



GLOBAL DAIRY PLATFORM

Nutrição e Saúde Benefícios dos Laticínios

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Global Dairy Platform

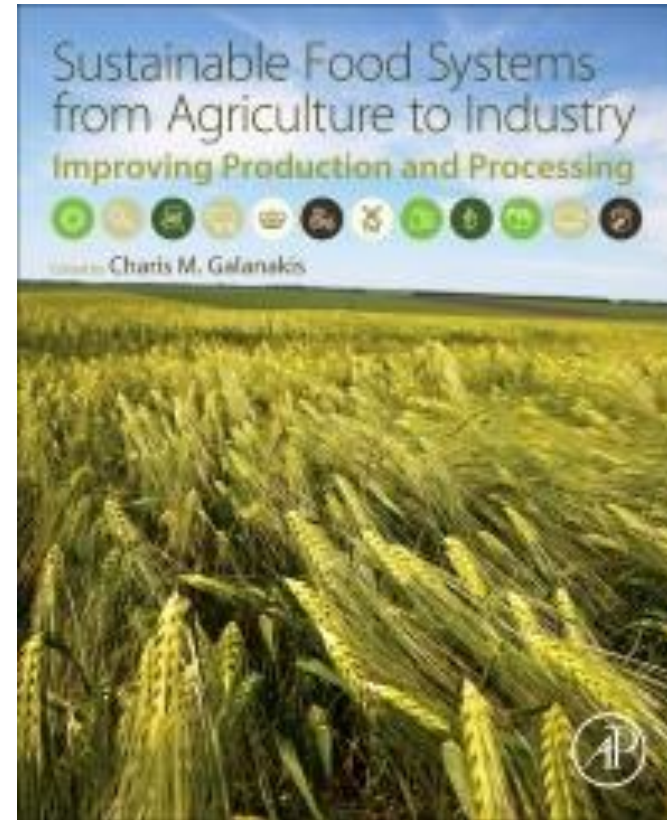
Discover the **Good**

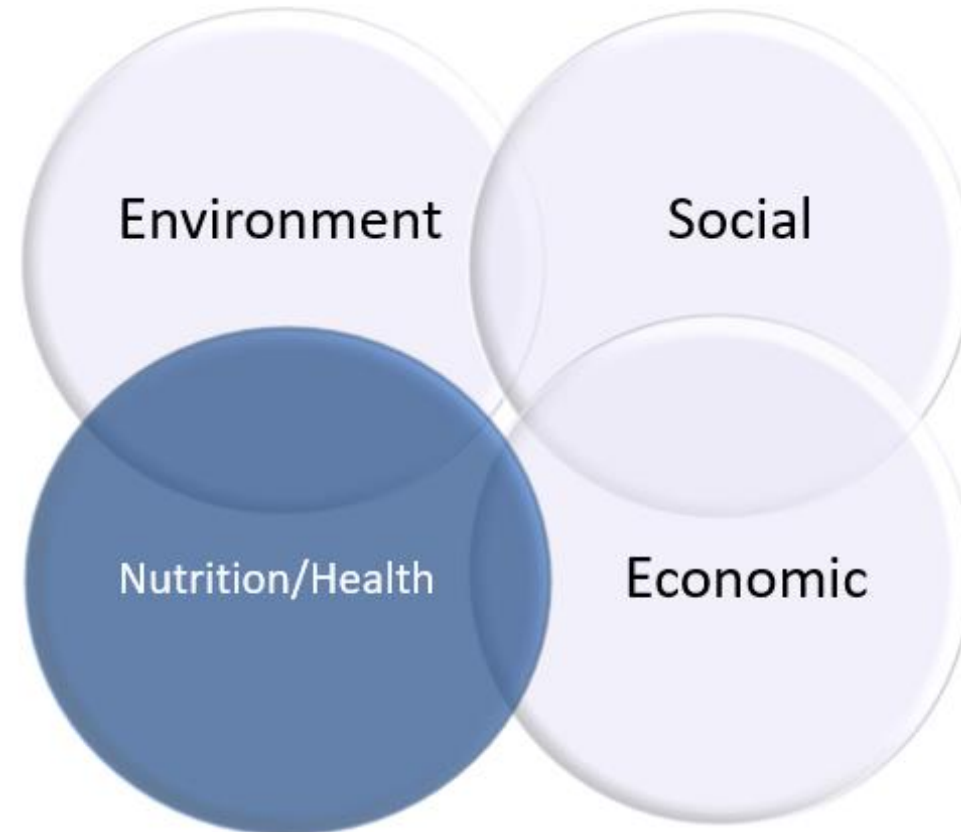




Sistema Alimentar Sustentável conforme definição da FAO

*Um **sistema alimentar sustentável** é um que fornece **segurança alimentar e nutrição** para todos, de tal forma que as bases **econômicas, sociais e ambientais** para gerar segurança alimentar e nutrição não comprometerão as futuras gerações.*



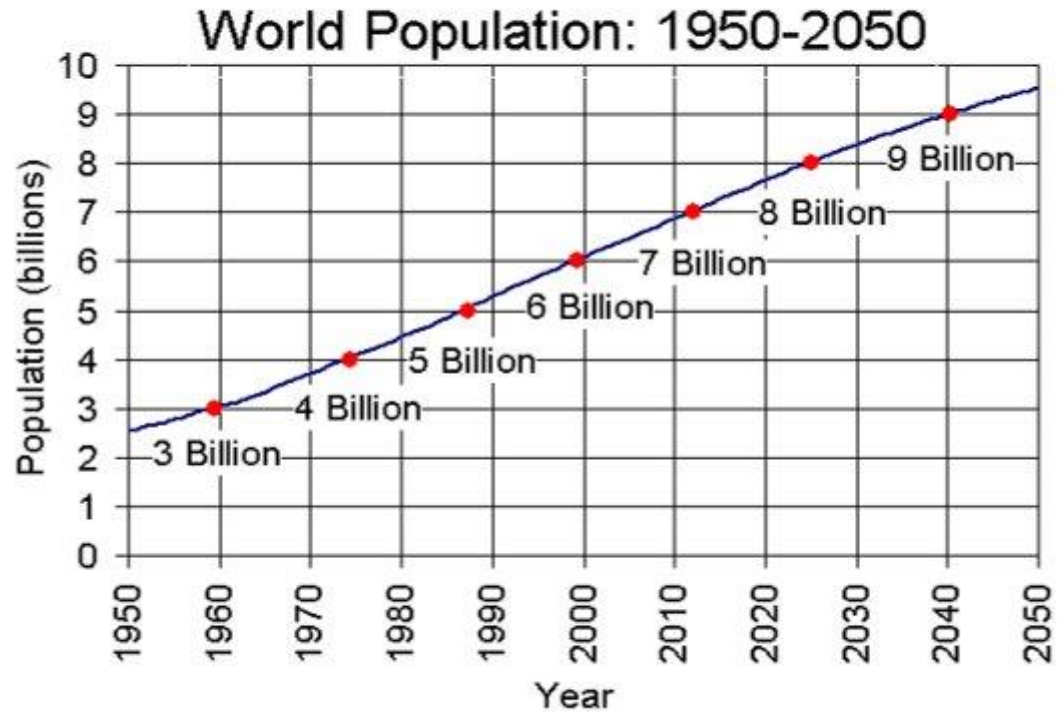


Os laticínios são componentes vitais de um sistema alimentar saudável e sustentável



Crescimento Populacional

World Population: 1950-2050



Source: U.S. Census Bureau, International Data Base, December 2008 Update.





Os laticínios são uma parte importante das Diretrizes Nutricionais Globais



Arab Countries
2-3 servings of dairy products per day



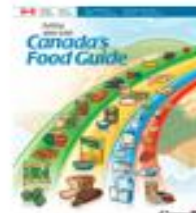
Argentina
Consume daily milk, yogurt or cheese. It is necessary for all age groups



Australia
3 servings of reduced-fat dairy per day



Brazil
3 portions of low-fat milk and dairy products



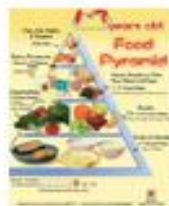
Canada
2-3 servings for children (2-8 yrs), adults (19-51+); 3-4 servings for children and teens (9-18 yrs)



China
100 g per day of dairy products



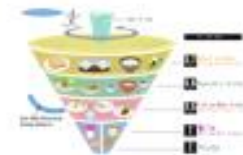
France
3 servings per day for adults; 3-4 servings for children and adolescents



Hong Kong
1-3 glasses of milk per day



Ireland
3 servings of low-fat milk, cheese, yogurt per day for adults. 5 servings per day for children (9-18 yrs)



Japan
2 servings of milk/milk products a day



Malaysia
1-2 daily servings for adults; 2 daily servings for children (2-6 yrs)



Spain
2 servings per day; preferably low-fat



Switzerland
3 portions of milk or dairy per day



Thailand
1-2 glasses of milk/yogurt per day



Laticínios são naturalmente nutritivos





Melhorando a qualidade da proteína nutricional reduz os efeitos negativos da inatividade física na composição corporal e função muscular.

