

# Health from the Gut UP

By Jerry Brunetti



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PASA

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# Digestion

*“All Diseases Begin in the Gut”*

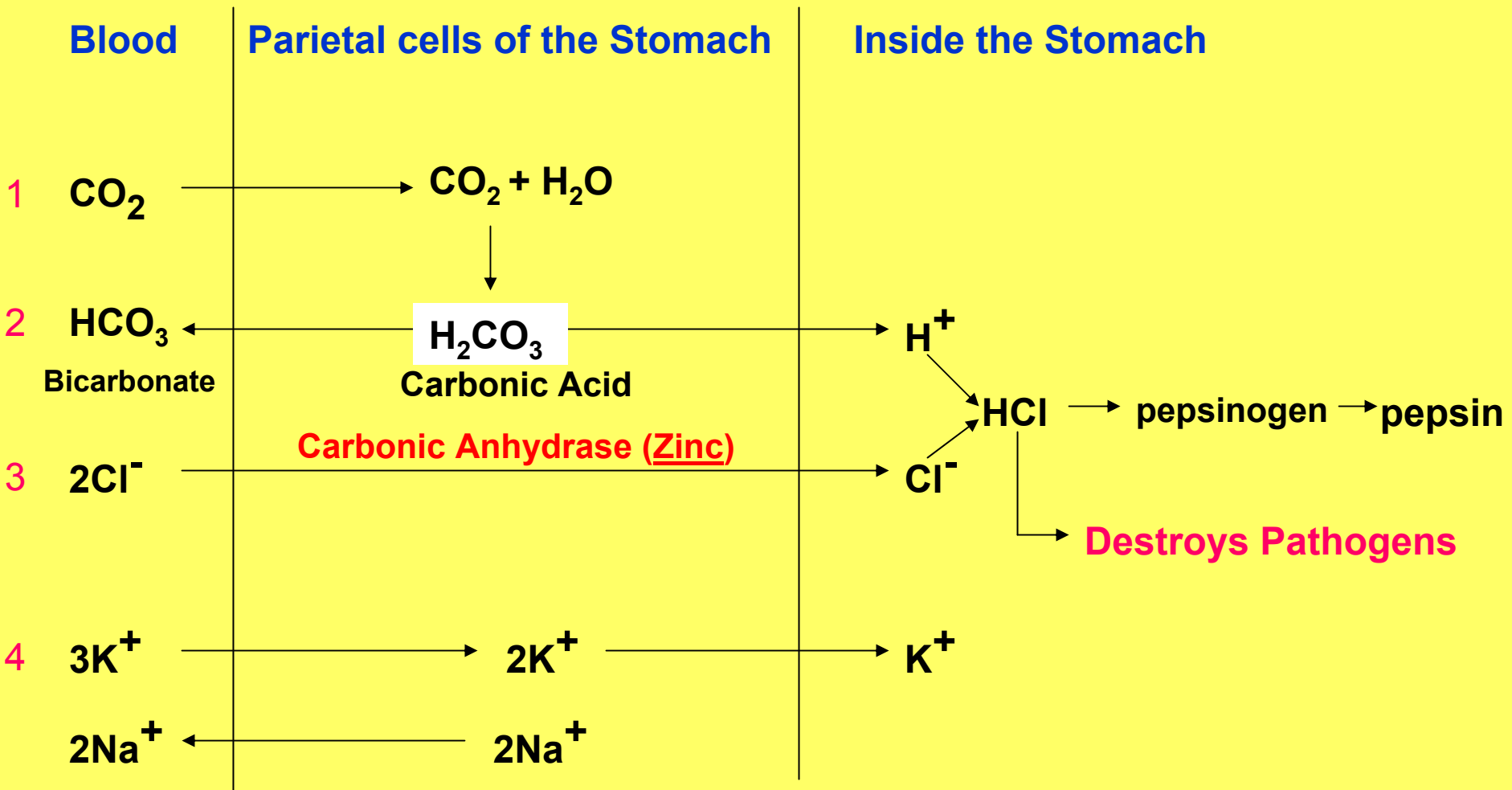
*Hippocrates, 460-370 B.C.*



# How Don't You Spell Relief?

- 60 Million Americans with Acid Reflux
- 60% of Medicated Patients: problems 3X/week
- 75% of Patients on Rx's also taking OTC's
- 56% Increase in Last 5 Years with 0-4 year olds
- 60% of Asthma Adults have Acid Reflux

# HOW STOMACH ACID IS MADE



# Pre-Digestion

- Resting pH of Stomach = pH 5.0-6.0
- Active Stomach (with food):
  - 30-60 minutes → pH <3.0 (0.8-2.5)
- Food Enzymes: Active @ pH 3.0-9.0
  - Stomach Digestion of: 60% Starch;  
30% Protein; 10% Fat!
- Pancreatic Enzymes: @ pH 7.2-9.0
  - Active in Duodenum Only

# pH SCALE

Alkaline (OH<sup>-</sup>)

14  
13  
12  
11  
10  
9  
8  
7  
6  
5  
4  
3  
2  
1

Acid (H<sup>+</sup>)

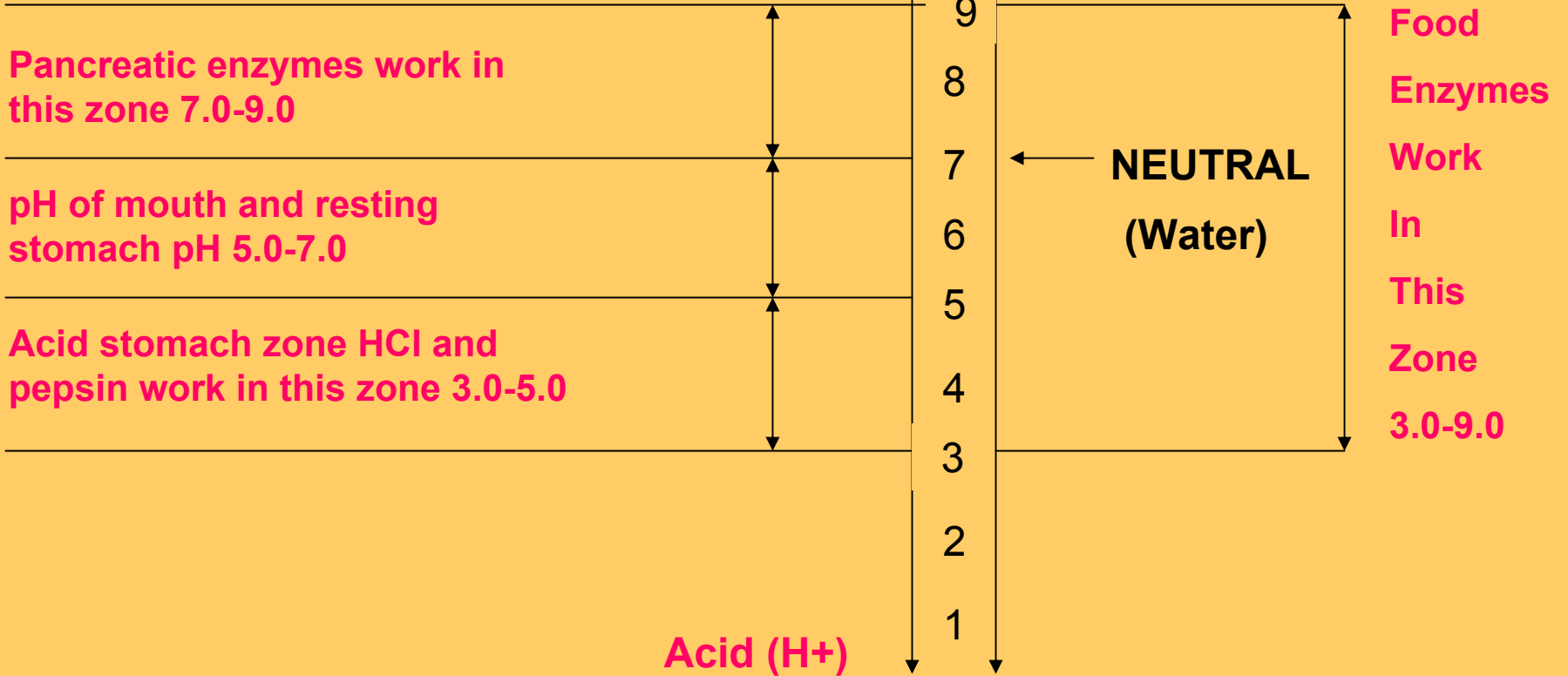
Pancreatic enzymes work in this zone 7.0-9.0

pH of mouth and resting stomach pH 5.0-7.0

Acid stomach zone HCl and pepsin work in this zone 3.0-5.0

NEUTRAL  
(Water)

