

Nutrition: gender differences and the role of women

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In the last two decades, nutrition has taken on a leading role in maintaining health in the world's population and is considered to be an essential tool of primary prevention. There is no doubt that there is a correlation between inadequate nutrition and an increased risk of chronic degenerative diseases, the so-called non-communicable diseases (heart attack, stroke, hypertension, type 2 diabetes, cancer), which are the main cause of death worldwide. These diseases are strongly influenced by lifestyles which, among other factors, include eating habits, which in turn are influenced by biological, gender and environmental factors. Extensive scientific literature, developed starting in the United States, has shown, however, that nutrition affects the health of men and women differently, although the latter have hardly ever been the subject of scientific research in the nutritional field, to the point that the same modern nutritional recommendations are based on studies conducted predominantly among males. Recently, research in nutrition is strongly oriented, as well as medicine in general, towards personalised nutrition, that is, a form of precision nutrition that takes into account inter- and intra-individual differences, in the field of genomics, metabolomics, proteomics and microbiota. Each of these profiles can be combined in different ways with all the others, creating a countless series of possibilities that contribute to defining not only the needs of each individual, in particular of males and females, but also the different responses to the same nutrient. This complex scenario is further complicated in women who in the course of their lives encounter periodic biological and social variations. Women are the ones who feed; women have al-

ways been the ones to take care of the pantry and prepare and serve food in the family, taking care of the welfare of the whole family. Yet women are the ones today who are affected prematurely and massively by precisely those non-communicable diseases with fatal outcomes. That is why the health of the female population, from infancy throughout the fertile period and after menopause, should become the subject of educational, monitoring and counselling measures. This necessarily requires a great deal of empowerment by women themselves.

Eating behaviour is acquired through a progressive learning process that starts from the earliest years of life and is influenced in both sexes by numerous biological and socio-economic factors.

Significant differences in the eating habits of men and women have been highlighted, the determinants of which have not yet been clarified. The first obvious difference lies in the different phenotypic constitution: women are on average smaller than men, shorter and with a lower body weight; women have less lean mass and bone mass than men and, for this reason, in old age they are more prone to fractures, but have a greater fat mass. The distribution of body fat is also different: women accumulate subcutaneous fat in the lower part of the body (hips, buttocks and thighs), while men accumulate mainly visceral fat, i.e., localized at the level of the abdomen. Visceral fat is associated with an increased risk of cardiovascular disease and type 2 diabetes. The way in which fats are used is also very different and is strongly affected by the different hormonal patterns; men use them more easily to produce energy; women of childbearing age, on the other hand, are programmed to accumulate them to respond to a biological function that is fundamental for the species such as procreation and lactation, thus ensuring the survival of offspring. In menopause, women experience an increase in the accumulation of

visceral fat typical of men, due to the sharp decrease in oestrogen hormones. Numerous scientific studies show that men and women differ for their basal metabolic rate, which is lower (-5%-15%) in women than in men, as a result of which they eat different amounts of food: males eat more than females, at any age. This is because the nutritional requirements and especially the energy requirements are different: women consume less energy, although in some phases or conditions of their lives the requirements increase. This means that women must consume a lower quantity of kilocalories per day than men through their diet, even though the percentage distribution of the different nutrients to be consumed during the day to meet their energy needs is practically the same for both sexes; the protein requirement, for example, is the same for women and men, but since it is calculated based on body weight, the quantity in grams of protein to be consumed daily is lower for women than for men. The same applies to fats and carbohydrates, whose nutritional requirements must also be calculated based on age, type of physical activity, type of work, hormonal state, etc. With regard to carbohydrates, which should account for 55%-60% of the daily calorie intake with diet in both males and females, women need to pay particular attention to the fraction of simple sugars, those which they tend to make greater use of in two particular conditions: pregnancy and peri-menopausal age. Both these situations, in fact, tend to favour the onset of insulin-resistance which can result in pre-diabetes and then a diabetes with associated increase in triglycerides.

Equally important is an adequate intake of micronutrients (minerals, electrolytes, vitamins, etc.) that are distributed in varying and different concentrations in food; hence the need for a diet as varied as possible in both sexes. Iron is one of the most important elements whose need is greater in women than in men,

throughout the fertile period, due to monthly menstrual losses. However, it is estimated that at least 25% of young European women suffer from a subclinical iron deficiency condition. Another requirement that has some differences between males and females is that of folic acid: the recommendations in both sexes provide the same level of intake that doubles in pregnant women and immediately before. Supplementation is also necessary in women undergoing oestro-progestin therapy, which results in a reduction in the bioavailability of B vitamins of which folates are part.

The need for calcium is superimposed in males and females until menopause, when its intake needs to increase in women because of the massive demineralization of the skeleton as a result of the loss of the protective effect of oestrogen on the bone matrix. The need for calcium is also increasing in pregnant women and older women. In women of peri-menopausal age, the need for vitamin D also increases compared to men. In this phase, women tend to gain weight and the visceral adipose tissue accumulated around the waist absorbs vitamin D, which is fat-soluble and no longer circulates.

Equally important for women of childbearing age, pregnant and breastfeeding women and then women of peri-menopausal age, is to increase the intake of magnesium and potassium as their need grows physiologically in these conditions.

Eating habits are also determined by other factors that can be strongly influenced by gender differences, such as education, ethnicity, cultural traditions, religious and/or ideological motivations, education and individual socio-economic status. It follows that the differences between males and females may imply a different access to proper nutrition, thus representing a very strong health determinant.

European studies show that the population as a whole often makes dietary mistakes such as skipping meals, consuming little fruit and vegetables, drinking little milk and consuming little yoghurt and dairy products, eating foods with high calories and low nutritional value, eating often at fast-food restaurants and frequently resorting to ready-made foods. However, many studies, including the PASSI surveillance project of the Italian National Institute of Health, show that women are more attentive to food than men,

and in this their educational role in future generations is fundamental. Studies conducted in some African countries have shown that the education of women would cost \$1 per day, revolutionising the prevalence of hunger, which would be reduced by 70%.

Women consume more fruit and vegetables, legumes and whole grain and sweet foods than men who tend to prefer foods rich in fats and proteins, alcohol and sugary and carbonated drinks. Although women are more likely to change their diet, they tend to more easily abandon the new healthy diet and return to their old habits; men, however, when they choose to change their diet are more consistent in following the new diet.

Finally, there are real cultural stereotypes about food. Some foods are considered "masculine", others "feminine": red meat, for example, is food for men, while salad and desserts are considered food for women. It is clear that primary prevention needs to take into account gender differences in nutrition as well as biological factors. Only in this way will preventive health policy interventions be effective and able to influence and modify the eating habits of the population, starting from childhood.

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