

FOOD CONSUMPTION BY DEGREES OF FOOD PROCESSING IN PREGNANT WOMEN IN TOCANTINS



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ABSTRACT

Introduction: During pregnancy, profound physiological transformations occur that increase nutritional needs. A balanced diet rich in nutrients is essential for the health of the mother and fetus, although emotional, socioeconomic and cultural factors can influence food consumption, distancing the behavior of pregnant women from health

recommendations. **Objective:** to evaluate the adequacy of energy, macronutrient and micronutrient intakes by pregnant women in Tocantins and to analyze energy and macronutrient intake according to the degree of processing of the food consumed.

Methodology: 93 pregnant women, living in urban and rural areas, assisted by the public health network of Palmas, Tocantins, Brazil, participated in the study. A 24-hour food recall was applied, whose data were tabulated and processed in the GloboDiet software. The daily nutrient intake of the participants was compared to that proposed by the Dietary Reference Intakes. Energy and macronutrient intakes were also estimated by food group, according to the NOVA classification. Descriptive statistical analysis was used, and for the association between energy intake from ultra-processed foods and the daily intake of macro and micronutrients, Linear Regression Analysis was used. The analyses were performed using the R software. **Results:** most of the pregnant women had daily energy intake below the recommended for the period of gestation in which they were. Daily carbohydrate and lipid intakes were inadequate for 34.5% and 49.4% of the pregnant

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women, respectively. Natural and minimally processed foods were responsible for most of the daily energy intake. The consumption of ultra-processed foods negatively influenced the daily protein intake of pregnant women and was associated with a higher daily consumption of total and saturated fats. **Conclusion:** the consumption of ultra-processed foods by the population studied reinforces the need for nutritional interventions in prenatal care, with the aim of educating and supporting pregnant women in the selection of foods that contribute positively to maternal and fetal health.

Keywords: Pregnancy. Feeding. Nutrient. Ultra-processed.

INTRODUCTION

Pregnancy is a special period in a woman's life cycle, marked by profound physiological transformations and, consequently, by a significant increase in nutritional needs (MANN *et al.*, 2010). Adequate nutrient intake during this phase is essential for the health of the mother and the developing fetus, where maternal nutritional demand increases considerably to meet the metabolic needs of the pregnant woman herself and fetal growth (COUTINHO *et al.*, 2014).

A balanced diet rich in essential nutrients, such as proteins, vitamins, minerals and polyunsaturated fatty acids, becomes essential for the development of the fetus (GARCÍA *et al.*, 2016). Food consumption, throughout the different life cycles, is influenced by a complex network of emotional, physiological, socioeconomic and cultural factors, which shape eating patterns, especially of pregnant women, moving them away from what is established by current dietary recommendations (BAIÃO; DESLANDES, 2010).

A balanced and varied diet is essential during pregnancy, to ensure healthy fetal growth and adequate gestational weight gain. Although the needs of some nutrients during pregnancy remain similar to the needs of non-pregnant women, there are many specificities and increases in the needs at this stage, especially with regard to energy, protein, some vitamins and minerals (COUTINHO, 2014).

According to data from SISVAN, of a total of almost one million adult pregnant women followed up in primary health care, in 2020, 10.8% were underweight, 56.9% were overweight and obese, and 76% reported the consumption of ultra-processed foods the day before the interview (BRASIL, 2020).

Ultra-processed foods are food products, which have gone through several stages of industrial processing, containing additives, sugars and additional fats, in addition to being poor in nutrients. The literature shows that excessive consumption of processed and ultra-processed foods can be related to health problems, such as obesity, diabetes, cardiovascular disease, and cancer (RAUBER *et al.*, 2018).

According to the guidelines of the World Health Organization (WHO), the pregnant woman's diet should consist of fruits, vegetables, whole grains, lean proteins and low-fat dairy products. In addition, it is recommended to avoid foods rich in saturated fats, sugars, and sodium, such as processed and ultra-processed foods (WHO, 2020).

In this context, the objective of the present study was to evaluate the daily intake of energy, macronutrients and micronutrients of pregnant women in Tocantins, comparing the

recommendations for the gestational period, as well as to analyze the consumption of energy and macronutrients according to the degree of processing of the food consumed.

METHODOLOGY

This is an observational cross-sectional study with probabilistic sampling that used part of the data from an original project entitled "Multicenter Study on Iodine Deficiency – EMDI Brazil".