Food Enzymes Work In This Zone 3.0-9.0



# Low Stomach Acidity

- Creates deficiency of Secretin/cholecystokinin
- Creates absorption of Partially Digested Protein
  - Casomorphin & gliadomorphin (gluteomorphin)
  - Auto-immune reactions, allergies
- Creates Malabsorption of vitamins/minerals
- Creates Maldigested carbohydrates → food for pathogenic flora → alcohols, acetaldehydes
- Creates Mal-digested Fat → deficiency of fat soluble ADEK, EFA's

# Stomach Digestion Acidity

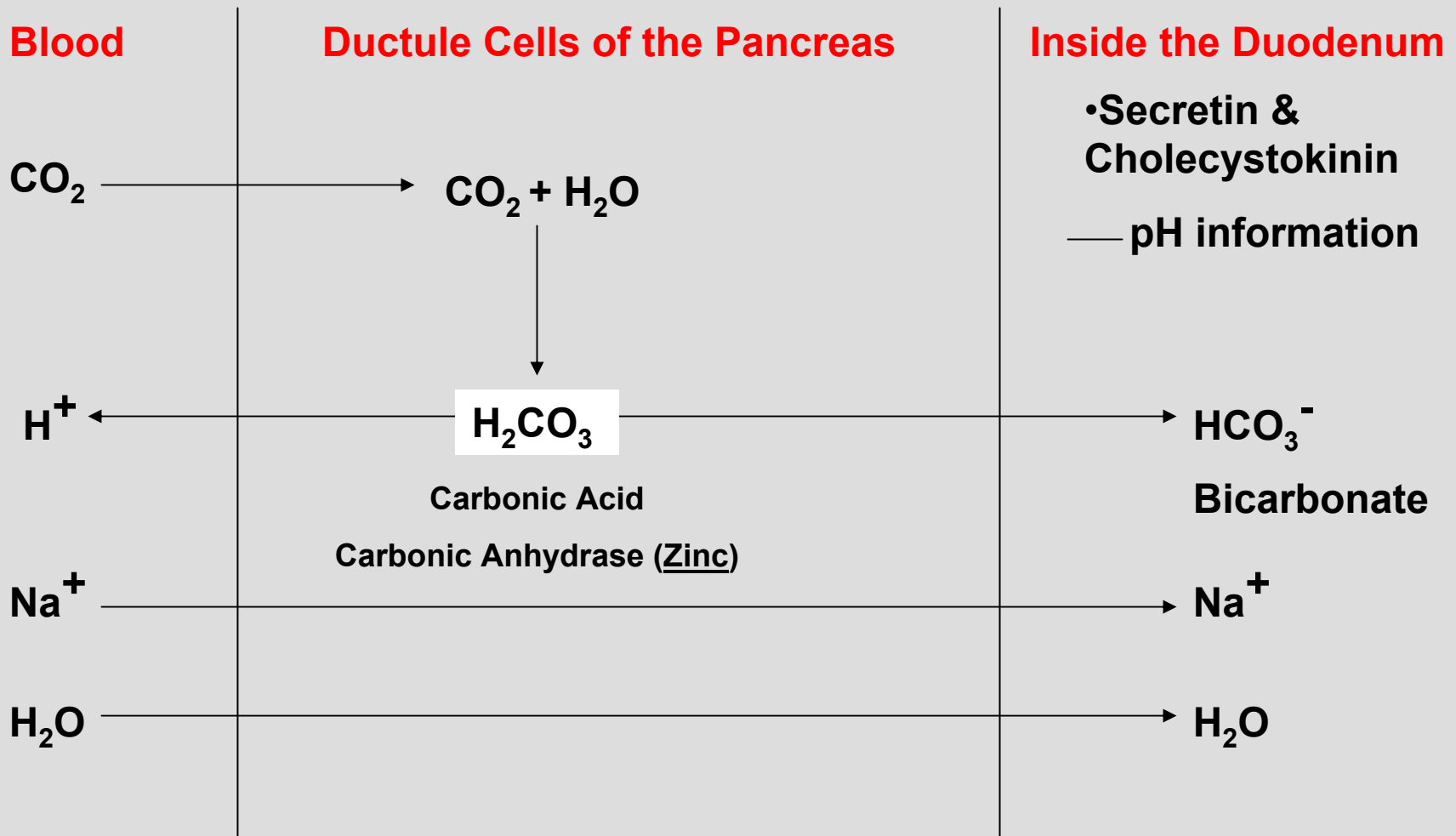
- Low pH (<2.0) stimulates Secretin & Cholecystokinin
  - Secretion
    - Prevents the production of HCl by stomach (natural “Brake”)
    - Causes Liver to Produce Bile
    - Causes Mucous Production on Intestinal Wall
    - Causes Pancreas to Produce Bicarbonate (raises pH)
  - Cholecystokinin
    - Produces pancreatic enzymes
    - Halts Stomach Activity
    - Gall Bladder Empties Bile
    - Pancreas Secretes Enzymes Protease, Amylase, Lipase
- Low pH (Acidity) Destroys Pathogens (e.g. Helicobacter pylori, Campylobacter pylori, Salmonella, Enterobacteria, Streptococci, Candida, etc.)
- 50% of 60 (+) years: Low HCl and 80% of 80 (+) years: Low HCl
- HCl necessary for B-12 absorption
- Secretion of Picolinate (needed to absorb zinc)
  - Zinc needed to produce HCl

# Intestinal Digestive System

## Relative Importance of Site absorption within the Small Intestine

Location	Length	Exits to Blood
<b>Duodenum</b>	12-18 inches Susceptible To plaque Build up!	Chlorine, Sulfuric acid, Calcium, Magnesium, Iron, Zinc, Copper, Manganese Monosaccharides, Glucose, Galactose, Fructose B <sub>1</sub> , B <sub>2</sub> , B <sub>6</sub> , Folate, C Fat (i.e., short-chain fatty acids, long-chain fatty acids, and partially split glycerides) Fat Soluble vitamins A, D, E, H
<b>Jejunum</b>	10 feet	Disaccharides, sucrose, maltose, lactose Water-Soluble vitamins: thiamine, pyridoxine, riboflavin, folic acid Proteins and amino acids
<b>Ileum</b>	12 feet	Cholesterol Vitamin B <sub>12</sub> Bile Salts

# HOW THE DUODENUM BECOMES ALKALINE



# Proteins

Stomach → Pepsin → Duodenum →  
Pancreatic Protease → Peptide →  
Villi Enterocyte → Peptidases →  
Amino Acids → absorption

• Damaged gut wall → peptides (e.g. gluten/casein) leak through gut wall

**Best Proteins: Eggs, Fish, Meat (broiled, stewed, poached)**

# Protein Digestion

## Mouth:

- Chewing to Expose Surface Area
- Weak protease from sublingual glands

## Stomach:

- Plant (food) Enzymes & Salivary Protease
- Hydrolyze proteins for 30-60 minutes @ pH 5.0-6.0
- 30% Protein digestion @ pH >3.0
- HCl reduces pH to <3.0
- HCl activates pepsin
- Chyme enters duodenum @ pH >5.0

## Duodenum:

- Pancreatic Protease Reduces Long Chain Polypeptides
  - Short chain polypeptides, tripeptides, dipeptides and amino acids by amino peptidase & dipeptidase
  - Into Portal Vein

Portal Vein: Amino Acids transported to liver for metabolism

# Carbohydrates

- **Monosaccharides**
  - Glucose/fructose (fruit & vegetables, honey)
  - Galactose (soured milk) from lactose
- **Disaccharides (Disaccharidases from microvilli)**
  - Sucrose (also unripe fruit)
  - Lactose
  - Maltose (digestion of starch)
- **Poor Gut Lining** → **Damaged microvilli**
  - Disaccharides = substrate for pathogens (no absorption)

