The aim of this study was to characterize the effect of mTOR inhibition in spermatogenesis and sex hormone profile from male rats, analyzing the altered mechanics and their recovery during the withdrawal of the inhibitor. Adult Wistar rats were distributed in two groups, vehicle or mTOR inhibitor (sirolimus/SRL). Vehicle group was treated for 12 weeks. Rats treated with SRL were sacrificed at 4, 8 and 12 weeks. A group of rats was treated with SRL for 4 weeks and then continued with vehicle injection during 8 weeks. This group was used to analyze the possible reversibility of the effect of mTOR inhibition. Body and testicular weight, testosterone, FSH and LH levels were measured. The testes were collected to perform histological measurements; seminiferous tubules area and inner diameter. The proliferation and apoptosis was analyzed by immunohistochemistry using Ki67 and TUNNEL stain, respectively. mTOR inhibition in healthy animals produces a significant reduction of testosterone (5.4±7.0 ng/mL vs 2.0±0.7 or 1.1±2.2 ng/mL at 8 or 12 weeks; p<0.05), a seminiferous tubule dystrophy and the blockade of spermatogenesis on the spermatogonial level. Withdrawal of treatment led to complete recovery of testosterone (14±8.6 ng/mL; non significant compared with VEH group) and spermatogenesis.