Pregnant women in all trimesters of pregnancy, usual risk, over 18 years of age, and who underwent prenatal care in the public health network of Palmas, Tocantins State, Brazil, were invited to participate in the study. Pregnant women, living in the urban and rural areas of Palmas and users of the Unified Health System (SUS) were considered eligible for evaluation.

Considering the exclusion criteria set forth in the original study, women with a history of thyroid disease and/or surgery, a reported diagnosis of hypothyroidism, previous hypertension, or hypertensive syndrome of pregnancy were not included in the present study.

Initially, pregnant women in the first, second and third trimesters of pregnancy were identified and located, and their distribution in prenatal care at the Basic Health Units (UBS) of Palmas. Next, visits were made to the UBS, and the women were interviewed while waiting for routine prenatal care. Sampling was carried out by convenience, according to the pregnant women wanting to answer the survey, and two visits were made, at different times, to each UBS in Palmas.

To characterize the population, socioeconomic and health information was collected from the application of a semi-structured questionnaire, with the help of the online data management platform RedCap®.

To assess food intake, a 24-hour Food Recall (24hR) was applied, as proposed by Crispim et al. (2022). The 24hR was applied during a face-to-face interview, conducted using the Multiple Pass Method (MOSHFEHGH *et al.*, 2008) and with the aid of a photographic manual of food quantification (CRISPIM *et al.*, 2017).

The tabulation and treatment of food consumption data were conducted by typists qualified to use the GloboDiet software (BELSERRAT *et al.*, 2017), Brazilian version, in Dietary Entry mode.

For each research participant, the consumption of energy, total macro and micronutrients, and energy and macronutrients by food group was estimated, according to the NOVA classification, which categorizes foods and food products into four groups: Group 1: *natural* and minimally processed foods; Group 2: Culinary ingredients Group 3: Processed foods; Group 4: Ultra-processed foods (MONTEIRO *et al.*, 2016).

The data were analyzed using descriptive statistics, presenting the absolute and relative frequencies and the measures of central tendency. Linear Regression Analysis was used to associate energy intake from ultra-processed foods and daily intake of macro and micronutrients, with measures of quality evaluation and adjustment of the model by the F and R2 tests, at 5% significance. The analyses were performed using the R (R Core Team) software.

The present study was approved by the Research Ethics Committee of the Federal University of Tocantins, under opinion number 2,702,535 and is part of the Multicenter Study of Iodine Deficiency (EMDI Brazil).

RESULTS

Table 1 shows the sociodemographic and health profiles of the 93 pregnant women studied.

Table 1- Sociodemographic and health characteristics of pregnant women in the public health network of the municipality of Palmas-TO, 2020.

CHARACTERISTIC	Percentages, Averages or Medians
Age in years (n=93)	24.62 ± 5.37* 23 (Min: 18; Max: 39)♦
Place of residence (n=93)	(N)%
Urban	(78) 83,9%
Rural	(15) 16,1%
Skin color (self-reported by the pregnant woman) (n= 93)	(N)%
White	(14) 15,1%
Black	(16) 17,2%
Brown	(16) 58,1%
Indigenous	(8) 1,1%
Yellow	(8) 8,6%
Education (n=92)	(N)%
Incomplete Elementary School	(11) 12,13%
Complete Elementary School	(3) 3,3%

Incomplete high school	(18) 19,6%
Complete high school	(35) 38%
Incomplete higher education	(13) 14,1%
Complete Higher Education	(11) 12,0%
Postgraduate studies	(1) 1,1%
Per capita income (n= 56)	R\$1410,50 ± 1226,16*
	R\$1019.00 (Min.: 0.00; Max.: 5000.00)†
Paid work in the last month (n=93)	(N)%
No	(31) 33,3%
Yes	(62) 66,7%
Trimester of gestation (n=93)	(N)%
First	(17) 18,3%
Second	(30) 32,3%
Third	(46) 49,5%

A group of adult pregnant women was observed, brown, living in an urban area, and having at least completed high school. Most of the participants revealed that they had a paid job, with a median *per capita* income below the minimum wage in force in the country at the time. Most of the pregnant women (49.5%) were in the third trimester of pregnancy.

Table 2 shows the average daily nutrient intake by 88 pregnant women, assessed by the 24-hour recall, and the percentages of participants who reached the reference dietary intakes (adequate) or not (inadequate). The recalls of 5 participants could not be tabulated due to inconsistencies in the information of the portions consumed.

