In nutritionally adequate diets, the frequency of consumption of foods from the 4 SENS* classes follows a hierarchical progression, from Class-1 (high frequency) to Class-4 (low frequency).

*Systeme d’Etiquetage Nutritionnel Simplifie [Simplified nutritional labelling system]

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INTRODUCTION
Dietary advices, which aimed at promoting healthy eating, must consider not only the nutritional profile of foods but also the amount consumed (portion size) and the frequency of consumption.

The SENS nutrient profiling system distributes foods into 4 classes, from the most (Class-1) to the least (Class-4) favourable profile.

OBJECTIVES
To test the relevance of associating to each SENS class a wording related to the frequency of consumption.

MATERIALS AND METHODS
Classification of foods and definition of portion-sizes
• The 1192 foods of the French food database were assigned into the 4 classes defined by the nutrient profiling SENS system (Figure 1).
• A standard portion-size was defined for each food, based on published references (Table 1).
• The distribution of the portion-sizes of foods was assessed within each class of SENS.

Modelling nutritionally adequate diets (See Poster SENS system N°3)
• For each individual diet consumed by adults in the nationally representative INCA2 dietary survey (n=1719 observed diets), an optimized diet (i.e. iso-nutritional, nutritionally adequate and as close as possible to the subject’s observed food choices), was designed with modelling.
• All the optimized diets respected official recommendations on nutrients (protein, fats, carbohydrates, fibers, essential fatty acids, vitamins, minerals, sodium, free sugars, saturated fats, cholesterol).

RESULTS
1/ Portion size distributions in the French food database by SENS classes
A high variability of portion-sizes was observed within each SENS class. Class-1 and Class-2 foods had higher portion-sizes (median 100g) than Class-3 and Class-4 foods (median = 45g and 50g, respectively), which is consistent with their lower energy density (Figure 2).

2/ Average frequencies by SENS classes, in observed and optimized diets
In the observed diets, an average of 6 portions/day of foods from each class was consumed (6.2; 6.0; 5.6 and 6.1 portions/day in classes 1, 2, 3 and 4, respectively; P<0.05) (Figure 3).
In the optimized diets, the frequencies of consumption differed largely between the 4 SENS classes, and followed a coherent and significant progression regarding the number of portions/day: 9.3 (including six portions/d of fruit and vegetables) >> 6.5 > 5.2 > 3.7 for the class 1, 2, 3, 4, respectively (P<5%).

3/ Percentage of subjects complying with optimization-induced frequency increase for Classes 1 and 2 and decrease for Classes 3 and 4
The optimisation (i.e. the reaching nutritional adequacy):
• increased the frequency of Class-1 foods (98.3% of subjects) and Class-2 foods (66.8%);
• decreased that of Class-3 (57.2%) and Class-4 foods (94.8%) (Figures 4a and 4b).

CONCLUSION
• In diets optimized to fit nutritional recommendations, the daily frequency of consumption of foods from Class-1 (and Class-2) was much higher (higher) and the frequency of consumption of foods from Class-4 (and Class-3) was much lower (lower) than in the observed diets.
• It appears relevant to accompany the simplified nutritional labelling based on the SENS nutrient profiling system with simple and consumer-friendly messages advising that Class-1 (including all kind of fruit and vegetables) and Class-2 foods should be eaten more often and that foods belonging to Class-3 and Class-4 of the SENS should be eaten less often.

Table 1. Portion-sizes used in the analysis

Table 1. Percentage of subjects complying with optimization-induced frequency increase for Classes 1 and 2 and decrease for Classes 3 and 4

Figure 4a. Percentage of subjects for which the optimisation increased the frequency of Class-1 and Class-2 foods

Figure 4b. Percentage of subjects for which the optimisation decreased the frequency of Class-3 and Class-4 foods

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