Production of dried sourdough by spray drying and fluidized bed process

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With the revival of slow bakeries, sourdough is gaining notoriety. Managing this sort of ferment, however, presents some challenges, including handling complex microbiota with yeast and lactic acid bacteria and a limited shelf-life, which implicates in a laborious and frequent sourdough maintenance. Drying is one of the most common techniques for extending food products' shelf-life and two of the most revered unit processes are spray drying (SD), which has been previously used for drying sourdough, and fluidized bed drying (FB), with no record of usage with sourdough. This study aimed to produce a stable and viable dried sourdough. The sourdough (SR) was prepared by mixing the sourdough starter, water and flour in proportions 1:2:3 and incubated at 20ºC for 6 h. For FB, 35 % of corn starch was added to SR to obtain pellets through extrusion and spheronization, proceeding to a 1 h drying process at 40 °C. The same starched dough (SRA), diluted with distilled water in proportions 1:1, was fed to SD and dried for 1.5 h at 140 °C. Moisture content and water activity as well as the sourdough's fermentative power, which was tested using a simple rehydration process for dried sourdough with 60 % saline solution and 1 % sucrose incubated at 28 ºC for 22 h, were monitored before and after each drying process. Drying 400 g of SRA provided an efficiency of over 98 % in FB, while it was limited to 25 % in SD. Both dried SRA presented viable microbiota, water activity below 0,6 and water content around 8 % and 4 % for fluidized and spray dried sourdough, respectively. FB process proved more efficient and quicker than SD, in addition to granting higher microbiota viability, resulting in greater volume increase once rehydrated. These results suggest that even with a low residence time, SD's high temperatures may have affected the microbiota's survival rate. In summary, dried viable sourdough may be obtained using different drying technics, being FB the operation that better preserves the microbiota.