E. Arentson-Lentz et al.

J. Gerontol 2019 doi:10.1093/geronona/glz003

- A adição de *whey* (soro do leite) na dieta de homens e mulheres saudáveis sujeitos a 7 dias acamados
- Conclusão: Durante o período acamado, melhorando a qualidade proteica sem aumentar a ingestão de energia total tem o efeito de parcialmente reverter alguns dos efeitos negativos do período acamado em adultos mais velhos.



Laticínios e Saúde Vascular





Evidências crescentes: A ingestão de laticínios pode ter uma associação benéfica para o risco de doença cardiovascular.

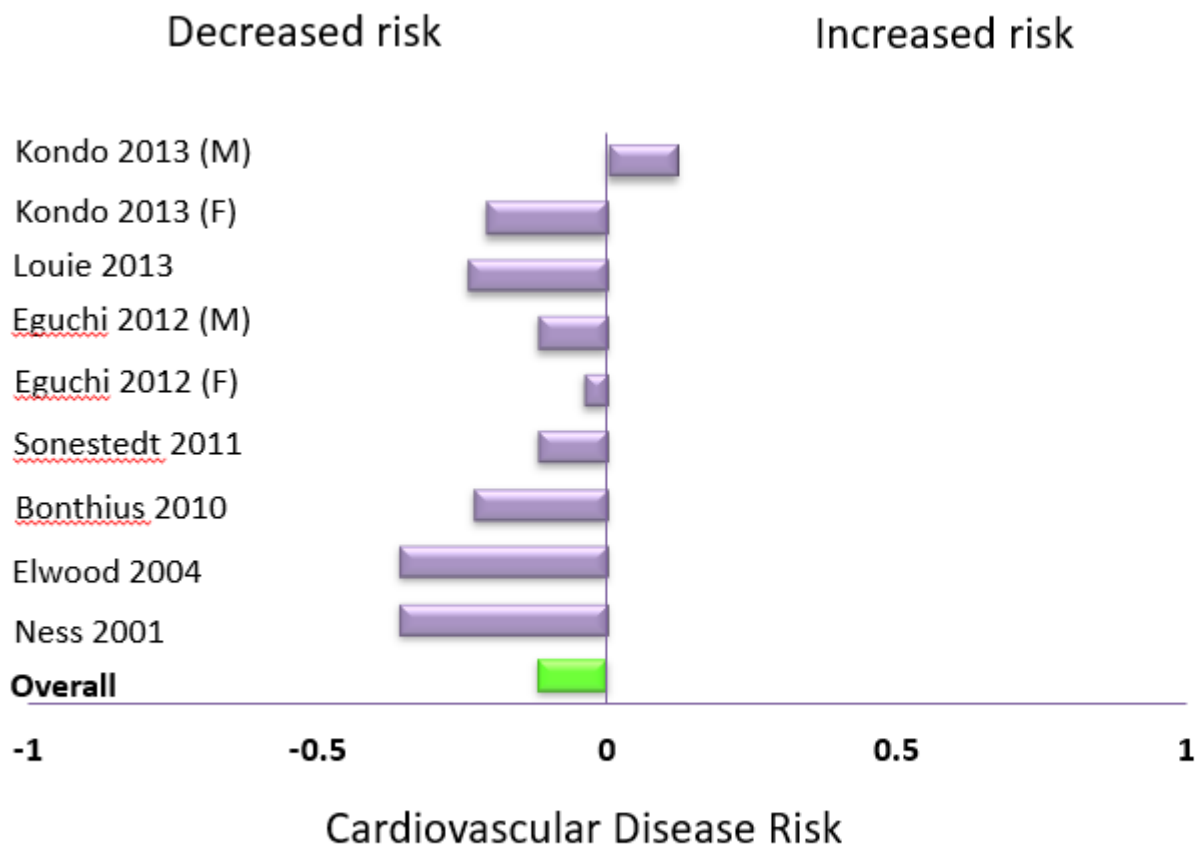
<p>Advances in Nutrition AN INTERNATIONAL REVIEW JOURNAL</p> <p>Systematic Review of the Association between Dairy Product Consumption and Risk of Cardiovascular-Related Clinical Outcomes¹⁻³</p> <p>Systematic Review</p> <p>“...there is no evidence that consumption of dairy fat or of low-fat or full-fat dairy foods are detrimental to cardiovascular-related clinical outcomes – supporting the inclusion of dairy foods, regardless of fat level, in a healthy eating pattern.”</p>	<p>British Journal of Nutrition</p> <p>Dairy consumption and CVD: a systematic review and meta-analysis</p> <p>31 cohort studies >1 million participants</p> <p>“...dairy consumption may be associated with reduced risks of CVD, although additional data are needed to more comprehensively examine potential dose-response patterns.”</p>
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*NDC sponsored studies



Metanálise:

Laticínios integrais reduzem o risco para doença cardiovascular



Asia Pacific

Journal of

Clinical Nutrition

Intake of saturated and trans unsaturated fatty acids and risk of all cause mortality, cardiovascular disease, and type 2 diabetes: systematic review and meta-analysis of observational studies

22 cohort studies
>800,000 participants

“...the findings of the present meta-analysis have suggested that dairy consumption (regardless of fat content) is significantly and inversely associated with the risks of CVD and stroke.”

Qin et al. Asia Pac J Clin Nutr 2015



O consumo de leite integral está associado a um menor risco de progressão da calcificação da artéria coronária: comprovação de um Estudo Multiétnico sobre Aterosclerose

Ghosh et al. Eur J Nutr 2020 Prepublication

- A progressão da calcificação da artéria coronária (CAC) é um forte preditor de morbidade e mortalidade por doença cardiovascular (DCV).
- Estudos recentes destacam os efeitos benéficos dos ácidos graxos de cadeia curta (SCFA) obtidos no leite integral para o risco para DCV.
- 5273 indivíduos preencheram um questionário nutricional na linha de base. Foram retestados a cada 2 anos, durante um período de 10 anos.
- O consumo autoavaliado de leite integral foi inversamente associado com a progressão da CAC em participantes morando em comunidades, especialmente naqueles que tinham um risco de DVC relativamente baixo.
- O efeito benéfico foi parcialmente mediado pela SCFA.



Mais de 50 anos com o foco em gordura



The 7 *Seven Countries Study*

1950s-1970s



American Heart Association



1961 Recommendations

American Heart Association Report (1961)¹

1. Maintain a correct body weight.
2. Engage in moderate exercise, e.g., walking to aid in weight reduction.
3. Reduce intake of total fat, saturated fat, and cholesterol. Increase intake of polyunsaturated fat.
4. Men with a strong family history of atherosclerosis should pay particular attention to diet modification.
5. Dietary changes should be carried out under medical supervision.



Paradigma original de Dieta – Coração

O paradigma original dieta – coração argumentava que porque as gorduras saturadas aumentam o colesterol LDL (“mau”), e o colesterol LDL aumenta o risco para doença coronariana (CHD), então gorduras saturadas aumentam o risco para doença coronariana (CHD).



The latest evidence indicates that the real story may be more complex



Prova que surge:

O consumo de gorduras saturadas pode não estar relacionado ao risco de DCV.

 **The American Journal of
CLINICAL NUTRITION**

Meta-analysis of prospective cohort studies
evaluating the association of saturated fat
with cardiovascular disease^{1,2,3,4,5}

Patty W Siri-Tarino, Qi Sun, Frank B Hu, and Ronald M Krauss

**2010; 21 observational studies
347,747 participants**

*"...there is no significant evidence
for concluding that dietary
saturated fat is associated with an
increased risk of CHD or CVD."*

Annals of Internal Medicine

ESTABLISHED IN 1927 BY THE AMERICAN COLLEGE OF PHYSICIANS

Association of Dietary, Circulating, and Supplement Fatty Acids With
Coronary Risk

A Systematic Review and Meta-analysis

Rajiv Chowdhury, MD, PhD; Samantha Wamukula, MPhil¹; Setor Kumutso, MD, MS¹; Francesca Crowe, PhD; Heather A. Ward, PhD;
Laura Johnson, PhD; Oscar H. Franco, MD, PhD; Adam S. Butterworth, PhD; Nita G. Forouhi, MRCP, PhD; Simon G. Thompson, FMedSci;
Kay-Tee Khaw, FMedSci; Dariush Mozaffarian, MD, DrPH; John Danesh, FRCP¹; and Emanuele Di Angelantonio, MD, PhD^{*}

**2014; 32 observational studies
530,525 participants**

*"Current evidence does not clearly
support cardiovascular guidelines
that encourage high consumption
of polyunsaturated fatty acids and
low consumption of total
saturated fats."*



A Fundação do Coração e AVC do Canadá reduziu o limite para gorduras saturadas.