Table 2: Daily nutrient intake of the group and percentage of pregnant women in adequacy/inadequacy in relation to the recommended intakes, among pregnant women in the public health network of the municipality of Palmas-TO, 2020 (n=88).

Nutrient	Daily Intakes Means ± Standard Deviations	Medians (Minimums and Maximums)	Pregnant women in adequacy/inadequacy (%)
Energy (Kcal)	1786.00 ± 679.00	1786.00 (Min.: 490.52; Max.: 3981.98)	Adequate 39,1 Inadequate 60,9
Carbohydrates (%)	49.18 ± 10.18	203.34 (Min.: 64.04; Max: 200.59)	Adequate 65,5 Inadequate 34,5
Proteins (%)	18.76 ± 6.19	74.57 (Min.:17.96; Max: 220.30)	Adequate 94,3 Inadequate 5,7
Lipids (%)	33.90 ± 8.55	62.56 (Min.:14.78; Max: 181.48)	Adequate 50,6 Inadequate 49,4
Fibers (g)	17.81 ± 9.89	17.47 (Min.: 3.32; Max: 44.51)	Adequate 22,7 Inadequate 77,3
Calcium (mg)	476, 54 ± 342.19	423.93 (Min.: 56.56; Max.: 2375.14)	Adequate 0 Inadequate 100
Iron (mg)	9.69 ± 4.20	8.97 (Min.: 2.40; Max.: 60.61)	Adequate 0 Inadequate 100

Zinc (mg)	12.02 ± 6.65	11.34 (Min.: 5.1; Max.: 45.70)	Adequate	28,7
			Inadequate	71,3
Sodium (mg)	3267, 31 ± 11615.45	1913.93 (Min.: 113.40; Max.: 110062.00)	Adequate	18,4
			Inadequate	81,6
Potassium (mg)	2133.91 ± 1114.25	2009.69 (Min.: 228.27; Max.: 9111.02)	Adequate	5,7
			Inadequate	94,3
Iodine (mg)	102.02 ± 55.83	92.83 (Min.: 24.42; Max.: 336.78)	Adequate	6,9
			Inadequate	93,1
Selenium (mcg)	48.46 ± 49.28	36.52 (Min.: 2.94; Max.: 372.78)	Adequate	6,9
			Inadequate	93,1
Vitamin D (mcg)*	3.72 ± 4.11	2.31 (Min.: 0.00; Max.: 25.42)	Adequate	0
			Inadequate	100
Vitamin E (mcg)	8.10 ± 11.40	5.27 (Min.: 0.79; Max.: 72.13)	Adequate	14,9
			Inadequate	85,1

It is observed that most of the pregnant women had daily energy intake below the recommended for the period of pregnancy in which they were. With regard to macronutrients, carbohydrate intake was inadequate in 34.5% of the pregnant women; protein intake was inadequate in 5.7%; lipid consumption was inadequate in 49.4%; and fiber intake was inadequate in 77.3% of the pregnant women. For the micronutrients studied, inadequate intakes of sodium, potassium, zinc, iodine, selenium and vitamin E were observed.

For the analysis of nutrient intake by degree of food processing, only 90 24-hour recalls were evaluated, as 3 did not offer complete information about the foods and their preparation. Table 3 shows the number of food items consumed per day, according to the degree of processing, in addition to the percentage that each class of processing degree represented in the total number of food items ingested daily.

Table 3: Daily consumption of food items, according to degree of processing, by pregnant women in the public health network of the municipality of Palmas-TO, 2020 (n=90).

Processing Grade	Average and median n of items	0 to 15 items N (%)	11 to 20 items N (%)	21 to 30 items N (%)	30 to 40 items N (%)
Fresh and minimally processed	17.76 ± 6.46* 18 (Min.:3; Max.: 36) ♦	(11) 12,2%	(46) 51,1%	(30) 33,3%	(3) 3,3%
Culinary Ingredients	5.81 ± 2.3* 6 (Min.: 1; Max.: 12) ♦	(88) 97,7%	(2) 2,2%	(0) 0%	(0) 0%
Processed	0.73 ± 0.94* 0 (Min.: 0; Max.: 4) ♦	(90) 100%	(0) 0%	(0) 0%	(0) 0%
Ultra-processed foods	3.19 ± 2.3* 3 (Min.: 0; Max.: 13) ♦	(88) 97,7%	(2) 2,2%	(0) 0%	(0) 0%

Mean values and standard deviations; ♦Median, minimum and maximum values

When analyzing the food consumption patterns of the pregnant women studied, it was observed that there was a predominance of *fresh* and minimally processed foods, particularly in the range of 11 to 20 daily items (51.1%). The most consumed natural and minimally processed foods were rice, beans, potatoes, onions, garlic, tomatoes and couscous. Among the most consumed culinary ingredients were soybean oil and salt. The most consumed processed foods were cheese, corn and canned peas, and among the ultra-processed foods, hamburger bread, cheese bread, soda, tomato sauce and industrialized cake predominated.

