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HEALTHY AND SAFE NUTRITION DURING THE EARLY MONTHS OF PREGNANCY

U.Maxamatov

Clinical Residents **Sh.Umarov, F.Mamadaliyev, X.Kenjayeve**
Fergana Medical Institute of Public Health, Uzbekistan

Abstract: Healthy and safe nutrition during the early months of pregnancy is essential for maintaining maternal health and supporting normal fetal growth and development. During this period, the maternal diet should provide adequate amounts of protein, complex carbohydrates, healthy fats, vitamins, minerals, and fluids. Particular attention should be paid to folate, iron, calcium, iodine, vitamin D, and other micronutrients whose requirements increase during pregnancy. At the same time, pregnant women should avoid or limit foods and beverages associated with foodborne infections, excessive mercury exposure, alcohol consumption, and excessive caffeine intake. A balanced dietary pattern based primarily on minimally processed foods, vegetables, fruits, whole grains, legumes, dairy products, eggs, lean meat, and low-mercury fish may contribute to a healthy pregnancy. Food hygiene and appropriate thermal processing are also important components of safe nutrition during pregnancy.

Keywords: pregnancy, first trimester, healthy nutrition, food safety, folic acid, iron, protein, micronutrients, fetal development, maternal nutrition.

Introduction

Pregnancy is a period of substantial physiological adaptation during which maternal nutritional requirements increase to support maternal tissues, placental development, and fetal growth. The first trimester is particularly important because embryonic organogenesis and other critical developmental processes occur during this period. Therefore, appropriate nutrition from the earliest stages of pregnancy should be considered an important component of antenatal care.

A healthy dietary pattern during pregnancy should be adequate, balanced, diverse, moderate, and safe. The World Health Organization emphasizes that a healthy diet should be based mainly on a variety of minimally processed or unprocessed foods while limiting foods high in unhealthy fats, free sugars, and sodium. Food safety is an integral component of a healthy diet because pregnant women are more susceptible to certain foodborne infections. [1,2]

During pregnancy, the diet should not only meet physiological nutritional requirements but should also be acceptable to the pregnant woman. Nausea, vomiting, changes in taste and smell, and reduced appetite may occur during the first trimester. Therefore, dietary recommendations should be individualized according to the woman's nutritional status, tolerance of particular foods, and medical condition.

Nutritional Characteristics of the First Trimester



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The first 12 weeks of pregnancy are associated with significant physiological and hormonal changes. Nausea and vomiting, commonly referred to as morning sickness, may affect food intake and dietary preferences. For women experiencing nausea, small and frequent meals may be better tolerated than large meals.

A balanced diet during this period should include adequate protein, whole grains, vegetables, fruits, dairy or suitable alternatives, and healthy sources of fat. Highly processed foods, excessive sweets, sugar-sweetened beverages, fast food, and foods containing excessive amounts of salt and saturated fat should be limited.

Foods should preferably be prepared by boiling, steaming, baking, or stewing rather than deep-frying. Such cooking methods may help reduce excessive fat intake while preserving the nutritional quality of foods.

Nutritional Requirements During Pregnancy

The main macronutrients in the diet of a pregnant woman are proteins, carbohydrates, and fats. Their appropriate balance is essential for maternal health and fetal development.

Protein

Protein is an essential component of the maternal diet during pregnancy. It is required for the growth of fetal tissues, placenta, maternal tissues, and blood volume expansion.

Recommended protein-rich foods include:

- poultry and lean meat;
- properly cooked fish;
- eggs that are thoroughly cooked;
- beans, peas, chickpeas, and lentils;
- milk, yogurt, kefir, and cottage cheese;
- nuts and seeds in moderate amounts.

A variety of protein sources is preferable to relying on a single food group.

Folate and Folic Acid

Folate is particularly important during the early stages of pregnancy because it contributes to normal cell division and development of the fetal neural tube. WHO recommends daily iron and folic acid supplementation during pregnancy, including 400 µg of folic acid together with 30–60 mg of elemental iron, according to the relevant antenatal care recommendations. Supplementation should be individualized in accordance with national guidelines and the woman's clinical condition. [3]

Important dietary sources of folate include:

- spinach and other dark green leafy vegetables;
- broccoli;
- legumes;
- avocado;
- citrus fruits;
- whole-grain products;
- fortified cereal products where available.



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Dietary sources are important, but food alone may not provide the recommended amount of folic acid during the periconceptional and early pregnancy periods; therefore, supplementation should be discussed with a healthcare professional.

Iron

Iron requirements increase during pregnancy because of the expansion of maternal blood volume and the needs of the developing fetus and placenta. Iron deficiency can contribute to maternal anemia and may adversely affect pregnancy outcomes.

Dietary sources of iron include:

- lean red meat;
- poultry;
- legumes;
- green leafy vegetables;
- iron-fortified cereals and bread;
- dried fruits such as raisins and dried apricots.

Iron-containing foods should be included regularly in the diet. Iron supplements should be taken according to medical advice rather than indiscriminately.

