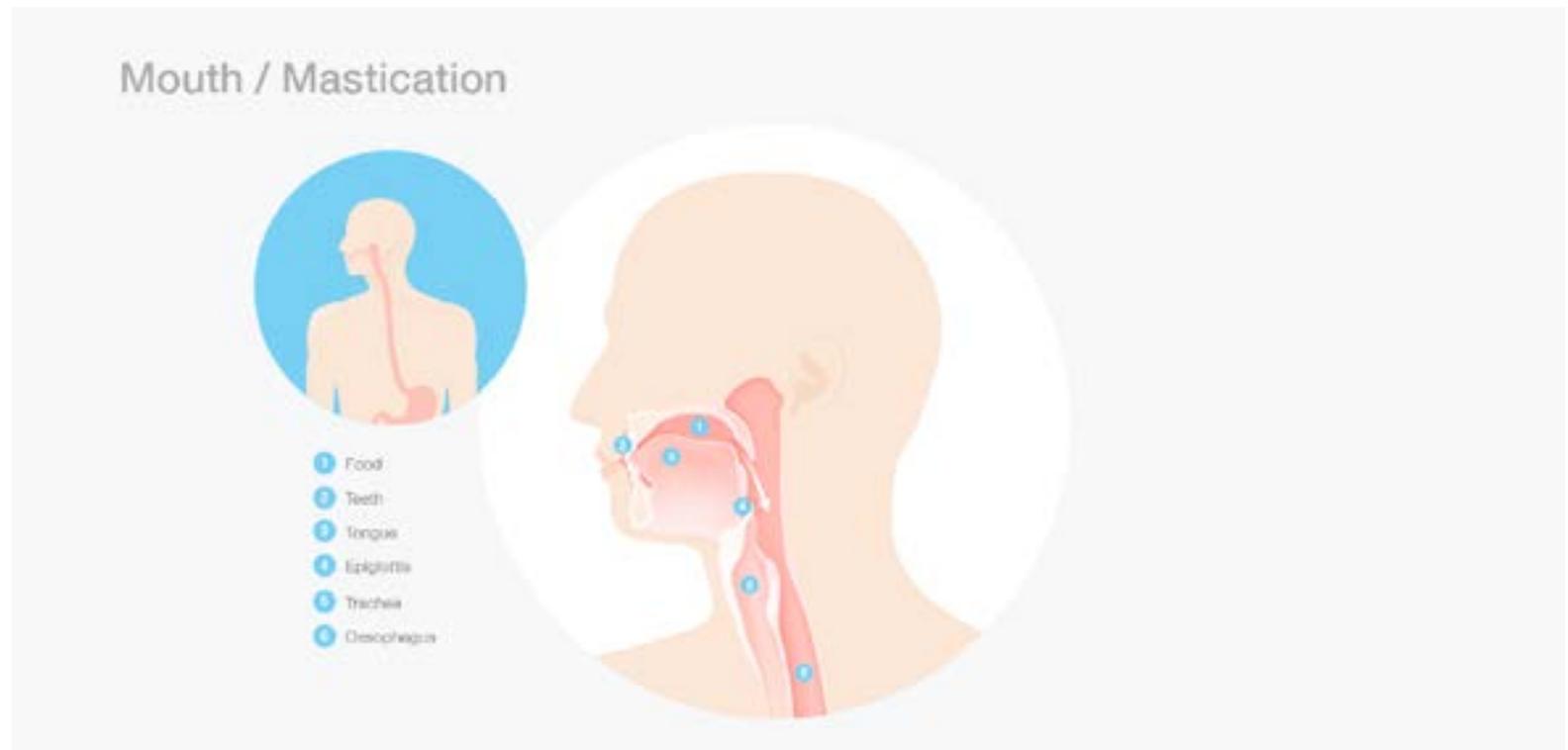


The first step of digestion takes place in the mouth. It is called mastication. It is defined by the action of crushing food with the teeth.

The mastication process is so composed :

First of all, the incisors cut the food. Then, the canine teeth will tear them off and finally the molars and premolars crush the food. Food products are impregnated by saliva which allows a better passage through the stomach. Another organ intervenes in the chewing process, the tongue. It enables to displace the food that is not yet chewed under the molars in order to crush them. The tongue also permits to enhance the mixture of saliva with the food.

In order to facilitate a good digestion, chewing is essential. Chewing well, enables the body to better assimilate food. Yet the medical studies show that a good



mastication allows to significantly slow down the speed of food intake.

Note that mastication has other « virtues ». Taking time to chew stimulates the secretions of saliva which particularly contributes to a good dental health. Moreover, mastication favors and maintains the maxillofacial muscles that are essential for the effective

development of the jaw for young children. At last, the studies suggest that keeping the food products long enough in mouth helps the brain and body to perceive more signals and the hormonal and enzymatic (gastric juices) responses are enhanced.



The present study suggests that eating rice with different feeding tools has different chewing times and amount of food taken per mouthful and then alters the Glycemic Index of the rice.		11 healthy volunteers
2015	Physiology & Behavior Feb;139:505-10	Sun L Henry CJ.



The results suggest that a higher number of masticatory cycles before swallowing may provide beneficial effects on satiety and facilitate glucose absorption.		21 healthy males
2015	Journal of the Academy of Nutrition and Dietetic Jun;114(6):926-31. doi: 10.1016/j.jand.2013.08.020. Epub 2013 Nov 9.	Zhu Y, Hollis JH.





