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The impact of nutrients on yeast fermentation and Pálinka quality

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The production of high-quality Pálinka relies on the successful completion of alcoholic fermentation and the production of desirable flavour compounds by yeast strains. Flavour compounds encompass all volatile and non-volatile compounds that contribute to the perception of aroma, taste, and touch in the mouth. Although flavour production and fermentation performance of yeasts are genetically determined, these characteristics are also dependent on fruit mash composition (including nutritional factors) and environmental conditions. Thus, the fermentation-derived flavour outcomes can be manipulated by the use of suitable yeast strains and by the addition of nutrients aimed to improve the kinetics and the overall quality of the spirit. The aim of this study was to assess the impact of five different nutrient supplementations (added either to the initial fruit mash or at different stages of fermentation), on the fermentation performance of *S. cerevisiae* and on the final quality of Pálinka. To better understand the interactions occurring during and after the completion of fermentation, different enological parameters were investigated. Sugar consumption and organic acid production were determined by HPLC. Ester and fusel oil contents were determined after distillation. Moreover, sensory evaluation was performed to evaluate the distillates. According to the results, all the samples showed similar characteristics during mash fermentation. The addition of nutrients didn't significantly affect the fermentation kinetics but gave rise to the production of some chemical compounds which contribute to the flavour of the distillate. These results were supported by the sensory evaluation, where the distillates produced by the mash fermented in the presence of nutrients, were more favored. Ultimately, this assessment on the effects of nutrients during fermentation will contribute to practical guidelines for Pálinka production, aiming to improve aroma profile, style, and quality.