"UNHEALTH PROHIBITED"

REDDUCING: Processed foods, Postprandial inflammation,
Perinatal inflammation towards "Paleo-like"?

www.synbiotics.se
www.bengmark.com
stig@bengmark.se

SYNBIOTICS
LIFE-SAVING PRE-, PRO- AND SYNBIOTICS
DIFFERENT TIME/LIFESTYLE – DIFFERENT DISEASE PATTERN

DISEASES

THIRD MILLENIUM

DRAMATIC increase in incidence in recent 27 years (1990 – 2017) USA

Lear R. The Root Cause in the dramatic rise of Chronic Disease

https://app.box.com/s/iyjuzrxtkx3gpblu4vmt0wjrgsxykuzc
PROGNOSIS ALZHEIMER USA – 2050

Hebert LE et al  Arch Neurol 2003;60:1119-1122
DISCRETE PERSISTANT CHRONIC INFLAMMATION
- THE MOTHER OF DISEASE

Bengmark S. J Clin Nutr 2004;23:1256-1266

REVIEW

Acute and "chronic" phase reaction—a mother of disease

Stig Bengmark

Department of Surgery and Liver Institute, UCL, London, UK

Received 23 July 2004

KEYWORDS
Acute phase response; Chronic phase

Summary The world is increasingly threatened by a global epidemic of chronic diseases. Almost half of the global morbidity and almost two thirds of global mortality is due to these diseases—approximately 35 million die each year from chronic diseases. And they continue to increase. Increasing evidence suggest that these diseases are associated with lifestyle, stress, lack of physical exercise, poor...
Available at http://bengmark.com/research-articles/

**64.1 A Dramatic Increase in Incidence of Chronic Diseases**

The burden of chronic diseases is steadily increasing all around the world and is forecasted to continue to do so for at least another 50 years. While the increase in chronic diseases in Western countries, although accelerating in the last 50 years, had been ongoing for more than 100 years, it is mainly in the period after the last world war that more pronounced increases in incidences of chronic diseases have occurred, especially outside the Western hemisphere. Pronounced increases are, for example, reported from Japan from the period of the first 50 years after the last world war (1948–1998) – dramatic increases in incidences of diseases such as breast, ovarian, prostatic, and testicular, much in parallel to the Japanese population adapting Western food habits, to a large extent complementing or eventually also replacing traditional horticultural and aqua-cultural foods with processed Western-type agricultural foods. During these 50 years, for example, prostatic cancer in Japan increased by no less than 25 times, much in parallel to an increase in intake of egg 7 times, meat 11 times, and dairy products 20 times [1,2]. Similar, although slightly delayed, developments are also reported both from other continents and from neighboring Asian countries to Japan [3]. Seemingly this epidemic dominated by obesity and associated diseases has its epicenter in the southern United States, with states such as Alabama, Louisiana, and Mississippi having the highest incidence of obesity and chronic diseases in the United States.
Dietary AGEs and Their Role in Health and Disease

By Jaime Uribarri

Available at http://bengmark.com/research-articles/

Dietary Intake of AGEs and ALEs and Inflammation—Nutritional Aspects

Stig Bengmark
University College London
London, United Kingdom

CONTENTS
26.1 Western Life Style and Food Habits—A Real Threat to Health .............................................. 310
26.2 Inflammation—Early Warnings ................................................................................................. 310
26.3 Without Lifestyle Changes—Worse Is to Come ........................................................................ 311
26.4 Easy Access of Food and High Consumption of Processed Foods Is the Problem ................. 311
26.5 Developing Countries Soon to Take Over the “Yellow Jersey” ................................................. 311
26.6 Incidence of Obesity and Chronic Disease Increases with Unprecedented Speed .............. 312
26.7 The Interval between Change of Lifestyle and Signs of Ill Health Is Shorter than Ever Before ................................................ 312
26.8 Postprandial Inflammation: A “Deadly” Threat to Long-Term Health .................................... 313
26.9 Abdominal/Visceral Obesity Enhances Postprandial Inflammation ....................................... 314
26.10 Postprandial Inflammation Induced by Long-Chain but Not Medium-Chain Fatty Acids 314
26.11 Reduced Intake of LCFA and Increased Intake of MCFAs Are Good for Microbiota and Health .................................................................................................................. 315
26.12 Intake of Animal-Based Foods Induces Dysbosis and Inflammation within 24 Hours 315
26.13 No AGE-Preventing Drug Available—But Lifestyle Changes Are Very Effective 316
26.14 AGE-Reducing Fasting Habits ................................................................................................ 316
26.15 Reduction in Intake of Protein, Especially Sulfur-Containing, Is also of Importance for Health .......................................................... 316
26.16 Antioxidants and Vitamins ...................................................................................................... 317
26.17 Turmeric with its Curcuminoids: Strong Inhibitors of Inflammatory Genes Such as COX-2—“The World’s Healthiest Food” ............................................................................. 317
26.18 Curcuminoid Treatment—Strong Clinical Effects ................................................................. 318
26.19 Probiotics, Especially When Combined with Plant Fibers (Symbiotics), Are Effective to Eliminate Poisonous Substances ................................................................. 320
26.20 First Ever Trial with Symbiotic Treatment in Chronic Renal Disease Published in 2011 .... 321
26.21 Rest, Recuperation, Cleansing, Detoxification—Important to Reduce Poisonous Substances and Maintain Health .......................................................... 322
26.22 Paleolithic Lifestyle Stimulates a Robust Circadian Rhythm and a Healthy and Long-Lasting Life ................................................................................................. 322

References ....................................................................................................................................... 322

KEY POINTS
- Chronic, silent, often low-grade, inflammation is associated with almost all lifestyle-associated chronic diseases.
- The degree of inflammation is enforced by postprandial inflammation induced by certain foods.
UNDERSTANDING INFLAMMATION
= UNDERSTANDING DISEASE
  - Perinatal
  - Postprandial etc
= UNDERSTANDING INNATE IMMUNITY

Inflammation - the Mother of Disease!
IMMUNOPARESIS & IMMUNOSCENENCE
DISEASE & AGING means:

○ Loss of optimal molecular fidelity
○ Shrinkage of T cell repertoire
○ Involution of thymus
○ Exhaustion of naive T cells
○ Chronic inflammatory status
MALFUNCTIONING INNATE IMMUNITY

- Reduced number & function of monocytes and macrophages
- Reduced expression of Toll-like receptors
- Impaired production of several cytokines
- Macrophages and neutrophils demonstrate reduced efficacy: impaired respiratory burst, reactive nitrogen intermediate production & decreased ability to destroy pathogens.
- Dendritic cells are less efficient to activate both T and B cell
- Natural killer (NK) cells show decreased killing ability

DISEASE & PREMATURE AGING
A striking local preponderence (70-90 %) of IgA immunocytes in the gut: plasma cells, plasma blasts.

The gut content is constantly tested by recognition cells such as dentritic cells (DC) &

Programming/tuning the immune system.

Each DC commands about 1200 T-cells.

DYSBIOSIS LEAKY GUT &

INDUCING INFLAMMATION

FACILITATING INFLAMMATION, INFECTION & DISEASE
THE DENDRITIC CELL IN ACTION

Kraehenbuhl JP, Corbett M. Science 2004;303:1624-1625
The frequency with which doctors prescribe antibiotics varies greatly from state to state. The reasons for this variation are being studied and might suggest areas where improvements in antibiotic prescribing (fewer unnecessary prescriptions) would be most helpful.

Dysbiosis = malfunctioning intestinal flora (microbiota)

Highest number of PRESCRIPTIONS

Louisiana Mississippi, Alabama, Arkansas, Tennessee, Indiana, West Virginia
METABOLIC SYNDROME - A GLOBAL TZUNAMI
- strongly associated to modern agriculture & mass-produced cheap processed foods

EPICENTRE: Louisiana Mississippi, Alabama, Arkansas, Tennessee, Indiana, West Virginia

Soon to lead "the league of unhealth"
SIX DANGEROUS METABOLIC MANIFESTATIONS
OFTEN OCCURING IN THE SAME CHRONICALLY ILL PERSONS

Today strongly associated with consumption of "Western-type" foods

Suggested in 1923 by Eskil Kylin, Eksjö, Jönköping and Stockholm.

