



"VI Curso de Políticas y Programas para la Promoción de Hábitos y Estilos de Vida Saludable"

"UNA MIRADA INTEGRAL DE LA ALIMENTACIÓN SALUDABLE: FLEXIBILIDAD FENOTÍPICA".

Mercedes Mora N.D

Magister en Fisiología. Universidad Nacional de Colombia

Magister en Nutrición Humana. Universidad de Londres

Docente Cátedra Departamento de Bioquímica y Nutrición

Pontificia Universidad Javeriana

Antropometrista Nivel III ISAK

E-mail: mercedes.mora@javeriana.edu.co

Flexibilidad fenotípica como un factor clave en la nutrición humana y su relación con la salud.

Fenotipo:
Conjunto de
caracteres visibles
que un individuo
presenta como
resultado de la
interacción entre su
genotipo y el medio.

Genes Nutr (2014) 9:423
DOI 10.1007/s12263-014-0423-5

REVIEW

Phenotypic flexibility as key factor in the human nutrition and health relationship

Ben van Ommen · Jan van der Greef ·
Jose Maria Ordovas · Hannelore Daniel

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Abstract Metabolic adaptation to a disturbance of homeostasis is determined by a series of interconnected physiological processes and molecular mechanisms that can be followed in space (i.e., different organs or organelles) and in time. The amplitudes of these responses of this "systems flexibility network" determine to what extent the individual can adequately react to external challenges of varying nature and thus determine the individual's health status and disease predisposition. Connected pathways and regulatory networks act as "adaptive response systems" with metabolic and inflammatory processes as a core—but embedded into psycho-neuro-endocrine control mechanisms that in their totality define the phenotypic flexibility in an individual. Optimal metabolic health is thus the orchestration of all mechanisms and processes that maintain this flexibility in an organism as a phenotype. Consequently, onset of many chronic metabolic diseases results from impairment or even loss of flexibility in parts of the system. This also means that metabolic diseases need to be

diagnosed and treated from a systems perspective referring to a "systems medicine" approach. This requires a far better understanding of the mechanisms involved in maintaining, optimizing and restoring phenotypic flexibility. Although a loss of flexibility in a specific part of the network may promote pathologies, this not necessarily takes place in the same part because the system compensates. Diagnosis at systems level therefore needs the quantification of the response reactions of all relevant parts of the phenotypic flexibility system. This can be achieved by disturbing the homeostatic system by any challenge from extended fasting, to intensive exercise or a caloric overload.

Keywords Phenotypic flexibility · Systems biology · Metabolism · Biomarker

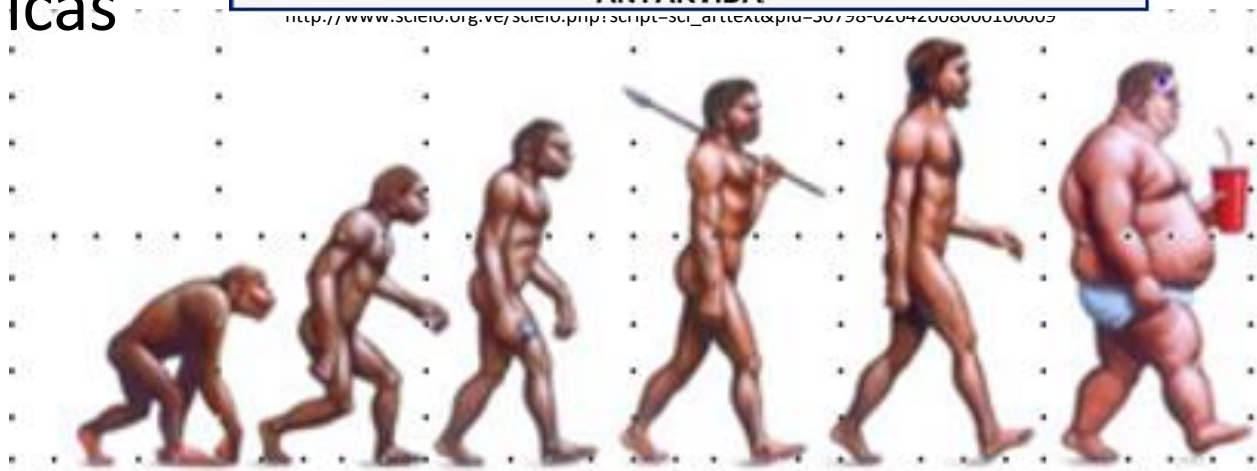
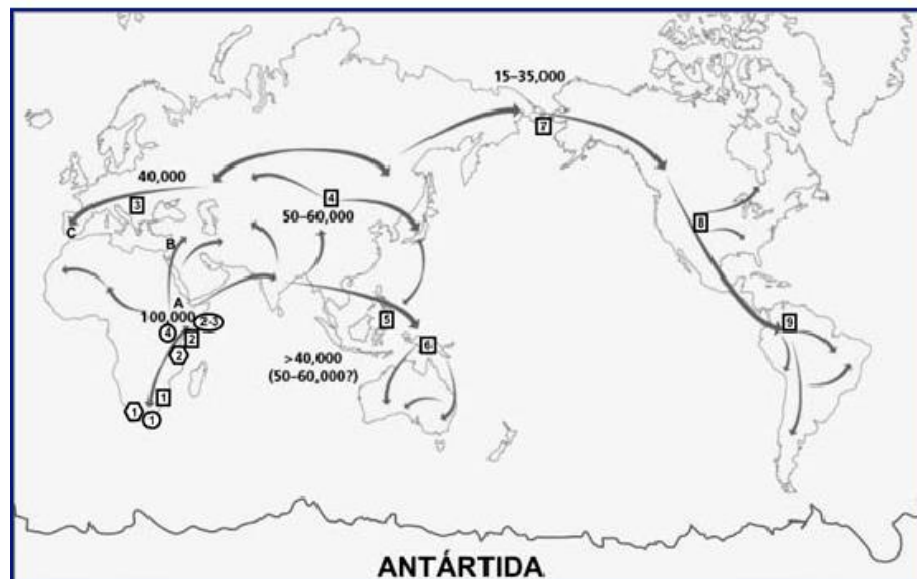
Introduction

Ommen, B.V., Greef, J.V.D., Ordovas, J.M. and Hannelore, D. (2014). Phenotypic flexibility as key factor in the human nutrition and health relationship. Genes Nutr, 9:423

La evolución de la especie humana ha implicado la interacción entre el ambiente y la genética

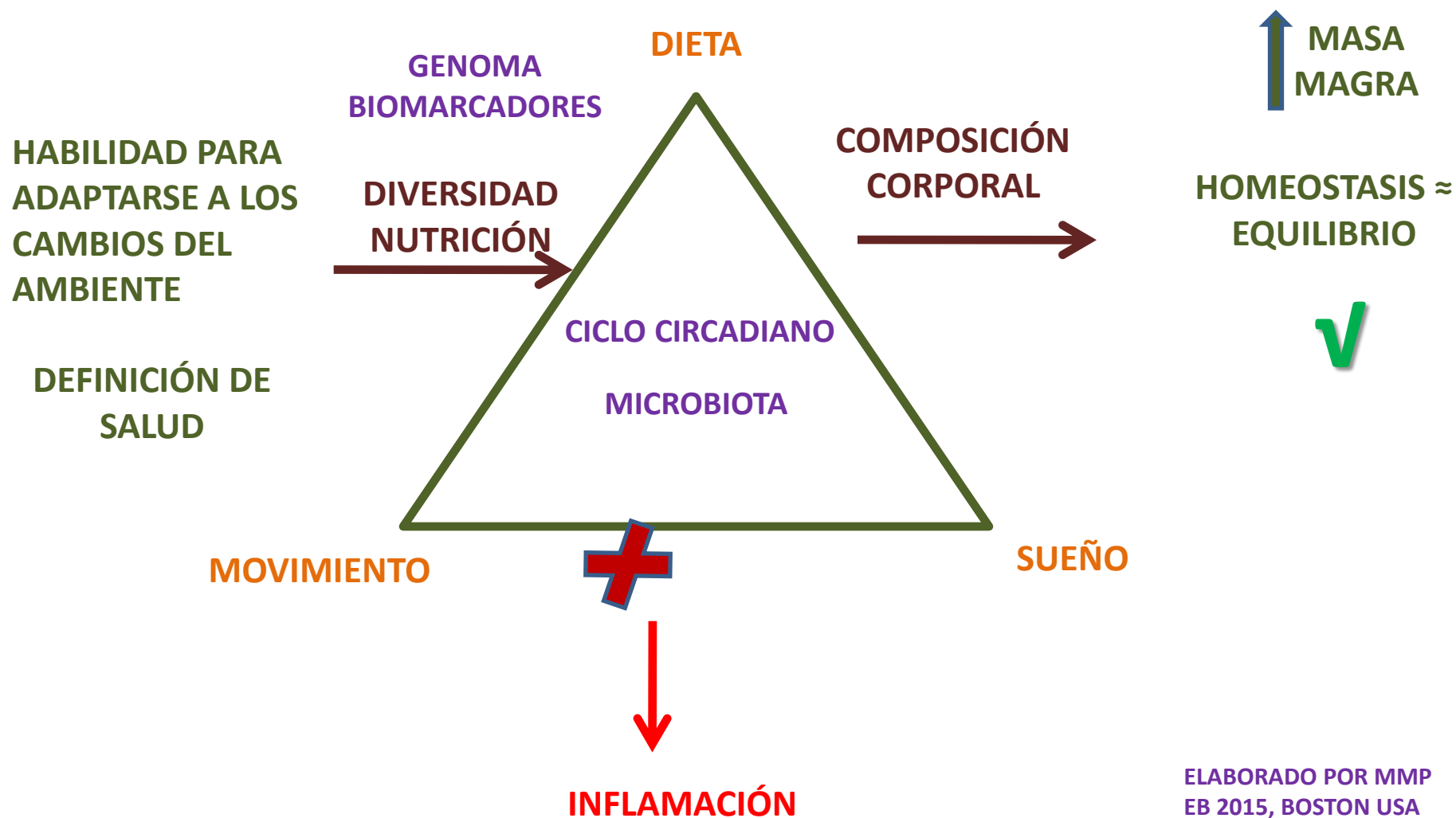


Enfermedades crónicas degenerativas





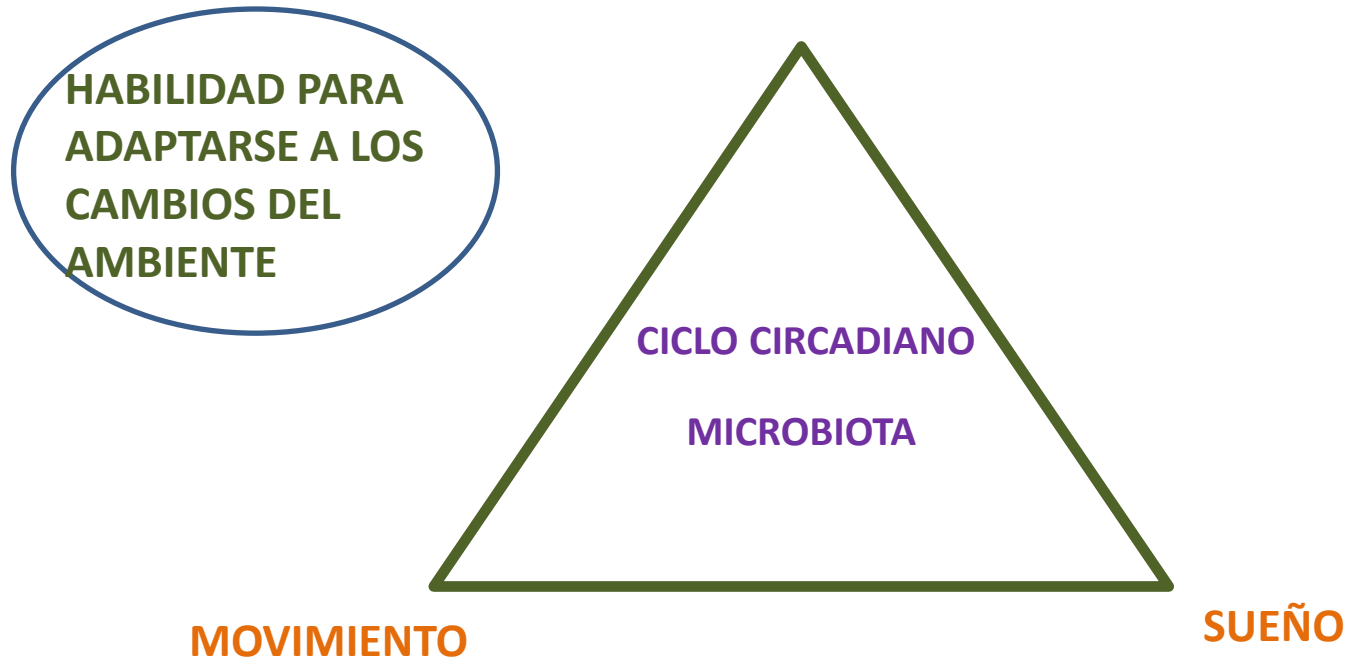
NUTRICIÓN Y FLEXIBILIDAD FENOTÍPICA



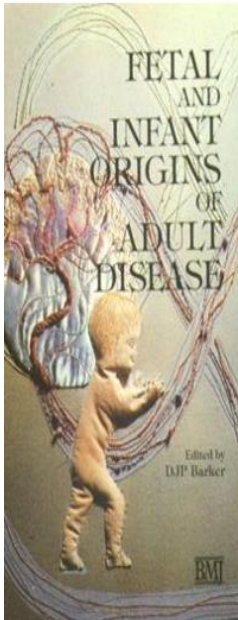
ELABORADO POR MMP
EB 2015, BOSTON USA



NUTRICIÓN Y FLEXIBILIDAD FENOTÍPICA



TEORIA DE BARKER

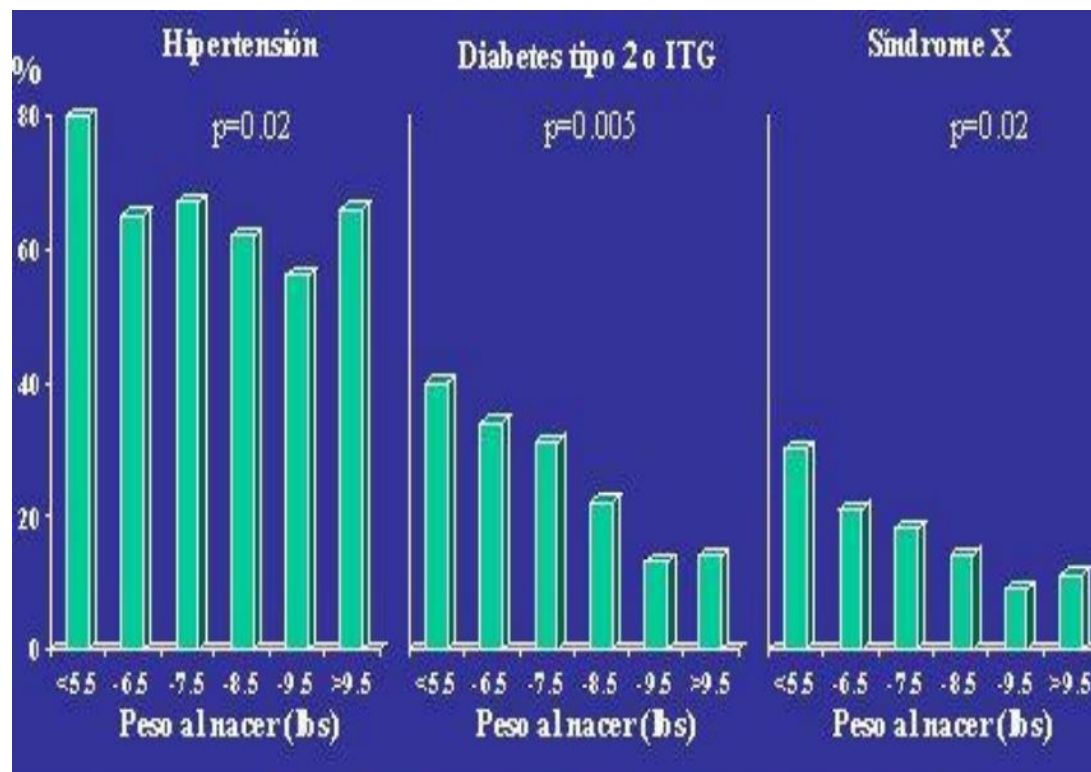


- **David Barker postula que ciertos estímulos o agresiones *in útero* durante los primeros meses de embarazo sería capaz de producir una programación anormal de diversos sistemas relacionados entre sí, que se manifestaría durante la vida del individuo dando lugar a consecuencias permanentes. (1986)**
- **(Fenotipo Frugal)**

Fetal and placental size and risk of hypertension in adult life. (1990). *BMJ*, 301(6751), 551-552.