HEART & STROKE FOUNDATION POSITION STATEMENT

SATURATED FAT HEART DISEASE

There are different dietary saturated fatty acids including lauric acid, myristic acid, palmitic acid and stearic acid. There is emerging evidence to suggest that the health effects of saturated fats could vary depending on the food sources in which they are found.⁷

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RECOMMENDATIONS

The science of nutrition is ever-evolving with new evidence emerging all the time. It is becoming increasingly clear that what has the most impact on health is the overall quality of one's diet, combined with the types and quantity of food consumed. The following recommendations do not include a threshold or limit for saturated fat and instead focus on a healthy balanced dietary pattern, which can help Canadians reduce consumption of saturated fats.

- Dietary fats and oils provide energy to the body as well as essential fats that are needed to prevent a nutrient deficiency and also help your body absorb fat soluble vitamins such as A, D, E and K. You need fat in your diet for normal body function.¹⁰
- There are different types of fats including poly- and mono-unsaturated fats, saturated fats, and trans fatty acids. The type of fat consumed is more important for health than the total amount of fat consumed.
- Saturated fats (or saturated fatty acids) occur naturally in animal products like meats, eggs and dairy products as well as some plant-based and vegetable oils such as coconut, palm and palm kernel oil. These fats can be used during production of baked goods, fried and highly processed food products.
- Saturated fat increases LDL cholesterol levels in the blood. High LDL cholesterol is a risk factor for heart disease and stroke. Replacing saturated fats with mono- and poly-unsaturated fats decreases LDL cholesterol.¹¹



A área acadêmica diz que nem todas as gorduras são criadas da mesma maneira: Focalizar em um único ácido graxo é muito simplista.

FROM THE ACADEMY
Position Paper

eat right.

Position of the Academy of Nutrition and Dietetics: Dietary Fatty Acids for Healthy Adults

ABSTRACT
It is the position of the Academy of Nutrition and Dietetics (the Academy) that dietary fat for the healthy adult population should provide 20% to 35% of energy, with an increased consumption of n-3 polyunsaturated fatty acids and limited intake of saturated and trans fats. The Academy recommends a food-based approach through a diet that includes regular consumption of fatty fish, nuts and seeds, lean meats and poultry, low-fat dairy products, vegetables, fruits, whole grains, and legumes. These recommendations are made within the context of rapidly evolving science delineating the influence of dietary fat and specific fatty acids on human health, in addition to fat as a valuable and culturally diverse macronutrient with a central role in supplying essential nutrients and supporting healthy body weight. Evidence on individual fatty acids and fatty acid groups is emerging as a key factor in nutrition and health. Small variations in the structure of fatty acids within broader categories of fatty acids, such as polyunsaturated and saturated, appear to elicit different physiological functions. The Academy recognizes that scientific knowledge about the effects of dietary fat on human health is young and takes a prudent approach in recommending an increase in fatty acids that benefit health and a reduction in fatty acids shown to increase risk of disease. Registered dietitian practitioners are uniquely positioned to translate fat and fatty acid research into practical and effective dietary recommendations.

POSITION STATEMENT
It is the position of the Academy of Nutrition and Dietetics that dietary fat for the healthy adult population should provide 20% to 35% of energy, with an increased consumption of n-3 polyunsaturated fatty acids and limited intake of saturated and trans fats. The Academy recommends a food-based approach through a diet that includes regular consumption of fatty fish, nuts and seeds, lean meats and poultry, low-fat dairy products, vegetables, fruits, whole grains, and legumes.

THIS IS AN UPDATE OF THE 2007 Dietary Fatty Acid Position Paper developed by the Academy of Nutrition and Dietetics (the Academy, formerly the American Dietetic Association) and the Dietitians of Canada. This update and the associated position reflect the current opinions of the Academy and is based on the most current scientific literature with consideration of other academic or organizational body recommendations.^{1,2} The objectives of the current position paper are to provide information on specific fatty acids including structure, current and recommended intakes, function, and impact on health. This position paper evaluates the evidence for both beneficial and adverse effects of dietary fatty acids for the purpose of providing a rationale for intake levels of total fat, n-3 and n-6 polyunsaturated fatty acids (PUFA), monounsaturated fatty acids (MUFA), saturated fatty acids (SFA), and trans-fatty acids (TFA) for healthy individuals. From this, a position has been developed that will guide registered dietitian practitioners (RDs) in their practice and dietetic technicians, registered (DTRs) who work under the supervision of the RD in counseling healthy individuals. As the stated position reflects recommendations for fatty acid intakes in the context of healthy individuals, it will not provide dietary guidance for children, pregnant women, or specific disease states. Fatty acids are the major form of dietary fat and primarily exist in foods in the triglyceride form. Although fatty acids are often categorized by their saturation status (ie, monounsaturated, saturated), understanding the role of individual fatty acids on health, other than as a group, is important. Because of this, fatty acids will be presented individually in the following order: polyunsaturated, monounsaturated, saturated, and trans. In addition, PUFA are often further classified based on the position of the first double bond from the fatty acid methyl terminus, creating n-3 and n-6 fatty acids. In n-3, the first double bond is at the third carbon from the methyl end (PUFA), as well as the configuration of the double bonds (ie, cis or trans). In addition, PUFA are often further classified based on the position of the first double bond from the fatty acid methyl terminus, creating n-3 and n-6 fatty acids. In n-3, the first double

1 2010-2015.10.16.000
<http://www.andeal.org/14-10/10/2014/11/2014>

136 JOURNAL OF THE ACADEMY OF NUTRITION AND DIETETICS © 2014 by the Academy of Nutrition and Dietetics

“...fatty acids are consumed as a part of foods that contain other nutrients and dietary compounds; these have both additive and synergistic effects on health and interact in complex ways that are difficult to delineate.”





Gordura Saturada e Saúde: Uma reavaliação e proposta para recomendações baseadas em alimentos.

Astrup et al.

JACC 2020 76(7): 844-857

- Diferentes SFAs possuem diferentes efeitos biológicos, que são depois modificados pela matriz alimentar e o conteúdo de CHO na dieta.
- Muitos alimentos relativamente ricos em SFAs, como laticínios integrais, chocolate amargo e carne não processada, não estão associados com o aumento de DCV ou o risco para o diabetes.
- Não há comprovações robustas que os limites arbitrários superiores atuais na população em geral sobre o consumo de SF (nos EUA) irão evitar DCV ou reduzir a mortalidade.



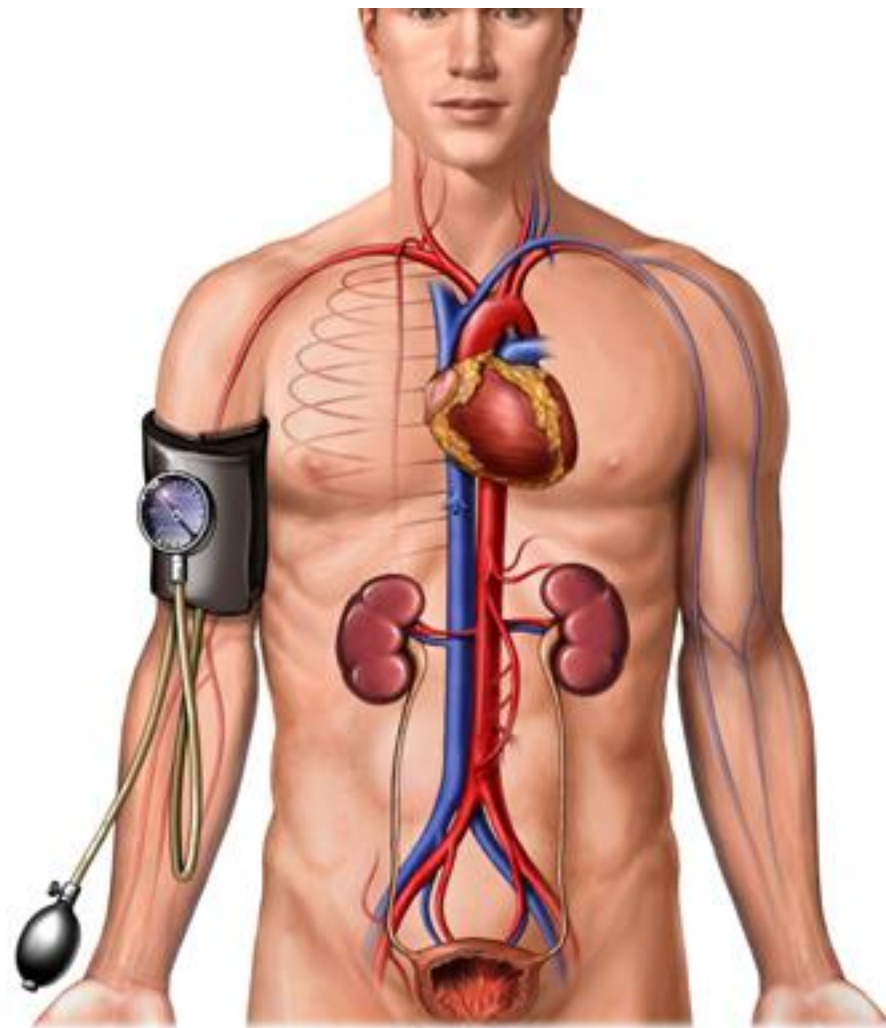
A matriz dos alimentos derivados do leite pode modular os efeitos da gordura dos laticínios para o risco de doença cardiovascular.



