INTRODUCTION: Glucocorticoids (GCs) are important hormones playing a role during stress response and adaptation to environment. However disturbances in GCs secretion is associated with metabolic disturbances. GCs can modulate mitochondrial function, but the modulation of mitochondrial function by GCs in adipose tissue remains unclear. OBJECTIVES: Therefore, the goal of this study is to evaluate the mitochondrial function in brown adipose tissue (BAT) of male Wistar rats. MATERIALS AND METHODS: Male Wistar rats were treated for 21 days with 1% EtOH (C) or 0.1 mg/mL of corticosterone (CORT) in drinking water, afterwards decapitated and blood samples, adrenals and BAT were obtained. Serum was collected and specific corticosterone radioimmunoassay was performed. Adrenals and BAT were weighted. BAT was homogenized in glass potter and the homogenate was submitted to differential centrifugation to obtain the mitochondrial fraction. Oxygen consumption and ATP synthesis were performed with the mitochondrial fraction. Western blotting was performed to evaluate UCP1 and ATP synthase contents. Mitochondrial biogenesis was evaluated through citrate synthase assay. RESULTS: Corticosterone serum levels were not statistically different among groups. Adrenals were lower between groups (C: 17.9 ± 3.6 vs CORT: 9.5 ± 2.5 mg adrenals/100g body weight) and BAT weight was increased among groups (C: 56.7 ± 13.3 vs CORT: 88.7 ± 14.4 mg BAT/100g body weight). Oxygen consumption did not differed, however ATP synthesis was lower in CORT group (C: 0.076 ± 0.02 vs CORT: 0.022 ± 0.008 μmol Pi/mg . 20 min). UCP-1 level was unchanged and ATP synthase was lower in experimental group (C: 1.3 ± 0.3 vs CORT: 0.3 ± 0.14 AU). Mitochondrial biogenesis was unchanged among groups. CONCLUSIONS: Our results suggest a modulation of mitochondrial function based on ATP synthesis regulation by corticosterone treatment, possibly involved in metabolic disturbances. FINANCIAL SUPPORT: CNPq & FAPERJ.