SETIYONO dan DIAH NUGRAHANI PRISTIHADI.

This research investigates the impact of orange juice consumption on the histological structure of the duodenum, a critical site for nutrient absorption and digestion. Focusing on pediatric animals, orange juice (with a pH of 3) was administered to post-weaning rats aged 4 weeks to 6 weeks at dosages ranging from 0g/kg BW to 20g/kg BW over two weeks. Duodenal histopathology was assessed, focusing on parameters such as the quantity of crypts of Lieberkuhn, as well as the length, height, width, and depth of villi (measured in μm). Anatomical pathology examination included measurements of the length and width of the duodenum (also in μm), as well as the color mean (OD). The research findings indicate no significant changes in histopathology or anatomy pathology of the duodenum. This suggests that young individuals can adapt to acidic challenges without compromising gastrointestinal health. These findings offer reassurance regarding the short-term consumption of acidic orange juice (with a pH of 3) with minimal risks to intestinal integrity, both during growth and development.

Keywords: acidic changes, anatomy pathology, duodenum, histopathological changes, oranges, pediatric

ABSTRAK

TEO QIN YAN. Histopatologi Duodenum Tikus Pediatri (*Rattus norvegicus*) yang Diberi Jus Jeruk (*Citrus sinensis*). Dibimbing oleh AGUS SETIYONO dan DIAH NUGRAHANI PRISTIHADI.

Penelitian ini bertujuan untuk mengetahui efek konsumsi jus jeruk pada struktur histologi duodenum, sebuah organ penting yang berperan untuk penyerapan nutrisi dan proses pencernaan. Berfokus pada hewan pediatri, jus jeruk (pH 3) diberikan pada tikus pascasapih berusia 4-6 minggu, pada dosis 0-20g/kg BW selama dua minggu. Histopatologi duodenum dievaluasi, dengan fokus pada parameter seperti jumlah kript Lieberkuhn, serta panjang, tinggi, lebar, dan kedalaman villus (diukur dalam μm). Pemeriksaan patologi anatomi termasuk pengukuran panjang dan lebar duodenum (juga dalam μm), serta rata-rata warna (OD). Hasil penelitian menunjukkan tidak ada perubahan signifikan gambaran histopatologi dan patologi anatomi duodenum hewan perlakuan. Hal ini mengindikasikan bahwa individu muda dapat beradaptasi dengan asupan pangan yang bersifat asam tanpa mengganggu kesehatan saluran pencernaan. Temuan ini menegaskan jaminan mengenai keamanan konsumsi jus jeruk asam (pH 3) dalam jangka pendek pada integritas usus, baik selama masa pertumbuhan maupun perkembangan.

Kata kunci: anatomi patologi, duodenum, jeruk, perubahan asam, perubahan histopatologis, pediatrik



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DUODENAL HISTOPATHOLOGY OF PEDIATRIC RAT (*Rattus norvergicus*) FED WITH ORANGE JUICE (*Citrus sinensis*)

TEO QIN YAN

Undergraduate Thesis
as one of the requirements to obtain the degree
Bachelor's at
School of Veterinary Medicine and Biomedical Sciences

**STUDY PROGRAM OF VETERINARY MEDICINE
SCHOOL OF VETERINARY MEDICINE AND
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May this scientific endeavor serve the needs of those seeking knowledge and contribute to the advancement of understanding in the field.

Bogor, July 2024

Teo Qin Yan



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ATTACHMENT

- 1 Approval of animal ethics from animal ethics committee school of veterinary medicine and biomedical sciences IPB, with the code number of 159/KEH/SKE/I/2024