Titel des Beitrags: Sensomics mapping and identification of the key bitter metabolites in Gouda cheese

Abstract: Application of a sensomics approach on the water-soluble extract of a matured Gouda cheese including gel permeation chromatography, ultrafiltration, solid phase extraction, preparative RP-HPLC, and HILIC combined with analytical sensory tools enabled the comprehensive mapping of bitter-tasting metabolites. LC-MS-TOF and LC-MS/MS, independent synthesis, and sensory analysis revealed the identification of a total of 16 bitter peptides formed by proteolysis of caseins. Eleven previously unreported bitter peptides were aligned to beta-casein, among which 6 peptides were released from the sequence beta-CN(57-69) of the N terminus of beta-casein and 2 peptides originated from the C-terminal sequence beta-CN(198-206). The other peptides were liberated from miscellaneous regions of beta-casein, namely, beta-CN(22-28), beta-CN(74-86), beta-CN(74-77), and beta-CN(135-138), respectively. Six peptides were found to originate from alpha(s1)-casein and were shown to have the sequences alpha(s1)-CN(11-14), alpha(s1)-CN(56-60), alpha(s1)-CN(70/71-74), alpha(s1)-CN(110/111-114), and alpha(s1)-CN(135-136). Sensory evaluation of the purified, synthesized peptides revealed that 12 of these peptides showed pronounced bitter taste with recognition thresholds between 0.05 and 6.0 mmol/L. Among these peptides, the
decapeptide YPFPGPIHNS exhibited a caffeine-like bitter taste quality at the lowest threshold concentration of 0.05 mmol/L.