

WEBNÁRIO GRATUITO  
DR. ERIC SLYWITCH  
para Médicos, Nutricionistas e  
Profissionais da Saúde

*“Quando alguém modifica seus hábitos alimentares, não significa que essa pessoa simplesmente mudou o que come, mas sim que a sua forma de se relacionar com o mundo foi transformada.”*

*Dr. Eric Slywitch*

**MATERIAL DIDÁTICO DOS 3  
WEBNÁRIOS REALIZADOS EM 2023**

# Sumário

Aula 1 - Quais ajustes nutricionais confirmam se a origem do colesterol alto é genética?

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Diretor do Departamento de Medicina e Nutrição da União Vegetariana Internacional (IVU)



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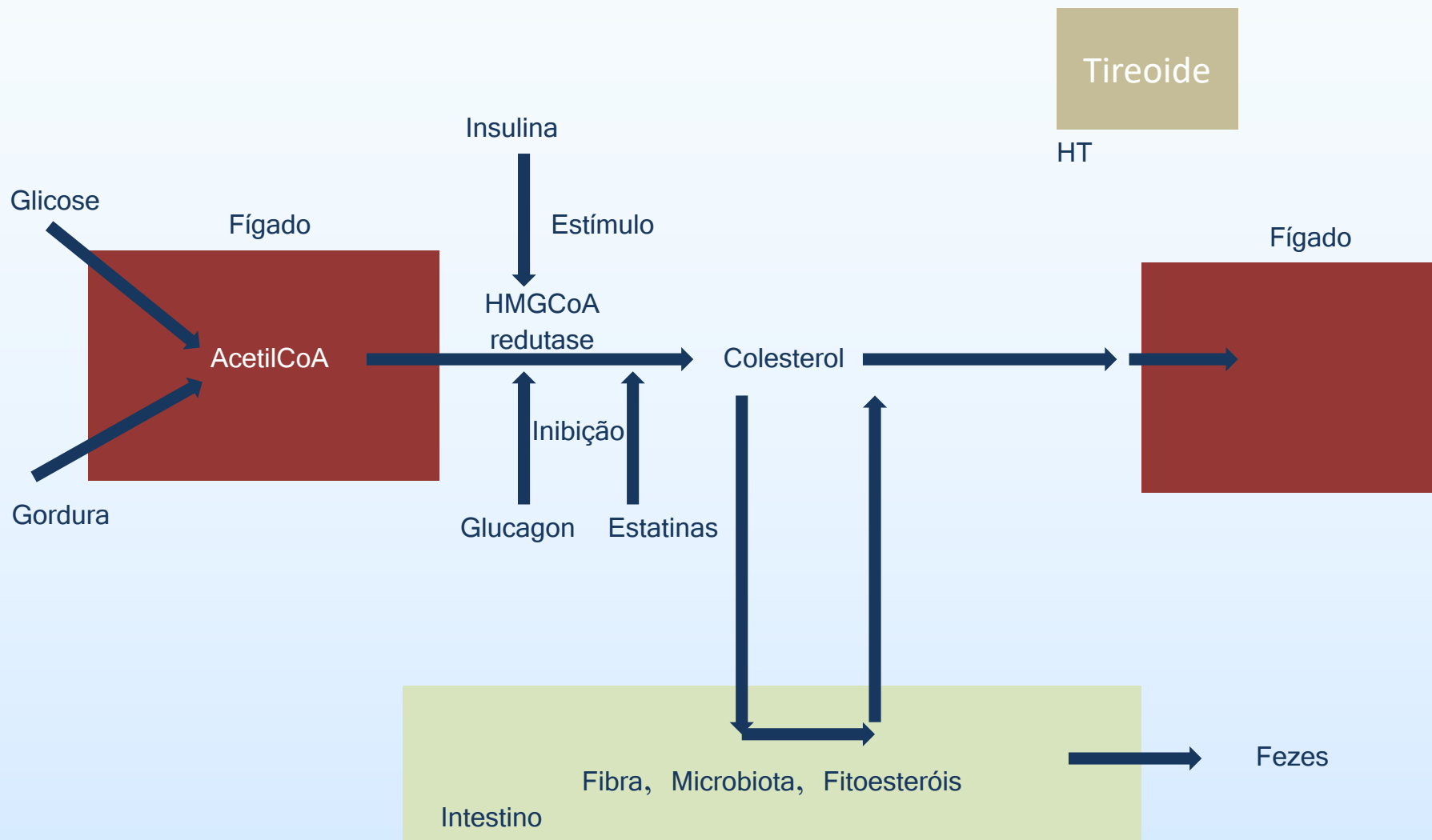
<https://www.eric Slywitch.com/av>

# 1º WEBNÁRIO

## “Quais ajustes nutricionais confirmam se a origem do colesterol alto é genética?”



# Cinética do Colesterol



# Ações metabólicas da fermentação de carboidratos e proteínas

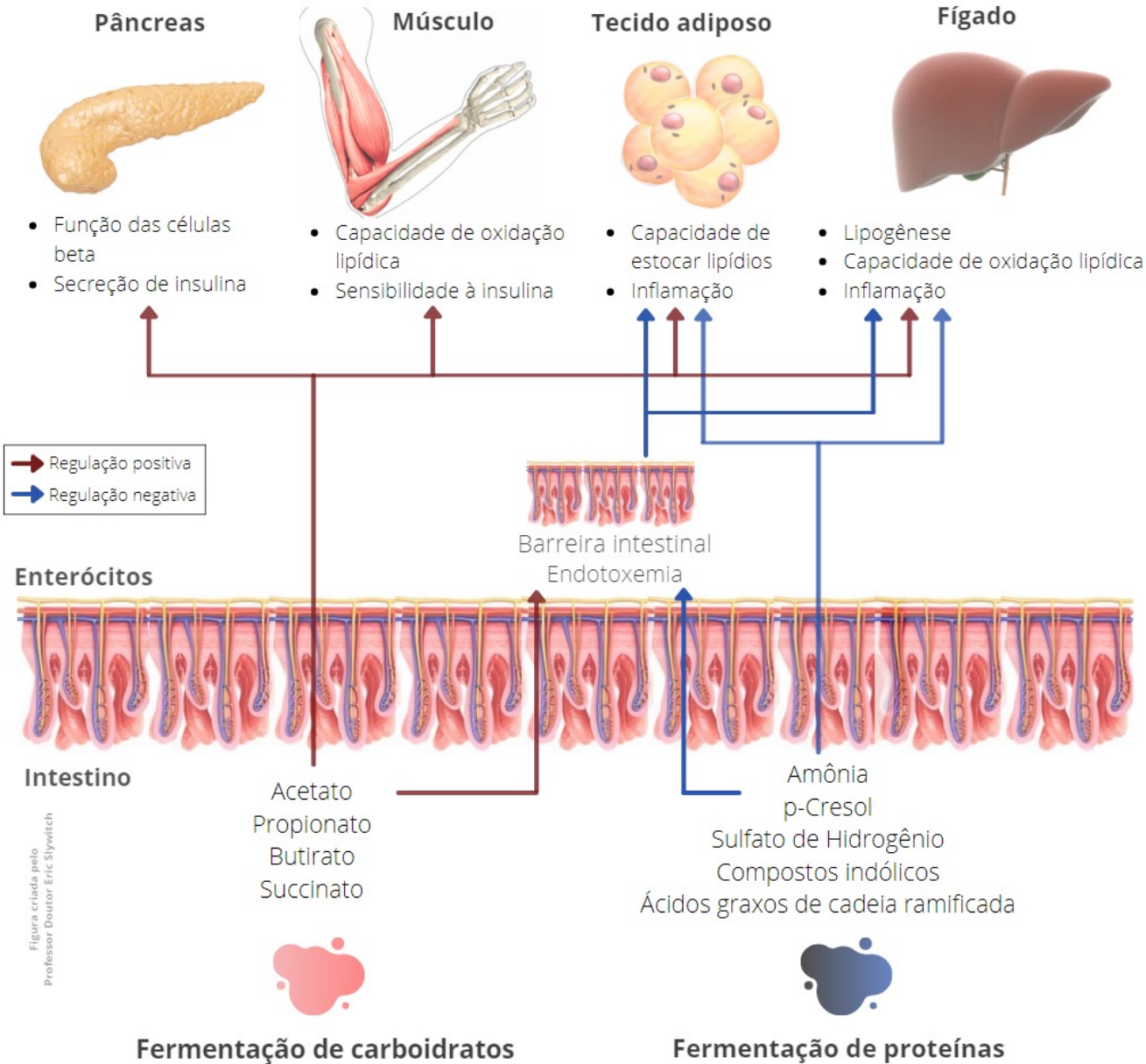
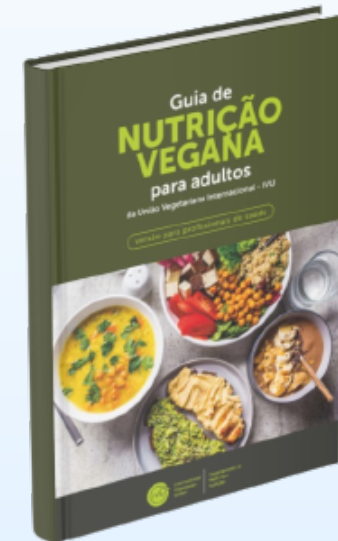


Figura criada pelo Professor Doutor Eric Slywitch



**Coprostanol**

Review Article

**Lipotoxicity: Effects of Dietary Saturated and Transfatty Acids**

Débora Estadella,<sup>1</sup> Claudia M. da Penha Oller do Nascimento,<sup>1</sup> Lila M. Oyama,<sup>1</sup>  
 Eliane B. Ribeiro,<sup>1</sup> Ana R. Dâmaso,<sup>2</sup> and Aline de Piano<sup>1</sup>

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Mediators of Inflammation

Volume 2013, Article ID 137579, 13 pages

<http://dx.doi.org/10.1155/2013/137579>

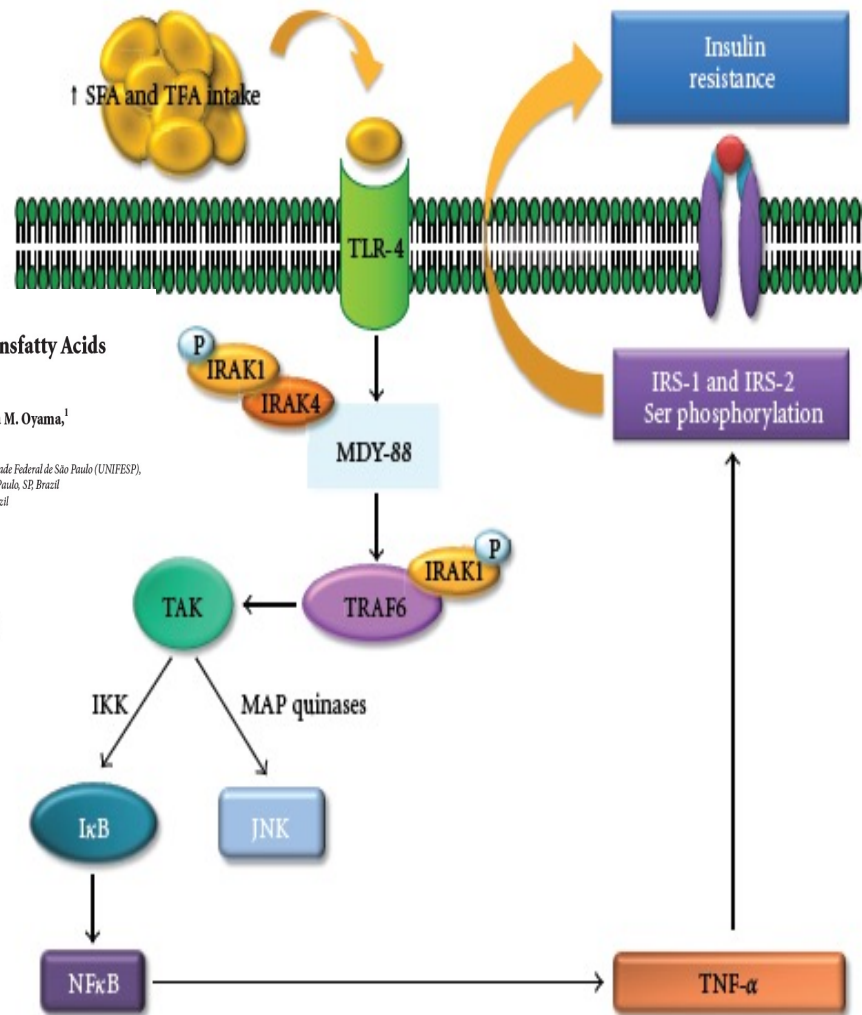
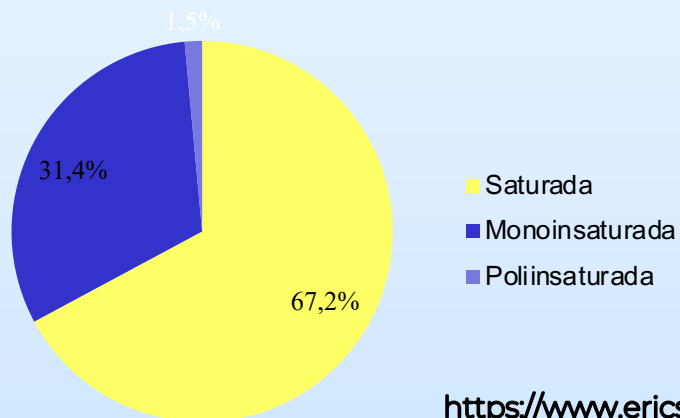
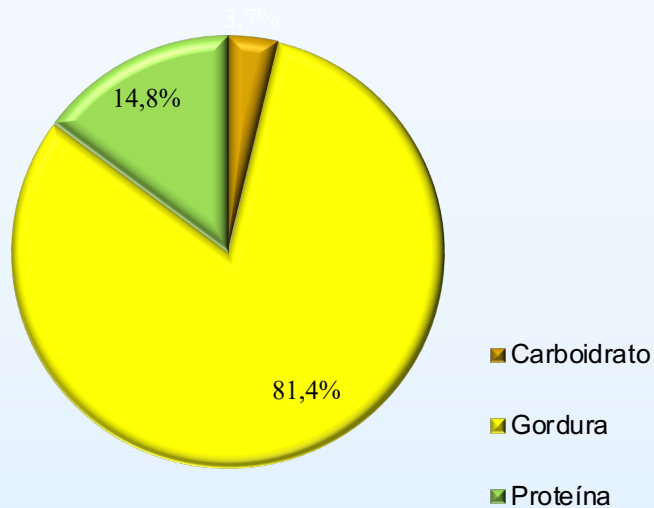
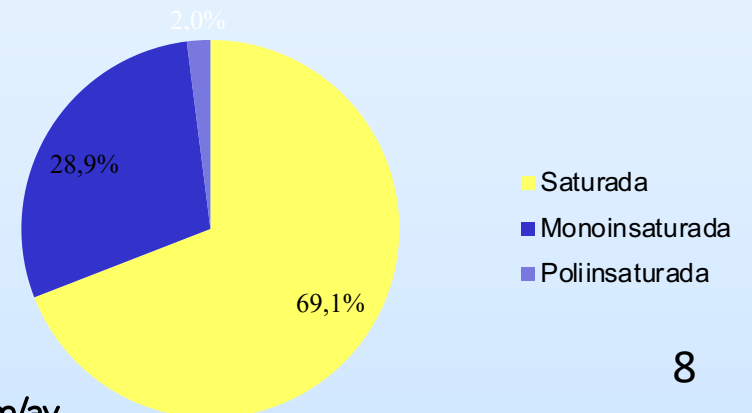
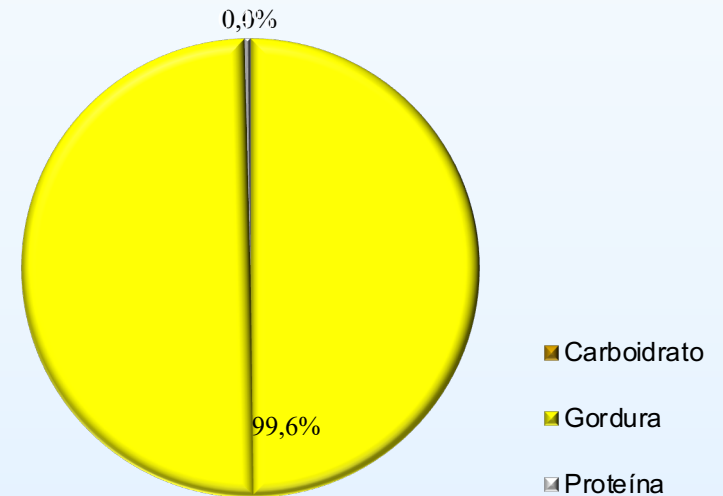


FIGURE 3: Schematic representation of SFA and TFA excess intake effects in the mechanisms of insulin resistance development. IκB: inhibitor of nuclear factor-κB, IKK: inhibitor of nuclear factor-κB kinase, IRAK-1: interleukin-1 receptor-associated kinase 1, IRAK-4: interleukin-1 receptor-associated kinase 4, IRS-1: insulin receptor substrate-1, IRS-2: insulin receptor substrate-2, JNK: Jun N-terminal kinase, MAP kinases: mitogen activated protein kinases, MDY-88: myeloid differentiation primary response gene (88), NF-κB: nuclear factor kappa B, P: phosphorus, TAK: thylakoid arabidopsis kinase, TLR-4: Toll-like receptor-4, TNF-α: tumor necrosis factor-alpha, TRAF-6: receptor-associated factor 6.

