The aim of this work was to illustrate the use of a general process simulators, developed for the Chemical Industry, to the Food Industry. It was considered ProSimPlus as the simulator and was used to simulate a milk pasteurization process (HTST). The simulation process diagram was developed on the simulator as well as a data base with data and relationships to compute the physical properties of the product (whole milk). Afterwards an optimization problem was formulated considering as variables the flux of the streams used as thermal sources and the recirculation rates. The objective function was the heat exchanged relative to the flux considered in each section of the process. The use of the simulator allowed developing a tool useful for the design as well as for the daily operating process optimization. More cases could be considered due to the versatility of the simulator.