

Dietotherapy

DIET DURING PREGNANCY

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NUTRITION is generally recognized as an environmental factor which deserves consideration as an important part of prenatal care. The physiologic processes of the body are greatly altered during pregnancy and additional demands are imposed on the maternal organism. Digestion and absorption from the intestinal tract are often impaired in the early months of pregnancy and nutritional requirements are considerably elevated, especially in the later months of pregnancy. Pregnancy is a period of additional stress and for these reasons it is not strange that evidences of nutritional deficiencies are more likely to appear at this time. Thus it is obvious that a woman's nutritional status should be evaluated and dietary advice offered from as early in pregnancy as possible. Ideally, young women should be educated so that they understand the importance of entering pregnancy in good nutritional condition.

This article will discuss the nutritional requirements of the pregnant woman and how these may be met by diet. The nutritional allowances for pregnancy (last trimester) as recommended by the Food and Nutrition Board of the National Research Council are given in the following table:¹

RECOMMENDED DAILY DIETARY ALLOWANCES

Nutritional essentials	Normal non-pregnant woman*	Pregnancy 3rd trimester
Calories†	2300	add 400
Protein (Gm.)	55	80
Calcium (Gm.)	0.8	1.5
Iron (mg.)	12	15

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Nutritional essentials	Normal non-pregnant woman*	Pregnancy 3rd trimester
Vitamin A (I.U.)‡	5000	6000
Thiamine (mg.)	1.2	1.5
Riboflavin (mg.)	1.4	2.0
Niacin (mg.)	12	15
Ascorbic Acid (mg.)	70	100
Vitamin D (I.U.)		400

* These requirements are for a woman weighing 55 Kg. (121 lb.) and having a height of 157 cm. (62").

† Energy requirements vary with activity, size of person, etc.

‡ The requirement for vitamin A may be less if it is provided as vitamin A and may be more if it is taken chiefly in the form of carotene.

These allowances were designed to serve as guides and include a margin of safety over minimum requirements. They are based on the assumption that a woman enters pregnancy in excellent nutritional condition. When the diet has not been good previous to pregnancy, as is often the case, it should be improved to the recommended levels as soon as pregnancy is known. The recent revision of the Recommended Daily Dietary Allowances of the National Research Council states that these increased allowances are only for the third trimester of pregnancy. However, there is considerable basis for recommending the suggested increases for the latter half of pregnancy.

The diet needed during pregnancy is a more special one than is generally appreciated, because as pregnancy advances the requirements for protein, minerals, and vitamins are increased considerably more, percentage-wise, than is the caloric requirement (see table). For example, the caloric requirement increases only approximately 20 per cent, while the need for protein is increased approximately 45 per

cent, for calcium 100 per cent, and the increased need for riboflavin closely parallels the protein increase. *It takes approximately 2000 calories of very carefully selected foods to meet the daily increased needs for nutrients other than calories.* This means that a woman's free choice of food is considerably narrowed during pregnancy, if the important structural and regulatory foods are to be eaten in optimum amounts daily. The nonpregnant woman can obtain her normal needs for these nutrients in about 1200 calories, to which must be added almost another 1000 calories in food to meet her daily energy requirement under normal conditions, i.e. if her weight is "desirable" for her and if her daily activity is considered to be "moderate."

Caloric requirements vary widely with activity and must be adjusted to individual needs. The pregnant woman should be expected to gain 20 to 25 pounds above a desirable weight for her height and build.² This implies that the underweight woman should gain more. The overweight woman's diet should be controlled carefully by restricting her calories only while her protein, mineral, and vitamin needs are fully provided.

DAILY DIET DURING PREGNANCY³

Here is a summary of the foods or their nutritional equivalents which should be taken daily during pregnancy:

FOOD NUCLEUS TO INSURE OPTIMUM NUTRITION DURING PREGNANCY

Food	Amount	Protein (Gm.)
Milk, whole	4 glasses (8 oz.) (1 quart). (Patient should label own and see that entire quart is taken each day.)	32
Meat (lean), poultry, fish, liver is desirable at least once each week, cheese	2 servings/day, in all at least 4-5 oz. or equivalent in grams of protein	25-30
Egg	One	6
Fruit	At least 2 servings. Two servings of citrus fruit or equivalent	

	should be eaten. (1 serving = 4 oz. orange juice, 1 med. orange, 8 oz. tomato juice, or 1/2 med. grapefruit.)	2
Potato	1 medium (150 Gm.)	3
Other vegetables cooked and/or raw	2 or more servings (1 serving = 1/2 cup). Dark green leafy or deep yellow vegetables often.	3
Bread and cereal	3 to 4 servings. (1 serving = 1 sl. bread or 1/2 cup cereal.) Whole grain or enriched.	6-8
Butter or fortified margarine	1 tablespoon	
Vitamin D	An amount to supply 400 I.U.	77-84

The above foods in the amounts suggested supply approximately 2000 calories and approximately 80 grams of protein. Additional food—either more of these foods or others of the patient's own choice—will be needed if she is underweight and may be necessary if she is of normal weight to furnish sufficient calories to produce the desired weight gain.

MEAL PLAN AND SAMPLE MENU

A meal plan and sample menu are given to illustrate how the necessary foods can be supplied in simple daily meals.

