We discuss the ensemble version of the Deutsch-Jozsa (DJ) algorithm which attempts to provide a “scalable” implementation on an expectation-value NMR quantum computer. We show that this ensemble implementation of the DJ algorithm is at best as efficient as the classical random algorithm. As soon as any attempt is made to classify all possible functions with certainty, the implementation requires an exponentially large number of molecules. The discrepancies arise out of the interpretation of mixed state density matrices.