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NEW ERA OF PREGNANCY AND POSTPARTUM EXERCISE

**NEPPE**



## Nutritional & weight gain recommendations for pregnant clients

Rui Jorge, PhD Clinical Nutrition

PROGRAM SPINAKEK

Fundusze Europejskie Wzrost i Edukacja (Rozwój)

Rzeczpospolita Polska

NAVVA

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NUTRITION FOR LIFE / EARLY LIFE NUTRITION

# 1000

The first 1000 days: a unique window of opportunity to shape lifelong health.

Pregnancy ( $\pm 270$  days) + 2 first years (730 days)


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## Pregnancy nutrition starts even before getting pregnant!

Women should start correcting nutritional deficits at least 2 to 3 months before conception.




American Journal of Obstetrics & Gynecology MAY 2022


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## Usual nutritional concerns before pregnancy


- Folic acid (Folate - vitamin B<sub>9</sub>) *Am Fam Physician. 2017 May 15;95(10)*
- Iodine *Journal of Trace Elements in Medicine and Biology 27 (2013) 174–183*
- Iron (mostly if in deficit, but the deficit is common) *Intern Med J. 2016 Apr;46(4):470-8.*

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## E.g. Portugal


Iodine guidelines for preconception, pregnancy and lactation



- Pregnant and lactating women in Portugal do not have optimal iodine levels (mean prevalence of 83 to 99% depending on the region);
- Iodine is essential for the development of the fetus central nervous system;
- Daily supplementation of 150 to 200 µg of iodine is advised.

Direção-Geral da Saúde. Aporte de iodo em mulheres na preconceção, gravidez e amamentação n° 011/2013.

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## Similar problems but different solutions (e.g. USA)

**DEPARTMENT OF HEALTH AND HUMAN SERVICES**

**Food and Drug Administration**

**21 CFR Parts 136, 137, and 139**

**[Docket No. 91N-100S]**

**RIN 0910-AA19**

**Food Standards: Amendment of Standards of Identity For Enriched Grain Products to Require Addition of Folic Acid**

**AGENCY:** Food and Drug Administration, HHS.







**ACTION:** Final rule.

**SUMMARY:** The Food and Drug Administration (FDA) is amending the standards of identity for several enriched grain products and, by cross-reference, the standards of identity for enriched bromated flour, enriched vegetable macaroni, and enriched vegetable noodle products, to require the addition of **folic acid**. The agency is requiring that these products be fortified with folic acid at levels ranging from 0.43 milligrams (mg) to 1.4 mg per pound (mg/lb) or 95 micrograms (µg) to 309 µg/100 grams (g), of product. These values are based on a fortification level of 140 µg/100 g (0.635 mg/lb) of the cereal grain product. This action is

being taken **to help women of childbearing age to reduce their risk of having a pregnancy affected with spina bifida or other neural tube defects** (NTD's) and to comply with the recommendation of the U.S. Public Health Service (PHS) that they consume at least 0.4 mg (400 µg) of folic acid daily. This action also responds to a citizen petition submitted by Glenn Scott.

**EFFECTIVE DATE:** January 1, 1998.

Federal Register / Vol. 61, No. 44 / Tuesday, March 5, 1996 / Rules and Regulations 8781

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## Usual nutritional EXCESS before pregnancy?

Energy intake  $\longrightarrow$  Overweight and Obesity

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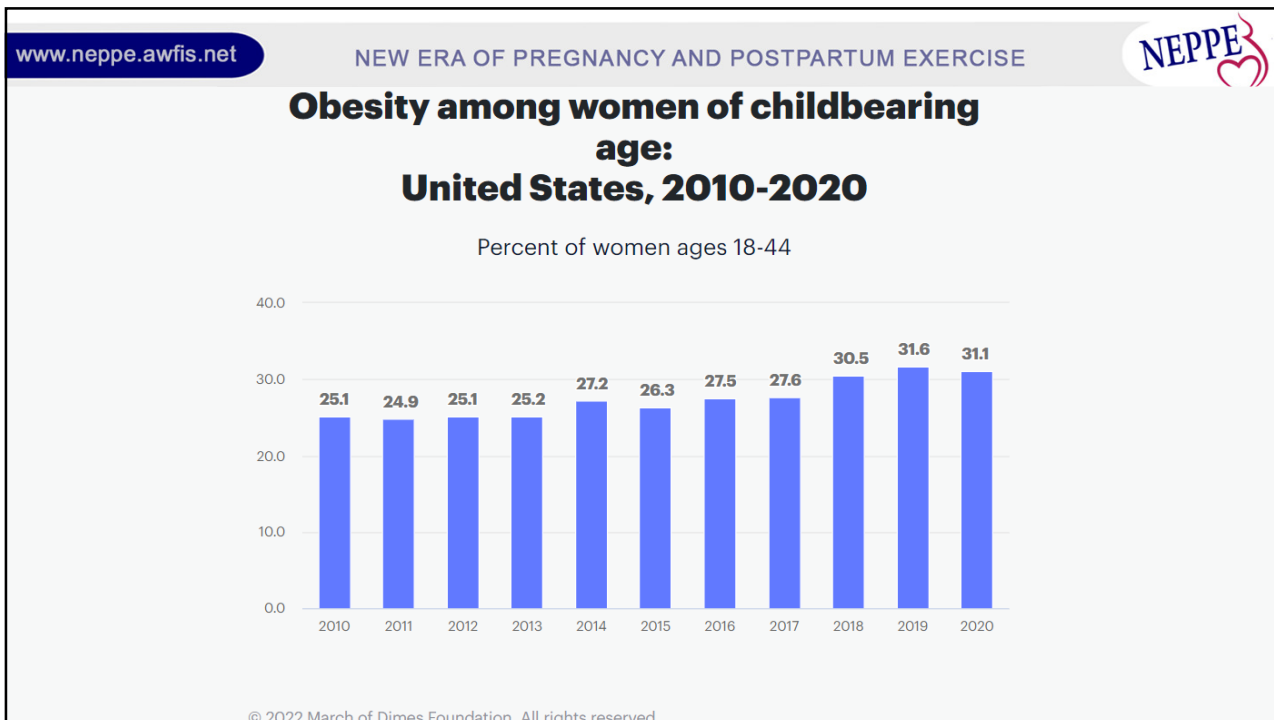
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### A Overweight and obesity (BMI $\geq 25$ kg/m<sup>2</sup>)

Year	Developed, women	Developed, men	Developing, women	Developing, men	Global, women	Global, men
1980	42	49	23	20	30	29
1982	42	49	23	20	30	29
1984	42	49	23	20	30	29
1986	42	49	23	20	30	29
1988	42	49	23	20	30	29
1990	42	49	23	20	30	29
1992	42	49	23	20	30	29
1994	42	49	23	20	30	29
1996	42	49	23	20	30	29
1998	42	49	23	20	30	29
2000	42	49	23	20	30	29
2002	42	49	23	20	30	29
2004	42	49	23	20	30	29
2006	42	49	23	20	30	29
2008	42	49	23	20	30	29
2010	42	49	23	20	30	29
2012	42	49	23	20	30	29
2013	42	49	23	20	30	29

www.thelancet.com Published online May 29, 2014 [http://dx.doi.org/10.1016/S0140-6736\(14\)60460-8](http://dx.doi.org/10.1016/S0140-6736(14)60460-8)







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### Risks associated with obesity in preconception and pregnancy, for the woman

	BMI (kg/m <sup>2</sup> )	Odds ratios (CI 95%)
<b>Maternal outcomes</b>		
Gestational diabetes	30-35	3.01 (2.34-3.87)
	>35	5.55 (4.27-7.21)

**obesity** reviews (2015) **16**, 621-638  
*Obesity* (2013) **21**, 1046-1055. doi:10.1002/oby.20088

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C-section	> 35	2.05 (1.86–2.27)
	> 40	2.89 (2.28–3.79)

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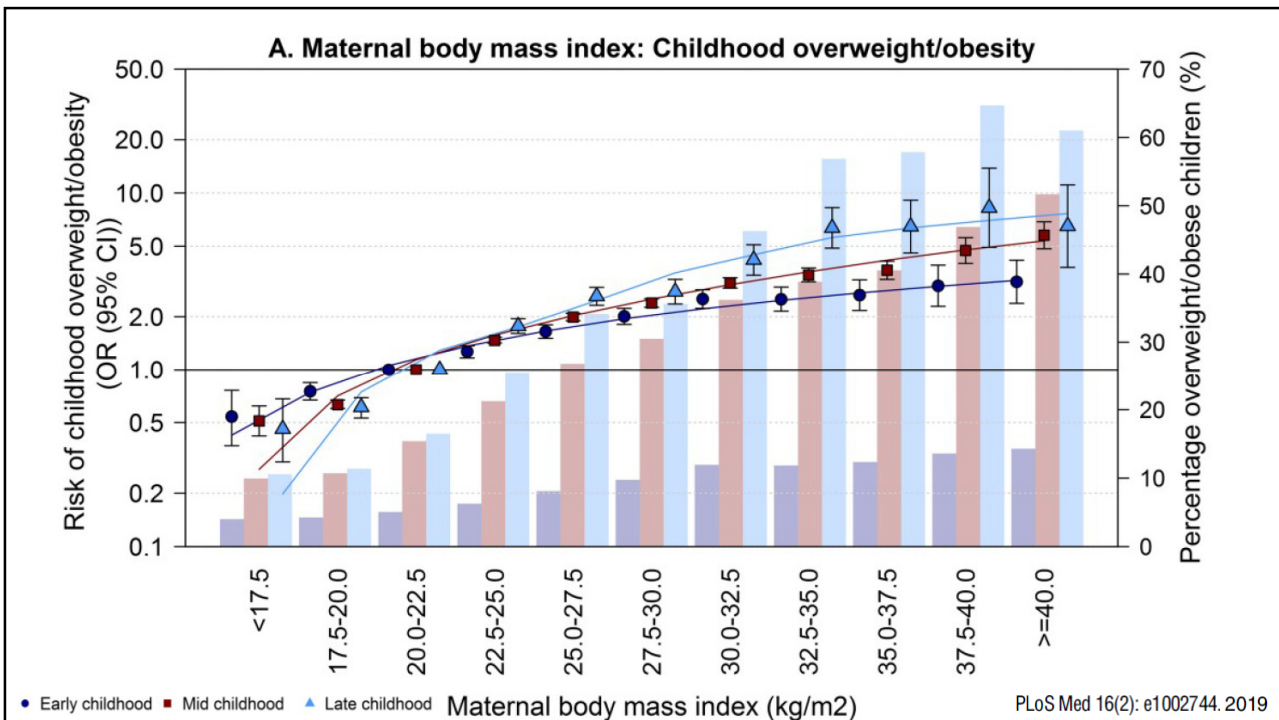

