D-33: Suppression of acetate ester production during beer wort fermentation

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It was previously reported that increased dissolved carbon dioxide (DCO_2) in fermenting liquid suppressed the production of acetate esters *viz.* ethyl acetate and isoamyl acetate, however, the activity of alcohol acetyltransferase (AAT) was not affected. The relationship between the behaviour of cellular acetyl CoA and the production of acetate esters was studied under different concentrations of DCO_2 during beer fermentation. Cellular acetyl CoA production was suppressed under high concentration of DCO_2 which also caused the suppression of cellular ester synthesis. These results suggest that not only the AAT but also the amount of intracellular acetyl CoA played an important role in the synthesis of acetate esters during beer fermentation. *In vitro* studies showed that cellular pyruvate decarboxylase was inhibited by 30% by increased DCO_2 (0.20 w/w%) and a similar result was obtained with commercially available purified pyruvate decarboxylase from *Saccharomyces cerevisiae*. The results agreed with the fact that the amount of intracellular pyruvic acid increased two fold under the increased DCO_2 (0.58 w/w%). Final apparent extract and ethanol concentrations were respectively 2.3 and 7.0 (w/w%) in fermented beer and were not affected by the DCO_2. No significant inhibition of the cellular succinic acid, fumaric acid and malic acid were found and their maximum cellular values were respectively 183, 66 and 78 (μg/g yeast) at 0.58 (w/w%) DCO_2.