MEAL PATTERN

SAMPLE MENU

Breakfast

Fruit	Orange juice, 4 oz.
Cereal and/or bread and butter or fortified margarine	Oatmeal, 1/2 cup and/or toast, 1 slice and 1 tsp. butter
Egg	One
Milk	Milk, whole, 8 oz. (part on cereal)
Coffee or tea	Coffee

Luncheon

Main dish (protein)	Sandwich of cold sliced meat (lean) and/or American Cheddar cheese
Bread and butter or fortified margarine	2 slices bread, 1 tsp. butter
Vegetables	Salad, tomato and lettuce
Milk	Milk, whole, 8 oz.
Fruit	Grapefruit, half

Dinner

Meat (lean) or equivalent	Hamburg, lean, 4 oz.
Potato	Potato, 1 medium, baked
Other vegetables	Peas, $\frac{1}{2}$ cup; carrots, $\frac{1}{2}$ cup
Butter or fortified margarine	Butter, 1 tsp.
Milk	Milk, whole, 8 oz.
Fruit or simple dessert	Custard

Between Meals

Milk	Milk, 8 oz. or the remainder of the quart if not taken with meals
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Again, the woman of normal weight *may* and the woman who is underweight *will* need to eat more of these foods, as well as other foods of her own choosing, in order to gain to a desirable weight. For example, she may want both cereal and bread and perhaps bacon and jam at breakfast. At noontime she may want more than one sandwich or she may prefer to eat a dinner-type meal. She can have a higher caloric fruit or a dessert, such as custard or ice cream, at both luncheon and dinner. If her appetite is small, she may prefer to have four to six smaller meals in order for her to consume the necessary amount of food.

If weight gain is too rapid, the patient should be carefully instructed in the foods which she should not eat. She should be instructed to avoid foods rich in fats, sugars, and starches, such as gravies, bacon, mayonnaise, and other salad dressings, fat meats, doughnuts, potato chips, macaroni, spaghetti, rice, pies, pastries, cakes, rich puddings, ice cream, candy, all soft drinks, alcoholic beverages, popcorn, nuts, and the like.

In teaching our patients, we have found it important to explain why certain foods called the "essential foods" are necessary, and it is also equally necessary to explain any food restrictions. In this way we not only help the patient to understand the diet recommended for her but often list as well the foods she is to avoid.

TOTAL LIQUIDS

For the normal pregnant woman, fluid intake should be adequate, approximately two

quarts of total liquid daily. This includes milk, fruit juices, tea, coffee, water, etc. Any change from this should be upon the advice of the physician caring for the patient.

SALT

Iodized salt should be recommended, especially in regions where goiter is endemic. Under normal conditions salt may be eaten in moderate amounts, but excessive use should be avoided. Common foods high in sodium content are bacon, ham, salt pork, salt fish, chipped beef, and other salty prepared meats, sauerkraut, dark rye bread, potato chips, pretzels, popcorn, pickles, olives, and the like. Certain vegetables, such as beets, celery, certain greens, as beet greens and dandelion greens, are high in sodium content; so also are canned vegetables. Most frozen vegetables have added salt.

Sodium bicarbonate ("Soda") should not be taken by the pregnant woman.

Further restriction should be upon the advice of the physician caring for the patient, and his instructions should be followed implicitly. When weight gain is too rapid and/or when a patient shows symptoms of toxemia, and in certain other conditions, the physician may further restrict the sodium content of the diet. He may instruct the patient to use no added salt either at the table or in cooking, or he may wish the patient to have further instruction in regard to a low sodium diet.

GENERAL CONSIDERATIONS

In a practical and intelligent nutritional approach to the pregnant patient, much can be accomplished from a preventive standpoint if her physician at her first prenatal visit (which should be early in pregnancy) discusses with her: "What is a desirable nonpregnant weight for you?" Having established such a weight on the basis of build, he can then discuss what she should weigh at delivery. From this point on, the nutritional approach to the patient proceeds on the basis of a diet to provide the necessary amounts of protein, minerals, and vitamins to safeguard to the best of our present knowledge the health and course of pregnancy of the mother and the development and

health of the fetus. The physician, nurse, or nutritionist who is to handle her diet will have to spend sufficient time with the patient to motivate her to want to improve her food habits, when indicated, by explaining the possible benefits to both herself and her unborn child.

When a patient's protein needs are met by the essential foods already suggested or their equivalents in nutritional value, all other nutrients except ascorbic acid, vitamin A, and vitamin D will be provided in reasonably good amounts because of their natural association with protein in food. Protein is also one of the nutrients easy to check for clinical purposes, so that the amount usually consumed can be ascertained. When protein is deficient in the diet of the pregnant woman, her calcium and phosphorus, iron, riboflavin, and other B-vitamins will usually be deficient also. If her protein is not supplied by her daily food, she has no other possible way of obtaining it. She needs approximately 80 grams daily. Her increased requirement for protein has been shown repeatedly by the nitrogen balance studies of Hunscher and Macy⁴ and others. These studies indicate that a woman normally stores 200 to 400 Gm. of nitrogen over and above that needed by the fetus and its adnexa. This storage of protein starts at about the eighth week of gestation and continues until close to term. It approximates 1250 to 2500 Gm. of protein, in addition to 850 to 900 Gm. which represent the total net requirement of the fetus. These figures represent an increase of 10 to 20 Gm. of protein over and above the normal nonpregnant woman's daily requirement. Our studies have shown that only 10 to 15 per cent of the women interviewed were taking the needed amount of protein; in fact,

15 to 20 per cent were taking less than 45 Gm. when first seen in the prenatal clinic.⁵

While the cause of toxemia of pregnancy is still a controversial subject, it is generally accepted that a well-balanced high protein diet acts as a preventive measure. The work of Hamlin⁶ in Australia and our own work in the toxemia clinic of the Boston Lying-in Hospital (a preliminary report of this work has been published)⁷ have demonstrated the preventive aspects of the nutritional control of toxemia. In both of these preventive programs, attention to the diet of the mother, together with attention to her weight gain, so that it was gradual throughout the course of pregnancy, were especially important.

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