



**YOGURT  
IN  
NUTRITION**

INITIATIVE FOR A BALANCED DIET



**2<sup>nd</sup> GLOBAL SUMMIT ON THE  
HEALTH EFFECTS OF  
YOGURT  
EB 2014**

**Wednesday, April 30th, 2014 – 8:00**



**International Osteoporosis  
Foundation**



**DANONE INSTITUTE**  
*Nutrition for Health*



- 8:00 **Welcome & Introduction**, by Sharon M. Donovan and Raanan Shamir
- 8:05 – 8:30 **History of yogurt and current patterns of consumption**  
*Speaker: Mauro Fisberg / Moderator: Andrew Prentice*
- 8:30 – 10:00 **Yogurt and health in the life cycle**
  - Yogurt consumption associated with adequate nutrient intake and decreased metabolic diseases in children and adolescents (including latest results of HELENA study)  
*Speaker: Luis Moreno*
  - Impact of Yogurt on appetite control and energy balance and body composition  
*Speaker: Angelo Tremblay / Moderator: Barbara Rolls*
  - Importance of milk protein on the health status of the elderly (> 50 years health status)  
*Speaker: Robert R. Wolfe / Moderator: René Rizzoli*
  - Dairy protein and musculoskeletal health: Report of the EU working group  
*Speaker: René Rizzoli / Moderator: Robert R. Wolfe*
- 10:00 – 10:15 **Break**
- 10:15 – 11:45 **Future hot topics**
  - Dietary dairy product intake and incident type 2 diabetes  
*Speaker: Nita Forouhi / Moderator: Sharon Donovan*
  - Gut microbiota & health, what's new  
*Speaker: Olivier Goulet / Moderator: Raanan Shamir*
  - Microbiota and the Gut-Brain axis  
*Speaker: John Bienenstock / Moderator: Raanan Shamir*
  - Yogurt and sustainability: energy and protein conversion by dairy cows  
*Speaker: Toon Van Hooijdonk / Moderator: Chris Cifelli*
- 11:45 – 12:15 **Posters session**  
Short presentations from selected posters dedicated on yogurt  
*Moderator: Sharon Donovan*
- 12:15-12:30 **Wrap up to conclude on the key role of yogurt for the future**  
*Speaker: Frans Kok*
- 12:30 **Conclusion**, by Sharon Donovan and Raanan Shamir
- 12:30 – 14:00 **Tasting session with Ellie Krieger**  
After a short presentation, Ellie Krieger will organize an original tasting session featuring the yogurt in all different ways. A signing session of her last book « weeknight wonders » will follow.

# Abstracts

# History of yogurt and current patterns of consumption (1/2)

Mauro Fisberg, MD, PhD

Federal University of Sao Paulo, Brasil

Yogurt is an ancient food whose importance has been recently rediscovered in the role of one of the most important single foods in human history. Fermented or non-fermented dairy products have probably appeared in our history together with the transition from a nomadic to a sedentary lifestyle, leading to the domestication of some animals and the use of milk in the alimentation. It is now considered that yogurt or products similar to it, were first used in the period that ranges from 10.000 to 5.000 B.C., in the Neolithic era. By chance or by observation, herdsman from the Middle East discovered that the product derived from milk left in the heat or in contact with it, could lead to a curdled or thick product (called by many names, depending on the region). For millennia, making yogurt was the only known safe method to preserve milk without drying it. The first reference of this food in the Bible is in the book of Job, and some of the historians do interpret the phrase "Land of Milk and Honey" as a reference to yogurt. The use of yogurt by medieval Turks is recorded in books written in the 11<sup>th</sup> century. They were the first to evaluate its value as a medicine besides the use as a conservative heritage food. Used in the Balkans and many regions of Asia (Russian Empire, India), yogurt was later on brought to Europe and was an instant success as dessert or mixed with many ingredients (such as cinnamon, honey, fruits etc..).

Yogurt in modern times is regulated and its definition must be respected: yogurt is a fermented milk, with the necessary presence of two strains *Lactobacillus delbrueckii* subsp. *bulgaricus* and *Streptococcus thermophilus*. The huge concentration (up to a billion live cells per milliliter) of *L. bulgaricus* and *S. thermophilus* discourages the growth of other bacterium, possibly disease-causing, at the same time that fermentation helps preserve the milk and improves its digestibility by breaking down the lactose.

Yogurt has many other names or possible cousin products that are slightly similar in the literature. The most frequent spelling comes from the ancient Turkish word *yogurt*, and is related to the verb *yoğurmak*: "to be curdled or coagulated; to thicken". Yogurt cousin are: *Da-hi* is (India), *Dadih* or *Dadih* (West Sumatra), *Matsoni* (Georgia), *Dovga* (Azerbaijan), *Zabadi* (Egypt), *Raita* (Asia and India) and so one....In Spain (and therefore in Spanish American countries) is described the *cuajada* also called *coahada* in Portuguese regions.

One of the most important modifications of yogurt in modern times is the global spreading of ready to eat products: in packets for children, with probiotics or with possible claiming regarding intestinal functioning and in the prevention of infections.

# History of yogurt and current patterns of consumption (2/2)

The yogurt consumption is very different around the world. Traditional European countries, Asian and Russian sphere influence regions have higher consumptions. In regions with high lactose intolerance levels, dairy products are associated indirectly with milk and derivatives, thus their intake is very low, leading to very low calcium intake. In some regions this deficiency could be relieved by added calcium in juices and other foods; but in other countries, the clinical situation is critical, with high levels of osteopenia and osteoporosis.

Yogurt is a product that is associated with the increase of socioeconomic level of the population and there is a relationship between yogurt intake and educational level, income and information. Because yogurt is acknowledged more and more as an essential food in some developing countries, there is a growing tendency: yogurt is seen as an important source of calcium and not only as a snack or a dessert.

