

**THE EFFECTS OF *Averrhoa bilimbi* FRUIT EXTRACT ON MALE
REPRODUCTIVE SYSTEM IN HIGH FAT DIET INDUCED
SPRAGUE DAWLEY RATS**

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ABSTRACT

THE EFFECTS OF *Averrhoa bilimbi* FRUIT EXTRACT ON MALE REPRODUCTIVE SYSTEM IN HIGH FAT DIET INDUCED SPRAGUE DAWLEY RATS

Obesity is defined as abnormal or excessive accumulation of fat that leads to health impairments and is a consequence of high-fat diet (HFD). Fat accumulation accounts for oxidative stress level increment and can significantly reduce sperm quality. *Averrhoa bilimbi* or locally known as 'Belimbing Buluh' is known to possess medicinal values. However, there are still lacking of findings on the effectiveness of this fruit to treat male infertility. This study is designed to investigate the hypoglycemic effects of *A. bilimbi* fruit extract and their effect on sperm quality by using Sprague Dawley rats as research model. The *Averrhoa bilimbi* fruit extract was obtained and rats were given high fat diet for 6 weeks. The rats were then divided into 3 groups (6 rats in each) which were control, HFD-treated and AB-treated group. Analysis were made on weekly body weight, ROW, sperm count, sperm motility, sperm morphology and blood glucose level. Differences were compared for statistical significance by using one-way ANOVA. The control group showed a continuous increase in body weight with a slight fall on week 3. Meanwhile, in HFD and AB group, week 3 is the starting point of a drastic body weight decrement. There were no marked differences in the relative organ weight of epididymis, kidney and heart. In HFD treated groups, testis and kidney show the highest ROW. AB group on the other hand, showed a reduction in the ROW of testis, liver and lung. For liver, ROW displayed a reduction in HFD group. AB and HFD group both statistically showed a significant decrement of 0.25% and 0.46% respectively. There were no significant difference between the sperm count of HFD and AB group. Sperms that showed no sign of motility (NM) is the highest among the HFD group. Non motile sperms were significantly 25.37% higher in HFD group compared to control group. There were no marked differences observed between HFD and AB group. NPM mean for HFD and AB did not show any significant difference. Sperms with progressive motility was the highest in the control group with a large significant difference of 51.64% and 42.55% for HFD and AB group respectively. HFD group showed the highest abnormal sperm morphology and the lowest normal sperm morphology with significant difference of 587.44% and 58.22% respectively. Microscopic assessment revealed that there were normal, looped tail, blunt tail, bent neck, headless, and tailless sperms observed. The highest blood glucose decrement is shown by the HFD group followed by AB group and control group. The decrement in control group was significant to both HFD and AB group with a percentage of 228% and 178%. However, there were no significant difference between HFD and AB group.