A fonte dos alimentos é importante quando temos a ligação entre consumo de gordura e risco de DCV.



Laticínios e Pressão arterial

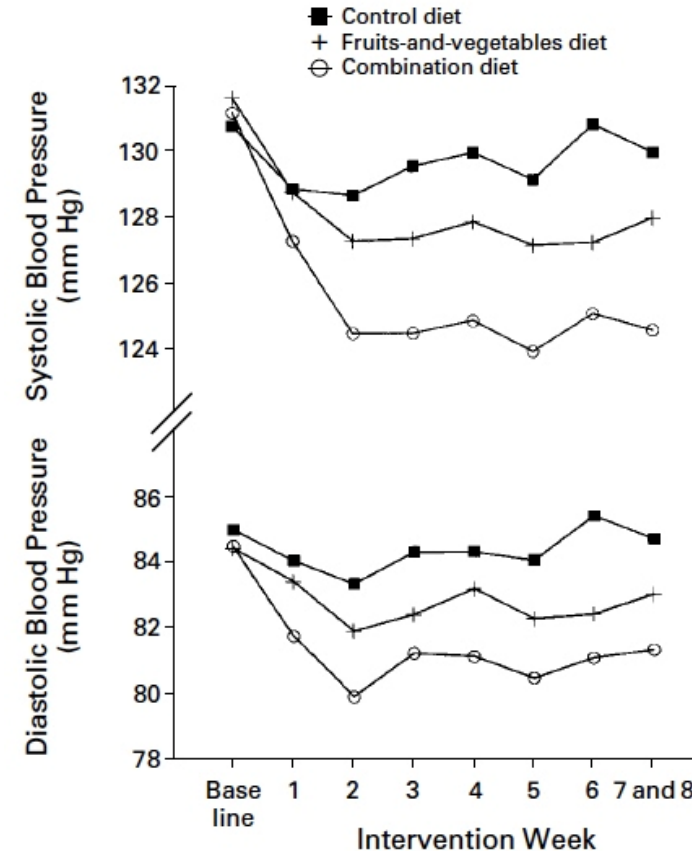




O estudo DASH mostrou que mudanças nutricionais podem reduzir a pressão arterial

Três padrões nutricionais foram testados em adultos com hipertensão (SBP < 160 mm Hg e DBP 80 – 95 mm Hg)

- Controle, uma dieta típica americana
- Uma dieta rica em frutas e vegetais
- Uma dieta rica em frutas e vegetais assim como em produtos derivados do leite com baixo teor de gordura e com gorduras totais e saturadas reduzidas





O consumo de laticínios melhorou os índices de rigidez vascular e função endotelial da artéria braquial.

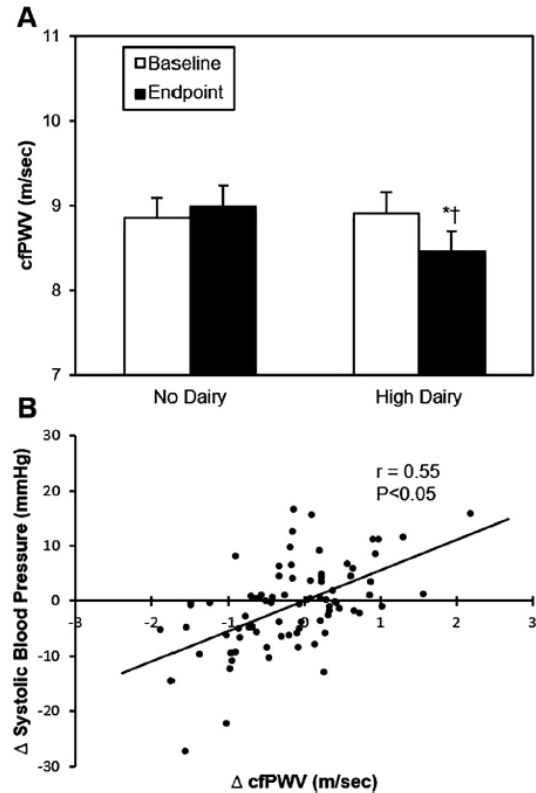


Figure 3 Carotid-femoral pulse wave velocity before and after each dietary condition (A), Relation of Δ cfPWV and Δ central systolic blood pressure in both conditions (B). * $P < 0.05$ vs. Baseline. † $P < 0.05$ vs. Endpoint in No Dairy condition. Values are means \pm SEM.

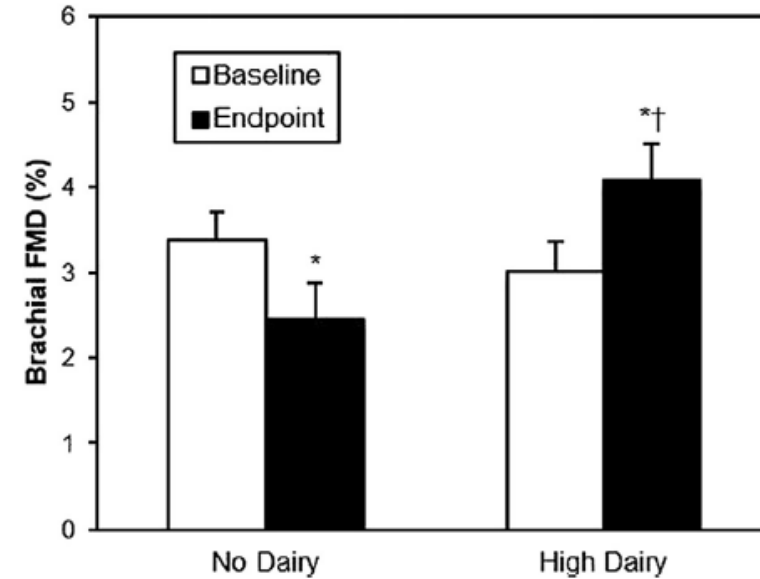


Figure 4 Flow-mediated dilation before and after each dietary condition ($n = 47$). * $P < 0.05$ vs. Baseline. † $P < 0.05$ vs. Endpoint in No Dairy condition. Values are means \pm SEM.



O sódio na nutrição possui diferentes efeitos na função vascular, dependendo da fonte do alimento.

Objetivo: Analisar os efeitos relativos a uma grande ingestão de sódio em queijo e ingestão de sódio em não-derivados do leite na função microvascular em adultos saudáveis.

560 mg sodium cheddar cheese (3 oz.)	560 mg sodium pretzels (2.3 oz.)	560 mg sodium soy cheese (3 oz.)
1,120 mg sodium cheddar cheese (6 oz.)	1,120 mg sodium pretzels (4.6 oz.)	

