How the brain influences our eating behaviour

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Credit: AI-generated image (disclaimer)

Why do we overeat and consume more calories than we need? Is food our way of rewarding ourselves, and can stress make us want to eat more? These are just some of the questions a European food study aims to answer.

NEUROFAST ('Integrated Neurobiology of Food Intake, Addiction and Stress') is a project led by the Sahlgrenska Academy at the University of Gothenburg in Sweden. It has also gathered together the clinical and experimental expertise of 13 partners from across seven European countries. Their objective, with the support EU-funding of EUR 6 million, is to investigate brain biology in the context of eating behavior, addiction and stress.

The focus will also be on the socio-psychological analysis of determinants of food addiction and substance abuse, as well as risk factors such as stress that drive addictive behaviour.

There are also interrelationships which need to be addressed, such as the links to current eating-disorder research, and research on obesity, stress and addiction. Experiments include a combination of controlled laboratory studies, characterisation of patient groups, and the examination of real-world scenarios based on epidemiological community samples. This, say project partners, will assist in further policy development.

Professor Suzanne Dickson specialises in physiology and neuroendocrinology at the Institute of Neuroscience and Physiology, which is part of the Sahlgrenska Academy. She explains the significance of the project: 'We decided to work on this because increasing evidence linked excessive overeating to brain pathways involved in reward, including pathways known to be targets for addictive drugs. Overeating can be influenced by genetic predisposition traits, psychiatric diseases, and cues from the environment that trigger expectation of a food reward. Other factors include socio-economic pressures and a stressful lifestyle, including stress in the workplace or home.'

Investigations so far include studying an area of the brain called the ventral tegmental area (VTA). Its role is complex and it is widely

implicated in the drug and natural reward circuitry of the brain. It is an important area in studying cognition, motivation, drug addiction, intense emotions relating to love, and several psychiatric disorders. Scientists working on the NEUROFAST project have a special interest in looking at the VTA and its connection with food-searching behaviours.

Referring to the achievements of NEUROFAST to date, Professor Dickson concludes: 'We have recently learned from the field of bariatric - weight loss - surgery that it is possible to change reward behaviour towards food. This involves unknown mechanisms that are likely linked to the brain's food-reward system. We are focusing specifically on a hormone called ghrelin whose secretion is altered after bariatric surgery. We hope to reveal new information that is of clinical and therapeutic relevance for future drug strategies for this disease area.'

There have also been other discoveries. 'So far, in the laboratory, we have learned a lot about the basic brain mechanisms controlling food reward and the role played by gut hormones in regulating these. We therefore know a lot more about mechanisms, namely about the brain systems and circuits underpinning over-eating, and especially for calorie dense foods.'

More information: NEUROFAST www.neurofast.eu/

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