

# The importance of a balanced diet before and during pregnancy

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## Abstract

The diet of the pregnant woman is an essential part of the pregnancy, for a good maternal-fetal development. However, it seems that between 20% and 30% of all pregnant women worldwide have micronutrient values below the normal limits. Preconception maternal nutritional status and during pregnancy is important for a good maternal-fetal development. Preconception care defines the measures taken to improve the quality of life and maternal health at least two years before pregnancy, in order to increase the percentage of children and mothers who will benefit from a good development during conception and postconception. Preconception care also integrates the measures that can be applied to the couple, so that both partners are in a better state of health at the time of conception than before the preconception care measures. At a time when pediatric obesity represents a real health issue worldwide, and the importance of the first 1000 days is well known, trying to provide a good nutritional start, beginning with the first day of the 1000 days, is a first step to reduce the prevalence of obesity cases at young ages. We consider it useful and necessary to introduce nutritional education programs, to direct attention to women of childbearing age by presenting the roles of macro- and micronutrients in healthy maternal-fetal development, the importance of maintaining body weight within normal limits, and explaining the concept of nutritional programming.

**Keywords:** preconceptional care, nutritional education, maternal-fetal health, pediatric obesity prevention

## Rezumat

Alimentația femeii însărcinate este o parte esențială a sarcinii pentru o bună dezvoltare materno-fetală. Totuși, se pare că între 20% și 30% din totalul femeilor însărcinate la nivel mondial prezintă valori ale micronutrienților sub limitele normale. Statutul nutrițional matern preconcepțional și în timpul sarcinii este important pentru o bună dezvoltare materno-fetală. Îngrijirea preconcepțională definește măsurile luate pentru îmbunătățirea calității vieții și a stării de sănătate materne înainte de sarcină cu cel puțin doi ani, pentru a crește procentajul copiilor și al mamelor care vor beneficia de o bună dezvoltare în timpul concepției și postconcepție. Îngrijirea preconcepțională integrează și măsurile care pot fi aplicate cuplului, astfel încât ambii parteneri să fie în momentul concepției într-o stare de sănătate mai bună decât cea anterioară măsurilor de îngrijire preconcepțională. Într-un moment în care obezitatea pediatrică reprezintă o problemă de sănătate la nivel mondial, iar importanța primelor 1000 de zile este bine cunoscută, încercarea de a oferi un bun start nutrițional, începând cu prima zi din cele 1000, este un prim pas pentru a reduce prevalența cazurilor de obezitate la vârste fragede. Considerăm că sunt utile și necesare introducerea unor programe de educare nutrițională, îndreptarea atenției asupra femeilor aflate la vârsta fertilă prin prezentarea rolurilor macro- și micronutrienților în dezvoltarea sănătoasă materno-fetală, alături de importanța menținerii greutateii corporale în limite normale și de explicarea conceptului de programare nutrițională.

**Cuvinte-cheie:** îngrijire preconcepțională, educare nutrițională, sănătate materno-fetală, prevenție obezitate pediatrică

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## Importanța alimentației echilibrate înainte și în timpul sarcinii

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## Introduction

A pregnant woman's diet is an essential part of pregnancy, at a time characterized by multiple physiological changes. The importance of effective nutrition is supported by numerous studies and promoted by specialists. However, it seems that between 20% and 30% of all pregnant women worldwide present values of micronutrients below normal limits<sup>(1,2)</sup>.

At a time when pediatric obesity is a global health problem, and the first 1000 days of a child's life are essential for a good development, we consider it useful to direct attention to the eating habits that a future child comes into contact with from the first days of life.

## Preconception care and maternal weight gain

Preconceptional maternal nutritional status and during pregnancy is important for a good maternal-fetal development. For this reason, preconceptional care is important and preferable to be present in the life of every woman of childbearing age who intends to become pregnant in the future<sup>(3)</sup>.

Preconception care defines the measures taken to improve the quality of life and the state of maternal health at least two years before pregnancy, in order to increase the percentage of children and mothers who will benefit from a good development during conception and postconception. Preconception care also

integrates the measures that can be applied to the couple, so that both partners are in a better state of health at the time of conception than before the preconception care measures<sup>(4,5)</sup>.

The analysis of nutritional status before conception together with nutritional counseling are important but, unfortunately, they receive less attention than nutritional counseling during pregnancy. If the woman has a weight within normal limits or as close as possible to these limits and a nutritional management then, as a result, she would benefit from a good maternal-fetal development.

The nutrition of the pregnant woman is essential for the weight and development of the fetus; thus, an underweight mother, with inadequate nutrition during pregnancy, risks giving birth to a child with a low weight, a fact that subjects the newborn to multiple risks. At the opposite pole, overweight during pregnancy affects the good development of the product of conception, being subjected to an increased risk of developing obesity in childhood and adult life<sup>(3,4,6-8)</sup>.