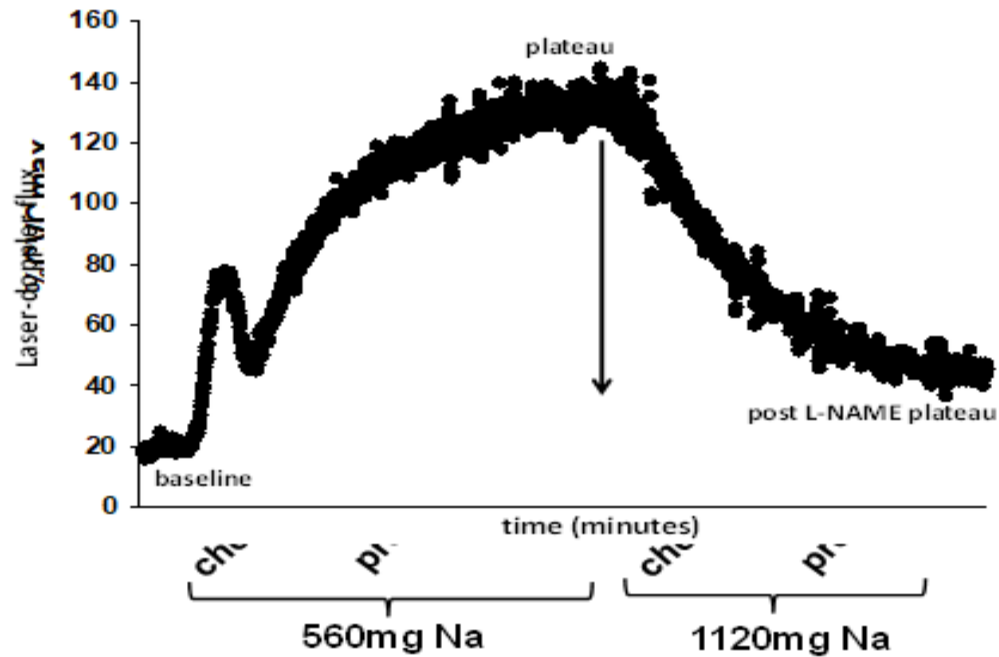


*NDC sponsored study

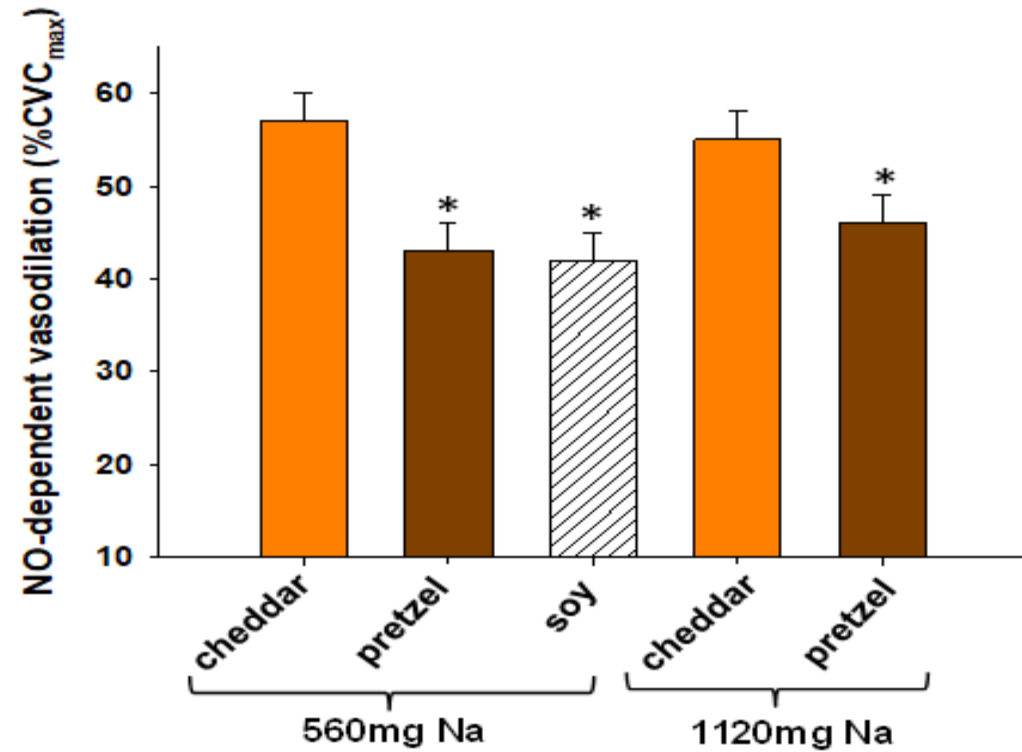
Stanhewicz et al. *Br J Nutr*; 2016



A vasodilatação foi menor após a ingestão de Na⁺ em pretzels ou queijo de soja quando comparado a uma quantidade igual de Na⁺ no queijo



*NDC sponsored study



Sistema imunológico (Inflamação)





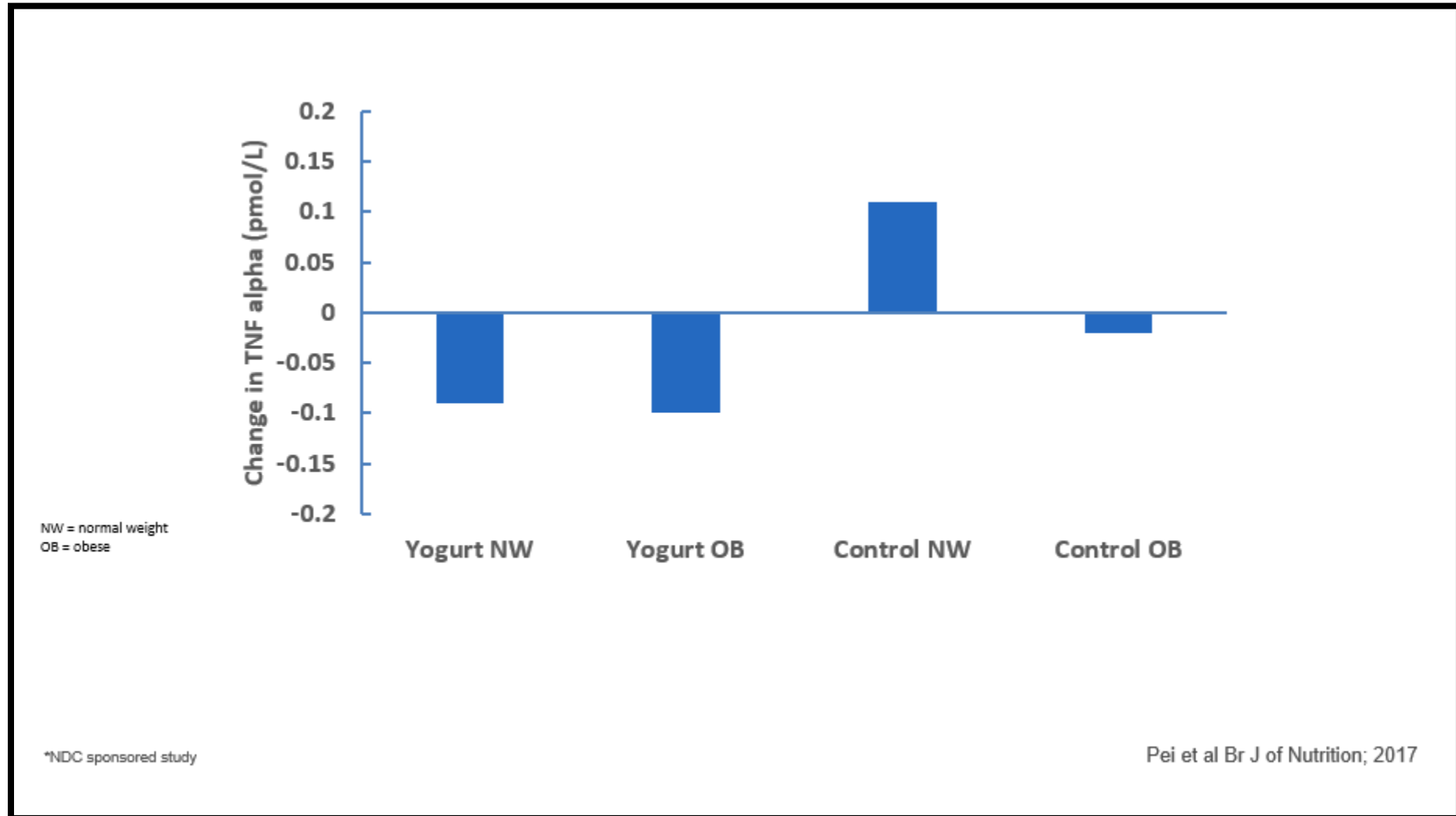
Laticínios não relacionados à inflamação



- ✓ Comer alimentos derivados do leite parece não estar associado a um aumento de inflamação
- ✓ Em alguns casos comer alimentos derivados do leite foi associado à redução dos indicadores de inflamação sistêmica.

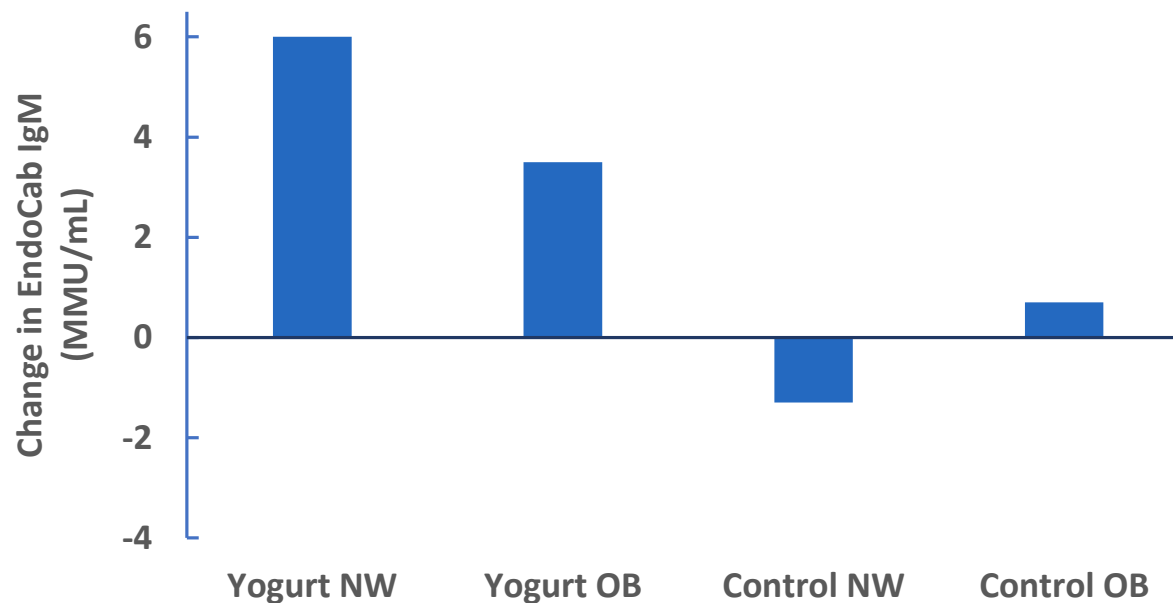


Comer iogurte relacionado à redução da inflamação





Comer iogurte relacionado a uma melhora na função da barreira intestinal



NW = normal weight
OB = obese

*NDC sponsored study

Pei et al. Br J of Nutrition; 2017

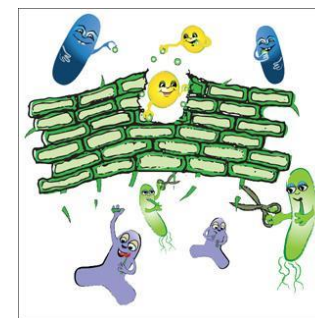


Probióticos e Prebióticos podem ajudar a normalizar um microbioma desequilibrado e melhorar a saúde