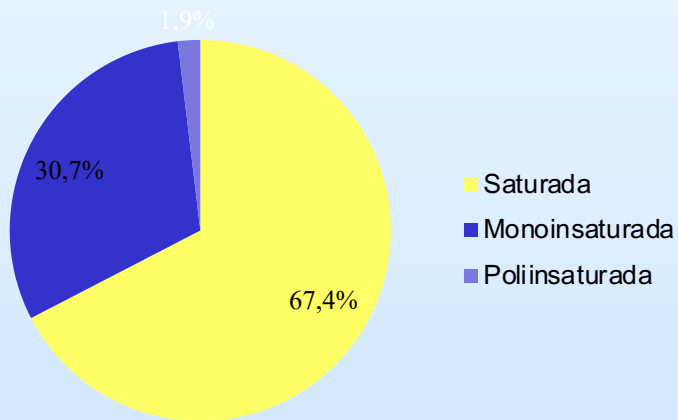
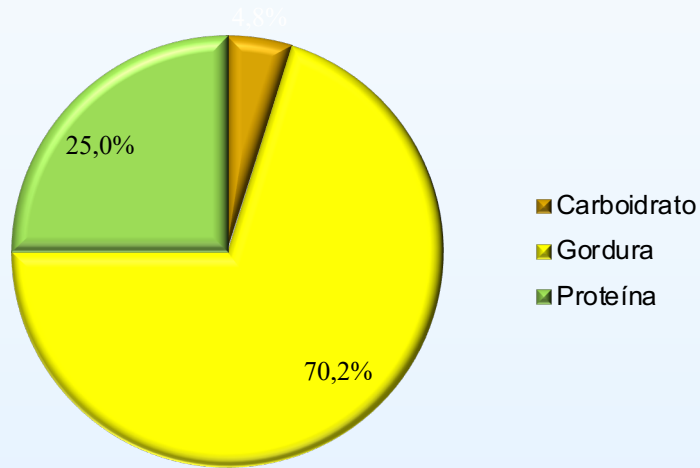
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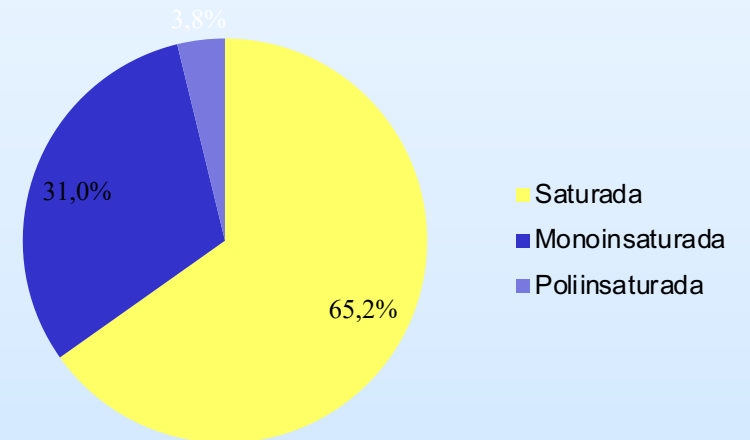
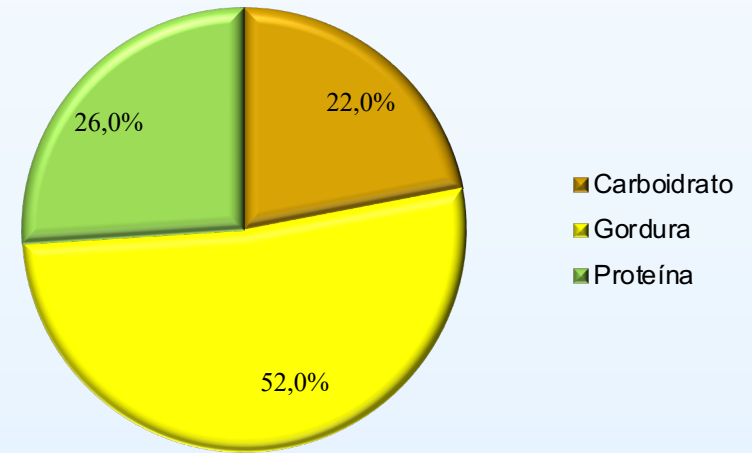
## Manteiga



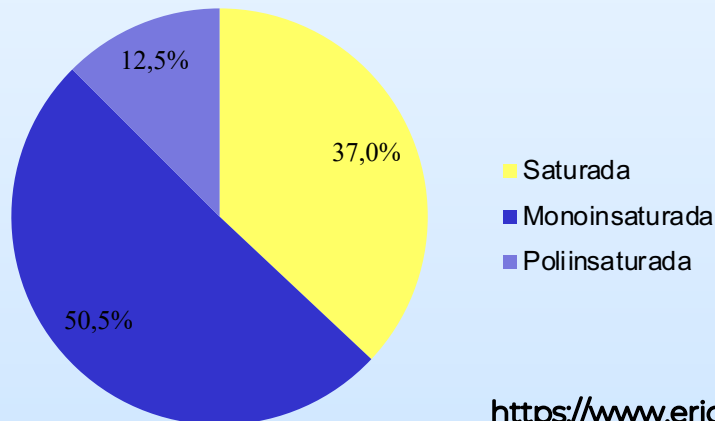
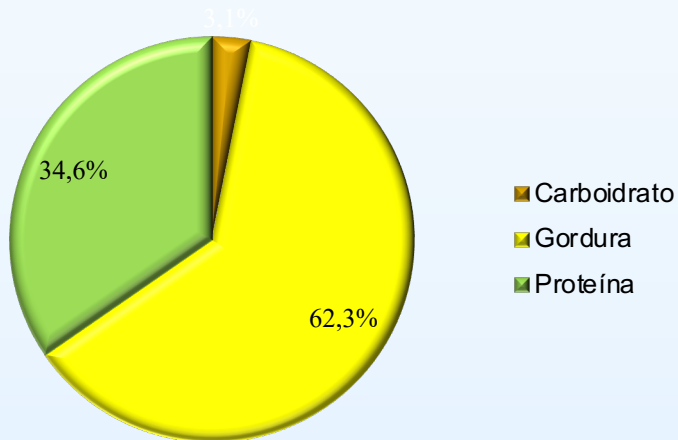
## Queijos



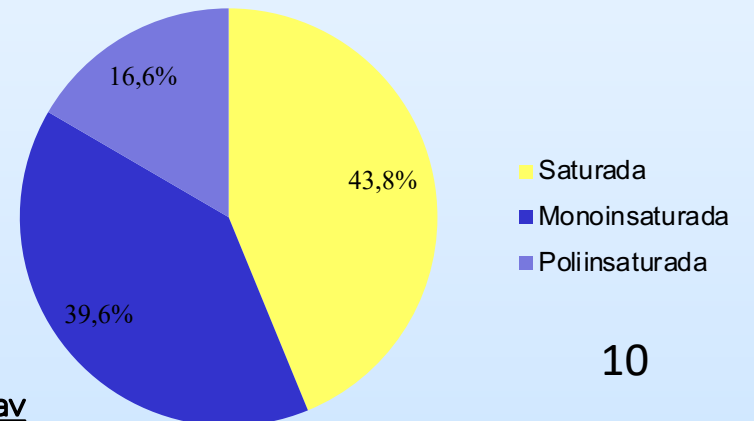
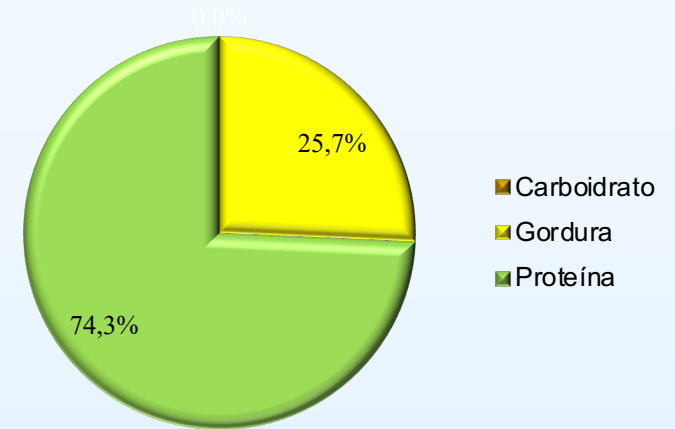
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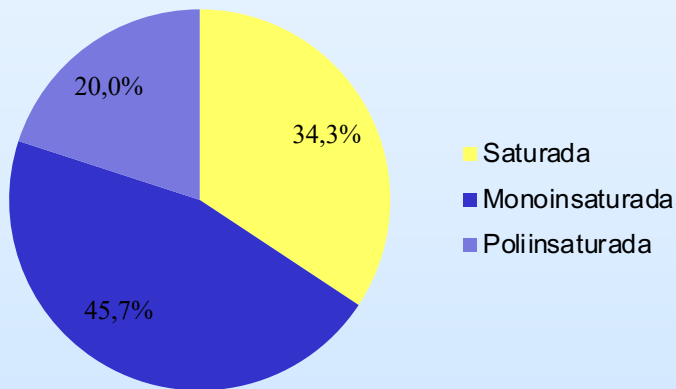
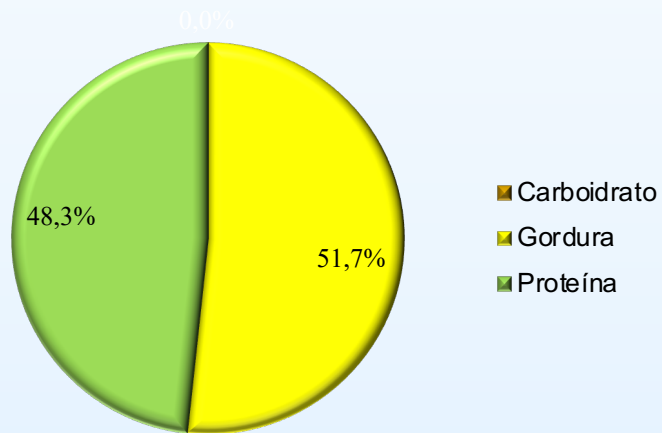
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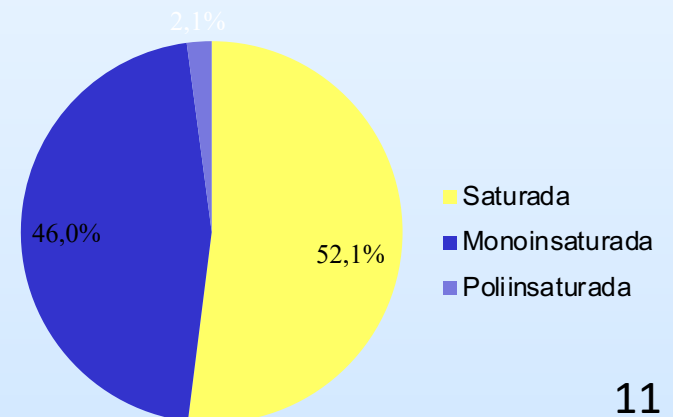
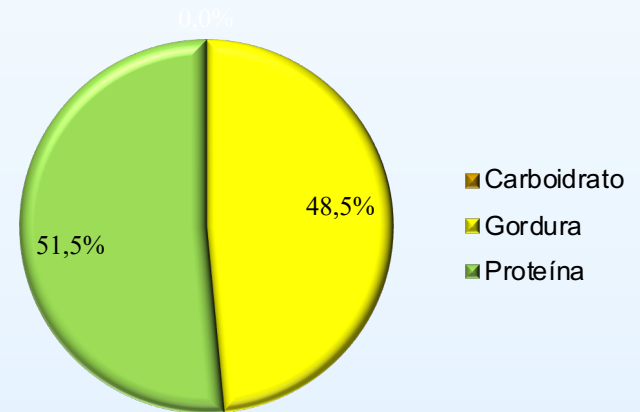
## Peixe



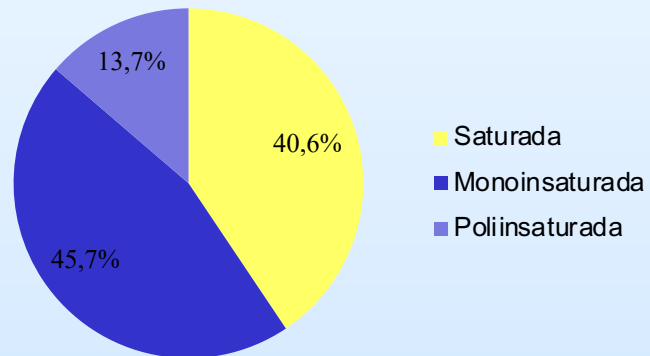
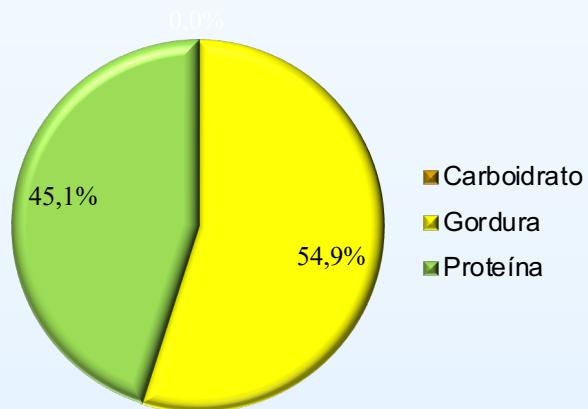
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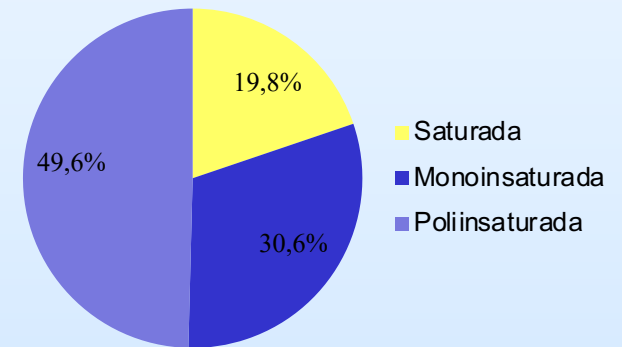
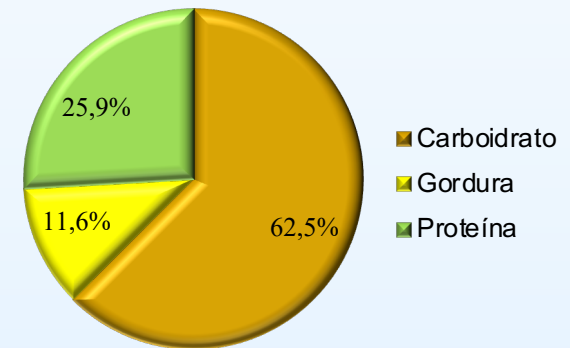
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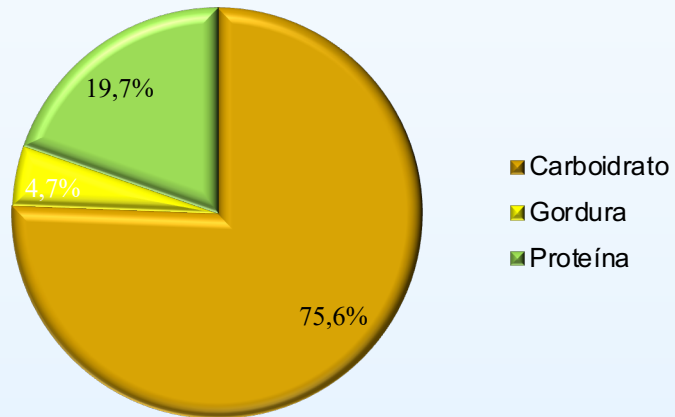
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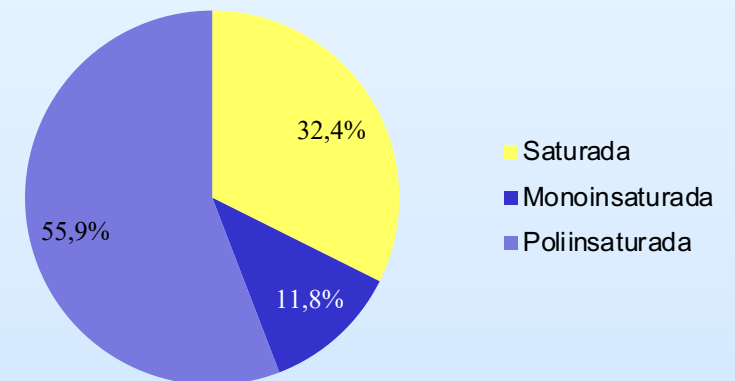
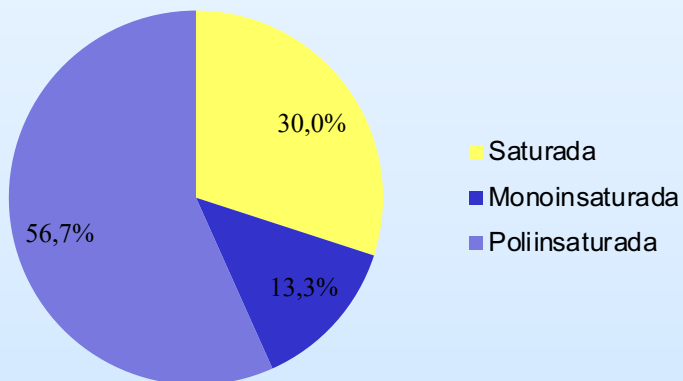
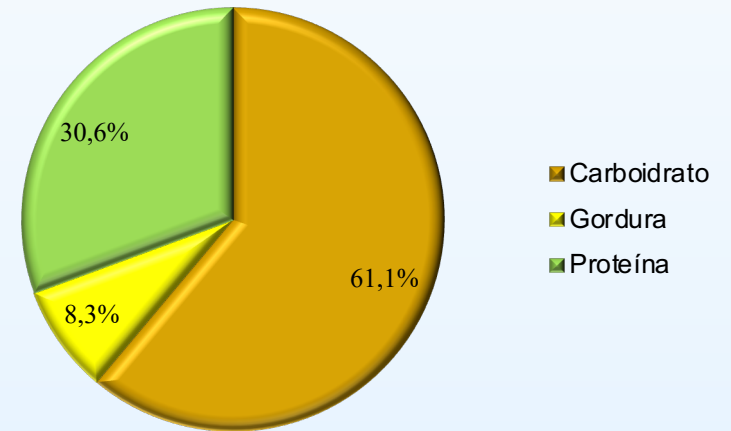
## Feijões



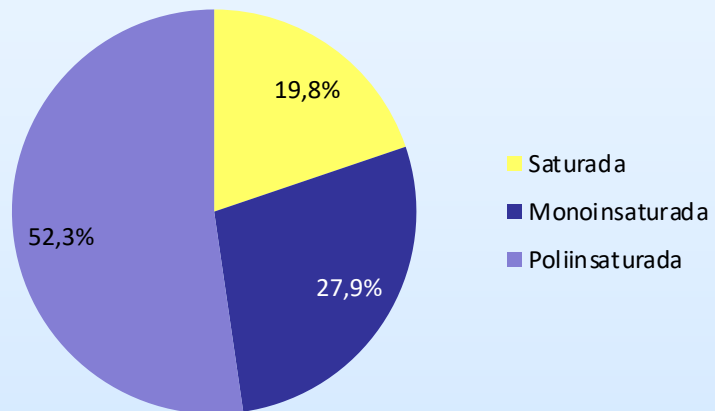
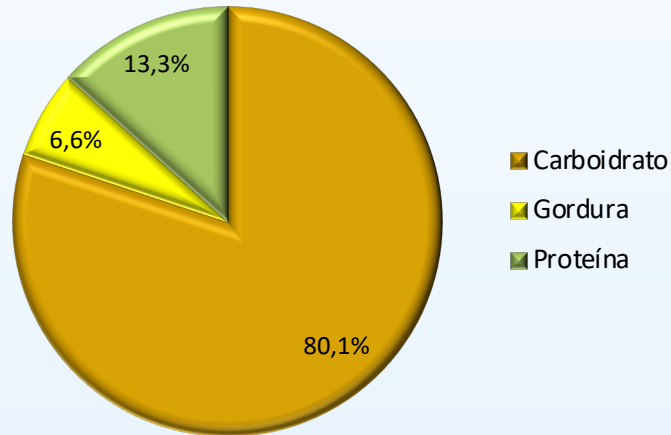
## Legumes