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	≥ 35	3.43 (2.59–4.55)
<b>C-section</b>	> 35	2.05 (1.86–2.27)
	> 40	2.89 (2.28–3.79)
<b>Preterm birth (&lt; 33 weeks)</b>	≥ 34.9	1.49 (0.89–2.50)
	≥ 40	2.02 (1.24–3.29)

**obesity** reviews (2015) **16**, 621–638  
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Maternal body mass index, gestational weight gain, and the risk of overweight and obesity across childhood: An individual participant data meta-analysis PLoS Med 16(2): e1002744. 2019

Ellis Voerman<sup>1,2</sup>, Susana Santos<sup>1,2</sup>, Bernadeta Patro Golab<sup>1,2,3</sup>, Pilar Amiano<sup>4,5,6</sup>,

We observed not only that maternal pre-pregnancy overweight and obesity were associated with an increased risk of childhood overweight/obesity, but that this risk increased gradually over the full range of maternal BMI. Similarly, the risk of childhood overweight/obesity increased across the full range of gestational weight gain.

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We estimated that 21.7% to 41.7% of childhood overweight/obesity prevalence could be attributed to maternal overweight and obesity together, whereas 11.4% to 19.2% could be attributed to excessive gestational weight gain.



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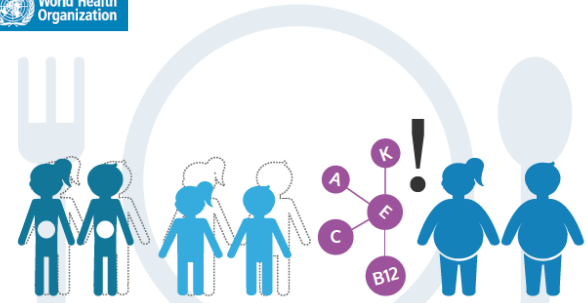
The additional effect of excessive gestational weight gain on the risk of childhood overweight/obesity was small among women who are already overweight or obese before pregnancy.

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## Beware of the double burden of malnutrition!


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Undernutrition (wasting, stunting & micronutrient deficiencies) along with overweight and obesity within individuals, households and populations

**Double burden of malnutrition is defined as the coexistence of under-and-over nutrition in the same population/group, the same household/family, or the same person**

Coll Antropol, 2012 Mar;36(1):39-45.









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Energy cost of pregnancy estimated from increments in total energy expenditure and energy deposition

	1st trimester (kj/day)	2nd trimester (kj/day)	3rd trimester (kj/day)	Total energy cost	
				(MJ)	(kcal)
Protein deposition	0	30	121	14.1	3 370
Fat deposition	202	732	654	144.8	34 600
Total energy expenditure	85	350	1300	161.4	38 560
<b>Total energy cost</b>	<b>287</b>	<b>1112</b>	<b>2075</b>	<b>320.2</b>	<b>76 530</b>

Source: FAO/WHO/UNU (2004).

**1 kcal = 4.184 kj**

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**EER (Estimated Energy Requirement (kcal/day):**

**1<sup>st</sup> Trimester** = EER for the adolescent or adult woman + 0

**2<sup>nd</sup> Trimester** = EER for the adolescent or adult woman + 160\* + 180\*\*

**3<sup>rd</sup> Trimester** = EER for the adolescent or adult woman + 272\* + 180\*\*

\* Increment in total energy expenditure.  
\*\* Increment in total energy deposition (fat and protein).

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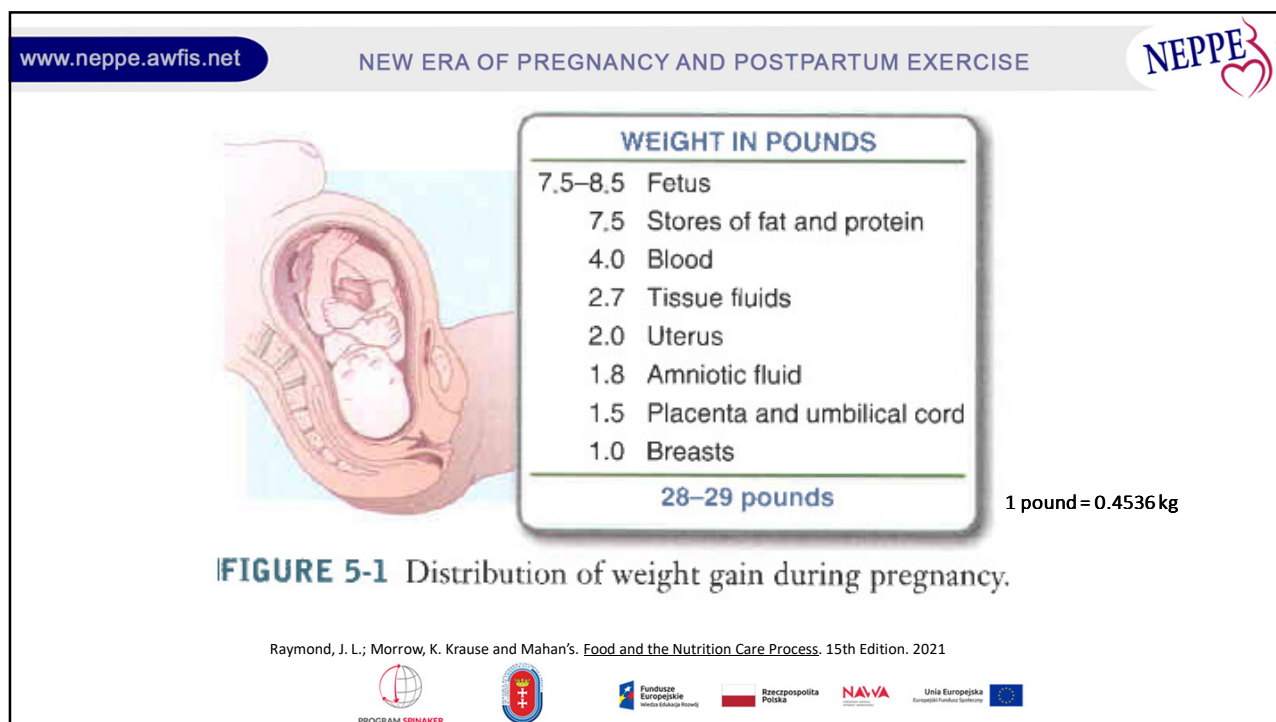
	Pregnancy		
	1 <sup>o</sup> Trimester	2 <sup>o</sup> Trimester	3 <sup>o</sup> Trimester
Energy, kcal/day	(+) 70	(+) 260	(+) 500


EFSA (European Food Safety Authority), Dietary Reference Values for nutrients. Summary Report, EFSA supporting publication, Editor. 2017.







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**Table 1.** Institute of Medicine Weight Gain Recommendations for Pregnancy [↔](#)

Prepregnancy Weight Category	Body Mass Index*	Recommended Range of Total Weight (lb)	Recommended Rates of Weight Gain <sup>†</sup> in the Second and Third Trimesters (lb) (Mean Range [lb/wk])
Underweight	Less than 18.5	28–40 (12.7-18.1 kg)	1 (1–1.3) 0.5 (0.5-0.6 kg)

\*Body mass index is calculated as weight in kilograms divided by height in meters squared or as weight in pounds multiplied by 703 divided by height in inches.

<sup>†</sup>Calculations assume a 1.1–4.4 lb weight gain in the first trimester.

Modified from Institute of Medicine (US). *Weight gain during pregnancy: reexamining the guidelines*. Washington, DC. National Academies Press; 2009. ©2009 National Academy of Sciences.

**Table 1.** Institute of Medicine Weight Gain Recommendations for Pregnancy ↵

Prepregnancy Weight Category	Body Mass Index*	Recommended Range of Total Weight (lb)	Recommended Rates of Weight Gain <sup>†</sup> in the Second and Third Trimesters (lb) (Mean Range [lb/wk])	
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Normal Weight	18.5–24.9	25–35 (11.3-15.9 kg)	1 (0.8–1)	0.5 (0.4-0.5 kg)

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Overweight	25–29.9	15–25 (6.8-11.3 kg)	0.6 (0.5–0.7)	0.3 (0.2-0.3 kg)

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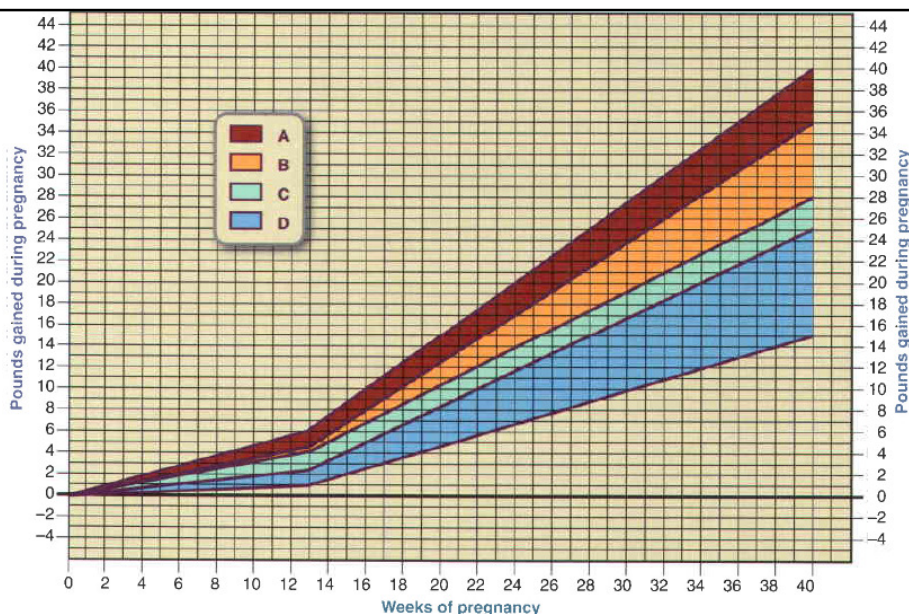
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Overweight	25–29.9	15–25 (6.8–11.3 kg)	0.6 (0.5–0.7) 0.3 (0.2–0.3 kg)
Obese (includes all classes)	30 and greater	11–20 (5.0–9.1 kg)	0.5 (0.4–0.6) 0.2 (0.2–0.3 kg)

\*Body mass index is calculated as weight in kilograms divided by height in meters squared or as weight in pounds multiplied by 703 divided by height in inches.