_abdominal obesity
_ high blood pressure
_ elevated blood sugar
_ elevated blood triglycerides
_ low blood HDL cholesterols
_ fatty liver & fat-infiltrated skeletal muscles
_ high blood uric acid
THE QUARTET OF DEATH

Excessive body weight
Hypertension
Impaired glucose homeostasis
Atherogenic dyslipidemia
GLOBAL STROKE INCIDENCE

METABOLIC SYNDROME & DYSBIOSIS


High fat/sugar, low fibre diet causes an imbalance between “good” and “bad” gut bacteria

Dysbiosis of colonic microbiota mucous production and epithelial integrity—resulting in a “leaky gut”

NORMAL GUT FUNCTION

“LEAKY GUT”

Normal tight junction function and mucous barrier preventing the trans-epithelial passage LPS

Macrophages activated by bacterial LPS that passes through gut wall

Polycystic morphology on ultrasound

Acne/ hirsuitism

Insulin resistance

Insulin drives Testosterone Production in ovary, while impairing follicle development

Insulin drives Testosterone Production in ovary, while impairing follicle development

Polycystic Ovary Syndrome

Impaired ovulation

Obesity alters gut microbiota

Obesity directly increases gut permeability

Gut inflammation initiated State of Insulin resistance
”Never has blood-borne, Gram-negative bacterial endotoxin (LPS) been invoked in the pathogenesis of so many diseases—not only as a trigger for septic shock, once its most cited role, but also as a contributor to atherosclerosis, obesity, chronic fatigue, metabolic syndrome, and many other conditions.”
ENDOTOXIN - THE VILLAIN & ASSOCIATED DISEASES:

- **Cognitive impairment** Lee JW et al. J Neuroinflammation 2008; 5: 37
- **Arterio-/Coronary Diseases** Heo SK et al Immunol Lett 2008;120:57-64
- **Diabetes type 1** Nymark M et al Diabetes Care 2009 32(9): 1689–1693
- **Diabetes type 2** Andreasen AS Intensive Care Med. 2010;36:1548-1555
- **Chronic Liver diseases** Nolan JP Hepatology 2010;52:1829-1835.

ADHD, allergy, ALS, autism, autoimmune diseases, bipolar disease, cataracts, chronic fatigue, syndrome, chronic kidney disease, chronic lung disease - COPD, fibromyalgia, glaucoma, gulf war syndrome, HIV, iritis, macular degeneration, minimal encephalopathy, multiple sclerosis, nephropathies, obesity, osteoporosis, paradontosis, Parkinson, polycystic ovary syndrome, rheumatoid disease, stress, schizophrenia, stroke, uveitis, etc
DYSBIOSIS-INDUCED METABOLIC DISORDERS

Cani PD et al Diabetes 2008;57:1470-1481

Bacteria induced metabolic disease hypothesis

LPS = ENDOTOXIN – THE VILLAIN

INTRODUCING

LPS concentration 10 to 50 X higher than those obtained during septic shock

PROCESSED FOODS – THE CAUSE

Excess of refined foods; fats, sugars, bioactive peptides, hormones, chemicals (incl pharmaceuticals)

Destabilizes the immune system

Increases prooxidant actions

Stimulates overexpression of NF-κB, COX-2, LOX, iNOS

Reduced microbiota - Creates dysbiosis

Reduces resistance to disease

www.bengmark.com
Modern techniques aimed to increase food productivity are increasingly associated with UNHEALTH:

**PLANT BREEDING** including GMO

**ANIMAL BREEDING**

**ARTIFICIAL INSEMINATION**

**SUPPLEMENTING CHEMICALS:** herbicides (to kill weeds), insecticides (to kill bugs), fungicides (to eliminate funguses), soil fumigants (to disinfect), desiccants (drying agent), harvest aids (to speed up hardening), and plant growth regulators (also called plant hormones, aimed to increase growth of plants: cells, tissues and organs)

**INDUSTRIAL PROCESSING:** separation, condensation, drying, freezing, irradiation, burning, roasting, curing, microvawing, emulsifying, toasting, supplementing salt & other food additives, PASTEURISING

**HOME PROCESSING:** baking, cooking, microvawing, frying, wooking, grilling etc.

**FOOD ADDITIVES** – commonly used: antibiotics, acidity regulators, thickeners, stabilizers, emulsifiers, acidity regulators, anti-caking agents, glazing agents, flavour enhancers, gases, sweeteners
PLANT BREEDING – NEGATIVE EFFECTS

Eighty-Year Decline in Mineral Content of One Medium Apple

*Raw, With Skin*

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium</td>
<td>13.5mg</td>
<td>7.0mg</td>
<td>7.0mg</td>
<td>-48.15</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>45.2mg</td>
<td>10.0mg</td>
<td>7.0mg</td>
<td>-84.51</td>
</tr>
<tr>
<td>Iron</td>
<td>4.6mg</td>
<td>0.3mg</td>
<td>0.18mg</td>
<td>-96.09</td>
</tr>
<tr>
<td>Potassium</td>
<td>117.0mg</td>
<td>110.0mg</td>
<td>115.0mg</td>
<td>-1.71</td>
</tr>
<tr>
<td>Magnesium</td>
<td>28.9mg</td>
<td>8.0mg</td>
<td>5.0mg</td>
<td>-82.70</td>
</tr>
</tbody>
</table>

### FRUCTOSE CHART

<table>
<thead>
<tr>
<th>Fruit</th>
<th>Serving Size</th>
<th>Grams of Fructose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limes</td>
<td>1 medium</td>
<td>0</td>
</tr>
<tr>
<td>Lemons</td>
<td>1 medium</td>
<td>0.6</td>
</tr>
<tr>
<td>Cranberries</td>
<td>1 cup</td>
<td>0.7</td>
</tr>
<tr>
<td>Passion fruit</td>
<td>1 medium</td>
<td>0.9</td>
</tr>
<tr>
<td>Prune</td>
<td>1 medium</td>
<td>1.2</td>
</tr>
<tr>
<td>Apricot</td>
<td>1 medium</td>
<td>1.3</td>
</tr>
<tr>
<td>Guava</td>
<td>2 medium</td>
<td>2.2</td>
</tr>
<tr>
<td>Date (Deglet Noor)</td>
<td>1 medium</td>
<td>2.6</td>
</tr>
<tr>
<td>Cantaloupe</td>
<td>1/8 of med. melon</td>
<td>2.8</td>
</tr>
<tr>
<td>Raspberries</td>
<td>1 cup</td>
<td>3.0</td>
</tr>
<tr>
<td>Clementine</td>
<td>1 medium</td>
<td>3.4</td>
</tr>
<tr>
<td>Kiwifruit</td>
<td>1 medium</td>
<td>3.4</td>
</tr>
<tr>
<td>Blackberries</td>
<td>1 cup</td>
<td>3.5</td>
</tr>
<tr>
<td>Star fruit</td>
<td>1 medium</td>
<td>3.6</td>
</tr>
<tr>
<td>Cherries, sweet</td>
<td>10</td>
<td>3.8</td>
</tr>
<tr>
<td>Strawberries</td>
<td>1 cup</td>
<td>3.8</td>
</tr>
<tr>
<td>Cherries, sour</td>
<td>1 cup</td>
<td>4.0</td>
</tr>
<tr>
<td>Pineapple</td>
<td>1 slice (3.5&quot;x.75&quot;)</td>
<td>4.0</td>
</tr>
<tr>
<td>Grapefruit, pink or red</td>
<td>1/2 medium</td>
<td>4.3</td>
</tr>
<tr>
<td>Baysenberries</td>
<td>1 cup</td>
<td>4.6</td>
</tr>
<tr>
<td>Tangerine/ mandarin/orange</td>
<td>1 medium</td>
<td>4.8</td>
</tr>
<tr>
<td>Nectarine</td>
<td>1 medium</td>
<td>5.4</td>
</tr>
<tr>
<td>Peach</td>
<td>1 medium</td>
<td>5.4</td>
</tr>
<tr>
<td>Orange (navel)</td>
<td>1 medium</td>
<td>6.1</td>
</tr>
<tr>
<td>Papaya</td>
<td>1/2 medium</td>
<td>6.3</td>
</tr>
<tr>
<td>Honeydew melon</td>
<td>1/8 of med.</td>
<td>6.7</td>
</tr>
<tr>
<td>Banana</td>
<td>1 medium</td>
<td>7.1</td>
</tr>
<tr>
<td>Blueberries</td>
<td>1 cup</td>
<td>7.4</td>
</tr>
<tr>
<td>Date (Medjool)</td>
<td>1 medium</td>
<td>7.7</td>
</tr>
<tr>
<td>Apple (Composite)</td>
<td>1 medium</td>
<td>9.5</td>
</tr>
<tr>
<td>Persimmon</td>
<td>1 medium</td>
<td>10.6</td>
</tr>
<tr>
<td>Watermelon melon</td>
<td>1/16 med.</td>
<td>11.3</td>
</tr>
<tr>
<td>Pear</td>
<td>1 medium</td>
<td>11.8</td>
</tr>
<tr>
<td>Raisins</td>
<td>1/4 cup</td>
<td>12.3</td>
</tr>
<tr>
<td>Grapes, seedless (green or red)</td>
<td>1 cup</td>
<td>12.4</td>
</tr>
<tr>
<td>Mango</td>
<td>1/2 medium</td>
<td>16.2</td>
</tr>
<tr>
<td>Apricots, dried</td>
<td>1 cup</td>
<td>16.4</td>
</tr>
<tr>
<td>Figs, dried</td>
<td>1 cup</td>
<td>23.0</td>
</tr>
</tbody>
</table>