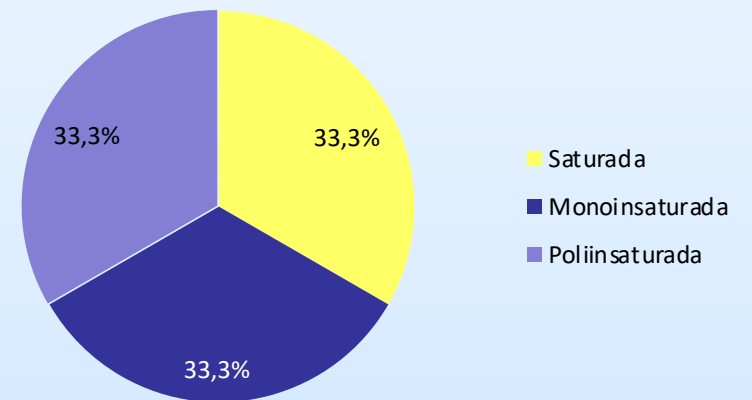
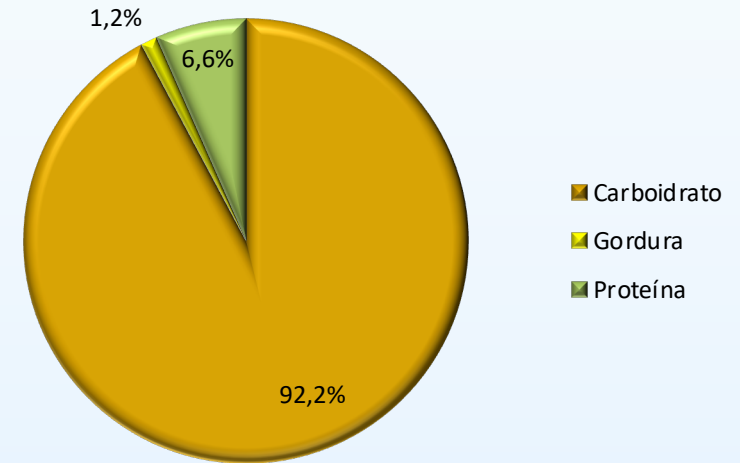
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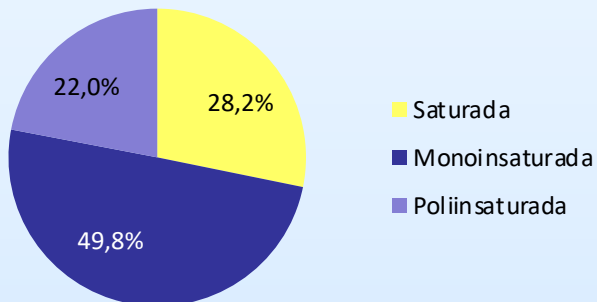
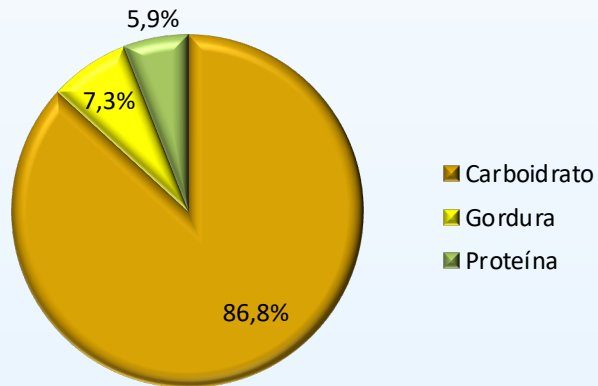
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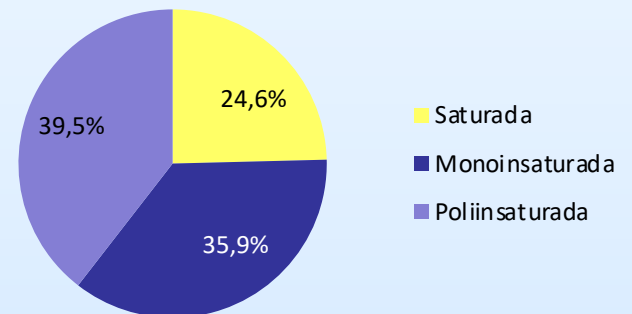
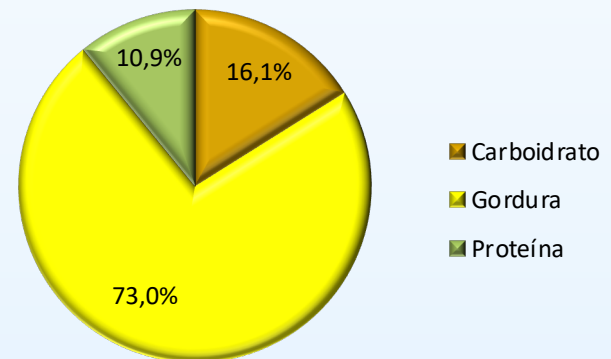
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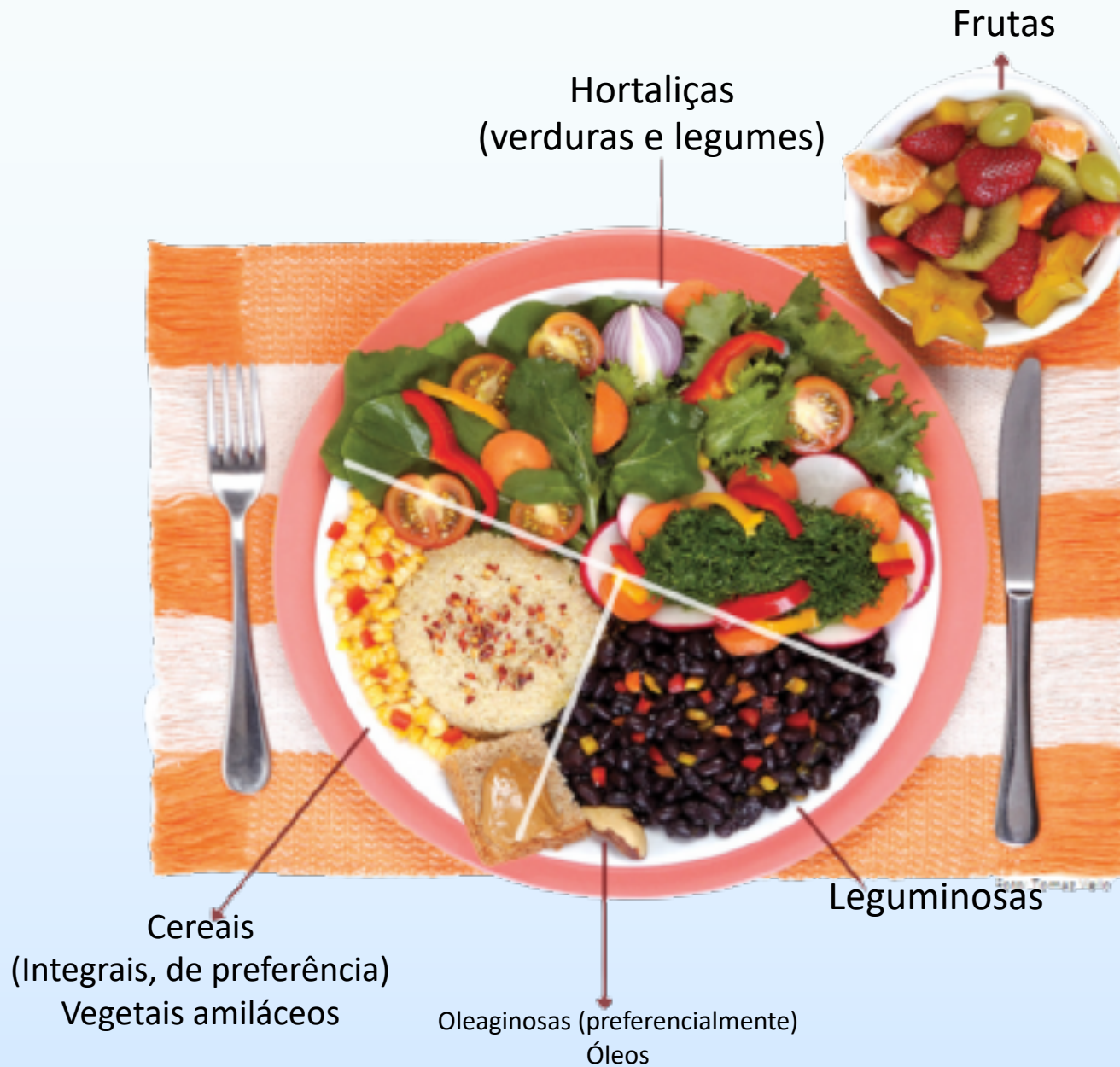


## Frutas



## Oleaginosas





# Substituições dos alimentos dentro de cada grupo alimentar



Figura criada pelo Professor Doutor Eric Slywitch

**Não se esqueça:**

- Vitamina B12 (suplemento / alimento fortificado);
- Vitamina D (sol / suplemento);
- Cálcio: suplementação / alimento fortificado se não atingir 1.000 mg/dia com alimentos.
- Iodo (alimento fortificado / suplemento);
- Atividade física
- Sono adequado
- Controle do estresse

# Na prática, funciona?

Resenha de 9 estudos

Sobre nível sérico de colesterol

Não  
vegetarianos

Controle

Ovo-lacto-  
vegetarianos

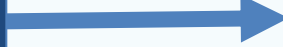
14 % menor

Veganos

35 % menor

Phillips RL, Lemon FR, Beeson L, Kuzma JW. Coronary heart disease mortality among Seventh-Day Adventists with differing dietary habits: A preliminary report. Am J Clin Nutr 1978;31:S191-S198.

Ajustando o IMC



Persiste a diferença

Não  
vegetarianos



Ovo-lacto-  
vegetarianos



Veganos

Controle

Menor nível

Menor nível

*Thorogood, M., McPherson, K., Mann, J. "Relationship of body mass index, weight, and height to plasma lipid levels in people with different diets in Britain."Community Med 1989;11:230-233.*

# Effects of Plant-Based Diets on Plasma Lipids

Hope R. Ferdowsian, MD, MPH<sup>a,b,\*</sup>, and Neal D. Barnard, MD<sup>a,b</sup>

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Dyslipidemia is a primary risk factor for cardiovascular disease, peripheral vascular disease, and stroke. Current guidelines recommend diet as first-line therapy for patients with elevated plasma cholesterol concentrations. However, what constitutes an optimal dietary regimen remains a matter of controversy. Large prospective trials have demonstrated that populations following plant-based diets, particularly vegetarian and vegan diets, are at lower risk for ischemic heart disease mortality. The investigators therefore reviewed the published scientific research to determine the effectiveness of plant-based diets in modifying plasma lipid concentrations. Twenty-seven randomized controlled and observational trials were included. Of the 4 types of plant-based diets considered, interventions testing a combination diet (a vegetarian or vegan diet combined with nuts, soy, and/or fiber) demonstrated the greatest effects (up to 35% plasma low-density lipoprotein cholesterol reduction), followed by vegan and ovo-lacto-vegetarian diets. Interventions allowing small amounts of lean meat demonstrated less dramatic reductions in total cholesterol and low-density lipoprotein levels. In conclusion, plant-based dietary interventions are effective in lowering plasma cholesterol concentrations. © 2009 Elsevier Inc. All rights reserved. (Am J Cardiol 2009;104:947–956)

## Effects of Plant-Based Diets on Plasma Lipids

Hope R. Ferdowsian, MD, MPH<sup>a,b,\*</sup>, and Neal D. Barnard, MD<sup>a,b</sup>

(Am J Cardiol 2009;104:947-956)

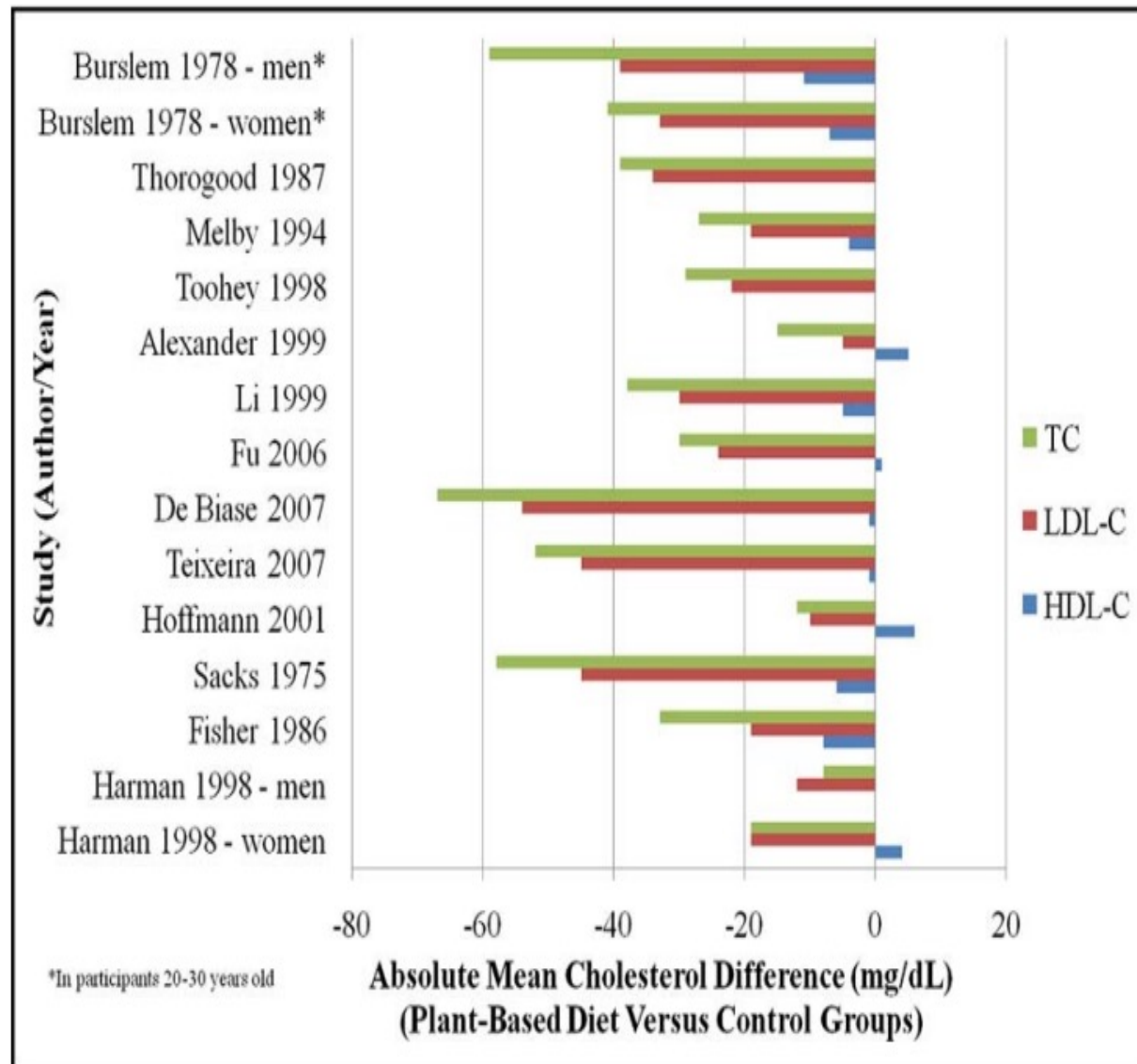


Figure 2. Effects of plant-based diets on cholesterol: observational studies. HDL-C = HDL cholesterol; LDL-C = LDL cholesterol.

# Effects of Plant-Based Diets on Plasma Lipids

Hope R. Ferdowsian, MD, MPH<sup>a,b,\*</sup>, and Neal D. Barnard, MD<sup>a,b</sup>

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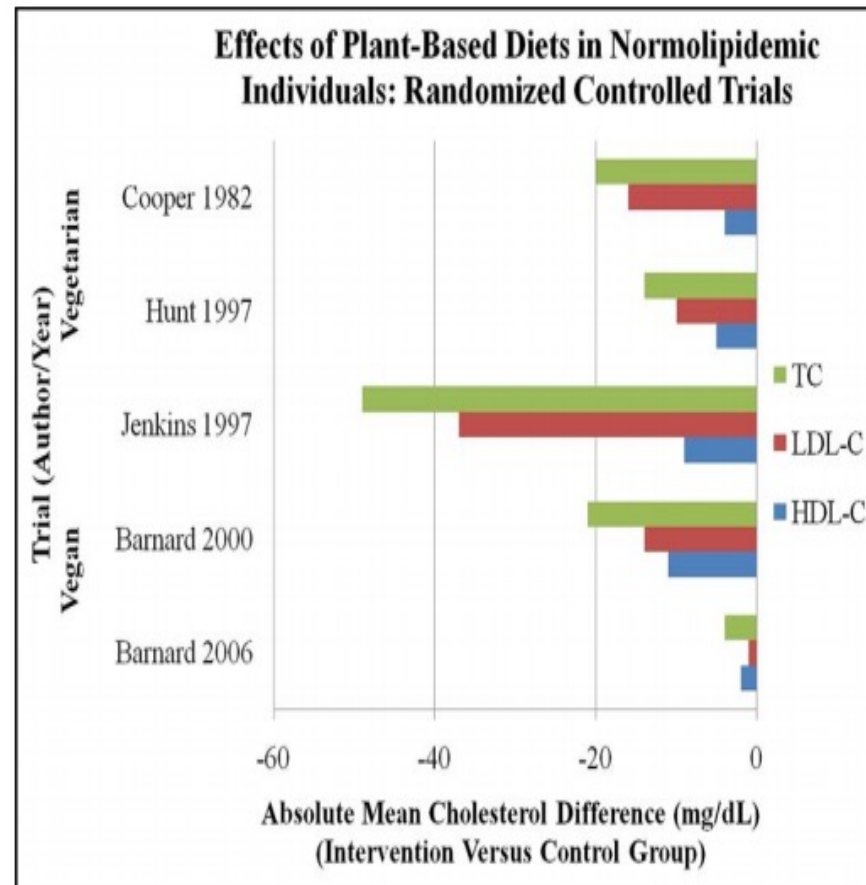


Figure 4. Effects of plant-based diets in subjects with normal lipid levels: randomized controlled trials. HDL-C = HDL cholesterol; LDL-C = LDL cholesterol.