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Modified from Institute of Medicine (US). Weight gain during pregnancy: reexamining the guidelines. Washington, DC. National Academies Press; 2009. ©2009 National Academy of Sciences.



1 pound = 0.4536 kg

**FIGURE 5-2** Desirable weight gain during pregnancy. Females who are of normal weight before their pregnancy should aim for a weight gain in the *B* to *C* range (25 to 35 lb) during pregnancy. Underweight females should gain in the *A* to *B* range (28–40 lb). Females who are overweight before pregnancy should gain in the *D* range (15 to 25 lb).


Raymond, J. L.; Morrow, K. Krause and Mahan's. Food and the Nutrition Care Process. 15th Edition. 2021


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Twin pregnancy gestational weight gain recommendation:

- 16.8 to 24.5 kg for women with normal weight
- 14.1 to 22.7 kg for women with overweight
- 11.3 to 19.1 kg for women with obesity

IOM (Institute of Medicine). 2009. *Weight Gain During Pregnancy: Reexamining the Guidelines*. Washington, DC: The National Academies Press.

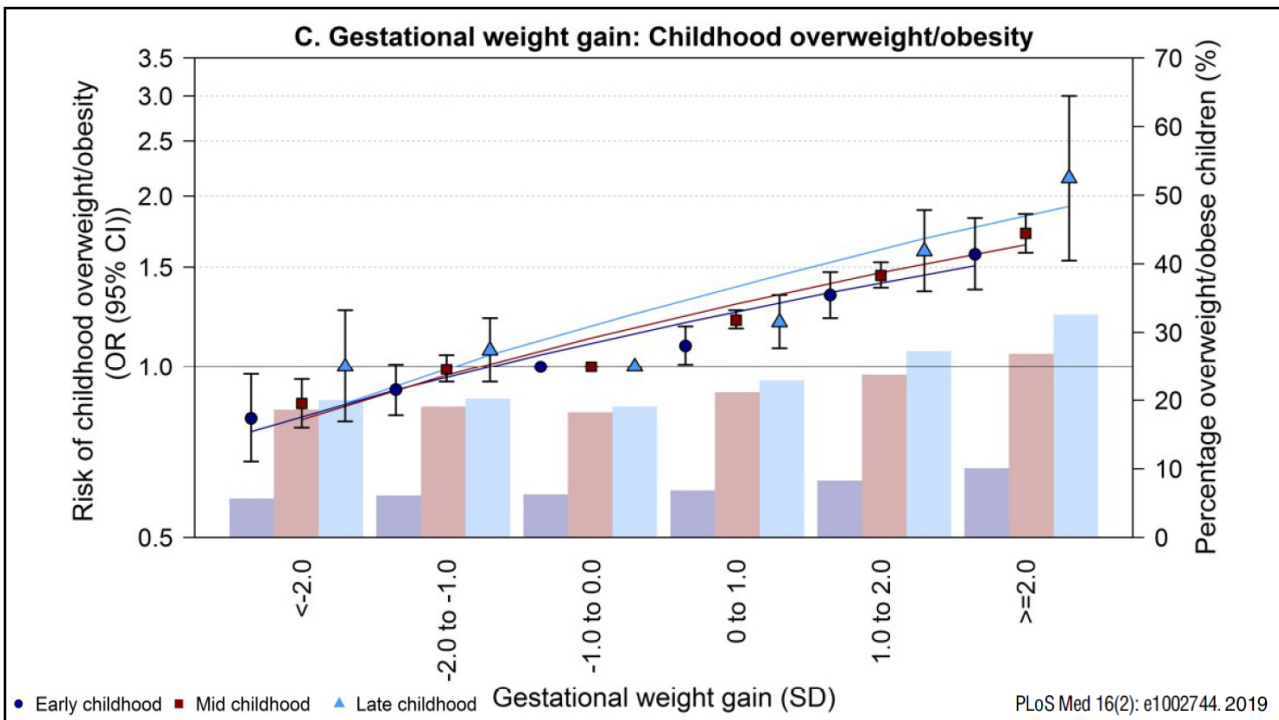
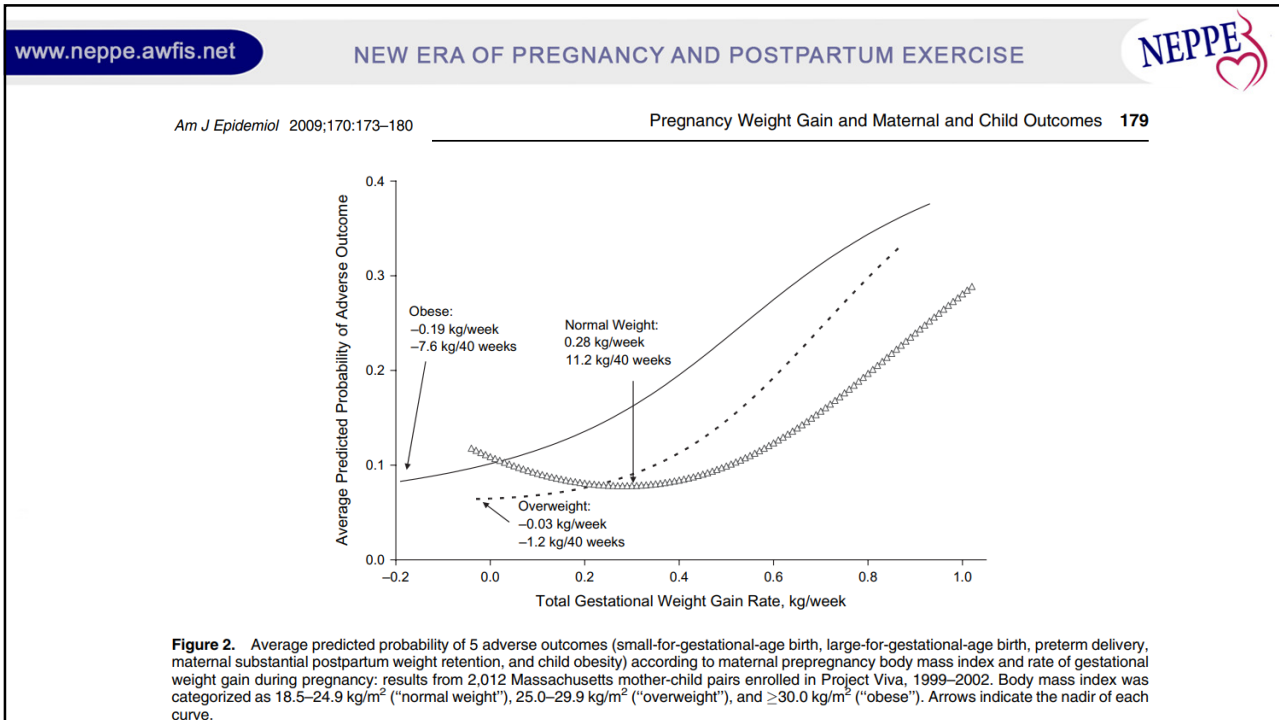
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 The American College of Obstetricians and Gynecologists  
WOMEN'S HEALTH CARE PHYSICIANS

## COMMITTEE OPINION

Number 548 • January 2013  
Committee on Obstetric Practice

Individualized care and clinical judgment are necessary in the management of the overweight or obese woman who is gaining (or wishes to gain) less weight than recommended but has an appropriately growing fetus. Balancing the risks of fetal growth (in the large-for-gestational-age fetus and the small-for-gestational-age fetus), obstetric complications, and maternal weight retention is essential but will remain challenging until research provides evidence to further refine the recommendations for gestational weight gain, especially among women with high degrees of obesity.





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“Eat for two”



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## The importance of nutrition in pregnancy and lactation: lifelong consequences

Nicole E. Marshall, MD; Barbara Abrams, DrPH, RD; Linda A. Barbour, MD, MSPH; Patrick Catalano

A diet with balanced macronutrient intake provides the best chance for a healthy pregnancy and optimal perinatal outcomes.

A diet that consistently and substantially restricts any macronutrient should be avoided during pregnancy. Fad diets as promoted by the popular press are widespread and may be especially harmful during pregnancy because of the resulting nutrient imbalance and consequent nutrient deficiencies or ketosis.