Calcium and Vitamin D

Calcium is necessary for the development of fetal bones and teeth and plays an important role in maternal bone metabolism. Good sources include milk, yogurt, kefir, cottage cheese, and other appropriately pasteurized dairy products.

Vitamin D is important for calcium metabolism and bone health. Vitamin D supplementation may be indicated in some pregnant women depending on individual nutritional status and local clinical recommendations. It should be used under professional guidance rather than at excessive doses. [4]

Fluids

Adequate fluid intake is important during pregnancy. Water should be the primary beverage, while excessive intake of sugar-sweetened beverages should be avoided. Individual fluid requirements may vary depending on weather conditions, physical activity, diet, vomiting, and medical status.

Foods and Beverages That Should Be Avoided or Limited

Raw or Undercooked Foods

Pregnant women should avoid raw or inadequately cooked eggs, meat, poultry, fish, and shellfish because these foods may contain pathogenic microorganisms.

Raw or undercooked animal products can increase the risk of foodborne infections. Pregnant women should also avoid unpasteurized milk and dairy products and should thoroughly wash fruits and vegetables before consumption. [5]

Appropriate food preparation should follow the basic principles of food safety: clean, separate, cook, and chill.

Fish and Mercury Exposure

Fish can be an important source of high-quality protein, omega-3 fatty acids, iodine, vitamin D, iron, zinc, and choline. Therefore, fish should not generally be excluded from the diet during pregnancy.



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However, pregnant women should select fish species that are low in mercury. Current FDA/EPA recommendations advise pregnant and breastfeeding women to consume approximately 2–3 servings (8–12 ounces) of a variety of lower-mercury fish per week. Fish with high mercury concentrations, including shark, swordfish, king mackerel, tilefish, marlin, orange roughy, and bigeye tuna, should be avoided. [6,7]

Alcohol

Alcohol should be completely avoided during pregnancy. There is no established safe amount of alcohol consumption during pregnancy, and alcohol exposure may adversely affect fetal development. [8]

Caffeine

Caffeine is present in coffee, tea, chocolate, cola-type beverages, and energy drinks. According to ACOG, moderate caffeine consumption of less than 200 mg per day is generally considered acceptable during pregnancy. The total daily amount should include caffeine from all dietary sources. [9,33,34,35]

Highly Processed Foods and Fast Food

Chips, highly processed meat products, sweetened carbonated beverages, instant foods, and fast food may contain excessive amounts of sodium, saturated fat, free sugars, and other ingredients. Their frequent consumption should therefore be limited.

Fresh or minimally processed foods should form the foundation of the pregnancy diet.

Food Hygiene During Pregnancy

Food hygiene is particularly important during pregnancy because pregnant women are more vulnerable to certain foodborne infections, including listeriosis.

The following principles should be observed:

1. Wash hands before preparing and eating food.
2. Wash fruits and vegetables thoroughly.
3. Keep raw meat, poultry, and fish separate from ready-to-eat foods.
4. Cook meat, poultry, eggs, and seafood thoroughly.
5. Use pasteurized milk and dairy products.
6. Refrigerate perishable foods promptly.
7. Avoid foods that have been stored improperly or for an excessively long period.
8. Maintain cleanliness of kitchen surfaces, utensils, and food-contact equipment.

These measures reduce the risk of foodborne illness and contribute to maternal and fetal safety. [10,11,12,13,14]

Nutrition During the Second and Third Trimesters

Although the first trimester is particularly important for embryonic development, appropriate nutrition should continue throughout pregnancy.

During the second trimester, appetite may increase. Nevertheless, increased appetite should not lead to excessive consumption of energy-dense foods. The diet should remain balanced and diverse.



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During the second and third trimesters, the dietary pattern may continue to include:

- vegetables and fruits;
- whole grains;
- legumes;
- lean meat and poultry;
- properly cooked low-mercury fish;
- eggs;
- pasteurized dairy products;
- nuts and seeds;
- adequate amounts of water.

Fried foods, fast food, highly processed foods, and excessive sweets should remain limited.

Sample Seven-Day Meal Plan for the First Trimester

The following menu is an example of a balanced dietary pattern and should be adapted according to individual nutritional requirements, food tolerance, allergies, medical conditions, and healthcare recommendations.

Monday

Breakfast:

- omelet prepared from two well-cooked eggs with vegetables;
- one slice of whole-grain bread;
- one glass of pasteurized milk.

Lunch:

- chicken and vegetable soup;
- steamed rice;
- fresh cucumber and tomato salad with a small amount of vegetable oil;
- one apple.

Dinner:

- cottage cheese;
- a small portion of nuts or dried fruit;
- one glass of kefir or yogurt.

Tuesday

Breakfast:

- rice or oatmeal porridge with milk;
- one banana;
- caffeine-free herbal beverage or water.

Lunch:

- boiled lean beef;
- mashed potatoes;
- carrot and green vegetable salad;
- two or three dried apricots.

