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# Dynamic flavor release from chewing gum: mechanisms of release

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Dynamic flavour release curves from chewing gum were measured using an Artificial Mouth coupled to an AFFIRM®, which measures the release of volatiles in real time. A flavour distribution model for chewing gum is proposed, where flavour is present as droplets in both the hydrophilic (water-soluble) and the hydrophobic (water insoluble) parts of the chewing gum and is present as molecularly dissolved in the hydrophobic part of the gum. During mastication, the flavour droplets in the water-soluble phase are first released and responsible for an initial burst release. The flavour droplets captured in the gum-base are subsequently pushed towards the interface by mastication and are responsible for the second release. The flavour components molecularly dissolved in the gum-base, released only by diffusion, are responsible for the limited release at very long time scales, more than 15 minutes. The release of the flavours from the chewing gum takes place directly through the airflow, simulating breathing, as well as through the waterflow, simulating the saliva and swallowing. Both aspects are significantly important; thus all aspects of the dynamics of flavour transfer have to be taken into account to understand the dynamic release of flavours from chewing gum. The physicochemical properties of five flavour components were related to the release curves of these individual components from the chewing gum. It was found that the oil-water partition constant is an important parameter to explain the flavour release, where hydrophobic components show slower and longer release, while more hydrophilic components show more burst release.