## Some references

- [www.bonappetit.com](http://www.bonappetit.com) : The etymology of the word yogurt by Sam Dean
- [www.culturesforhealth.com](http://www.culturesforhealth.com) : what is yogurt ?
- [www.fao.org/docrep/003/t0251e/T0251E14.htm](http://www.fao.org/docrep/003/t0251e/T0251E14.htm) acidified milks. FAO
- [en.wikipedia.org/wiki/yogurt](http://en.wikipedia.org/wiki/yogurt)
- [www.respostatecnica.org.br/dossie-tecnico/downloadsDT/Mzlw](http://www.respostatecnica.org.br/dossie-tecnico/downloadsDT/Mzlw)
- [www.saudiaramcoworld.com/issue/200804/of.yogurt.and.yoruks.htm](http://www.saudiaramcoworld.com/issue/200804/of.yogurt.and.yoruks.htm)
- *The Gaylord Hauser Cook Book: Good Food, Good Health, Good Looks*, Gayelord Hauser, Coward-McCann New York, 1946
- "Look Younger, Live Longer," Gayelord Hauser, condensed version, *Readers Digest*, October 1950
- *Craig Claiborne's The New York Times Food Encyclopedia*, Joan Whitman compiler, Times Books New York, 1985
- *Nectar and Ambrosia: An Encyclopedia of Food in World Mythology*, Tamra Andrews, ABC CLIO Santa Barbara, 2000
- Swiss Food Law: Article 56, Yogurt, section 2: "The final product must contain a total of at least 10 million colony forming units of microorganisms under paragraph 1 or 1.2 per gram
- *A Taste of Persia: An Introduction to Persian Cooking*, Batmanglij, Najmieh, I.B.Tauris. p. 170, 2007
- *The Natural History of Pliny*, tr. John Bostock, Henry Thomas Riley, London: Bell, 1856-93, Volume 3
- Kolars J. C.; Levitt M. D.; Aouji M.; Savaiano D. A. (1984). "Yogurt – an Auto digesting Source of Lactose". *New England Journal of Medicine* 310 (1): 1-3.
- Ripudaman S. Beniwal *et al.*, (2003) "A Randomized Trial of Yogurt for Prevention of Antibiotic-Associated Diarrhea", *Digestive Diseases and Sciences* 48:10:2077-2082
- "Making Yogurt at Home", Hutkins Robert, Univ. of Nebraska. Archived from the original on 2006-08-23.
- *The World Encyclopedia of Food*, Coyle, L. Patrick, Facts On File Inc. p. 763, 1982.

# ***YOGURT AND HEALTH IN THE LIFE CYCLE***

# Yogurt consumption associated with adequate nutrient intake and decreased metabolic diseases in children and adolescents

Luis Moreno, PhD

Public Health, University of Zaragoza, Spain

Although there is no clear evidence of the role of dairy consumption on cardiovascular diseases (CVD) risk development in adults, several studies have suggested dairy consumption to have a protective effect. There is limited information on the relationship between milk and dairy products consumption and CVD risk factors among adolescents. To identify those food groups best discriminating individuals at high/low CVD risk and to investigate the relationship between dairy consumption and CVD risk factors we studied a sample of adolescents (12.5–17.5 years) from eight European cities participating in the cross-sectional (2006–2007) HELENA (Healthy Lifestyle in Europe by Nutrition in Adolescence) study. Diet, waist circumference, skin-fold thickness, systolic blood pressure, insulin resistance, triglycerides, total cholesterol/high-density lipoprotein ratio and cardiorespiratory fitness (CRF) were assessed. Individual z-scores of CVD risk factors were summed to compute sex-specific clustered CVD risk scores. Dairy emerged as the food group best discriminating adolescents at low/high CVD risk. In both boys and girls, waist circumference and sum of skin-folds were inversely associated with consumption of milk and milk- and yogurt-based beverages. Moreover, CVD risk score was also inversely associated with overall dairy consumption, but only in girls. This study adds further evidence to the scarce literature on the influence of milk and dairy products on adolescents' cardiovascular health.

# Impact of yogurt on appetite control and energy balance and body composition

Angelo Tremblay, PhD

Department of Kinesiology, Laval University, Canada

The properties of yogurt promoting a facilitation of appetite control and a negative energy balance are partly the same as those of other dairy foods such as milk and low-fat cheese. The high calcium content of these foods has been shown to be negatively related to the consumption of carbonated beverages and other sweetened beverages. At the opposite, a calcium-specific appetite control hypothesis suggests that low calcium intake favors an increase in food intake, presumably to restore calcium homeostasis. Dairy proteins are also known to promote satiety with a reduced energy intake. The food matrix of yogurt can also accommodate some modifications which are associated with a decrease in subjective appetite and subsequent energy intake. These include the incorporation of fibers and probiotics which can also favorably influence body weight over time. This is concordant with recent population studies demonstrating that regular yogurt consumption is related to a decrease in body weight over time. Taken together, these observations suggest that yogurt is a healthy food that facilitates short-term control of appetite and energy intake, be it in the context of an obesity management program or under free-living conditions.

# Importance of milk proteins in elderly health status

Robert R. Wolfe, PhD

University of Arkansas for Medical Sciences, Little Rock,

A variety of epidemiological studies suggest that adequate muscle mass is important for health, especially in the elderly. This is particularly true in response to serious disease. Muscle mass can be increased by increased protein intake as a result of stimulation of muscle protein synthesis. Adequate muscle strength and physical function appear to be even more important to the well-being of the elderly than muscle mass. Prospective trials have shown that strength and physical function can be improved in elderly by increased protein or amino acid intake. In determining the optimal amount of protein intake for elderly it is important to consider physiological roles of dietary protein beyond its effect on muscle. Increased protein intake has been shown to benefit both cardiovascular and bone health, and to aid in weight management. In considering the optimal protein intake, it is important to account for not only the amount but the quality of protein intake. The quality of protein is determined by the profile and amount of essential amino acids (EAAs) and the ileal digestibility of each EAA. A new scoring system called the Digestible Indispensable Amino Acid Score (DIAAS) calculates the percent of EAA requirements met by ingestion of 0.66 g of the test protein/kg/day. In the case of a high-quality protein such as milk protein, the DIAAS is approximately 140%, whereas vegetable proteins are mostly below 80%. Thus, the amount of calories required in a food source to deliver the daily requirement of all EAAs is far greater than for most vegetable proteins than for animal proteins such as milk proteins.

We conclude that when end-points related to all health aspects of protein intake are considered, the optimal intake of protein in elderly is probable around 1.5g/kg/day. Ingestion of high-quality proteins, such as milk proteins, will result in much greater EAA intake than lower-quality proteins, such as those contained in vegetables.

# Dairy protein and musculoskeletal health: report of the EU working group

René Rizzoli, MD, PhD

University Hospital of Geneva, Switzerland

After the age of 50, ageing is accompanied by a loss of skeletal muscle mass and strength. This pathology called sarcopenia runs in a vicious circle since a sedentary lifestyle, nutritional factors and chronic diseases exacerbate this loss. Sarcopenia contributes to the increasing risk of falls. Osteoporosis, also observed with aging, is associated with deterioration of bone mass and bone tissue fragility and an increased risk of fragility fractures. Osteoporosis occurs more commonly in women and the prevalence increases markedly after the menopause. These diseases resulting from deterioration in musculoskeletal health can have major consequences beyond falls and fracture risk, including debilitating pain, physical disability, loss of independence, depression and premature death. However, the risk of developing sarcopenia and osteoporosis may be prevented through healthy lifestyle changes such as adequate dietary protein and vitamin D intakes, and regular physical exercises. Protein intake and physical exercise are one of the main anabolic stimuli for muscle synthesis. Exercise training can increase muscle mass and strength as well as improve endurance and functional capacity. Protein intake combined with regular exercise result in a greater degree of muscle synthesis than either intervention alone. Last research highlighted an important role of vitamin D on muscle mass and strength. Higher protein intake and vitamin D levels are associated with higher muscle mass and muscle strength and improved bone health. Thus, healthy lifestyle measures in women aged over 50 years are likely to be important for optimizing healthy ageing.

