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Ultrasound Boosts Red Wine Color

A study finds timed ultrasonic treatment during fermentation can raise anthocyanin levels without harming wine quality

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A new study suggests that carefully timed ultrasound during yeast fermentation could help winemakers extract more anthocyanins from grape skins and improve the color and overall quality of red wine.

The research, published in Food Research International, examined how strategic ultrasonic treatment affects Saccharomyces cerevisiae fermentation. Anthocyanins are the pigments that give red wine much of its color, and they also play a role in phenolic stability, which can affect how a wine looks and ages. The study found that applying ultrasound at specific stages of fermentation increased anthocyanin levels without harming the wine's sensory or chemical profile.

According to the researchers, the treatment influenced yeast metabolism and helped release more color compounds from the grape skins into the fermenting must. The work also pointed to changes in other aroma-related compounds, including esters and terpenes, which can shape a wine's smell and flavor. The metabolomic analysis showed that anthocyanins and related derivatives were upregulated, suggesting that the process may do more than intensify color alone.

The findings matter because red wine producers have long looked for ways to make fermentation more consistent while preserving quality. In practice, ultrasound could offer a tool for wineries trying to improve extraction during fermentation without relying only on longer maceration times or more aggressive cellar techniques. That could be especially useful in vintages or grape lots where color extraction is difficult.

The study did not present ultrasound as a finished commercial solution. Instead, it framed the method as a promising process adjustment that still needs refinement. The researchers said more work is needed to determine the best ultrasound settings and to understand the biochemical mechanisms behind the effect.

For winemakers, the appeal is straightforward: better control over fermentation could mean deeper color, stronger phenolic structure and more predictable results in the bottle.