Godfrey, K., Barker, D., Peace, J., Cloke, J., & Osmond, C. (1993). Relation of fingerprints and shape of the palm to fetal growth and adult blood pressure. *BMJ*, 307(6901), 405-409.

Tasas de mortalidad para enfermedad coronaria en hombres y mujeres nacidos en Hertfordshire

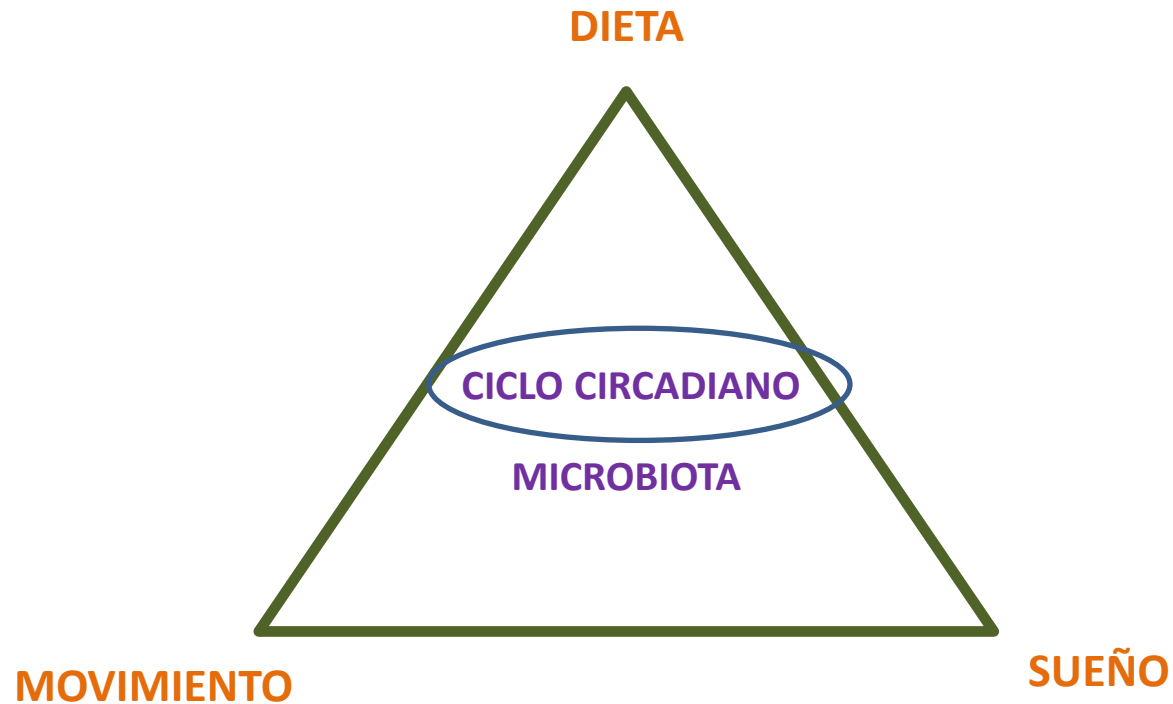


Prevalencia de Hipertensión, Diabetes tipo 2 y Síndrome X en hombres de Hertfordshire de 61-70 años de edad. n=370. (BMJ 1991; 303:1019; Diabetologia 1993; 36:6).

Asociación del bajo peso de la placenta, bajo peso al nacer y bajo peso al año de edad con aumento de muerte por enfermedad coronaria y cardiovascular.



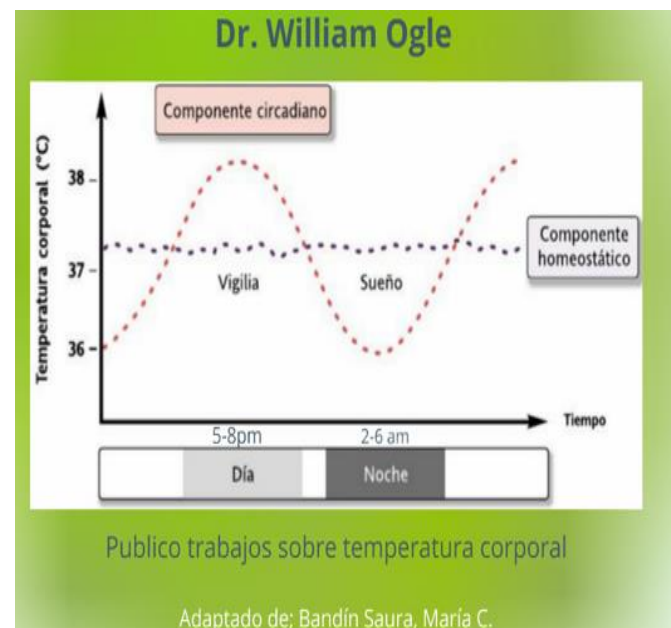
NUTRICIÓN Y FLEXIBILIDAD FENOTÍPICA



CICLO CIRCADIANO

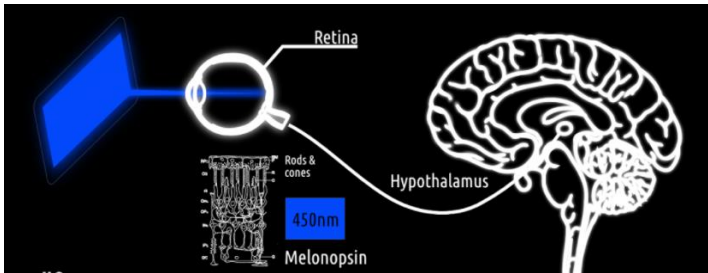


Reloj interno de funciones biológicas periódicas que responden a los estímulos de la luz del día y de ausencia de luz en la noche.



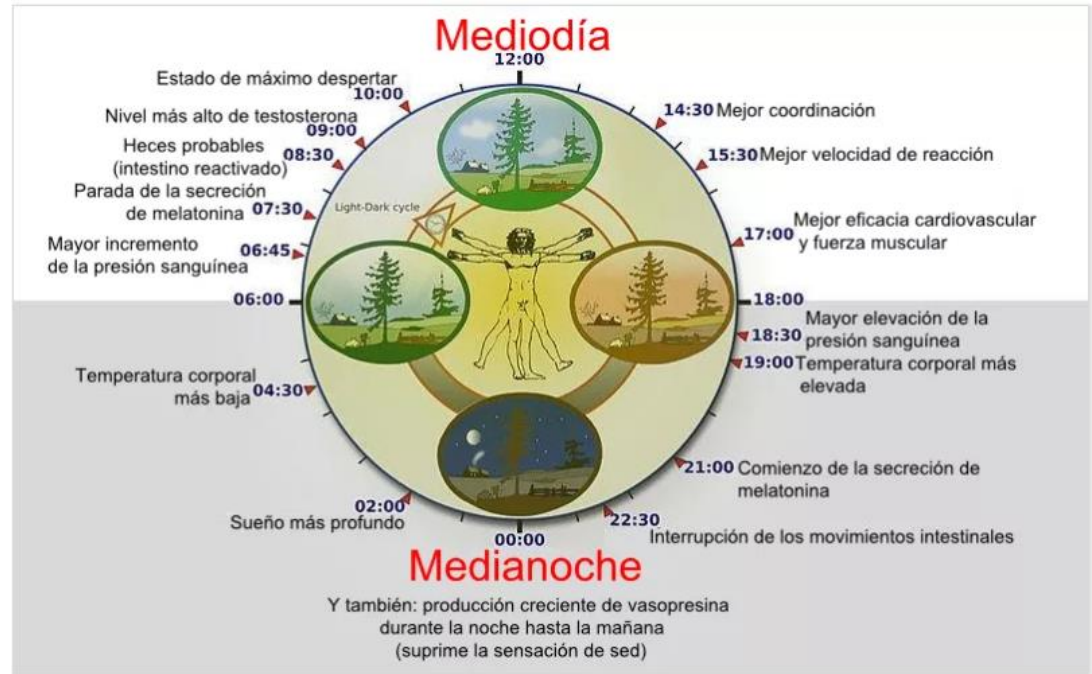
CICLO CIRCADIANO

FACTORES QUE INFLUYEN EN EL CICLO CIRCADIANO



La fisiología circadiana humana evolucionó para promover ciertos comportamientos y actividades durante el día o la noche

En los mamíferos este ciclo circadiano corresponde al ciclo de 24 horas luz-oscuridad, señales luminosas que alcanzan un reloj maestro situado dentro del hipotálamo.



Con la amplia disponibilidad de iluminación eléctrica, los seres humanos tienen la capacidad de auto-seleccionar sus ciclos de luz y oscuridad y extender las actividades de vigilia hasta noche.



<http://www.elhombre superior.com/ritmo-circadiano-mejorar-salud-desempeno-siguiendo-reloj-biologico/>

CICLO CIRCADIANO

El tipo de luz principalmente emitido por el sol es **azul** y señala el día

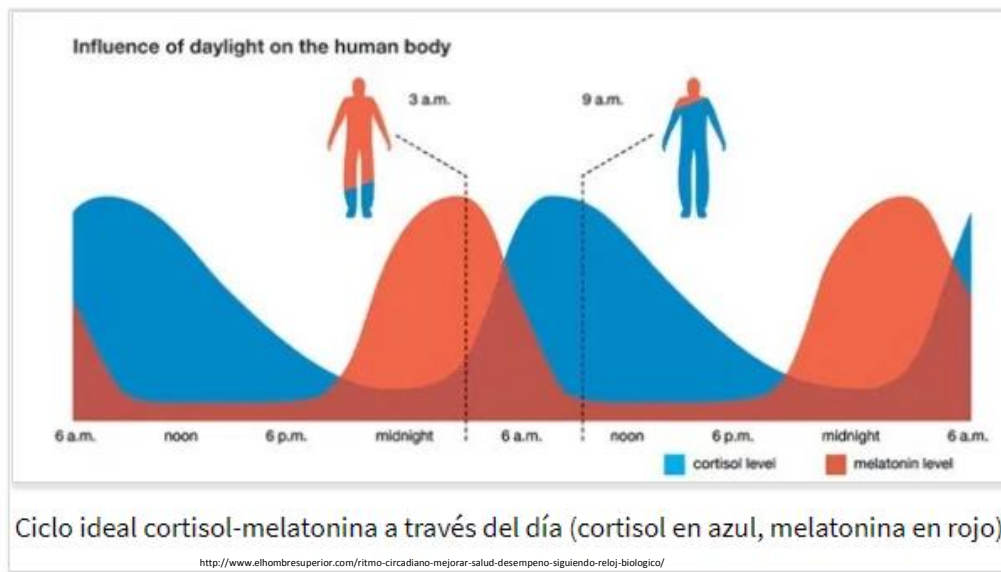


Estimula la producción de **CORTISOL**

ACTIVIDAD

HORMONA CORTISOL

HORMONA MELATONINA



La oscuridad (luz roja) estimula la producción de **MELATONINA**

SUEÑO

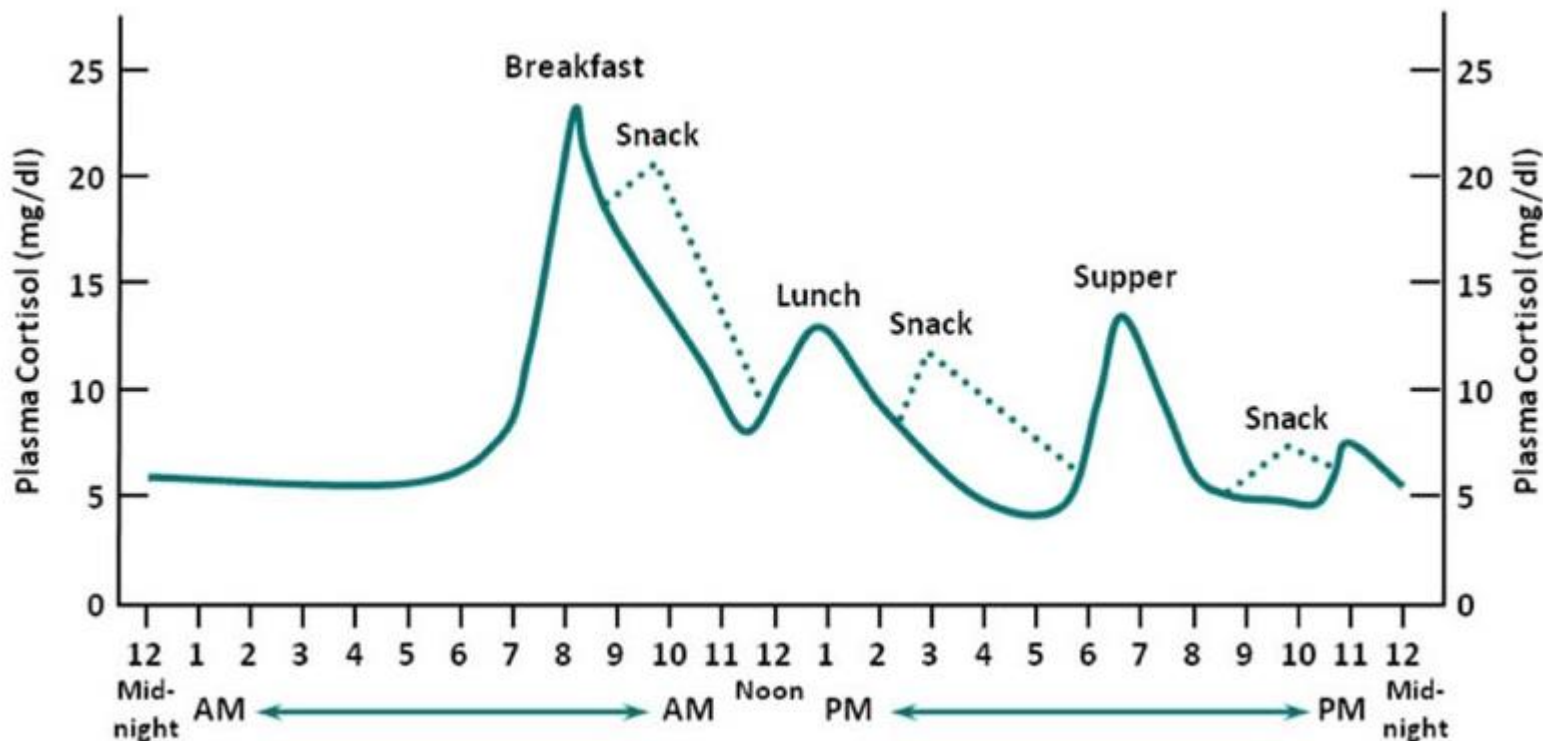
Otros tipos de luz **azul** son:

- Televisores
- Teléfonos celulares
- Computadoras
- Bombillos led
- Lámparas fluorescentes.