In consideration of existing recommendations and knowledge base on the impact of protein and vitamin D on muscle mass and strength and bone health, The Task Force of the European Society for Clinical and Economic Aspects of Osteoporosis and Osteoarthritis (ESCEO) recommends optimal dietary protein and vitamin D intakes combined with regular physical exercise in postmenopausal women for healthy aging and for prevention of the age-related disorders of musculoskeletal health. The ESCEO Task Force recommends in postmenopausal women (aged 50–70 years) to increase protein intakes from 0.8g/Kg/bw/day to 1.0 g/Kg/bw/day to fit their special needs/metabolism. Because the type of protein consumed impacts the anabolic response of protein synthesis, the ESCEO TASK Force advised to consume preferentially high quality protein like dairy source. Vitamin D intakes should be from 800 to 1000 IU/d to maintain serum 25-(OH)D concentration >50 nmol/L. Regular physical exercise at least 3 times per week should be undertaken, which may be combined with protein intake in proximity to exercise, for optimal muscle health.

*Vitamin D and Calcium Supplementation to Prevent Fractures in Adults: U.S. Preventive Services Task Force Recommendation Statement* : <http://annals.org/article.aspx?articleid=1655858#Abstract>

# ***FUTURE HOT TOPICS***

# Dietary dairy product intake and incident on type 2 diabetes

Nita Forouhi, PhD

University of Cambridge School of Clinical Medicine, UK

With the unrelenting escalation in the global burden of type 2 diabetes and its related consequences, strategies for its prevention are urgently needed. Despite evidence that lifestyle interventions are effective in the primary prevention of diabetes, in day-to-day practice there is uncertainty on the specific dietary factors that relate to diabetes risk or the optimal dietary advice for individuals and populations. There is accumulating evidence that dairy products intake may be inversely associated with risk of type 2 diabetes, but limitations of research have included inconsistencies of findings, and lack of clarity on associations with dairy sub-types. We set out to address these research uncertainties using two distinct but complementary approaches.

Firstly, within the EU-funded InterAct project across 8 countries of Europe, we investigated the association of the consumption of the amount and type of dairy products, assessed using food frequency questionnaires, with the development of new-onset type 2 diabetes<sup>1</sup>. In a large nested case-cohort design based on cohorts from 26 European centres of the European Prospective Investigation into Cancer (EPIC) study, we ascertained 12,403 cases of type 2 diabetes and randomly selected 16,835 sub-cohort participants from a total cohort with nearly 4 million person years of follow-up. We found no significant association with total dairy products intake, but higher combined intake of fermented dairy products (cheese, yogurt, and thick fermented milk) was inversely associated with diabetes (hazard ratio 0.88; 95% CI: 0.78, 0.99; P-trend = 0.02) in adjusted analyses comparing extreme intake quintiles. In a second approach, we took advantage of the greater detail of information from a prospective 7-day food diary in a nested case-cohort design (892 type 2 diabetes cases; 4000 sub-cohort participants) in the UK-based EPIC Norfolk study<sup>2</sup>. We found that higher consumption of low-fat fermented dairy products was associated with a lower risk of new-onset diabetes over 11 years, compared with non-consumption. Low-fat fermented dairy products largely (87%) consisted of yoghurt but also included unripened cheese, such as fromage frais and low-fat cottage cheese, in a middle-aged population in the UK. Other types of dairy, and total dairy, were not significantly associated with type 2 diabetes risk.

While we try to understand mechanisms of association and investigate cause-effect relationships, our collective epidemiological findings suggest that specific types of dairy product may help prevent diabetes within overall healthy lifestyles. They also highlight the importance of considering food group subtypes, rather than overall food-group categories, when examining the role of diet in the prevention of chronic diseases.

## References

- Sluijs, I., Forouhi, N. G., Beulens, J. W., van der Schouw, Y. T., Agnoli, C., Arriola, L., et al. The amount and type of dairy product intake and incident type 2 diabetes: results from the EPIC-InterAct Study (2012) *The American Journal of Clinical Nutrition* 96, 382-390.
- O'Connor LM, Lentjes MA, Luben RN, Khaw KT, Wareham NJ, Forouhi NG. Dietary dairy product intake and incident type 2 diabetes: a prospective study using dietary data from a 7-day food diary (2014) *Diabetologia* Feb 8. [Epub ahead of print]

# Gut microbiota & health, what's new ?

Olivier Goulet, MD, PhD

Necker Hospital - enfants malades, Paris, France

**Microorganisms are introduced into the human gut early after birth.** The microbial composition of the microbiota varies with delivery methods, feeding (i.e., breast vs. bottle), infant care environment and antibiotic use. Post natal development of the human gut is largely influenced by the intestinal microbiota. Today, it is an increasing evidence that the early phases of microbiota implementation may influence the occurrence of later diseases. As for “metabolic programming”, one might consider nowadays, “**microbiological programming**”. Conventional culture techniques detect only a small number of the species of intestinal bacteria. During the last decade, the diversity of gut microbiota has been revealed by genetic or metagenomic studies. It has been clearly evidenced that microbes are represented by more than 1500 microbial species. The vast majority of microbial species give rise to symbiotic host-bacterial interactions that are fundamental for human health.

**Obesity has become one of the most prevalent health issues** of our time with over 1.5 billion overweight adults in the world and, of these, approximately 500 million are clinically obese. As a matter of fact, more deaths are caused worldwide by excessive weight than those caused by being underweight. Obesity is a multifactorial condition but it can be most simply described as being the result of a long-term imbalance between energy intake and energy expenditure. While modern eating habits and ever increasingly sedentary lifestyles are contributory factors in this burden, the link between obesity and the composition and functionality of the microorganisms in the gut is nowadays pointed as a major factor.

**Metagenomic analysis and 16S ribosomal RNA gene sequencing**, have shown that Firmicutes, Bacteroidetes, Actinobacteria and Proteobacteria are the predominant bacterial phyla among the intestinal bacteria in adults. Changes in the composition of the diverse gut microbiota (dysbiosis) are associated with several clinical conditions, including obesity, autoimmune diseases, and allergy. Current research involve the comparison of gut microbiota of lean and obese animals, the metagenomic study of the gut microbiota of lean and obese humans, the impact of diet on the gut microbiota, and by manipulating the gut microbiota to understand the mechanisms by which the gut microbiota might impact on body weight gain and adiposity.