# Effects of Plant-Based Diets on Plasma Lipids

Hope R. Ferdowsian, MD, MPH<sup>a,b,\*</sup>, and Neal D. Barnard, MD<sup>a,b</sup>

(Am J Cardiol 2009;104:947–956)

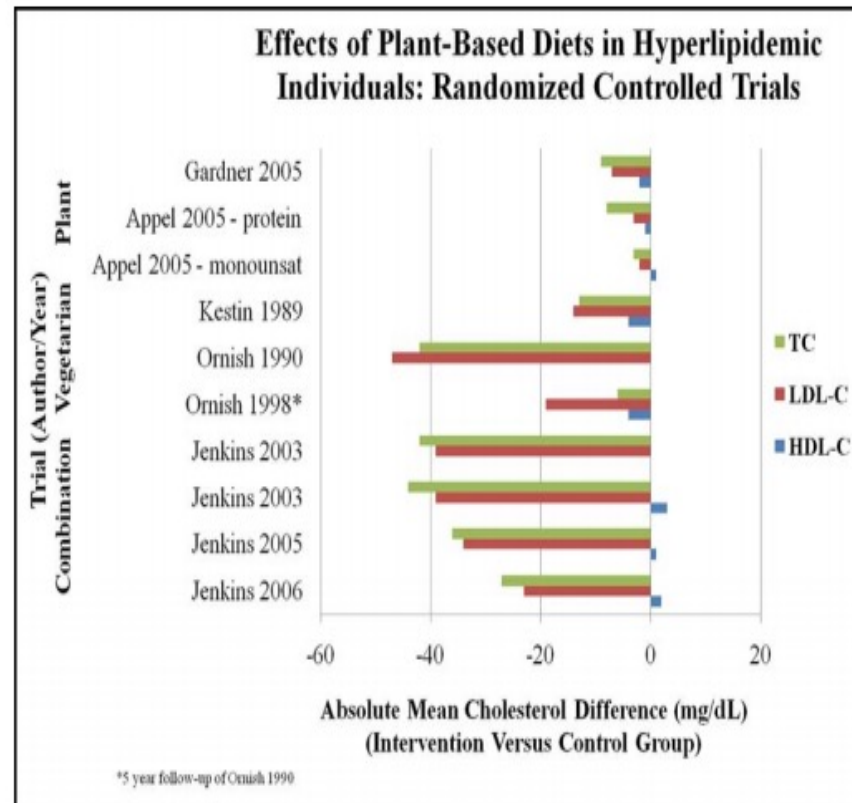
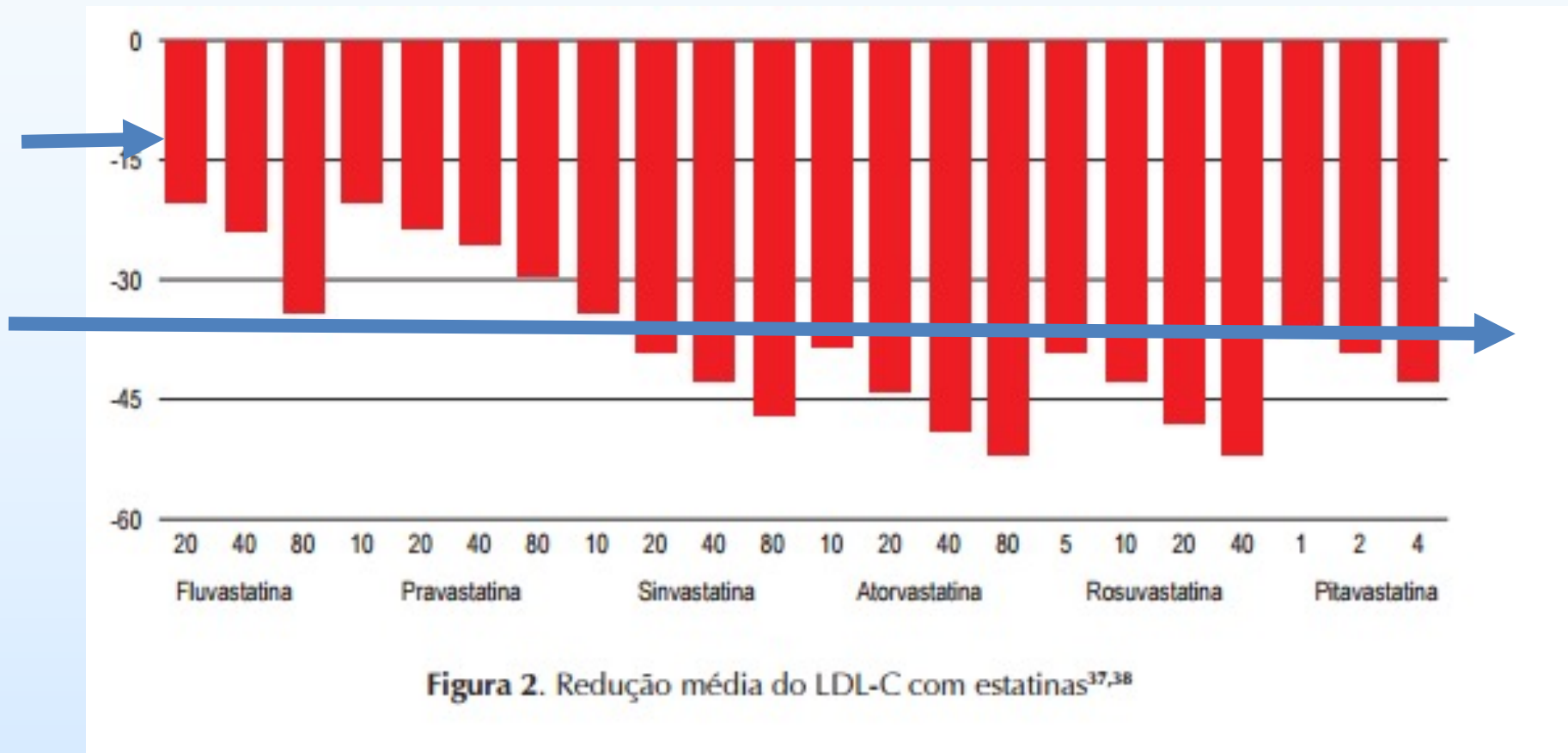


Figure 5. Effects of plant-based diets on cholesterol in subjects with hyperlipidemia: randomized controlled trials. HDL-C = HDL cholesterol; LDL-C = LDL cholesterol.

# V DIRETRIZ BRASILEIRA DE DISLIPIDEMIAS E PREVENÇÃO DA ATEROSCLEROSE

  
WEBNÁRIO GRATUITO  
DR. ERIC SLYWITCH  
para Médicos, Nutricionistas e  
Profissionais da Saúde



ORIGINAL RESEARCH



## Effects of Vegetarian Diets on Blood Lipids: A Systematic Review and Meta-Analysis of Randomized Controlled Trials

Fenglei Wang, MS; Jusheng Zheng, PhD; Bo Yang, MPH; Jiajing Jiang, MS; Yuanqing Fu, PhD; Duo Li, PhD

**Conclusions**—This systematic review and meta-analysis provides evidence that vegetarian diets effectively lower blood concentrations of total cholesterol, low-density lipoprotein cholesterol, high-density lipoprotein cholesterol, and non-high-density lipoprotein cholesterol. Such diets could be a useful nonpharmaceutical means of managing dyslipidemia, especially hypercholesterolemia. (*J Am Heart Assoc.* 2015;4:e002408 doi: 10.1161/JAHA.115.002408)

# Vamos um pouco além...

# Intensive Lifestyle Changes for Reversal of Coronary Heart Disease

Dean Ornish, MD; Larry W. Scherwitz, PhD; James H. Billings, PhD, MPH; K. Lance Gould, MD; Terri A. Merritt, MS; Stephen Sparler, MA; William T. Armstrong, MD; Thomas A. Ports, MD; Richard L. Kirkeeide, PhD; Charissa Hogeboom, PhD; Richard J. Brand, PhD

JAMA, December 16, 1998—Vol 280, No. 23

Plant based

Dieta com 10% de gordura  
Uso de carboidrato complexo  
Atividade física moderada  
Controle de estresse  
Suporte psicossocial

## Program Intervention

Experimental group patients were prescribed an intensive lifestyle program that included a 10%-fat vegetarian diet, moderate aerobic exercise, stress management training, smoking cessation, and group psychosocial support previously described in detail.<sup>8,7-10</sup> Patients were encouraged to avoid simple sugars and to emphasize the intake of complex carbohydrates and other whole foods. Only 1 patient in the experimental group was actively smoking at baseline, and she quit at entry. Control group patients were asked to follow the advice of their personal physicians regarding lifestyle changes.

Can lifestyle changes reverse coronary heart disease?

The Lifestyle Heart Trial

DEAN ORNISH SHIRLEY E. BROWN LARRY W. SCHERWITZ  
JAMES H. BILLINGS WILLIAM T. ARMSTRONG THOMAS A. PORTS  
SANDRA M. McLANAHAN RICHARD L. KIRKEEIDE  
RICHARD J. BRAND K. LANCE GOULD

*Lancet* 1990; **336**: 129-33.

Experimental-group patients were asked to eat a low-fat vegetarian diet for at least a year. The diet included fruits, vegetables, grains, legumes, and soybean products without caloric restriction. Some take-home meals were provided for those who wanted them. No animal products were allowed except egg white and one cup per day of non-fat milk or yoghurt. The diet contained approximately 10% of calories as fat (polyunsaturated/saturated ratio greater than 1), 15–20% protein, and 70–75% predominantly complex carbohydrates. Cholesterol intake was limited to 5 mg/day or less. Salt was restricted only for hypertensive patients. Caffeine was eliminated, and alcohol was limited to no more than 2 units per day (alcohol was excluded for anyone with a history of alcoholism, and no one was encouraged to drink). The diet was nutritionally adequate and met the recommended daily allowances for all nutrients except vitamin B<sub>12</sub>, which was supplemented.

# Intensive Lifestyle Changes for Reversal of Coronary Heart Disease

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JAMA, December 16, 1998—Vol 280, No. 23

## Plant based

Dieta com 10% de gordura  
Uso de carboidrato complexo  
Atividade física moderada  
Controle de estresse  
Suporte psicossocial

## ONÍVOROS

Dieta e estilo de vida orientados pelo cardiologista (AHA)

# Intensive Lifestyle Changes for Reversal of Coronary Heart Disease

Dean Ornish, MD; Larry W. Scherwitz, PhD; James H. Billings, PhD, MPH; K. Lance Gould, MD; Terri A. Merritt, MS; Stephen Sparler, MA; William T. Armstrong, MD; Thomas A. Ports, MD; Richard L. Kirkeeide, PhD; Charissa Hogeboom, PhD; Richard J. Brand, P

JAMA, December 16, 1998—Vol 280, No. 23

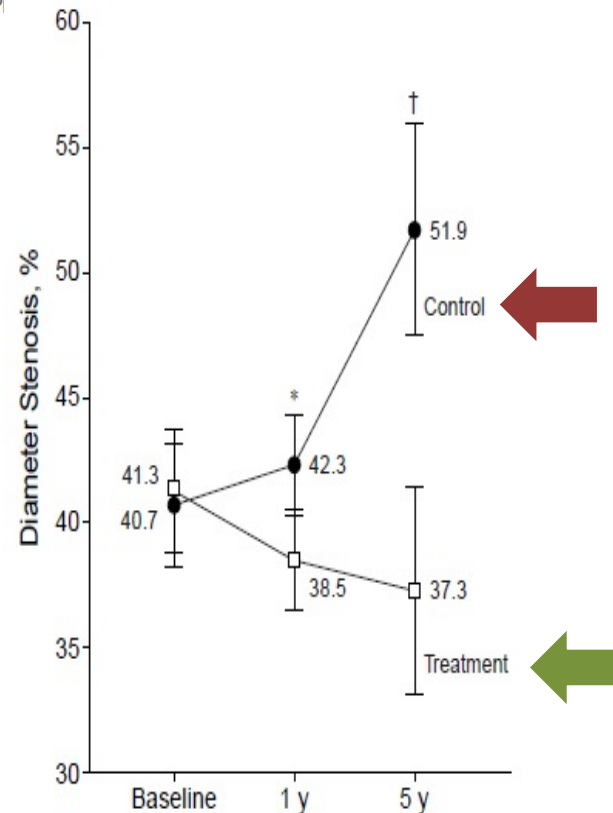


Figure 1.—Mean percentage diameter stenosis in treatment and control groups at baseline, 1 year, and 5 years. Error bars represent SEM; asterisk,  $P = .02$  by between-group 2-tailed test; dagger,  $P = .001$  by between-group 2-tailed test.

# Intensive Lifestyle Changes for Reversal of Coronary Heart Disease

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JAMA, December 16, 1998—Vol 280, No. 23

Mudança no diâmetro da estenose conforme a aderência da dieta

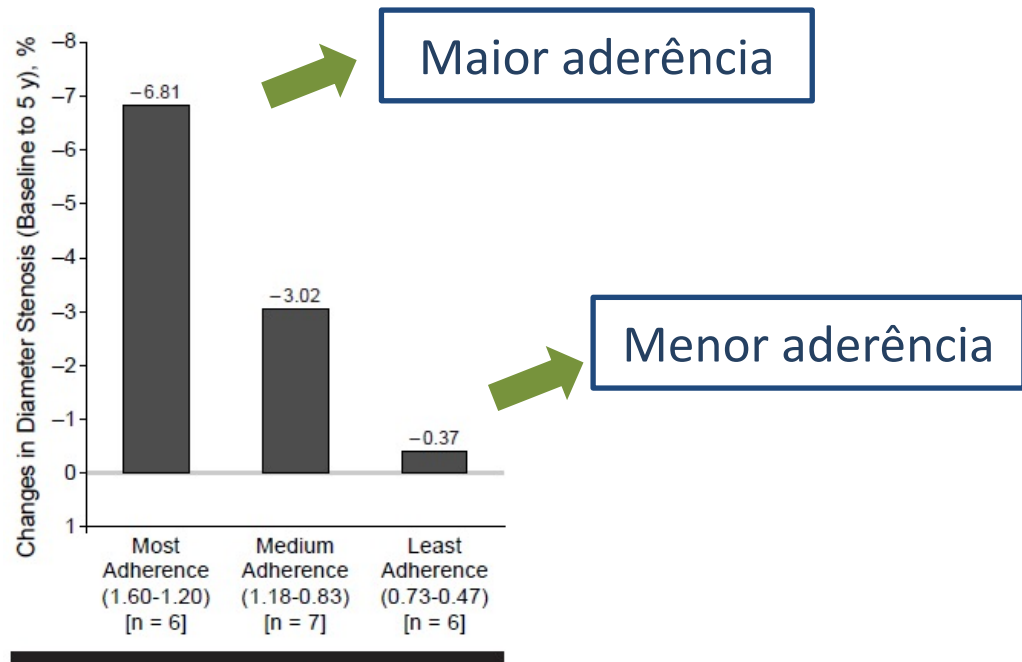


Figure 2.—Changes in percentage diameter stenosis by 5-year adherence tertiles for the experimental group.

# Intensive Lifestyle Changes for Reversal of Coronary Heart Disease

Dean Ornish, MD; Larry W. Scherwitz, PhD; James H. Billings, PhD, MPH; K. Lance Gould, MD; Terri A. Merritt, MS; Stephen Sparler, MA; William T. Armstrong, MD; Thomas A. Ports, MD; Richard L. Kirkeeide, PhD; Charissa Hogeboom, PhD; Richard J. Brand, PhD

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Table 6.—Cardiac Events During 5-Year Follow-up

	No. of Events		Risk Ratio	95% Confidence Interval	P Value
	Experimental* (n = 28)	Control† (n = 20)			
Myocardial infarction	2	4	2.74	0.393-30.3	.26
Percutaneous transluminal coronary angioplasty	8	14	2.40	0.939-6.60	<.05
Coronary artery bypass graft	2	5	3.43	0.561-36.0	.14
Cardiac hospitalizations‡	23	44	2.62	1.55-4.55	<.001
Deaths	2	1	0.685	0.012-13.2	.81
Any event	25	45	2.47	1.48-4.20	<.001

\*Person-years of observation was 108.04.

†Person-years of observation was 78.81.

‡Includes myocardial infarction, percutaneous transluminal coronary angioplasty, and coronary artery bypass graft.

# Intensive Lifestyle Changes for Reversal of Coronary Heart Disease

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JAMA, December 16, 1998—Vol 280, No. 23

**Conclusions.**—More regression of coronary atherosclerosis occurred after 5 years than after 1 year in the experimental group. In contrast, in the control group, coronary atherosclerosis continued to progress and more than twice as many cardiac events occurred.

Mais regressão da aterosclerose coronariana ocorreu após 5 anos do que após 1 ano no grupo experimental.

Em contraste, no grupo de controle, a aterosclerose coronária continuou a progredir e os eventos cardíacos foram 2 vezes maiores.

## Anti-Inflammatory Effects of a Vegan Diet Versus the American Heart Association–Recommended Diet in Coronary Artery Disease Trial

Binita Shah, MD, MS; Jonathan D. Newman, MD, MPH; Kathleen Woolf, PhD, RD; Lisa Ganguzza, MS, RD; Yu Guo, MA; Nicole Allen, BS; Judy Zhong, PhD; Edward A. Fisher, MD, PhD; James Slater, MD



Estudo randomizado com 100 indivíduos com doença arterial coronariana com intervenção por 8 semanas.

**Avaliação e PCR-US**

Alimentação  
vegana

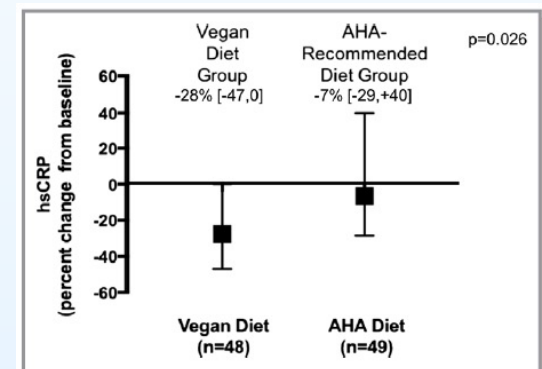
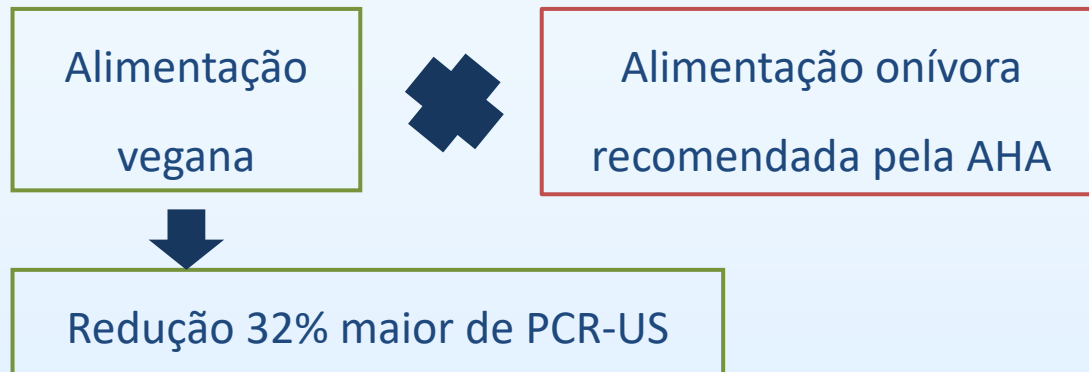


Alimentação onívora  
recomendada pela AHA



## Anti-Inflammatory Effects of a Vegan Diet Versus the American Heart Association–Recommended Diet in Coronary Artery Disease Trial

Binita Shah, MD, MS; Jonathan D. Newman, MD, MPH; Kathleen Woolf, PhD, RD; Lisa Ganguzza, MS, RD; Yu Guo, MA; Nicole Allen, BS; Judy Zhong, PhD; Edward A. Fisher, MD, PhD; James Slater, MD



**Figure 2.** Percent change in hsCRP (high-sensitivity C-reactive protein) over the study period in participants with angiographically defined coronary artery disease randomized to the vegan vs American Heart Association (AHA)-Recommended diet. Data shown as median [interquartile range] and compared between diet groups using the Mann-Whitney test.

A vegan diet resulted in a significant 32% lower high-sensitivity C-reactive protein (b, 0.68, 95% confidence interval [0.49–0.94]; P=0.02) when compared with the American Heart Association diet. Results were consistent after adjustment for age, race, baseline waist circumference, diabetes mellitus, and prior myocardial infarction (adjusted b, 0.67 [0.47–0.94], P=0.02).

**Conclusions**—In patients with coronary artery disease on guideline-directed medical therapy, a vegan diet may be considered to lower high-sensitivity C-reactive protein as a risk marker of adverse outcomes.