# Carbohydrate Digestion

- Mouth**
- Chewing to Expose Surface Area and Remove Cellulose
  - Parotids Secrete Amylase
  - Salivary pH @ 6.3-9.0 working range
- Stomach**
- Plant Amylase (Food) Enzymes & Salivary Amylase
  - Hydrolyze carbohydrates for 30-60 minutes @ pH 5.0-6.0
  - 40-85% of starches digested @ pH >3.0!
  - HCl reduces pH <3.0
- Duodenum**
- Pancreatic Amylase: Carbohydrates to Disaccharides (Maltose, Sucrose, Lactose)
  - Lactose & Maltose not absorbed into blood → gas, diarrhea
  - Sucrose absorbed into blood → kidney stress, constipation
- Jejunum**
- Microvilli secrete Lactase, Maltase, Sucrase  
Glucose → Blood
- Disaccharidases in Jejunum (Microvilli)**
- Lactase hydrolyzes Lactose → Glucose & Galactose
  - Sucrase hydrolyzes Sucrose → Glucose & Fructose
  - Maltase hydrolyzes Maltose → Glucose & Glucose

# Cellulose/Cellulase

- Cellulose = Glucose + SCFA
- **NOT Digestible by Humans!**
  - Discomfort from Raw Foods → Intestinal Gas
- Cooking Destroys Cellulose
- Thorough Chewing Destroys Cellulose
- Cellulase Found In: Apples, Pears, Papaya, Melons, Wheat, Millet

# Raffinose & Stachyose/Glucoamylase

- Abundant in Beans, Peas, Nuts, Seeds, Beets, Broccoli, Cabbage, Pumpkin, Oats, Wheat, Barley, Millet
- Glucoamylase not produced by Humans!
  - Undigested sugars feed bacteria  
→ gas



# Phytates/Phytase

Grains, Seeds, Nuts, Rhizomes



# Pectins/Pectinase

- Non-cellulose polysaccharide in Fruits & Vegetables
- Enzyme increase water solubility of fiber → Bind Toxins & Pre-biotic e.g. modified citrus pectin

# Where Hydrolytic Enzymes Are Found

- **Plants**
  - Ripening Process- Digestion
  - Predigestion in Humans
- **Digestive Tracts**
  - Salivary Glands
  - Stomach
  - Pancreas
  - Small Intestine
- **White Blood Cells**
  - Digestive Leukocytosis-Phagocytosis
  - Inflammation
- **Every Cell Wall**
  - Lysosomes
- **Inside Every Cell**
  - Catalase

# Lipid Digestion



## Mouth:

- Chewing to Expose Surface Area
- Weak Lipase from Sublingual Glands

## Stomach:

- Gastric Lipase, Plant (food) Enzymes and Salivary Lipase
- Hydrolyzed for 30-60 minutes @ pH 5.0-6.0
- 10% Fat Digestion at pH >3.0
- HCl reduces pH to <3.0

## Duodenum:

- Bile emulsifies fat
- Pancreatic enzymes hydrolyze fat
- FA's released from glycerol
  - FA's & Triglycerides & Diglycerides → absorption
  - SCFA: attracted to water → intestinal wall
  - LCFA → chylomicrons → lacteals (lymph) → systemic veins

# Large Intestine

- Length 3-5 Feet
- 2.5 Gallons Water per day (80% removal)
- Colon Bacteria
  - Lower pH
  - Synthesize vitamins A,B,K
  - Ferment Fiber
    - Create Short Chain Fatty Acids (Butyric, Propionic, Acetic, Valeric)
      - Energy For Colonic Cells
      - Deficiency = colitis, cancer, IBS
  - Excretion of Degraded Hormones (Beta-glucuronidase = cancer marker)
- Stool Transit Time: 1-2 B.M.'s/day
  - <12 hours: malabsorption
  - 12-24: optimal
  - >24: poor
  - Stool transit test: 5-6 charcoal tablets or 3-4 red beets
- Stool Excretion
  - Americans: Average 5 oz. stool/day
  - Africans (Traditional diet): Average 16 oz.stool/day
- Fiber
  - American Average Fiber: 12 grams/day vs. NCI recommendation: 20-30 grams/day
  - High Fiber-good when healthy flora is present!
  - High Fiber- bad when unhealthy flora is present

# Healthy Gut Eco-System

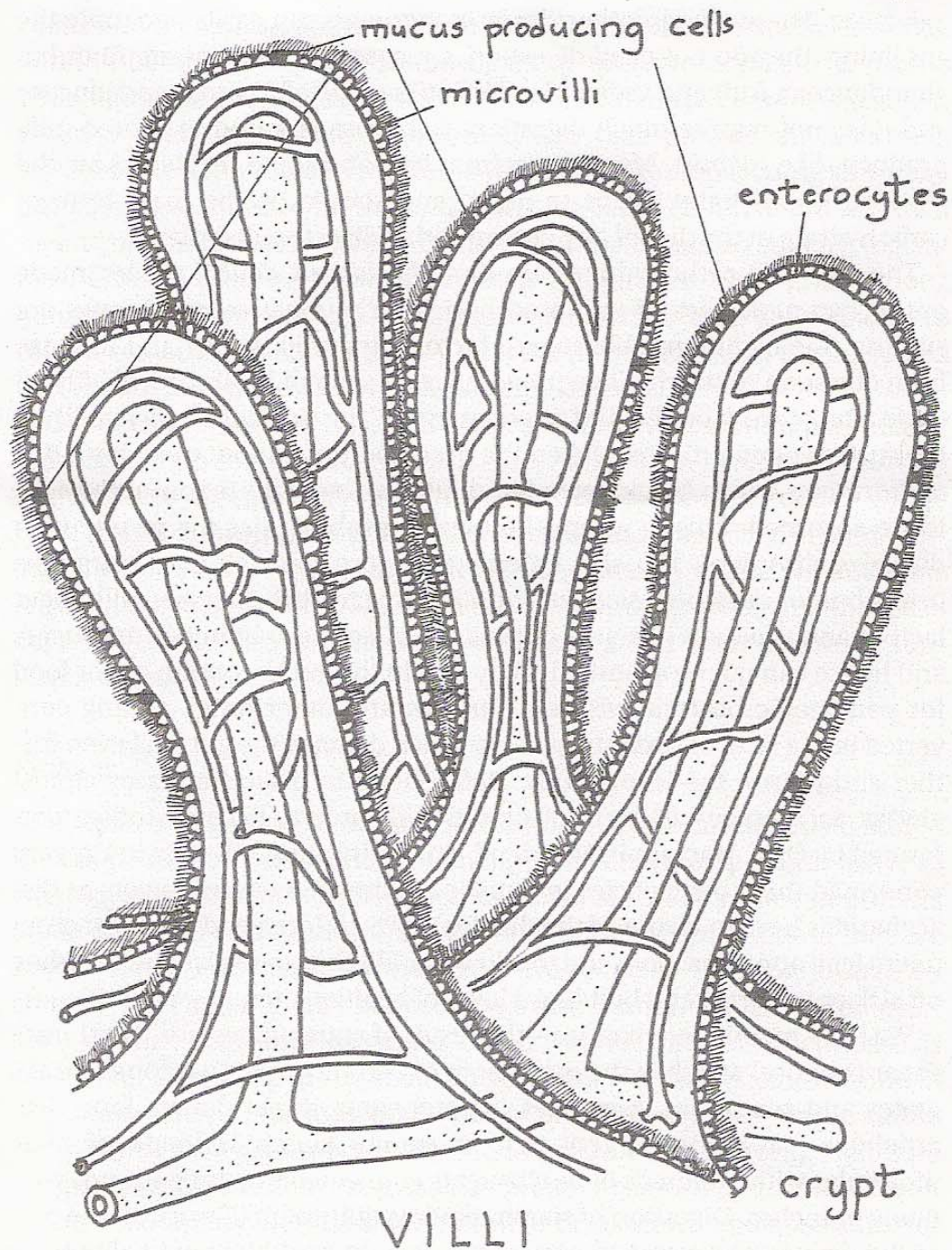
- 3-5 lbs of 500 species of Bacteria-greater than number of cells in the body! Only 30% identified!
- Essential: Bifido, Lacto, Propiono, E. coli, Enterococci, Peptostreptococci
- Gut flora produce steady stream of water-soluble B vitamins, amino acids, vitamin K.
- Produce antibiotics, anti-virals, anti-fungals
- Organic acids: Gut wall pH=4.0-5.0
- Immune substances: interferon, lysozyme, surfactants
- Neutralize toxins: nitrates, indoles, skatoles, phenols, histamine
  - chelate heavy metals
  - suppress hyperplastic processes
- Normal Gut Flora
  - Nourish gut epithelia (60-70% energy from bugs!)

