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HIGH PROTEIN BAKED PIECE AND METHOD OF PRODUCING THE SAME

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Filed Mar. 21, 1961, Ser. No. 97,275

6 Claims. (Cl. 99-86)

The present invention is concerned with a high protein wafer-like baked piece which contains sufficient protein, carbohydrate, and fat to provide a balanced diet when ingested by a human being in an amount based on the calorie equivalent thereof, and with a process for the manufacture of said baked piece. Preferred baked pieces of this invention embody vitamins and minerals in amounts sufficient so that the wafer-like products may be employed as the sole food. Other preferred forms have unusually low fat contents and are especially adapted for weight control diets.

A number of effective, palatable, nutritionally balanced dietary formulations in the form of liquids and powders comprising mixtures of processed plant and animal proteins, fats, carbohydrates and other ingredients have become available recently for weight control purposes in line with the metered calorie or 900 calorie principle. Such powder and liquid formulations have become well-accepted by large numbers of people.

Such diets, while successful in a high proportion of instances, may become rather monotonous when adhered to for prolonged periods of time, as is sometimes necessary with overweight individuals. In order to provide a varied menu, resort has been had to the preparation of low calorie soups, puddings, ice creams, and dessert-like products from such dietary powders. These efforts have, however, met with only partial success and do not provide a complete solution to the problem of providing variety in the diet. The high protein content necessary to provide a dietary composition which is sufficiently low in caloric equivalent, but yet nutritionally adequate, has prevented the use of such materials in the preparation of cakes, cookies, and other baked items.

It is an object of the present invention to provide a palatable wafer-like baked piece comprised of protein, fat, and carbohydrate, and containing from 15 to 40% by weight of protein.

It is an additional object to provide a baked piece of the nature of a wafer or cookie having a high protein content and supplemented with vitamins and minerals, which closely resembles the above dietary powder and liquid formulations in nutritional composition.

It is a further object to provide such a wafer of uniform size and composition which will permit the individual to substitute a specific number of such wafers for all or a portion of the normally specified daily intake of the equivalent powder or liquid formulation and still maintain his caloric intake below a predetermined limit while receiving a nutritionally balanced diet.

Still another object is to provide a palatable satisfying wafer resembling, for instance, an oatmeal or spice cookie in appearance, consistency, and taste.

Yet another object is to provide a method for the manufacture of such a wafer that is adapted to volume production in standard commercial bakery equipment. These and other objects will be apparent to those skilled in the art from the following disclosure.

The first consideration in formulating a product according to the present invention is to provide a composition which will supply from 58 to 100 g. of dietary protein per day. This amount of protein fulfills the accepted requirement for maintenance of nitrogen balance in an individual depending upon the level of physical activity

in which he partakes. Seventy grams per day is considered an average and adequate amount of protein for regular daily intake except for manual laborers who may require more. The present compositions provide this amount of protein in a daily dietary unit of from 1/2 to 1 lb. of the finished baked pieces.

In order to provide this amount of protein, the present baked pieces contain from 15 to 40% by weight thereof. For wafers adapted for weight losing diets, the amount by weight of fat therein may be as low as 5%. For the preparation of a high calorie wafer for weight gaining regimens, as much as 20% by weight of edible fatty glyceride may be included in the baked piece. In addition, from 5 to 25% the weight of said baked piece is made up of moisture, flavors, fillers, nutritionally inert ingredients, etc. These ingredients, when they include vitamins and minerals, are present in sufficient amounts to provide a nutritionally balanced product and an elegant product. The remainder of the composition is made up of digestible carbohydrate, which in any event comprises at least 35% by weight of the finished baked piece. Preferred compositions of the present invention for weight loss purposes contain on a weight basis from 25 to 40% protein, from 5 to 15% edible fatty glyceride, from 5 to 25% nutritionally inert ingredients, and at least 35% digestible carbohydrate.

The baked pieces of the present invention are thus comprised essentially of closely intermingled particles of protein, fat, digestible carbohydrate, inert ingredients, and preferably vitamin and mineral supplements. They are cemented together to form a wafer-like product with water soaked and dehydrated wheat gluten, as is herein-after described. The resulting wafer, when containing vitamin and mineral supplements is capable as the sole food of supplying all of the nutritional needs of an adult human being. They are preferably uniform in size so that a specific caloric equivalent for each unit is provided. In this form the present products are uniquely adapted for use in controlled dietary regimens for either weight gaining or weight losing purposes and moreover are adapted for use in combination interchangeably with the liquid or powder-form nutritionally balanced dietary products to which reference has been made above. Animal feeding experiments have shown that the nutritive value, particularly the protein quality, of the finished baked pieces of this invention is higher than that of the total of the ingredients used in their preparation.

It is within the scope of the present invention to bake such wafers in essentially any desired size, but it has been found that a rather thick baked piece (about 1/2 centimeter) of relatively small diameter (about 5 centimeters), has an appealing appearance and provides about 25 calories per wafer in formulations containing about 9% fat. Wafers of higher caloric content are prepared by increasing the proportion of fat therein, since, on a weight basis, both carbohydrate and protein have approximately the same caloric equivalent, while that of fat is substantially higher.

The dough components necessary to provide a wafer of the present type have heretofore been considered by those skilled in the art to be incompatible in the proportions necessary to provide a nutritionally balanced wafer having the present composition. This problem has been overcome as a result of the present invention. Water is used as the chief dough lubricant in preparing the present baked pieces, thus eliminating the necessity for employing a dough of high fat content as was previously necessary to prepare high protein wafer-like products. Prior attempts to employ water as the chief dough lubricant in high protein products have failed due to swelling of the protein constituents on contact with the water to form a glue-like mass which is quite unmanageable.