

best on about the following amounts in the following proportions:

Thus, each of the three meals should average about:

Protein	1½ oz.	=	170 calories
Fat	¾ oz.	=	230 calories
Carbohydrate	6 oz.	=	700 calories
	8¾		1100

So much is clear; but now comes the real difficulty. We do not have protein in one can, fat in another, carbohydrate in another, in such shape that people will eat and enjoy them, day after day. We must carefully select such commonplace as meat, potatoes, bread, fruit, etc., so that the total eaten will represent these things, in the proper proportions, and giving after all a very commonplace appearance on the table.

To show how it is done, an illustration is given here, together with the necessary tables for a number of the ordinary foods.

EXAMPLE OF BALANCED RATION.

"Meat and Potatoes and Bread."

Desired for one average meal:—			
Protein	42 grams	=	1½ oz.
Fat	25 grams	=	¾ oz.
Carbohydrate	170 grams	=	6 oz.

CONSTITUENTS.

	Protein %	Fat %	Carbohydrate %
Lamb Chop	17.6	28.3	0.0
Potato	2.2	0.1	18.0
White Bread	9.2	1.3	53.1

Evidently all three supply protein, while the potatoes and bread supply the carbohydrate, and the chop supplies the fat chiefly.

If we are to have no waste, we must calculate the chop on the basis of the fat, thus 7/25 (28. per cent.) of the chop is fat; ¾ of 1 ounce of fat we require in the meal; hence we need chop enough so that 7/25 of it will weigh ¾ of an ounce; that is, the whole chop should weigh 25/7 of ¾, equals 3¼ oz.

This not only supplies us fat, but part of the one and a half ounces of protein we require, i. e., about 1/6 (17.6 per cent.) the chop is protein; hence 1/6 of 3¼ ounces—1/6 of 25/8—about ¼ ounce. The rest of the protein we may get from the potatoes and bread. Of course a great many combinations might be made. If we discard the bread and use potatoes only for our carbohydrate, the six ounces of carbohydrate would require over two pounds (say 33 ounces) of potatoes to supply it, for the carbohydrate content of potatoes is only between 1/5 and 1/6 of their total weight. Incidentally, this would add protein to the extent of about 1/45 (2.2 per cent.) of the total weight, i. e., about ¼ of one ounce, or nearly

enough to make up the protein deficiency in the 3¼ ounces of chop.

However, few people would wish to eat over two pounds of potatoes at a sitting; most people would rather substitute bread for part of it. The white bread given is nearly three times as strong in carbohydrates as the potatoes; hence one ounce of bread would replace nearly three ounces of potatoes, and furnish one-half more protein. Suppose then we replace say two-thirds of the 33 ounces of potatoes already figured by bread; i. e., leave out 23 ounces of potatoes and add 10 ounces of bread; then we will have about one and four-fifths ounces carbohydrate from the potato and about five and one-third from the bread, making over the six ounces required; and we should have one-quarter ounce of protein from the potato, about one ounce from the bread. Thus we would obtain nearly the proportions desired.

	Chop	Potato	Bread	Protein	Fat	Carbohydrate
Chop	3¼ oz.			½ oz.	¾ oz.	0.0
Potato	10 oz.			¾ oz.	1/10 oz.	1½
Bread	10 oz.			1/4 oz.	¼ oz.	5¾

over 1½ oz. over 1 oz. over 7 oz.

There is an average wastage of 10 per cent., increasing with the vegetable and carbohydrate foods, and hence this combination would be very nearly correct. We have not figured in any butter or sugar; they would reduce the amount of fat required in the meat and bread; and would make up for some of the carbohydrate. The combinations that might be made are almost inexhaustible. Thus, another chop weighing 3¼ ounces would make up for half the bread so far as protein was concerned, although doubling the fat required; the loss in bread would cut the carbohydrate by over 2¼ ounces. However, the extra fat, having more than twice the heat value of the carbohydrate, would very nearly balance the loss of carbohydrate.

On the other hand, the potato might be cut in two without much damage to the meal, if half a chop (of 3¼ ozs. in weight) were added, for this would more than supply the protein lost, and the fat added would supply enough heat value to make up the loss of carbohydrate. Of course, sugar in coffee, tea or taken as candy or in pies, would make up carbohydrate requirements very fast, for sugar, weight for weight, yields nearly double the carbohydrate in bread.

From the table which follows, "balanced rations" can be constructed for many of the ordinary foods.