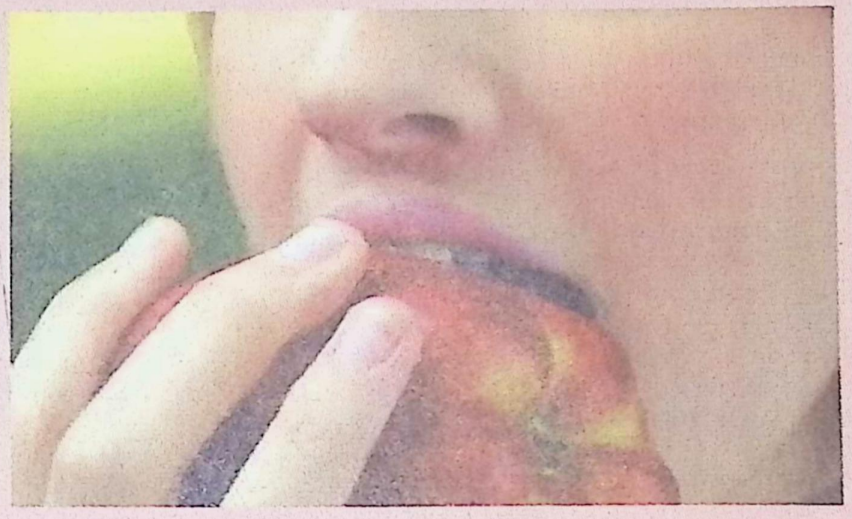
Stomach 'Clock' Tells Us How Much to Eat



University of Adelaide researchers have discovered the first evidence that the nerves in the stomach act as a circadian clock, limiting food intake to specific times of the day.

The discovery could lead to new information about how the gut signals to our brains about when we're full, and when to keep eating.

In the University's Nerve-Gut Research Laboratory, Dr Stephen Kentish investigated how the nerves in the stomach respond to stretch, which occurs as a consequence of food intake, at three-hourly intervals across one day.

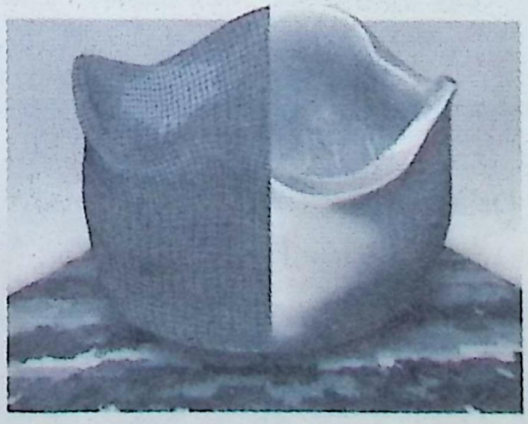
"What we've found is that the nerves in the gut are at their least sensitive at time periods associated with being awake. This means more food can be consumed before we feel full at times of high activity, when more energy is required," Kentish writes in a paper published in *The Journal of Neuroscience*. "However, with a change in the day-night cycle to a period associated with sleeping, the nerves in the stomach become more sensitive to stretch, signaling fullness to the brain quicker and thus limiting food intake. This variation repeats every 24 hours in a circadian manner, with the nerves acting as a clock to coordinate food intake with energy requirements,"

So far this discovery has been made in laboratory studies, not in humans.

Computer Scientists Create New 3-D Technique

University of Texas Dallas computer scientists have developed a technique to create 3-D images that finds practical applications of a theory created by a famous mathematician.

This technique uses anisotropic triangles -- triangles with sides that vary in length depending on their direction -- to create 3-D "mesh" computer graphics of more accurate approximations of the shape of the original object, and in a shorter amount of time than current techniques. These types of images are used in movies, video games and computer modeling of various phenomena, such as the flow of water or air across the earth, the deformation and wrinkles of clothes on the human body, or in mechanical and other types of engineering designs. Researchers hope this technique will also lead to greater accuracy in models of human organs to more effectively treat human diseases, such as cancer.



The technique finds a practical application of the Nash embedding theorem, which was named after mathematician John Forbes Nash Jr., subject of the Hollywood movie *A Beautiful Mind*.

The computer graphics field represents shapes in the virtual world through triangle mesh. Traditionally, it is believed that isotropic triangles -- where each side of the triangle has the same length regardless of direction -- are the best representation of shapes. However, the aggregate of these uniform triangles can create edges or bumps that are not on the original objects. Because triangle sides can differ in anisotrophic images, creating images with this technique would allow the user flexibility to more accurately represent object edges or folds.

The next step of this research would be to move from representing the surface of 3-D objects to representing 3-D volume.