**Recent studies indicated that obesity and diet could be associated with altered gut microbiota** characterized by a high Firmicutes to Bacteroidetes ratio and a dramatic fall in overall microbial diversity. The altered gut microbiota could, in turn, alter the host metabolic potential. Therefore, the gut microbiota might contribute to obesity through increases in the harvest of energy from diet, gut permeability, and fat deposition in adipose tissue and the liver.

**According to these recent advances, modulation of gut microbiota** has been suggested as a treatment for obesity, using fermented dairy products, probiotics, or prebiotics.

# Microbiota and Gut-Brain Axis (1/2)

John Bienenstock, MD

McMaster University, Canada

Advances in technology have brought about a revolution in microbiology. The gut microbiome alone contains at least 100 times the genome of the host. It can now be a legitimate question as to whether we or the microbiome are the hosts. It is certainly becoming clear that the microbiome has a major role to play in the physiological homeostasis of the gut and the various systems it contains, including epithelial and immune function and metabolic and endocrinologic activities. Most recently attention has been drawn to the role of the normal gut microbiome in determining the development and function of both the enteric and central nervous systems. The rapidly accumulating experimental evidence points to the possibility that gut microbes and their products including those of fermentation, play a significant role in these changes. Ingestion of communities of bacteria and even specific bacteria such as certain bifidobacteria or lactobacilli have now been shown to attenuate stress responses of the HPA axis, and even reduce anxiety-like behavior. Most recently the gut-brain axis has been implicated in preventing behavioral changes associated with autistic behavior in an experimental model. The signals responsible for communication between bacteria in the lumen of the gut and the brain are just beginning to be understood. For example, vagotomy has been shown to abrogate many of these effects. Some of the pathways responsible for transduction of these signals are becoming a focus of research and range from the production of neuroactive gases such as carbon monoxide, nitric oxide and hydrogen sulfide, neurotransmitters such as GABA, bacterial membrane components such as exopolysaccharides and products of fermentation such as butyrate. These experimental results are only just starting to be applied to the clinical situation and early experimental data, while showing great promise, have yet to be confirmed.

# Microbiota and Gut-Brain Axis (2/2)

## References

- Benton D., Williams C., and Brown A. Impact of consuming a milk drink containing a probiotic on mood and cognition. 2007. *Eur. J. Clin Nutr* 61, 355-361.
- Bercik P. The microbiota-gut-brain axis: learning from intestinal bacteria? 2011. *Gut* 60, 288-289.
- Bercik P. et al. The intestinal microbiota affect central levels of brain-derived neurotropic factor and behavior in mice. 2011. *Gastroenterology* 141, 599-609, 609 e591-593.
- Bravo J.A. et al. Ingestion of *Lactobacillus* strain regulates emotional behavior and central GABA receptor expression in a mouse via the vagus nerve. 2011. *Proc Natl Acad Sci USA* 108, 16050-16055.
- Collins S.M., Surette M., and Bercik P. The interplay between the intestinal microbiota and the brain. 2012. *Nat Rev Microbiol*.
- Cryan J.F., Dinan T.G. Mind-altering microorganisms: the impact of the gut microbiota on brain and behaviour. 2012. *Nat Rev Neurosci* 13, 701-712.
- Forsythe P., Kunze W. Voices from within: gut microbes and the CNS. 2013. *Cell Mol Life Sci* 70, 55-69.
- Hsiao E.Y. et al. Microbiota modulate behavioral and physiological abnormalities associated with neurodevelopmental disorders. 2013. *Cell* 155, 1451-1463.
- Lyte M. Microbial endocrinology in the microbiome-gut-brain axis: how bacterial production and utilization of neurochemicals influence behavior. 2013. *PLoS Pathog* 9, e1003726.
- Mao Y.K. et al. *Bacteroides fragilis* polysaccharide A is necessary and sufficient for acute activation of intestinal sensory neurons. 2013. *Nat Commun* 4, 1465.
- Mayer, E.A. Gut feelings: the emerging biology of gut-brain communication. 2011. *Nat Rev Neurosci* 12, 453-466.
- Messaoudi M., et al. Assessment of psychotropic-like properties of a probiotic formulation (*Lactobacillus helveticus* R0052 and *Bifidobacterium longum* R0175) in rats and human subjects. 2011. *The British journal of nutrition* 105, 755-764.
- Perez-Burgos A. et al. Psychoactive bacteria *Lactobacillus rhamnosus* (JB-1) elicits rapid frequency facilitation in vagal afferents. 2013. *Am J Physiol Gastrointest Liver Physiol* 304, G211-220.
- Rao A.V. et al. A randomized, double-blind, placebo-controlled pilot study of a probiotic in emotional symptoms of chronic fatigue syndrome. 2009. *Gut Pathog* 1, 6.
- Schroeder F.A. et al. Antidepressant-like effects of the histone deacetylase inhibitor, sodium butyrate, in the mouse. 2007. *Biological psychiatry* 62, 55-64.
- Sudo N. et al. Postnatal microbial colonization programs the hypothalamic-pituitary-adrenal system for stress response in mice. 2004. *The Journal of physiology* 558, 263-275.
- Tillisch K. et al. Consumption of fermented milk product with probiotic modulates brain activity. 2013. *Gastroenterology* 144, 1394-1401

# How cows convert human-inedible feed into nutrient rich milk

Toon Van Hooijdonk

Wageningen University, The Netherlands

Supplying a growing population with sufficient food is one of the world's major challenges and protein will be the decisive macronutrient with respect to the constraints of limiting resources and reduced emissions (1). Evaluating the position of dairy in a diet should both take the nutritional and environmental impact into account. Dairy products such as yoghurt are nutrient rich and an important food group to assure nutrient security for the future. Even quite small amounts of animal products in the diet improve the nutritional status of low-income households (2). Meta-analyses have shown that the consumption of dairy may reduce the risk of chronic diseases and thereby reduce the cost of health care (3;4;5). Due to population growth and the continues rise of income the FAO (6) estimated that the demand for milk will grow from the current 700 to over 1000 billion kg in 2050. Effective strategies are needed to mitigate the greenhouse gas emissions and to improve resource efficiency of the dairy chain. Increasing the productivity of a dairy cow will improve the feed (energy and protein) efficiency and reduce the connected greenhouse gas emissions (7;8). Local conditions are important and in many parts of the world the cow is an efficient converter of human-inedible resources in a nutrient dense food containing essential micro-nutrients and proteins of the highest quality. The ration of a dairy cow consist for the major part of resources humans cannot or do not consume and ruminants therefor do not directly compete with the human food chain (9). Although, the overall energy and protein efficiency of a dairy cow may not be higher than 25%, the return on the human-edible part may be more than 400%, as is the case in the Dutch situation (10). In addition, the cow converts lower-quality proteins, such as grain and soy protein, into proteins of the highest quality.