Up to 15 items per day consumed ultra-processed foods for most of the pregnant women studied (97.7%).

Table 4 shows the percentage distribution of energy and macronutrient contents ingested daily, by degree of processing of the foods from which the nutrients originated.

Table 4: Daily energy and macronutrient intake, by degree of processing of source foods, in pregnant women in the public health network of the municipality of Palmas-TO, 2020 (n=90).

	<i>Fresh and minimally processed</i>	<i>Culinary Ingredients</i>	<i>Processed</i>	<i>Ultra-processed foods</i>	<i>Total daily consumption</i>
Energy (Kcal)	1251.10 ± 613.96 * 1156.36 (Min.: 144.28; Max.: 3277.46)*	52.76 ± 60.63* 32.68 (Min.: 3.20; Max.: 374) ♦	152.14, ± 130.05* 149.86 (Min.: 0.00; Max.: 648.68) ♦	469 ± 501.70* 301.48 (Min.: 3.34; Max.: 2448.33) ♦	1824.07 ± 819.11* 1742.74 (Min.: 490.52; Max.: 4842.86) ♦
Proteins (g)	71.48 ± 40.20* 62.60 (Min.: 6.40 Max.: 205.50) ♦	0.00 ± 0.02* 0.00 (Min.: 0; Max.: 0.17) ♦	6.67 ± 6.00* 4.91 (Min.: 0.00; Max.: 28.79) ♦	11.29 ± 15.95* 6.43 (Min.: 0.00; Max.: 89.74) ♦	88.21 ± 45.81* 79.66 (Min.: 17.82; Max.: 248.96) ♦
Carbohydrates (g)	149.20 ± 84.88* 137.45 (Min.: 21.21; Max.: 473.56) ♦	1.26 ± 5.09* 0.00 (Min.: 0.00; Max.: 30.52) ♦	23.48 ± 24.16* 25.74 (Min.: 0.00; Max.: 93.90) ♦	59.18, ± 65.15* 42.24 (Min.: 0.00; Max.: 325.81) ♦	218.09 ± 107.77 196.10 (Min.: 52.95; Max.: 633.0) ♦
Lipids (g)	79.41 ± 320* 43.5 (Min.: 3.74; Max.: 3071) ♦	5.27 ± 6.17* 3.28 (Min.: 0.36; Max.: 36.67) ♦	4.14 ± 5.58* 1.21 (Min.: 0.00; Max.: 24.11) ♦	21.76 ± 25.08* 13.68 (Min.: 0.00; Max.: 124.51) ♦	107.02 ± 319, 62* 64.2 (Min.: 14.79; Max.: 3082.75) ♦

*Mean values and standard deviations; ♦Median, minimum and maximum values.

The analysis of Table 4 reveals that, among the pregnant women studied, *natural* and minimally processed foods (group 1) were responsible for most of the energy intake, contributing an average of 69.55% of the total daily calories ingested. Next, the consumption of ultra-processed foods (group 4) contributed with 22.98% of the total daily energy intake. Culinary ingredients and processed foods contributed less than 10% of the daily energy consumed.

For the macronutrients carbohydrates, proteins, and lipids, *natural* and minimally processed foods also contributed with the majority of the daily energy consumed, followed by ultra-processed foods. Culinary ingredients and processed foods contributed less than 10% of the daily total macronutrients consumed

Table 5 shows the linear influence of daily energy intake from ultra-processed foods on the total daily intake of macronutrients by the pregnant women studied.

Table 5: Linear effect of energy intake in the form of ultra-processed foods on the total daily intake of macronutrients in the diet of pregnant women in the public health network of the municipality of Palmas-TO, 2020.