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Nutrition,  
Metabolism &  
Cardiovascular Diseases

## Metabolism of triglyceride-rich lipoproteins and transfer of lipids to high-density lipoproteins (HDL) in vegan and omnivore subjects

J.C. Vinagre <sup>a</sup>, C.G. Vinagre <sup>a</sup>, F.S. Pozzi <sup>a</sup>, E. Slywitch <sup>b</sup>, R.C. Maranhão <sup>a,c,\*</sup>

<sup>a</sup> *Lipid Metabolism Laboratory, Heart Institute, University of São Paulo Medical School, São Paulo, Brazil*

<sup>b</sup> *Department of Nutrition, Federal University of São Paulo, São Paulo, Brazil*

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Received 9 August 2010; received in revised form 25 February 2011; accepted 28 February 2011  
Available online 21 September 2011



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Nutrition,  
Metabolism &  
Cardiovascular Diseases

  
CURSO GRATUITO  
DE NUTRIÇÃO  
DR. ERIC SLYWITCH  
para Médicos, Nutricionistas e  
Profissionais da Saúde

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<sup>a</sup>Lipid Metabolism Laboratory, Heart Institute, University of São Paulo Medical School, São Paulo, Brazil

<sup>b</sup>Department of Nutrition, Federal University of São Paulo, São Paulo, Brazil

<sup>c</sup>Faculty of Pharmaceutical Sciences, University of São Paulo, São Paulo, Brazil

Received 9 August 2010; received in revised form 25 February 2011; accepted 28 February 2011  
Available online 21 September 2011

**Conclusion:** Remnant removal from circulation, estimated by cholesteryl oleate FCR was faster in vegans, but the lipolysis process, estimated by triglyceride FCR was equal. Increased removal of atherogenic remnants and diminution of cholesteryl ester transfer may favor atherosclerosis prevention by vegan diet.

## Conclusion

Vegans showed better regulation of the metabolism of TG-rich lipoproteins, because they were more efficient in removing remnants that are potentially atherogenic. In addition, the diminished CE transfer shown in our results and the diminished LDL cholesterol levels that have been previously documented in published studies clearly suggest that a vegan lifestyle protection against atherogenesis.

## TMAO as a biomarker of cardiovascular events: a systematic review and meta-analysis

Luigina Guasti<sup>1</sup> · Silvia Galliazzo<sup>2</sup> · Marta Molaro<sup>3</sup> · Eleonora Visconti<sup>1</sup> · Benedetta Pennella<sup>1</sup> · Giovanni Vincenzo Gaudio<sup>1</sup> · Alessandro Lupi<sup>1</sup> · Anna Maria Grandi<sup>1</sup> · Alessandro Squizzato<sup>1,4</sup>

Received: 3 April 2020 / Accepted: 3 August 2020  
© Società Italiana di Medicina Interna (SIMI) 2020

### Abstract

**Background** Unmasking the residual cardiovascular risk is a major research challenge in the attempt to reduce cardiovascular disease (CVD) morbidity and mortality. Mounting evidence suggests that a high circulating level of trimethylamine *N*-oxide is a new potential CVD risk factor. We performed a systematic review of the published studies to clarify the association between circulating high levels of TMAO and cardiovascular events.

**Methods** Studies evaluating the association between TMAO and CVD events were searched by electronic databases up to December 2018. Pooled results were expressed as risk ratio (RR) with 95% pertinent confidence interval (CI).

**Results** Three studies for a total of 923 patients at high/very high CVD risk were included in our analysis. Overall, a high TMAO level was associated with both major adverse cardiovascular events (RR = 2.05; 95% CI 1.61–2.61) and all-cause mortality (RR = 3.42; 95% CI 2.27–5.15).

**Conclusions** Our findings support a role of high TMAO levels in predicting CVD events. High levels of TMAO may be a new CVD risk factor, potentially useful to better plan personalized CVD prevention strategies.



WEBNÁRIO GRATUITO  
DR. ERIC SLYWITCH  
para Médicos, Nutricionistas e  
Profissionais da Saúde

# 2º WEBNÁRIO

## “Erros mais comuns no tratamento da deficiência do Ferro”



<https://www.EricSlywitch.com/av>



## REGRAS METABÓLICAS

- 1) O oxigênio é o nutriente mais importante para o organismo;
- 2) Ferro não pode andar livre no organismo;
- 3) Números mágicos da ferritina: 30, 50, 70;
- 4) Inflamou, bagunçou!
- 5) Ferro EV: mais é menos!



# Bases Metabólicas

## Absorção do ferro pelo enterócito

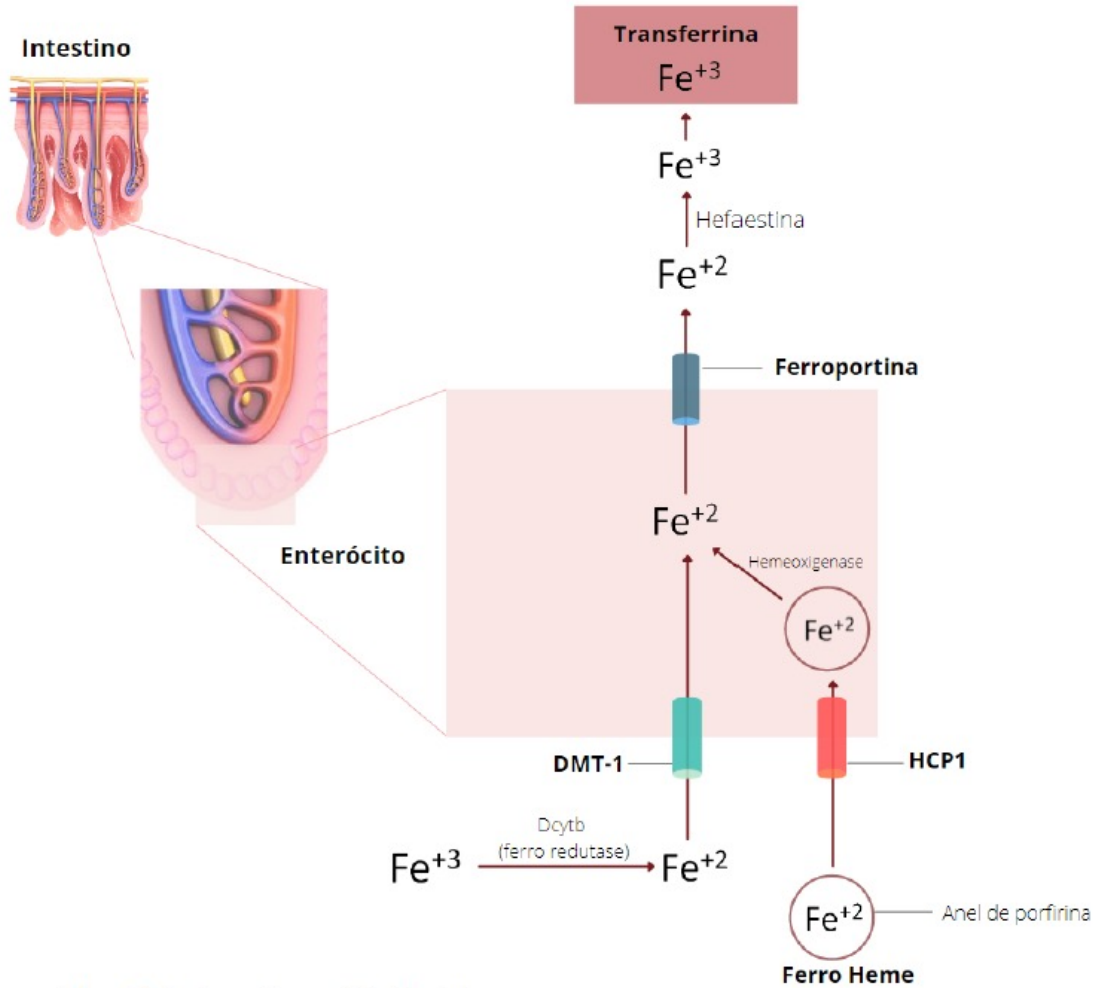
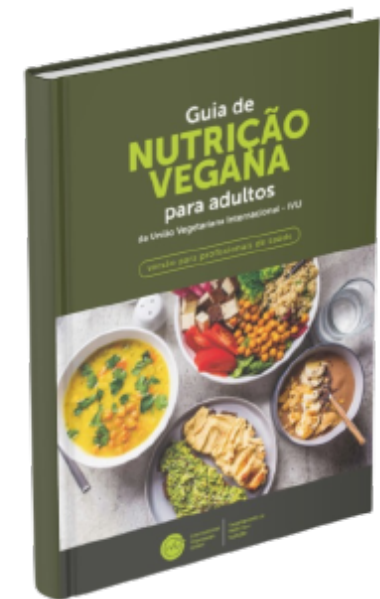


Figura criada pelo Professor Doutor Eric Slywitch



## Teor de ferro e funções dos compartimentos na sua homeostase

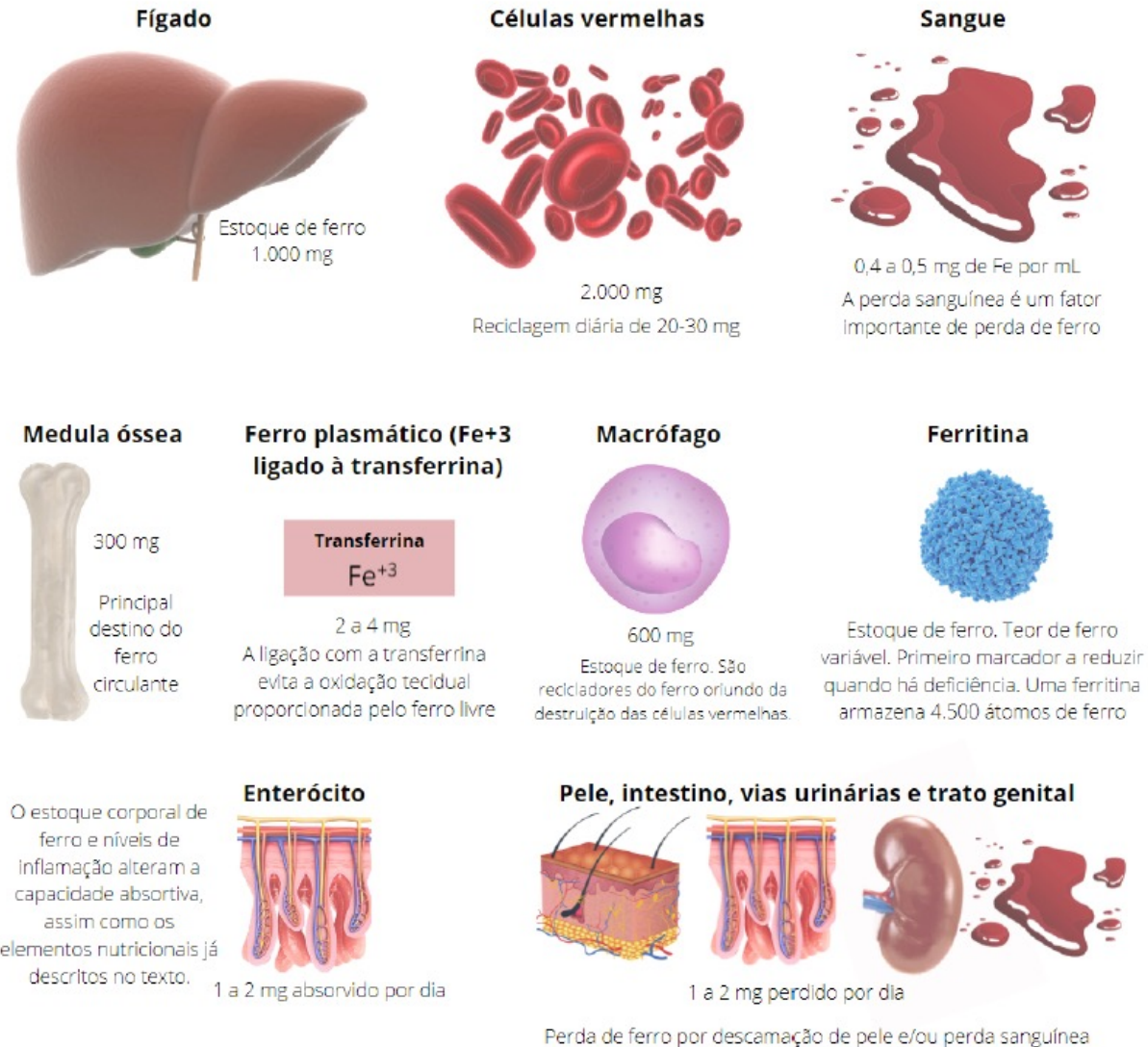


Figura criada pelo Professor Doutor Eric Slywitch

# Gordura no fígado

90

*Original Article*

DOI: 10.15171/mejdd.2018.96



## Correlation between Serum Ferritin Level and Histopathological Disease Severity in Non-alcoholic Fatty Liver Disease

Seyed Reza Modares Mousavi<sup>1</sup>, Bita Geramizadeh<sup>2</sup>, Amir Anushiravani<sup>3</sup>, Fardad Ejtehad<sup>4</sup>,  
Mohammad Hossein Anbardar<sup>5</sup>, Maryam Moini<sup>6,\*</sup>

Ferritina – é elevada na lesão hepática, mas seus níveis dosados não permitem estabelecer o grau de lesão ou fibrose.

### CONCLUSION

Serum ferritin level may not be useful as a single marker for the prediction of histopathological severity of disease in young patients with NASH who are not morbidly obese.

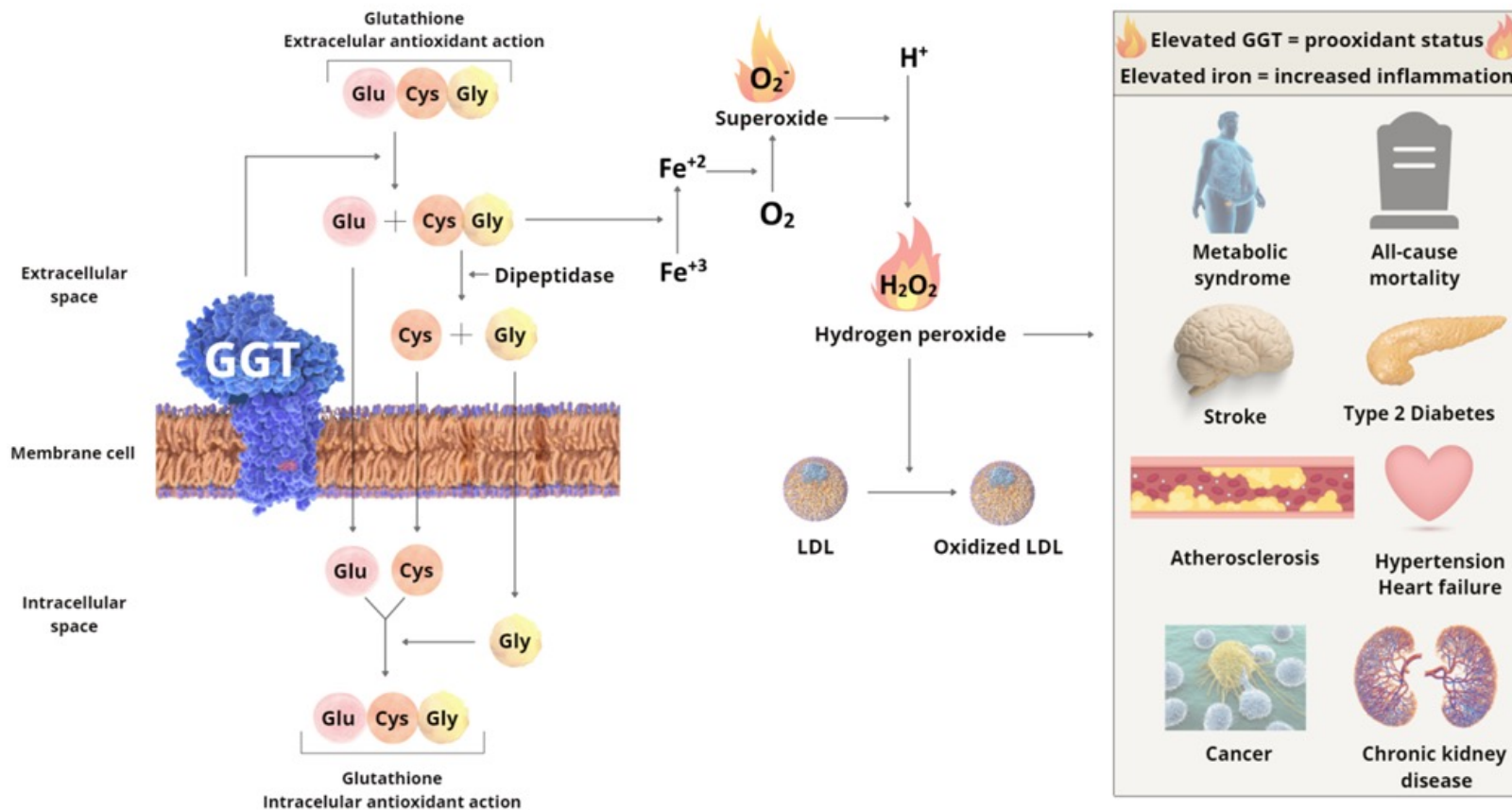


# Atenção!

Article

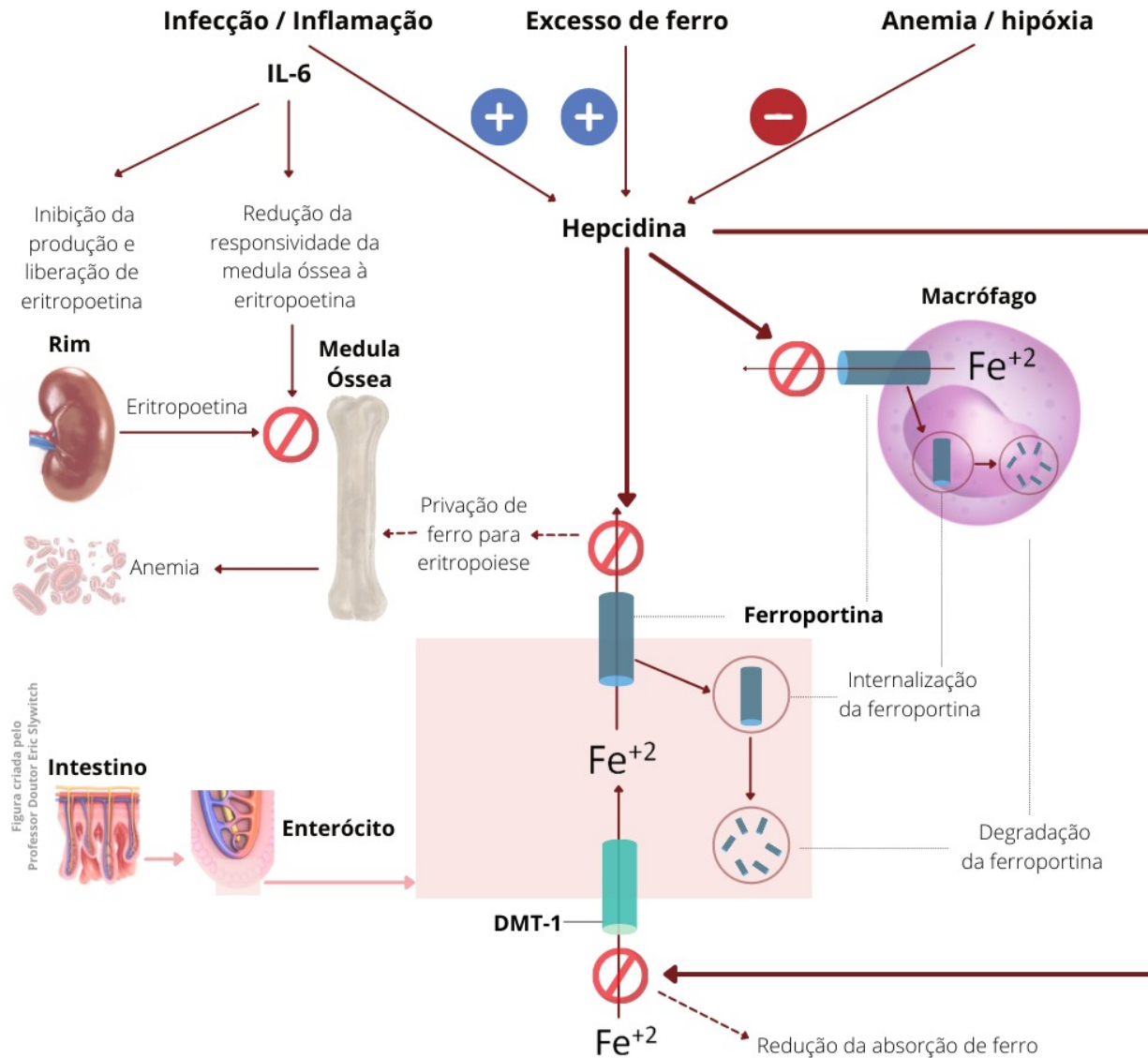
# Obese Vegetarians and Omnivores Show Different Metabolic Changes: Analysis of 1340 Individuals

Eric Slywitch <sup>1,\*</sup>, Carine Savalli <sup>2</sup>, Antonio Cláudio Duarte <sup>3</sup> and Maria Arlete Meil Schimith Escrivão <sup>1</sup>



**Figure 1.** Correlation between the prooxidant effect of gamma-glutamyl transferase (GGT), iron, and disease. Cysteine (Cys); Glutamic acid (Glu); Glycine (Gly); Low-density lipoprotein (LDL); Iron (Fe). Adapted from Ndrepepa, G. and A. Kastrati [10].