- Probióticos são microrganismos vivos que consumimos ou aplicamos ao nosso corpo e que trazem um efeito benéfico ao hospedeiro.
- Prebióticos são substratos utilizados seletivamente pelos microrganismos do hospedeiro conferindo benefícios à saúde.



Vamos introduzir mais caras legais



Vamos alimentar os caras legais



O microbioma intestinal tem um papel importante na manutenção da saúde.

- “Todas as doenças começam no intestino.” (Hipócrates)
- 10x mais bactérias do que células do corpo
- O que fazem?
 - Produzem vitaminas e hormônios; retiram energia dos alimentos; protegem contra patógenos; fortalecem o sistema imunológico; influenciam outras partes do corpo.
- Uma diversidade reduzida ou disbiose está associada à enterocolite, eczema, asma, doenças intestinais inflamatórias, obesidade e diabetes.



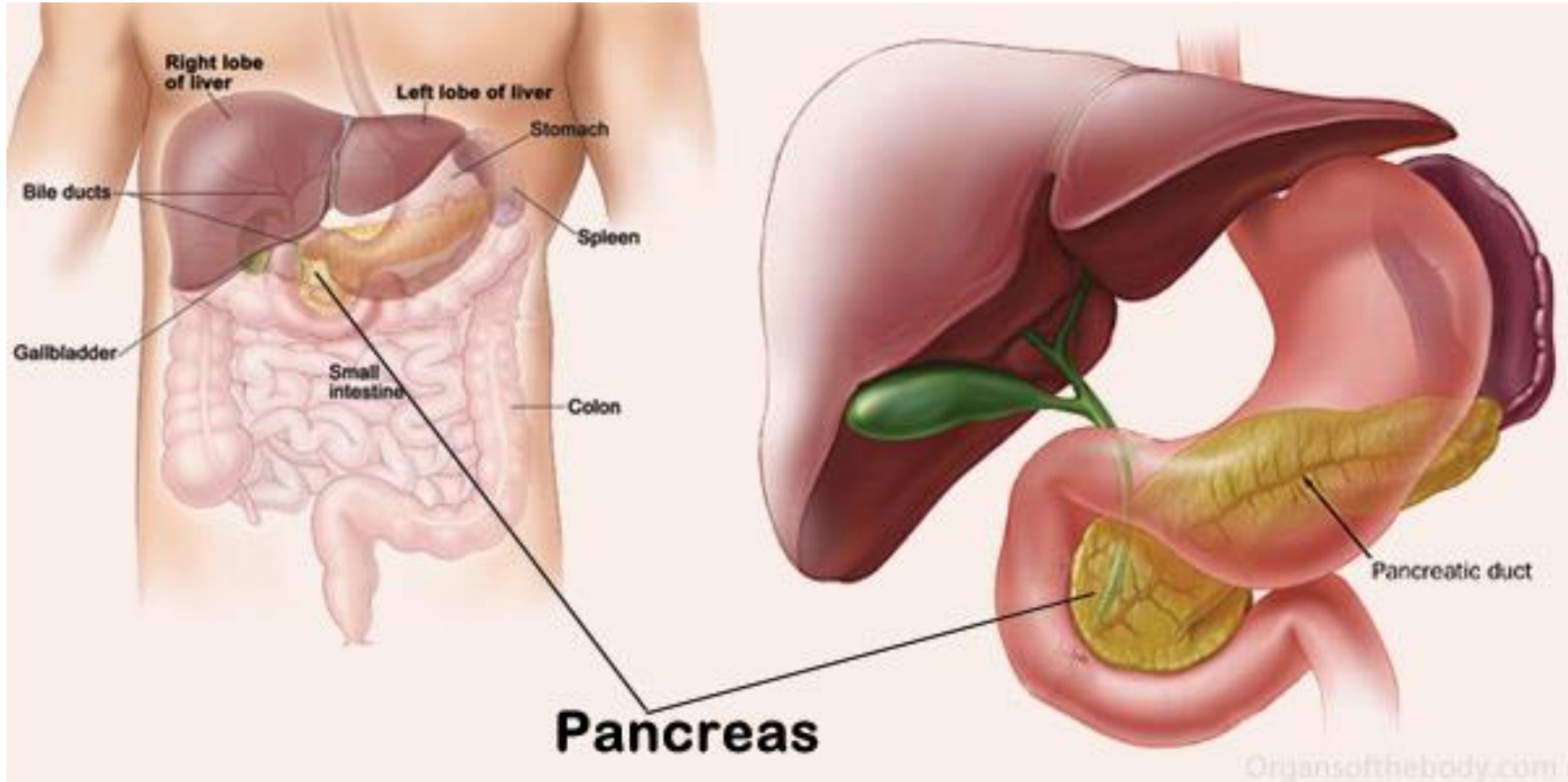


Laticínios contêm compostos bioativos

Compostos bioativo	Efeitos e Mecanismo putativo
Cálcio, Potássio, Magnésio	SBP -1.27 to -4.6 mmHg DBP -0.24 to -3.8 mmHg (Kris-Etherton et al. <i>J Am Col Nutr</i> 2009, Suppl 1:103S-19S) VSM Ca+, controle neuro-hormonal da excreção de Na+
α β κ caseínas: Lactotripeptídios (Ile-Pro-Pro, Val-Pro-Pro, eLeu-Pro-Pro)	Propriedades dos inibidores da ECA (2.6 mg/d; Engbering et al <i>Hypertension</i> 51:399-405,2008)
Whey α - e β -lactoglobulina, α -lactalbumina, imunoglobulinas , glicomacropéptidos, albumina sérica bovina, lacoperoxidase, lisozima, lactoferrina , lacoperoxidase, Ala-Leu-Pro-Met	Removem H ₂ O ₂ Síntese da glutatona Propriedades dos inibidores da ECA



Laticínios e Diabetes Tipo 2





A metanálise de dose-resposta de estudos de coorte prospectivos apresentam associações benéficas consistentes entre alimentos derivados do leite e o risco do diabetes tipo 2.

Ingestão total de laticínios associada a uma redução de 7% do risco para diabetes tipo 2 por 400g de porção de laticínio

Ingestão total de laticínios associada a uma redução de 12% do risco para diabetes do tipo 2 por 200 g de porção de laticínio

Dairy products and the risk of type 2 diabetes: a systematic review and dose-response meta-analysis of cohort studies¹⁻³

Dagfinn Aune, Teresa Norat, Pall Romundstad, and Lars J Vatten

ABSTRACT

Background: The association between intake of dairy products and the risk of type 2 diabetes has been investigated in several studies, but the evidence is not conclusive.

Objective: We conducted an updated systematic review and dose-response meta-analysis of dairy product intake and the risk of type 2 diabetes.

Design: We searched the PubMed database for prospective cohort and nested case-control studies of dairy product intake and risk of type 2 diabetes up to 5 June 2013. Summary RRs were estimated by use of a random-effects model.

Results: Seventeen cohort studies were included in the meta-analysis. In the dose-response analysis, the summary RRs (95% CIs) were 0.93 (0.87, 0.99; $I^2 = 33\%$) per 400 g total dairy products/d ($n = 12$), 0.98 (0.94, 1.03; $I^2 = 8\%$) per 200 g high-fat dairy products/d ($n = 9$), 0.91 (0.86, 0.96; $I^2 = 40\%$) per 200 g low-fat dairy products/d ($n = 9$), 0.87 (0.72, 1.04; $I^2 = 94\%$) per 200 g milk/d ($n = 7$), 0.92 (0.86, 0.99; $I^2 = 0\%$) per 50 g cheese/d ($n = 8$), and 0.78 (0.60, 1.02; $I^2 = 70\%$) per 200 g yogurt/d ($n = 7$). Nonlinear inverse associations were observed for total dairy products (P -nonlinearity < 0.0001), low-fat dairy products (P -nonlinearity = 0.06), cheese (P -nonlinearity = 0.05), and yogurt (P -nonlinearity = 0.004), and there was a flattening of the curve at higher intakes.