American Journal of Obstetrics & Gynecology MAY 2022

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**efsa**  
European Food Safety Authority

Amended: 23 September 2019

PRI for protein

Age	PRI for Protein (g/kg bw <sup>(a)</sup> per day)
18–59 y	0.83
<b>Pregnancy</b>	
1 <sup>st</sup> trimester	+1 g/d <sup>(c)</sup>
2 <sup>nd</sup> trimester	+9 g/d <sup>(c)</sup>
3 <sup>rd</sup> trimester	+28 g/d <sup>(c)</sup>

(c): in addition to the PRI for protein of non-pregnant, non-lactating women

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**efsa**  
European Food Safety Authority

Amended: 23 September 2019

RIs for total fat and carbohydrates and AIs for fatty acids, dietary fibre and water

Age group (years)	Total carbohydrates (E%) <sup>(a)</sup>	Dietary fibre (g/d) <sup>(b)</sup>	Total fat (E%) <sup>(a)</sup>	SFA	LA (E%) <sup>(b)</sup>	ALA (E%) <sup>(b)</sup>	EPA+DHA (mg/d) <sup>(b)</sup>	DHA (mg/d) <sup>(b)</sup>	TFA	Age group (years)	Water (L/d) <sup>(b), (c)</sup>	
											M	F
≥ 18	45–60	25	20–35	ALAP	4	0.5	250		ALAP	≥ 18	2.5	2.0
<b>Pregnancy</b>												
			20–35	ALAP	4	0.5	250	+100–200 <sup>(e)</sup>	ALAP			2.3

ALA; α-linolenic acid; ALAP, as low as possible; d, day; DHA, docosahexaenoic acid; E% percentage of energy intake; EPA, eicosapentaenoic acid; F, female; L, liter; LA, linoleic acid; M, male; mo, months; SFA, saturated fatty acids; TFA, trans-fatty acids

(a): RI, reference intake range  
 (b): AI, adequate intake  
 (c): includes water from beverages of all kind, including drinking and mineral water, and from food moisture  
 (d): i.e. the second half of the first year of life (from the beginning of the 7<sup>th</sup> month to the 1<sup>st</sup> birthday)  
 (e): in addition to combined intakes of EPA and DHA of 250 mg/day

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Fundusze Europejskie Wzrost i Edukacja (Rozwój)

Rzeczpospolita Polska

NAVVA

Unia Europejska Europejski Fundusz Spożywczy

## PRIs and AIs for vitamins, females

Amended: 23 September 2019

Age group (years)	$\alpha$ -Tocopherol (mg/d)	Biotin ( $\mu$ g/d)	Choline (mg/d)	Cobalamin ( $\mu$ g/d)	Folate ( $\mu$ g DFE/d) <sup>(a)</sup>	Niacin (mg NE/MJ) <sup>(b)</sup>	Pantothenic acid (mg/day)	Riboflavin (mg/d)	Thiamin (mg/MJ)	Vitamin A ( $\mu$ g/d) <sup>(c)</sup>	Vitamin B6 (mg/d)	Vitamin C (mg/d)	Vitamin D ( $\mu$ g/d) <sup>(e)</sup>	Vitamin K ( $\mu$ g/d) <sup>(g)</sup>
$\geq 18$	11	40	400	4.0	<b>330</b>	<b>1.6</b>	5	<b>1.6</b>	<b>0.1</b>	<b>650</b>	<b>1.6</b>	<b>95</b>	15 <sup>(f)</sup>	70
<b>Pregnancy</b>														
	11	40	480	4.5	600	<b>1.6</b>	5	<b>1.9</b>	<b>0.1</b>	<b>700</b>	<b>1.8</b>	<b>105</b>	15 <sup>(f)</sup>	70

d, day; MJ, megajoule;

(a): DFE: dietary folate equivalents. For combined intakes of food folate and folic acid, DFEs can be computed as follows:  $\mu$ g DFE =  $\mu$ g food folate + (1.7  $\times$   $\mu$ g folic acid)

(b): NE: niacin equivalent (1 mg niacin = 1 niacin equivalent = 60 mg dietary tryptophan)

(c): RE: retinol equivalent, 1  $\mu$ g RE equals 1  $\mu$ g of retinol, 6  $\mu$ g of  $\beta$ -carotene and 12  $\mu$ g of other provitamin A carotenoids(e): for conversion between  $\mu$ g and International Units (IU) of vitamin D intake: 1  $\mu$ g = 40 IU and 0.025  $\mu$ g = 1 IU

(f): under conditions of assumed minimal cutaneous vitamin D synthesis. In the presence of endogenous cutaneous vitamin D synthesis, the requirement for dietary vitamin D is lower or may be even zero.

(g): based on phyloquinone only

## PRIs and AIs for minerals, females

Amended: 23 September 2019

Age group (years)	Calcium (mg/d)	Age group (years)	Fluoride (mg/d)	Iodine ( $\mu$ g/d)	Manganese (mg/d)	Molybdenum ( $\mu$ g/d)	Phosphorus (mg/d)	Potassium (mg/d)	Selenium ( $\mu$ g/d)	Zinc (mg/d)		Age group (years)	Iron (mg/d)	Age group (years)	Copper (mg/d)	Magnesium (mg/d)		
										LPI (mg/d)								
18-24	<b>1,000</b>	$\geq 18$	2.9	150	3.0	65	550	3,500	70	300	<b>7.5</b>	$\geq 18$	<b>16<sup>(d)</sup></b>	$\geq 18$	1.3	300		
$\geq 25$	<b>950</b>									600	<b>9.3</b>						Premenopausal	<b>11</b>
										900	<b>11.0</b>						Postmenopausal	
										1,200	<b>12.7</b>							
<b>Pregnancy</b>																		
18-24	<b>1,000</b>		2.9	200	3.0	65	550	3,500	70		<b>+1.6<sup>(e)</sup></b>		<b>16<sup>(d)</sup></b>		1.5	300		
$\geq 25$	<b>950</b>																	

d, day; LPI, level of phytate intake;

PRIs are presented in **bold type** and AIs in ordinary type

(d): The PRI covers the requirement of approximately 95% of premenopausal women.

(e): in addition to the PRIs for non-pregnant, non-lactating women.

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Nutrient	Adult woman	Pregnancy
Energy (kcal)	2,403	2,743 <sup>c</sup> , 2,855 <sup>d</sup>
Protein (g/kg/d)	0.8	1.1
Carbohydrate (g/d)	130	175
Total fiber (g/d)	25	28
Linoleic acid (g/d)	12	13
Vitamin A ( $\mu\text{g}$ RAE <sup>e</sup> )	700	770
Vitamin D ( $\mu\text{g}$ )	5	5
Vitamin E (mg $\alpha$ -tocopherol)	15	15
Vitamin K ( $\mu\text{g}$ )	90	90
Vitamin C (mg)	75	85
Thiamin (mg)	1.1	1.4
Riboflavin (mg)	1.1	1.4
Vitamin B-6 (mg)	1.3	1.9
Niacin (mg NE <sup>f</sup> )	14	18
Folate ( $\mu\text{g}$ dietary folate equivalents)	400	600
Vitamin B-12 ( $\mu\text{g}$ )	2.4	2.6
Pantothenic acid (mg)	5	6
Biotin ( $\mu\text{g}$ )	30	30
Choline (mg)	425	450

(Institute of Medicine. *Dietary Reference Intakes: The Essential Guide to Nutrient Requirements* Washington, DC: National Academies Press; 2006).

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Nutrient	Adult woman	Pregnancy
Calcium (mg)	1,000	1,000
Phosphorus (mg)	700	700
Magnesium (mg)	320	350
Iron (mg)	8	27
Zinc (mg)	8	11
Iodine ( $\mu\text{g}$ )	150	220
Selenium ( $\mu\text{g}$ )	55	60
Fluoride (mg)	3	3
Manganese (mg)	1.8	2.0
Molybdenum ( $\mu\text{g}$ )	45	50
Chromium ( $\mu\text{g}$ )	25	30
Copper ( $\mu\text{g}$ )	900	1,000
Sodium (mg)	2,300	2,300
Potassium (mg)	4,700	4,700

(Institute of Medicine. *Dietary Reference Intakes: The Essential Guide to Nutrient Requirements* Washington, DC: National Academies Press; 2006).


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## How to comply with all this nutrition recommendations without a tailored food plan?














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The message should be "eat better, not more."

This can be achieved by basing diet on a variety of nutrient-dense, whole foods, including fruits, vegetables, legumes, whole grains, healthy fats with omega-3 fatty acids that include nuts and seeds, and fish, in place of poorer quality highly processed foods.

**American Journal of Obstetrics & Gynecology MAY 2022**

## My Pregnancy Plate

**Choose large portions of a variety of non-starchy vegetables, such as leafy greens, broccoli, carrots, peppers or cabbage.**

**Choose small amounts of healthy oils (olive and canola) for cooking or to flavor foods. Nuts, seeds and avocados contain healthy fats.**

**Choose a variety of whole fruits. Limit juice and dried fruits. Fruit is great for snacks and dessert, too.**

**Aim for at least 30 minutes of walking or another physical activity each day.**

**Choose 2 to 3 servings of nonfat or 1% milk or yogurt (cow, soy or almond). A serving is 8 oz. Choose yogurt with less than 15 g of sugar per serving.**

**Drink mainly water, decaf tea or decaf coffee and avoid sugary beverages.**

**Choose protein sources such as poultry, beans, nuts, low-mercury seafood, eggs, tofu or low-fat cheese. Limit red meat and avoid cold cuts and other processed meats.**

**Choose whole grains, such as whole wheat bread or pasta, brown rice, quinoa or oats and other healthy starches like beans, lentils, sweet potatoes or acorn squash. Limit white bread, white rice and fried potatoes.**

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### Summary of foodborne pathogens that can cause potential harm in pregnancy

	Consequences of infection in pregnancy	Foods to avoid	Further comments
<b>Listeriosis</b>	Can cause miscarriage, stillbirth or severe illness in the newborn.	Pâté and mould-ripened soft cheeses, e.g. Brie, Camembert, blue-veined cheeses; unpasteurised milk and milk products.	Destroyed by heat, so re-heat ready-prepared meals thoroughly. Wash fruit and vegetables well.

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Ministerstwo Zdrowia

Narodowy Instytut Higieny i Epidemiologii

Urząd Rejonowy Państwowej Inspekcji Sanitarnej

Unia Europejska







*Nutrition Bulletin, 31, 28–59*


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<b>Salmonella</b>	In severe cases may cause miscarriage or premature labour.	Raw eggs or foods containing raw or partially cooked eggs, e.g. home-made mayonnaise.	Cook eggs until white and yolk are solid. Cook all meat, particularly poultry, thoroughly.