La cafeína potencia la acción del **CORTISOL**

El estrés aumenta las concentraciones de **CORTISOL**

CICLO CIRCADIANO - PRODUCCIÓN DE CORTISOL CON Y SIN INGESTA DE ALIMENTOS



<http://www.xeviverdaguer.com/fem-un-cafe/>

La producción de cortisol es mayor en la mañana y va reduciendo durante el día. La ingesta de alimentos estimula la producción de cortisol



AJCN. First published ahead of print September 6, 2017 as doi: 10.3945/ajcn.117.161588.



La ingesta de alimentos posterior de la sincronización circadiana se asocia con aumento de la grasa corporal

Later circadian timing of food intake is associated with increased body fat

Andrew W McHill,^{1,3} Andrew JK Phillips,^{1,3} Charles A Czeisler,^{1,3} Leigh Keating,² Karen Yee,² Laura K Barger,^{1,3} Marta Garaulet,⁴ Frank AJL Scheer,^{1,3} and Elizabeth B Klerman^{1,3}

¹Sleep Health Institute and Division of Sleep and Circadian Disorders, Departments of Medicine and Neurology, and ²Center for Clinical Investigation, Brigham and Women's Hospital, Boston, MA; ³Division of Sleep Medicine, Harvard Medical School, Boston, MA; and ⁴Chronobiology Laboratory, Department of Physiology, University of Murcia and Research Biomedical Institute of Murcia, Murcia, Spain

ABSTRACT

Background: Weight gain and obesity have reached alarming levels. Eating at a later clock hour is a newly described risk factor for adverse metabolic health; yet, how eating at a later circadian time influences body composition is unknown. Using clock hour to document eating times may be misleading owing to individual differences in circadian timing relative to clock hour.

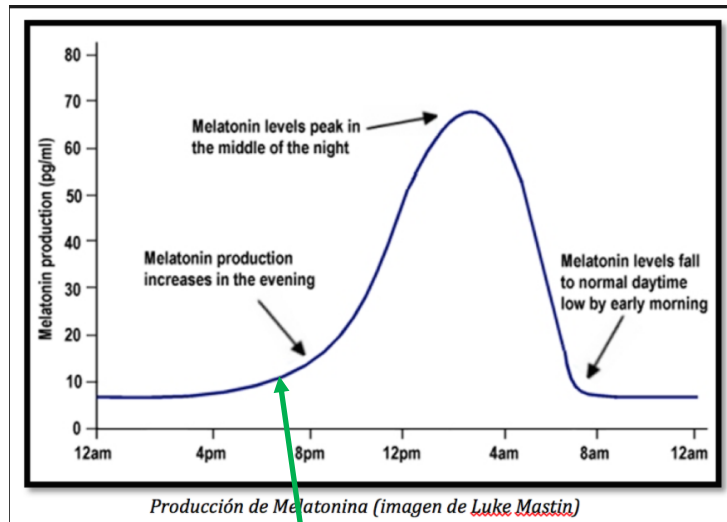
Objective: This study examined the relations between the timing of food consumption relative to clock hour and endogenous circadian time, content of food intake, and body composition.

Design: We enrolled 110 participants, aged 18–22 y, in a 30-d cross-sectional study to document sleep and circadian behaviors within their regular daily routines. We used a time-stamped-picture mobile phone application to record all food intake across 7 consecutive days during a

physiologic functioning. Human circadian physiology has evolved to promote certain behaviors and activities during the day (e.g., physical activity, arousal, and metabolism) or night (e.g., sleep and fasting) (1). In mammals, the internal circadian timing system is entrained to the 24-h light-dark cycle through light signals reaching a master clock located within the hypothalamus (2). With the relatively recent widespread availability of electrical lighting, humans have the ability to self-select their light-dark cycles and extend wakefulness activities far into the night (3). This capability to alter the timing of wakefulness can result in a misalignment between behavior and endogenous circadian physiology (3, 4) and has been associated with adverse health outcomes such as decreased energy metabolism (5, 6), impaired glucose metabolism (7–9), and increased cardiovas-

McHill, A., Phillips, A., Czeisler, C., Keating, L., Yee, K., Barger, L., Garaulet, M., Scheer, F. and Klerman, E. (2017). Later circadian timing of food intake is associated with increased body fat. *The American Journal of Clinical Nutrition*, p.ajcn161588.

La ingesta de alimentos posterior de la sincronización circadiana se asocia con aumento de la grasa corporal

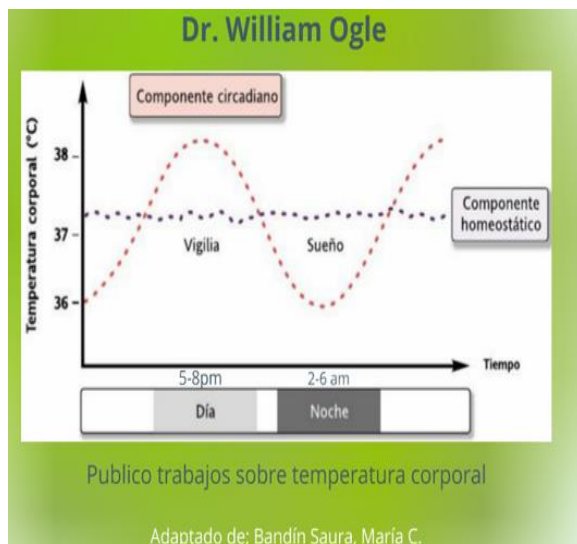


Los individuos con mayor grasa corporal consumieron la mayor parte de sus calorías una hora más cerca de la aparición de melatonina, que anuncia el comienzo de la noche biológica

El momento del consumo calórico relativo al inicio de la producción de melatonina se asocia con un aumento del porcentaje de grasa corporal

LA ALTERACIÓN DEL SISTEMA CIRCADIANO ALTERA EL METABOLISMO Y FAVORECE EL SOBREPESO Y LA OBESIDAD

Krieger, Endocrinology. 95: 1195. 1974



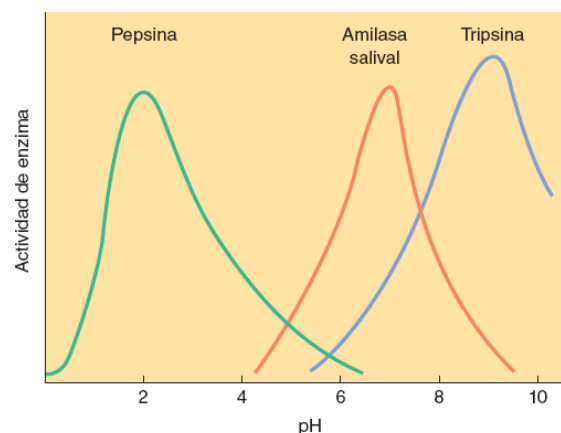
Food and Water Restriction Shifts Corticosterone, Temperature, Activity and Brain Amine Periodicity

DOROTHY T. KRIEGER

Division of Endocrinology, Mount Sinai School of Medicine, New York, New York

ABSTRACT. The circadian periodicity of plasma corticosteroid levels was determined in individual adult male and female rats, sampled every 4 hr over a 48-hr period. Access of these rats to food and water was then restricted to 9:30 AM–11:30 AM for a 15-day period, the animals being kept under normal laboratory lighting conditions (lights on 8:00 AM, off 8:00 PM). At the end of this period, such animals had a 12-hr shift in the time of the circadian peak of plasma corticosteroid levels. A similar alteration in the time of the peak of body temperature levels was also seen in these animals. Alteration of patterns of

running activity, with a marked increase in daytime running activity was also present in such food and water restricted animals. There was also a reversal of AM/PM ratios of hippocampal norepinephrine and of serotonin levels in these animals. These findings demonstrate that presence of normal light-dark alteration is not sufficient for the maintenance of normal circadian periodicity of plasma corticosteroid levels. It is suggested that disruption of the sleep-wake pattern induced by food restriction may be a factor responsible for the observed changes. (*Endocrinology* 95: 1195, 1974)



Fuente: Stuart Ira Fox: *Fisiología humana*, 14e: www.accessmedicina.com
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El cortisol es una hormona estimulante que mantiene la actividad metabólica , junto con la serotonina y la hormona del crecimiento, regulan los patrones de hambre y saciedad.

ENERGY BALANCE-OBESITY

Food Intake during the Normal Activity Phase Prevents Obesity and Circadian Desynchrony in a Rat Model of Night Work

Roberto Salgado-Delgado, Manuel Angeles-Castellanos, Nadia Saderi, Ruud M. Buijs, and Carolina Escobar

Departamento de Anatomía (R.S.-D., M.A.-C., C.E.), Facultad de Medicina, and Departamento de Biología Celular y Fisiología (R.S.-D., N.S., R.M.B.), Instituto de Investigaciones Biomédicas, Universidad Nacional Autónoma de México, México DF 04510, México

Shift work or night work is associated with hypertension, metabolic syndrome, cancer, and other diseases. The cause for these pathologies is proposed to be the dissociation between the temporal signals from the biological clock and the sleep/activity schedule of the night worker. We investigated the mechanisms promoting metabolic desynchrony in a model for night work in rats, based on daily 8-h activity schedules during the resting phase. We demonstrate that the major alterations leading to internal desynchrony induced by this working protocol, flattened glucose and locomotor rhythms and the development of abdominal obesity, were caused by food intake during the rest phase. Shifting food intake to the normal activity phase prevented body weight increase and reverted metabolic and rhythmic disturbances of the shift work animals to control ranges. These observations demonstrate that feeding habits may prevent or induce internal desynchrony and obesity. (*Endocrinology* 151: 1019–1029, 2010)

Neuroscience 154 (2008) 922–931

INTERNAL DESYNCHRONIZATION IN A MODEL OF NIGHT-WORK BY FORCED ACTIVITY IN RATS

R. SALGADO-DELGADO,^a
M. ÁNGELES-CASTELLANOS,^a M. R. BUIJS^b
AND C. ESCOBAR^{a*}

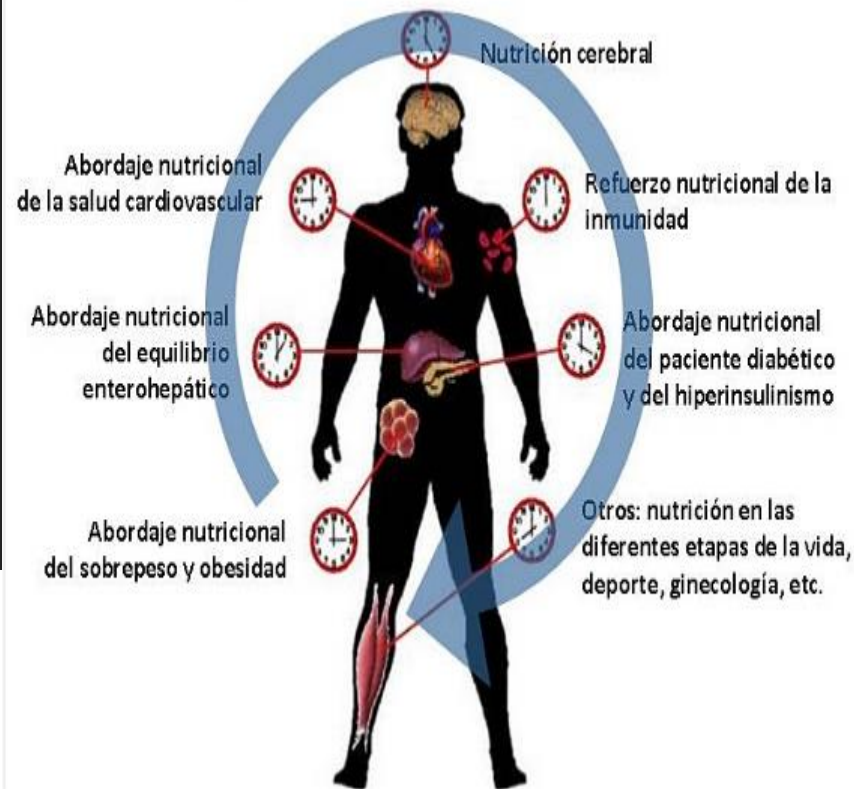
^aDepartamento de Anatomía, Facultad de Medicina, Edificio "B" 4° Piso, Universidad Nacional Autónoma de México, México DF 04510, México

^bDepartamento de Biología Celular y Fisiología, Instituto de Investigaciones Biomédicas, Universidad Nacional Autónoma de México, México DF 04510, México

peripheral oscillators. Rhythmic activity in the SCN originates from transcriptional/translational feedback loops involving a set of clock genes that include *per1*, *per2* and *per3*, *cry1* and *cry2*, *clock* and *bmal1* (Ko and Takahashi, 2006). The SCN is mainly entrained by the light/dark (LD) cycle (Klein et al., 1991), and transmits rhythmic messages to the entire organism (Buijs and Kalsbeek, 2001) in order to coordinate circadian and peripheral oscillators to the LD

combined with feeding uncouples metabolic functions from the biological clock which remains fixed to the LD cycle. **The present data suggest that in the night worker the combination of work and eating during working hours may be the cause of internal desynchronization.**

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<http://www.instimed.es/blog/micronutricion-o-ritmonutricion-un-paso-mas-en-la-nutricion-medica/>

.... “Los presentes datos sugieren que la combinación entre trabajar de noche y comer en las horas de la noche es la posible causa de la desincronización interna.”



BREASTFEEDING MEDICINE
Volume 12, Number 7, 2017
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DOI: 10.1089/bfm.2017.0070

Perspective

Circadian Variation of Breast Milk Components and Implications for Care

Robert D. White

Abstract

Several components of breast milk show circadian variability. It is likely that at least some of these macronutrients, hormones, and micronutrients produce circadian stimuli that enhance the well-being of breast-fed infants. Future research should determine whether high-risk infants benefit if breast milk is given during the same circadian phase as it was expressed.

Keywords: breast milk, circadian, infant nutrition

Introduction

THE EXTENSIVE BENEFITS of breast milk are well recognized. It is also well known that components of breast milk vary between foremilk and hindmilk, and over time. Less known is that a number of breast milk constituents vary over the course of a 24-hour day. In this brief review, we will explore the extent and potential biological implications of this circadian rhythm of breast milk components.

In a few cases, this transfer appears to have an active component, when the pattern diverges from or levels exceed those in the serum.

Implications for Care

It is given that certain components of breast milk, such as macronutrients and minerals, are essential for the survival and growth of the newborn. It is less clear whether other components play a necessary function or are simply "inno-

Micronutrientes y hormonas tienen una variación diurna en la leche materna, incluyendo algunas vitaminas, hierro, nucleótidos, micro-ARN, cortisol, y melatonina.

White, R. (2017). Circadian Variation of Breast Milk Components and Implications for Care. *Breastfeeding Medicine*. <http://dx.doi.org/10.1089/bfm.2017.0070>

El ciclo circadiano del triptofano en la leche materna afecta el ritmo de la β sulfatoxymelatonina y el sueño del recién nacido

Neuro Endocrinol Lett 2005 Dec;26(6):657-61.

The circadian rhythm of tryptophan in breast milk affects the rhythms of 6-sulfatoxymelatonin and sleep in newborn.