## References

1. FAO (2013) Dietary protein quality evaluation in human nutrition.
2. FAO (2011) World Livestock 2011, Livestock in food security.
3. Moore LL, Bradlee ML, Singer MR, Qureshi MM, Buendia JR, Daniels SR (2012) Dietary Approaches to Stop Hypertension (DASH) eating pattern and risk of elevated blood pressure in adolescent girls. *Br J Nutr.* 108(9):1678-85.
4. Elwood PC, Pickering JE, Givens DI, Gallacher JE (2010). The consumption of milk and dairy foods and the incidence of vascular disease and diabetes: an overview of the evidence. *Lipids* 45:925-939.
5. McCarron DA, Heaney RP (2004) Estimated healthcare savings associated with adequate dairy food intake. *Am J Hypertens.* 17(1):88-97.
6. FAO (2012) World Agriculture Towards 2030/2050, The 2012 Revision
7. Thomas, C. (2004). Feed into milk: a new applied feeding system for dairy cows. Nottingham University Press, Nottingham, UK.
8. Gerber, P.J., Vellinga, T.V., Opio, C. and Steinfeld, H. (2011). Productivity gains and greenhouse gas emissions intensity in dairy systems. *Animal Feed Science and technology* 139, 100-108.
9. CAST (1999) Animal Agriculture and Global Food Supply. Task force report, no. 135. Council for Agricultural Science and Technology, Ames, Iowa, USA
10. Dijkstra J, France J, Ellis JL, Strathe AB, Kebreab E, Bannink A (2013) Production efficiency of ruminants: feed, nitrogen and methane. In: Kebreab, E. (editor), Sustainable animal agriculture. CAB International, Wallingford, UK.

# Biographies



## Sharon DONOVAN, PhD

University of Illinois at Urbana-Champaign, IL,  
USA

*Co-Chair*

Sharon Donovan received her B.S. and Ph.D. in Nutrition from the University of California, Davis. After completing a post-doctoral fellowship in Pediatric Endocrinology at Stanford University School of Medicine, she accepted a faculty position at the University of Illinois, Urbana in 1991. She was promoted to Professor in 2001 and, in 2003, was named the first recipient of the Melissa M. Noel Endowed Chair in Nutrition and Health at the University of Illinois. She served as Director of the Division of Nutritional Sciences Interdisciplinary Graduate Program from 1999-2009. She is actively involved in her professional societies and currently serves as the Presidency of the American Society for Nutrition (2011-2012).

Her research focuses on pediatric nutrition, with an emphasis on optimization of neonatal intestinal development. She compares the biological effects of human milk and infant formulas on intestinal function in human infants, neonatal piglets and in various models of intestinal disease.

She has published over 100 peer-reviewed publications, review articles and conference proceedings. She has garnered ~ \$20M in research funding as principal investigator or co-Investigator and her research is funded by NIH, USDA and private industry and foundations. She the recipient of several awards in recognition of her research, including the Mead Johnson Award and the Norman A. Kretchmer Award from the American Society for Nutrition.



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## Raanan SHAMIR, MD, PhD

Sackler Faculty of Medicine, Tel Aviv University  
Institute of Gastroenterology, Nutrition and Liver  
Diseases at Schneider Children's Medical Center of  
Israel

Co-Chair

Raanan Shamir is Professor of Pediatrics at the Sackler Faculty of Medicine, Tel Aviv University, and the Chairman of the Institute of Gastroenterology, Nutrition and Liver Diseases at Schneider Children's Medical Center of Israel.

Raanan Shamir received his MD degree in the Hebrew University in Jerusalem, Israel, and was trained in Pediatrics at the Beilinson Medical Center, in Petach-Tiqva, Israel. In the early 90's, he was a fellow at the Division of Pediatric Gastroenterology and Nutrition at The Children's Hospital of Philadelphia, and came back to Israel to be the Head of the Department of Nutrition at the Israel Ministry of health, and then held the position of Head of the Gastroenterology and Nutrition Unit at Meyer Children's Hospital in Haifa.

Prof. Shamir published more than 250 original papers, reviews and comments, book chapters and guidelines. His research has been supported by prestigious funds such as the European Community Framework funds and the Israel Science Foundation.

His current research areas include exploring the effects of oral insulin supplementation on the intestine, pediatric nutrition, celiac disease, inflammatory bowel disease and childhood hyperlipidemia.

Prof. Shamir serves as an Editor for the pediatric section of Current Opinion in Clinical Nutrition and Metabolism, is the Senior Associate Editor of the Journal of Pediatric Gastroenterology and Nutrition (JPGN), and serves as a reviewer for journals in the field of Pediatrics, Nutrition, Gastroenterology and atherosclerosis.

Past committee appointments include: President of the Israel Society for Pediatric Gastroenterology and Nutrition, Chairman of the Scientific Committee on Milk and Human Health at the Israel Ministry of Health, Chief Scientist Office, Member of the Committee on Nutrition, European Society of Pediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN CoN), 2004-2012, ESPGHAN Council member, 2005-2009, Council member of the Israel Pediatric Association, 2008-2012, Chairman of ESPGHAN CoN, 2008-2012.

Current committee appointments include being the, Chairman of the Governmental Supreme Committee on Food, Israel Ministries of Health, Agriculture, Commerce and Environment, Chairman of the Nutrition Committee of the Israel Pediatric Association, Member of the General Assembly, Upper Gastrointestinal Section, Scientific committee of the UEGF (United European Gastroenterology Federation), Member of the Scientific Committee, ESPEN (European Society for Clinical Nutrition and Metabolism) and President of the Israel Strauss Institute for Nutrition.



## Mauro FISBERG, MD, PhD

Federal University of Sao Paulo, Brasil

Born in Santos, São Paulo, Brazil, August 17<sup>th</sup>, 1953, married, one child.

