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Paper Title **Demonstration of Kefir Grains Microbial Stability Using Metabolic Profiles as Indicators**

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ABSTRACT

Kefir is a fermented beverage obtained by adding a microbial rich cauliflower-like structure called Kefir grains to milk. Kefir grains are an indefinitely reusable starter culture that can be commercialised to the public. To be commercially viable, it is important to ensure the microbial stability of the grains. Therefore, this study assessed the flavour compound (acetaldehyde, ethanol, acetone, diacetyl and 2-butanone) profile of a Kefir beverage using headspace gas chromatography. The Kefir was prepared with wild grains and mass cultured grains over a period of 9 days. Results showed that only acetaldehyde, ethanol, acetone and diacetyl were present in both types of Kefir. It was observed that the variations, over the 9 days study period, in concentrations of all compounds were not significantly different ($p > 0.05$) in Kefir made with wild grains. In Kefir prepared with mass cultured grains, however, acetaldehyde concentrations differed significantly ($p < 0.05$) over the study period. The acetaldehyde trend was positive, marked by concentrations (2.7 - 6.6 ppm) increasing from day 1 to 9. The absence of significant differences in the variation of concentrations indirectly demonstrated the stability of the microbial population of Kefir grains. On the contrary a significant difference in a compound concentration reveals changes in the microbial composition of the grains. Assessing flavour metabolites can be used as a simple, rapid and accurate indicator to detect microbial changes in Kefir microbial population.