Bite frequency is not affected by the confederate, while meal durations showed a significant effect. It seems that intake was influenced as a result of copying meal termination.		A total of 30 normal weight young adults (m/f = 8/22, age: 21.2 ± 1.9 years, BMI: 21.2 ± 1.6 kg/m(2))
2015	Appetite.2014.08.032. Epub 2014 Aug 27.Mar;86:25-30.	Van den Boer JH, Mars M.



Counseling aimed at slowing the rate of ingestion could be promising behavioral treatments for obese persons		48 (24 males; 24 females) non-obese and pre-obese young adults
2015	Physiology & Behavior Jan;138:69-74.	Park S, Shin WS.

Chewing



Increasing the number of chews also prolonged meal duration and reduced eating rate.		18 Older adults 72±1years, body mass index 25.9±1.2kg/m(2)
2014	Physiology and Behaviour Jan 17;123:62-6	Zhu Y, Hollis JH



Increasing the habitual number of chews reduced significantly the eating rate. Eating rate at 100% HNC : 22.5 g/s Eating rate at 150% HNC : 16,4 g/s Eating rate at 150% HNC : 13.7 g/s		45 normal-weight, overweight, and obese participants (18-45y)
2013	Journal of the Academy of Nutrition and Dietetics Nov 9. pii: S2212-2672(13)01375-0	Zhu Y, Hollis JH



Foods that consumed in smaller bites, were chewed more and for longer and expected to impart a higher satiation. We conclude that bite size and oral-sensory exposure time could contribute to higher satiation within a meal for equal calories.		15 subjects consumed 50 g of 35 different savoury food items over 5 sessions
2013	Appetite Jan;60(1):208-19. doi	Forde CG, van Kuijk N, Thaler T, de Graaf C, Martin N.



Higher masticatory performance and slow eating prevent the occurrence of diabetes.		6927 citizens of Nagahama City aged 40-74
2013	PLoS One Jun 5;8(6):e64113	Yamazaki T, Nagahama Study Collaboration Group.

Chewing



<p>Compared with lean participants, obese participants had a higher ingestion rate and a lower number of chews per 1 g of food.</p> <p>Regardless of status, the subjects ingested 11.9% less after 40 chews than after 15 chews.</p> <p>Compared with 15 chews, 40 chews resulted in lower energy intake and postprandial ghrelin concentration and higher postprandial GLP 1 and cholecystokinin levels.</p>		30 lean and obese young men
2011	American Journal of Clinical Nutrition Sep;94(3):162-70	Li J, Wang S.



<p>Decreasing bite size significantly lowered ingestion rate for the whole meal.</p> <p><i>As bite size decreased from 15 to 5 g, the ingestion rate at the beginning of the meal decreased from 30.0 to 19.6 g/min. Considering the whole meal, the average ingestion rate decreased from 19.4 to 15.9.</i></p>		18 lean and obese women
1993	Appetite Oct;21(2):131-45	Spiegel TA, Stellar E.



<p>Larger bites accounted for the increased rate of the obese, the high preference subjects, and those having a larger body size.</p> <p>The hungry subjects increased their eating rate by taking faster bites.</p>		142 College students
1984	Appetite Jun;5(2):73-83	Hill SW, McCutcheon NB.

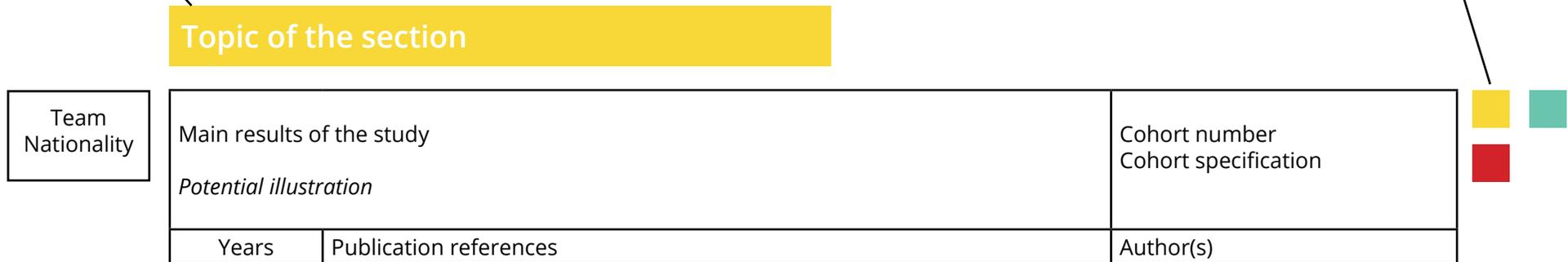


<p>Observations revealed that obese Subjects took more bites, performed fewer chews per bite, and spent less time chewing than did nonobese Subjects.</p>		100 obese and nonobese adults
1975	Journal of Consulting and Clinical Psychology 43:123-5	Gaul DJ, Craighead WE, Mahoney MJ

Presentation of the studies

Color of the section

Color of the related topic the study treats



Color by section :

- | | | | | | |
|---|-----------------|--|--------------|---|-------------------|
|  | Satiety |  | Diabetes |  | Portion Size |
|  | Food Intake |  | GERD |  | Mindful eating |
|  | Obesity |  | Food quality |  | Gastric surgery |
|  | Metabolic Risks |  | Chewing |  | Scientific Method |