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**The Use of Facial Hedonic Measurements to  
Explore Relationships between Food  
Structure, Oral Processing and Acceptability**

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# Abstract

Hedonic responses to food should vary over time because flavour perception during oral processing is dynamic. Hedonic liking scales and temporal drivers of liking (TDL) are frequently used to assess food acceptability during product development and evaluation. These tools are only able to provide an assessment of liking at a static time point and they are also interruptive of normal food behaviours. To overcome these limitations, this thesis assesses dynamic affective responses to imagery stimuli and tastant stimuli using facial electromyography as a psychophysiological measurement (EMG) (Chapter 3.3 and 4.4). Facial muscles that are used to display negative affect (M. Corrugator supercilii and M. levator), a muscle that is active when smiling (M. zygomaticus major) and a muscle that is active when chewing (M. masseter) were all recorded using facial EMG. Additionally, multi-level modelling (MLM) was used to predict the hedonic liking ratings to these stimuli (Chapter 5.3.3). This direct measure revealed that dynamic affective responses were able to be discriminated using facial EMG. Strong activity in corrugator and levator muscles was evoked by disliked stimuli, whereas for liked stimuli only the zygomaticus muscle increased in activity. From the multi-level modelling results, hedonic liking ratings were able to be predicted using facial muscle activity. Importantly, hedonic liking ratings were able to be predicted using muscle data at the beginning and the end of the tasting (Chapter 4.4). These experiments confirm that facial EMG is not only able to assess dynamic affective responses to foods, but also that facial muscle activity can predict hedonic liking ratings.