# Main Bacteria Types in Our Bodies

Type	Aerobic/Anaerobic	Percent
<i>Bacteroides, twenty species</i>	Anaerobic	<b>Almost 50</b>
<i>Bifidobacterium</i>	Anaerobic	11
<i>Pepto streptococcus</i>	Anaerobic	8.9
<i>Fusobacteria, five species</i>		7
<i>Rheumanococcus, eleven species</i>		4.5
<i>Lactobacillus</i>	Both	<b>2-2.5</b>
<i>Clostridia</i>		0.6
<i>Enterobacteria, E. coli, Klebsiella, Aerobacteraerobacter, etc.</i>		Less than 0.5

# Opportunistic Microbes

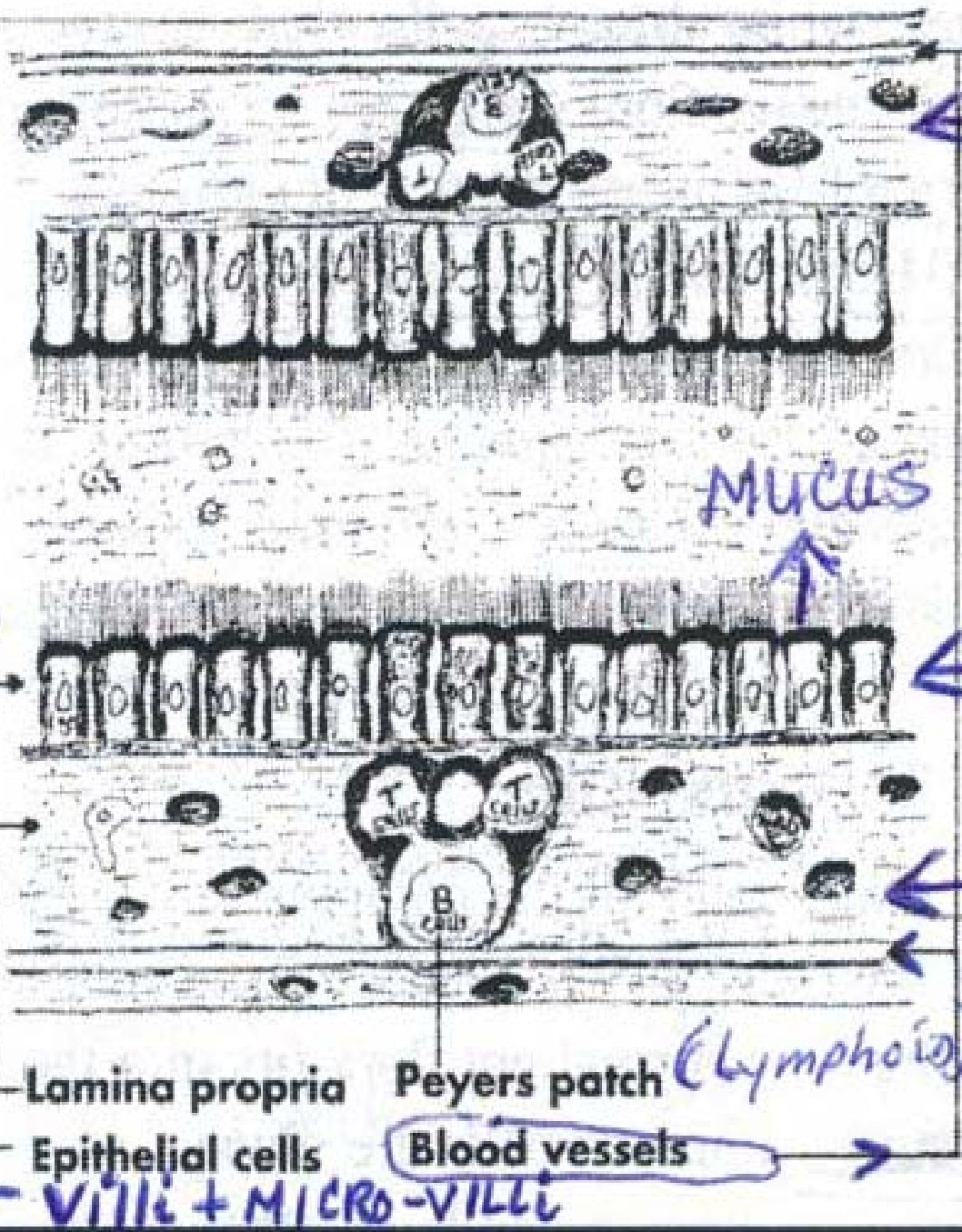
- Bacteroids, Peptococci, Staph, Strep, Bacilli, Clostridia, Enterobacteria (Proteus, Klebsiella, Citrobacteria), Fuzobacteria, Eubacteria, Catenobacteria
- Iron Loving: Actinomycetes, Mycobacteria, E. coli, Corynebacterium, etc.
  - Create anemia



Enterocytes begin in crypt as “stem” cells, mature as they migrate upwards into enterocytes, slough off every 3-5 days

# Gut Associated Lymphoid Tissue (G.A.L.T.)

- 70% Immune System Located in Gut
- Antigen  $\xrightarrow{\text{M-Cells}}$  Peyers Patches
- Peyers Patches (lymph nodes) 1-25 mm
  - Alert B-cells, T-Cells  $\longrightarrow$  Transport antigens to mucosa: macrophage ingestion
  - Filters Lymph (imprisons pathogens)
  - Produces Lymphocytes



LAMINA  
 PROPRIA  
 (CONNECTIVE  
 TISSUE + BLOOD  
 VESSELS)

G.A.L.T.  
 (25%)