*Agrawal R, Gomez-Pinilla F J Physiol 2012;590:2485–2499*
1. High intake in bacterial toxins
2. High intake of proteotoxins in certain foods: casein (dairy), gluten, zein (corn), ATIs (wheat) etc.
3. High intake of heat- and storage-induced proteotoxins: glycated (AGEs), lipoxidated molecules (ALEs), processed carbohydrates induces
4. Low intake of fresh plant foods: GREENS, vegetables, fruits, SPICES induces:
   - Dysbiosis: reduced numbers & diversity
   - Leakage of various body membranes: leaky gut, leaky airways, leaky skin, leaky vagina, leaky eye cavity, leaky nose, leaky placenta, leaky blood-brain barrier etc.
PROLAMINS & TRYPTOPHAN/CORTEX

Choi S et al Physiol Behav 2009;98:156-162

An up to 8-fold decrease in cortex tryptophan & similar decrease in serotonin observed after feeding:

Marked reductions; Zein (corn)

Significant reductions: Casein (dairy) & Gluten (wheat, rye, barley)

Small reductions: Lactalbumin (dairy)

Small increases: Vegetable protein (soy)
ATIs A "SUPER"- TRIGGER OF INFLAMMATION


ATIs –(amylase-trypsin inhibitors) - app 4 % of wheat proteins – have strong inflammation-inducing abilities -known to induce:

developers

- Coeliac disease
- Asthma
- Multiple Sclerosis
- Rheumatoid arthritis
- Inflammatory bowel disease
- Non-coeliac sensitivity
- Systemic lupus erythematousus
- Autoimmune encephalomyelitis etc

A potent microflora should have ability de break down ATIs.
ATIs – THE REAL VILLAINS

Schuppan D, Zevallos V. Dig Dis. 2015;33:260-263

ATIs from gluten containing cereals

Intestinal lumen

Intestinal epithelium

Basement membrane

Lamina propria

Favoured by mucosal permeability increase

Stimulation of TLR4 on MC, MΦ, and DCs

PMN attraction/activation

MΦ attraction/activation

IEL activation

IL-8

CCL2

IL-15

Potentiation of existing adaptive (auto-) immune activation

Antigen primed APC

Intestine to lymph nodes?

Recirculation and homing to other sites

Fuelling inflammation & autoimmunity in the gut and at distant sites

ATI

TLR4

Antigen

HLA
ATIs-INDUCED INFLAMMATION


A

LPS = Endotoxin

B

IL-8 (pg/ml)

MCP-1 (ng/ml)

0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000 5500 6000

Medium, PT gliadin 250μg/ml, PT gliadin 500μg/ml, PT zein 250μg/ml, PT zein 500μg/ml, LPS 10ng/ml

0 5 10 15

Medium, PT gliadin 250μg/ml, PT gliadin 500μg/ml, LPS 10 ng/ml

* indicates significant difference from control
ATIs- comp. ENDOTOXIN-INDUCED INFLAMMATION
Zevallos VF et al. 2017;152:1100-1113
HEAT-INDUCED TOXINS (AGEs & ALEs) IN FOODS

“smoking with the stomach”

Dys-functioning, glycated PROTEINS (AGEs) and lipoxidated fats/oils (ALEs) induce about 50 times more inflammation in the body compared to non-heated proteins and fats/oils:

- Accumulate in tissues (amyloid)
- Weaken immune system
- Impair DNA repair mechanisms
- Reduce antioxidant defense
- Induce inflammation & infection
- Accelerate development of various diseases.

Bengmark S. Modified Amino Acid-Based Molecules; Accumulation and Health Implications. In Amino Acids in Human Nutrition and Health. Ed Mello JFD, CABI Allingford, UK, 2011
# AGEs & INFLAMMATION-INDUCTION

Bohlender JM  Am J Physiol Renal Physiol 2005;289:F645-659

## Table 2. Cytokines and cellular events associated with AGE or RAGE activation

<table>
<thead>
<tr>
<th>Cytokine/Event</th>
<th>Cells/Cell Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>VCAM-1 ↑</td>
<td>Endothelial cells</td>
</tr>
<tr>
<td>ICAM-1 ↑</td>
<td>Endothelial cells</td>
</tr>
<tr>
<td>E-selectin ↑</td>
<td>Endothelial cells</td>
</tr>
<tr>
<td>PDGF ↑</td>
<td>Pancreatic cancer cells</td>
</tr>
<tr>
<td>eNOS ↓</td>
<td>Endothelial cells</td>
</tr>
<tr>
<td>Tissue factor ↑</td>
<td>Endothelial cells, smooth muscle cells, macrophages</td>
</tr>
<tr>
<td>TGF-β ↑</td>
<td>Mesangial cells, proximal tubular cells, vascular smooth muscle cells, macrophages</td>
</tr>
<tr>
<td>TNF-α ↑</td>
<td>Endothelial cells, mesangial cells, mononuclear macrophages</td>
</tr>
<tr>
<td>IGF-1 ↑</td>
<td>Mesangial cells</td>
</tr>
<tr>
<td>MCP-1 ↑</td>
<td>Mesangial cells, endothelial cells</td>
</tr>
<tr>
<td>CTGF ↑</td>
<td>Fibroblasts, mesangial cells</td>
</tr>
<tr>
<td>IL-6 ↑</td>
<td>Endothelial cells</td>
</tr>
<tr>
<td>PAI-1 ↑</td>
<td>Endothelial cells</td>
</tr>
<tr>
<td>RAGE ↑</td>
<td>Mesangial cells, endothelial cells, podocytes</td>
</tr>
<tr>
<td>VEGF ↑</td>
<td>Podocytes, endothelial cells, mesangial cells</td>
</tr>
<tr>
<td>ANG II-dependent cell activation ↑</td>
<td>Vascular smooth muscle cells</td>
</tr>
<tr>
<td>Type IV collagen expression ↑</td>
<td>Mesangial cells</td>
</tr>
<tr>
<td>Fibronectin ↑</td>
<td>Mesangial cells</td>
</tr>
<tr>
<td>Cell cycle progression ↓</td>
<td>Fibroblasts, mesangial cells</td>
</tr>
</tbody>
</table>

*eNOS, endothelial nitric oxide synthase; TGF-β, transforming growth factor-β; MCP-1, monocyte chemotactic protein-1; CTGF, connective tissue growth factor; PAI-1, plasminogen activator inhibitor-1.*
FOOD & HEAT-INDUCED TOXINS (AGEs & ALEs)

😊 MEAT, POULTRY, FISH: AGE content increases with exposure to higher temperatures:

comp: Boiling 1000 vs Frying 9000 kU/serving


 рассматриваемые продукты:

😊 DAIRY: CHEESE, espec. hard cheeses

😊 POWDERED MILK (espec. ice cream, baby & clinical nutrition formulas)

😊 GRAIN PRODUCTS: Toasted bread, bread crusts & crisp breads

😊 VEGETABLE OILS: ex. heated olive oil ca 8000 kU

😊 OTHERS: Egg yolk powder, lecithin powder, coffee, espec dark roasted, hard-cured teas, roasted and salted peanuts, dark and sugar-rich alcoholic beverages - high in i.g. broth, Chinese soy, balsamic vinegar, Cola drinks etc
AGEs IN VARIOUS MILK PRODUCTS

Baptista J, Carvalho R Food Res Int 2004;37:739-747

Milk-based Products

- Powder Milk (a)
- Powder Milk (b)
- UHT Milk
- Evapor. Milk
- Pasteur. Milk
- DIF (c)
- DIF (d)
- Powder Milk (e)
- DIF (d)
- Powder Milk (e)
- UHT lact. Free
- Powder Milk (f)
- UHT Homog.
- DIF with Milk
- DIF lact. Free
- Soya Milk
- Milk (g)

Furosine mg/g of Protein

- 2 years storage in room temperature
- 1 year storage in room temperature

STORAGE IN ROOM TEMPERATURE 1-2 YEARS
Acrylamide has been studied extensively for more than 40 years, but the first detection of acrylamide in carbohydrate-rich foods was made as late as 2002.