## Ação da Hecpidina e inflamação no metabolismo do ferro





# Valores de Ferritina



## Detection, evaluation, and management of iron-restricted erythropoiesis

Lawrence Tim Goodnough, Elizabeta Nemeth and Tomas Ganz

The generally accepted cut-off level for serum ferritin to indicate absolute iron deficiency previously has been  $\leq 12$  ng/mL.<sup>19</sup> However, more recent studies correlating the presence or absence of stainable iron with serum ferritin in normal individuals and in patients, and also patients with anemia responsive to iron therapy, indicate that this threshold level of ferritin had only a sensitivity of 25% for detecting iron deficiency.<sup>20</sup> The sensitivity could be improved to 92%, with a positive predictive value of 83%, by using a diagnostic cutoff value of  $\leq 30$  ng/mL.

Utilizar o valor de ferritina abaixo de **30 ng/mL** para definir, isoladamente, a deficiência de ferro.

**Effect of iron supplementation on fatigue in nonanemic menstruating women with low ferritin: a randomized controlled trial**

CMAJ, August 7, 2012, 184(11)

Paul Vaucher DiO MSc, Pierre-Louis Druais MD, Sophie Waldvogel MD, Bernard Favrat MD

Open Access

Research

**BMJ Open Efficacy of iron supplementation on fatigue and physical capacity in non-anaemic iron-deficient adults: a systematic review of randomised controlled trials**

Brett L Houston,<sup>1,2</sup> Daryl Hurrie,<sup>3</sup> Jeff Graham,<sup>1,2</sup> Brittany Perija,<sup>4</sup> Emily Rimmer,<sup>1,2</sup> Rasheda Rabbani,<sup>5,6</sup> Charles N Bernstein,<sup>7</sup> Alexis F Turgeon,<sup>8,9</sup> Dean A Fergusson,<sup>10</sup> Donald S Houston,<sup>1,2</sup> Ahmed M Abou-Setta,<sup>5,6</sup> Ryan Zarychanski<sup>1,2,5,6</sup>

Houston BL, *et al.* *BMJ Open* 2018;**8**:e019240. doi:10.1136/bmjopen-2017-019240

Utilizar o valor de ferritina de **50 ng/mL** para a melhora dos quadros de fadiga e de perna inquietas.

› [Metallomics](#). 2021 Jun 11;13(6):mfab030. doi: 10.1093/mtomcs/mfab030.

## Optimal serum ferritin level range: iron status measure and inflammatory biomarker

Ralph G DePalma <sup>1 2</sup>, Virginia W Hayes <sup>3</sup>, Timothy J O'Leary <sup>1 4</sup>

Utilizar o valor de ferritina de **75 ng/mL** para o estado nutricional ideal de ferro.



## Iron deficiency

*Lancet* 2021; 397: 233-48

*Sant-Rayn Pasricha, Jason Tye-Din, Martina U Muckenthaler, Dorine W Swinkels*

the ferritin threshold.<sup>79</sup> When inflammation is present, WHO defines ID at a ferritin concentration less than 30 µg/L in children under 5 years and less than 70 µg/L in older children and adults.<sup>76</sup> Diagnosing absolute ID in



# Quais exames solicitar?



## Avaliação do Ferro: dos exames abaixo, o que realmente importa?

### Hemograma

Hemoglobina

Hematócrito

VCM

HCM

HCM

RDW

### Metabolismo do ferro

Ferritina

Ferro sérico

Transferrina

Saturação da transferrina

### Inflamação:

PCR-US

Fibrinogênio

VHS

Alfa-1-glicoproteína

Homocisteína

Ácido úrico

TNF-alfa

### Enzimas hepáticas

ALT

AST

### Outros

Insulinemia

Ureia



# Atenção ao desenho dos estudos

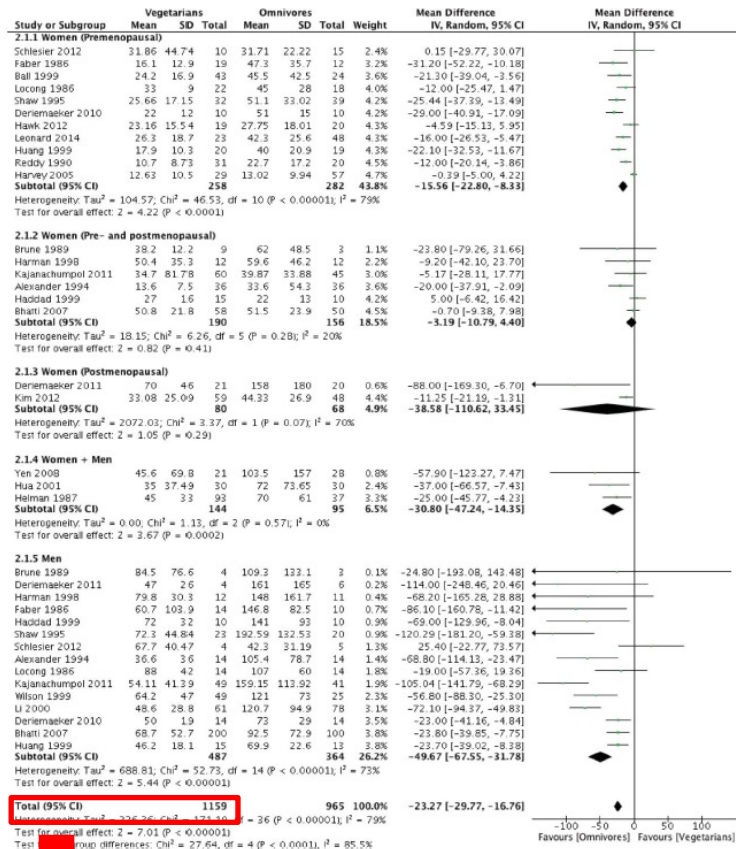


## The effect of vegetarian diets on iron status in adults: A systematic review and meta-analysis

Lisa M. Haider<sup>a,\*</sup>, Lukas Schwingshackl<sup>b,\*</sup>, Georg Hoffmann<sup>c</sup>, and Cem Ekmekcioglu<sup>a</sup>

<sup>a</sup>Department of Environmental Health, Center for Public Health, Medical University of Vienna, Vienna, Austria; <sup>b</sup>Department of Epidemiology, German Institute of Human Nutrition, Nuthetal, Germany; <sup>c</sup>Department of Nutritional Sciences, University of Vienna, Vienna, Austria

### Comparaç o da ferritina entre as dietas



24 estudos

**Conclusions:** In conclusion our results showed that vegetarians are more likely to have lower iron stores compared with non-vegetarians. However, since high iron stores are also a risk factor for certain non-communicable diseases, such as type 2 diabetes, it is recommended that not only vegetarians but also non-vegetarians should regularly control their iron status and improve their diet regarding the content and bioavailability of iron by consuming more plants and less meat.

Figure 3. Forest plot showing pooled mean differences of serum ferritin (in µg/l) with corresponding 95% CI for the effects of LOV+LV+OV+V+VEG+SV compared to non-vegetarians (omnivores).

Total (95% CI)

1159

## Original Article

## Selected micronutrient intake and status in men with differing meat intakes, vegetarians and vegans

Duo Li<sup>1</sup> MB, MSc, PhD, Andrew J Sinclair<sup>1</sup> B Agr Sci, PhD, Neil J Mann<sup>1</sup> B Appl Sci, BSc (Hons), Dip Ed, PhD, Alan Turner<sup>2</sup> MSc, FIBMS and Madeleine J Ball<sup>3</sup> MD, MRCP, FRCPath

**Table 1.** Characteristics of subjects in the dietary groups (mean  $\pm$  SD)

	High meat (n = 18)	Moderate meat (n = 60)	Ovolacto-vegetarian (n = 43)	Vegan (n = 18)
Age (years)	34.2 $\pm$ 9.4	38.3 $\pm$ 7.3	34.9 $\pm$ 9.0 <sup>moa</sup>	33.0 $\pm$ 7.7 <sup>mva</sup>
BMI	27.0 $\pm$ 3.4	26.4 $\pm$ 3.4	23.6 $\pm$ 2.8 <sup>hoc, moc</sup>	23.3 $\pm$ 3.5 <sup>hvc, mvc</sup>
Waist/hip	0.8 $\pm$ 0.06	0.8 $\pm$ 0.05	0.8 $\pm$ 0.04 <sup>moa</sup>	0.8 $\pm$ 0.05 <sup>mva</sup>
Systolic BP	123 $\pm$ 14.6	123 $\pm$ 10.5	123 $\pm$ 13.4	122 $\pm$ 9.7
Diastolic BP	81 $\pm$ 8.0	81 $\pm$ 7.9	77 $\pm$ 10.4 <sup>hoa, moa</sup>	77 $\pm$ 7.8

BMI, body mass index; BP, blood pressure; <sup>moa</sup>moderate meat versus ovolacto-vegetarian; <sup>mva</sup>moderate meat versus vegan; <sup>hoc</sup>high meat versus ovolacto-vegetarian; <sup>hvc</sup>high meat versus vegan. <sup>a</sup>P < 0.05; <sup>b</sup>P < 0.01; <sup>c</sup>P < 0.001.

**Table 4.** Haematological characteristics of subjects in the four dietary groups (mean  $\pm$  SD).

	High meat (n = 18)	Moderate meat (n = 60)	Ovolacto-vegetarian (n = 43)	Vegan (n = 18)
RBC ( $\times 10^{12}/L$ )	5.17 $\pm$ 0.19	5.12 $\pm$ 0.30	5.13 $\pm$ 0.37 <sup>hoc, mob</sup>	4.71 $\pm$ 0.24 <sup>hvc, mvb</sup>
Hgb (g/L)	154.2 $\pm$ 5.5	149.1 $\pm$ 7.6	142.1 $\pm$ 9.8 <sup>hoc, moc</sup>	143.1 $\pm$ 7.0 <sup>hvb, mvb</sup>
Ferritin ( $\mu$ g/L)	153 $\pm$ 117	111 $\pm$ 86 <sup>hma</sup>	48 $\pm$ 29 <sup>hoc, moc</sup>	50 $\pm$ 29 <sup>hvc, mvb</sup>
Vitamin B <sub>12</sub> (pg/mL)	544 $\pm$ 228	449 $\pm$ 134 <sup>hma</sup>	285 $\pm$ 132 <sup>hoc, moc</sup>	188 $\pm$ 89 <sup>hvc, mvc, ova</sup>
Folate (ng/mL)	6.7 $\pm$ 2.3	5.6 $\pm$ 1.7	6.3 $\pm$ 2.4	7.7 $\pm$ 3.2 <sup>mvb, ova</sup>
$\alpha$ -Tocopherol (mg/L)	5.17 $\pm$ 0.98	5.43 $\pm$ 2.09	5.48 $\pm$ 2.11	5.19 $\pm$ 2.28
Retinol (mg/L)	0.90 $\pm$ 0.16	0.89 $\pm$ 0.20	0.81 $\pm$ 0.17 <sup>moa</sup>	0.77 $\pm$ 0.14 <sup>hva, mva</sup>

<sup>hma</sup>high meat versus moderate meat; <sup>hoc</sup>high meat versus ovolacto-vegetarian; <sup>moa</sup>moderate meat versus ovolacto-vegetarian; <sup>hvc</sup>high meat versus vegan; <sup>mvb</sup>moderate meat versus vegan; <sup>ova</sup>ovolacto versus vegan. RBC, red blood cell; Hgb, haemoglobin. <sup>a</sup>P < 0.05; <sup>b</sup>P < 0.01; <sup>c</sup>P < 0.001.

Mais ferro ou mais  
inflamação???



*Article*

# **Iron Deficiency in Vegetarian and Omnivorous Individuals: Analysis of 1340 Individuals**

Eric Slywitch <sup>1,\*</sup>, Carine Savalli <sup>2</sup>, Antonio Cláudio Goulart Duarte <sup>3</sup> and Maria Arlete Meil Schimith Escrivão <sup>1</sup>

Article

## Iron Deficiency in Vegetarian and Omnivorous Individuals: Analysis of 1340 Individuals

Eric Slywitch <sup>1,\*</sup>, Carine Savalli <sup>2</sup>, Antonio Cláudio Goulart Duarte <sup>3</sup> and Maria Arlete Meil Schimith Escrivão <sup>1</sup>

Todos os participantes da amostra

Table 3. Overall sample: diagnosis of iron deficiency among men and women who do not menstruate and menstruate based on eating habits.

Sample	Habit	Ferritin		Total	p-Value
		Normal (≥30 µg/L)	Altered (<30 µg/L)		
Men	Vegetarian	225	7	232	0.0201 <sup>(2)</sup>
	%	96.88	3.02	100.00	
	Omnivore	180	0	180	
	%	100.00	0	100.00	
	Total	405	7	412	
Women who do not menstruate	Vegetarian	95	19	114	0.0014 <sup>(1)</sup> X <sup>2</sup> <sub>(df=1)</sub> = 10.1756
	%	83.33	16.67	100.00	
	Omnivore	105	4	109	
	%	96.33	3.67	100.00	
	Total	200	23	223	
Women who menstruate	Vegetarian	214	206	420	<0.0001 <sup>(1)</sup> X <sup>2</sup> <sub>(df=1)</sub> = 24.1562
	%	50.95	49.05	100.00	
	Omnivore	179	76	225	
	%	70.20	29.80	100.00	
	Total	257	209	675	

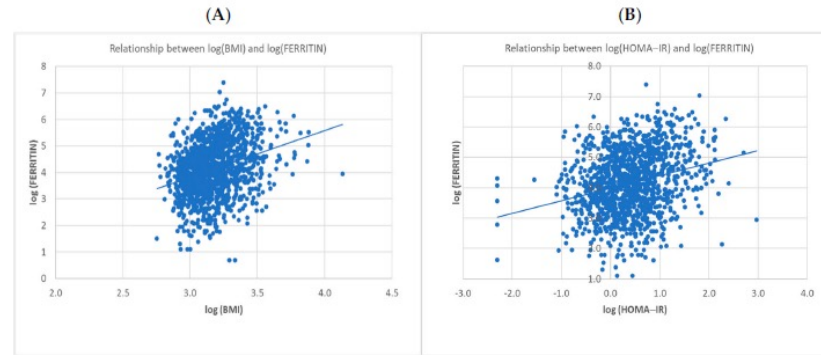
<sup>(1)</sup> Chi-squared test; <sup>(2)</sup> Fisher's exact test.

Article

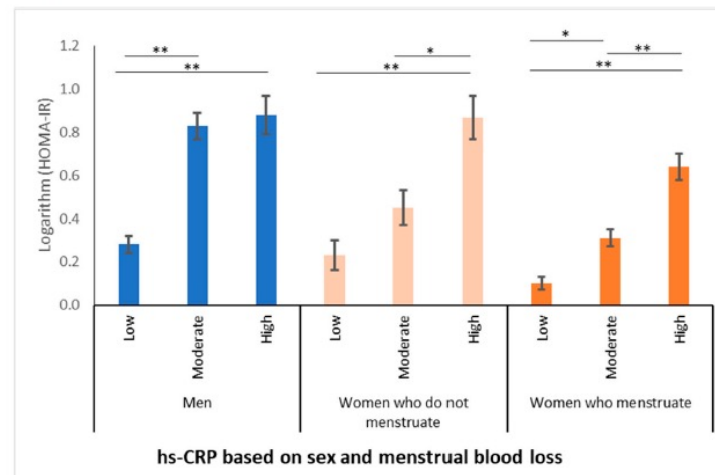
# Iron Deficiency in Vegetarian and Omnivorous Individuals: Analysis of 1340 Individuals

Eric Slywitch <sup>1,\*</sup>, Carine Savalli <sup>2</sup>, Antonio Cláudio Goulart Duarte <sup>3</sup> and Maria Arlete Meil Schimith Escrivão <sup>1</sup>

Inflamou, bagunçou!



**Figure 3.** (A) Scatter plot of ferritin vs. body mass index (BMI), both on the logarithmic scale (Pearson’s correlation = 0.30;  $p < 0.0001$ ;  $n = 1311$ ). (B) Scatter plot of ferritin vs. homeostatic model assessment-insulin resistance (HOMA-IR), both on the logarithmic scale (Pearson’s correlation = 0.26;  $p < 0.0001$ ;  $n = 1241$ ).



**Figure 4.** Relationship between homeostatic model assessment-insulin resistance (HOMA-IR) values and degrees of inflammation in men and women (all eating habits grouped). \*  $p \leq 0.001$ ; \*\*  $p < 0.0001$ . Data expressed on the logarithmic scale.