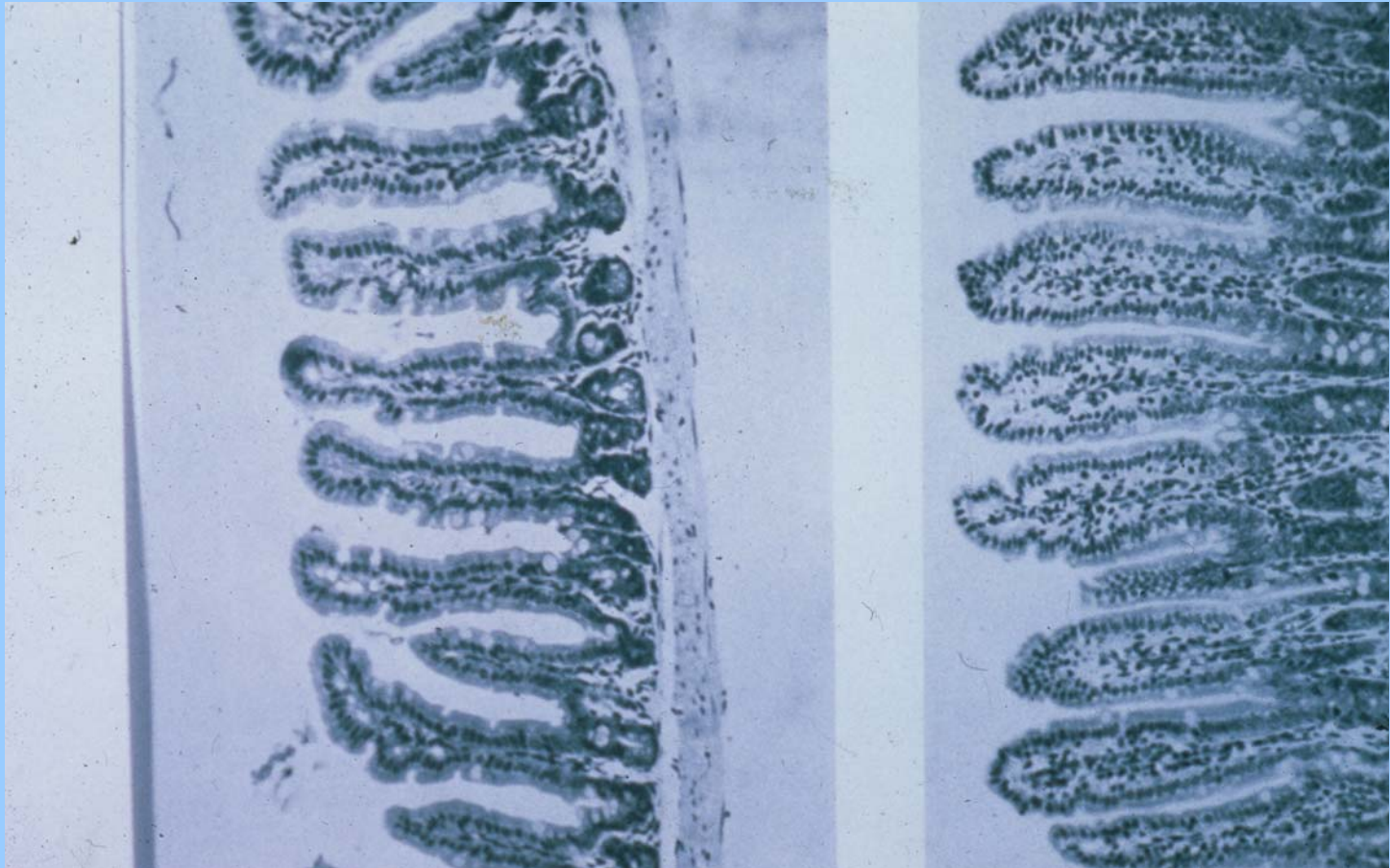
CD-4; CD-8,  
 Dendrocytes,  
 MAST CELLS

Lamina propria  
 Epithelial cells  
 Villi + MICRO-VILLI

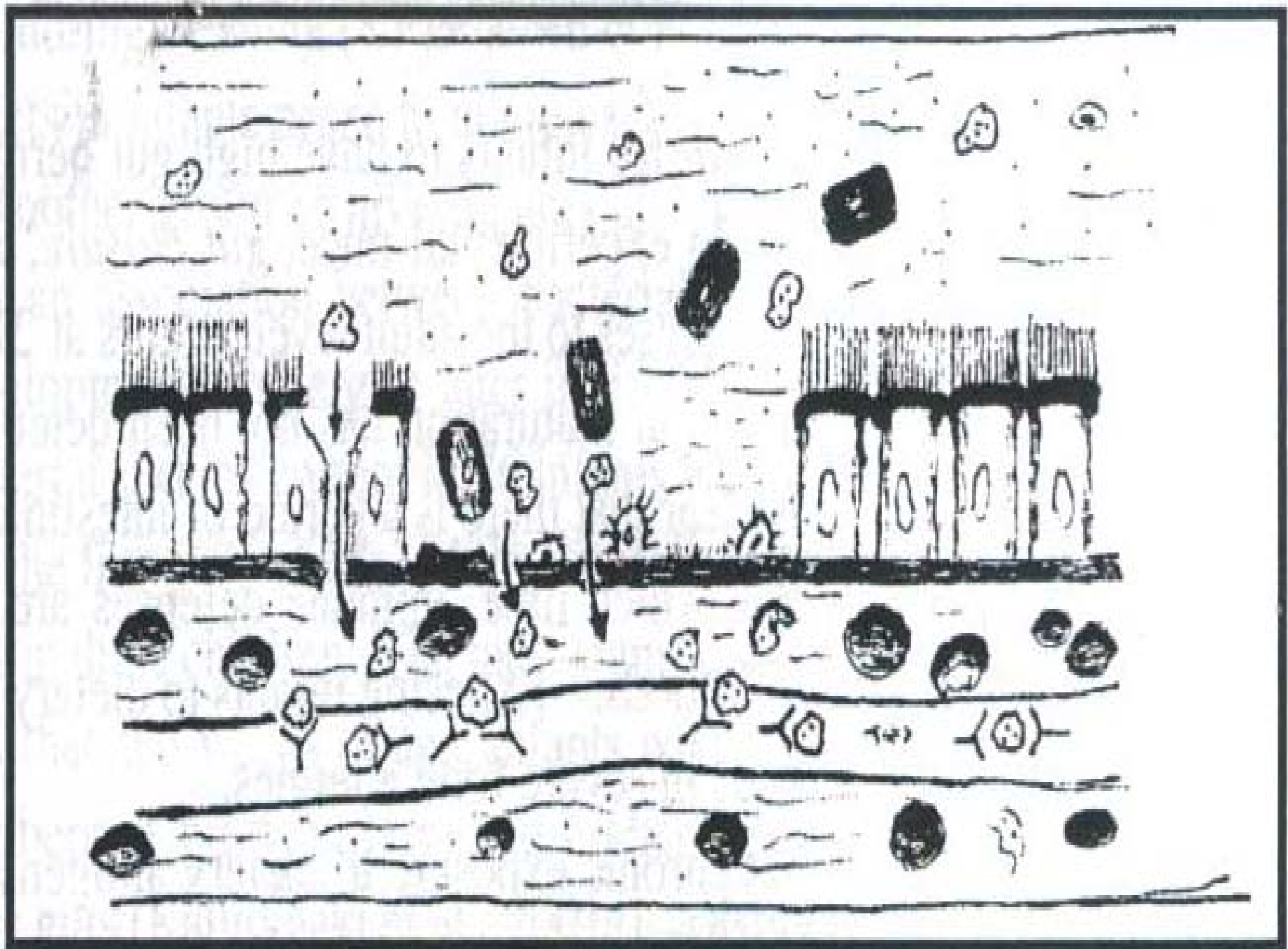
Peyers patch (Lymphoid)  
 Blood vessels

# The Gut's Immune System

1. Immune Exclusion: IgA Antibodies Enhanced by Probiotic Flora
  - Confine Infection to GI Tract
2. Immune Elimination: GALT Degrades Invaders
3. Immune Regulation: Based Upon Immune “Memory”
  - Specialized ‘T’ Cells (Memory Cells) → Rapid B-cell Antibody Response
  - Oral Tolerance: Memory of Beneficial (Harmless) Flora & Foods
    - Impaired by Inflammatory Reactions
    - Impaired by Immunosuppressive Influences (disease, drugs)
    - Impaired by IgA Deficiency
    - Gut organisms = Earliest & Largest Stimulus Upon Oral Tolerance
    - Age When Exposed, Duration of Antigen Exposure



