Yacon (Smallanthus sonchifolius) is a native plant from the Andean region. Yacon roots consist mostly of water and carbohydrates. In the root dry matter, 90% is carbohydrate, among which 40–70% are frutooligosaccharides. Due to its physiological benefits, yacon flour has been used as a food ingredient. Considering the influence of substrate concentration on fermentation process, this work aimed to evaluate the effect of different yacon flour concentrations on yogurt fermentation. Five yogurt formulations with different concentrations of yacon flour (0%, 2.14%, 2.85%, 3.57%, and 4.28%) were produced in two batches. The flour pH was 6.47 and its centesimal composition was: 6.42% water, 2.14% protein, 0.74% fat, 5.58% minerals and 85.12% total carbohydrates. The whole raw bovine milk, which acidity was 0.18% lactic acid, was added with yacon flour, heated to 83°C for 30 minutes, cooled to inoculation temperature, and inoculated with starter culture. As a starter culture natural yogurt from bovine milk was used. The samples were incubated at 43°C to pH 4.6-4.7. The data were submitted to regression analysis, and curves of pH versus time (hours) were obtained. It was observed that higher yacon flour concentration resulted in longer fermentation time. Fermentation times to pH 4.6-4.7 of yogurt samples with 0%, 2.14%, 2.85%, 3.57%, and 4.28% yacon flour were: 5, 10, 15, 16 and 18 hours, respectively. Although fermentation time was longer, it is technologically feasible to produce yogurt with addiction of yacon flour in the evaluated concentrations.