THE INFLUENCE OF HYDROTHERMAL PROCESSING UPON
SOLUBLE PHOSPHORUS CONCENTRATION FROM RYE

Banu Iuliana, Cornelia Lungu, Oana Constantin, Iuliana Aprodu, Liliana Vîrlan

"Dunarea de Jos" Galati University, 111, Domneasca St, 800201, Galati,
iuliana.banu@ugal.ro

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SUMMARY

Through the hydrothermal treatment, we can create conditions for activating phytases in cereals. This enzyme, once activated, hydrolizes the phytate at myo-inositol, inorganic phosphates and very low quantities of myo-inositol tri- to pentaphosphates. The activity of the cereal phytases depends on the humidity, the pH and the temperature. The hydrothermal treatment is considered as an efficient process used in reducing the phytat level in grains.

The aim of the present research was to study the reduction of the esterified phosphorus quantity in favour of the soluble one, after hydrothermal treatment at conditions considered optimal for phytase activity.

We have used the Gloria rye, a semiprecocious variety, resistant to freezing cold and wintering, cultivated for its grains. The content of soluble phosphorus was determined through its extraction in trichloroacetic acid and dosing through the spectrophotometrical method with ammonium phosphomolybdat.

We have used the analysis of variance in relation with the factors analysed – temperature and concentration of acid solution (used for cereals soaking). The temperature has been varied between 45 and 55°C, and the concentration of acid between 0 and 1.5%.

The total variance of the soluble phosphorus contents for every experiment has been decomposed in the components definite by variance source. The decomposition has been made on the basis of the sum of square of deviation from the overall mean. The percentage contribution of the factors and of the interactions has been performed with the Fischer test (Jaba, 1998).

The results have indicated that, due to the hydrothermal treatment, we can get a rise in the soluble phosphorus of 1.2 (at 45°C and 0% concentration of acid solution) to 4.5 times (at 55°C and 1.5% concentration of acid solution). The quantity of solubilised phosphorus is higher when better conditions for the phytase action are created. The analysis of the variance indicated that the two factors analysed and the interaction between them have a significant influence, at level 0.05, on the quantity of soluble phosphorus which is formed. The percentage contribution of the factor “concentration of acid solution” was higher than that of the other factors.
REFERENCES


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