Healthy villi vs. Unhealthy villi



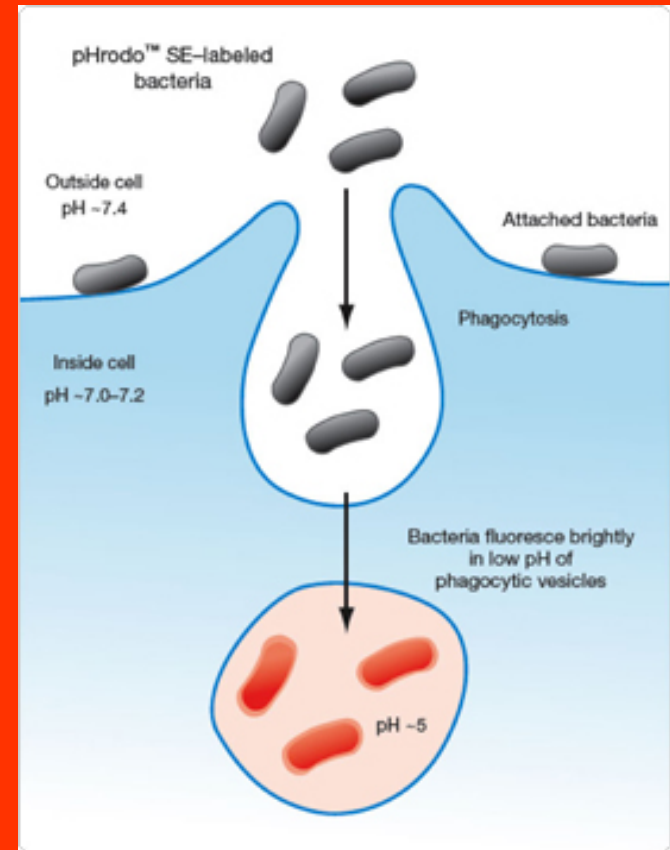
# When the Barrier is Breached

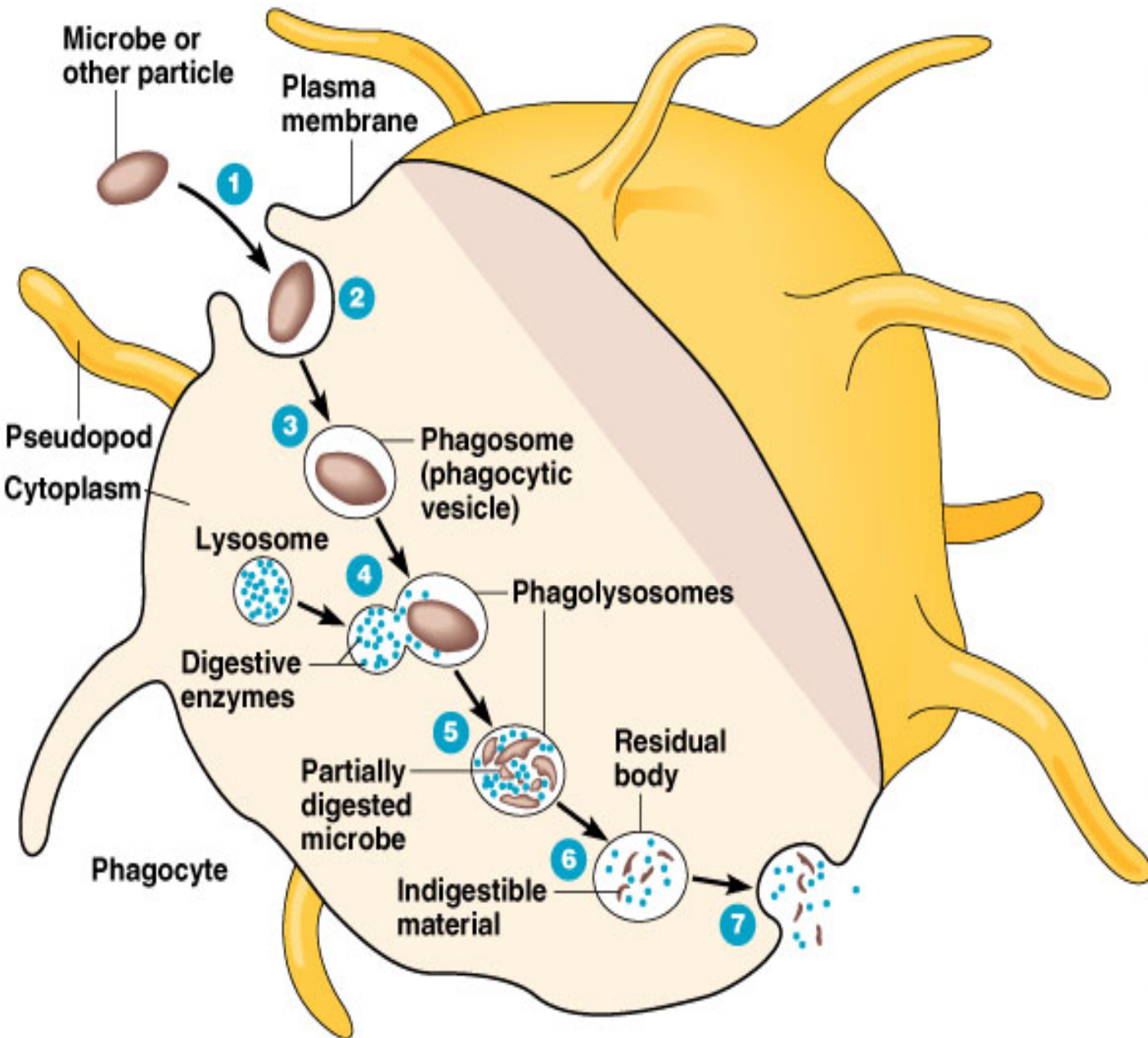


- Digestion is forced upon Leukocytes!
  - Digestive Leukocytosis
  - Researched by Paul Kouchakoff, MD in 1930
  - Raw/Frozen Food: No Leukocytosis
  - Cooked Food: Mild Leukocytosis
  - Canned Food: Moderate Leukocytosis
  - Refined Foods (sugar, carbs, sodas, alcohol): Severe Leukocytosis
  - Cured, Salted, Canned, Cooked Meats: The Worst Leukocystosis
  - Biggest Processed Meat Consumers: US Military & Babies

# Phagocytosis

- Occurs in a fraction of a second!
- Macrophages
  - 5X amount of neutrophils
  - Can engulf large particles
  - Can engulf necrotic tissue
  - Contain proteolytic (bacteria) and lipase (lipid membrane of T.B. etc.)



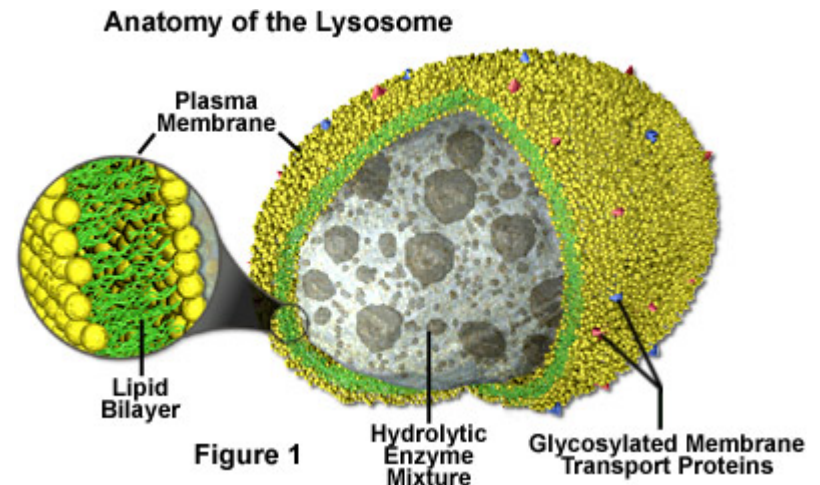
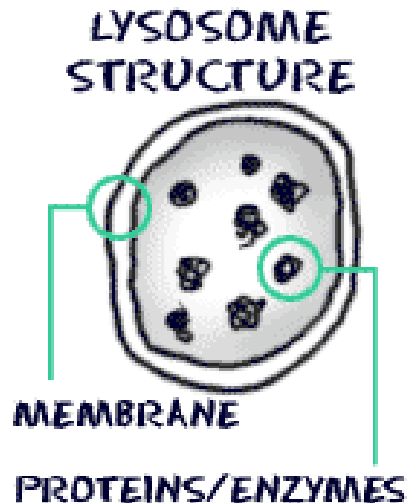


- 1** Chemotaxis and adherence of microbe to phagocyte.
- 2** Ingestion of microbe by phagocyte.
- 3** Formation of a phagosome.
- 4** Fusion of the phagosome with a lysosome to form a phagolysosome.
- 5** Digestion of ingested microbe by enzymes.
- 6** Formation of residual body containing indigestible material.
- 7** Discharge of waste materials.

**(a) Phases of phagocytosis**

# Lysosomes (Body of Enzymes)

- Sacs in cell membrane: digest debris following phagocytosis
- Autolysis: cell destruction following lysosome rupture



# Immune Alert: Circulating Immune Complexes (CIC's)

–Causes systemic inflammation

\* NSAIDS and Steroids (Prostaglandin Inhibitors) increase gut permeability (NSAIDS: 70 million Rx's/year (+) OTC's!)