Article

## Iron Deficiency in Vegetarian and Omnivorous Individuals: Analysis of 1340 Individuals

 Eric Slywitch <sup>1,\*</sup>, Carine Savalli <sup>2</sup>, Antonio Cláudio Goulart Duarte <sup>3</sup> and Maria Arlete Meil Schimith Escrivão <sup>1</sup>

 Alinhando as variáveis de comparação: IMC de eutrofia, PCR-US baixa  
 N = 773

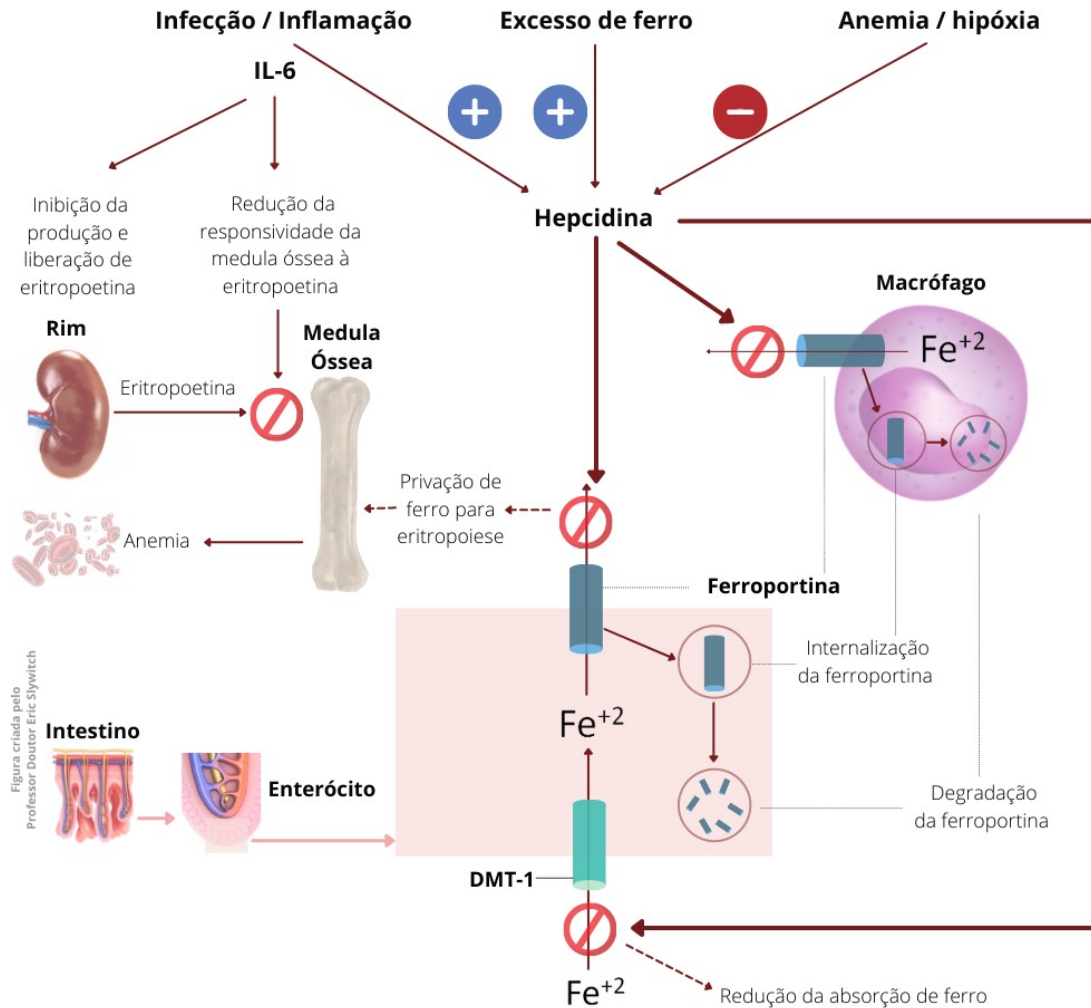
**Table 4.** Diagnosis of iron deficiency among men and women who do not menstruate and menstruate based on eating habits.

Sample	Habit	Ferritin		Total	p-Value
		Normal (≥30 µg/L)	Altered (<30 µg/L)		
Men	Vegetarian	124	4	128	0.3032 <sup>(2)</sup>
	%	96.88	3.13	100.00	
	Omnivore	64	0	64	
	%	100.00	0	100.00	
	Total	188	4	192	
Women who do not menstruate	Vegetarian	49	8	57	0.1062 <sup>(1)</sup> X <sup>2</sup> <sub>(df=1)</sub> = 2.6104
	%	85.96	14.04	100.00	
	Omnivore	55	3	58	
	%	94.83	5.17	100.00	
	Total	104	11	115	
Women who menstruate	Vegetarian	150	159	309	<0.0001 <sup>(1)</sup> X <sup>2</sup> <sub>(df=1)</sub> = 16.1839
	%	48.54	51.46	100.00	
	Omnivore	107	50	157	
	%	68.15	31.85	100.00	
	Total	257	209	466	

<sup>(1)</sup> Chi-squared test, <sup>(2)</sup> Fisher's exact test.

# Infusão de ferro: Mais é menos

## Ação da Hecpidina e inflamação no metabolismo do ferro





# Tratamento

# Muitos Guidelines – Pouco Consenso

Adv Ther (2021) 38:201–225  
<https://doi.org/10.1007/s12325-020-01564-y>



REVIEW

## A Review of Clinical Guidelines on the Management of Iron Deficiency and Iron-Deficiency Anemia in Women with Heavy Menstrual Bleeding

Diana Mansour · Axel Hofmann · Kristina Gemzell-Danielsson



**Fig. 2** Guideline recommendations for iron screening. There is high heterogeneity among the guidelines with recommendations for screening iron levels in women with HMB, varying from those that recommend it routinely, those that specifically advise against this practice, and those

that recommend iron testing as a second-line investigation. *HMB* heavy menstrual bleeding, *ID* iron deficiency. Guidelines referred to: red circle [51, 55, 59], blue circle [5, 52, 56, 57, 60, 62], turquoise circle [4, 50, 56, 57]

# Muitos Guidelines – Pouco Consenso

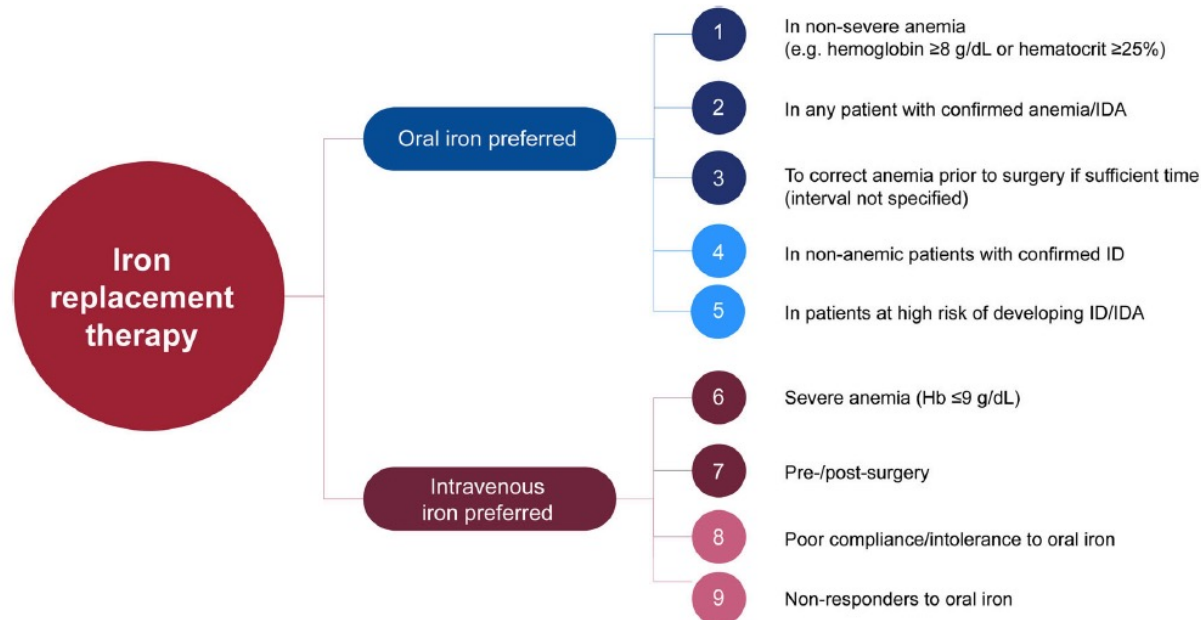
Adv Ther (2021) 38:201–225  
https://doi.org/10.1007/s12325-020-01564-y



REVIEW

## A Review of Clinical Guidelines on the Management of Iron Deficiency and Iron-Deficiency Anemia in Women with Heavy Menstrual Bleeding

Diana Mansour · Axel Hofmann · Kristina Gemzell-Danielsson



**Fig. 3** Patient populations in which iron replacement therapy is recommended by guidelines. Oral iron administration is the preferred route of treatment if permitted by the patient’s health and circumstances, both for patients with confirmed ID/IDA and patients classified at risk of developing ID/IDA. IV iron therapy is most commonly recommended in patients who do not respond, cannot

tolerate, or do not comply with oral iron administration, before and after surgery and in patients with severe anemia. *ID* iron deficiency, *IDA* iron-deficiency anemia. Guidelines referred to: (1) [51, 57], (2) [5, 62, 63], (3) [5, 57], (4) [57, 62, 63], (5) [62], (6) [57], (7) [5, 57, 62], (8) [51, 57, 62], (9) [5, 57, 62, 63]



## Tratamento

- 1) Via oral – gotas/cápsulas/comprimidos
- 2) Via sublingual
- 3) Intramuscular
- 4) Endovenoso

# Noripurum x Ferrinject

## NORIPURUM® EV

sacarato de hidróxido férrico 100 mg/5 mL



### APRESENTAÇÕES

Solução injetável endovenosa 20 mg/mL (100 mg/5 mL). Embalagens contendo cinco ampolas de 5 mL cada.

### VIA ENDOVENOSA

### USO ADULTO E PEDIÁTRICO

### COMPOSIÇÃO

Cada ampola de 5 mL contém:

sacarato de hidróxido férrico (equivalente a 100 mg de ferro III) .....2.700 mg

Excipientes: água para injetáveis e hidróxido de sódio.

## Ferinject®

carboximaltose férrica

50 mg/mL



### APRESENTAÇÕES

Solução injetável intravenosa de 50 mg de ferro III/mL.  
Embalagem com 1 frasco-ampola de vidro de 10 mL.

### VIA INTRAVENOSA USO ADULTO

### COMPOSIÇÃO

Cada frasco-ampola de 10 mL contém:

carboximaltose férrica (equivalente a 500 mg de ferro III) ..... 1.800 mg

Excipientes: água para injetáveis, hidróxido de sódio (para ajuste de pH) e ácido clorídrico (para ajuste de pH).

Takeda Noripurum Endovenoso 5 Ampolas X 5ml

Detalhes Lojas

**Drogaria São Paulo** R\$ 64,70  
Noripurum Endovenoso Solução Injetável 100mg/5ml Takeda 5...

**paguemenos.com.br** R\$ 65,35  
Noripurum Injetável Endovenoso Com 5 Ampolas De 5ml

**Farmácia Rosário** R\$ 60,79  
Noripurum 1 x R\$ 60,79 - sem juros  
Endovenoso 5...  
Frete de R\$ 14,32

**Farma22** R\$ 69,90  
Noripurum Intra 2 x R\$ 34,95 - sem juros  
Venoso Ampola...

**Drogaria São Paulo** R\$ 64,70  
Noripurum Endovenoso Solução Injetável 100mg/5ml Takeda 5...

Ferinject 50mg/mL, caixa com 1 ampola com 10mL de solução de uso intravenoso

**PanVel** Vendido e entregue por PanVel Comprar garantida

Informe seu endereço para calcular o frete!  
Clique para calcular prazos e preços de entrega.  
[Calcular método de entrega](#)

Quantidade:

**R\$ 638,40**  
Ex de R\$ 106,40 s/juros. Saiba mais

**Adicionar ao carrinho**

**PHARMED** Vendido e entregue por Pharmed Comprar garantida

Informe seu endereço para calcular o frete!  
Clique para calcular prazos e preços de entrega.  
[Calcular método de entrega](#)

Quantidade:

**R\$ 585,00**  
Ex de R\$ 37,50 s/juros. Saiba mais

**Adicionar ao carrinho**

Frete grátis para SP Capital, Região metropolitana e ABC. Atendemos demandas judiciais. Entregamos em todo território nacional

**Integralmed** Vendido e entregue por Integralmed Comprar garantida

Informe seu endereço para calcular o frete!  
Clique para calcular prazos e preços de entrega.  
[Calcular método de entrega](#)

Quantidade:

**R\$ 588,19**  
Ex de R\$ 36,02 s/juros. Saiba mais

**Adicionar ao carrinho**

Entrega grátis em compras acima de R\$500. Válido para as Capitais. Demais regiões, consulte valor no carrinho de compras.

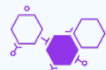
**RMED** Vendido e entregue por Remed Florianópolis Comprar garantida

Informe seu endereço para calcular o frete!  
Clique para calcular prazos e preços de entrega.  
[Calcular método de entrega](#)

Quantidade:

**R\$ 599,00**  
Ex de R\$ 36,02 s/juros. Saiba mais

**Adicionar ao carrinho**

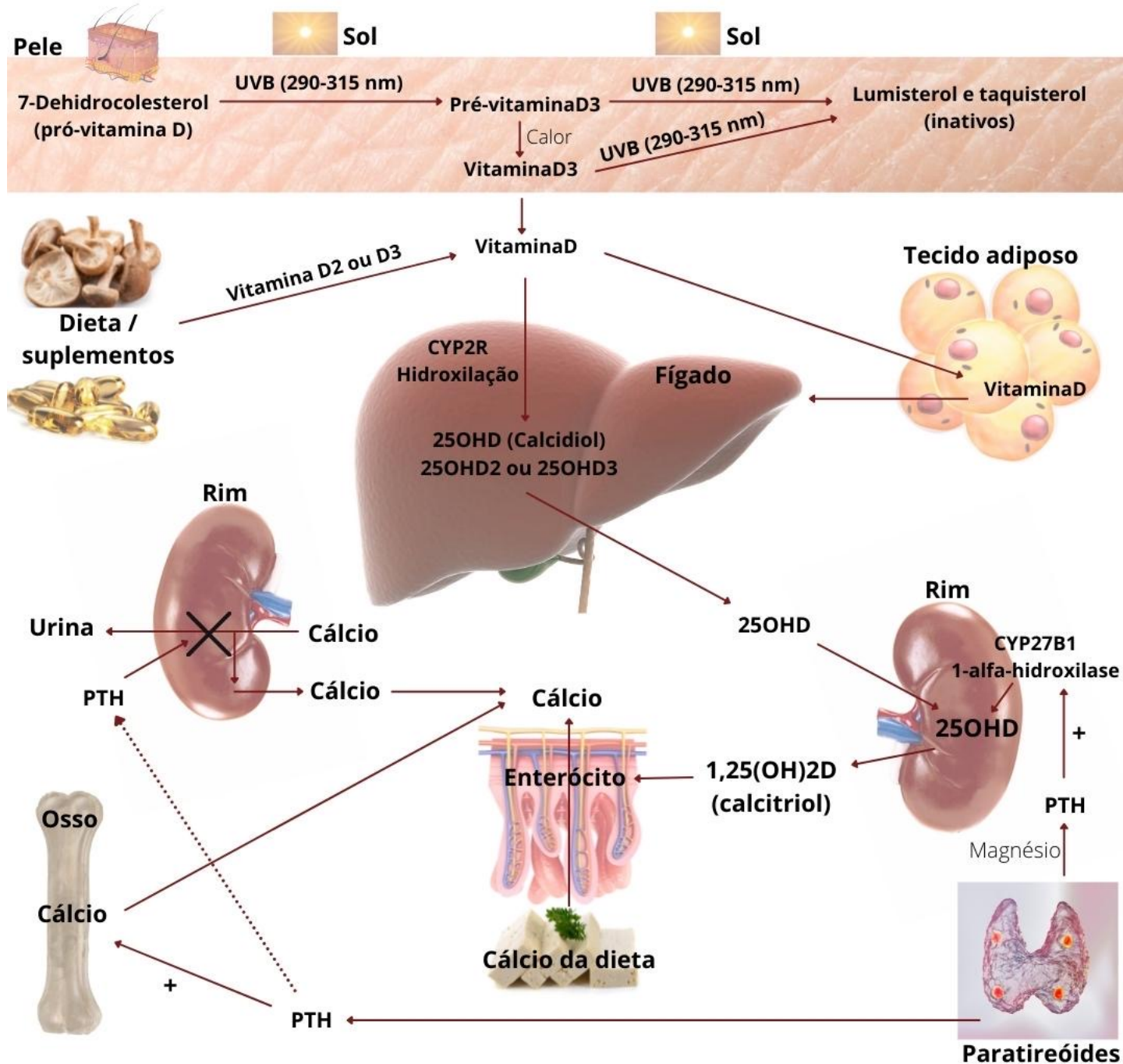


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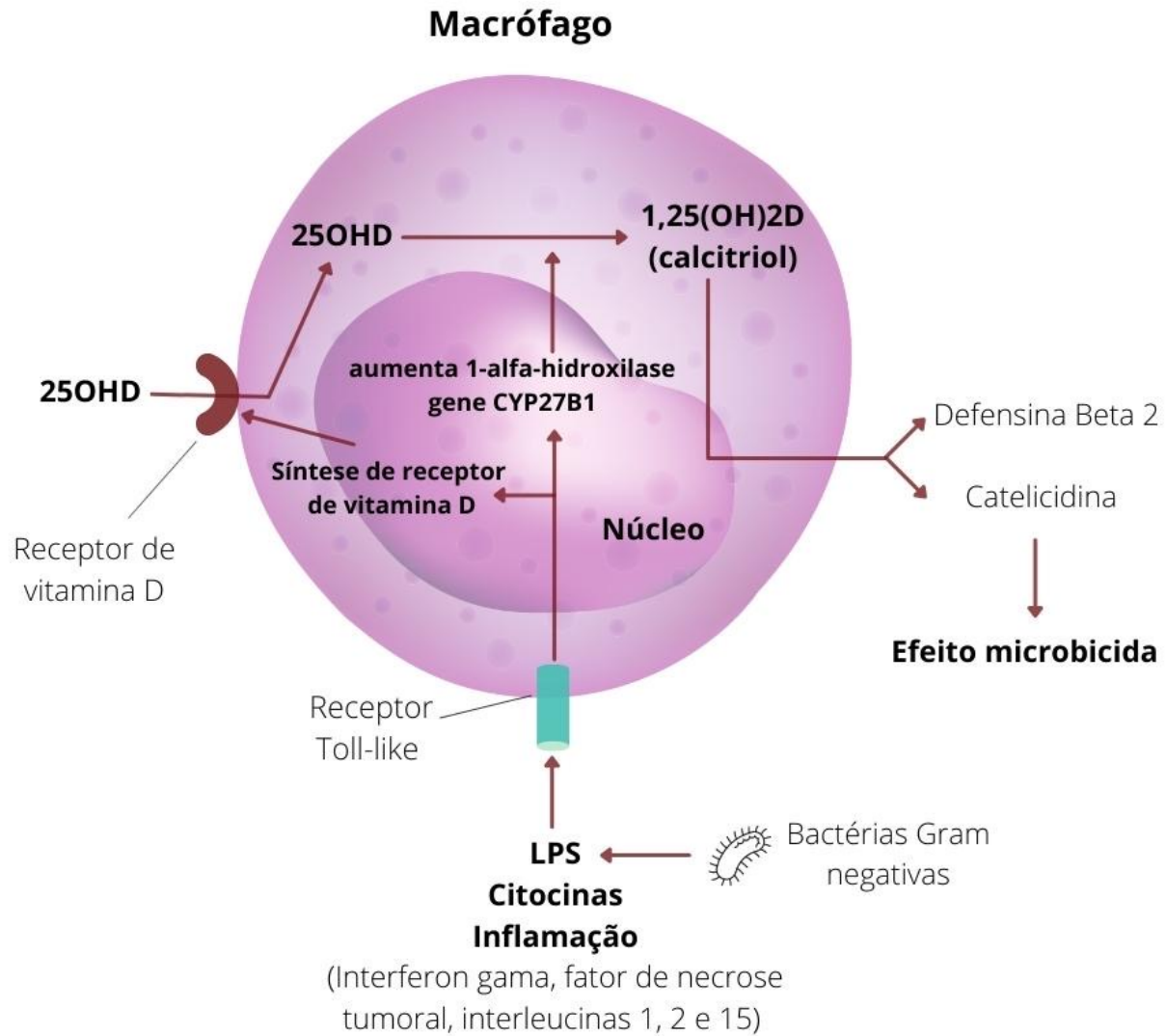
# 3º WEBNÁRIO

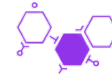
## “Os perigos da Vitamina D”

# Metabolismo da Vitamina D e Cálcio



## Ação imunológica da vitamina D





# Vitamin D Toxicity—A Clinical Perspective

September 2018 | Volume 9 | Article 550

*Ewa Marcinowska-Suchowierska<sup>1\*</sup>, Malgorzata Kupisz-Urbańska<sup>1</sup>, Jacek Łukaszewicz<sup>2</sup>, Paweł Płudowski<sup>3</sup> and Glenville Jones<sup>4</sup>*

## Sintomas de Hipercalcemia

Manifestações neuropsiquiátricas: dificuldade de concentração, confusão, sonolência, depressão, psicose e, em casos extremos, estupor e coma.

