Fructooligosaccharides (FOS) are important ingredients in the functional food industry because they have different biological properties such as decrease level of triglycerides, cholesterol and phospholipids and stimulate growth of probiotics for enhancement of microflora in large intestine. However, current strategies for the FOS production through simple and economical bioprocess has been necessary. The aim of this work was evaluated the capacity of three fungal strains (Aspergillus niger GH1, Aspergillus niger PSH and Aspergillus oryzae DIA-MF) to produce fructooligosaccharides (FOS) using aguamiel from Agave salmiana as an economical substrate. In addition, Czapek Dox medium supplemented with sucrose as carbon source was used as a control medium for the FOS production. A. oryzae DIA-MF was a fungi producer of FOS using aguamiel or Czapek Dox medium as substrate at 24h of fermentation. However, the yield of FOS was increased two folds (20.30g/L), with a productivity of 0.84g FOS/l.h when aguamiel was used as substrate. On the other hand, A. niger GH1 and A. niger PSH showing only hydrolytic activity on sucrose under the studied conditions. In conclusion, this study shown excellent compatibility of A. oryzae DIA-MF using aguamiel as an economical substrate for the FOS production under a simple bioprocess.