Macronutrient	Regression Coefficient	95% CI	R2	p* value
Carbohydrates (g)	42,64	-2,381 to 3,030	0,04388	0,856
Proteins (g)	-0,494	-0.886 to -0.102	0,06887	0,014
Lipids (g)	0,3821	0.026 to 0.738	0,05084	0,035
Saturated fatty acids (mg)	0,1631	0.028 to 0.297	0,06379	0,018

*P values for the F-Test at 5% significance. R2 adjusted.

The consumption of ultra-processed foods negatively influenced the daily protein intake of pregnant women and was associated with a higher daily consumption of total and saturated fats. The negative regression coefficient for proteins (-0.494; $p = 0.014$) indicates that an increase in calorie intake of 1% in the form of ultra-processed foods can reduce the total amount of daily protein consumed by 0.5g.

On the other hand, the influence of caloric intake in the form of ultra-processed foods increases the total daily intake of lipids by 0.38g (0.3821; $p = 0.035$) and saturated fatty acids by 0.16g (0.1631; $p = 0.018$).

DISCUSSION

High percentages of pregnant women with inadequate consumption of lipids, carbohydrates and fibers were observed; in addition to a significant inadequacy of the daily intake of micronutrients.

The consumption of ultra-processed foods was associated with lower protein intake and higher intake of lipids and saturated fatty acids.

High lipid consumption during pregnancy can increase the risk of developing complications such as gestational diabetes, hypertension, and maternal obesity (HAIDER et al., 2019). On the other hand, insufficient fat consumption can make it difficult to meet daily energy needs, making it difficult to gain adequate gestational weight, in addition to failing to provide essential fatty acids, which are necessary for fetal development (SILVA, 2007).

A study on therapeutic interventions for constipation, common during pregnancy, highlighted a positive association between fiber consumption and increased bowel frequency. This suggests that increasing fiber intake may be beneficial in managing constipation during pregnancy (JEWELL, 2001). The study also highlights the importance of adequate fiber intake during pregnancy, both in the context of gestational diabetes control and constipation management, while also highlighting the worrying prevalence of inadequate fiber intake among pregnant women (KALKWARF, 2001).

For micronutrients, the inadequacies in the intake of the nutrients iron, calcium and vitamin D observed in all pregnant women studied are highlighted. Iron is essential during pregnancy, as it plays a role in the production of hemoglobin, which transports oxygen to the cells of the body and fetus and needs to accompany the plasma expansion of this period. Inadequate iron intake can increase the risk of anemia during pregnancy, which can negatively affect the baby's growth and development (SATO, 2010). Calcium is necessary for the proper development of the baby's bones and teeth. If the pregnant woman does not consume enough calcium, the body can mobilize calcium from the mother's bones to meet the needs of the fetus, increasing the risk of osteoporosis and bone problems after pregnancy (GOMES, 2016). Vitamin D is important for calcium absorption and bone development. During pregnancy, the mother's body must absorb extra calcium to meet the demands of the growing fetus. Vitamin D deficiency can affect calcium absorption and increase the risk of complications, such as preeclampsia (GOMES, 2016).

When analyzing the food consumption patterns of the pregnant women studied, it is observed that there is a predominance of the consumption of *natural* and minimally processed foods, particularly in the range of 11 to 20 daily items (51.1%). The literature shows that these foods are essential for a balanced and healthy diet, providing necessary nutrients without chemical additives, which is particularly important during pregnancy

(BRASIL, 2014). The preference for less processed foods among pregnant women, who consume a greater variety of items, suggests an awareness of the importance of food quality in promoting maternal and fetal health.

On the other hand, a consumption of ultra-processed foods of up to 15 items per day was observed for most of the pregnant women studied, indicating a low diversity in the diet, associated with unhealthy food choices.

The literature points to the benefits of a diet rich in *natural* and minimally processed foods and the risks of frequent consumption of highly processed foods (FERNANDES *et al.*, 2019).

For the macronutrients carbohydrates, proteins, and lipids, *natural* and minimally processed foods also contributed with the majority of the daily amounts consumed, followed by ultra-processed foods. Culinary ingredients and processed foods contributed less than 10% of the daily total macronutrients consumed.

This pattern of eating behavior observed in pregnant women is positive, since *natural and* minimally processed foods generally contain fewer additives and are richer in micronutrients, which is beneficial for maternal and fetal health (FERNANDES *et al.*, 2019). The promotion of dietary diversity, in addition to contributing to the well-being of pregnant women, is essential for the healthy development of babies (OLIVEIRA *et al.*, 2023).