Acrylamide has a number of adverse effects on the human body - two major effects being 😖 NEUROTOXICITY & 😞 CARCINOGENICITY.

Table 1. Acrylamide data of heat-treated foods.

<table>
<thead>
<tr>
<th>Product group</th>
<th>Typical range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potato crisps</td>
<td>600–2000</td>
</tr>
<tr>
<td>French fries</td>
<td>300–700</td>
</tr>
<tr>
<td>Pan fries potatoes</td>
<td>250–300</td>
</tr>
<tr>
<td>Biscuits and crackers</td>
<td>100–600</td>
</tr>
<tr>
<td>Popcorn</td>
<td>400</td>
</tr>
<tr>
<td>Crisp breads</td>
<td>50–400</td>
</tr>
<tr>
<td>Coffee (powder)</td>
<td>200</td>
</tr>
<tr>
<td>Breakfast cereals</td>
<td>50–250</td>
</tr>
<tr>
<td>Corn crisps</td>
<td>100–600</td>
</tr>
<tr>
<td>Soft breads</td>
<td>&lt;30–50</td>
</tr>
<tr>
<td>Meat and fish products</td>
<td>&lt;30–50</td>
</tr>
<tr>
<td>Pizza, pancakes, waffles</td>
<td>&lt;30</td>
</tr>
<tr>
<td>Scramble egg</td>
<td>&lt;30</td>
</tr>
<tr>
<td>Raw, boiled or mashed</td>
<td>&lt;30</td>
</tr>
<tr>
<td>Potatoes</td>
<td>&lt;30</td>
</tr>
<tr>
<td>Pasta</td>
<td>&lt;30</td>
</tr>
<tr>
<td>Wheat and rye flour</td>
<td>&lt;30</td>
</tr>
<tr>
<td>Rice, oat flakes</td>
<td>&lt;30</td>
</tr>
<tr>
<td>Vegetarian schnitzel</td>
<td>&lt;30</td>
</tr>
<tr>
<td>Cauliflower gratin</td>
<td>&lt;30</td>
</tr>
<tr>
<td>Dried fruit</td>
<td>&lt;30</td>
</tr>
</tbody>
</table>
Toasted bread contains several-fold more of acrylamide than untoasted.

Wheat: 11–161 vs < 5 mg/kg. Rye: 27–205 vs 7–23 mg/kg

Granby K et al. Food Additiv Contamin 2008; 25:921–929

"Smoking with the stomach"
Acrylamide – a strong inducer of acute and chronic diseases among other effects

- NEUROTOXICITY
- NEFROTOXICITY
- CARCINOGENICITY

It was first in 2002 that acrylamide was known to be produced when carbohydrate-rich foods is heated.
Figure 6. Acrylamide concentrations (micrograms per kilogram), corrected for weight loss, in French-fried potatoes heated in a temperature-programmed oven.
DISEASES WITH ELEVATED AGEs/ALEs

- ADHD
- AGING
- AUTISM
- Allergy & Autoimmune diseases
- Alzheimer’s disease
- Amyotrophic lateral sclerosis
- Atherosclerosis & Cardiovascular diseases
- Chronic kidney, liver & pulmonary disorders
- Chronic ophtalmic diseases ??
- Creutzfeldt-Jakob disease
- Diabetes
- Epilepsia

- Familial amyloidotic polyneuropathy
- Fibromyalgia
- Hormone deficiencies ???
- Huntington’s disease
- Macula degeneration
- Multiple sclerosis
- Osteoporosis
- Paradontosis
- Parkinson’s disease
- Polycystic Ovary Syndrome ??
- Rheumatoid diseases
- Ruptured Achilles tendon
- Sepsis
- Stroke
## Improvement on Low AGE diet + exercise

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Baseline*</th>
<th>3-mo follow-up*</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (kg)</td>
<td>82.7 ± 9.6</td>
<td>79.3 ± 9.3</td>
<td>0.015</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>28.9 ± 2.2</td>
<td>27.7 ± 2.0</td>
<td>0.000</td>
</tr>
<tr>
<td>Waist (cm)</td>
<td>102.2 ± 5.1</td>
<td>97.4 ± 6.6</td>
<td>0.000</td>
</tr>
<tr>
<td>SBP (mm Hg)</td>
<td>125.1 ± 12.5</td>
<td>126.3 ± 13.7</td>
<td>0.667</td>
</tr>
<tr>
<td>DBP (mm Hg)</td>
<td>82.2 ± 13.3</td>
<td>81.0 ± 9.7</td>
<td>0.475</td>
</tr>
<tr>
<td>FBG* (mmol/L)</td>
<td>4.99 ± 0.79</td>
<td>4.86 ± 0.42</td>
<td>0.49</td>
</tr>
<tr>
<td>TG (mmol/L)</td>
<td>2.20 ± 1.32</td>
<td>1.49 ± 0.52</td>
<td>0.015</td>
</tr>
<tr>
<td>HDL-C (mmol/L)</td>
<td>1.27 ± 0.16</td>
<td>1.44 ± 0.18</td>
<td>0.003</td>
</tr>
<tr>
<td>LDL-C (mmol/L)</td>
<td>2.37 ± 0.59</td>
<td>2.69 ± 0.71</td>
<td>0.082</td>
</tr>
<tr>
<td>sCML (U/mL)</td>
<td>10.1 ± 1.51</td>
<td>8.6 ± 1.87</td>
<td>0.003</td>
</tr>
<tr>
<td>sMG (nmol/mL)</td>
<td>2.12 ± 0.29</td>
<td>1.5 ± 0.57</td>
<td>0.001</td>
</tr>
<tr>
<td>Diet-Cal (kcal/d)</td>
<td>2471 ± 595</td>
<td>1826 ± 410</td>
<td>0.000</td>
</tr>
<tr>
<td>Diet-AGE (kU/d)</td>
<td>13 019 ± 4526</td>
<td>7306 ± 2811</td>
<td>0.000</td>
</tr>
<tr>
<td>Diet-AGE density*</td>
<td>5.3 ± 1.4</td>
<td>4.1 ± 1.4</td>
<td>0.038</td>
</tr>
<tr>
<td>HR max (bpm)</td>
<td>174.9 ± 10.3</td>
<td>174.9 ± 9.5</td>
<td>0.977</td>
</tr>
<tr>
<td>VO₂ max (mL·kg·min⁻¹)</td>
<td>36.5 ± 4.1</td>
<td>38.6 ± 4.3</td>
<td>0.000</td>
</tr>
</tbody>
</table>
Eating 800 g fruit and vegetables a day – or 10 portions – is associated with:

😊 28 % reduced risk of cardiovascular disease
😊 24 % reduced risk of heart disease
😊 33 % reduced risk of stroke
😊 13 per cent reduced risk of total cancer
😊 31 % reduction in premature death

RECOMMENDATION for optimal health  1 – 1 ½kg/person/day
ADVANTAGES OF RAW FOOD VEGAN DIET

Fontana L et al. Rejuvenation Res. 2007;10:225–234

Consuming a low-calorie low-protein vegan diet, composed of unprocessed and uncooked plant derived foods

Recruited from The St. Louis Vegetarian Society and a Raw Food online magazine (Raw Food News, www.rawfoods.newsmagazine.com).

