Physico-chemical and functional properties of spray-dried sourdough in breadmaking

Abolfazl Golshan Tafti a,b, Seyed Hadi Peighambardoust a,*, Javad Hesari a, Akbar Bahrami a, Elnaz Shakuoe Bonab a

a Department of Food Science, College of Agriculture, University of Tabriz, Tabriz 5166616471, I.R. Iran

b Department of Agricultural Engineering Research, Agricultural Research Centre, Kerman, I.R. Iran

*Presenting author. Tel.: +98 9141003110; fax: +98 411 3345332;
e-mail: peighambardoust@tabrizu.ac.ir

ABSTRACT

In present study, spray-dried sourdoughs were produced using a pilot scale spray dryer and the physico-chemical and microbial characteristics of the obtained sourdough powder were investigated. The application of the spray-dried sourdough at different levels (3, 6, 9 and 15%) in breadmaking was also evaluated. Bulk density, wettability and suspensibility of the sourdough powder were 0.6 g/cm³, 98 s and 29%, respectively. The most of the powder particles were in a range of 106-250 µm. The spray-dried sourdough had a moisture content and ash content of 3.72% and 1.9% (db), respectively. The pH and total titratable acidity (TTA) of the sourdough powder were 3.26 and 59 (mL of 0.1 N NaOH/10 g powder) respectively. Spray
drying reduced the microbial population of the sourdough to $2 \times 10^5$ cfu/g compared to the initial value of $10^7$ cfu/g. Iranian traditional flat bread (Sangak) made with different levels of the sourdough powder had significantly ($p<0.05$) lower pH and higher TTA compared to those of the control. The results of sensory evaluation showed that Sangak breads containing 15% sourdough powder were slightly darker and sourer than the other breads. Incorporation of spray-dried sourdough delayed bread staling, as judged by sensory panel. The results suggest that spray-dried sourdough at the level of 9% can be successfully used for Sangak breadmaking, leading to bread with an improved flavor and delayed staling.

**Keywords:** Spray-dried; Sourdough; Physico-chemical; Sangak; Flat Bread