Cubero J¹, Valero V, Sánchez J, Rivero M, Parvez H, Rodríguez AB, Barriqa C.

Author information

Abstract

INTRODUCTION: The hormone melatonin regulates the sleep and this pineal hormone is synthesized in the organism from the amino acid tryptophan. It is known that breast-fed babies have better sleep patterns and a better entrained sleep/wake cycle than bottle-fed babies (adapted formula).

OBJECTIVE: To compare the circadian rhythm of 6-sulfatoxymelatonin (aMT6s)--the metabolite of melatonin excreted in the urine--in urine of bottle-fed and breast-fed children, and relate it to the circadian rhythm of tryptophan in breast milk, also evaluating the possible effects on the baby's night-time rest.

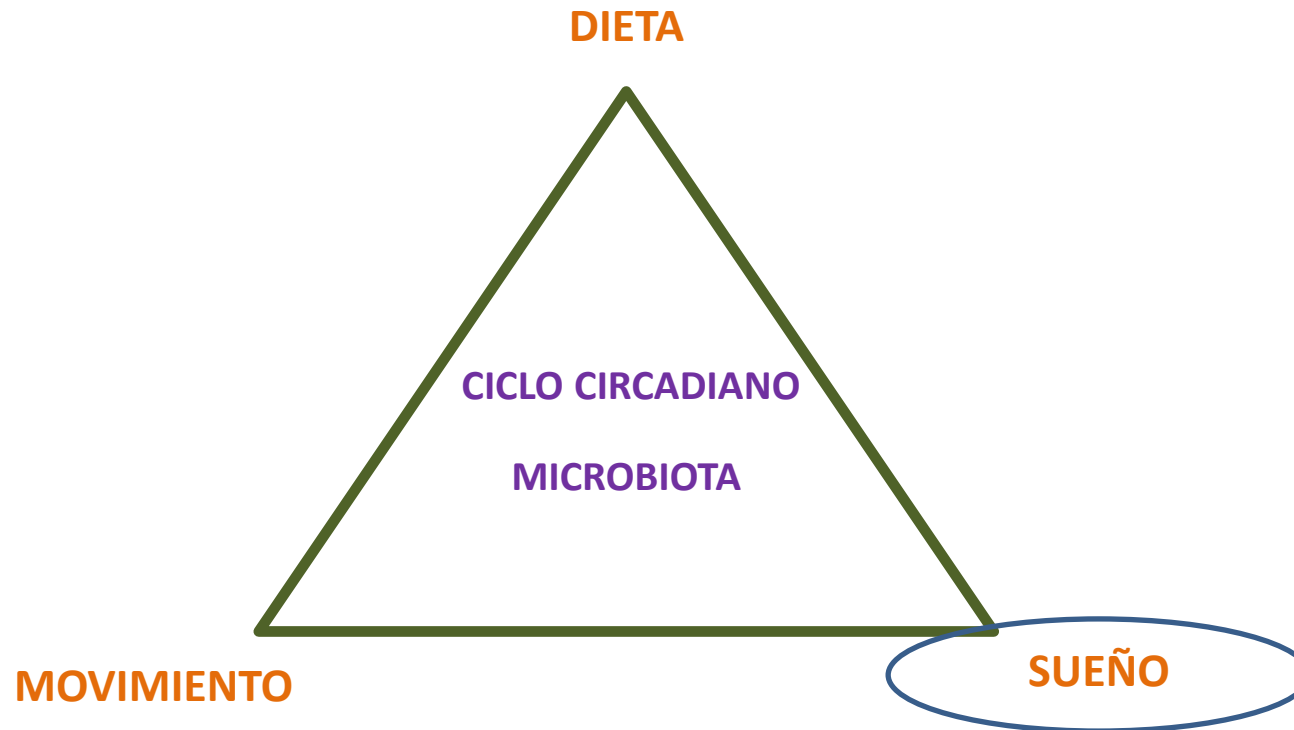
METHODS: 16 infants of 12 weeks of age were studied, divided into two groups depending on their exclusively natural or artificial feeding. The circadian rhythm of 6-sulfatoxymelatonin in urine was measured for the two groups of infants and for the breast-feeding mothers. In the breast milk, the circadian rhythm of the amino acid tryptophan was measured. The rest of the infants was tested by wrist actimeters for a week and the sleep parameters of the infants were measured and evaluated.

RESULTS: The tryptophan in the breast milk presented a circadian rhythm with acrophase at around 03:00. This affected the 6-sulfatoxymelatonin circadian rhythm with acrophase at 06:00 in the breast-fed infants, and also promoted nocturnal sleep. Assumed sleep, actual sleep, and sleep efficiency were significantly increased in the breast fed infants with respect the formula fed infants.

CONCLUSION: A temporal relationship was observed between the circadian rhythm of 6-sulfatoxymelatonin of the exclusively breast-fed babies and that of tryptophan in the mother's milk. Acting this amino acid as a zeitgeber entrainment of the biological rhythms in the breast-fed infant.



NUTRICIÓN Y FLEXIBILIDAD FENOTÍPICA



Editorial



See corresponding article on page 980.

Obesidad, genes y hábitos de sueño

Obesity, genes, and sleep habits

Angelo Tremblay* and Louis Pérusse

Faculty of Medicine, Department of Kinesiology, Laval University, Quebec City, Quebec, Canada

Obesity is a multifactorial health problem that remains an object of major preoccupation, partly because of the difficulty in deriving effective prevention and treatment strategies from recent research on its etiology. In this regard, it is still valid to consider that obesity is the consequence of a positive energy-lipid balance. However, it is also relevant to emphasize that the first law of thermodynamics, which underlies this issue, is not so informative about the cause of obesity. Current mechanistic and clinical research has highlighted the potential impact of unsuspected environmental factors that might contribute more to altering energy balance than the traditionally considered determinants of obesity (i.e., insufficient physical activity and suboptimal diet). These factors include short sleep duration, which promotes hormonal changes related to excess energy intake (1, 2), reduced energy expenditure (3), and a state of fatigue associated with reduced physical activity (4). Accordingly, population studies repeatedly showed that short sleepers are at greater risk of excess body weight (5, 6). Evidence also shows that long sleepers (e.g., adults who report ≥ 9 h sleep/d) are more prone to overweight (6).

Research in genetics has also contributed to innovation in obesity by showing the existence of genetic-environment interaction effects that influence the predisposition to gain or to lose body fat in response to lifestyle changes. For instance, overfeeding in monozygotic twins resulted in a significant within-pair similarity in body fat changes over time, suggesting that heredity can modify the response of body energy stores to hyperphagia (7). More recently, the advent of genomewide association studies has en-

variables and GPRS. The results also showed that sleep duration modulated this relation. Specifically, the association between GPRS and BMI or WC was more pronounced in short (< 7 h/d) and long (> 9 h/d) sleepers than in normal sleepers (7–9 h/d). From a scientific standpoint, this finding is novel and provides evidence for the first time, to our knowledge, that sleep-related behaviors influence genetic susceptibility to obesity.

Beyond its contribution to scientific innovation, this study has important clinical implications. First, it adds to the evidence that some individuals are at increased risk of obesity because they inherited susceptibility genes. Second, the reported results provide a different facet of the gene-environment interaction. As indicated above, this concept has traditionally been used to describe the influence of single genes on the body's response to environmental and lifestyle changes. This vision is extended by the results of the present study, which shows that an environmental factor such as sleep duration can modify the relation between genetic susceptibility, as assessed by a GPRS, and energy balance. Third, this study contributes to proof-of-concept of personalized medicine in obesity by providing evidence that, for some individuals, changes in sleep-related behaviors might be relevant to partly compensate for an increased genetic susceptibility to obesity.

Globally, the study by Celis-Morales et al. (10) offers interesting perspectives toward predictive and personalized medicine. Indeed, the modulation of the genetic risk of obesity by sleep habits suggests that obesity management will be enriched in the near future by the documentation of an interaction between susceptibility genes and a better understanding of environmental effects on energy balance.





Obesity, genes, and sleep habits

Angelo Tremblay* and Louis Pérusse

variables and GPRS. The results also showed that sleep duration modulated this relation. Specifically, the association between GPRS and BMI or WC was more pronounced in short (<7 h/d) and long (>9 h/d) sleepers than in normal sleepers (7-9 h/d). From a scientific standpoint, this finding is novel and provides evidence for the first time, to our knowledge, that sleep-related behaviors influence genetic susceptibility to obesity.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4871113/pdf/nut00001.pdf>

La duración del sueño se relaciona con la predisposición genética a desarrollar obesidad

Menos de 7 horas de sueño

Mas de 9 horas de sueño



Predisposición genética de obesidad



OBESIDAD

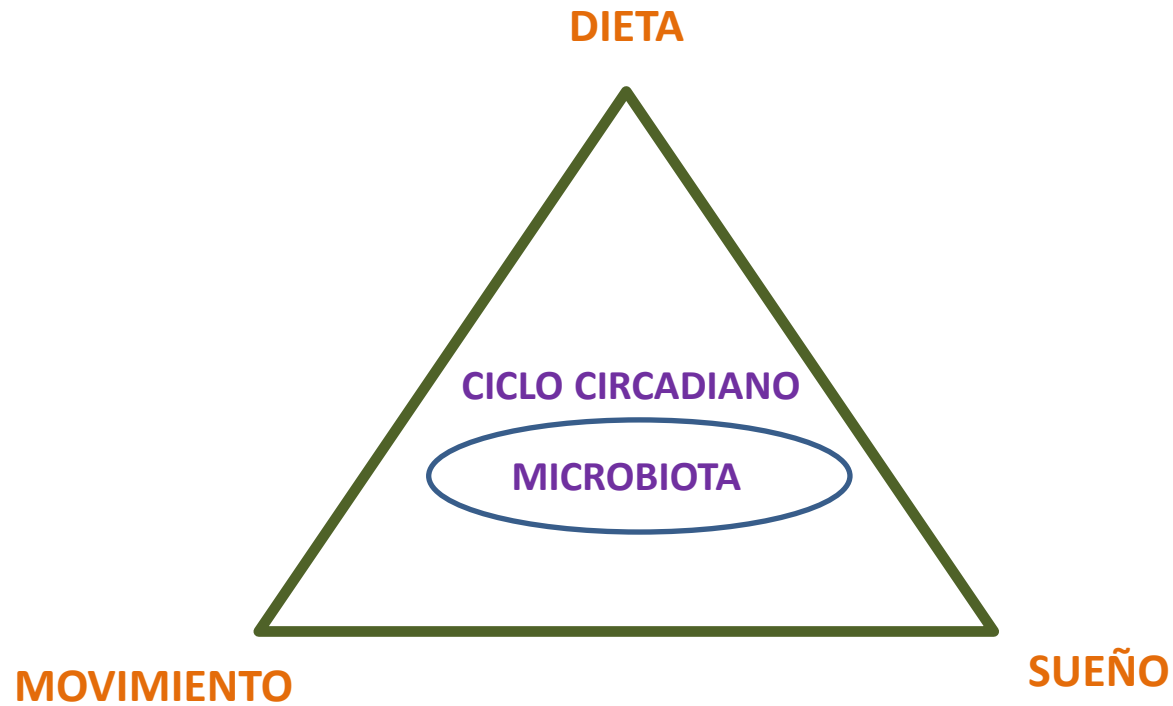
CUANTO
SUEÑO

SE NECESITA?





NUTRICIÓN Y FLEXIBILIDAD FENOTÍPICA



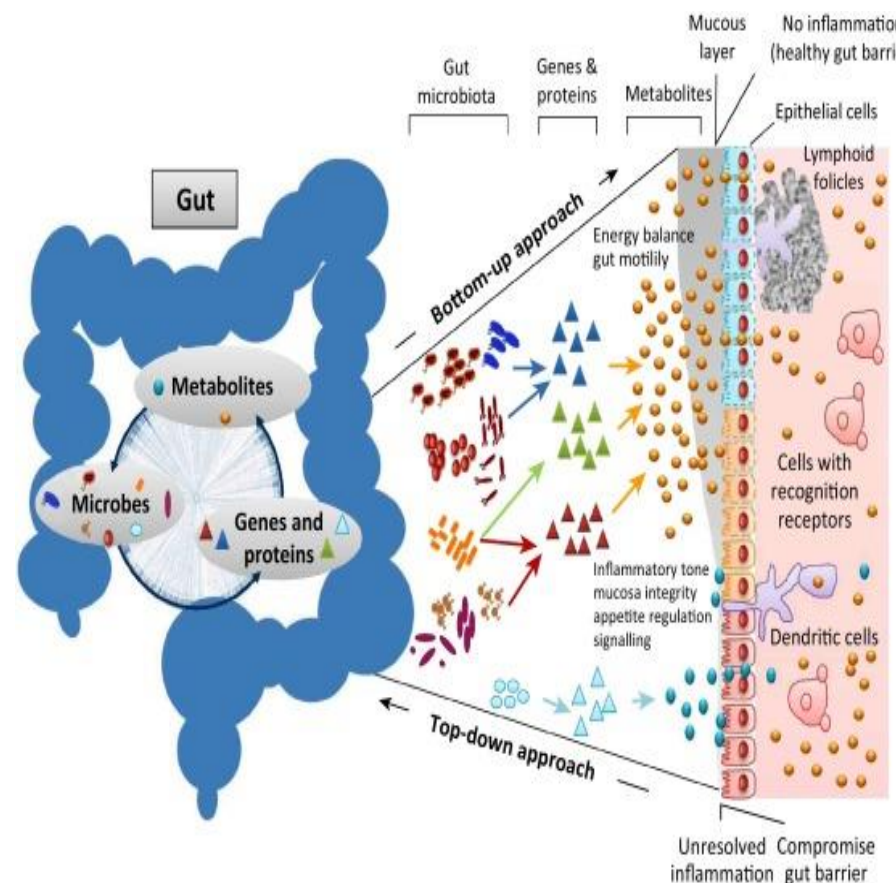
REVIEW

The environment within: how gut microbiota may influence metabolism and body composition

A. Vrieze • F. Holleman • E. G. Zoetendal •
W. M. de Vos • J. B. L. Hoekstra • M. Nieuwdorp

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MICROBIOTA





AJCN. First published ahead of print September 27, 2017 as doi: 10.3945/ajcn.117.156380.

El momento del día y el comportamiento alimentario se asocian con la composición de la microbiota intestinal humana



Time of day and eating behaviors are associated with the composition and function of the human gastrointestinal microbiota

Jennifer L Kaczmarek,¹ Salma MA Musaad,² and Hannah D Holscher¹⁻³

¹Division of Nutritional Sciences, ²Family Resiliency Center, and ³Department of Food Science and Human Nutrition, University of Illinois at Urbana-Champaign, Urbana, IL

ABSTRACT

Background: Preclinical research has shown that the gastrointestinal microbiota exhibits circadian rhythms and that the timing of food consumption can affect the composition and function of gut microbes. However, there is a dearth of knowledge on these relations in humans.

Objective: We aimed to determine whether human gastrointestinal microbes and bacterial metabolites were associated with time of day or behavioral factors, including eating frequency, percentage of energy consumed early in the day, and overnight-fast duration.

