Abstract: We partially solve the adaptive ergodic stochastic optimal control problem where the driving process is a fractional Brownian motion with Hurst parameter $H > 1/2$. A formula is provided for an optimal feedback control given a strongly consistent estimator of the parameters of the controlled system is available. There are some special conditions imposed on the estimator which means the results are not completely general. They apply, for example, in the case where the estimator is independent of the driving fractional Brownian motion. In the course of the thesis, construction of stochastic integrals of suitable deterministic functions with respect to fractional Brownian motion with Hurst parameter $H > 1/2$ over the unbounded positive real half-line is presented as well.