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# Alterations in Phosphatidylcholine and Phosphatidylethanolamine Content During Fermentative Metabolism in *Saccharomyces cerevisiae* Brewer's Yeast

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**Summary**

During beer production and serial recycling, brewer's yeasts are exposed to various stress factors that, overpowering the cellular defence mechanisms, can impair yeast growth and fermentation performance. It is well known that yeast cells acclimatize to stress conditions in part by changing the lipid composition of their membranes. The main focus of this study is the effect of stressful fermentation conditions on two phospholipid species, phosphatidylcholine (PtdCho) and phosphatidylethanolamine (PtdEtn), in *Saccharomyces cerevisiae* bottom-fermenting brewer's yeast. For this purpose the content and fatty acid profile of these major classes of phospholipids have been compared, as well as their ratio in the whole cells of the starter culture, non-stressed yeast population, and the first three recycled yeast generations. The stressed yeast generations showed an increased mass fraction of PtdCho and a decreased mass fraction of PtdEtn, which led to an increased PtdCho/PtdEtn ratio in the recycled cells as compared to the non-stressed yeast culture. The most pronounced variation of PtdCho/PtdEtn ratio was found in the second yeast generation, yielding a 78 % increase with respect to the starter culture. Variations in the content of both, PtdCho and PtdEtn, were accompanied by a higher mass fraction of unsaturated fatty acids in both phospholipid species (palmitoleic acid in PtdCho, and palmitoleic and oleic in PtdEtn) and by the increased ratio of $C_{16}/C_{18}$ acids in PtdCho.

The results suggest that both phospholipid species, including their fatty acids, are highly involved in the adaptation of brewer's yeast to stressful fermentation conditions.

*Key words*: brewer's yeast, *Saccharomyces cerevisiae*, phospholipids, phosphatidylcholine, phosphatidylethanolamine, fatty acids, stress

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