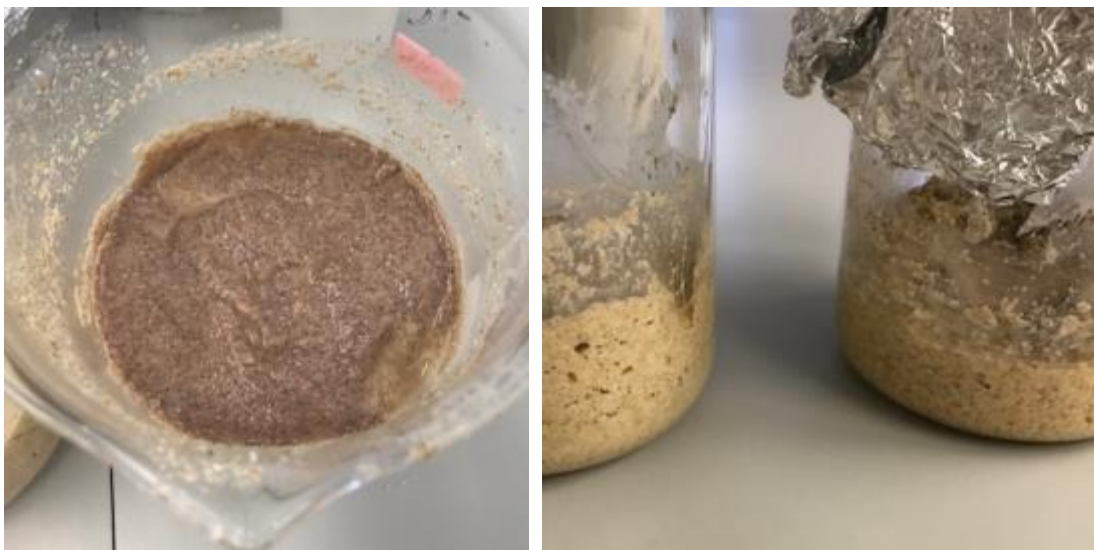


Utilisation of the hulless barley variety Kornelija in development of spontaneous leaven

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Leaven preparation in the technological bread-making process is a traditional technique. With the growing interest in the importance of leavens not only from a technological but also from a nutritional point of view, opportunities are being sought to use not only traditional rye and wheat crops, but also, for example, barley. Barley stands out with its high nutritional value and biologically active substance content, which would be a good environment for the development of lactic acid bacteria. Through carried out pilot studies with spontaneous leaven from the barley variety 'Kornelija', solutions are being sought for the development of a barley leaven with increased nutritional value.

During the experiment, preparation of spontaneous barley leaven was performed using the barley flour of the barley variety Kornelija, and yeast microflora was studied in order to determine the growth dynamics of mesophilic aerobic and facultative anaerobic bacteria (MAFAM) $\text{kfu} \cdot \text{g}^{-1}$ and lactic acid bacteria (PB) $\text{kfu} \cdot \text{g}^{-1}$ and yeasts $\text{kfu} \cdot \text{g}^{-1}$ in a fermentation period of 56 h, namely, in the following intervals – 0 h, 24 h, 26 h (renewal of the leaven), 32 h, 34 h (renewal of the leaven), and 48 h.



1. Fig. Spontaneous leaven preparation process

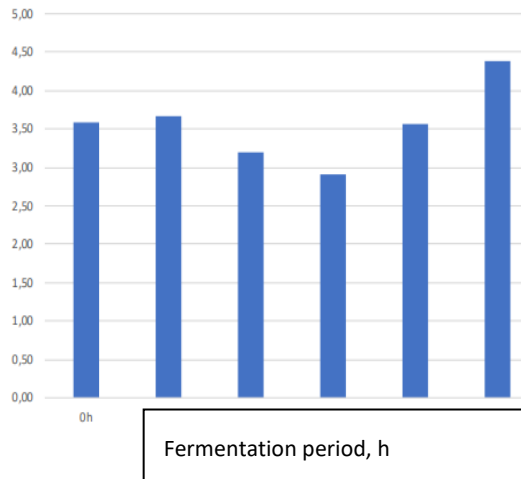


Fig. 2. Development dynamics of lactic acid bacteria

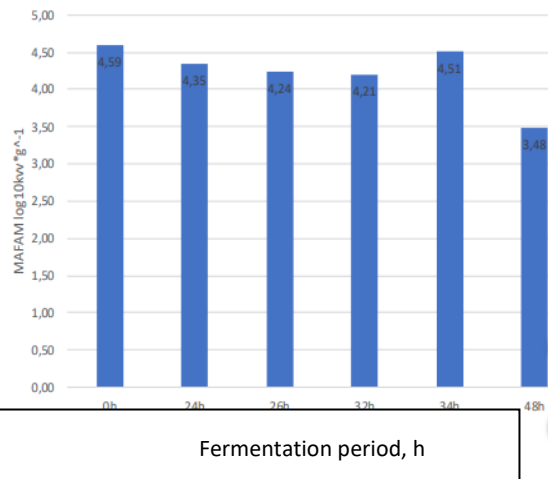


Fig. 3. Development dynamics of MAFAM

Analysis of changes in the number of lactic acid bacteria kfu depending on yeast fermentation time (Fig. 2) was performed with analysis of variance (ANOVA), and a conclusion was drawn that there is no significant difference $p = 0.69$ ($p > 0.05$), an insignificant increase exists. The largest changes in the number of lactic acid bacteria colony forming units are observed in the 48 h time group, indicating a positive trend in the fermentation process of leaven, positive growth and development of PB microflora of barley flour is observed.

MAFAM was performed of changes in the number of kfu depending on yeast fermentation time (Fig. 3) was performed with analysis of variance (ANOVA), and a conclusion was drawn that there is no significant difference $p = 0.115$ ($p > 0.05$), an insignificant decrease exists. After 48 h of fermentation, the number of MAFAM kfu tends to decrease. Organoleptic evaluation: barley leaven has a brine-like taste that decreases during fermentation. After 24 hours of fermentation, pink colour was found on the surface, which does not appear as intensively during further preparation and after 48 hours it does not appear at all.

The pH of the samples tends to decrease during fermentation.

There is no positive trend in the change in the number of yeast kfu.

Conclusions

- Fermentation shall be repeated in several generations until the lactic acid bacteria and yeast microflora are strengthened and can reproduce more successfully; for better results, it is possible to vary the leaven preparation temperatures and the flour/water ratio.
- Barley crop leaven is traditionally not used in baking of bread and there is little research on it; experiments with an activated flour additive could significantly improve the result and take advantage of the high nutritional value of the barley crops.