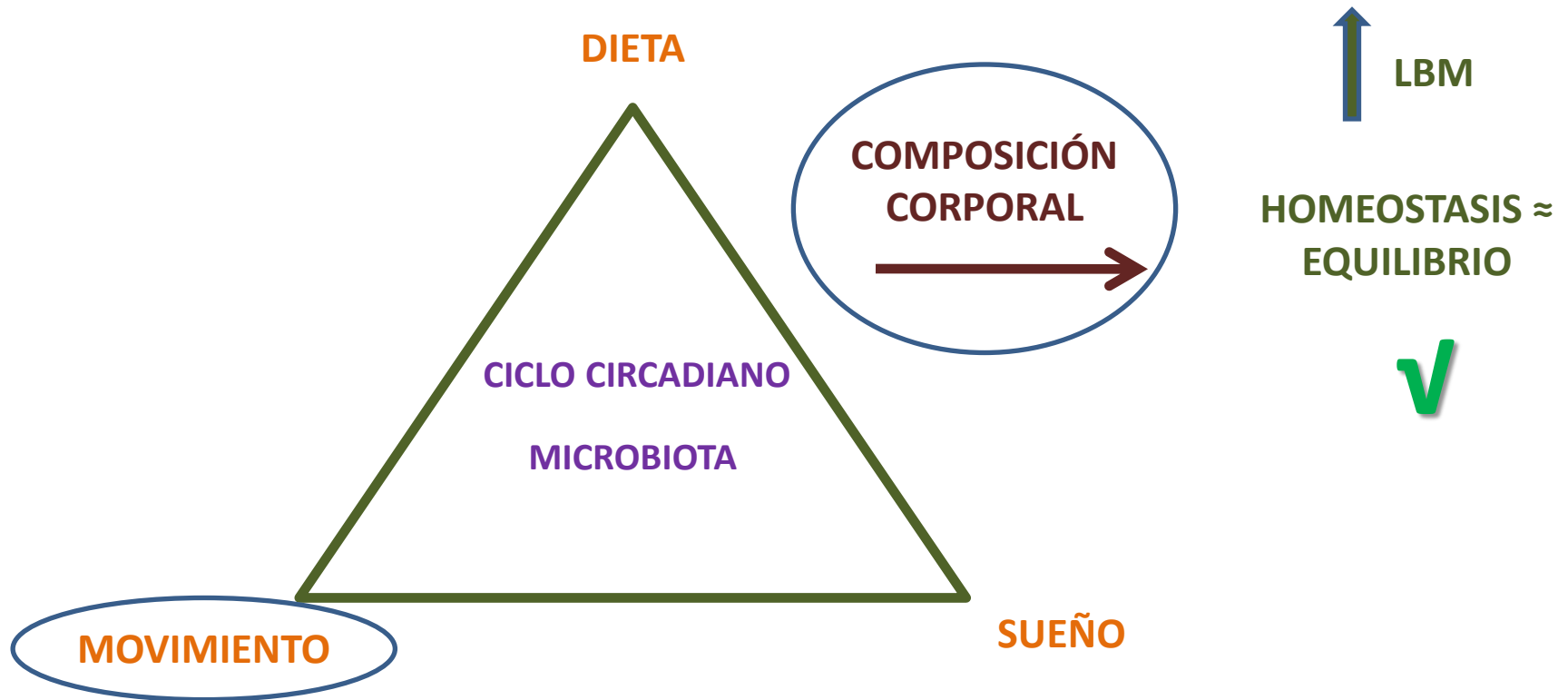
Design: We analyzed 77 fecal samples collected from 28 healthy men and women. Fecal DNA was extracted and sequenced to determine the relative abundance of bacterial species.

there is keen interest in developing evidence-based strategies to modulate the gastrointestinal microbiota for health benefit. Clinical research findings indicate that diet and consumption of fiber and prebiotics affect the gut microbiota (3–5). Intriguingly, preclinical research suggests that gastrointestinal microbes are influenced by circadian rhythms (6–8). Circadian rhythms are cycles of gene expression, metabolism, and behaviors created by an internal clock to maximize an organism's metabolic efficiency (9). The underlying transcriptional and translational feedback loops will proceed without environmental input (e.g., pure biology), but they can also be affected by environmental factors such as light and food.

La composición y la función de la microbiota gastrointestinal humana varía a lo largo del día lo cual puede estar relacionado con el ciclo circadiano del cuerpo humano, la comunidad microbial propia del individuo y el comportamiento alimentario.

Kaczmarek, J., Musaad, S., & Holscher, H. (2017). Timing of Eating Behaviors is Associated with the Gastrointestinal Microbiota. *Journal Of The Academy Of Nutrition And Dietetics*, 117(9), A37.

NUTRICIÓN Y FLEXIBILIDAD FENOTÍPICA





PERSPECTIVES FOR PROGRESS

The Evolving Definition of "Sedentary"

Russell R. Pate, Jennifer R. O'Neill, and Felipe Lobelo

Department of Exercise Science, Arnold School of Public Health, University of South Carolina, Columbia, SC, United States

PATE, R.R., J.R. O'NEILL, and F. LOBELO. The evolving definition of "sedentary." *Exerc. Sport Sci. Rev.*, Vol. 36, No. 4, pp. 173-178, 2008. Studies that did not directly measure sedentary behavior often have been used to draw conclusions about the health effects of sedentariness. Future claims about the effects of sedentary, light, and moderate-to-vigorous activities on health outcomes should be supported by data from studies in which all levels of physical activity are differentiated clearly and measured independently.

Key Words: physical activity, health, accelerometry, adult, child

EVALUAR EL SEDENTARISMO ACTIVO SEDENTARIO

ORIGINAL INVESTIGATION

Sitting Time and All-Cause Mortality Risk in 222 497 Australian Adults

Hilde P. van der Ploeg, PhD; Tien Chey, MAppStats; Rosemary J. Korda, PhD;
Emily Banks, MBBS, PhD; Adrian Bauman, MBBS, PhD

Background: Prolonged sitting is considered detrimental to health, but evidence regarding the independent relationship of total sitting time with all-cause mortality is limited. This study aimed to determine the independent relationship of sitting time with all-cause mortality.

cause mortality hazard ratios were 1.02 (95% CI, 0.95-1.09), 1.15 (1.06-1.25), and 1.40 (1.27-1.55) for 4 to less than 8, 8 to less than 11, and 11 or more h/d of sitting, respectively, compared with less than 4 h/d, adjusting for physical activity and other confounders. The population-attributable fraction for sitting was 6.0%. The associa-



Dra. Elena Ramo (Ced. 3672547)
Especialista en Medicina Familiar.

Sedentarismo

Muerte por Inactividad

NORMAL OBESOGENICO

IMC= 38

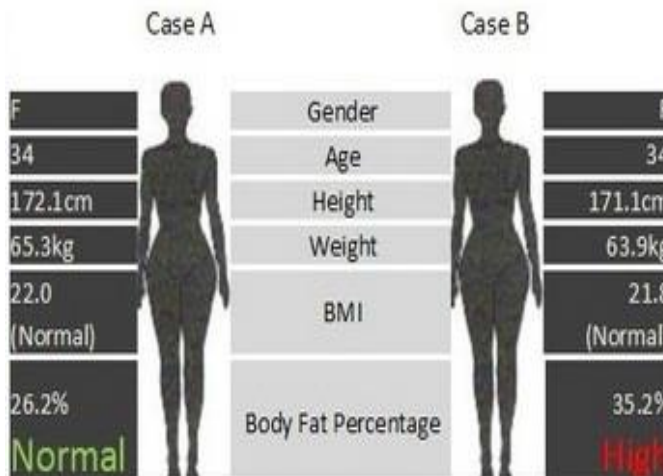


Peso: 110 kg
Talla: 1.70 m
OBESO



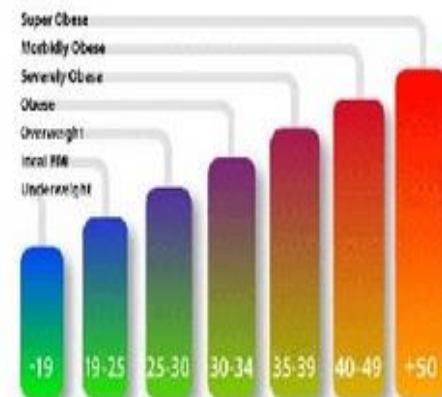
Peso: 110 kg
Talla: 1.70 m
ATLETA

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<https://www.bing.com/images/search?q=imc+normal+alta+grasa&view=detailv2&id=7F428E618267EA5503D6E6F655BF28B4AF20A0738&selectidindex=9&ccid=Mpuo85HK&simid=608054498492286529&thid=OIP.M329ba8f984a8b2e5e699430022fa9e2o0&ajaxhist=0>

BODY MASS INDEX (BMI)



“Personas con peso corporal normal de acuerdo al IMC y con porcentaje de grasa alto, presentan alteraciones en la regulación del metabolismo”“ mayor riesgo a desarrollar Síndrome Metabólico, disfunción cardiometabólica y mayor mortalidad...”.



The Concept of Normal Weight Obesity

Estefania Oliveros^a, Virend K. Somers^a, Ondrej Sochor^{a,b}, Kashish Goel^a, Francisco Lopez-Jimenez^{a,*}

^aDivision of Cardiovascular Diseases, Mayo Clinic, Rochester, Minnesota

^bInternational Clinical Research Center, St. Anne's University Hospital, Brno, Czech Republic

IMC= 38



Peso: 110 kg
Talla: 1.70 m
OBESO



Peso: 110 kg
Talla: 1.70 m
ATLETA

La pérdida de masa muscular con incremento de la masa grasa se denomina “**OBESIDAD SARCOPÉNICA**”.

Esta clasificación es independiente del IMC

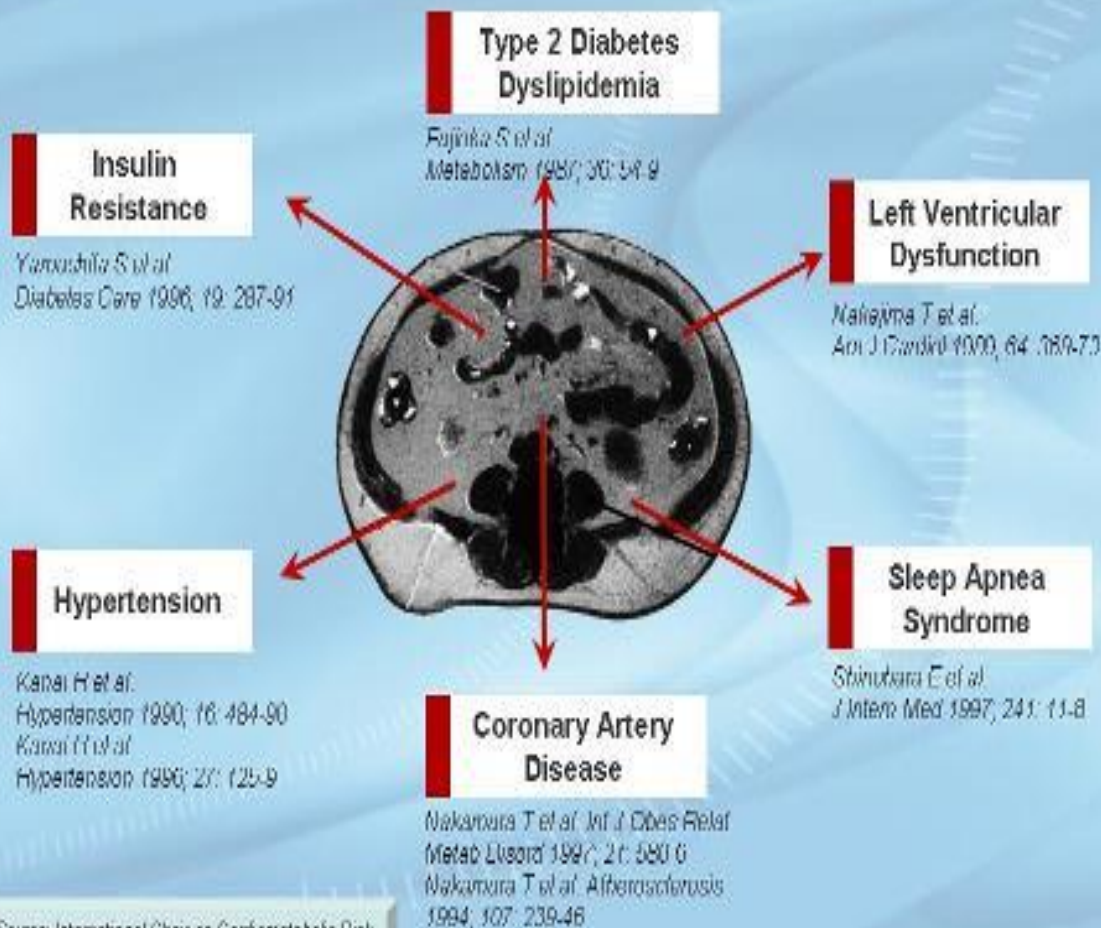


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<https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcRq7QXumpUyGgWxp-GaVsre-jDECtCsPf86ahBZgf-VtUyKSuF>

Visceral Fat Accumulation is an Important Determinant of Metabolic and Cardiovascular Disease



Source: International Chair on Cardiometabolic Risk
www.cardiometabolic.nsk.org

Mantener una buena musculatura, más importante aún que el porcentaje graso



HÁBITOS ALIMENTARIOS ADECUADOS



ACTIVIDAD FÍSICA REGULAR



<http://www.vitonica.com/enfermedades/no-hacer-nada-disminuye-la-masa-muscular>

Review Article

Muscular strength as a strong predictor of mortality: A narrative review

Konstantinos A. Volaklis ^{a,b,*}, Martin Halle ^{a,c}, Christa Meisinger ^d

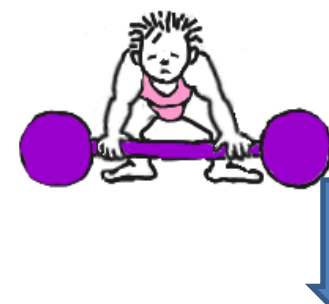
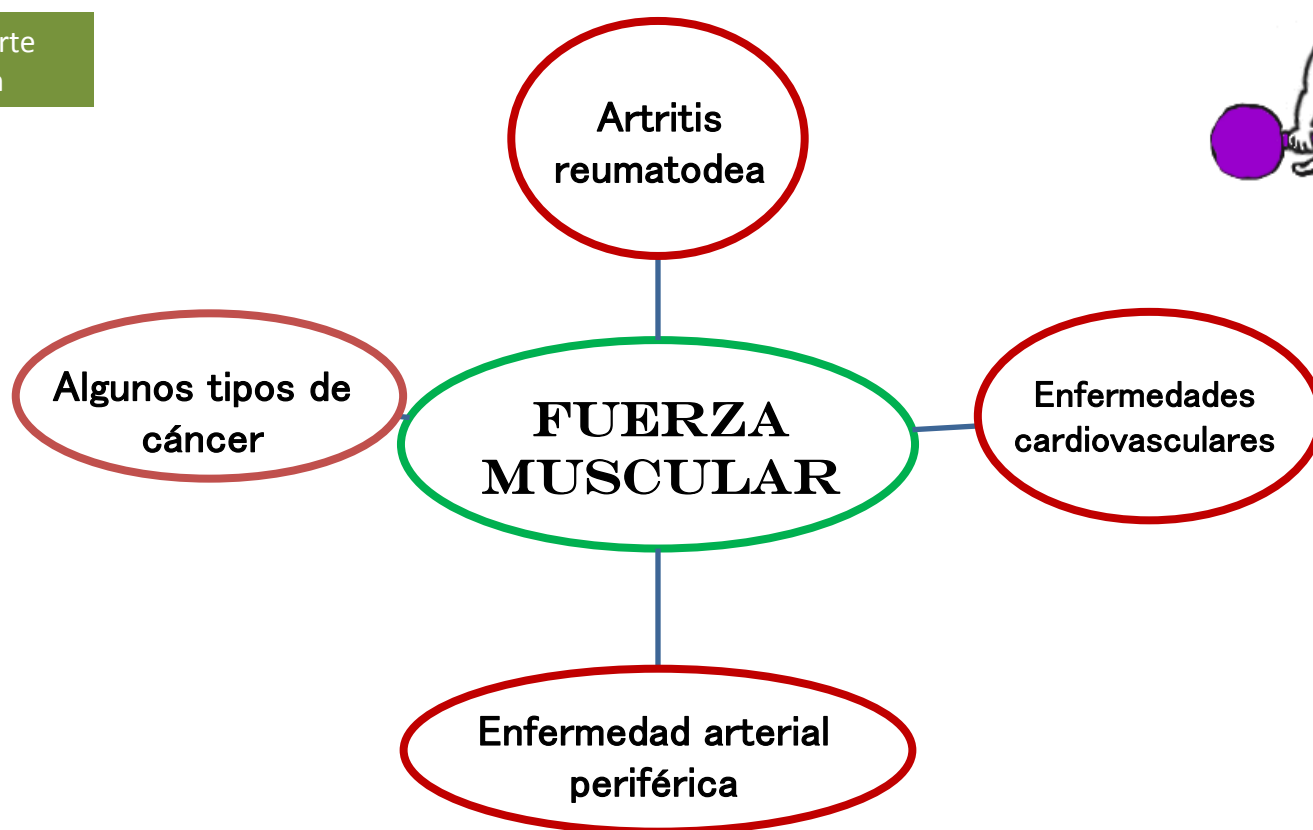
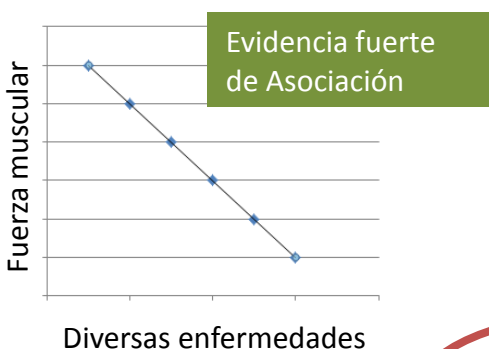
^a Department of Prevention and Sports Medicine, Technische Universität München, Munich, Germany

