Validation of the well-being questionnaire on satiation, satiety and digestive comfort: the Satiarome questionnaire

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[16] PHYSIOLOGIE ET NUTRITION / PHYSIOLOGY AND NUTRITION

Obesity alters the gustatory perception of lipids in the mouse: plausible involvement of lingual CD36

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INTRODUCTION AND OBJECTIVE:
Recent data suggest the existence of a relationship between orosensory detection of dietary lipids and regulation of fat intake and body mass index. However, the mechanisms by which changes in taste sensitivity take place remain poorly understood. Moreover, whether obesity by itself can affect the preference for fatty foods remains unknown.

METHODS:
To address these questions, C57Bl6 mice were fed an obesogenic diet composed of 33% palm oil (w/w) during 4 weeks.A group of these diet-induced obese (DIO) mice were then subjected to a caloric restriction (60% of daily energy intake of animals on high fat diet). Body weight and composition, as well as fasted plasma insulin and glucose levels were measured.Preference for lipids was explored using long term (12h) two-bottle preference tests in conditions minimizing textural influences. Different concentrations of rapeseed oil were explored. Lingual CD36 expression levels in gustatory circumvallate papillae (CVP) were assessed by Western Blotting and calcium imaging experiments were carried out in freshly isolated CD36-positive taste bud cells to explore variations in Ca2+ signal.

RESULTS:
As expected, body weight and fat mass were significantly increased in DIO mice compared to controls fed a standard laboratory chow (4RF21, Mucedola, Italy; containing 3% fat, w/w). Plasma glucose and insulin levels were increased suggesting the setting-up of an insulin resistance.
Double-choice tests show that the preference for lipids is lower in DIO mice compared to controls.
This phenomenon is reversed in DIO mice subjected to caloric restriction, revealing an inverse correlation between fat preference and adipose tissue size.
Western blot analyses indicate that the fasted CD36 levels are not altered in DIO mice. By contrast, obesity suppresses the lipid-mediated down-regulation of the lipid sensor CD36 in CVP, usually found during the refeeding of lean mice. Moreover the lipid-dependent signalling cascade controlling the intracellular calcium levels ([Ca2+]i) in taste bud cells is impaired in DIO mice.

CONCLUSION:
This data indicate for the first time that a diet-induced obesity leads to an alteration of the preference for fat. This phenomenon is independent of basal CD36 expression in the CVP, but it seems to take place through a dysfunction in the CD36-mediated mechanism responsible for the lipid

[17] CONSOMMATEURS / CONSUMERS

Validation of the well-being questionnaire on satiation, satiety and digestive comfort: the Satiarome questionnaire

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INTRODUCTION AND OBJECTIVE:
In order to improve the approach to well-being related to satiation, satiety and digestive comfort, a questionnaire by the name of Satiarome has been on the basis of the existing literature and of the analysis of a series of interviews on the subject. This study looks to validate the psychometric properties of the questionnaire in accordance with the required methodological stages, namely validation of its reproducibility, its internal consistency, its external validity and its sensitivity to change.

METHODS:
The Satiarome questionnaire is made up of three blocks of questions with superimposable structures relating to the periods 'breakfast/morning', 'lunch/afternoon' and 'dinner/evening'. The reproducibility study relates to a group of 24 people who were served strictly identical, normocaloric standardised meals two days apart.
Sensitivity to change was the subject of a cross-over study of two groups of 30 people who were given standardised satiating/satietogenic or hyposatiating/satietogenic meals in succession depending on the randomisation, at a 48-hour interval. The subjects completed the Hill & Blundel (1982) questionnaire (satiety assessment), the gastro-intestinal quality of life questionnaire (GIQLI) and the Satiarome questionnaire. The study of the questionnaire's internal consistency and its external validation against the Hill & Blundel and GIQLI questionnaires cover all of the observations from the previous two studies.

RESULTS:
The results show that all of the Satiarome questionnaire blocks are reproducible. A surge in satiety for the intake of the hyper-satiating meal versus the hypo-satiating meal is observed for all the Satiarome questionnaire blocks ($p<0.0001$ for each of the blocks with variations of the order of 50%). The standardised Cronbach coefficients are 0.814, 0.7946 and 0.8457 for each of the blocks. Close correlations are found among the various blocks of the Satiarome questionnaire and those of the Hill & Blundel questionnaire: 0.66 for 'breakfast/morn ng', 0.71 for 'lunch/afternoon' and 0.64 for 'dinner/evening' ($p<0.0001$ for the three blocks). Correlations with the GIQLI questionnaire are weaker, 0.36 for 'breakfast/morning', 0.40 for 'lunch/afternoon' and 0.48 for 'dinner/evening' but remain significant ($p<0.0001$ for the 3 blocks), probably because items about digestive discomfort are under-represented in the Satiarome questionnaire compared with those on satiety and satiation.

CONCLUSION:
These results validate the psychometric properties of the Satiarome questionnaire. Clinical studies can be expected to confirm its utility in evaluating products designed to improve digestive well-being especially in relation to satiation and satiety.