Preference for high-fat diet is developed by young Swiss CD1 mice after short-term feeding and is prevented by NMDA receptor antagonists

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Obesity is a worldwide epidemic that is increasing at an alarming rate. One of its causes is the increased availability and consumption of diets rich in fat. In the present study, we investigated the effects of short-term consumption of a high fat diet (HFD) on dietary preferences in Swiss CD1 mice and its relation in time to specific metabolic effects. Mice that were weaned 21. days postpartum and fed a chow diet for one week were afterward subjected to a diet preference test for 5. days, exposed to both a regular diet (RD) and HFD. We found that mice did not show any preferences. In a second experiment, two groups of mice that were weaned 21. days postpartum and subjected to a chow diet for one week were fed either RD or HFD for 18. days, and a diet preference test was performed for 5. days. After this short-term consumption of HFD, mice preferred HFD, while mice subjected to RD did not show any preference. Importantly, no differences in blood glucose levels were found between the groups prior to and after the experiments. The results support our hypothesis that the preference for HFD is not a spontaneous behavior in CD1 mice, but it can be observed after short-term consumption; additionally, this preference develops before metabolic effects appear. Finally, this preference for HFD could not be observed when the mice were i.p. injected daily with low doses of the NMDA receptor antagonists, ketamine, ifenprodil or MK-801 during the HFD feeding period. These data suggest that acquisition of dietary preference for HFD is a NMDA receptor-dependent learning process. © 2013 Elsevier Inc.

Dietary preference

Feeding behavior

High-fat diet

Obesity

dizocilpine

glucose

ifenprodil

ketamine

n methyl dextro aspartic acid receptor blocking agent

animal experiment

animal model

article

controlled study

diet preference test

experimental test

feeding behavior

glucose blood level

lipid diet

low drug dose

male

metabolism

mouse

nonhuman

Dietary preference

Feeding behavior

HFD

high-fat diet

High-fat diet

N-methyl-D-Aspartate

NMDA

Obesity

PBS

phosphate buffer saline

RD

regular diet

Animals

Blood Glucose

Diet, High-Fat

Dizocilpine Maleate

Excitatory Amino Acid Antagonists

Food Preferences

Ketamine

Male

Mice

Mice, Inbred Strains

Piperidines

Receptors, N-Methyl-D-Aspartate