SBP=Systolic blood pressure, DBP=Diastolic blood pressure, HOMA-IR=homeostatic model assessment - a method used to quantify insulin resistance and beta-cell function, hsCRP=high sensitive c-reactive protein – indicator of inflammation

<table>
<thead>
<tr>
<th></th>
<th>Low-calorie low-protein vegan diet group (n = 21)</th>
<th>Endurance runner group (n = 21)</th>
<th>Western diet group (n = 21)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBP (mm Hg)</td>
<td>104 ± 15&lt;sup&gt;a,c&lt;/sup&gt;</td>
<td>122 ± 13</td>
<td>132 ± 14</td>
<td>0.0001</td>
</tr>
<tr>
<td>DBP (mm Hg)</td>
<td>62 ± 11&lt;sup&gt;b,c&lt;/sup&gt;</td>
<td>72 ± 9&lt;sup&gt;f&lt;/sup&gt;</td>
<td>79 ± 8</td>
<td>0.0001</td>
</tr>
<tr>
<td>Fasting glucose (mg/dL)</td>
<td>85 ± 7&lt;sup&gt;c&lt;/sup&gt;</td>
<td>88 ± 6&lt;sup&gt;f&lt;/sup&gt;</td>
<td>95 ± 6</td>
<td>0.0001</td>
</tr>
<tr>
<td>Fasting insulin (μU/mL)*</td>
<td>2.8 ± 2&lt;sup&gt;g&lt;/sup&gt;</td>
<td>2.1 ± 2&lt;sup&gt;d&lt;/sup&gt;</td>
<td>5.9 ± 4</td>
<td>0.0001</td>
</tr>
<tr>
<td>HOMA-IR</td>
<td>0.59 ± 0.43&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.45 ± 0.38&lt;sup&gt;d&lt;/sup&gt;</td>
<td>1.36 ± 0.83</td>
<td>0.0001</td>
</tr>
<tr>
<td>hsCRP (mg/L)*</td>
<td>0.52 ± 0.6&lt;sup&gt;e&lt;/sup&gt;</td>
<td>0.75 ± 0.9&lt;sup&gt;e&lt;/sup&gt;</td>
<td>2.61 ± 3.3</td>
<td>0.003</td>
</tr>
<tr>
<td>Carotid artery IMT (mm)</td>
<td>0.56 ± 0.1&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.63 ± 0.1&lt;sup&gt;e&lt;/sup&gt;</td>
<td>0.74 ± 0.1</td>
<td>0.0001</td>
</tr>
</tbody>
</table>
SPICES – EFFECTS ON HB-GLYCATION

CALORIE-CONDENSED & PRO-INFLAMMATORY FOODS 😞 😞 😞

😞 Alcohol
😞 Bread & Pasta, Pastries
😞 Butter
😞 Cheese
😞 Chips
😞 Fast food & takeaways
😞 Fried food

😞 Jam and marmalade
😞 Milk & Latte
😞 Potatoes & other tubers – EATEN WARM – NOT COLD
😞 Red meat
😞 Refined oils incl oils such as Olive & Canola oil
😞 Tomato ketchup
😞 Soft drinks

Jon Brower Minnoch, USA, 1941 -1983, 635 kg - The ever world’s heaviest person

Celebrating birthday
CALORIE-CONDENSED FOODS & UNHEALTH

Cani PD, Delzenne NM Curr Pharm Des. 2009;15:1546-1558
Metabolic Syndrome is a Portal to Other Chronic Diseases

- Type 2 Diabetes (5X risk)
- Sarcopenia
- Sleep Apnea
- Obesity
- NASH
- Cardiovascular Disease (2X risk)
- Dyslipidemia
- Hypertension
- Erectile Dysfunction
- PCOS
- Osteoporosis
- Cognitive Decline / Alzheimers Disease
LIFESTYLE CAUSES OF DEATH

DISEASE, GENES ENVIRONMENT

example cancer


Environment 90-95 %

Genes 5 %

DIET app 1/3
A TZUNAMI OF PROSTATE CANCER -JAPAN

The age-adjusted death rate in ChDs such as prostatic cancer rose in Japan during the period 1948 - 98

25-fold

parallel to increases in intake of:

egg    7 X

meat   9 X

dairy  20 X

Ganmaa D et al Medical Hypotheses 2003;60:724-730
"WARNING SIGNALS" - CHRONIC INFLAMMATION

Unexplained fatigue, sleep problems, frequent headache, hair loss, gray hair, dandruff, acne, skin rashes, dry eyes, frail nails, dry mouth or increased salivation, reduced sex functions, irregular menstruations, obstipation or diarrhea, osteoporosis, overweight, frequent infections, mental depression, easy breathless, sweaty feet, sweaty hand palms etc.

www.bengmark.com
PRESENT  POOR EATING – POOR IMMUNITY  PALEO

THE FRONT DOOR – SHORTCUT 1
app 60 % are Sugar and Suger-like substances which enters the body in upper jejunum via mainly the arterial system < 15 %

THE BACK DOOR – THE DANGEROUS ROUTE
app 30 % animal fats & vegetable oil enters via the body via the lymphatic system and remains in circulation for hours > 10 %

THE MAIN DOOR
< 20 % raw greens, vegetables, fruits are Foods for Microbiota and reaches the large intestine after 2-3 hours, enhancing immune system & preventing inflammation app 80 %
Normal:
72-108 mg/dL = 4-6 mmol/l fasting, max 157 = 8.7 after meal.
SATURATED FATTY ACID METABOLISM

**MCFA:** Coconut Oil 85,2, Palm kernel oil 81,5, Palm Oil 45,3, Olive Oil 14.5 (70 % monosaturated)

**LCFA:** Animal fats

---

*Fig. 1.* Digestion and transport of fats. Note greater efficiency of absorption of MCTs versus LCTs, resulting in more rapid production of energy.
POSTPRANDIAL INFLAMMATION & ENDOTOXEMIA

POSTPRANDIAL HYPERLIPIDEMIA IN METABOLIC SYNDROME
Alcala-Diaz JF et al. Plos One 2014;9:e96297

![Graph showing triglycerides levels over postprandial period (hours). The graph compares Non-MetS with MetS, indicating significant differences in triglyceride levels. The legend indicates statistical significance: Non MetS vs MetS p < 0.001, Time p < 0.001, Time vs MetS p < 0.001.]
INDUCERS OF POSTPRANDIAL INFLAMMATION

López-Moreno J et al. *J Agric* 2017;65:7756-7763

Rich in:
- Saturated Fat
- Monosaturated Fat
- + Omega-3

Fats
- (animal fat)
- (sunflower oil 85 %, olive oil 75 %, canola oil 75 %, lard 40 %)

LFHCC = COMPLEX CARBOHYDRATES
Medium chain fatty acids – MCFAs - protect from lipotoxicity and subsequent insulin resistance  
MCFA TOP SOURCES: Coconut oil and palm kernel oil

Dietary long-chain fatty acids – LCFAs - impair insulin sensitivity & lipid metabolism – LCFA TOP SOURCES: C14, C16, C18 – mainly dairy and meat

Table 2. Fatty acid profile of the high-fat diets

<table>
<thead>
<tr>
<th>Fatty acid</th>
<th>MCT</th>
<th>LCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>C8:0</td>
<td>8.55</td>
<td>n.d.</td>
</tr>
<tr>
<td>C10:0</td>
<td>3.16</td>
<td>n.d.</td>
</tr>
<tr>
<td>C12:0</td>
<td>0.05</td>
<td>0.04</td>
</tr>
<tr>
<td>C14:0</td>
<td>n.d.</td>
<td>0.15</td>
</tr>
<tr>
<td>C16:0</td>
<td>0.49</td>
<td>5.08</td>
</tr>
<tr>
<td>C16:1</td>
<td>n.d.</td>
<td>5.95</td>
</tr>
<tr>
<td>C18:0</td>
<td>0.16</td>
<td>n.d.</td>
</tr>
<tr>
<td>C18:1</td>
<td>0.71</td>
<td>0.76</td>
</tr>
<tr>
<td>C18:2</td>
<td>2.18</td>
<td>2.17</td>
</tr>
<tr>
<td>C18:3</td>
<td>0.29</td>
<td>0.29</td>
</tr>
<tr>
<td>Others</td>
<td>n.d.</td>
<td>0.10</td>
</tr>
</tbody>
</table>

