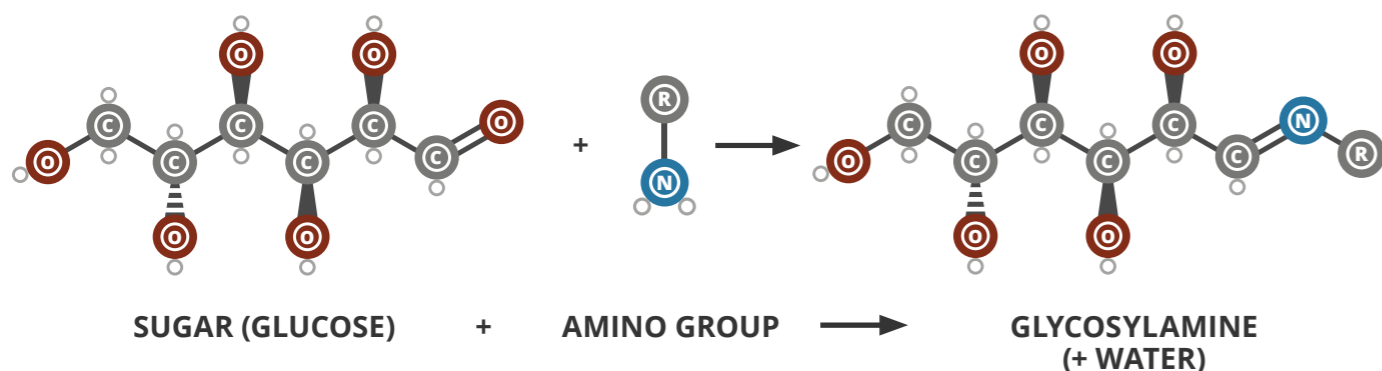


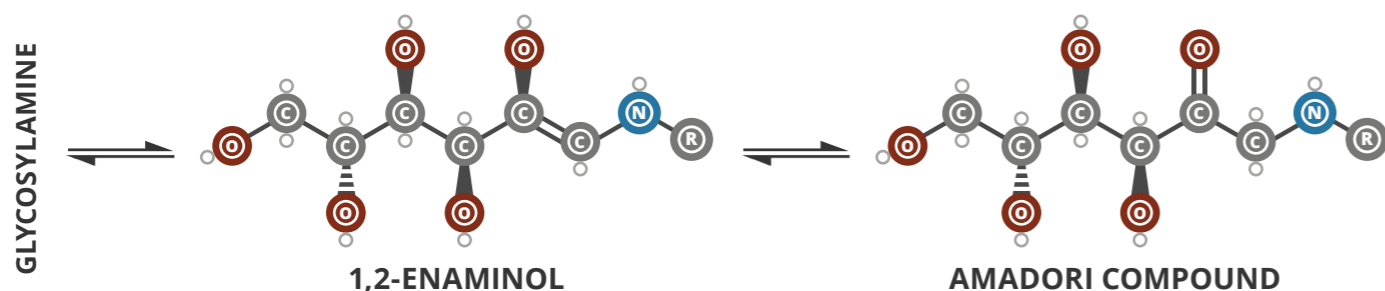
A GUIDE TO THE MAILLARD REACTION

The Maillard reaction occurs during cooking, and it is responsible for the non-enzymatic browning of foods when cooked. It actually consists of a number of reactions, and can occur at room temperature, but is optimal between 140-165°C. The Maillard reaction occurs in three stages, detailed here.

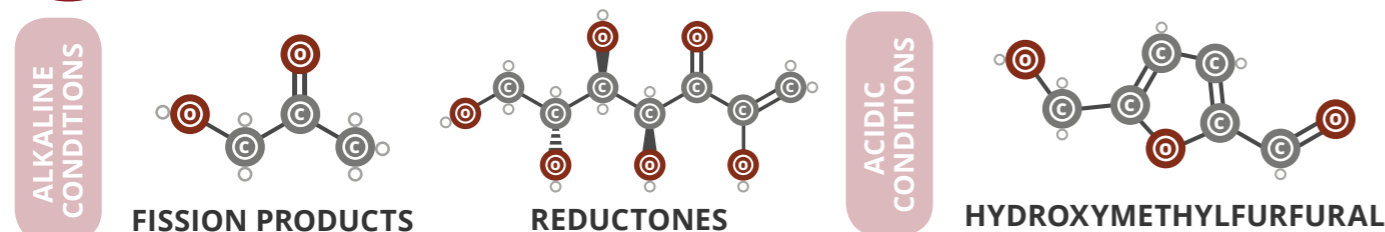
1 The carbonyl group on a sugar reacts with a protein or amino acid's amino group, producing an N-substituted glycosylamine.



2 The glycosylamine compound generated in the first step isomerises, by undergoing Amadori rearrangement, to give a ketosamine.



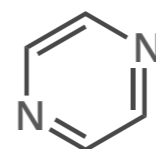
3 The ketosamine can react in a number of ways to produce a range of different products, which themselves can react further.



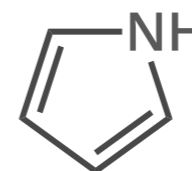
Classes of Maillard Reaction Products



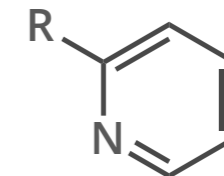
The Maillard reaction produces hundreds of products; a small subset of these contribute to flavour and aroma, some groups of which are described below. Melanoidins are also formed, brown, polymeric substances which contribute to the colouration of many cooked foods.



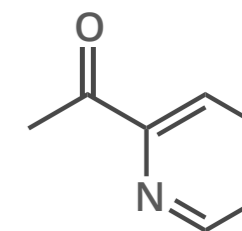
PYRAZINES
cooked
roasted
toasted



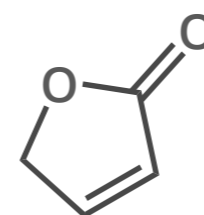
PYRROLES
cereal-like
nutty



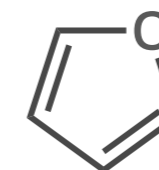
ALKYLPYRIDINES
bitter
burnt
astringent



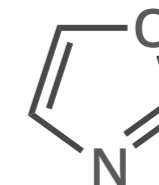
ACYLPYRIDINES
cracker-like
cereal



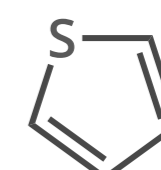
FURANONES
sweet
caramel
burnt



FURANS
meaty
burnt
caramel-like



OXAZOLES
green
nutty
sweet



THIOPHENES
meaty
roasted