*Nutrition Bulletin, 31, 28–59*














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Summary of foodborne pathogens that can cause potential harm in pregnancy

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<b>Salmonella</b>	In severe cases may cause miscarriage or premature labour.	Raw eggs or foods containing raw or partially cooked eggs, e.g. home-made mayonnaise.	Cook eggs until white and yolk are solid. Cook all meat, particularly poultry, thoroughly.
<b>Toxoplasmosis</b>	In rare cases can lead to severe fetal abnormalities.	Raw or undercooked meat; unpasteurised milk and milk products.	Avoid contact with soil or cat liver trays by wearing gloves.

*Nutrition Bulletin, 31, 28–59*

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Summary of foodborne pathogens that can cause potential harm in pregnancy

	Consequences of infection in pregnancy	Foods to avoid	Further comments
<b>Listeriosis</b>	Can cause miscarriage, stillbirth or severe illness in the newborn.	Pâté and mould-ripened soft cheeses, e.g. Brie, Camembert, blue-veined cheeses; unpasteurised milk and milk products.	Destroyed by heat, so re-heat ready-prepared meals thoroughly. Wash fruit and vegetables well.
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<b>Toxoplasmosis</b>	In rare cases can lead to severe fetal abnormalities.	Raw or undercooked meat; unpasteurised milk and milk products.	Avoid contact with soil or cat liver trays by wearing gloves.
<b>Campylobacter</b>	May cause premature birth, spontaneous abortion or stillbirth.	Raw or undercooked poultry; unpasteurised milk and milk products.	Domestic pets and soil can also be a source of infection.

Nutrition Bulletin, 31, 28–59

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Exercise and Physical Activity During Pregnancy and Postpartum

Evidence-Based Guidelines

Rita Santos-Rocha  
Editor

Second Edition

Springer

Active Pregnancy guide

physical activity, nutrition and sleep

Rita Santos-Rocha  
Alma Siqueira  
Janina Wojcik  
Natalia Myer  
Maria-Isabel S. Silva  
Rui Jorge  
Miguel Angel Ordoñez-Cara

Jorge, R., Teixeira, D., Ferreira, I., Alvarez-Falcón, AL. (2022). Diet Recommendations for the Pregnant Exerciser and Athlete. In: Santos-Rocha, R. (eds) Exercise and Physical Activity During Pregnancy and Postpartum. Springer, Cham. [https://doi.org/10.1007/978-3-031-06137-0\\_14](https://doi.org/10.1007/978-3-031-06137-0_14)

Santos-Rocha et al. Active Pregnancy Guide: Physical Activity, Nutrition and Sleep. Sports School of Rio Maior, Polytechnic Institute of Santarém. Santarém, Portugal. ISBN: 978-989-8768-50-6










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# Questions?

 **rui.jorge@ipleiria.pt**

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## Nutritional & weight loss recommendations for postpartum clients

**Rui Jorge, PhD Clinical Nutrition**

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**EER - Estimated Energy Requirement (kcal/day):**

**1<sup>st</sup> Semester** = EER for the adolescent or adult woman + 500\* - 170\*\*

**2<sup>nd</sup> Semester** = EER for the adolescent or adult woman + 400\* - 0\*\*

\* Increment in total energy expenditure for milk production.

\*\* Decrease in energy needs due to weight loss.

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**Human milk**

Composititon

Component	Percentage
Water	87.5%
Carbohydrates	7.5%
Lipids	3.4%
Protein	1.4%
Others	0.2%

Energy value  
energy kcal, total metabolisable 66 kcal

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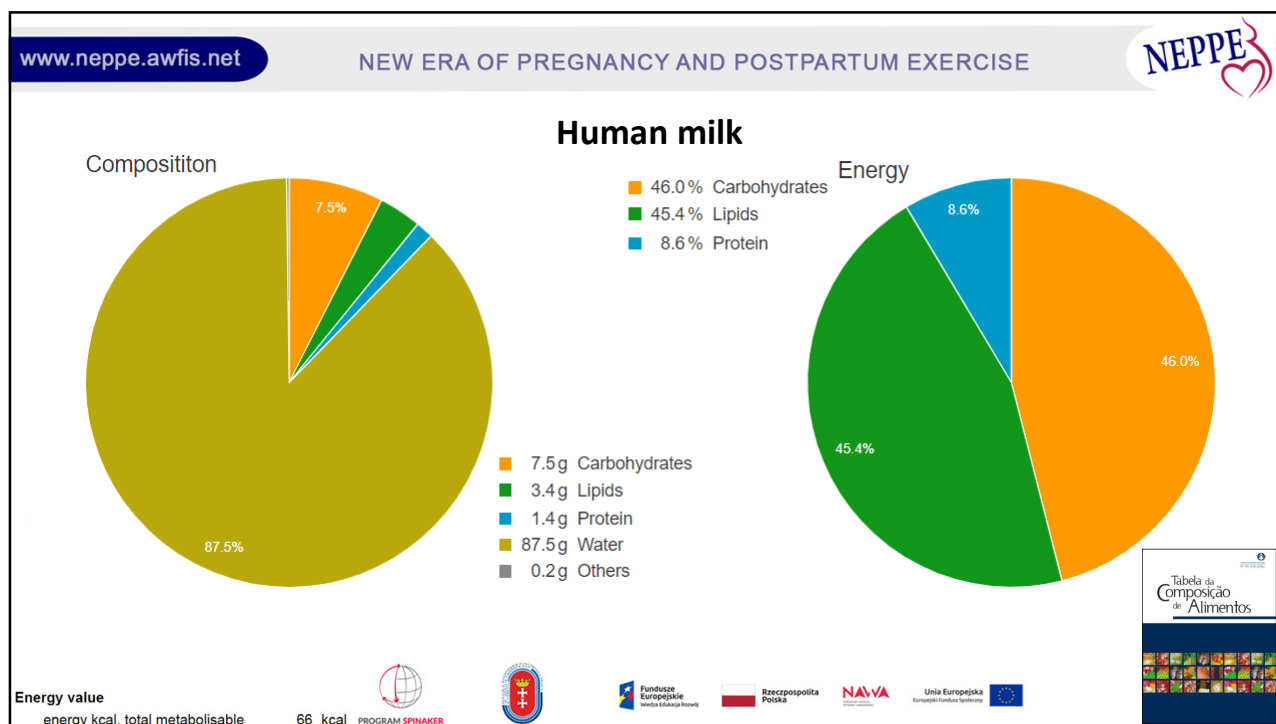
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Tabela de Composição de Alimentos



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### Nutritive content per 100g edible portion

Energy value		Vitamins		Minerals	
energy kcal, total metabolisable	66 kcal	vitamin A	68 µg	sodium	19 mg
energy kJ, total metabolisable	277kJ	vitamin D	0.1 µg	potassium	69 mg
<b>Macro nutrients</b>		alpha-tocopherol	0.35 mg	calcium	32 mg
<b>Lipids</b>		thiamin	0.08 mg	phosphorus	19 mg
fatty acids, total saturated	1.5 g	riboflavin	0.03 mg	magnesium	4 mg
fatty acids, total monounsaturated	1.3 g	niacin	0.7 mg	iron	0.1 mg
fatty acids, total polyunsaturated	0.4 g	vitamin B-6	0.01 mg	zinc	0.1 mg
fatty acid 18:2 n-6 cis,cis	0.3 g	vitamin B-12	0.01 µg		
fatty acids, total trans	0 g	vitamin C	4 mg		
<b>Carbohydrates</b>		folate	6 µg		
lactose	7.5 g	<div style="border: 2px solid black; padding: 5px;">           ... immunoglobulins; pro and anti-inflammatory cytokines, microRNA, microbiota (e.g. Streptococcus, Staphylococcus, Serratia, Corynebacteria).         </div>			
protein	1.4 g				
water	87.5g				
cholesterol	16 mg				

Front. Pediatr., 16 October 2018

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Tabela de Composição de Alimentos

## The importance of nutrition in pregnancy and lactation: lifelong consequences

Nicole E. Marshall, MD; Barbara Abrams, DrPH, RD; Linda A. Barbour, MD, MSPH; Patrick Catalano

Human milk composition is influenced by maternal dietary intake during lactation and maternal adipose nutrient stores, which together influence maternal milk and nutrient production and composition.

American Journal of Obstetrics & Gynecology MAY 2022



### PRIs for protein

Age	PRI for Protein (g/kg bw <sup>(a)</sup> per day)
18–59 y	0.83
<b>Pregnancy</b>	
1 <sup>st</sup> trimester	+1 g/d <sup>(c)</sup>
2 <sup>nd</sup> trimester	+9 g/d <sup>(c)</sup>
3 <sup>rd</sup> trimester	+28 g/d <sup>(c)</sup>
<b>Lactation</b>	
0–6 mo <i>post partum</i>	+19 g/d <sup>(c)</sup>
>6 mo <i>post partum</i>	+13 g/d <sup>(c)</sup>

(c): in addition to the PRI for protein of non-pregnant, non-lactating women



Amended: 23 September 2019



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**efsa**  
European Food Safety Authority

Amended: 23 September 2019

RI for total fat and carbohydrates and AIs for fatty acids, dietary fibre and water

Age group (years)	Total carbohydrates (E%) <sup>(a)</sup>	Dietary fibre (g/d) <sup>(b)</sup>	Total fat (E%) <sup>(a)</sup>	SFA	LA (E%) <sup>(b)</sup>	ALA (E%) <sup>(b)</sup>	EPA+DHA (mg/d) <sup>(b)</sup>	DHA (mg/d) <sup>(b)</sup>	TFA	Age group (years)	Water (L/d) <sup>(b), (c)</sup>	
											M	F
≥ 18	45–60	25	20–35	ALAP	4	0.5	250		ALAP	≥ 18	2.5	2.0
<b>Pregnancy</b>												
			20–35	ALAP	4	0.5	250	+100–200 <sup>(d)</sup>	ALAP			2.3
<b>Lactation</b>												
			20–35	ALAP	4	0.5	250	+100–200 <sup>(d)</sup>	ALAP			2.7

ALA; α-linolenic acid; ALAP, as low as possible; d, day; DHA, docosahexaenoic acid; E% percentage of energy intake; EPA, eicosapentaenoic acid; F, female; L, liter; LA, linoleic acid; M, male; mo, months; SFA, saturated fatty acids; TFA, trans-fatty acids

