# Kinetic of phytic acid degradation in spontaneously fermented ancient wheat sourdoughs

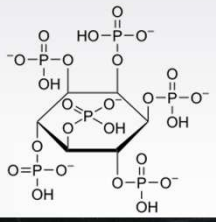
Tamara Dapčević-Hadnađev[1], Nikola Maravić[1], Pavle Jovanov[1], Miroslav Hadnađev[1]
[1]University of Novi Sad, Institute of Food Technology, Novi Sad, Serbia

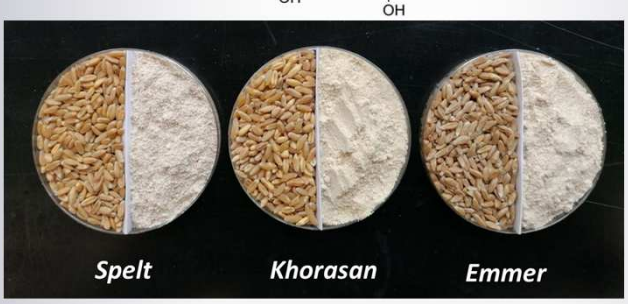
## BACKGROUND

Whole grain flour is an important source of minerals but also contains considerable amounts of phytic acid, which is known to reduce their dietary availability. Some processing technologies, such as sourdough fermentation, influence increased phytate hydrolysis through pH lowering effect thus releasing chelated divalent cations. The aim of this study was to investigate the influence of ancient wheat variety on the phytic acid degradation during spontaneously fermented sourdough propagation with traditional backslopping procedure throughout 48 hours.

## MATERIALS AND METHODS

Spontaneously fermented emmer, spelt and khorasan sourdough was prepared through backslopping (every 24 h, 5 days) under laboratory conditions (temperature of 25 °C, dough yield of 200). Phytic acid content, as well as total and free phosphorous content, was monitored during the 48 h of sourdough propagation with the aid of an enzymatic assay kit.



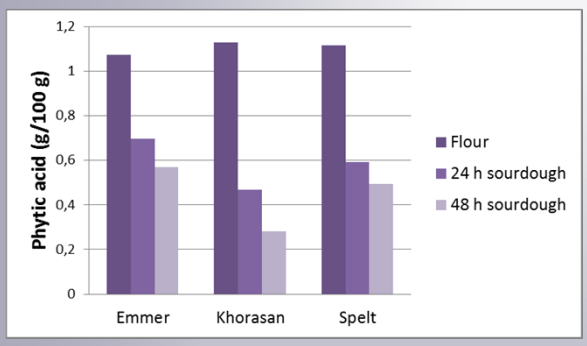


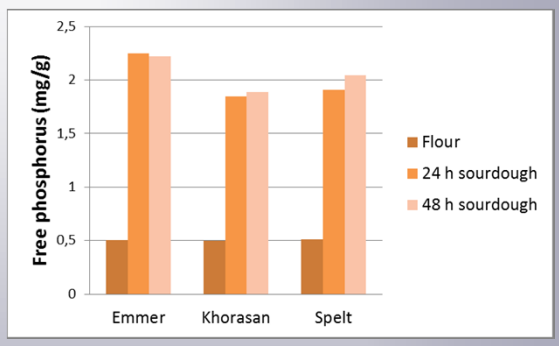

## RESULTS AND DISCUSSION

Initial phytic acid content in emmer, spelt and khorasan wholegrain flour ranged from 1.07 to 1.13 g/100 g. Sourdough fermentation of ancient cereal flours resulted in abrupt decrease in phytate content after second backslopping step (47% to 75% of the initial content). The extent of phytate degradation was shown to be dependent from the ancient wheat variety used for spontaneously fermented sourdoughs preparation. Khorasan flour was characterized with the highest phytate reduction rate. Consequently, phosphorous bioaccessibility of all three wholegrain flours was improved due to phytate hydrolysis, as well as direct solubilisation. An increase in free phosphorous content (3.8 to 4.4 times) was detected in sourdough samples compared to respective flour samples.

## CONCLUSIONS

In general, spontaneous sourdough fermentation was proved to be an efficient processing technology for phytic acid reduction in whole grain cereal flour. The extent of phytic acid degradation was influenced with ancient wheat variety, where spontaneously fermented hulled grains' flours such as spelt and emmer performed less efficient in comparison to hull less khorasan wheat.




## ACKNOWLEDGEMENTS

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