MCT, medium-chain triacylglycerol; LCT, long-chain triacylglycerol; n.d., not detectable.
MINIMIZE POSTPRANDIAL INFLAMMATION

1. Avoid long-chain fatty acids including olive oil.
2. Avoid highly processed foods and drinks containing sugar, high-fructose corn syrup, white flour.
3. Keep servings modest & reduce the numbers of meals.
4. Avoid being overweight.
5. Eat daily salads of leafy greens dressed with vinegar + drink vinegar mixed with water at your meals.
6. Eat richly anti-inflammatory spices such as turmeric, chili pepper & cummin.
8. Choose high-fiber, low GI foods - whole grains, legumes & vegetables & fruits.
9. Eat lean protein at all meals – peas, beans, nuts, almonds or lean meat or fish.
10. Obtain ≥ 30 min of daily physical activity of at least moderate intensity.
**BENEFITS OF MEDIUM CHAIN TRIGLYCERIES - MCTs - SUPPLY**

- Provides antifungal, antibacterial and antiviral properties *Nguyen VTA et al. J Lipids 2017;2017:7170162*
- Promotes heart health *Kamisah Y et al. Pharm Biol. 2015;53:1243-1249*
- Promotes brain function *BMC Neurosci 2008;9(suppl 2):16*
- Supports healthy thyroid function *Positive Med, September 16, 2015*
- Protects against dementia *Nafar F et al Neurochem Int 2017;105:64-79*
- Inhibits cancer cell growth *Lappano R Cell Death Discover 2017;3:17063*
- Promotes weight loss *Chamma CM et al. Food Funct 2017;8:778-787*
- Control Crohn’s disease
- Maintain healthy skin
- Control Candida
- Maintain oral health.
SOURCES OF MCTs

The main sources of MCTs (C6, C8, C10, C12) are coconut products, palm oil, and dairy products.
LEAKY BARRIERS

- Gastrointestinal tract
- Airways
- Skin
- Oral cavity
- Vagina
- Nose
- Eye cavity
- Placenta
- Blood brain barriers

Maccaferri S et al Dig Dis 2011;29:525–530
Curr Opin Nephrol Hypertens 1997; 6:106-110

We know that “disorders of adult life, including coronary heart disease, stroke and diabetes, arise through interaction between influences in our adult lifestyle and genetically determined susceptibility.”

David Barker 1838 - 2016

Recent research, however, suggest that growth in utero may also play an important role” “Even brief periods of ... may permanently change/`reprogramming´ the body...and lead to persistent changes in blood pressure, cholesterol metabolism, insulin response to glucose, and in a range of other metabolic, endocrine and immune parameters.”
INFLAMMATION IN OBESE PREGNANT WOMEN

Basu S et al Obesity 2011;19:476-482

(a) Cytokine expression in SVF (FC lean vs. obese)
- MCP1
- IL-8
- IL-6
- TNFα
- Leptin

(b) Expression of LPS-sensitive genes (FC lean vs. obese)
- CD14
- TLR4
- TRAM2
LEAKY PLACENTA
A shocking 9/20 (43 %) of umbilical cord blood, cultivated from healthy neonates, born by cesarean section, demonstrate positive growth:

*Enterococcus faecium, Propionibacterium acnes, Staphylococcus epidermidis & Streptococcus sanguinis*

Mothers from families with high burden of allergies received during the last 2-4 weeks of pregnancy and the baby during first 6 mo *Lactobacillus GG*

2003 – 14/53 (26 %) in the probiotic group and 25/54 (46 %) in the placebo group developed atopic eczema

2015 – Probiotic-treated individuals showed no ADHD or Asperger syndrome - 0/40 = 0 %

In contrast to placebo group - 6/35 (17.1%) - about every 6th child
President Bill Clinton – now a vegan radically changed diet, lost 20 lbs. in weight & improved his health, Clinton tells CNN. After experiencing periodic heart problems leading up to the 2004 surgery, the former junk food lover now calls himself a vegan, shunning meat, eggs, dairy and almost all oil saying: "I like the vegetables, the fruits, the beans, the stuff I eat now" 😊 "I feel good, and I also have ... more energy." 😊
SAFE: grains?, legumes, lentils, vegetables, fruits, nuts and seeds

NOT SAFE: oils, dairy foods, meat, poultry, & fish (frequently containing unacceptable levels of PCBs, dioxin, and mercury)
<table>
<thead>
<tr>
<th>Food</th>
<th>Vitamin K (micg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thyme, dried</td>
<td>1715</td>
</tr>
<tr>
<td>Sage, dried</td>
<td>1700</td>
</tr>
<tr>
<td>Parsley raw</td>
<td>1640</td>
</tr>
<tr>
<td>Amaranth leaves</td>
<td>1160</td>
</tr>
<tr>
<td>Kale raw</td>
<td>817</td>
</tr>
<tr>
<td>Mustard greens, raw</td>
<td>497</td>
</tr>
<tr>
<td>Spinach, raw</td>
<td>483</td>
</tr>
<tr>
<td>Basil, fresh</td>
<td>413</td>
</tr>
<tr>
<td>Beat greens, raw</td>
<td>400</td>
</tr>
<tr>
<td>Turnip greens, raw</td>
<td>251</td>
</tr>
<tr>
<td>Lettuce, raw</td>
<td>174</td>
</tr>
<tr>
<td>Broccoli raw</td>
<td>102</td>
</tr>
</tbody>
</table>
**THE DILEMMA: PHARMA & MICROBIOTA ARE INCOMPATIBLE!**

😊 Antibiotics destroys about 90% of microbiota functions: bile acid metabolism, eicosanoid and steroid hormone synthesis etc


😊 Chemotherapeutics reduces microbiota 100-fold; decrease anaerobic bacteria up to 10,000-fold & increase in PPMs 100-fold


😊 Pharma as proton pump inhibitors (peptic ulcer) during pregnancy increase the risk of offspring getting asthma

_Andersen AB et al. Aliment Pharmacol Ther 2012;35:1190-1198_

😊 Anti-hypertensives induce gastrointestinal dysbiosis & reduce mucosa protection, espec. mucus production

PLANT FOOD & MICROBIOTA & HEALTH

Duranti S et al Genes & Nutrition 2017;1218:18

TREATMENTS

Energy intake
Carbohydrates 55-60 %
Proteins 15 %
Fat < 30 %

Microbiota modulation
↑ Bacteroides and C. perfringens
↑ Christensenellaceae spp.
↑ Akkermansia spp.

Enterotypes
Bacteroides
Prevotella
Ruminococcus

Energy intake
Carbohydrates 51.8 %
Proteins 15.4 %
Fat 32.8 %

Microbiota modulation
↑ Alistipes, Bilophila and Bacteroides spp.
↓ Roseburia and Eubacterium spp.
↑ B. thetaiotaomicron and M. smithii

Chronic vascular disease, hypertension, stroke, kidney stones and gastrointestinal tract cancers

Dietary manipulation
Dietary fibers (Inulin, resistant starch, beta-glucans)
↑ R. bromii, Oscillibacter and E. rectale
↑ Bifidobacterium and Atopobium groups
↓ Bacteroides/Prevotella
Most lactobacillus strains are not probiotics

Suzuki C et al Int J Food Microbiol 2008;123:159-165

IMMUNE IMODULATION – studied in 46 strains of lb. Lactis

<table>
<thead>
<tr>
<th>Strains</th>
<th>IL-6 (ng/ml)</th>
<th>IL-12 (ng/ml)</th>
<th>TNF-α (ng/ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>S63</td>
<td>138</td>
<td>37</td>
<td>20</td>
</tr>
<tr>
<td>P79</td>
<td>100</td>
<td>23</td>
<td>10</td>
</tr>
<tr>
<td>H-17</td>
<td>118</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>H45</td>
<td>4</td>
<td>2</td>
<td>0.33</td>
</tr>
<tr>
<td>O 62</td>
<td>4</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>G50</td>
<td>10</td>
<td>2</td>
<td>16</td>
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<tr>
<td>1257</td>
<td>0.29</td>
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<td>0.23</td>
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<tr>
<td>ATCC19435</td>
<td>21</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>O19</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>O20</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>LPS</td>
<td>170</td>
<td>8</td>
<td>4</td>
</tr>
</tbody>
</table>
FERMENTATION ABILITY