(a): RI, reference intake range  
 (b): AI, adequate intake  
 (c): includes water from beverages of all kind, including drinking and mineral water, and from food moisture  
 (d): i.e. the second half of the first year of life (from the beginning of the 7<sup>th</sup> month to the 1<sup>st</sup> birthday)  
 (e): in addition to combined intakes of EPA and DHA of 250 mg/day

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PRIs and AIs for vitamins, females

**efsa**  
European Food Safety Authority

Amended: 23 September 2019

Age group (years)	α-Tocopherol (mg/d)	Biotin (µg/d)	Choline (mg/d)	Cobalamin (µg/d)	Folate (µg DFE/d) <sup>(a)</sup>	Niacin (mg NE/MJ) <sup>(b)</sup>	Pantothenic acid (mg/day)	Riboflavin (mg/d)	Thiamin (mg/MJ)	Vitamin A (µg/d) <sup>(c)</sup>	Vitamin B6 (mg/d)	Vitamin C (mg/d)	Vitamin D (µg/d) <sup>(e)</sup>	Vitamin K (µg/d) <sup>(g)</sup>
≥ 18	11	40	400	4.0	330	1.6	5	1.6	0.1	650	1.6	95	15 <sup>(f)</sup>	70
<b>Pregnancy</b>														
	11	40	480	4.5	600	1.6	5	1.9	0.1	700	1.8	105	15 <sup>(f)</sup>	70
<b>Lactation</b>														
	11	45	520	5.0	500	1.6	7	2.0	0.1	1,300	1.7	155	15 <sup>(f)</sup>	70

d, day; MJ, megajoule;


(a): DFE: dietary folate equivalents. For combined intakes of food folate and folic acid, DFEs can be computed as follows: µg DFE = µg food folate + (1.7 × µg folic acid)  
 (b): NE: niacin equivalent (1 mg niacin = 1 niacin equivalent = 60 mg dietary tryptophan)  
 (c): RE: retinol equivalent, 1 µg RE equals 1 µg of retinol, 6 µg of β-carotene and 12 µg of other provitamin A carotenoids  
 (e): for conversion between µg and International Units (IU) of vitamin D intake: 1 µg = 40 IU and 0.025 µg = 1 IU  
 (f): under conditions of assumed minimal cutaneous vitamin D synthesis. In the presence of endogenous cutaneous vitamin D synthesis, the requirement for dietary vitamin D is lower or may be even zero.  
 (g): based on phyloquinone only


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e.g. folate food sources

B9	250 µg / 100 g	210 µg / 100 g	200 µg / 100 g	170 µg / 100 g	160 µg / 100 g
	Fortified whole wheat flakes		Boiled cowpeas		Watercress
					Fortified corn flakes
					Boiled asparagus

Instituto Nacional de Saúde Doutor Ricardo Jorge, Tabela da Composição de Alimentos. 2019  
Silva et al. Nutrição e Alimentação na Gravidez. DGS. 2021

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PRIs and AIs for minerals, females Amended: 23 September 2019

Age group (years)	Calcium (mg/d)	Age group (years)	Fluoride (mg/d)	Iodine (µg/d)	Manganese (mg/d)	Molybdenum (µg/d)	Phosphorus (mg/d)	Potassium (mg/d)	Selenium (µg/d)	Zinc (mg/d)		Age group (years)	Iron (mg/d)	Age group (years)	Copper (mg/d)	Magnesium (mg/d)
										LPI (mg/d)						
18–24	<b>1,000</b>	≥ 18	2.9	150	3.0	65	550	3,500	70	300	<b>7.5</b>	≥ 18 Premenopausal Postmenopausal	<b>16<sup>(d)</sup></b> <b>11</b>	≥ 18	1.3	300
≥ 25	<b>950</b>									600	<b>9.3</b>					
										900	<b>11.0</b>					
										1,200	<b>12.7</b>					
<b>Pregnancy</b>																
18–24	<b>1,000</b>		2.9	200	3.0	65	550	3,500	70		<b>+1.6<sup>(e)</sup></b>		<b>16<sup>(d)</sup></b>		1.5	300
≥ 25	<b>950</b>															
<b>Lactation</b>																
18–24	<b>1,000</b>		2.9	200	3.0	65	550	4,000	85		<b>+2.9<sup>(e)</sup></b>		<b>16<sup>(d)</sup></b>		1.5	300
≥ 25	<b>950</b>															

d, day; LPI, level of phytate intake; (d): The PRI covers the requirement of approximately 95% of premenopausal women.  
PRIs are presented in **bold type** and AIs in ordinary type (e): in addition to the PRIs for non-pregnant, non-lactating women.


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### e.g. iodine food sources



Food Source	Iodine Content (µg / 100g)
Codfish	138 µg / 100g
Sardine	26 µg / 100g
Horse Mackerel	44 µg / 100g
Egg	24 µg / 100g

WHO Regional Office for Europe, Scientific update on the iodine content of Portuguese foods. 2018  
Silva et al. Nutrição e Alimentação na Gravidez. DGS. 2021



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Nutrient	Adult woman	Pregnancy	Lactation (0-6 mo)
Energy (kcal)	2,403	2,743 <sup>c</sup> , 2,855 <sup>d</sup>	2,698
Protein (g/kg/d)	0.8	1.1	1.1
Carbohydrate (g/d)	130	175	210
Total fiber (g/d)	25	28	29
Linoleic acid (α/d)	12	13	13
Vitamin A (µg RAE <sup>a</sup> )	700	770	1,300
Vitamin D (µg)	5	5	5
Vitamin E (mg α-tocopherol)	15	15	19
Vitamin K (µg)	90	90	90
Vitamin C (mg)	75	85	120
Thiamin (mg)	1.1	1.4	1.4
Riboflavin (mg)	1.1	1.4	1.6
Vitamin B-6 (mg)	1.3	1.9	2.0
Niacin (mg NE <sup>b</sup> )	14	18	17
Folate (µg dietary folate equivalents)	400	600	500
Vitamin B-12 (µg)	2.4	2.6	2.8
Pantothenic acid (mg)	5	6	7
Biotin (µg)	30	30	35
Choline (mg)	425	450	550

<sup>a</sup>Data from reference 22 (Institute of Medicine. *Dietary Reference Intakes: The Essential Guide to Nutrient Requirements* Washington, DC: National Academies Press; 2006).  
<sup>b</sup>Values are Recommended Dietary Allowances except for energy (Estimated Energy Requirement) and total fiber, linoleic acid, α-linolenic acid, vitamin D, vitamin K, pantothenic acid, biotin, choline, calcium, manganese, chromium, sodium and potassium (Adequate Intakes).  
<sup>c</sup>Second trimester for women age 19 to 50 years.  
<sup>d</sup>Third trimester for women age 19 to 50 years.  
<sup>e</sup>RAE – retinol activity equivalents.  
<sup>f</sup>NE – niacin equivalents.

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e.g. ascorbic acid food sources

					
	108 mg / 100 g	77 mg / 100 g	72 mg / 100 g	68 mg / 100 g	60 mg / 100 g
	Bell pepper	Watercress	Kiwi	Papaya	Boiled Brussels sprouts

Instituto Nacional de Saúde Doutor Ricardo Jorge, Tabela da Composição de Alimentos. 2019  
Silva et al. Nutrição e Alimentação na Gravidez. DGS. 2021

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Nutrient	Adult woman	Pregnancy	Lactation (0-6 mo)
Calcium (mg)	1,000	1,000	1,000
Phosphorus (mg)	700	700	700
Magnesium (mg)	320	350	310
Iron (mg)	8	27	9
Zinc (mg)	8	11	12
Iodine (µg)	150	220	290
Selenium (µg)	55	60	70
Fluoride (mg)	3	3	3
Manganese (mg)	1.8	2.0	2.6
Molybdenum (µg)	45	50	50
Chromium (µg)	25	30	45
Copper (µg)	900	1,000	1,300
Sodium (mg)	2,300	2,300	2,300
Potassium (mg)	4,700	4,700	5,100

<sup>1</sup>Data from reference 22 (Institute of Medicine. *Dietary Reference Intakes: The Essential Guide to Nutrient Requirements* Washington, DC: National Academies Press; 2006).

<sup>2</sup>Values are Recommended Dietary Allowances except for energy (Estimated Energy Requirement) and total fiber, linoleic acid, α-linolenic acid, vitamin D, vitamin K, pantothenic acid, biotin, choline, calcium, manganese, chromium, sodium and potassium (Adequate Intakes).

<sup>3</sup>Second trimester for women age 19 to 50 years.

<sup>4</sup>Third trimester for women age 19 to 50 years.

<sup>5</sup>RAE=retinol activity equivalents.

<sup>6</sup>NE=niacin equivalents.

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e.g. copper food sources

					
	2,2 mg / 100 g	1,8 mg / 100 g	1,8 mg / 100 g	1,7 mg / 100 g	1,6 mg / 100 g
	Cashew	Sunflower seeds	Brazil nut	Sesame seeds	Chia seeds

National Food Institute Technical  
University of Denmark, Danish food  
composition database FRIDA. 2019  
Silva et al. Nutrição e Alimentação na  
Gravidez. DGS. 2021







     

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**Common ground for healthy dietary patterns**

- Whole, unprocessed foods and beverages
- Rich in fruits and vegetables
- Whole grains and complex carbohydrates, including ancient grains
- Healthy fats (monounsaturated and polyunsaturated), including nuts and seeds
- Healthy fish
- Plant-based protein
- Drink more water
- Lean meats and dairy products

*Marshall. Nutrition in pregnancy: lifelong consequences. Am J Obstet Gynecol 2022.*

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## Gestational Weight Gain and Long-term Maternal Obesity Risk: A Multiple-Bias Analysis


Hutchins, Franya<sup>a</sup>; Krafty, Robert<sup>b</sup>; El Khoudary, Samar R.<sup>a</sup>; Catov, Janet<sup>a</sup>; Colvin, Alicia<sup>a</sup>; Barinas-Mitchell, Emma<sup>a</sup>; Brooks, Maria M.<sup>a</sup>

**Results:**

Among the 2,339 women in this analysis, 937 (40%) experienced obesity in mid-life. In complete case analysis, women with excessive gestational weight gain had an estimated 39% greater risk of obesity (RR = 1.4, CI = 1.1, 1.7), covariate-adjusted.







