

## Changes in free amino acid, peptide-N, sugar and pyrazine concentration during cocoa fermentation

### ABSTRACT

The free amino acids, peptide-N, reducing sugars (the flavour precursors in cocoa) and pyrazine profiles of mix hybrid cocoa beans fermented in a rotary drum reactor were monitored over a period of 6 days. As fermentation progressed, the acidic free amino acid concentration decreased significantly ( $P < 0.05$ ) by 15%, whereas total, hydrophobic and other free amino acids increased significantly by 148, 280 and 127%, respectively. In terms of hydrophobic/acidic/other free amino acids ratio, the unfermented cocoa beans contained 30%:18%: 52%, whereas those of fermented beans contained 46%: 6%: 48%. Concentrations of peptide-N and total reducing sugars were significantly ( $P < 0.05$ ) increased by 55 and 208%, respectively during fermentation; however, those of sucrose and total sugars decreased significantly ( $P < 0.05$ ) by 89% and 75%, respectively. The unfermented cocoa beans contained no pyrazine; however during fermentation, the 2-methyl-, 2,5-dimethyl-, 2,6-dimethyl-, 2,3-dimethyl-, trimethyl- and tetramethylpyrazine were formed. The two principle pyrazines were tetramethyl- ( $2099.30 \mu\text{g kg}^{-1}$ ) and trimethylpyrazine ( $692.00 \mu\text{g kg}^{-1}$ ).

**Keyword:** Cocoa beans; Fermentation; Flavour precursors; Free amino acid; Peptide-N; Pyrazine; Sugar