The ability of 712 different LAB to ferment oligofructans (inulin, phleins) studied:

16/712 able to ferment the phleins &

8/712 able to ferment the inulin type fibre

Only four species had the ability:

*Lactobacillus plantarum* (several)
*Lactobacillus paracasei* subsp. *paracasei*
*Pediococcus pentosaceus* &
*Lactobacillus brevis*


Included in Synbiotic 2000
CONTROL OF PATHOGENS

The ability of 50 different LAB to control 23 different pathogenic *Clostridium difficile* tested:

❌ 27 were totally ineffective
✅ 18 antagonistic to some
✅ 5 effective against all:
✅ 2 strains - *Lb paracasei s. paracasei*
✅ 3 strains - *Lb plantarum*

1986: Review of 81 extensive liver resections

Prophylactic antibiotic (ampicillin, cephalosporin, tetracyclines) given to 57/81 patients

No antibiotics to 24/81 patients

Morbidity: 33% (17 % major)

ALL INFECTIONS WERE IN ANTIBIOTIC TREATED PATIENTS

NO INFECTIONS WERE SEEN IN THE PATIENTS WHO DID NOT RECEIVE ANTIBIOTICS

Ekberg, PhD thesis, Lund University 1986
The abilities of 535 Lactobacillus strains to control inflammation and infection were studied. 355 harvested from humans & 180 from plants.
4 of 535 studied LAB selected because:

😊 All induce several Bioactive Proteins & cross-react with stress proteins

😊 All transcribe NF-κB – to the largest extent L plantarum and L paracasei

😊 All produce both pro-inflammatory (IL-1β, IL-8) and anti-inflammatory (IL-10) cytokines, to the largest extent L plantarum, and to less extent Leuconostoc mesenteroides

Ljungh Å, Microb Ecol Health Dis 2002;3, Suppl 4:4
Kruszewska D et al Microecol. Ther. 2002;29:37
40 BILLION LACTIC ACID BACTERIA:

- $10^9$ of *Pediococcus pentosaceus* 5-33:3
- $10^9$ of *Leuconostoc mesenteroides* 32-77:1
- $10^9$ of *Lactobacillus paracasei sbsp. paracasei*
- $10^9$ of *Lactobacillus plantarum* 2362

10 GRAM BIOACTIVE FIBRES:

- 2.5 g of betaglucan
- 2.5 g of inulin
- 2.5 g of pectin
- 2.5 g of resistant starch
SYNBIOTIC 2000 IN LUNG INJURY

SYNBIOTIC 2000 INHIBITS GROWTH OF MULTIRESISTANT BACTERIA
Professor Val Edwards-Jones, University of Manchester, UK

Multi-resistant
*Acinetobacter baumanii*

Multi-resistant *Klebsiella*
50 to 85 % of transplant patients develop nosocomial infections within 30 days.

Compared effects of daily supply of Synbiotic 2000 and Only fibres daily from the day before surgery & during following 14 postoperative days

30 day-infection rate:

Synbiotic 2000       1/33 - 3 %
Only fibres          17/33 - 51 %
## SYNBIOTIC 2000 IN LIVER TRANSPLANTATION

<table>
<thead>
<tr>
<th>Isolated bacteria</th>
<th>Synbiotic 2000</th>
<th>Fibres only</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Enterococcus faecalis</em></td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td><em>Escherichia coli</em></td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td><em>Enterobacter cloacae</em></td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td><em>Pseudomonas aeruginosa</em></td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td><em>Staphylococcus aureus</em></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

**SYNBIOTIC 2000 IN PANCREATECTOMY**

**INFECTIONS:**

<table>
<thead>
<tr>
<th></th>
<th>Synbiotic 2000</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wound infections</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Peritonitis</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Urinary</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Sepsis</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Cholangitis</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Empyema</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5</strong></td>
<td><strong>20</strong></td>
</tr>
</tbody>
</table>

**SYNBIOTIQUES IN ACUTE PANCREATITIS**

Oláh A et al Hepato-gastroenterology 2007;54:36-41

<table>
<thead>
<tr>
<th>Isolated Microorganisms</th>
<th>SYNBIOTIC 2000</th>
<th>Fibres Only</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Pseudomonas aeruginosa</em></td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td><em>Enterococcus faecalis</em></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><em>Enterobacter spp</em></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><em>Streptococcus spp</em></td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td><em>Staphylococcus aureus</em></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><em>Enterococcus faecium</em></td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td><em>Candida spp</em></td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td><em>Staphylococcus haemolyticus</em></td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td><em>Serratia spp</em></td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td><em>Klebsiella spp</em></td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td><em>Escherichia coli</em></td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td><em>Stenotrophomonas maltophilia</em></td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td><em>Citrobacter freundii</em></td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

**Total** 7 17
102 patients supplied 15 days posttrauma with either Synbiotic 2000 Forte or placebo. The treated patients demonstrated reduced:

- Mortality
- Rate of infection ($P = 0.01$)
- Rate of SIRS & severe sepsis ($P = 0.02$)
- Numbers of days on mechanical ventilation ($P = 0.001$)
- ICU stay ($P = 0.01$)
One month supply of Synbiotic 2000 reduces:

😊 Mucosal pH

😊 PPM flora: *E. coli* (*p*<0.001) *Staphylococcus* (*p*<0.01) & *Fusobacterium* (*p*<0.05)

😊 Endotoxin, ammonia/s, ALT/s, bilirubin/s

&

improves:

😊 Albumin/s and prothrombin

😊 Degree of disease at Child classification &

😊 Degree of encephalopathy at psychometric testing
Traumatic brain injury (TBI) markedly reduced contractile activity of the intestinal smooth muscle ($P < 0.01$), impaired ICC networks and densities ($P < 0.01$) & reduction of defecation/obstipation ($P < 0.01$)

Application of Synbiotic2000™ Forte improves contractile activity of the small intestine ($P < 0.01$) & maintains contractile activity ($P < 0.01$)
Study at the Olympic Training Centre in Barcelona. Six swimmers (4 women and 2 men) ingested regularly Synbiotic 2000 Original

One of 2 men improved the Spanish record in 200 meters butterfly

Three of 4 women improved the Spanish records: 100 meters butterfly, 200 meters butterfly, 200 freestyle, 4x200 freestyle relays
<table>
<thead>
<tr>
<th>Procedure</th>
<th>Number of Patients</th>
<th>With Postoperative Infections</th>
<th>With Positive Blood Cultures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liver transplantation</td>
<td>66</td>
<td>16 =&gt; 1 = 94 per cent</td>
<td>11 =&gt; 1 = 91 per cent</td>
</tr>
<tr>
<td>Pancreatoduodenectomy for cancer</td>
<td>80</td>
<td>16 =&gt; 5 = 69 per cent</td>
<td>27 =&gt; 5 = 82 per cent</td>
</tr>
<tr>
<td>Severe pancreatitis</td>
<td>62</td>
<td>15 =&gt; 9 = 40 per cent</td>
<td>17 =&gt; 7 = 59 per cent</td>
</tr>
<tr>
<td>Severe trauma, treated with Synbiotic 2000 Standard</td>
<td>52</td>
<td>23/30 (77 %) =&gt; 17/35 (49 %)</td>
<td></td>
</tr>
<tr>
<td>Severe trauma, treated with Synbiotic 2000 Forte</td>
<td>72</td>
<td>13 =&gt; 5 = 62 per cent</td>
<td>13 =&gt; 5 = 62 per cent</td>
</tr>
</tbody>
</table>
Liver transplantation – 66 patients
Days on Antibiotics $3.8 \Rightarrow 0.1 = 3.7 = 97$ per cent
Days in ICUs $10.2 \Rightarrow 8.8 = 1.4 = 14$ per cent
Days in Hospital $27.9 \Rightarrow 27.8 = 0.1 = 13$ per cent

Pancreatoduodenectomy for cancer - 80 patients
Days on Antibiotics $10 \Rightarrow 2 = 8 = 80$ per cent
Days in ICUs $6 \Rightarrow 2 = 4 = 67$ per cent
Days in Hospital $22 \Rightarrow 17 = 5 = 23$ per cent

Severe acute pancreatitis – 62 patients
Days in Hospital $19.7 \Rightarrow 14.9 = 4.8 = 24$ per cent

Severe trauma treated with Synbiotic 2000 Forte – 65 patients
Days on Artificial Respiration $24 \Rightarrow 19 = 5 = 21$ per cent
Days in ICUs $41.3 \Rightarrow 27.7 = 13.6 = 33$ per cent
INFLAMMATION INVOLVES ABOUT 1200 GENES affect a wide range of effector molecules; pro-inflammatory cytokines, chemokines, matrix metalloproteinases (MMPs) and metabolic proteins

**BIOLOGICALS** aimed to target single genes such as; anti- TNF-α, anti-IL-1β, anti-HER2, IL-12/IL-23, IFN-γ, IL-17A, IL-2 and IL-6, and inhibitors of NF-KB etc.

