

Impact of Roasting Temperature Profiles on Chemical Reaction Conditions in Coffee Beans

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SUMMARY

Hot air roasting of coffee beans results in a large number of aroma compounds. For a given green coffee blend, the aroma profile is determined by the specific conditions for chemical reactions as controlled by the process parameters. Therefore, the influence of roasting temperatures on bean temperature, dehydration, pressure build-up, browning and the formation of key aroma compounds were investigated. Coffee was roasted in 6 different processes to equal degree of roast and the developing aroma compound profiles characterized by gas chromatography, mass spectrometry and olfactometry. A majority of aroma compounds showed the highest increase in concentration at medium stage of dehydration with bean water contents from 7 to 2% (wb). Different time-temperature histories lead to distinct aroma compound profiles. For specific flavor production, the precise control of roasting time and temperature is required.