^b FIT, Ambulantes Herz-Rehazentrum, Augsburg, Germany

^c Munich Heart Alliance, Munich, Germany

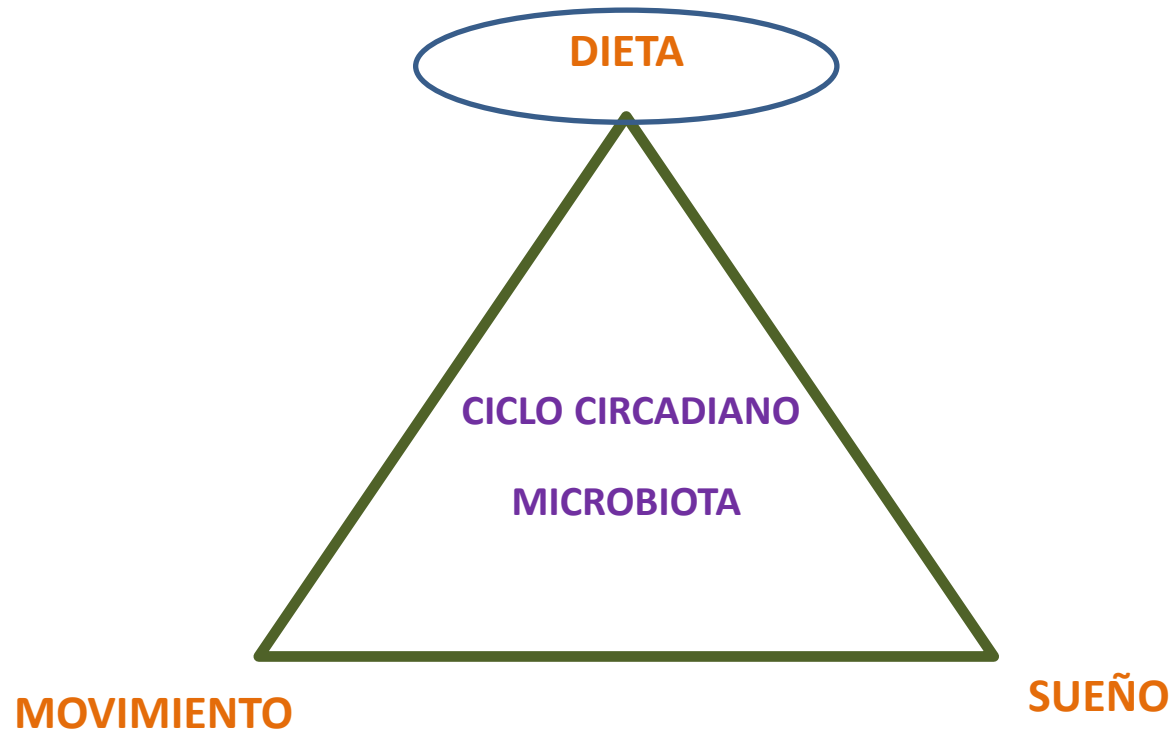
^d Institute of Epidemiology II, Helmholtz Zentrum München, German Research Center for Environmental Health, Neuherberg, Germany

FUERZA MUSCULAR



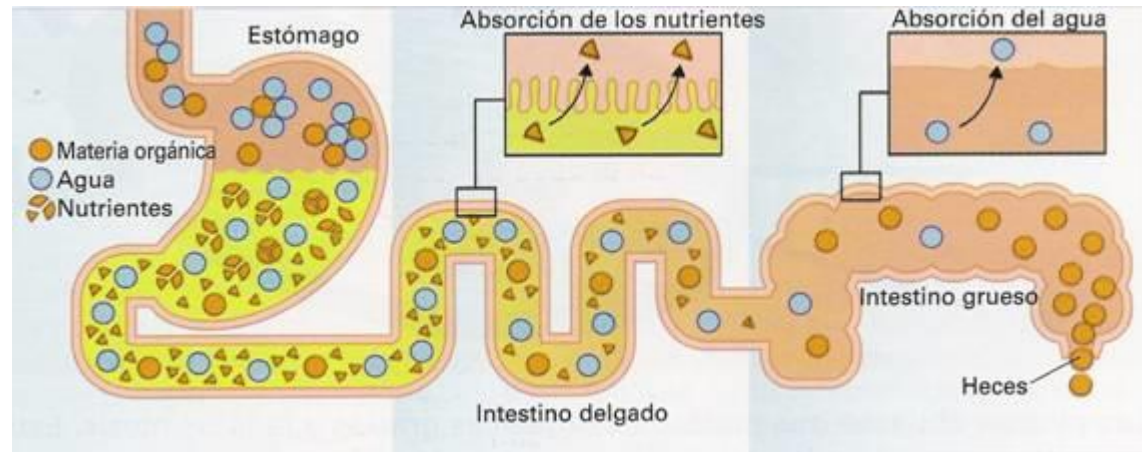
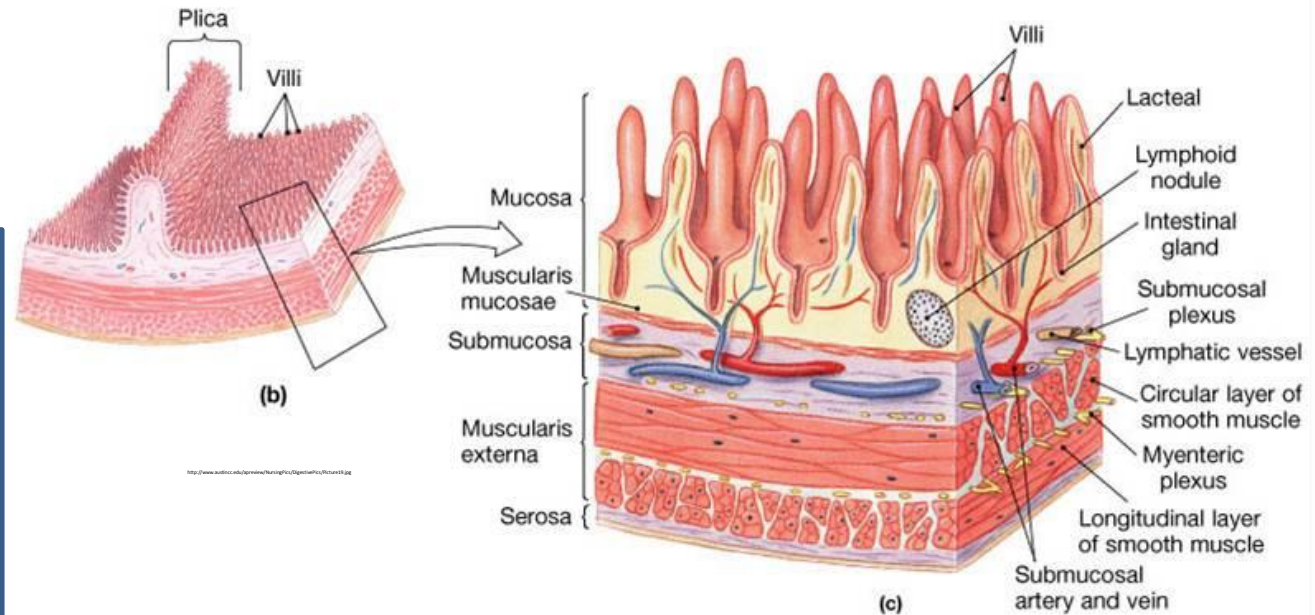
MAYOR EVIDENCIA EN HOMBRES

NUTRICIÓN Y FLEXIBILIDAD FENOTÍPICA



EN CUANTO A LA ALIMENTACIÓN

LA VERDADERA COMUNICACIÓN EN NUTRICIÓN DE NUESTRO ORGANISMO CON EL MEDIO AMBIENTE SE PRODUCE A TRAVÉS DEL INTESTINO HUMANO





Nutrientes: Sustancias contenidas en los alimentos que posibilitan el funcionamiento de nuestros órganos y tejidos y nuestro normal desarrollo.

Alimentos son aquellos que contienen nutrientes

Alimentación: es el hecho de consumir alimentos

Nutrición: Es el aprovechamiento de esos alimentos

"Destacar los efectos protectores de la alimentación que dependen de la estructura intacta de los alimentos y de interacciones entre nutrientes.

La suplementación farmacológica de nutrientes no reproduce los beneficios de la alimentación

Necesidad de implementar un nuevo enfoque para formular las directrices alimentarias, que priorice los alimentos intactos o mínimamente procesados y desincentive el consumo de productos ultraprocesados. "

WILLETT, W. C.; SKERRET, P. j. Eat, Drink, and Be Healthy: The Harvard Medical School Guide to Healthy Eating. New York: Free Press, 2005.



http://bvsms.saude.gov.br/bvs/publicacoes/guia_alimentaria_poblacion_brasilena.pdf

Ministerio de Salud de Brasil.
Secretaría de Atención a la Salud.
Departamento de Atención Primaria
Guía alimentaria para la población
brasileña / Ministerio de Salud de
Brasil, Secretaría de Atención a la
Salud, Departamento de Atención
Primaria; traducido por Carlos
Augusto Monteiro con Organización
Pan-Americana de la Salud. – Brasília:
Ministerio de Salud de Brasil, 2015.



DIEZ PASOS PARA UNA ALIMENTACIÓN SALUDABLE

- 1 HACER DE LOS ALIMENTOS NATURALES O MÍNIMAMENTE PROCESADOS LA BASE DE LA ALIMENTACIÓN
- 2 UTILIZAR ACEITES, GRASAS, SAL Y AZÚCAR EN PEQUEÑAS CANTIDADES AL CONDIMENTAR Y COCINAR LOS ALIMENTOS Y CREAR PREPARACIONES CULINARIAS
- 3 LIMITAR EL CONSUMO DE ALIMENTOS PROCESADOS
- 4 EVITAR EL CONSUMO DE ALIMENTOS ULTRAPROCESADOS
- 5 COMER CON REGULARIDAD Y ATENCIÓN, EN AMBIENTES APROPIADOS Y, SIEMPRE QUE SEA POSIBLE, ACOMPAÑADO
- 6 HACER COMPRAS EN LUGARES QUE OFREZCAN VARIEDADES DE ALIMENTOS NATURALES O MÍNIMAMENTE PROCESADOS
- 7 DESARROLLAR, EJERCITAR Y COMPARTIR HABILIDADES CULINARIAS
- 8 PLANEAR EL USO DEL TIEMPO PARA DAR A LA ALIMENTACIÓN EL ESPACIO QUE MERECE
- 9 AL COMER FUERA DE CASA, PREFERIR LUGARES QUE SIRVAN COMIDAS HECHAS EN EL MOMENTO
- 10 SER CRÍTICO RESPECTO A LA INFORMACIÓN, ORIENTACIONES Y MENSAJES SOBRE LA ALIMENTACIÓN DIFUNDIDAS EN LA PUBLICIDAD

DIEZ PASOS PARA UNA ALIMENTACIÓN SALUDABLE

1. HACER DE LOS ALIMENTOS NATURALES O MÍNIMAMENTE PROCESADOS LA BASE DE LA ALIMENTACIÓN

Los alimentos naturales se obtienen directamente de plantas o de animales, y son adquiridos para su consumo sin que hayan sufrido ningún tipo de alteración tras extraerlos de la naturaleza.



<http://www.bogota.gov.co/sites/default/files/styles/large/public/field/image/plaza-de-mercado.jpg?itok=DFbbOToV>



International Journal of Epidemiology, 2017, 1–28

doi: 10.1093/ije/dyw319

Original article



Original article

Fruit and vegetable intake and the risk of cardiovascular disease, total cancer and all-cause mortality—a systematic review and dose-response meta-analysis of prospective studies

Dagfinn Aune^{1,2,3*}, Edward Giovannucci^{4,5,6}, Paolo Boffetta⁷, Lars T. Fadnes⁸, NaNa Keum^{5,6}, Teresa Norat², Darren C. Greenwood⁹, Elio Riboli², Lars J. Vatten¹ and Serena Tonstad¹⁰

Las ingesta de frutas y verduras se asociaron con un menor riesgo de enfermedad cardiovascular, cáncer y mortalidad por todas las causas.

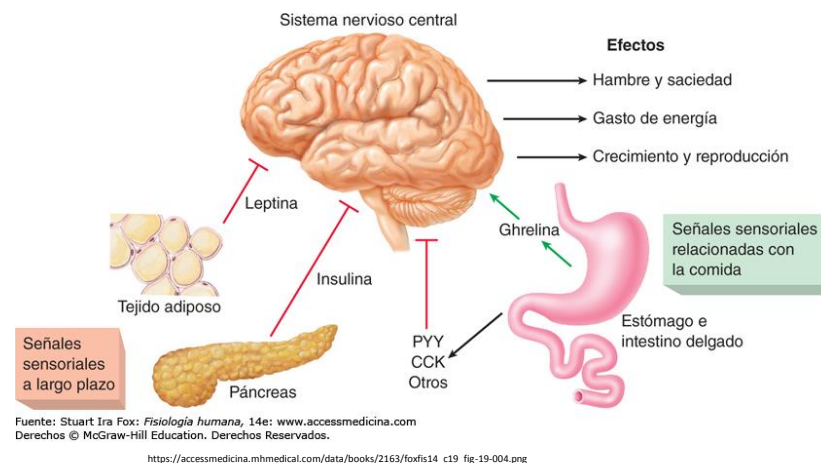
2. UTILIZAR ACEITES, GRASAS, SAL Y AZÚCAR EN PEQUEÑAS CANTIDADES AL CONDIMENTAR Y COCINAR LOS ALIMENTOS Y CREAR PREPARACIONES CULINARIAS

Utilizados **con moderación** en preparaciones culinarias con base en alimentos naturales o mínimamente procesados, los aceites, las grasas, la sal y el azúcar contribuyen a diversificar y hacer más sabrosa a la alimentación sin volverla nutricionalmente desequilibrada.