Sintomas gastrointestinais: vômitos recorrentes, dor abdominal, anorexia, obstipação, úlcera péptica e pancreatite.

# Vitamin D Toxicity—A Clinical Perspective

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Sintomas cardiovasculares: hipertensão, encurtamento do intervalo QT, elevação do segmento ST, bradiarritimias com bloqueio cardíaco de primeiro grau.

Sintomas renais: hipercalcúria (primeira manifestação), poliúria, polidipsia, desidratação, nefrocalcinose e falência renal.

Outros sintomas: ceratopatia, perda auditiva e calcinose periarticular dolorosa.

Atualmente, o nível de vitamina D considerado **valor de intoxicação** é  $25\text{OHD}_3 >375 \text{ nmol/L}$  ( $>150 \text{ ng/mL}$ ), mas alguns indivíduos apresentam as manifestações descritas abaixo com nível de vitamina D abaixo desse valor [503, 504].

A caracterização da intoxicação por vitamina D deve incluir a presença somada das manifestações abaixo [503]:

- hipercalcemia severa.
- hipercalciúria.
- nível de PTH muito baixo ou indetectável.
- $1,25(\text{OH})_2\text{D}$  normal ou elevado.



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503. Marcinowska-Suchowierska, E., et al., *Vitamin D Toxicity-A Clinical Perspective*. Front Endocrinol (Lausanne), 2018. 9: p. 550.

## Vitamin D Toxicity–A Clinical Perspective

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Laboratory findings (other than hypercalcemia) inpatients with symptomatic exogenous VDT related to overdosing of vitamin D or  $25(\text{OH})\text{D}$  show suppressed PTH (intact),  $25(\text{OH})\text{D}$  concentration  $>150 \text{ ng/ml}$  ( $>375 \text{ nmol/l}$ ), and normal or increased values of  $1,25(\text{OH})_2\text{D}$  concentration.



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Paweł Piudowski<sup>3</sup> and Glenville Jones<sup>4</sup>

## Atenção:

A hipercalcemia pode permanecer por 18 meses após a descontinuação da vitamina D suplementada.

## Vitamin D Toxicity—A Clinical Perspective

Ewa Marciniowska-Suchowierska<sup>1\*</sup>, Małgorzata Kupisz-Urbańska<sup>1</sup>, Jacek ŁukaszKiewicz<sup>2</sup>, Paweł Piudowski<sup>3</sup> and Glenville Jones<sup>4</sup>

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### Tratamento de primeira linha (da intoxicação por suplementação)

- 1) Imediata suspensão do suplemento;
- 2) Redução da ingestão de cálcio
- 3) Hidratação abundante
- 4) Considerar o uso de diurético de alça
- 5) Considerar o uso de corticóide (hidrocortisona 100 mg/d). Ações:
  - Inibe absorção transcelular intestinal de cálcio
  - Aumenta a excreção urinária
  - Altera a hidroxilação hepática, sintetizando metabólitos inativos
- 6) Terapia de estímulo de osteoblastos (Bisfosfonatos)

## Vitamin D Toxicity—A Clinical Perspective

Ewa Marciniowska-Suchowierska<sup>1\*</sup>, Małgorzata Kupisz-Urbańska<sup>1</sup>, Jacek Łukaszklewicz<sup>2</sup>, Paweł Piłdowski<sup>3</sup> and Glenville Jones<sup>4</sup>

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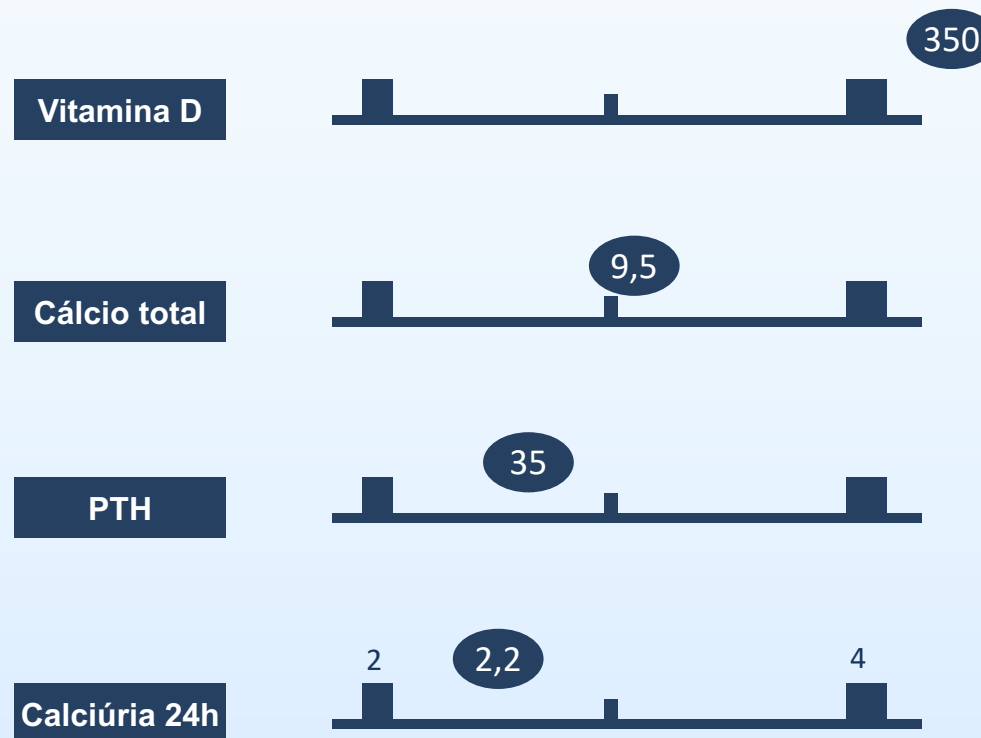
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### Tratamento de segunda linha (da intoxicação por suplementação)

- 1) Fenobarbital (reduz 25OHD por alterar enzimas hepática microssomais);
- 2) Cetoconazol (reduz a produção de  $1,25(\text{OH})_2\text{D}$  por inibição deo P450, CYP27B1);
- 3) Aminoquinolinas (cloroquina, hidroxiclороquina) reduz a produção de  $1,25(\text{OH})_2\text{D}$

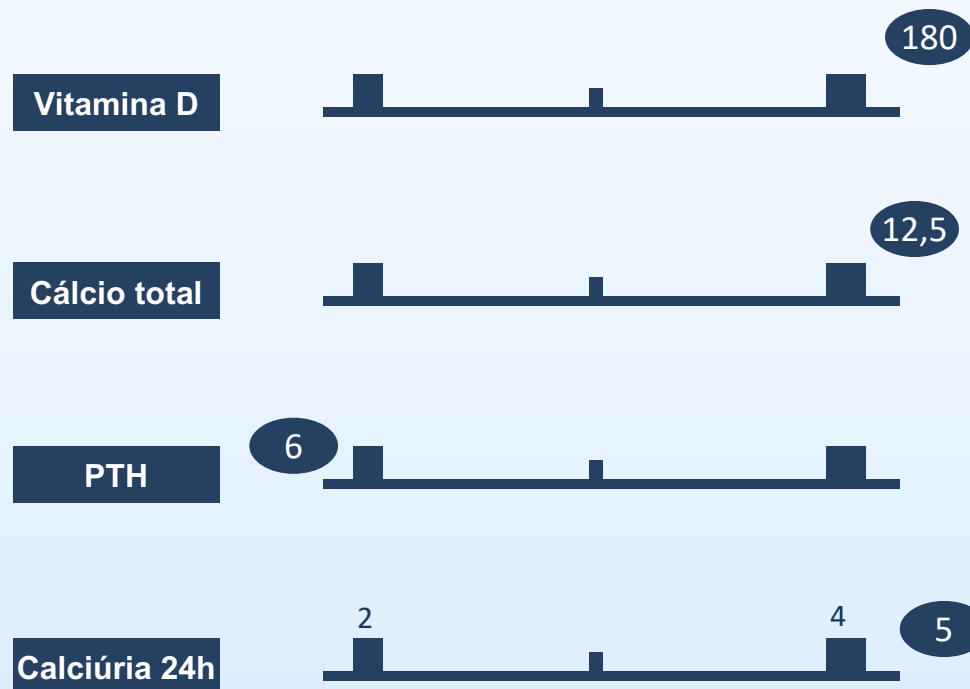


# Caso clínico 1



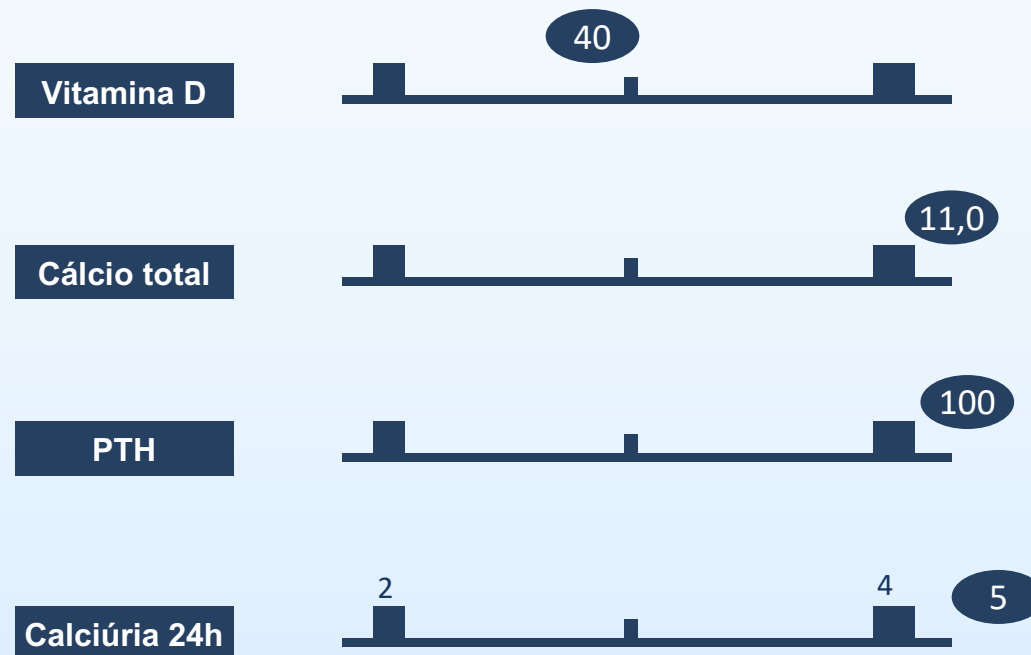


## Caso clínico 2





## Caso clínico 3



[Topo](#)[Ementa](#)[Calendário](#)[Dr. Eric Slywitch](#)[Depoimentos](#)[Matrícula](#)

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GARANTIA DE 7 DIAS PARA DEVOLUÇÃO INTEGRAL DO VALOR  
PAGO

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**DESCONTO DE 5%**

18 X

R\$ 1.112,44

PARA PIX/BOLETO, QUESTÕES DE LIMITE OU  
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# MÓDULO I

## Janeiro e fevereiro de 2023

- Tornando a bioquímica fácil de entender
- Metabolismo de carboidratos

Do alimento à análise do exame laboratorial.

Deficiência e excesso de carboidrato e suas manifestações clínicas e laboratoriais.

Mecanismos metabólicos e hormonais de controle glicêmico.

Ação do carboidrato no equilíbrio hídrico e osmolar.

- Metabolismo lipídico

Colesterol sob a ótica da necessidade orgânica e do ajuste nutricional.

Da deficiência ao excesso de gorduras.

Bioquímica do estoque à oxidação de Lipídios.

Leitura de exames laboratoriais.

- Metabolismo de proteínas e aminoácidos

Da deficiência ao excesso de proteínas: compreendendo a fisiologia e bioquímica.

Do alimento à análise do exame laboratorial

- Metabolismo do Etanol
- Interação carboidrato-proteína-gordura
- Avaliação nutricional
- Composição corporal e métodos de avaliação corporal
- Necessidade energética

Exames laboratoriais abordados nesse módulo:

- Glicemia de jejum
- Insulinemia
- Índices de Homa
- Hemoglobina glicada
- Frutosamina
- Colesterol total e frações
- Triglicerídeos
- Ureia
- Creatinina
- Albumina
- Globulinas

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# MÓDULO 2

## Março e abril de 2023

- Obesidade e Desnutrição

Análise bioquímica, laboratorial e estudo fisiológico das duas condições.

Identificação laboratorial antes dos sinais e sintomas se manifestarem.

Mapa das disfunções metabólicas integradas.

- Inflamação

Tipos de lesões e sinalizações inflamatórias.

Estudo das citocinas.

Composição lipídica da dieta e resposta inflamatória.

Marcadores laboratoriais de inflamação.

- Metabolismo do ferro

Fisiologia, bioquímica

Interpretação laboratorial da carência e excesso

Tratamento da deficiência

Vias de formas de suplementação

Exames laboratoriais abordados:

- Hemograma

Série vermelha (eritócitos, hemoglobina, hematócrito, VCM, HCM, CHCM, RDW)

Série Branca (neutrófilos, linfócitos, eosinófilos, monócitos, basófilos)

Plaquetas

- Proteína C reativa ultrasensível

- Fibrinogênio

- VHS

- Ácido úrico

- TGO (AST), TGP (ALT)

- Gama-GT

- Fosfatase alcalina

- Ferritina

- Ferro sérico

- Saturação da transferrina

- Capacidade de ligação do ferro

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# MÓDULO 3

Maio e junho de 2023

- Metabolismo do cálcio

Da bioquímica à fisiologia do cálcio

Diagnóstico da deficiência

Como não interpretar errado o metabolismo do cálcio

Tratamento da deficiência de cálcio

- Vitamina B12

Da descoberta da B12 às suas atualizações - são cerca de 10h de aulas sobre vitamina B12

- Folato

Bioquímica e fisiologia,

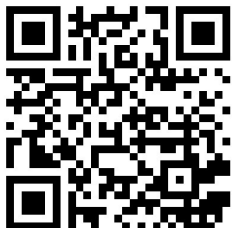
Interpretação laboratorial da deficiência

Tratamento da deficiência

Exames laboratoriais abordados:

- Cálcio total e ionizado
- Fósforo
- Magnésio
- PTH
- Vitamina D
- CTX
- Fosfatase alcalina
- Vitamina K - TP/AP
- Cálcio urinário
- Citrato, oxalato e ácido úrico urinário
- Vitamina B12
- Ácido fólico
- Homocisteína
- Ácido metilmalônico

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# MÓDULO 4

Julho e agosto de 2023

- Tireoide

Fisiologia e bioquímica da formação e ação dos hormônios tireoideanos

Ação dos diversos nutrientes sobre a função tireoideana

Ação de elementos nutricionais sobre a tireoide

Interpretação laboratorial

Ajuste nutricional

- Gestação

Alterações metabólicas da gestação

Abordagem nutricional e suplementação da gestante

Interpretação de todos os exames laboratoriais já abordados frente às alterações gestacionais

- Infância

Abordagem nutricional

Estudos sobre crianças vegetarianas

Interpretação de todos os exames laboratoriais já abordados durante o curso sob a ótica da infância

- Selênio, Zinco, Iodo e Colina

Fisiologia e bioquímica

Diagnóstico de deficiência

Avaliação laboratorial

Tratamento da deficiência

Exames laboratoriais abordados:

- TSH

- T4 livre

- T3 livre

- Anti-TPO e Anti-TG

- Anti-TRAB

- Selênio

- Zinco

- Iodo urinário

- Detalhes da Interpretação dos exames na gestação e infância

FORMAÇÃO  
AVALIAÇÃO  
METABÓLICA E  
NUTRICIONAL

COM ÊNFASE EM INTERPRETAÇÃO DE  
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# MÓDULO 5

Setembro e outubro de 2023

- Fisiologia digestiva

Tudo o que você precisa saber para ajustes metabólicos e nutricionais do trato digestório

- Fisiologia renal

Da bioquímica à fisiologia renal com foco em ajustes metabólicos e nutricionais

- Atletas

Fisiologia e bioquímica esportiva

Ajustes nutricionais

Suplementação

- Paciente bariátrico

Tipos de cirurgia

Como conduzir

Lidando com a avaliação nutricional e suplementação

- Água

Necessidade hídrica

Efeitos na inadequação hídrica corporal

Ajustes nutricionais

- Sódio

Fisiologia, bioquímica

Necessidades nutricionais

Avaliação metabólica

- Potássio

Fisiologia, bioquímica

Necessidades nutricionais

Avaliação metabólica

- Vitamina C

Fisiologia, bioquímica

Necessidades nutricionais

## Avaliação metabólica

- Nuances da Interpretação dos exames em atletas e pacientes bariátricos

Exames laboratoriais abordados:

Todos os exames já apresentados no curso, adaptando-os para cada condição clínica.

FORMAÇÃO  
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METABÓLICA E  
NUTRICIONAL

COM ÊNFASE EM INTERPRETAÇÃO DE  
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# MÓDULO 6

**Novembro e dezembro de 2023**

- Vitamina B1, B2, B3, B5, B6 e elementos traço

Fisiologia, bioquímica

Necessidades nutricionais

Avaliação metabólica

- Metabolismo do triptofano

- Da psicologia à psiquiatria

- Revisão geral

Exames laboratoriais abordados:

Todos os exames já apresentados no curso, adaptando-os para cada condição

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AVALIAÇÃO  
METABÓLICA E NUTRICIONAL



COM ÊNFASE EM INTERPRETAÇÃO  
DE EXAMES LABORATORIAIS

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