### Pediatrician and nutrologist

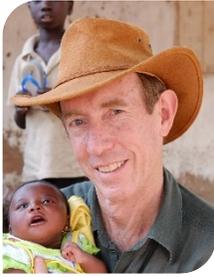
- Graduated in Medicine (Escola Paulista de Medicina - Federal University of Sao Paulo, 1976)
- Pediatrics Residence (Federal University of Sao Paulo - Brazil, 1978)
- Nutrition Specialization - World Hunger Program, United Nations University (1980) – Tokyo- Santiago.
- PhD in Pediatrics Nutrition (Federal University of Sao Paulo, 1987)
- Fellow Kellogg´s Fellowship in Human Development (Partners of the Americas 1992-1994)
- Past General Secretary and ex president (1998 – 2002), Latin American Society for Pediatric Research –SLAIP

### **Present situation:**

- Associate Professor and Clinical Coordinator of the Adolescent Service, Pediatrics Department, Escola Paulista de Medicina - Federal University of São Paulo-UNIFESP
- Director and Scientific Coordinator of the Task Force: Healthy Life Styles - ILSI (International Life Science Institute ) -Brasil
- Director Nutrition Institute- Sabara Infant Hospital
- Member of the Directory, Danone Institute International
- Editor and member of the editorial board of 2 international magazines and 9 national publications

### **Activities:**

- More than 400 papers presented in national and international congresses.
- More than 250 conferences in national events.
- 65 conferences and presentations in International events.
- More than 50 events organized in Pediatric and Nutrition , in Brazil
- 93 thesis published as Tutor and co-authorship
- 58 chapters in books as invited writer
- 6 books published for the scientific community and 3 books for lay people



## Andrew PRENTICE, PhD

MRC International Nutrition Group,  
London School of Hygiene & Tropical  
Medicine, UK

Andrew Prentice is Director of the MRC International Nutrition Group based at the London School of Hygiene & Tropical Medicine (LSHTM). He also directs the group's permanent field laboratory, MRC Keneba, in rural Gambia. The group is also active in Kenya, Tanzania and Bangladesh.

Born and bred in Uganda, he received a BSc in Biochemistry from Leeds and PhD in Nutrition from Cambridge University. Following 5 years of post-doctoral work in Keneba he returned to the UK to lead the Energy Regulation and Obesity Group at the MRC Dunn Clinical Nutrition Centre, Addenbrooke's Hospital. During this period he was involved in the development and exploitation of numerous novel technologies including stable isotope methods for assessing breastmilk intake and free-living energy expenditure ( $^2\text{H}_2^{18}\text{O}$ ), and whole-body calorimetry.

In 1999 he left Cambridge to establish his current research team at LSHTM and re-focus his attention exclusively on studying diet-disease relationships in low-income countries. The work of his research team is focused in 4 areas: nutritional modulation of immunity and infectious diseases; combating micronutrient deficiencies in poor populations; calcium, vitamin D and bone health; and nutritional genetics. The emphasis is on discovery science in response to a conviction that the development of more effective public health interventions is still greatly hampered by critical knowledge gaps.

Andrew has been a member of numerous national and international advisory committees on nutrition and is a former Vice-President of EASO and past Chair of the International Nutrition Council of the American Society for Nutrition (ASN). His work has been recognised by a number of awards, most recently the EV McCollum International Award 2010/11 from ASN. He has published over 300 peer-reviewed papers



## Luis MORENO, PhD

Public Health, University of Zaragoza, Spain

Luis A. Moreno is Professor of Public Health at the University of Zaragoza (Spain). He is also Visiting Professor of Excellence at the University of Sao Paulo (Brazil). He did his training as Medical Doctor and his PhD thesis at the University of Zaragoza. He studied Human Nutrition and Public and Community Health at the University of Nancy (France).

He has participated in several research projects supported by the Spanish Ministry of Health, and the European commission (HELENA, IDEFICS, EURRECCA, ENERGY, ToyBox and iFamily).

He has published more than 250 papers in peer reviewed journals. He is a former member of the ESPGHAN Committee of Nutrition.



**Angelo TREMBLAY, PhD**  
Department of Kinesiology, Laval University,  
Quebec City, Canada

Angelo Tremblay is currently professor at the Department of Kinesiology at Laval University, Quebec City, from where he obtained his undergraduate (BSc in Education) and postgraduate degrees (MSc in Nutrition and PhD in Physiology) between 1974 and 1982.

Dr. Tremblay's department has an international reputation in obesity research and his own particular interests are focused primarily on the environmental determinants of obesity in humans. He has published over 550 scientific papers. He is holder of the Canada Research Chair in Environment and Energy Balance



## Barbara J. ROLLS, PhD

Helen A. Guthrie Chair of Nutritional Sciences  
The Pennsylvania State University, University  
Park, PA, USA

Barbara J. Rolls, PhD is a graduate of the University of Pennsylvania, and received her PhD in physiology from the University of Cambridge, England. After spending her early research career at the University of Oxford, England, Dr. Rolls joined the faculty of the Johns Hopkins University School of Medicine as Professor of Psychiatry. In 1992, she became a faculty member at The Pennsylvania State University where she is Professor and the Helen A. Guthrie Chair of Nutritional Sciences.

Dr. Rolls' research includes characterization of mechanisms that control thirst as well as studies of hunger, satiety, and obesity. Her studies that received a MERIT award from the National Institute of Diabetes and Digestive and Kidney Diseases have demonstrated how characteristics of foods such as variety, energy density, and portion size can influence energy intake across the lifespan.

Her more than 250 research articles have been published in outstanding journals such as *The American Journal of Clinical Nutrition*, *The Journal of Nutrition*, *The New England Journal of Medicine*, *Appetite*, and *Obesity*. She has communicated to the public through the media and her six books including *Thirst*, *The Volumetrics Weight-Control Plan*, *The Volumetrics Eating Plan*, and *The Ultimate Volumetrics Diet*.

Dr. Rolls has served as President of both the Society for the Study of Ingestive Behavior and The Obesity Society. She has also served on the Advisory Council of NIDDK and on the National Task Force on the Prevention and Treatment of Obesity.

Her awards include: Honorary Member of the Academy of Nutrition and Dietetics, Fellow of the American Association for the Advancement of Science, International Award for Modern Nutrition, Atwater Lecturer, ASN Centrum Award in Human Nutrition, The Obesity Society's George A. Bray Founders Award and ASN's Fellows Class of 2011.



**Robert R. WOLFE, PhD**  
University of Arkansas for Medical Sciences,  
Little Rock, AR, USA

Robert R. Wolfe graduated from the University of California, Berkeley in 1969, and received his PhD from the University of California, Santa Barbara, in 1974. After a post-doctoral fellowship at the Louisiana St. U Medical School, Dr. Wolfe joined the faculty at Harvard Medical School in 1976 and remained there until 1983, when he became Professor and Chief of the Metabolism Unit at the University of Texas Medical Branch and Shriners Hospital for Crippled Children in Galveston, Texas. He held the Distinguished Chair in Clinical Research at UTMB from 2003-2006, when he moved to the University of Arkansas for Medical Sciences. Dr. Wolfe is currently the Wormack Chair in Nutritional Longevity, Professor of Geriatrics, and Director, Center for Translational Research in Aging and Longevity at UAMS.