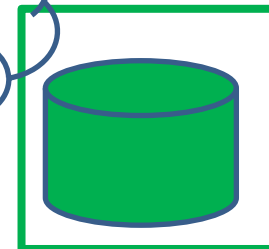
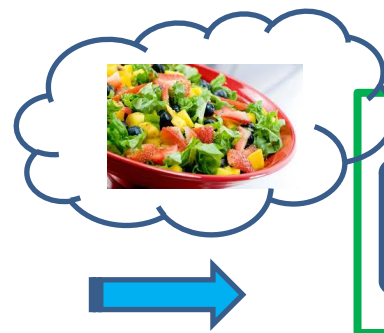
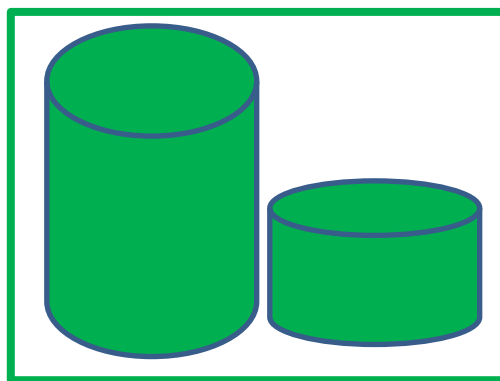
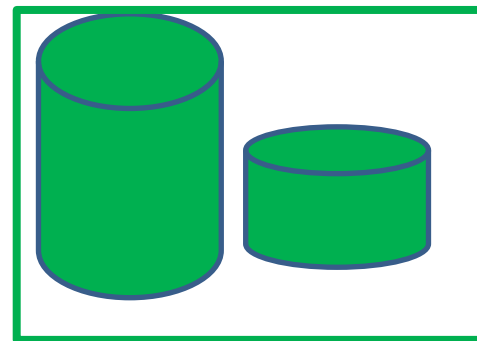
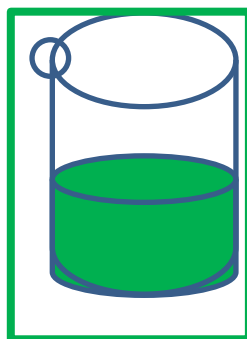
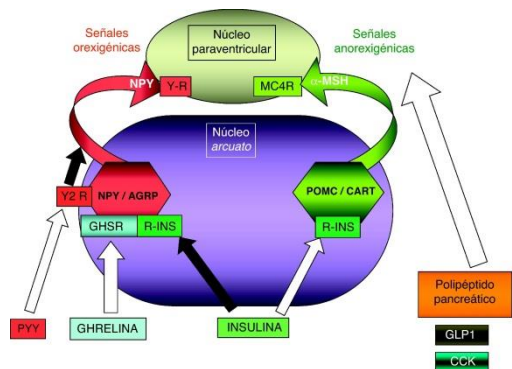


http://extension.illinois.edu/foodforthought_sp/0303.html

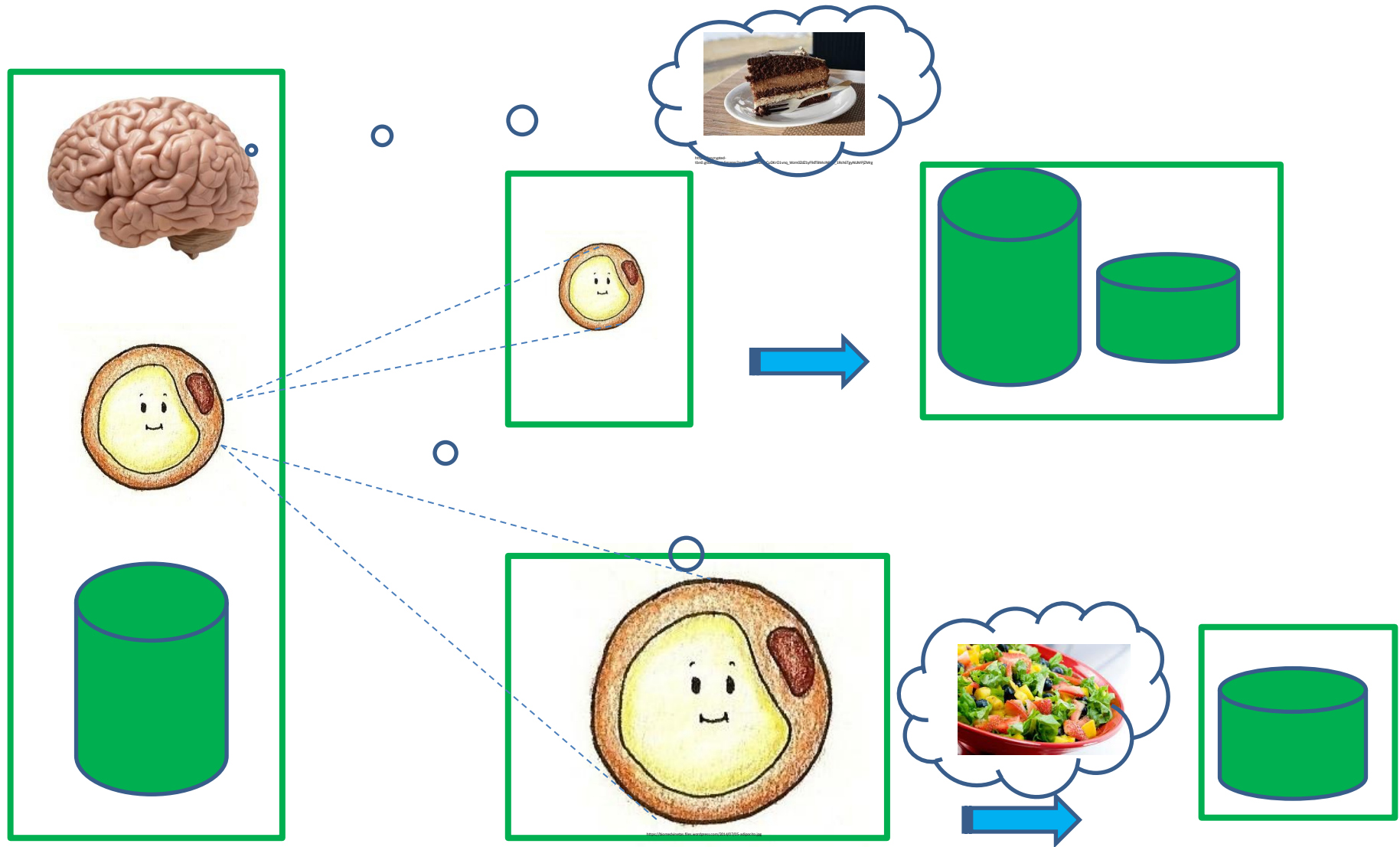
CONTROL DE LA INGESTA



CONTROL DE LA INGESTA A CORTO PLAZO

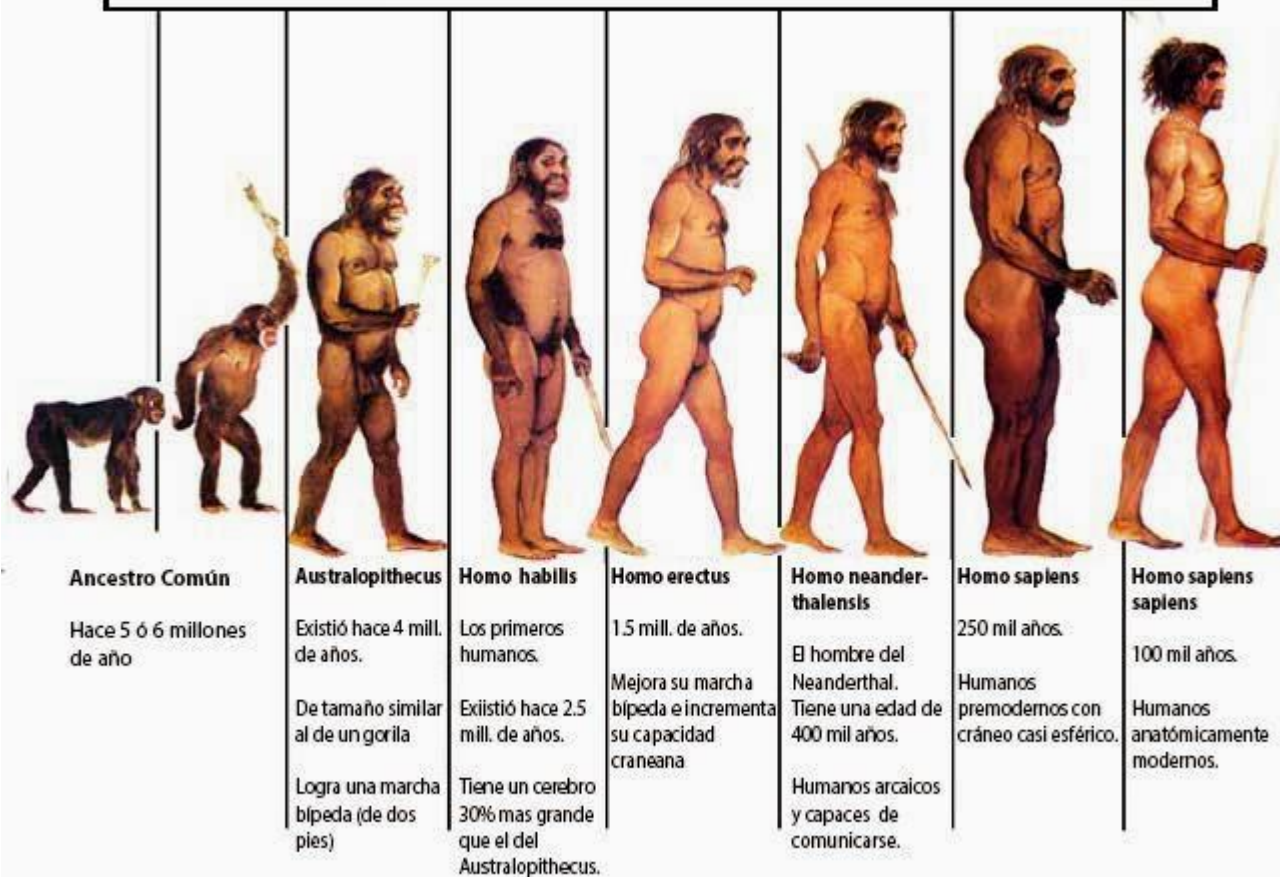


CONTROL DE LA INGESTA A LARGO PLAZO



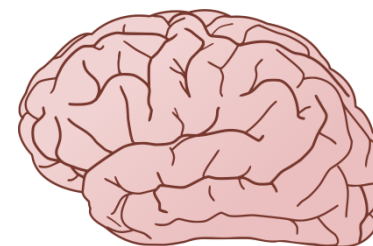
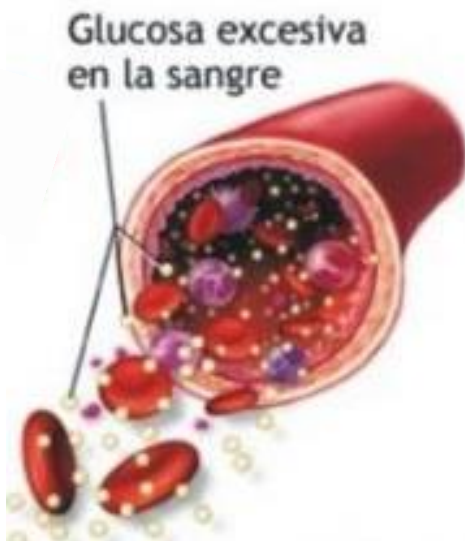
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LA EVOLUCIÓN DEL HOMBRE

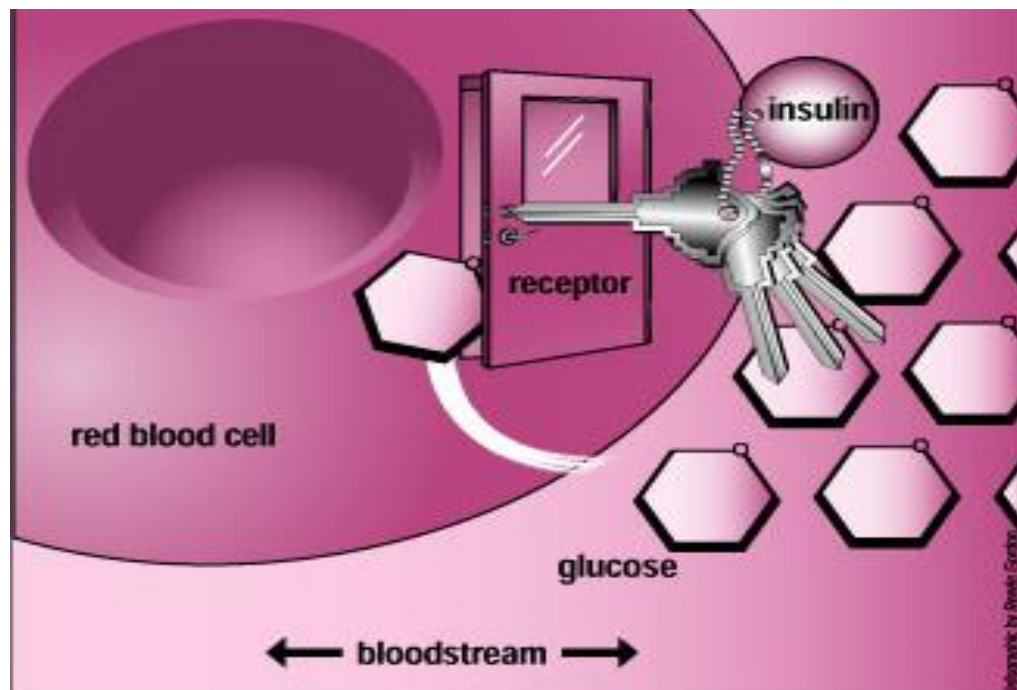


5 MILLONES DE AÑOS

100 MIL AÑOS



INSULINA





ARTÍCULO ESPECIAL

Consumo de bebidas para una vida saludable: recomendaciones para la población mexicana

Beverage consumption for a healthy life: recommendations for the Mexican population

Juan A. Rivera¹, Onofre Muñoz-Hernández², Martín Rosas-Peralta³, Carlos A. Aguilar-Salinas⁴, Barry M. Popkin⁵, Walter C. Willett⁶

¹Instituto Nacional de Salud Pública, Cuernavaca, Morelos, México; ²Hospital Infantil de México Federico Gómez, ³Instituto Nacional de Cardiología Ignacio Chávez, ⁴Instituto Nacional de Ciencias Médicas y Nutrición Salvador Zubirán, México, D.F., México; ⁵School of Public Health, University of North Carolina, Chapel Hill, NC, EUA, ⁶Harvard School of Public Health, Boston, MA, EUA.