However, significant rates of inadequate micronutrient intake were observed, indicating that although *natural foods* are present in the diet of pregnant women, it should be considered that dietary guidelines should be directed to the consumption of foods that are sources of important nutrients during the gestational period, especially sources of micronutrients that presented the highest rates of inadequate intake.

This study revealed that ultra-processed foods accounted for 22.98% of the total caloric intake of pregnant women, while Agostini *et al.* (2019) found a significantly higher participation, ranging from 39.8% to 40.1%, in pregnant women. Although the consumption of ultra-processed foods in the present study is lower compared to the literature, their daily contribution to the energy intake of pregnant women is still high.

Regarding proteins, *natural* and minimally processed foods contributed with 81.06% of the average daily intake observed for the group studied. Ultra-processed foods, on the other hand, contributed with only 13.32% of the daily protein intake.

Inadequate protein intake, below the recommendations, has been associated with different complications during pregnancy (PIRES; GONÇALVES, 2021). Studies show that

insufficient protein intake can contribute to excessive or insufficient weight gain during pregnancy (SANTOS *et al.*, 2018).

As for carbohydrates, *natural* and minimally processed foods accounted for most of the daily intake of pregnant women. However, ultra-processed foods also contributed to daily carbohydrate intake. This fact can be attributed to the high content of simple sugars and refined carbohydrates in these products. This finding is worrying, since excessive consumption of refined sugars can lead to health problems such as diabetes and unhealthy weight gain, which complicates both pregnancy and childbirth (SANTOS *et al.*, 2018).

For lipid intake, the contribution of food groups by degree of processing was similar to that of other macronutrients, with the main contribution of *fresh* and minimally processed foods, followed by ultra-processed foods.

During pregnancy, lipids should include polyunsaturated fats, which are healthier and essential for the development of the baby's brain and for the mother's cardiovascular health (AGOSTINI *et al.*, 2019). On the other hand, ultra-processed foods are sources of high total lipid contents, including saturated and trans fats (AGOSTINI *et al.*, 2019) and contributed with 25.9% of the daily lipids consumed by the group studied.

Sartorelli *et al.* (2019), in a study with pregnant women, had already shown that high consumption of *natural* or minimally processed foods reduced the risk of obesity by 51%, while the intake of ultra-processed foods tripled this chance. According to the Sisvan report, in 2022, 71% of Brazilian pregnant women consumed ultra-processed foods.

The results indicate that, although the overall consumption of ultra-processed foods by the pregnant women studied here is moderate, there are significant associations that raise nutritional concerns with insufficient protein intake and with the increase in the intake of lipids, especially saturated fats, as the consumption of ultra-processed foods by the group increases. Thus, the observed consumption pattern can lead to health complications such as gestational diabetes and unhealthy weight gain during pregnancy (LEONE *et al.*, 2022). Therefore, it is recommended to develop nutritional education strategies that encourage the reduction of the consumption of industrialized products, promoting a diet richer in fresh and minimally processed foods, in order to support a healthy pregnancy and fetal well-being.

The main limitation of the present study is related to the use of a single 24-hour recall to collect data on food consumption. This approach may be susceptible to recall bias and it is possible that pregnant women may want to overestimate their intake of healthy

foods during the gestational period, possibly to convey an image of health care in accordance with social expectations (MARCHIONI *et al.*, 2019).

It is important to also assess the impacts of socioeconomic conditions on nutrient intakes, as they affect access to food, education, and information on a healthy lifestyle (LOOPSTRA, 2018).

CONCLUSION

Food consumption revealed inadequacies in the daily intake of all micronutrients studied, with emphasis on 100% inadequacy for iron, calcium, and vitamin D. Given the relevance of these nutrients during the gestational period, it is essential to emphasize the importance of nutritional education strategies on foods that are sources of important micronutrients during pregnancy. both before and during the prenatal period, with the aim of improving the quality of the female diet and ensuring an adequate intake of essential nutrients.

The predominant preference for *natural* and minimally processed foods represents a positive aspect, evidencing food choices that promote a healthy pregnancy.

However, the consumption of ultra-processed foods is a cause for concern and reinforces the need for nutritional interventions in prenatal care, with the aim of educating and supporting pregnant women in the selection of foods that contribute positively to maternal and fetal health.

It is necessary to strengthen nutritional education programs and food policies in this population to promote healthy eating during pregnancy.

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