Conclusions: This meta-analysis suggests that there is a significant inverse association between intakes of dairy products, low-fat dairy products, and cheese and risk of type 2 diabetes. Any additional studies should assess the association between other specific types of dairy products and the risk of type 2 diabetes and adjust for more confounding factors. *Am J Clin Nutr* 2013;98:1066-83.

INTRODUCTION

The prevalence of type 2 diabetes is increasing rapidly around

beneficial dairy components. Epidemiologic studies have yielded mixed results: some have suggested a decreased risk associated with higher intake of dairy products (7-14), whereas other studies suggested no association (15-23). Studies of specific types of dairy products have also shown mixed results: some have reported inverse associations for low-fat dairy products (7, 10, 13, 15, 19), milk (12, 16), low-fat or skim milk (7, 10, 14), cheese (10, 14, 21), and yogurt (7, 10, 19, 21), whereas other studies suggested no association (8, 17, 18, 20, 22-24). In contrast, most studies of high-fat dairy products reported no association (7, 8, 10, 13, 15, 20, 24), and only one study reported a reduced risk (23). The dose-response relation between dairy products and type 2 diabetes needs more detailed examination to establish whether there could be potential threshold effects. In addition, it is important to establish whether the associations may differ according to the type of dairy product consumed and by study characteristics such as geographic location and adjustment for confounding factors. To clarify the association between dairy product intake and risk of type 2 diabetes, we conducted a systematic review and meta-analysis of the available prospective studies, with specific aims of analyzing different types of dairy products, to clarify whether the association differed by study characteristics and to clarify any dose-response relation between dairy product intake and the risk of type 2 diabetes.

METHODS

Search strategy

We searched the PubMed database (<http://www.ncbi.nlm.nih.gov/pubmed>) up to 5 June 2013 for cohort studies of dairy intake and type 2 diabetes risk. As part of a larger systematic review of

The American Journal of Clinical Nutrition



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Dairy Products Consumption and Risk of Type 2 Diabetes: Systematic Review and Dose-Response Meta-Analysis

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1 Department of Cardiology, The Second Affiliated Hospital, Xi'an Jiaotong University School of Medicine, Xi'an, Shaanxi, P.R. China, **2** Key Laboratory of Environment and Genes Related to Diseases (Xi'an Jiaotong University), Ministry of Education, Xi'an, Shaanxi, P. R. China, **3** Department of Endocrinology, The Second Affiliated Hospital, Xi'an Jiaotong University School of Medicine, Xi'an, Shaanxi, P.R. China, **4** Department of Epidemiology, Xi'an Jiaotong University School of Medicine, Xi'an, Shaanxi, P.R. China

Abstract

Background: The consumption of dairy products may influence the risk of type 2 diabetes mellitus (T2DM), but inconsistent findings have been reported. Moreover, large variation in the types of dairy intake has not yet been fully explored.

Methods and Results: We conducted a systematic review and meta-analysis to clarify the dose-response association of dairy products intake and T2DM risk. We searched PubMed, EMBASE and Scopus for studies of dairy products intake and T2DM risk published up to the end of October 2012. Random-effects models were used to estimate summary relative risk (RR) statistics. Dose-response relations were evaluated using data from different dairy products in each study. We included 14 articles of cohort studies that reported RR estimates and 95% confidence intervals (95% CI) of T2DM with dairy products intake. We found an inverse linear association of consumption of total dairy products (13 studies), low-fat dairy products (8 studies), cheese (7 studies) and yogurt (7 studies) and risk of T2DM. The pooled RRs were 0.94 (95% CI 0.91-0.97) and 0.88 (0.84-0.93) for 200 g/day total and low-fat dairy consumption, respectively. The pooled RRs were 0.80 (0.69-0.93) and 0.91 (0.82-1.00) for 30 g/d cheese and 50 g/d yogurt consumption, respectively. We also found a nonlinear association of total and low-fat dairy intake and T2DM risk, and the inverse association appeared to be strongest within 200 g/d intake.

Conclusion: A modest increase in daily intake of dairy products such as low fat dairy, cheese and yogurt may contribute to the prevention of T2DM, which needs confirmation in randomized controlled trials.

Citation: Gao D, Ning N, Wang C, Wang Y, Li Q, et al. (2013) Dairy Products Consumption and Risk of Type 2 Diabetes: Systematic Review and Dose-Response Meta-Analysis. *PLoS ONE* 8(9): e73965. doi:10.1371/journal.pone.0073965

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Aune D. et al. *Am J Clin Nutr.* 2013; 98(4):1066-83

Gao D et al. *PLoS One.* 2013; 8(9):e73965



Estudo PURE

Bhavadhahini et al.

A associação do consumo de laticínios com a síndrome metabólica, hipertensão e diabetes em 147. 812 indivíduos em 21 países.

BMJ Open Diabetes Research and Care 2020, 8:e000826

Novos resultados acabaram de ser publicados sobre o estudo PURE (*Prospective Urban Rural Epidemiology*) relacionado ao consumo de alimentos derivados do leite e sua associação com fatores de risco para doença cardiovascular.

- Estudo observacional prospectivo
- Dados de 147.812 indivíduos de 21 países
- Idade dos participantes entre 35 e 70 anos
- Ingestão nutricional habitual durante os 12 meses antes da avaliação feita através do *Food Frequency Questionnaires*
- Laticínios incluíam leite, iogurte, bebidas lácteas, queijo e pratos preparados com derivados do leite, e foram classificados com sendo leite integral ou semidesnatado (1-2%).
- Manteiga e nata foram avaliados independentemente pois não são consumidos regularmente em alguns dos países estudados.



Resultados do estudo PURE com laticínios

- Para laticínios totais e integrais, mas não laticínios semidesnatados, seu consumo foi associado a uma menor prevalência de síndrome metabólica
 - Um maior benefício foi visto nos países que geralmente consomem laticínios semidesnatados.
- O consumo de pelo menos 2 porções ao dia de laticínios totais versus nenhum consumo de laticínios foi associado a uma redução de 24% de risco para síndrome metabólica.
 - Uma maior redução de risco (28%) foi vista com apenas ingestão diária de laticínios integrais, quando comparado com nenhuma ingestão diária de laticínios.
- Da mesma forma, consumir pelo menos 2 porções ao dia de laticínios totais foi associada com uma redução de 11-12% para o risco de pressão alta e diabetes do tipo 2.
 - A redução de risco foi maior para ambos os problemas de saúde (13-14%) se o consumo diário for de 3 porções de laticínios totais ao dia.
 - As associações eram mais fortes para laticínios integrais do que para laticínios semidesnatados.



Joslin lança as Diretrizes que refletir as novas comprovações que abordam gordura saturada nos alimentos derivados do leite.



JOSLIN DIABETES CENTER and JOSLIN CLINIC
CLINICAL NUTRITION GUIDELINE FOR OVERWEIGHT AND OBESE ADULTS WITH TYPE 2 DIABETES, PREDIABETES OR THOSE AT HIGH RISK FOR DEVELOPING TYPE 2 DIABETES
 10-19-16

The Joslin Clinical Nutrition Guideline for Overweight and Obese Adults With Type 2 Diabetes, Prediabetes or Those at High Risk for Developing Type 2 Diabetes is designed to assist primary care physicians, specialists, and other healthcare providers in individualizing the care of and set goals for adult, non-pregnant patients with type 2 diabetes or individuals at high risk for developing type 2 diabetes. Several studies, which is jointly developed by the Joslin Diabetes Center and the Joslin Clinic, are intended to replace sound medical practice in certain situations where more or less evidence is available. The guidelines are intended to influence clinical behaviors in a safe and informed manner. Guidelines are developed by the Chief Medical Officer. The Clinical Nutrition Guideline is intended to support sound clinical practice. These guidelines may upgrade or downgrade the rating for a recommendation based on the quality of the evidence used to support the recommendation. The evidence level provided on page 6 describes the classification of the evidence. Evidence levels are classified as follows:

Target Individuals

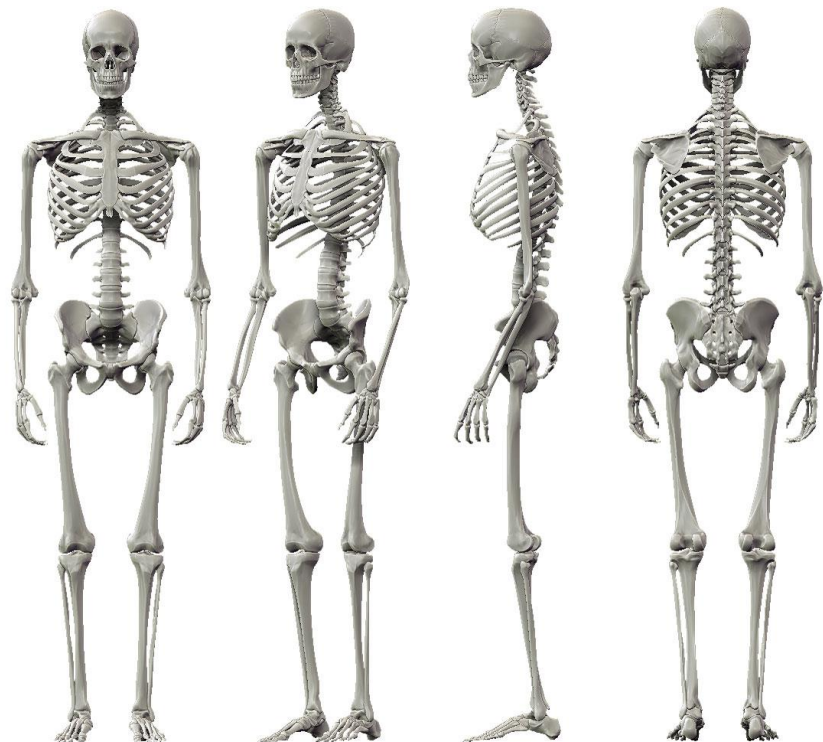
*Target

“Evidências recentes mostram que a gordura saturada dos laticínios (leite, iogurte, queijo) pode ser aceita numa ingestão calórica diária total.

Laticínios estão incluídos na lista de :
 “Alimentos que parecem estar associados com uma redução de risco para o desenvolvimento do diabetes tipo 2 em alguns estudos”



Laticínios e Saúde Musculoesquelética





Autoridades de Saúde recomendam nutrientes dos laticínios para melhorar a saúde óssea em crianças.

- **2011 IOM Dietary Reference Intakes for Calcium and Vitamin D:**

Com base na relação entre cálcio e Vitamina D e saúde óssea durante toda a vida.

- **2014 AAP Optimizing Bone Health in Children and Adolescents:**

“Motivar um aumento da ingestão nutricional de alimentos e bebidas contendo cálcio e vitamina D.” e “Crianças de 4 – 8 anos de idade necessitam de 2 a 3 porções de laticínios ou equivalentes por dia. Os adolescentes necessitam de 4 porções por dia.

- **2015 Dietary Guidelines for Americans:**

“A pesquisa associou a ingestão diária de laticínios a uma melhora na saúde óssea, especialmente entre crianças e adolescentes.”

- **National Osteoporosis Foundation: *A infância e adolescência são os anos para o desenvolvimento ósseo; fornecer uma dieta bem balanceada com alimentos ricos em cálcio como leite, iogurte, além de 60 minutos por dia de exercícios moderados.***



Cálcio, Vitamina D e Laticínios recebem alta pontuação para saúde óssea na revisão feita pela *National Osteoporosis Foundation*

- A revisão foi feita em artigos científicos publicados entre 2000 e 2004 que se concentraram nos **fatores nutricionais e de estilos de vida relacionados à massa óssea e força em crianças e adolescentes.**
- ***Tanto o Cálcio quanto a atividade física receberam nota "A".***
- ***Tanto os laticínios quanto a vitamina D receberam nota "B"***
- ***Estas foram as notas mais altas dadas a qualquer fator nutricional, alimentar ou de estilo de vida.***

Osteoporos Int (2016) 27:1281–1386
DOI 10.1007/s00198-015-3440-3



POSITION PAPER

The National Osteoporosis Foundation's position statement on peak bone mass development and lifestyle factors: a systematic review and implementation recommendations

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Abstract Lifestyle choices influence 20–40 % of adult peak bone mass. Therefore, optimization of lifestyle factors known to influence peak bone mass and strength is an important strategy aimed at reducing risk of osteoporosis or low bone mass later in life. The National Osteoporosis Foundation has issued this scientific statement to provide evidence-based guidance and a national implementation strategy for the purpose of helping individuals achieve maximal peak bone mass early in life. In this scientific statement, we (1) report the results of an evidence-based review of the literature since 2000 on factors that influence achieving the full genetic potential for skeletal mass; (2) recommend lifestyle choices that

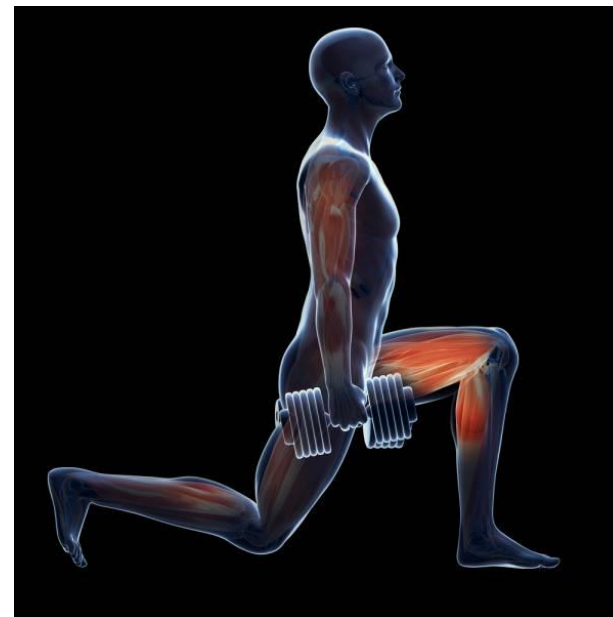
promote maximal bone health throughout the lifespan; (3) outline a research agenda to address current gaps; and (4) identify implementation strategies. We conducted a systematic review of the role of individual nutrients, food patterns, special issues, contraceptives, and physical activity on bone mass and strength development in youth. An evidence grading system was applied to describe the strength of a available evidence on these individual modifiable lifestyle factors that may (or may not) influence the development of peak bone mass (Table 1). A summary of the grades for each of these factors is given below. We describe the underpinning biology of these relationships as well as other factors for which a systematic

Author names for PubMed indexing: Weaver CM, Gordon CM, Janz KF, Kalkwarf HJ, Lappe JM, Lewis R, O'Karma M, Wallace TC, Zemel BS



A proteína *whey* pode aumentar a síntese proteica muscular e a massa magra após exercícios.

- Efeitos a curto prazo:
 - A proteína *whey* aumenta a síntese proteica muscular a uma taxa mais alta do que as proteínas de soja e caseína, após exercícios de resistência. ¹
- Efeitos a longo prazo:
 - A suplementação com *whey* resultou em mais massa magra após treinamento de resistência em jovens adultos quando comparados com a proteína da soja ou controle de carboidratos. ²





Proteínas de laticínios ajudam a manter a função muscular nos idosos.



A síntese proteica muscular é acentuada com doses crescentes de proteína whey mas não acentuada com proteína de soja em homens idosos.

Yang et al. Nutr & Metab 2012, 9: 57

*NDC sponsored study

A suplementação com proteína de *whey* e treinamento de resistência aumentam significativamente a potência máxima versus o controle.

Chale et al., 2012, J of Gerontology



A suplementação com MPC melhora o desempenho físico, mas não aumenta a massa muscular em adultos mais fracos.

Tieland et al., JAMDA. 2012 Oct;13(8):720-6



Saúde e Nutrição dos produtos lácteos: Resumo do estado da ciência

- Nutrição / Saúde são uma dimensão do desenvolvimento de uma história sobre os sistemas alimentares sustentáveis globais, e sua capacidade de promover saúde humana e ambiental perante a crescente população global.
- Os laticínios podem melhorar a saúde humana, mas também tem implicações positivas nas dimensões sociais e econômicas dos sistemas alimentares sustentáveis, e um melhor impacto ambiental também.
- Os laticínios contém muitos nutrientes que estão em carência (*shortfall nutrients*), e é fonte de uma das proteínas de melhor qualidade na dieta humana.
- O consumo de alimentos lácteos – independente do teor de gordura – foi frequentemente apresentado como não tendo nenhum impacto adverso no risco de doenças cardiovasculares, e em muitos ocasiões pode ter um efeito positivo.
- A matriz láctea pode apresentar benefícios à saúde que nenhum único nutriente pode fornecer, sugerindo que o todo é mais forte do que a soma das partes.



Saúde e Nutrição dos produtos lácteos : Resumo do estado da ciência (cont.)

- A ingestão de alimentos lácteos está associada a um menor risco do diabetes tipo 2 e hipertensão. Laticínios também estão associados a uma melhor densidade mineral óssea em crianças e adolescentes.
- Vários nutrientes e componentes bioativos existentes nos laticínios mostraram reduzir inflamação que, por sua vez, pode melhorar a função imunológica.
- Os probióticos encontrados no iogurte e produtos lácteos fermentados podem ter benefícios excepcionais para a saúde que diminuem o risco para doenças e promovem a saúde.
- Proteínas lácteas podem aumentar a síntese proteica muscular após exercícios, assim como ajudar a manter a função muscular nos idosos.
- Os alimentos derivados do leite são uma parte integrante dos sistemas alimentares sustentáveis.