Resumen

El Secretario de Salud convocó al Comité de Expertos para la elaboración de las "Recomendaciones sobre el consumo de bebidas para la población mexicana"; la finalidad fue desarrollar lineamientos basados en evidencia científica para los consumidores, los profesionales de la salud y el sector gubernamental. Las prevalencias de sobrepeso, obesidad y diabetes han aumentado con rapidez en México y las bebidas representan la quinta parte

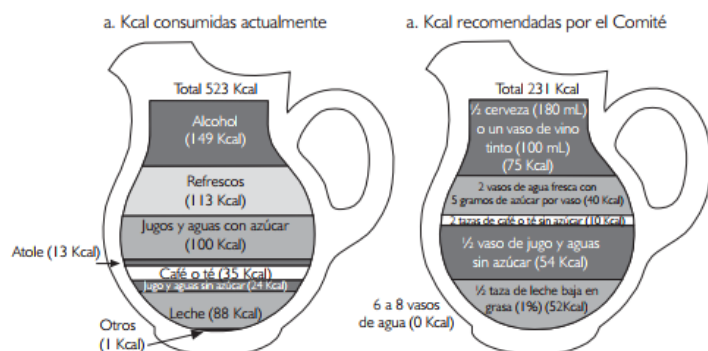
Summary

The Expert Committee in charge of developing the Beverage Consumption Recommendations for the Mexican Population was convened by the Secretary of Health for the purpose of developing evidence-based guidelines for consumers, health professionals, and government officials. The prevalence of overweight, obesity and diabetes have dramatically increased in Mexico; beverages contribute a fifth of all calories consumed by

Rivera, J., Muñoz-Hernández, O., Rosas-Peralta, M., Aguilar-Salinas, C., Popkin, B., & Willett, W. (2008). Consumo de bebidas para una vida saludable: recomendaciones para la población mexicana. *Salud Pública De México*, 50(2), 173-195. <http://dx.doi.org/10.1590/s0036-36342008000200011>

Consumo de bebidas para una vida saludable: recomendaciones para la población mexicana

Consumo de bebidas para una vida saludable: recomendaciones para la población mexicana.



Nota: Datos representativos en el ámbito nacional para adultos de 19 años y más

Nota: El Comité recomienda:

Agua: 750-2 000 mL al día (estas cantidades deben ser mayores en personas que practican actividad física vigorosa o en climas muy calurosos)

Leche baja en grasa (1%) o sin grasa y bebidas a base de soja: 0-500 mL al día

Té y café (sin azúcar): 0-1 litro al día (puede reemplazarse por agua; la cafeína es un factor limitante: se recomienda no tomar más de 400 mg al día, es decir, cerca de un litro al día de café filtrado)

Bebidas dietéticas: 0-500 mL al día

Jugos 100% de fruta: 0-125 mL al día; alcohol: si se toma, 0-1 bebida al día para hombres y mujeres (una bebida = una cerveza de 240 mL, 150 mL de vino, ó 45 mL de bebidas destiladas). No se recomienda la leche entera

Refrescos: ninguno

Adaptada con permiso de *The American Journal of Clinical Nutrition*¹

Figura 5. Patrones de consumo de bebidas para hombres adultos mexicanos, reales y recomendados 2006.

RECOMENDACIONES DE CONSUMO DE LÍQUIDOS

- ✓ Agua
- ✓ Te sin azúcar
- ✓ Café sin azúcar
- ✓ Infusiones sin azúcar
- ✓ Leche
- ✓ ¼ de vaso de jugo de fruta natural



Cambios en la calidad de la dieta en respuesta a una intervención en reducción de bebidas azucaradas

Dietary quality changes in response to a sugar-sweetened beverage–reduction intervention: results from the Talking Health randomized controlled clinical trial^{1,2}

Valisa E Hedrick,^{3*} Brenda M Davy,³ Wen You,⁴ Kathleen J Porter,³ Paul A Estabrooks,⁵ and Jamie M Zoellner³

Departments of ³Human Nutrition, Foods, and Exercise and ⁴Agricultural and Applied Economics, Virginia Tech, Blacksburg, VA; and ⁵Department of Health Promotion, Social and Behavioral Health, University of Nebraska Medical Center, Omaha, NE

ABSTRACT

Background: The reduction of sugar-sweetened beverage (SSB) intake may be beneficial for weight management and other related health conditions; however, to our knowledge, no data exist regarding the spontaneous changes in other dietary components or the overall dietary quality after an SSB-reduction intervention.

Objectives: We explored longitudinal changes within and between an SSB-reduction intervention (SIPsmartER) and a physical activity intervention (MoveMore) with respect to spontaneous changes in 1) energy intake and macronutrients and micronutrients, 2) dietary quality [Healthy Eating Index–2010 (HEI)], and 3) beverage categories.

Design: Participants were enrolled in a 6-mo, community-based behavioral trial and randomly assigned into either the SIPsmartER ($n = 149$) intervention group or the MoveMore ($n = 143$) matched-contact comparison group. Dietary intake was assessed through a mean of three 24-h dietary recalls at baseline and 6 mo. Dietary recalls were analyzed with the use of nutritional analysis software. A multilevel, mixed-effects linear regression with intention-to-treat analyses is presented.

Results: SIPsmartER participants showed a significant reduction in total SSBs (mean decrease: -366 mL; $P \leq 0.001$). Several spontaneous changes occurred within the SIPsmartER group and, compared with the MoveMore group, included significant HEI improvements for empty calorie, total vegetable, and total HEI scores (mean increases: 2.6, 0.3, and 2.6, respectively; all $P \leq 0.01$). Additional positive changes were shown, including significant decreases in total energy intake, *trans* fat, added sugars, and total beverage energy (all $P \leq 0.05$). Few dietary changes were noted in the MoveMore group over the 6-mo intervention.

contributor to obesity (1, 2) and related comorbidities such as type 2 diabetes (3, 4) and cardiovascular disease (2). Because $\sim 50\%$ of AS consumption is from sugar-sweetened beverages (SSBs) (5), reducing SSB intake is a common objective of AS-reduction interventions (6, 7) and public health policies (8–10). Recently, the US Dietary Guidelines recommended that $\leq 10\%$ of energy should come from AS and that SSBs should be replaced with water (11).

The reduction of SSB intake may be beneficial for weight management (12, 13) and other related health conditions (14). However, to our knowledge, no data exist that have examined concurrent changes in other dietary components or in the overall dietary quality that results from an intervention that has targeted an SSB reduction. Furthermore, the US Dietary Guidelines has recognized dietary pattern research as a substantial research gap (15) because foods are not consumed in isolation but, rather, in combination with other dietary components (16). With multiple AS recommendations and public policies (e.g., SSB taxation) being implemented (11, 17, 18), a key opportunity is to determine what compensatory dietary changes are occurring when SSB and AS intakes are reduced. The few studies that have examined longitudinal changes in dietary patterns have not specifically explored changes in dietary components or quality when SSB consumption has been reduced (19). Because SSB intake provides a lower satiety value than solid AS intake does, as a result of its liquid form, changes in SSB consumption may play a more substantial role in altering dietary intake and consequently increasing energy intake compared with changes in solid AS

- < Calorías vacías
- < Calorías totales
- < Gasas trans
- > Frutas y hortalizas





3, LIMITAR EL CONSUMO DE ALIMENTOS PROCESADOS

- ✓ Pueden consumirse como ingredientes de preparaciones culinarias o parte de comidas basadas en alimentos naturales
- ✓ Alteran de modo desfavorable la composición nutricional de los alimentos de los que se derivan. o mínimamente procesados.



http://www.izarroitz.com/contenidos/150-Productos_Infancia/queso-izarroitz-12-kg.pdf



4. EVITAR EL CONSUMO DE ALIMENTOS ULTRAPROCESADOS

- ✓ Son nutricionalmente desequilibrados.
- ✓ Tienden a consumirse en exceso
- ✓ Sustituye alimentos naturales o mínimamente procesados.
- ✓ Afectan el medio ambiente





Ultra-processed food and drink products in Latin America: Trends, impact on obesity, policy implications



Noncommunicable Diseases and Mental Health



Short Communication

Processed and ultra-processed foods are associated with lower-quality nutrient profiles in children from Colombia

Brittany Cornwell¹, Eduardo Villamor^{1,2}, Mercedes Mora-Plazas³, Constanza Marin³, Carlos A Monteiro⁴ and Ana Baylin^{1,5,*}

Los comestibles ultra-procesados tienen una menor calidad nutricional y bajos niveles de Omega 3, Vitaminas A, B12, C y E, así como Calcio y Zinc.

Cornwell, B., Villamor, E., [Mora-Plazas, M.](#), Marin, C., Monteiro, C. and Baylin, A. (2017). Processed and ultra-processed foods are associated with lower-quality nutrient profiles in children from Colombia. *Public Health Nutrition*, pp.1-6.



Adherence to a snacking dietary pattern and soda intake are related to the development of adiposity: a prospective study in school-age children

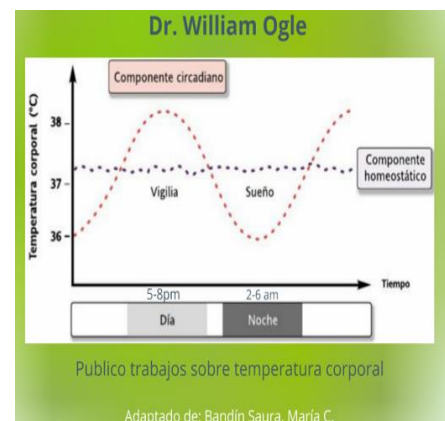
Monal R Shroff¹, Wei Perng², Ana Baylin², Mercedes Mora-Plazas³, Constanza Marin³ and Eduardo Villamor^{2,*}

La población infantil con el consumo más alto de comestibles empaquetados y bebidas azucaradas, presentó un Índice de Masa Corporal más alto, el cual se incrementaba anualmente el en un punto con respecto a los que tenían un consumo más bajo.

Shroff, M., Perng, W., Baylin, A., [Mora-Plazas, M.](#), Marin, C. and Villamor, E. (2013). Adherence to a snacking dietary pattern and soda intake are related to the development of adiposity: a prospective study in school-age children. *Public Health Nutrition*, 17(07), pp.1507-1513.

5. COMER CON REGULARIDAD Y ATENCIÓN, EN AMBIENTES APROPIADOS Y, SIEMPRE QUE SEA POSIBLE, ACOMPAÑADO

- ✓ Procure hacer sus comidas en horarios semejantes todos los días
- ✓ Evite "picar" en los intervalos entre las comidas.
- ✓ Coma siempre despacio y disfrute de lo que está comiendo, sin hacer ninguna otra actividad al mismo tiempo.
- ✓ Procure comer en lugares limpios, cómodos y tranquilos y donde no haya estímulos para consumir cantidades ilimitadas de alimentos.
- ✓ Siempre que sea posible, coma en compañía, y disfrute de la alimentación.
- ✓ Comparta también las actividades domésticas que anteceden y siguen a las comidas.



6. HACER COMPRAS EN LUGARES QUE OFREZCAN VARIEDADES DE ALIMENTOS NATURALES O MÍNIMAMENTE PROCESADOS

Procure comprar sus alimentos en supermercados, mercados al aire libre y mercados de productores y otros lugares que comercialicen variedades de alimentos naturales o mínimamente procesados. Dé preferencia a las legumbres, verduras y frutas de la estación y cultivadas localmente. Siempre que sea posible, compre alimentos orgánicos y de base agroecológica, de preferencia directamente de los productores.

7. DESARROLLAR, EJERCITAR Y COMPARTIR HABILIDADES CULINARIAS

Si usted tiene habilidades culinarias, procure desarrollarlas y compartirlas, principalmente con niños y jóvenes, sin distinción de género. Si no tiene habilidades culinarias —y eso vale tanto para hombres como para mujeres— procure adquirirlas. Para ello charle con quienes saben cocinar, pida recetas a familiares, amigos y colegas, lea libros, consulte la internet, haga cursos y... ¡comience a cocinar!



8. PLANEAR EL USO DEL TIEMPO PARA DAR A LA ALIMENTACIÓN EL ESPACIO QUE MERECE

Planee las compras de alimentos, organice la despensa doméstica y defina con anterioridad el menú de la semana. Divida con los miembros de su familia la responsabilidad de todas las actividades domésticas relacionadas con la preparación de las comidas. Haga de esa preparación y del acto de comer momentos privilegiados de convivencia y placer. Reevalúe la manera en que usa su tiempo y determine qué actividades podrían ceder espacio a la alimentación.

9. AL COMER FUERA DE CASA, PREFERIR LUGARES QUE SIRVAN COMIDAS HECHAS EN EL MOMENTO

En el día a día, procure lugares que sirvan comidas hechas en el momento y a un precio justo. Los restaurantes de “comida por kilo” pueden ser buenas opciones, al igual que las cantinas que sirvan “comida casera” en escuelas o en el lugar de trabajo. Evite las redes de comida rápida.

SIN EMBARGO ES PREFERIBLE LLEVAR PARA FUERA DE CASA COMIDA PREPARADA A CASO QUE COMPRAR PRODUCTOS NO SALUBRES PARA COMER FUERA DE CASA

10. SER CRÍTICO RESPECTO A LA INFORMACIÓN, ORIENTACIONES Y MENSAJES SOBRE LA ALIMENTACIÓN DIFUNDIDAS EN LA PUBLICIDAD

Recuerde que la función esencial de la publicidad es aumentar las ventas de productos y no informar ni, menos aún, educar. Evalúe de manera crítica lo que lee, ve y oye sobre alimentación en los anuncios y estimule a otras personas, en particular a los niños y jóvenes, a hacer lo propio.

Ley chilena de etiquetado de alimentos

Las etiquetas "ALTO EN" de fondo negro y letras blancas deben estar ubicadas en la cara principal del envase, de modo que sean visibles para los consumidores.



Nutrition Typical values (cooked as per instructions)	per 100g	per 1/4 pack	% adult GDA	GDA children (5-10 yrs)
Energy kJ	1007	2014		
Energy kcal	241	482		
Protein	8.4g	16.8g	24.1%	1800
Carbohydrate	20.6g	41.2g	37.3%	24g
of which sugars	1.8g	3.6g	17.9%	220g
of which starch	18.8g	37.6g	4.0%	85g
Fat	13.7g	27.4g	39.1%	70g
of which saturates	5.7g	11.4g	57.0%	20g
mono-unsaturates	5.9g	11.8g		
polyunsaturates	1.5g	3.0g		
Fibre	0.9g	1.8g		
Salt	0.50g	1.00g		
of which sodium	0.20g	0.40g		

GDA = Adult Guideline Daily Amounts are based on a diet of 2000 kcal per day. GDA's are guidelines and personal requirements vary depending on age, gender, weight and activity.



1

Consuma alimentos frescos y variados como lo indica el Plato saludable de la familia colombiana

2

Para favorecer la salud de músculos, huesos y dientes, consume diariamente leche u otros productos lácteos y huevo

3

Para una buena digestión y prevenir enfermedades del corazón, incluya en cada una de las comidas frutas enteras y verduras frescas

4

Para complementar su alimentación consume al menos dos veces por semana leguminosas como frijol, lenteja, arveja y garbanzo

5

Para prevenir la anemia, los niños, niñas, adolescentes y mujeres jóvenes deben comer vísceras una vez por semana

6

Para mantener un peso saludable, reduzca el consumo de "productos de paquete", comidas rápidas, gaseosas y bebidas azucaradas

7

Para tener la presión arterial normal, reduzca el consumo de sal y alimentos como carnes embutidas, enlatados y productos de paquete altos en sodio

8

Cuide su corazón, consuma aguacate, maní y nueces, disminuya el consumo de aceite vegetal y margarina, evite grasas de origen animal como mantequilla y manteca

9

Por el placer de vivir saludablemente realice actividad física de forma regular.



VOLVER AL COMIENZO

**COMER A TIEMPO, DESPACIO, CON
ATENCIÓN, ALIMENTOS FRESCOS NATURALES
PREPARADOS EN CASA CON AMOR Y
CON INGREDIENTES CULINARIOS CASEROS.**

GRACIAS !!!