Dr. Wolfe has performed pioneering research in human metabolism using stable isotope tracers. He has published more than 450 peer-reviewed papers that have been cited more than 13,000 times since 1995. In addition, Dr. Wolfe has authored more than 150 reviews and text chapters, as well three books on stable isotope tracer methodology that are widely considered to be the standard in the field. Dr. Wolfe's research has been funded by the National Institutes of Health continuously since 1975. The major focus of Dr. Wolfe's research has been the metabolic basis for specialized nutritional therapy of specific medical problems. He holds patents for nutritional products aimed at nutritional therapy in aging, cardiovascular disease, and cancer.



## René RIZZOLI, MD, PhD

University Hospital of Geneva, Switzerland

Dr. René Rizzoli is an internist and endocrinologist, with a subspecialty focus on metabolic bone diseases, osteoporosis and disorders of mineral metabolism. He is presently professor of medicine at the University Hospital of Geneva, head of the service of bone diseases.

Dr. Rizzoli is the former chairman of the Committee of Scientific Advisors of the International Osteoporosis Foundation. He is the chairman of the Scientific Advisory Board of the European Society for Clinical and Economic Aspects of Osteoporosis and Osteoarthritis, and co-chairing the scientific program committee of the annual IOF-ESCEO congress. He is involved in both basic and clinical research projects investigating hormone action, regulation of bone growth, pathophysiology of osteoporosis and of calcium and phosphate homeostasis disorders, and the role of nutrition, calcium, protein, bisphosphonates, selective estrogen modulators, parathyroid hormone, denosumab and strontium ranelate in the prevention and treatment of osteoporosis.

Dr. Rizzoli is author of more than 600 scientific articles, editor-in-chief of *Calcified Tissue International and Musculoskeletal Research* and associate editor of *Osteoporosis International*.



## Nita FOROUHI, PhD

MRC Epidemiology Unit, University of  
Cambridge School of Clinical Medicine, UK

Nita Forouhi, MBBS, MRCP, MSc, PhD, FFFHM, is the Program Leader of the Nutritional Epidemiology Group of the Medical Research Council (MRC) Epidemiology Unit, University of Cambridge. Nita is a Clinician Scientist and a Public Health Physician, having trained in Medicine in the UK in Newcastle and Edinburgh, in Clinical Epidemiology as a Wellcome Clinical Training Fellow at the London School of Hygiene & Tropical Medicine, and in Public Health Medicine in London and Cambridge. Nita leads a program of research that aims to understand the association between diet/nutrition and the risk of diabetes, obesity and related disorders. Her research has a particular focus on using improved methods to assess diet, including nutritional biomarkers, and she is interested in causal inference in nutritional epidemiology. She also contributes to research in dietary public health to understand the determinants of dietary behavior. Nita has worked towards making exposure assessment methods more readily available to researchers through online toolkits. She is also interested in between-population differences in behaviors and outcomes. She has worked on several large cohorts, and has worked with national and international collaborators on understanding the etiology of diabetes. She is well published, and enjoys teaching and training medical students, postgraduates and Public Health trainees, as well as having organized WHO/IDF/EASD international training seminars for increasing understanding of the epidemiological and public health aspects of diabetes. Nita is a member of the Diabetes UK Research Committee, member of the IDF (International Diabetes Federation) Diabetes Atlas Committee, has been adviser to the National Institute of Health and Clinical Excellence, and in addition to providing peer review for several scientific journals, she is also an Associate Editor for Diabetic Medicine.



# Olivier GOULET, MD, PhD

Hospital Necker-Enfants Malades, Paris,  
France

Professor of Pediatrics  
Pediatric Gastroenterology-Hepatology and Nutrition

## Hospital and University positions

- 1984-85 : Research Fellow in Gastroenterology and Nutrition at UCLA
- 1985-89 : Senior Registrar, Necker-Enfants Malades University Hospital
- Since 1995 : Professor of Pediatrics : University of Paris V – René Descartes
- Co-Chairman of the program of Intestinal and Liver Transplantation at Necker-Enfants Malades University Hospital *from 1995*
- Member of the Medical Council of the Hospital Necker-Enfants-Malades: 1998-2011
- Assistant of the Dean of the Necker University of Paris Descartes Medical School: 2000-2004
- Member of the Council of the Necker University of Paris Descartes Medical School: 2000-2004
- Chairman of the Pediatric Federation of the Hospital Necker-Enfants-Malades 2004-2007
- Chairman of the National Reference Center for Rare Digestive Diseases at Necker-Enfants Malades University Hospital *from 2004*
- Chairman of the European Master of Clinical Nutrition University Paris Descartes *from 2005*
- Chairman of the Department of Pediatric Gastroenterology, Hepatology and Nutrition at Necker-Enfants Malades University of Paris Descartes Hospital *from 2006*
- Member of the Council of the University of Paris Descartes Medical School: 2008-2012

## Functions in Scientific Societies

- Member of the Council of the *European Society of Pediatric Gastroenterology, Hepatology and Nutrition* (ESPGHAN) (1997-2004)
- Chairman of the Host Executive Committee of the 2° *World Congress of Pediatric Gastroenterology, Hepatology and Nutrition* Paris (2000-2004)
- Member of the Council of the French Society of Pediatrics 2005 - 2009
- Member of the Committee of Nutrition of the French Society of Pediatrics *from 1995*
- Member of the Committee of Nutrition of ESPGHAN *from 1999-2008*
- Member of the Council of Federation of International Society of Pediatric Gastroenterology, Hepatology and Nutrition (FISPGHAN) *from 2000*

## Editorial activities

- Over 120 book and Text book chapters
- 296 papers referenced in Pub Med data base

## Main interests and research activities

- **Immuno-pathology of the GI-tract** (IPEX, inflammatory bowel diseases and intestinal transplantation) in collaboration with the pathology department (Pr N.Brousse), INSERM U795 group chaired by Dr N.Cerf-Bensussan, University of Paris Descartes
- **Genetic and cell biology approach of congenital disease of the intestinal epithelium development** in collaboration with the pathology department (Pr N. Brousse), INSERM U781 Human Genetic group chaired by Pr S. Lyonnet, and, for cell biology, CNRS UMR7592, Institut Jacques Monod Paris Diderot University chaired by Françoise Poirier,.
- **Clinical Nutrition**



## John BIENENSTOCK, MD

Distinguished University Professor, McMaster University, Canada

Dr. John Bienenstock is internationally known as a physician and mucosal immunologist. He trained at King's College, London and Westminster Hospital, London, U.K. He holds the title of Distinguished University Professor at McMaster University, an Honorary MD (Goteborg, Sweden), is a Fellow of the Royal Society of Canada and a Member of the Order of Canada and was a recent inductee into The Canadian Medical Hall of Fame. He is the Founding Director of the McMaster Brain-Body Institute at St. Joseph's Healthcare Hamilton, a former Chair of Pathology and subsequently Dean and Vice-President of the Faculty of Health Sciences, McMaster University.

