

Research explains how you bite off the chocolate from nuts

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Nut dipped in chocolate

Simply biting off the chocolate from a nut dipped in chocolate, instead of biting through both the chocolate and nut requires sophisticated control of the biting power. This is possible owing to an advanced coordination of muscle activation and brake reflexes in different parts of the jaw muscles, in accordance with a thesis from Umeå University in Sweden.

The jaw muscles can generate a lot of force when biting food. For example, a force of over 4 kg is required to break a peanut with the front teeth and the energy for biting off a carrot is enough to splinter dental enamel. If these forces are not reduced quickly when the food cracks, the teeth would collide and risk being injured, which rarely happens.

In his thesis Anders Johansson, doctoral student at the Department of Integrative Medical Biology has studied how humans bite off food and also tried to find mechanisms which contribute to control of the fast reduction in the biting force.

"What we can show is that humans can control the reduction in biting force depending on the biting task. If the task is to, for example, bite through several layers of hard food, the reduction in force is less after each layer compared to if the task is to only bite through one layer," says Anders Johansson.

He also says that in order to achieve this you activate different areas of the [jaw muscles](#), that is, both to create the necessary biting force and to control the reduction in biting force which happens when the food cracks. This control is also supported by that the jaw opening reflex which is triggered when [food](#) breaks varies in strength, that is, that the reflex is weak when we bite through several layers and strong when we only bite through one layer.

"The results of the thesis provide greater understanding of the sophisticated [control](#) of biting force which is required when we, for example, choose to [bite](#) off the [chocolate](#) on a nut dipped in chocolate, instead of biting through both the chocolate and nut. This knowledge can in turn increase understanding of how tooth and jaw illnesses affect the biting and chewing function," says Anders Johansson.

More information: Johansson, Anders. "Context dependent adaptation

of biting behavior in human." Umeå University medical dissertations, ISSN 0346-6612; 1666.

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