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High levels of circulating SHBG have been reported during starvation in patients with anorexia nervosa. The present work investigated the relationships between SHBG and insulin or IGF-I in these patients. The serum concentration of SHBG, insulin, IGF-I and IGF-binding proteins (IGF-BP 1 and 3), using specific radioimmunoassay and/or Western ligand blot analysis, were measured in 12 patients during starvation and after weight gain through refeeding. The electrophoresis migration of SHBG monomers was also analysed using Western blotting.

As compared to a control group of healthy women (n = 9), the patients with anorexia nervosa had significantly increased serum concentrations of SHBG (82.2 ± 31.5 vs 47.9 ± 12.9 nmol/L, P < 0.001) and IGF-BP1 (112.1 ± 134.3 vs 26.5 ± 27.5 µg/L, P < 0.001), and significantly decreased concentrations of IGF-I (99.2 ± 56.8 vs 237.6 ± 90.6 µg/L, P < 0.001) and IGF-BP3 (2.5 ± 0.7 vs 3.4 ± 0.6 mg/L, P < 0.01). The fasting insulin level was not significantly different in the two groups (9.3 ± 5.4 vs 9.0 ± 1.5 mU/L). Weight gain (+ 4 kg) was associated with decreases in SHBG (41.1 ± 10.3 vs 82.2 ± 31.5 nmol/L, P < 0.001) and in IGF-BP1 (26.9 ± 28.3 vs 112.1 ± 134.3 µg/L, P < 0.001) levels and with increases in IGF-I (298.8 ± 129.1 vs 99.2 ± 56.8 µg/L, P < 0.001), IGF-BP3 (3.26 ± 0.79 vs 2.5 ± 0.7 mg/L, P < 0.002), and fasting insulin (12.9 ± 6.1 vs 9.3 ± 5.4 mU/L, P < 0.01) levels. Western blot analysis revealed no variation in the migration of SHBG monomers. This result suggested that there had been no alteration of SHBG glycosylation during refeeding. A negative and significant correlation between SHBG and IGF-I levels (r = –0.51, P = 0.001) was found, as well as an inverse relationship between the increase in insulin and the decrease in SHBG (r = –0.80, P = 0.001) levels.

These results suggested that insulin and IGF-I could be associated with the changes in SHBG concentration in anorexia nervosa. The relative effect of these growth factors on the production and/or on the metabolic clearance of SHBG remains to be further investigated.

Sensory stimuli are not accurate cues in the estimation of the energy content of biscuits. M Chabert [1], L Abdallah [1], B Le Roux [2], J Louis-Sylvestre [1] *([1] Ephe-Inserm, faculté de médecine Xavier-Bichat, 75018; [2] CNRS, faculté de médecine des Saints-Pères, 75006 Paris, France)*

A multidimensional data analysis was performed to determine the relationships between: i) actual nutritional composition of foods (content of water, sugars [disaccharides], fat and energy per 100 g food); ii) their structure; iii) their nutritional composition as estimated by subjects on a nine-point scale (sweetness, fatness, moisture, energy ['calories']); iv) intensity of perceived flavour (nine-point scale); v) palatability (nine-point scale) and vi) the amount of food that subjects think they would be able to eat (ie, prospective consumption).

Subjects were 102 healthy young men (nonsmokers, nonrestrained, with normal body weight). They all tasted 45 different kinds of biscuits, at 4:00 pm, on 3 test days a week apart. For each biscuit, they indicated if they were familiar with it (five levels), they rated the nutritional, sensory and hedonic parameters and their prospective consumption for a 4:00 pm snack.

However familiar the subjects were with biscuits, their evaluations of sweetness, fatness and moisture were about the same when they were performed just before or just after tasting. Depending on the biscuits,

the ratings of flavour intensity and energy content increased or diminished after tasting as compared to before tasting. These changes in rating were more pronounced for nonfamiliar biscuits than for familiar ones.

Sweetness was positively correlated with the actual content of sugar up to the level of 30% (g/g) and thereafter remained constant. Perceived fatness was weakly related to the actual value. Estimated energy content appeared to be independent of the actual energy value of the biscuits.

Palatability increased with the intensity of flavour but reached a limit for the most intense flavours. Prospective consumption of the biscuits for a 4:00 pm snack was positively associated with palatability and estimated energy content.

Principal component analysis yielded three main axes. The first axis (50% of total variance), called the *intensity axis*, distinguished the flavourless, simply structured and high-starch biscuits from the strongly flavoured, complex structured and high-sugar biscuits. The second axis (27% of total variance) distinguished the high-fat and high-energy biscuits from the high-sugar ones. The third axis (10% of total variance) was determined by the actual moisture of biscuits.

In conclusion, the more sensory stimuli the subjects received and the more intense the stimuli were, the more the subjects rated the biscuits as being high in energy.

Most biscuits are high-fat foods. Fat flavour and texture are not accurate sensory cues for the assessment of fat content and therefore of energy content. The energy potential from sugar was better assessed than the energy from fat.

Influence of the length of feeding duration with an unappetizing sweet white lupin-based diet on food intake in young and adult rats. R Lamghari, C Villaume, HM Bau, A Schwertz, L Mejean, JP Nicolas *(Inserm U 308, 38, rue Lionnois, 54000 Nancy, France)*

Sweet white lupin proteins precipitated with a mixture of alginic acid and calcium chloride differently affect rat food intake according to whether the seeds are peeled or not.

To better understand this observation, 21- or 63-day-old male Wistar rats were fed over different periods of time with concentrates of sweet white lupin (var Ares) proteins obtained from peeled (PL) or whole (WL) lupin seeds. The concentrates were made by grinding whole seeds or peeled seeds in water, followed by centrifugation

Protein intake of whole sweet white lupin (WL) or peeled sweet white lupin-based diets (PL).

Days	*Diets*	*Young rats*	
		Group 1	*Group 2*
6	WL	0.24 ± 0.02	–
14	(g/day)	–	0.28 ± 0.03
8	PL	0.61 ± 0.03	–
10	(g/day)	–	0.65 ± 0.03
20	WL	0.28 ± 0.06	–
10	(g/day)	–	0.22 ± 0.08
Days	*Diets*	*Adult rats*	
		Group 1	*Group 2*
6	WL	0.46 ± 0.05	–
14	(g/day)	–	0.37 ± 0.06
8	PL	0.94 ± 0.07	–
10	(g/day)	–	1.09 ± 0.06
20	WL	0.37 ± 0.09	–
10	(g/day)	–	0.28 ± 0.07

Mean ± SD; $n = 10$.