He has served as the President of the Canadian Society of Immunology, the Society of Mucosal Immunology and the Collegium Internationale Allergologicum. He has published more than 500 peer reviewed articles and other publications and has an H factor of 72. He has authored, edited and co-edited 8 books on mucosal immunology and allergy. He has supervised some 60 post doctoral fellows and 10 doctoral students. His current main areas of interest are: mechanisms of action of commensal bacteria on the nervous system and behaviour and in various models of inflammation.



## Toon VAN HOOIJDONK

Agrotechnology & Food Sciences, Wageningen University, The Netherlands

Since 2007 professor Toon van Hooijdonk holds the chair Dairy Science & Technology at Wageningen University. His research program is focused on milk composition in relation to human nutrition, sustainability and sensory.

Until 2012 Toon combined his part time professorship with the position of Global R&D Director at FrieslandCampina. Prior to that he worked for Unilever Research in the UK and for NIZO Food Research and Campina in the Netherlands

Professor Toon van Hooijdonk has always been active in a number of organizations supporting directly or indirectly the interests of the dairy sector. He has been in the boards of the Global Dairy Platform, the Food Valley Foundation and the Top Institute Food & Nutrition.



## Chris J. Cifelli, PhD

Nutrition Research, Dairy Research Institute

Christopher J. Cifelli, PhD currently serves as a Director of Nutrition Research at the Dairy Research Institute.

In this position, Dr. Cifelli directs dairy-centric research in two platforms, the Cardiometabolic Health platform, as well as the Digestive Health platform. In his role, Dr. Cifelli is responsible for the strategic planning, development, and management of both research programs as well as working to effectively communicate research findings to both internal and external scientific and lay audiences.

Dr. Cifelli obtained both his BS degree in Biology and his PhD degree in Nutritional Sciences from the Pennsylvania State University, where his graduate work focused on understanding how vitamin A status and inflammation affected retinoic acid metabolism. Additionally, mathematical modeling was utilized to study the effects of retinoic acid supplementation on whole-body vitamin A kinetics. During his post-doctorate work at Penn State, he examined vitamin A kinetics, storage and disposal rates in adults from different ethnic backgrounds. In his current role at the National Dairy Council, Dr. Cifelli is involved in the development, design, initiation, management and communication of research projects on the health benefits associated with adequate dairy consumption, including those studies examining the effects of vitamins and minerals found in dairy on bone density, weight maintenance, and metabolic health.

Dr. Cifelli has authored or co-authored more than 20 peer-reviewed research manuscripts, reviews and abstracts and he is an active member of numerous scientific organizations, including the American Society for Nutrition and the Obesity Society.



## Frans KOK, PhD

Division of Human Nutrition, Wageningen University, The Netherlands

Frans Kok (1950) is professor in Nutrition & Health and director of the Division of Human Nutrition at Wageningen University, The Netherlands. Kok was trained in human nutrition in Wageningen and epidemiology at Harvard University, Boston USA.

Kok's scientific research covers topics such as diet in disease prevention, dietary behavior, and overweight. In emerging economies in Asia and Africa attention is on diet and deficiency disorders. He is author of some 300 scientific publications (H-index = 54), and was promoter of 65 PhD graduates. Frans Kok is editor of three nutrition textbooks.

From 2006-2010 he acted as dean of Wageningen graduate schools being responsible for the quality of academic research and postdoctoral training. He has been member of the Academic Board of Wageningen University for more than 10 years.

Kok is member of several (inter)national scientific committees. He chaired the Dutch National Health Council committee responsible for the 2006 Dietary Guidelines for the Netherlands.

Kok presents and lectures on nutrition and health topics at many (popular)scientific (inter)national symposia, masterclasses, and the media.



## Ellie KRIEGER

Best known as the host of the Food Network's hit show "Healthy Appetite," Ellie's warmth and charisma have made her the leading go-to nutritionist in the media today. Krieger's success can be attributed to her unique way of offering real life advice without any of the gimmicks and crash diets that permeate the media today. She reaches people with her message that it is possible for anyone, given the tools and knowledge, to live life to the maximum by keeping a healthy balance and nurturing a richly satisfying and sumptuous, *attainable* lifestyle.

A registered dietitian, Ellie has a master's degree in nutrition from Teacher's College, Columbia University and completed her undergraduate degree at Cornell University. Ellie was an adjunct professor at New York University in the Department of Nutrition, Food Studies, and Public Health. In her years in private practice, she counseled a variety of clients, from homemakers and CEOs to notable celebrities.

Ellie has been at the forefront of First Lady Michelle Obama's "Let's Move" campaign from the beginning when Mrs. Obama's team personally invited her head up a nutrition education initiative at the "Healthy Kids Fair" at the White House in 2010. Ellie prepared a colorful array of fresh fruits and vegetables in the White House kitchen and challenged dozens of children from the community to "eat the rainbow" in produce every day; a simple and easy way to engage children in a healthier lifestyle. Ellie also participated in harvesting the White House garden with a group of school children as part of the Chef's Move to Schools launch. She has teamed up with New York City SchoolFood where she created healthy, delicious menu items for students citywide. And she works at a grass roots level with her daughter's New York City public school, having formed the Wellness Committee there. The school was recently awarded the Healthier US School Challenge award, the first and only in New York City to receive it. In 2010 on behalf of the Food Network, Ellie testified before the House Committee on Agriculture about nutrition, healthy eating and the growing epidemic of childhood obesity. Ellie has also teamed up with hunger organizations such as Feeding America, Share Our Strength and City Harvest to help all people have access to good, healthy food.

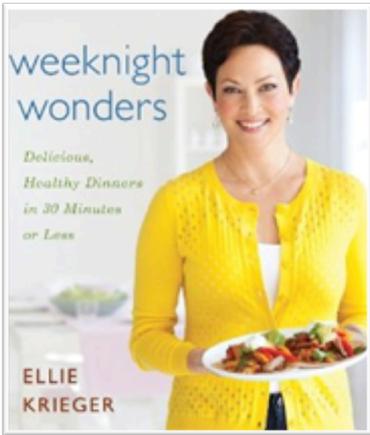
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Foundation



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**IN**  
**NUTRITION**

**INITIATIVE FOR A BALANCED DIET**