Epidemiology: March 2021 - Volume 32 - Issue 2 - p 248-258

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- Just **20%** of women **return to their pre-pregnancy weight** within the **first three months postpartum**;
- Average weight retention at **6 months postpartum** is 12 lb ( $\approx 5.5$  kg), with 50% of women retaining >10 ( $\approx 4.5$  kg) and 25% >20 lb ( $\approx 9.1$  kg);
- Between 24 to 27% of women retain at least 10 lb ( $\approx 4.5$  kg) one year postpartum;
- “late postpartum period is the pre-conception period for the next pregnancy”

*Nutrition Research Reviews* (2018), **31**, 225–238

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**NEPPE**

How does anyone loss weight?

How to loss weight and still have a proper diet (mostly if lactating)?

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**NEPPE**

The energy deficit should be sufficiently small to do not hinder the nutritional intake.

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NEPPE

Diets to avoid during pregnancy ...and postpartum (if breastfeeding)

Atkins diet 20-40-100	Low carbohydrate (20 g), high fat, beef, pork, poultry, fish, eggs, cheese, and sources of fat	Limit starchy vegetables, grains, legumes, simple sugars, and milk
Paleo diet	Lean meats, fish, eggs, nuts, seeds, fruits, vegetables, and oils	Processed foods, wheat, other grains, legumes, dairy, potatoes, refined sugar, salt, and refined oils
Ketogenic diet	Extreme carbohydrate restriction ketosis, skin-on poultry, fattier beef, pork, fish, green leafy vegetables, oils, and solid fats	Avoid starchy root vegetables, bread, pasta, other grains, and fruit

BP, blood pressure; CVD, cardiovascular disease.

Marshall. Nutrition in pregnancy: lifelong consequences. *Am J Obstet Gynecol* 2022.

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NEPPE

## E.g. of a healthy diet

-Healthy dietary patterns as **Mediterranean Diet** fits all the recommendations for **pregnant women, postpartum women and sportswomen**, and should be promoted as a good diet for pregnant exercisers.

Jorge, R., Teixeira, D., Ferreira, I., Alvarez-Falcón, AL. (2022). Diet Recommendations for the Pregnant Exerciser and Athlete. In: Santos-Rocha, R. (eds) Exercise and Physical Activity During Pregnancy and Postpartum. Springer, Cham. [https://doi.org/10.1007/978-3-031-06137-0\\_14](https://doi.org/10.1007/978-3-031-06137-0_14)

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## Portuguese MedDiet Wheel


**RODA DA ALIMENTAÇÃO MEDITERRÂNICA**





 Escolha alimentos locais e de época  
 Beba vinho tinto e amarelo moderadamente  
 Limite-se dos frutos gordos  
 Use ervas aromáticas  
 Mantenha a gastronomia saudável  
 Mesa-se - Divirta-se  
 Partilha refeições - Partilha saberes



2017

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 **nutrients** 






Review

## Defining a Healthy Diet: Evidence for the Role of Contemporary Dietary Patterns in Health and Disease

Hellas Cena <sup>1,2,\*</sup>  and Philip C. Calder <sup>3,4</sup> 

fresh fruits and vegetables, whole grains, legumes, seeds, and nuts and lower in animal-based foods, particularly fatty and processed meats.

*Nutrients* 2020, 12, 334; doi:10.3390/nu12020334

# What does predict success in WL and WLM?

**Obesity Facts**  
The European Journal of Obesity

Obes Facts 2018;11:67–82

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www.karger.com/ofa

## Psychosocial Pretreatment Predictors of Weight Control: A Systematic Review Update

Eliana V. Carraça<sup>a</sup> Inês Santos<sup>a</sup> Jutta Mata<sup>b</sup> Pedro J. Teixeira<sup>a</sup>

self-efficacy). Many psychosocial factors remain too little studied to allow reliable conclusions regarding their predictive value. **Conclusion:** Previous dieting attempts were identified as the soundest predictor of successful weight management. Several factors, previously considered

↓ Previous dieting attempts

Pretreatment

What can we do with this info?

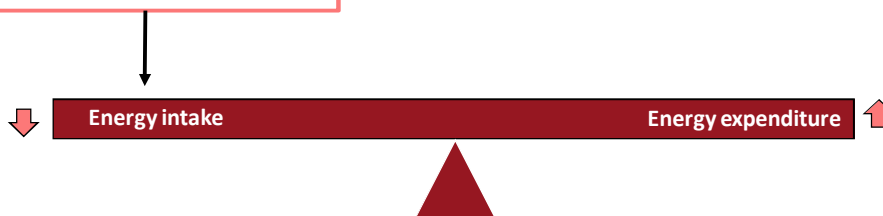
PREDITORES COMPORTAMENTAIS E PSICOSSOCIAIS DA PERDA E MANUTENÇÃO DO PESO PERDIDO A LONGO PRAZO: UMA REVISÃO CONCEPTUAL DE REVISÕES

Rui Jorge<sup>1,2</sup>; Inês Santos<sup>1</sup>; Eliana Veiga Carraça<sup>1</sup>; Vítor Hugo Teixeira<sup>1,2</sup>; Pedro Jorge Teixeira<sup>1</sup> ACTA PORTUGUESA DE NUTRIÇÃO 17 (2019) 16-20 | LICENÇA: cc-by-nc | <http://dx.doi.org/10.21011/apn.2019.1703>

ASSOCIAÇÃO PORTUGUESA DE NUTRIÇÃO<sup>3</sup> | [WWW.ACTAPORTUGUESADENUTRICAOP.T](http://WWW.ACTAPORTUGUESADENUTRICAOP.T) | [ACTAPORTUGUESADENUTRICAOP@AFN.ORG.PT](mailto:ACTAPORTUGUESADENUTRICAOP@AFN.ORG.PT)

# What does predict success in WL and WLM?

- ↑ Protein intake while reducing carbs and fat
- ↑ Dietary fiber intake
- ↓ Fat intake
- ↓ Sugar intake



↓ Previous dieting attempts

Pretreatment

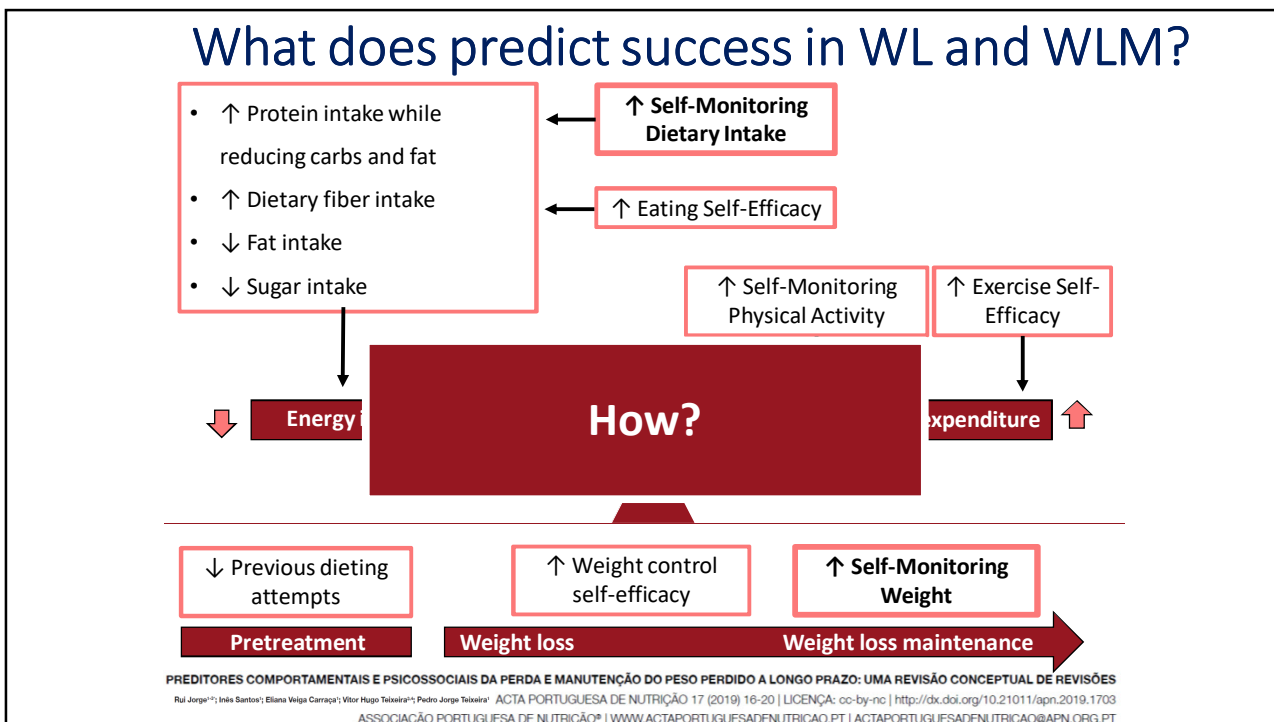
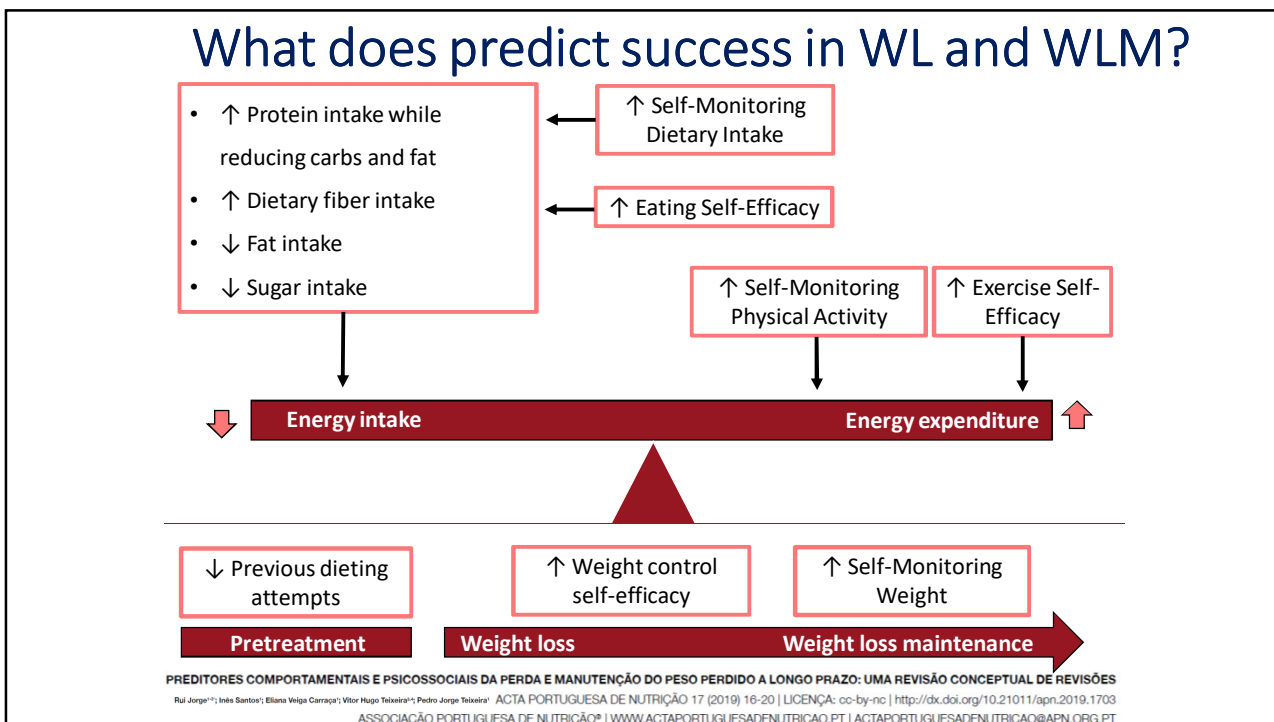
Weight loss

