

for-length (WL) and length-for-age (LA) were calculated as standard deviations (DS) of the WHO reference population.

Mean indices by age and country:

	Senegal	Congo	Bolivia
WL at 4 months	+0.43	+0.51	+1.00
WL at 7 months	-0.30	+0.31	+0.87
LA at 4 months	-0.62	-0.47	-0.99
LA at 7 months	-1.10	-0.77	-1.37

The mean weight increment between 4 and 7 months in Senegal (0.79 kg) was lower than at the other 2 sites (1.29 and 1.29 kg). The height increments were similar (4.55; 4.90 and 4.64 cm). The diet at 4 months was different at the 3 sites, with breast-feeding being predominant in 72, 10 and 62% of cases, supplemented by traditional weaning gruel in Senegal and Congo, but not in Bolivia, where the family meal is used earlier for this purpose.

The height retardation in these countries begins early and continues through the weaning period whatever the mode of feeding and weight growth during this period. Various hypotheses, besides the insufficient quality of the weaning diet, have been put forward including specific nutrient deficiencies of the mother or foetus, or interaction with clinical or subclinical infections. Its etiology at present is still unknown and linear growth retardation in developing countries should be studied further.

**Food intake correlates with restrained eating, disinhibition and hunger, in French obese patients.** A Lluch<sup>1</sup>, A Stricker-Krongrad<sup>1</sup>, JP Kahn<sup>2</sup>, O Ziegler<sup>2</sup>, P Drouin<sup>2</sup>, L Méjean<sup>1</sup> (<sup>1</sup>INSERM U 308, 38, rue Lionnois, 54000 Nancy; <sup>2</sup>CHU-

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We selected the Three-Factor Eating Questionnaire (Stunkard *et al* (1985) *J Psychosom Res* 29, 71-83) in order to assess in a quantified manner, the relationships between factors associated with eating behaviour (EB) and food intake. This 51-item self-rating questionnaire explores 3 dimensions of EB: 'cognitive restraint of eating', 'disinhibition' and 'hunger'. After a translation of the American version of the questionnaire and a back-translation, the French version was completed by 109 women (mean body mass index = 37.2; mean age = 42 years) seeking treatment for obesity. An individual score was calculated for each of the 3 scales. A high score indicated a high degree of the studied trait. Food intake was assessed by the technique of dietary history. Nutritional data and the scores of each of the 3 scales were submitted to a correlation analysis. In our sample, the mean total energy intake (TEI) was  $8\ 632 \pm 297$  kJ per d ( $2\ 065 \pm 71$  kcal). Protein, fat and carbohydrate accounted for, respectively, 19.4, 38.5 and 42.1% of the TEI. A negative correlation was observed between TEI and cognitive restraint ( $r = -0.5$ ;  $p < 0.001$ ) whereas a positive correlation related TEI to disinhibition ( $r = 0.3$ ;  $p < 0.01$ ) and hunger ( $r = 0.3$ ;  $p < 0.01$ ). Restraint resulted in a greater contribution of protein in the TEI ( $r = 0.4$ ;  $p < 0.001$ ) and a lower one of fat ( $r = -0.3$ ;  $p < 0.01$ ). When the disinhibition score was high, the protein proportion decreased ( $r = -0.3$ ;  $p < 0.05$ ). Finally, the hunger scores were negatively related to the protein contribution ( $r = -0.2$ ;  $p < 0.05$ ) and positively related to the carbohydrate contribution ( $r = 0.3$ ;  $p < 0.001$ ). The 3 dimensions of EB, assessed with our French version of the Three-Factor Eating Questionnaire in a population of obese women, were in excellent relation with predictable nutritional data. Hopefully, this psychometric tool could be useful to identify

personality factors related to individual eating patterns and will improve our knowledge of the relationships between factors associated with EB and food intake.

**Influence of consumption of beer without alcohol on resumption of diuresis after exertion.** D Boute<sup>1</sup>, R Cappelaere<sup>2</sup>, JM Antoine<sup>3</sup>, JM Borys<sup>1</sup>, M Robin<sup>2</sup> (<sup>1</sup> *Nutrika, 2, rue du Président-Kennedy, 59280 Armentières*; <sup>2</sup> *Lille Olympique Sporting Club, 59000 Lille*; <sup>3</sup> *Brasseurs de France, 25, bd Malesherbes, 75008 Paris, France*)

Exertion is responsible for a state of anti-diuresis, depending on the intensity, the duration of the activity and the surrounding climatic conditions. Water and sodium retention persist despite cessation of the exertion, sometimes hindering anti-drug tests. The influence of the consumption of beer without alcohol on the resumption of diuresis after 45 min of a football match was evaluated in 23 sports players, during 2 training matches played at an interval of 2 weeks. Each player was selected randomly at the end of the match according to the type of drink, either 750 mL of beer without alcohol (BWA) or the same volume of water (WATER). The weight, blood pressure, urinary volume, urinary osmolality and density, natriuresis, kaliuresis and chloruresis were recorded during the 2 h following rehydration.

The player's feelings of thirst, well-being and hunger were analysed by questionnaire. The clinical parameters did not differ significantly between the 2 groups. The total urinary volume in the 2 h following the end of the exertion was significantly higher in the BWA group than in the WATER group respectively  $168 \pm 19.9$  mL vs  $127.9 \pm 5.9$  mL ( $p = 0.04$ ). The urine osmolality and density tended to remain lower in the BWA group but the differences were not statistically significant. Natriuresis and chlorure-

sis increased in a parallel fashion in the 2 groups. Kaliuresis was significantly lower in the BWA group in comparison to the WATER group 30 and 60 min after rehydration (at 30 min, it was respectively  $68.1 \pm 5.6$  mEq/L vs  $84.2 \pm 6.6$  mEq/L;  $p = 0.03$ ). There was no demonstration of intolerance in the BWA group.

Due to its composition, beer possesses diuretic properties that are also found in the beer without alcohol. Beer induces aqueous diuresis, which is more effective against the anti-diuresis induced by physical activity. This effect is independent of its alcohol content, and is probably due to the ionic composition of beer without alcohol, which reduces the potassium loss observed during the phase of diuresis resumption.

**Influence of beer ingestion on weight and food consumption.** JM Borys<sup>1</sup>, S Cavare<sup>2</sup>, X Pelletier<sup>2</sup>, D Boute<sup>1</sup>, C Marti<sup>1</sup>, JM Antoine<sup>3</sup>, G Debry<sup>2</sup> (<sup>1</sup> *Nutrika, 2, rue du Président-Kennedy, 59280 Armentières*; <sup>2</sup> *Centre de Nutrition Humaine, 40, rue Lionnois, 54000 Nancy*; <sup>3</sup> *Brasseurs de France, 25, bd Malesherbes, 75008 Paris, France*)

The impact of a moderate and regular consumption of beer on weight evolution and food consumption was studied in 13 subjects of normal, stable weight. These subjects, of a mean age of  $23.4 \pm 0.4$  years, had a BMI of  $22 \pm 0.4$  kg/m<sup>2</sup> ( $20.4$ – $24.9$  kg/m<sup>2</sup>). For 28 d, they consumed 330 mL of beer at the midday and evening meals in addition to a free and balanced glucido-lipido-protein intake (50% carbohydrate, 35% fat and 15% protein). The intake was *ad libitum*. The addition of the beer ensured an extra caloric intake of 268.4 kcal (21 g of glucides, 2.5 g of proteins and 25 g of alcohol); the rest of the hydric requirements were supplied by water. After a free period of 15 d, the subjects entered a homologous phase of water consumption. The menus on homol-