

another with more fat content.

Distribution and nutrient's sources in the diet:

In this proposed model, foods are distributed in 06 daily meals and composed by 03 groups: a) cereals and grains as main source of carbohydrate; b) meat, milk, dairy and eggs as main source of protein; c) vegetables and fruits as main source of vitamins and minerals. There are emphasis on the basic functions of each group and, mainly about the increase in energy value when high energy components were put on the foods.

Determination of the servings and its distribution in the meals:

The servings were based on food exchange list,³⁶ and the food groups were distributed on the plate in three positions in the case of main meals (lunch and dinner - for Brazilian). This positions respected the next proportions: three parts of vitamins and minerals sources; two parts of carbohydrates sources and one part of proteins sources, in order to preserve the visual characteristic of the plate model that consists in a memorizing pattern. For intermediary meals, the patient should be advised to include at least one source of each food group to the meal, as it is demonstrated in almost all photos presented in this paper.

It is important to observe that, especially for main meals, this is a visual proportion, in other words, each food group should occupy one space on the plate, that not necessarily have correlation with number of equivalent servings. The equivalent distribution should be determined by nutritionists, and could be adapted to different energy values comparing with diet A and B, without modifying significantly the visual proposal of this model, once that adaptations can be necessary to achieve the patient nutrient requirements.

Anyway, if health professional considers convenient, it is not necessary to use specific energy values, neither use the equivalent system, because qualitative orientation has just a quite satisfactory repercussion on the dietary treatment, that is the initial proposal of the plate model.

Modifications in relation to original plate model:

The proposed model has a higher area destined to carbohydrates than the Armstrong model and a lower area destined to proteins, as can be observed in the figure 1.

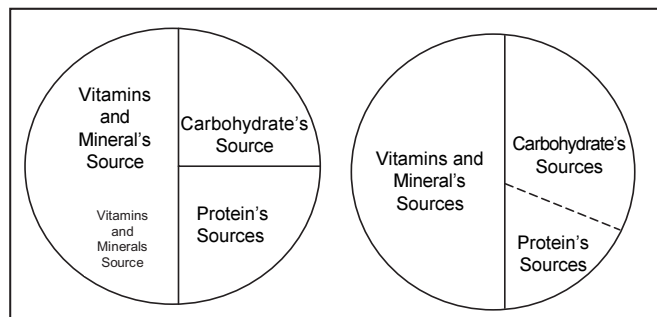


FIGURE 1 - Comparison among destined areas to each food group in the original plate model and the model proposed in this work.

Considering a diet with 2450 Kcal (diet A), in original model, carbohydrates group corresponds to 2 servings of equivalent arise from Exchange for Meal Planning³⁶ and the protein group corresponds to 2 servings respectively. In the proposed model, carbohydrates corresponds to 3 servings and the protein group corresponds to 1,5 servings.

In the case of fruits and vegetables there are not differences between the models. The Diet B has a half of these servings except for the vegetables and fruit group.

The vegetable's group is emphasized both in normo and hypocaloric diet because these are rich flavonoids sources, antioxidant nutrients and fibers, that have been highlighted as important dietary factors in prevention of non-communicable chronic diseases, among them those related to obesity, as atherogenesis, mainly for antioxidant cellular protection^{43, 44, 45, 46}.

The lower meat portion can dissatisfaction some patient, because its consumption has an important psychosocial component, being a full meat ingestion related to status and success⁴⁷ however, the amount proposal here is sufficient to reach protein requirements and to guarantee an acceptable intake of cholesterol, that is less than 300 mg/day, as recommended by FNB⁴⁰. Regarding the diet energy value, the reduction on meat portion, allows the amplification in carbohydrates consumption, that have more favorable biochemical and sensorial properties to dietary treatment than the pertinent ones to lipids, that were discussed previously. Besides that, the increase in carbohydrates consumption allows the preservation of muscular tissue, saving its use as energy substratum.

Another modification is that the original model only guides visually in relation to the main meals, while the proposal model shows a complete daily alimentary routine, exemplifying the main meals and the intermediaries. Besides that, there are meals with fats additional like creams, mayonnaise, fatty sauces, sweet candied, and so on, demonstrating that in spite of these fat-meals have a small volume comparing with meals without additional fats, the energy value becomes very larger, pointing out one of the damages of lipids excess in the diet. It is a way to amplify the nutritional education proposal for obese subjects and for preventing the weight excess too. This work also intends one association with equivalent system, in order to allow a more varied diet and easy to handle for patients.

RESULTS AND DISCUSSION

Analysis of the model

The sequence of photos (figure 2) consist in the proposal of adapted plate model for obese. The legends below each meal of the diets A, B e C indicate the individual energy value of these. Then, it is possible to establish a visual comparison among the diets B and C, and perceive that if Diet C would not had been added with additional fats, it would had the same energy value of Diet B. The alterations in the Diet C highlights the role of fat in energy density of foods.

Next to each meal, different spoons are demonstrated indicating the amount of complement allowed in each meal as sugar, honey, jelly, sweet in paste, margarine, and so on, that can be substituted in agreement with the food exchange list, without significant changes in chemical composition or energy value of the diet, because these foods were considered on initial diet proposed.

An additional nutritional advice is appropriate focussing the group properties in order to planning health meals.

The model was composed with usual foods of Brazilian diet, although there is adoption of North American alimentary practices, especially considering a growing "fast-foods" consumption for Brazilians. Such dietary patterns were not represented, therefore these are generally alimentary choices quite rich in fats, then it should be inadvisable or adjusted by the nutritionist.

In the Table 1 there are a description about diets composition, showing the number of servings used in each meal and the energy value. In diet C is also described the qualitative changes comparing with diet B, having emphasis in the energy difference found among these.