Weight loss maintenance

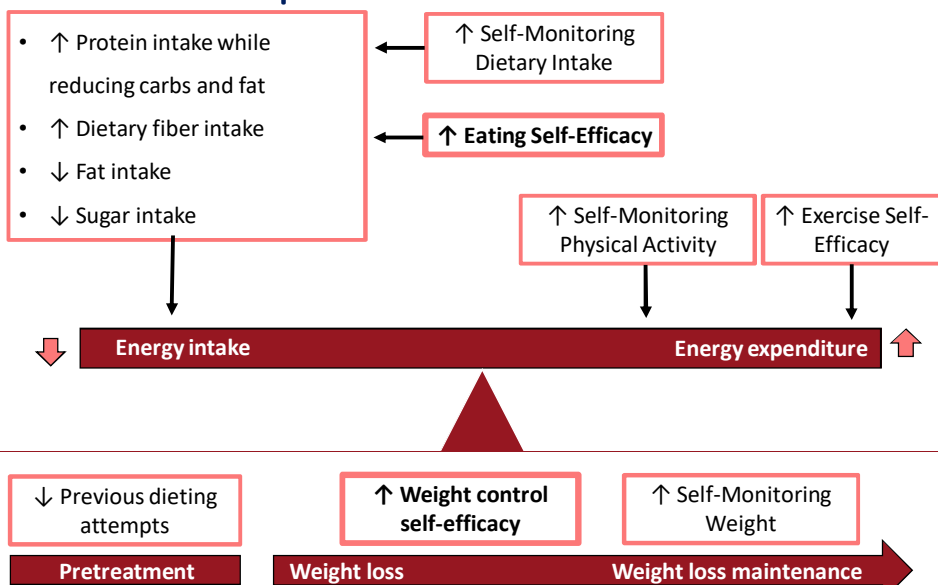
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## What does predict success in WL and WLM?



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Health Psychol Rev. 2014;8(3):270-85. doi: 10.1080/17437199.2013.813729. Epub 2013 Jul 15.

### How can self-efficacy be increased? Meta-analysis of dietary interventions.

Prestwich A<sup>1</sup>, Kellar J, Parker R, MacRae S, Learmonth M, Sykes B, Taylor N, Castle H.







- Determining and evaluating **goals** together – *process vs. results*.
- Promoting, suggesting how and “teaching” **self-monitoring** – *helping the client do find the best way (to her, not to us!)*.
- **Stress management** – *we can be part of the problem or part of the solution*.




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Systematic reviews indicate that interventions including both diet and physical activity along with individualised support and self-monitoring are more likely to be successful in promoting postpartum weight loss. High levels of attrition and poor engagement have been an issue in previous trials in this area.







*Nutrition Research Reviews* (2018), **31**, 225–238

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The difficulty of weight management at this stage of life should not be underestimated and careful consideration must be given to the design of interventions targeted at new mothers in order to identify the most appropriate settings and methods of supporting weight loss post-pregnancy. What works at other life stages may not necessarily work here owing to specific barriers to weight management encountered in the postpartum period.

*Nutrition Research Reviews* (2018), **31**, 225–238

## Successful weight loss maintenance: A systematic review of weight control registries

Catarina Paixão<sup>1</sup> | Carlos M. Dias<sup>2,3</sup> | Rui Jorge<sup>4,5</sup> | Eliana V. Carraça<sup>1</sup> |  
Mary Yannakoulia<sup>6</sup> | Martina de Zwaan<sup>7</sup> | Sirpa Soini<sup>8</sup> | James O. Hill<sup>9</sup> |  
Pedro J. Teixeira<sup>1</sup> | Inês Santos<sup>1,10</sup>



**52 studies included; 6888 participants from the 5 weight control registries**

In line with the most recent obesity treatment guidelines (3, 70, 71), the most frequently reported strategies encompassed reductions in energy intake and increases in energy expenditure (through physical activity/exercise). In fact, physical activity, total energy intake and also fat intake were the most consistent behavioral correlates of the magnitude of WLM, which is corroborated by a recent systematic review on




Obesity Reviews. 2020;1-15.

## Low- and non-caloric sweeteners

-If needed (e.g., gestational diabetes or weight management), consume foods with low- and non-caloric sweeteners (acesulfame potassium, aspartame, sucralose) in moderate amounts, adhering to the acceptable daily intake standards set by regulatory agencies. Avoid foods with cyclamate, saccharin and raw stevia leaf, as well as their infusions and extract.







Jorge, R., Teixeira, D., Ferreira, I., Alvarez-Falcón, AL. (2022). Diet Recommendations for the Pregnant Exerciser and Athlete. In: Santos-Rocha, R. (eds) Exercise and Physical Activity During Pregnancy and Postpartum. Springer, Cham. [https://doi.org/10.1007/978-3-031-06137-0\\_14](https://doi.org/10.1007/978-3-031-06137-0_14)

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## Caffeine

-Pregnant and lactating women **should minimize caffeine intake** up to a daily **maximum of 200 mg per day, which is equivalent to about two espresso coffees**. Opting for decaffeinated versions is a good way to reduce caffeine intake. We advise **against using caffeine supplementation as an ergogenic aid** in case of pregnancy or lactation.

Jorge, R., Teixeira, D., Ferreira, I., Alvarez-Falcón, AL. (2022). Diet Recommendations for the Pregnant Exerciser and Athlete. In: Santos-Rocha, R. (eds) Exercise and Physical Activity During Pregnancy and Postpartum. Springer, Cham. [https://doi.org/10.1007/978-3-031-06137-0\\_14](https://doi.org/10.1007/978-3-031-06137-0_14)

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 **Australian Government**  
Department of Health

## No safe level of alcohol consumption

To help keep you and your baby healthy, avoid drinking alcohol when you're:

- planning to become pregnant
- pregnant
- breastfeeding

Research by experts about alcohol and pregnancy shows that:

- No safe level of alcohol consumption during pregnancy or while breastfeeding has been identified.
- The risk of harm to the fetus increases the more the mother drinks and the more frequently drinks.

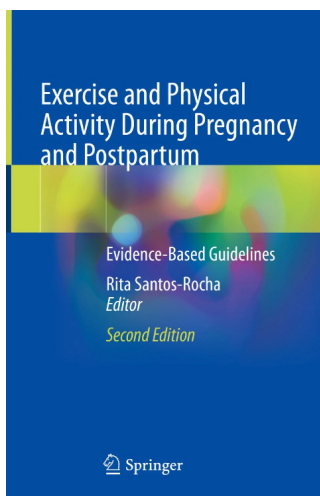
  

Report for systematic reviews of the association between different levels and patterns of maternal alcohol consumption during pregnancy and while breastfeeding and selected health outcomes for fetuses and children (up to age five)

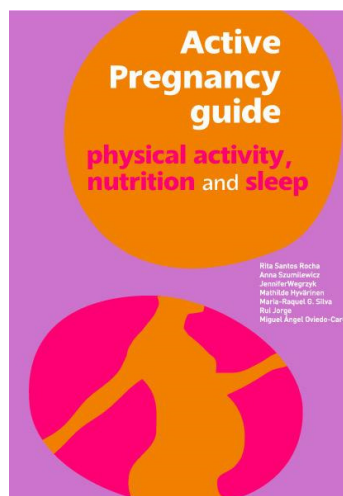
Prepared by  
Cochrane Australia and  
SAHMRI

Submitted: 23/11/2018





Jorge, R., Teixeira, D., Ferreira, I., Alvarez-Falcón, AL. (2022). Diet Recommendations for the Pregnant Exerciser and Athlete. In: Santos-Rocha, R. (eds) Exercise and Physical Activity During Pregnancy and Postpartum. Springer, Cham. [https://doi.org/10.1007/978-3-031-06137-0\\_14](https://doi.org/10.1007/978-3-031-06137-0_14)



Santos-Rocha et al. Active Pregnancy Guide: Physical Activity, Nutrition and Sleep. Sports School of Rio Maior, Polytechnic Institute of Santarém. Santarém, Portugal. ISBN: 978-989-8768-50-6

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## Questions?



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