

**SEX DIFFERENCES IN ACETYLCHOLINESTERASE
ACTIVITY AND TOTAL PROTEIN IN THE BRAIN AND
HYPOPHYSES OF THE RED SOKOTO BUCKS AND
DOES**

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ABSTRACT

Sex differences have been identified in the anatomy of the brain, the sizes of the brain regions and in the distributions of Acetylcholinesterase (AChE), an enzyme known to inactivate the neurotransmitter acetylcholine (ACh) in neuronal synapse. In this study, sex differences in the distribution of AChE and total protein in eight brain regions and hypophyses of 10 mature Red Sokoto (*Maradi*) bucks and 10 does of similar weight and husbandry system were determined. AChE is concentrated at varying levels in the various brain regions examined with the highest concentrations in the amygdala (7.79), mid and brain (6.78), hippocampus (6.21) and medulla oblongata (6.19) and the lowest concentrations in the cerebellum (4.32), pons (2.89) and cerebral cortex (0.78). However, the effect of sex is more significant in the pons, hypothalamus, midbrain and medulla oblongata where AChE was more concentrated ($P < 0.05$) in the bucks than in the does. Sex effects on total protein concentrations were significant ($P < 0.5$) in the pons, cerebellum, hypothalamus and medulla oblongata with the males recording higher concentrations than the females. The concentrations in the other brain regions and hypotheses were not significant. This study has provided additional information about sexual dimorphism of the goat brain in AChE activity and total protein concentrations.

Keywords: Acetylcholinesterase, protein, red Sokoto, estrogen, testosterone, brain regions, hypophyses.