The Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids of the European Food Safety Authority was requested to evaluate five flavouring substances in the Flavouring Group Evaluation 304, using the Procedure in Commission Regulation (EC) No 1565/2000. None of the substances were considered to have genotoxic potential. The substances were evaluated through a stepwise approach (the Procedure) that integrates information on structure-activity relationships, intake from current uses, toxicological threshold of concern, and available data on metabolism and toxicity. The Panel concluded that the three substances [FL-no: 16.117, 16.123 and 16.125] do not give rise to safety concerns at their levels of dietary intake, estimated on the basis of the MSDI approach. For the remaining two candidate substances [FL-no: 16.118 and 16.124], no appropriate NOAEL was available and additional data are required. Besides the safety assessment of these flavouring substances, the specifications for the materials of commerce have also been considered. Specifications including complete purity criteria and identity for the materials of commerce have been provided for all five candidate substances.