

# Oral Processing and Its Impact on Metabolic Outcomes

**Jeyakumar Henry** (*Clinical Nutrition Research Centre, National University of Singapore*)

Food ingestion is a daily activity that starts at birth. The earliest research on oral food processing concentrated on the physics of food breakdown including the mechanical properties of bolus formation and the process of lubrication offered by saliva. The association between diet and health has stimulated a resurgence of interest in understanding how oral food processing may influence health and nutrition. During the past few years, we have witnessed a large expansion in our understanding of the physico-chemical properties of food and their metabolic consequences. A considerable opportunity now exists in understanding how food structure can be manipulated to design and formulate novel foods. These novel systems can then be used to alter the bioavailability (increase or decrease) depending on the macro-micro nutrient under consideration. The nexus between food structure, oral processing and nutrition is an emerging field that has significant opportunities but large gaps in our knowledge still exists. This presentation will be a stimulus to enhance our understanding of this association. It is now well recognized that oral food processing is a major factor in the perception of flavour, taste, and texture and food preference. Once food is placed in the mouth, it is subjected to a series of complex processes that involve the teeth, tongue, cheek, saliva and the muscles that surround the mouth. In this presentation, a series of studies will be presented to illustrate how food structure, particle size, gel formation, food structure manipulation and mastication, can all be used to enhance the health benefits of the foods we consume. Examples include how food structure and mastication may impact on glycaemic response, energy intake, and lipid metabolism. Hardness of food has been shown to effect eating rate. The recent observation that basal metabolic rate may be a factor that influences eating rate, opens up a series of innovative ideas that may be used to manipulate glycaemic response, eating rate and energy intake. The presentation will further illustrate how this disruptive science may be used to develop novel foods with unique nutritional properties with special focus on diabetes and obesity.