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Oral processing behaviour of liquid, semi-solid and solid foods differs between consumers varying in age, gender and ethnicity

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Food oral processing is the first stage of human digestion, during which food is transformed into a bolus that can be safely swallowed. How food is handled inside the mouth depends for instance on the oral physiological characteristics of the individual consumer. It has been shown that with ageing muscles weaken and movement coordination during oral processing declines, complicating the eating process for elderly. The ability to masticate and swallow foods between genders and ethnicities might impact oral processing behaviour. The aim of this study was to determine the effect of age, gender, ethnicity and eating capability on the oral processing behaviour of liquid, semi-solid and solid foods. Oral processing behaviour was assessed for 3 groups of healthy consumers, Dutch adults (18-30 years, n=32), Chinese adults (18-30 years, n=35), Dutch elderly (65-85 years, n=29) and a fourth group of consumers with mild, self-reported swallowing problems and/or low mastication efficiency (18-85 years, n=39). Participants consumed 18 commercially available foods covering a wide range of physical properties, including liquid (drinkable), semi-solid (spoonable) and solid (chewable) foods. Participants were video recorded during consumption and bite/sip size, consumption time, number of chews and eating rate were obtained. Older consumers were characterized by having a longer consumption time, higher number of chews and lower eating rate compared to young consumers. Males consumed foods with larger bite size and higher eating rate than females. Asian consumers had a smaller bite size and lower eating rate compared to Caucasian consumers. Consumers with mild swallowing problems did not differ in their oral processing behaviour from healthy consumers. This might be due to the relative minor differences between this group and the healthy consumers. We conclude that age, gender and ethnicity influence oral processing behaviour of liquid, semi-solid and solid foods differently.