

when we remember that complete utilization of the food eaten, seldom or never occurs; nor can we expect every sample of any one kind of food to be strictly similar to every other. The average values of all ordinary food materials, stated as proteids fat and carbohydrates, have been very carefully determined. Full milk cheese, for example, as calculated from the examination of very numerous samples, contains 23 per cent. proteids, 27 per cent, fat and 4 per cent, carbohydrates; while skim milk cheese contains 33.4 per cent, proteids, 6.6 per cent, fat, and 5 per cent, carbohydrates, the difference in each case, being made up of mineral matters and water, which we do not recognize as food for our present purpose. But individual samples of cheese will vary from these averages by amounts that remain unknown to the consumer. The same thing is true of meats, fish, breads, and all other forms of food.

The individual variations must, for our purpose be left out of consideration in constructing a ration and we must agree to accept the best available averages as our guides. If we buy only honest and unadulterated food, we may feel reasonably sure that its energy equivalent will not depart very largely from the values given in the following table. Remembering what has been said, it will be sufficient to take the following ratios, as defining the rations indicated.

Cheapest satisfactory daily ration.

For man, of average weight (150-160 lbs).
Proteids, 4.2 oz : Fats 2 oz: Carbohydrates 18 oz. energy equivalent = 2903 calories.

For woman of average weight :
Proteids 3.5 oz: Fats 1.6 oz: Carbohydrates 14 oz. energy equivalent = 2452 calories.

A better ration would be :

For man, Proteids 4.2 oz: Fats 3 oz: Carbohydrates 16 oz., energy equivalent = 3135 calories.

For woman Proteid 3.5 oz: Fats 2 oz: Carbohydrates 15 oz. energy equivalent = 2674 calories.

If now we know the proteid, fat and carbohydrate value of every market-food, we can, with a good degree of exactness calculate the amounts of the various foods needed to furnish any desired ration ; and if in addition to this, we know the market prices of the different materials, we are able, by very simple calculations, to determine the cost of such ration; and to vary its cost according to changes in market prices, without changing the food value of the ration, that is its energy producing value, which is the main consideration in the case of most of us.

A few examples will suffice to indicate the process.

Each *one pound avoirdupois* of the following foods, contains the stated number of *ounces* of proteids, fats and carbohydrates respectively.

The numbers given have been re-calculated from the percentage numbers tabulated by Koenig in his great work "Chemie der Menschlichen Nahrungs und Genussmittel" 4th Edition.

In most cases they are averages from great numbers of analytical determinations; and although individual specimens of any particular food may vary considerably, from these averages, we may confidently accept them as representing the true food content, when more than one or two purchases are taken into account.