–Extreme use: Stomach, duodenal ulcers

\* Antacids: Increase amount of undigested proteins and reduces mineral absorption

\* Antibiotics: Overgrowth of yeast/fungi → inflammation

\* CIC's & Leukocytosis: Leading cause of Fibromyalgia inviting more analgesics and anti-inflammatories!

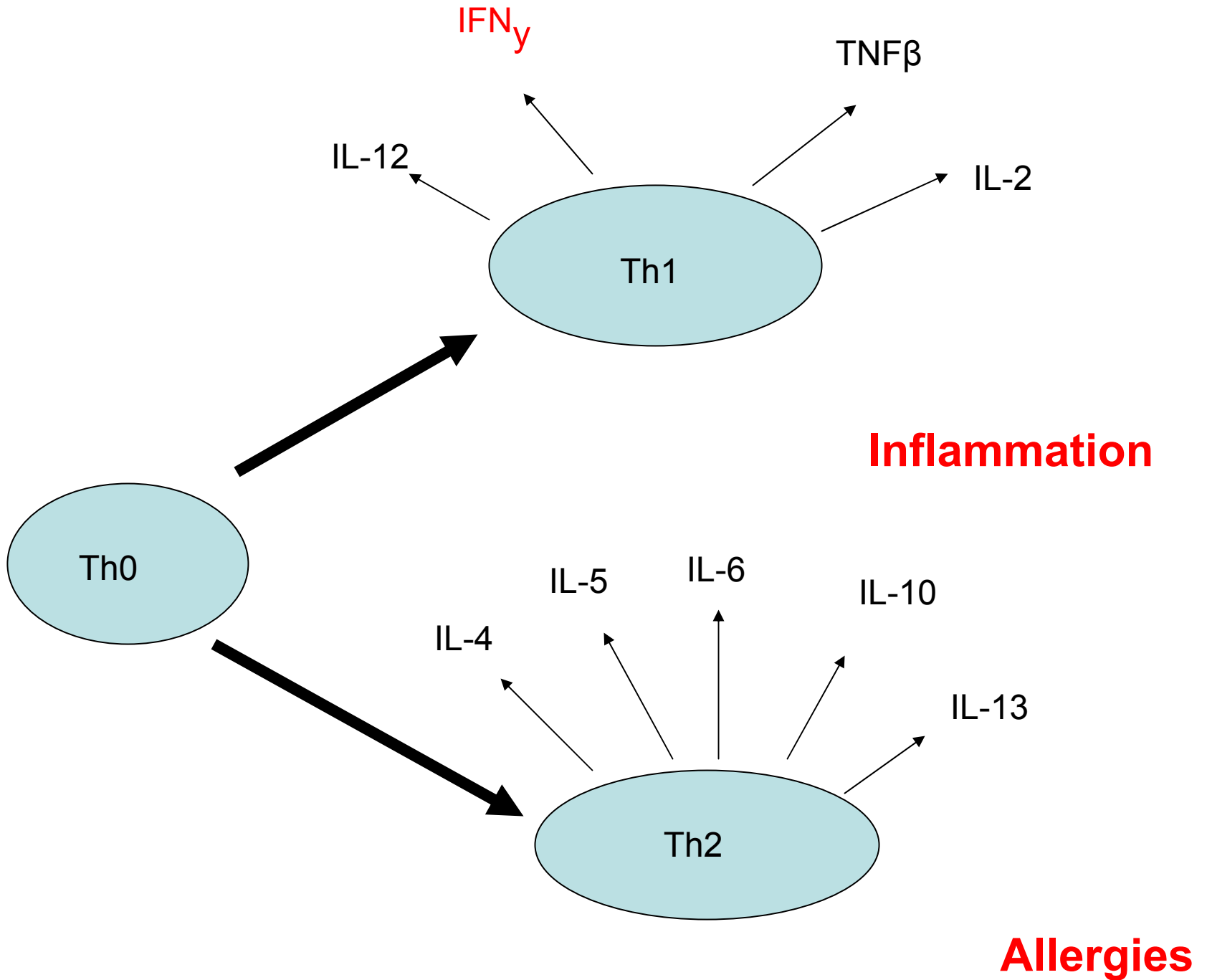
# Critical Care Medicine (1982; 10: 444-447)

ICU Patients: Gastric pH >4.0

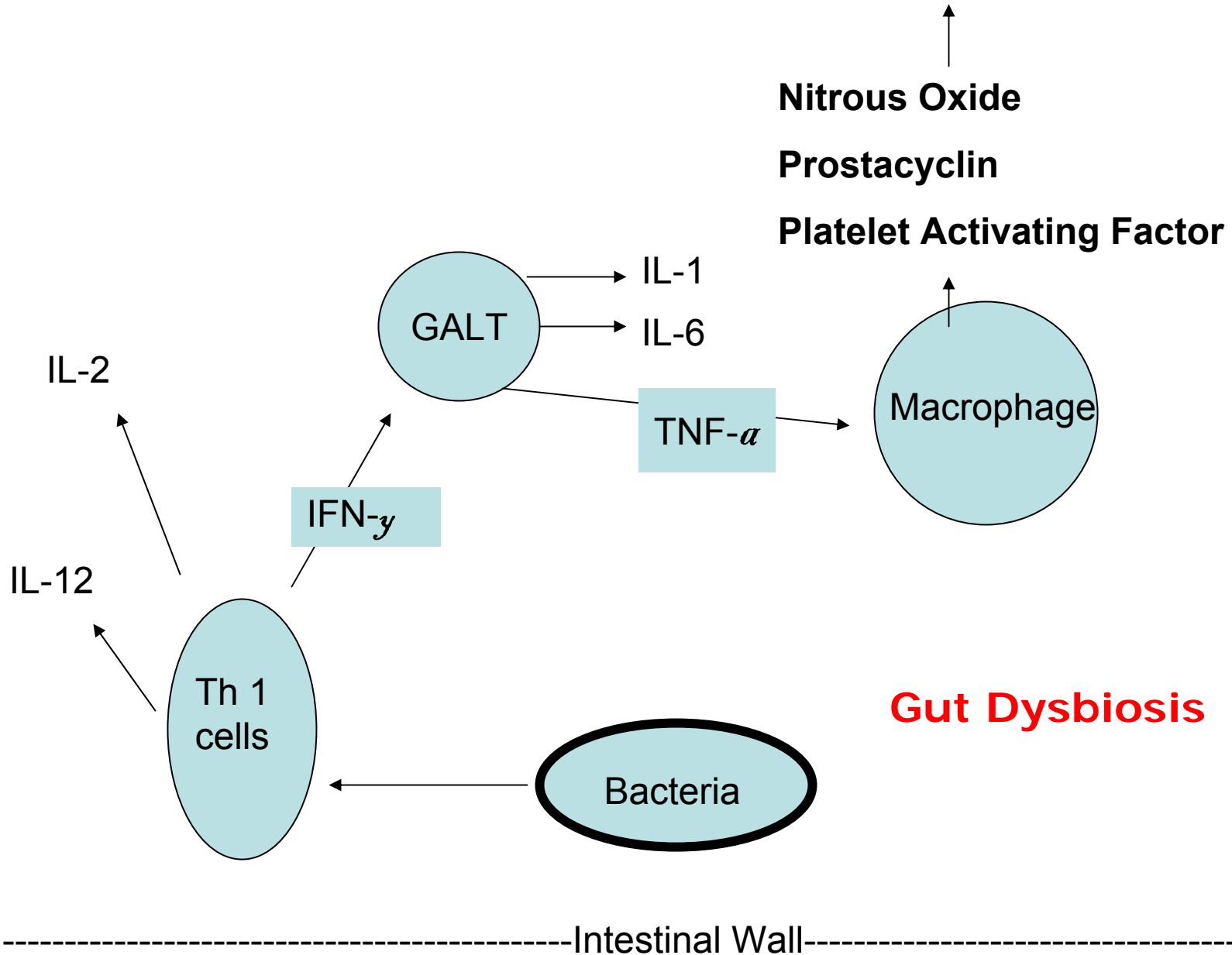
- Rapid Gastric Colonization of Organisms
- Bacteria & Virus Found in Oral Cavity