Dinner:



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- steamed or baked low-mercury fish;
- broccoli or cauliflower;
- unsweetened compote or water.

Wednesday

Breakfast:

- whole-grain bread with a well-cooked egg and tomato;
- natural unsweetened yogurt.

Lunch:

- lentil or mung-bean soup;
- steamed vegetables;
- seasonal fruit.

Dinner:

- cooked buckwheat;
- a portion of chicken;
- one glass of pasteurized milk or yogurt.

Thursday

Breakfast:

- oatmeal porridge prepared with milk or water;
- one orange;
- caffeine-free beverage.

Lunch:

- stuffed vegetables with lean meat or a vegetable-and-meat stew;
- salad containing parsley, dill, and other washed leafy vegetables;
- water or unsweetened compote.

Dinner:

- whole-wheat pasta;
- tomato-based sauce or baked fish;
- one glass of yogurt.

Friday

Breakfast:

- well-cooked egg and cheese on whole-grain bread;
- one kiwi or apple;
- caffeine-free herbal beverage.

Lunch:

- chicken and vegetable soup;
- cucumber and tomato salad;
- one slice of whole-grain bread.

Dinner:

- baked or stewed vegetables with lean meat;
- cottage cheese dessert with minimal added sugar;
- one glass of kefir.

Saturday



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Breakfast:

- buckwheat porridge with yogurt or a small amount of sour cream;
- one banana;
- water or a caffeine-free beverage.

Lunch:

- lean beef and vegetable soup;
- rice with steamed vegetables;
- seasonal fruit.

Dinner:

- vegetable omelet prepared with thoroughly cooked eggs;
- one glass of yogurt or kefir.

Sunday

Breakfast:

- low-fat pasteurized cheese with whole-grain bread;
- one orange or pear;
- milk-based beverage with limited caffeine.

Lunch:

- pilaf prepared with lean meat and a moderate amount of oil;
- fresh vegetable salad;
- a small portion of raisins or dried apricots.

Dinner:

- steamed chicken with vegetables;
- one glass of kefir or pasteurized milk.

Healthy Snacks

If additional food is needed between main meals, appropriate options may include:

- fresh fruit;
- natural unsweetened yogurt;
- cottage cheese;
- a small portion of unsalted nuts;
- dried fruit in moderate quantities;
- whole-grain crackers or bread.

Small, frequent meals may be particularly useful for women experiencing nausea or reduced appetite during the first trimester.

Role of Vitamin and Mineral Supplements

Pregnancy increases the need for several micronutrients. However, vitamin and mineral supplements should not be taken indiscriminately. Folic acid and iron supplementation are recommended as part of antenatal care, while the need for other supplements should be assessed individually.

WHO recommends daily iron and folic acid supplementation during pregnancy to help prevent maternal anemia and improve pregnancy outcomes. [15,16,17,18,19,20] The choice and dosage of additional supplements, including vitamin D and omega-3 fatty acids, should be based on individual nutritional needs and professional medical advice.

Discussion

The nutritional status of a woman before conception and during pregnancy can influence both maternal health and fetal development. The first trimester is particularly important because fundamental processes of embryonic development occur during this period.

A healthy dietary pattern should therefore focus on nutrient density rather than simply increasing the quantity of food consumed. Vegetables, fruits, whole grains, legumes, dairy products, eggs, lean sources of protein, and low-mercury fish can provide many of the nutrients required during pregnancy.

At the same time, dietary safety should receive equal attention. Raw or inadequately cooked animal products, unpasteurized dairy products, contaminated food, high-mercury fish, alcohol, and excessive caffeine may pose avoidable risks. [21,22,23,24,25,26,27]

It is also important to recognize that nutritional requirements vary among pregnant women. Age, pre-pregnancy nutritional status, physical activity, multiple pregnancy, nausea and vomiting, anemia, diabetes, gastrointestinal disorders, and other clinical factors may influence dietary recommendations.

Consequently, a universal menu should be regarded only as an example. Individual dietary plans should preferably be developed with the participation of an obstetrician, family physician, or qualified nutrition professional.[28,29,30,31,32]

Conclusion

Healthy and safe nutrition during pregnancy, particularly during the first trimester, is an essential component of maternal and fetal health. The diet should be diverse, balanced, nutrient-dense, and based primarily on minimally processed foods.

Adequate intake of protein, folate, iron, calcium, vitamin D, iodine, healthy fats, and fluids should be ensured according to individual requirements. Folic acid and iron supplementation should be provided in accordance with antenatal care recommendations.

Pregnant women should avoid alcohol and raw or inadequately cooked foods and should choose pasteurized dairy products and low-mercury fish. Caffeine intake should be limited to less than 200 mg per day. Food hygiene, appropriate storage, and adequate thermal processing are essential for reducing the risk of foodborne infections.

Thus, a rational nutritional pattern during pregnancy should combine nutritional adequacy, food safety, individual tolerance, and professional medical guidance. Such an approach can contribute to a healthier pregnancy and support normal fetal growth and development.

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