Animal models and in humans indicates the involvement of soy protein in decreasing serum cholesterol and LDL-cholesterol. The purpose of this study was to isolate the protein soybean glycinin and investigate the effect of oral administration compared to the statin drug. Wistar rats were divided into groups: 1) STD (Standard casein diet); 2) HC (hypercholesterolemic group): diet STD plus 1% of cholesterol and 0.5% of cholic acid; 3) HC+11S: glycinin (300mg/Kg body weight/day); 4) HC+ROS: rosuvastatin (10mg/Kg body weight/day); 5) HC+11S+ROS (glycinin and rosuvastatin at the same dose as in previous groups). The protein and the drug were administered by gavage. The rats fed diets and water ad libitum and at the end of 28 days the animals were sacrificed. The group HC+11S showed higher levels of plasmatic HDL-cholesterol. The hepatic cholesterol levels showed a significant reduction in HC+ROS group. However, the group HC+11S+ROS showed elevated hepatic cholesterol suggesting a negative interaction between the drug and the protein fraction. The groups HC+11S, HC+ROS and HC+11S+ROS showed a reduction in hepatic triglycerides in comparison to control group HC. The results of the increase in plasma HDL-cholesterol presented by the group HC+11S suggest that the major protein fraction of soy can have a significant role in the metabolism of cholesterol.