## Macronutrients

Proteins have a structural, functional and biological role. During pregnancy, there is a need to increase the intake of proteins, and an intake increased by 25 g per day of proteins is considered to be optimal<sup>(9)</sup>.

Proteins are classified, according to the source of origin, into complex proteins, those of animal origin and incomplete proteins, originating from plant sources. The difference is given by the presence of the nine amino acids in the structure of proteins of animal origin<sup>(10,11)</sup>.

Carbohydrates are sources of energy for both the mother and the fetus, but they also have a structural role; for this reason, their presence in the maternal diet is mandatory, an intake of 175 g per day being recommended.

Fatty acids are essential in the development of new tissues, arachidonic acid (AA), docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA) have vital roles for a good maternal-fetal development and can only be provided with the help of foods rich in fatty acids and supplements. The appropriate intake of fatty acids during pregnancy is more important, as it has also been demonstrated the reduction of maternal serum concentrations of fatty acids during this period<sup>(3,12,13)</sup>.

DHA plays the most important role in the development of the central nervous system and it also participates in the optimal development of the retina. Fatty acids participate in reducing the risk of preeclampsia through EPA<sup>(14)</sup>.

## Micronutrients

A good fetal development comes with an appropriate maternal intake of micronutrients. For this reason, the nutritional education of women regarding the importance of micronutrients on the development of the product of conception from the first days is important,

because pregnant women could present a higher compliance to food choices and supplements necessary to reach the intake of micronutrients<sup>(15-17)</sup>.

### Folic acid

Pregnancy is a time when folic acid supplementation is necessary and recognized worldwide. Thus, an intake of 400 micrograms for women starting with 8 weeks preconception and in the first 12 weeks of pregnancy is associated with the reduction of neural tube defects and of cardiac malformations. It is recommended to dose vitamin B12 before starting the administration of folic acid, because it can mask vitamin B12 deficiency and, thus, megaloblastic anemia can produce neurological abnormalities<sup>(3,18,19)</sup>.

A meta-analysis revealed the reduction of autism spectrum disorders by 33% in the case of women who supplemented their diet with folic acid during pregnancy<sup>(20)</sup>.

Folic acid cannot be produced by the human body, for this reason its supplementation with food or preparations is essential. Cheeses, broccoli, apples and citrus fruits are foods rich in folates, but they can provide approximately half of the daily requirement<sup>(3,21)</sup>.

### Iron

The lack of effective iron intake causes approximately 45 million pregnant women worldwide to be diagnosed with iron-deficiency anemia<sup>(17,22,23)</sup>.

Iron deficiency during pregnancy is associated with premature birth, low birth weight and with perinatal mortality. At the opposite pole, an excess of iron is associated with increased oxidative stress, hypertensive disorder and with lipid peroxidation<sup>(24-27)</sup>.

During pregnancy, the need for iron is increased, reaching 30 mg per day during the second and third trimesters, therefore the Institute of Medicine recommends a supplement during this period of pregnancy with iron. The amount of absorbed iron increases constantly throughout pregnancy, from 0.8 mg per day at the beginning of pregnancy to 6 mg per day in the third trimester of pregnancy<sup>(3,17,28)</sup>.

Calcium is recommended in doses of 1000 mg per day for adult pregnant women and in a dose of 1300 mg/day for pregnant teenagers. An adequate intake of calcium is necessary for the good development of the fetal skeleton and, according to studies, supplementing the maternal diet with calcium is associated with the reduction of preeclampsia<sup>(29)</sup>.

## Conclusions

We consider it useful and necessary to introduce nutritional education programs to focus the attention on women of childbearing age by presenting the roles of macro- and micronutrients in healthy maternal-fetal development. The importance of maintaining body weight within normal limits and explaining the concept of early nutritional programming are factors which would help increase the number of pregnancies without complications, births at term and babies with normal weight, without the appearance

of complications due to maternal undernutrition or overnutrition. The woman's attention to nutrition during the period of preconception and conception and later breastfeeding could reduce the number of overweight or obese children and adolescents, which is a real global health problem.

In a study carried out in India, through a questionnaire, on a group of 200 women, it was concluded that only 15% of them understood the importance of preconception measures for a good maternal-fetal development<sup>(30)</sup>.

Today's pediatric obesity is based on the lack of nutritional information of the woman during the period of preconception, conception and breastfeeding. Healthy food choices, by promoting a balanced nutrition, along with trying to minimize obese environments, can contribute to reducing the prevalence of obesity, thus preventing the appearance of noncommunicable chronic diseases. ■

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