- Uni-targetting
- Immediate powerful effects
- Limited by multiple toxicity
- Negative effects on microbiota
- Sometimes short-lasting effects
- Substantial adverse effects
- Indicated in aggressive diseases

**ECO-BIOLOGICALS**: utilizes the antiinflammatory effects of microbes and plants; greens, vegetables, fruits & spices to support microbiota

- Multi-targetting
- Slower and weaker effects
- GRAS – e.g. no toxicity
- Positive effects on microbiota
- Long-lasting effects
- No adverse effects
- Indicated for prevention & early disease
TRIPPLE-HELIX FOR ANTIINFLAMMATION

1. TWELVE COMMANDMENTS
2. GUT RECONDITIONING – SYNBIOTIC 2000
3. ANTIINFLAMMATORY TURMERICIC COCKTAIL
ANTI-INFLAMMATORY TURMERIC COCKTAIL
for consumption once or twice daily

<table>
<thead>
<tr>
<th>Description</th>
<th>µmol TE/100g</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 heapful tablespoon turmeric powder</td>
<td>159,277</td>
</tr>
<tr>
<td>1 heaped teaspoon Ceylon Cinnamon</td>
<td>267,536</td>
</tr>
<tr>
<td>OBS! Not Saigon cinnamon (toxic)</td>
<td>15,170</td>
</tr>
<tr>
<td>¼ teaspoon or more chilipepper powder</td>
<td></td>
</tr>
<tr>
<td>¼ teaspoon or more grounded cloves</td>
<td>314,446</td>
</tr>
</tbody>
</table>

Spread on sallad or mix with fruit dessert, yoghurt or juice or mix with ½ - 1 tablespoon apple cider vinegar in a glass of water


2. Limit/eliminate dairy products.

3. Limit red meat to 300 g/week. Avoid processed meat, pig meat, beef from supplement-fed animals and farmed fish. Focus on wild fish, game meat and beef from grass-fed animals.

4. Limit/eliminate intake of long-chain fatty acids and processed oils. Focus on plant fats such as cocos and avocado.

5. Eliminate foods containing inflammation-inducing proteins: casein (diary), gluten (wheet, rye, barley) och zein (corn).


7. Avoid exposure to microbial toxins such as endotoxin, pesticides and other poisons.

8. Limit your sodium & chloride salt intake - increase the intake of iodine. Avoid fluoride, bromide and reduce chloride.

9. Limit/eliminate as much as possible exposure to chemicals including pharmaceutical drugs.

10. Focus on plant foods rich in proteins, fibres, antioxidants. Use grains such as amaranth, durrah, teff, quinoa, various seeds, peas, beans, lentils, almonds and nuts. Germinate/sprout seeds, peas, beans, lentils, almonds and nuts for 12-24 hours.

11. Let the majority of your food (about 80 %) be fresh raw vegetables and fruits with low glycemic index, and anti-inflammatory spices and teas such as puerh, yerba & oliveteas. Supplement Vitamin D, omega3, turmeric and probiotics – the four corner stones of anti-inflammation. Supplement also iodine as KJ or Kelp.

12. Practise daily fasting as Peak fasting (intake of calories 6/24 hours) either as SKIPPING BREAKFAST (no food before noon) or SKIPPING DINNER (no food after 14 pm)
DAILY FASTING – AVOIDING LATE NIGHT EATING AND SKIPPING BREAKFAST – long-term effects

Zilberter T, Zilberter EY
Front Public Health 2014;2:59
Homo erectus
2 milj – 100 000 years BC
”diet consisted in GREEN LEAVES, WILD GRASSES, flowers, berries, nuts, honey, & less tubers, roots, occasionally red meat, shellfish and bird's eggs.”
PALEOLITHIC DIET

“Much support that our genes, adapted during million of years to the lifestyle of our prehistoric ancestors badly tolerate the dramatic changes, especially in food habits, which have occurred”.

Contained more of:

\( (X = \text{times more}) \)

- Minerals 2 X
- Fibers 4 to 10 X
- Antioxidants 10 X
- Omega-3 FA 50 X
- Lactic acid bacteria \( >10^{10} \) X

Contained less of:

\( (X = \text{times less}) \)

- Protein 2 X
- Saturated FA 4 X
- Sodium 10 X

# DIET & LONGEVITY

**Robbins J: Healthy at 100: The Scientifically Proven Secrets of the World's Healthiest and Longest-Lived Peoples**

<table>
<thead>
<tr>
<th></th>
<th>Abkhasia</th>
<th>Vilcabamba</th>
<th>Hunza</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of calories from carbohydrate</td>
<td>69%</td>
<td>74%</td>
<td>73%</td>
</tr>
<tr>
<td>Percent of calories from fat</td>
<td>18%</td>
<td>15%</td>
<td>17%</td>
</tr>
<tr>
<td>Percent of calories from protein</td>
<td>13%</td>
<td>11%</td>
<td>10%</td>
</tr>
<tr>
<td>Overall daily calories</td>
<td>1,800</td>
<td>1,700</td>
<td>1,800</td>
</tr>
<tr>
<td>Percentage of diet from plant foods</td>
<td>90%</td>
<td>99%</td>
<td>99%</td>
</tr>
<tr>
<td>Percentage of diet from animal foods</td>
<td>10%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Salt consumption</td>
<td>low</td>
<td>low</td>
<td>low</td>
</tr>
<tr>
<td>Sugar consumption</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Processed food consumption</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Incidence of obesity</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Read: [http://thepdi.com/hunza_health_secrets.htm](http://thepdi.com/hunza_health_secrets.htm)
VITAMIN D DEFICIENCY – COSTS
Gant WB et al Prog Biophys Mol Biol 2009;99:104-113

36 % of direct and 28 % of indirect Health Costs associated with vitamin D deficience:

🫡 Cardiovascular 13.5 and 7.5 % resp
🫡 Infections incl influenza 7 and 6.5 % resp
🫡 Type 2 diabetes 7 and 2.4 % resp
🫡 Cancer 6.4 and 9.6 % resp
🫡 Osteoporosis 1.5 and 0.5 % resp
🫡 Multiple sclerosis 1 and 0.2 % resp
to all European to 40 ng/mL would reduce

😊 the direct economic burden of disease by 11.4%, or EUR 105,000,000,000

😊 the indirect economic burden of disease by 6.4%, or EUR 82,000,000,000

😊 the total reduction in economic burden of disease by 17.7%, or

😊 EUR 187,000,000,000
Sweden 2017:
Individuals with low education and low income have

😊 60 % more disease
😊 minus 9-10 years life span
😊 affects also their children

“No election is won by poking one's nose into people's fridges”

Citation from Swedish conservative government minister.
"Health is not a political issue – only healthcare is."

Citation from Swedish socialist government minister.
SOCIOECONOMIC STATUS & OUTCOME, – USA
EARN MORE – LIVE LONGER

Chetty R et al JAMA 2016;315:1750-1766

A. Life Expectancy by Income Quartile by Year, Men

B. Life Expectancy by Income Quartile by Year, Women
AVAILABLE @:  
www.bengmark.com  
www.synbiotics.se  
www.facebook.com/stig.bengmark  

Videos:  
www.ihcanconferences.co.uk/antioxidantsapril2017/  
Podcast:  https://goo.gl/wTRvwh  
www.ihcanconferences.co.uk/a
Let us not wallow in the past!

The danger of wallowing in the past

Thank you!

Helping your gut bacteria can boost your health