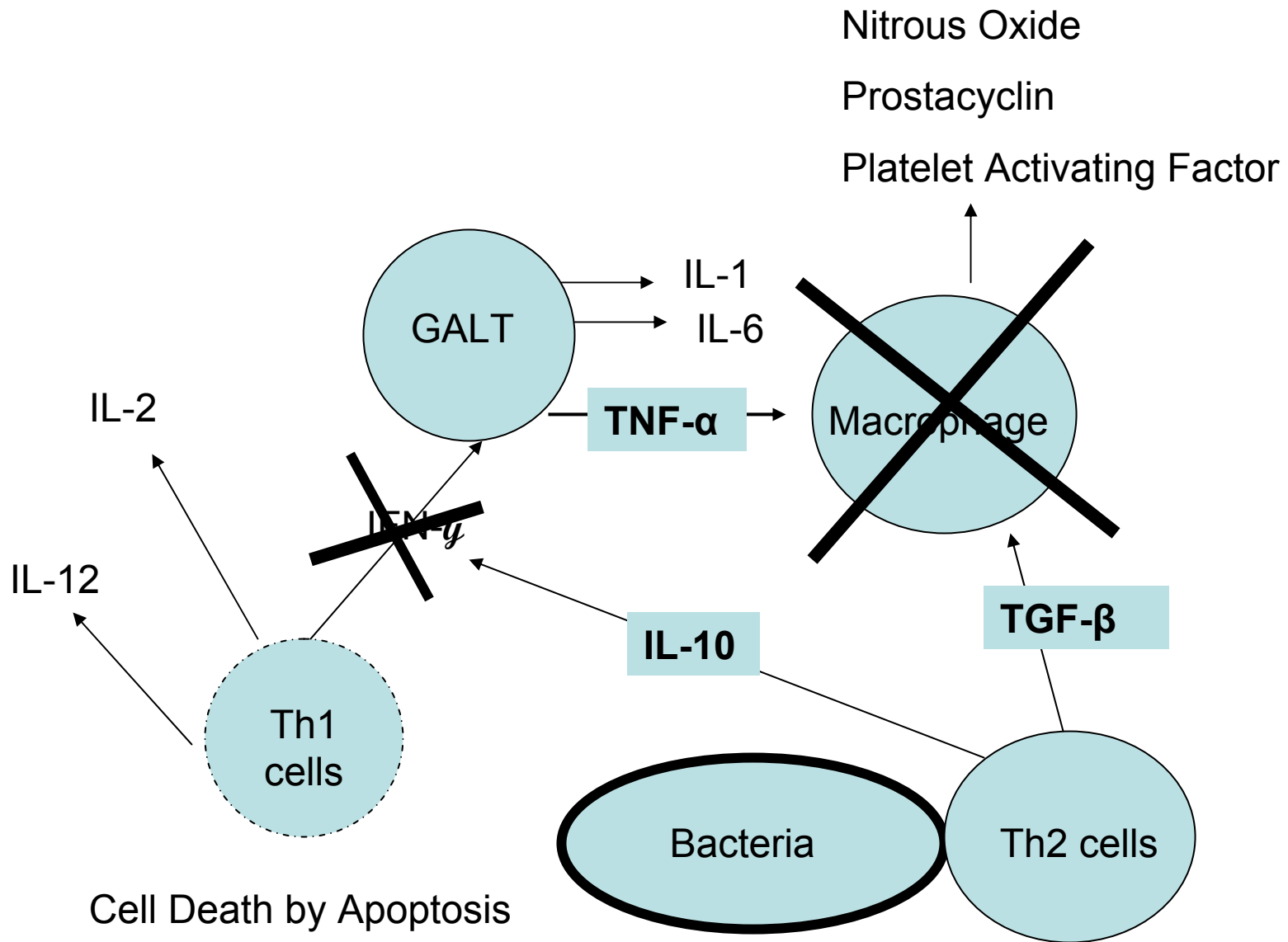
## Handy Guide to Your White Blood Cells, or Your Body's Cellular Army (Why Dirt is Good)

System	White Blood Cell Type	Function
Innate Immunity	Monocyte	Circulates in your blood until needed in the tissues; then exits the bloodstream and becomes a macrophage.
	Macrophage	The big eater-destroys invaders by engulfing and digesting them. Helps to activate T cells.
	Neutrophil	The most abundant white blood cell in your body. Circulates in the blood until needed in the tissues, then exits the bloodstream and destroys invaders by eating and digesting them. When this cell is frustrated by too much to eat it becomes bulimic and sterilizes the area with its "vomit."
	Mast cell	Granulocytic or flamethrower cell that fights parasites and is involved in allergic reactions.
	Eosinophil	Granulocytic or flamethrower cell that fights parasites and is involved in allergic reactions.
	Basophil	Granulocytic or flamethrower cell that fights parasites and is involved in allergic reactions.
	Natural killer cell	Cell that destroys a variety of invaders, including bacteria, viruses, tumor cells, fungi and parasites. Abbreviated as NK.
Adaptive Immunity	B cell	Antibody-producing cells.
	T cell	Cells that control the immune response.
	Helper T cell	A type of T cell that produces chemical signals to activate and direct the immune response. Abbreviated as Th.
	Killer T cell	T cells that directly attack and destroy cells infected with viruses or changed by cancer processes. Also called a cytotoxic T lymphocyte (CTL).



# Inflammation of Intestinal Wall





**Gut Microbial Homeostasis**

# Symptoms of Indicanuria (Intestinal Toxemia)

- Skin-Hair-Nails
  - Dermatitis
  - Eczema
  - Psoriasis
- Eyes-Ears-Nose-Sinuses
  - Diseases of nasal accessory sinuses
  - Diseases of middle and internal ear
  - Eye strain
- Genitourinary
  - Foul odor to urine
- Cardiovascular
  - Tachycardia
  - Cardiac arrhythmias
  - Migraines
- Endocrine System
  - Breast pathology
  - Eclampsia
  - Thyroid goiter
- Musculoskeletal System
  - Arthritis
  - Low back pain and sciatica
  - Fibromyalgia and myofascitis
- Respiratory System
  - Asthma
- Gastrointestinal
  - Gas and bloating
  - Constipation
  - Crohn's disease
  - Diarrhea
  - Food allergies
  - Foul Stool Odor
  - Gastritis-Heartburn-Hiatal hernia
  - Inflammatory bowel disease
  - Ileocecal valve
  - Mal-assimilation-Weight loss
- Mouth-Throat
  - Body Odor-Halitosis
- Nervous System
  - Depression and melancholy
  - Epilepsy
  - Excessive worry
  - In-coordination
  - Irritability
  - Lack of confidence
  - Loss of concentration and memory
  - Mental sluggishness and dullness
  - Schizophrenia
  - Senility
  - Sensory polyneuritis

# The Body's Defense Against Autointoxemia

1. Adequate HCl and pepsin in stomach.
2. Adequate bile secretion to emulsify fats.
3. Adequate pancreatic enzyme production.
4. Healthy microvilli in Jejunum to convert disaccharides to simple sugars.
5. Healthy intestinal flora.
6. Healthy mucus to trap undigested food remnants and provide mucosal antibodies to neutralize them.
7. An intact intestinal barrier to disallow large undigested molecules and allowing absorption of digested nutrients.
8. Gut Associated Lymphoid Tissue (GALT) of healthy Peyers Patches to neutralize invaders passing through mucosal barrier.
9. Healthy crypt that replaces epithelial lining daily.
10. Plant (food) enzyme rich diet, either from raw or fermented foods that pre-digest proteins, fats and carbohydrates.
11. Healthy oral cavity and adequate mastication (chewing) to release enzymes, increase surface area, remove cellulose and activate salivary enzymes.
12. Fermentation metabolites that detoxify, nourish indigenous flora.

# PRE-BIOTIC

## Food Sources (Fruits/Vegetables)

- Onions
- Garlic
- Leeks
- Chicory
- Asparagus
- Jerusalem Artichokes
- Bananas
- Kefir



# PRE-BIOTIC REQUIREMENTS

Healthy Bowel Needs: 4-8 gms/day

Clinical Trials: 10-15 gms/day

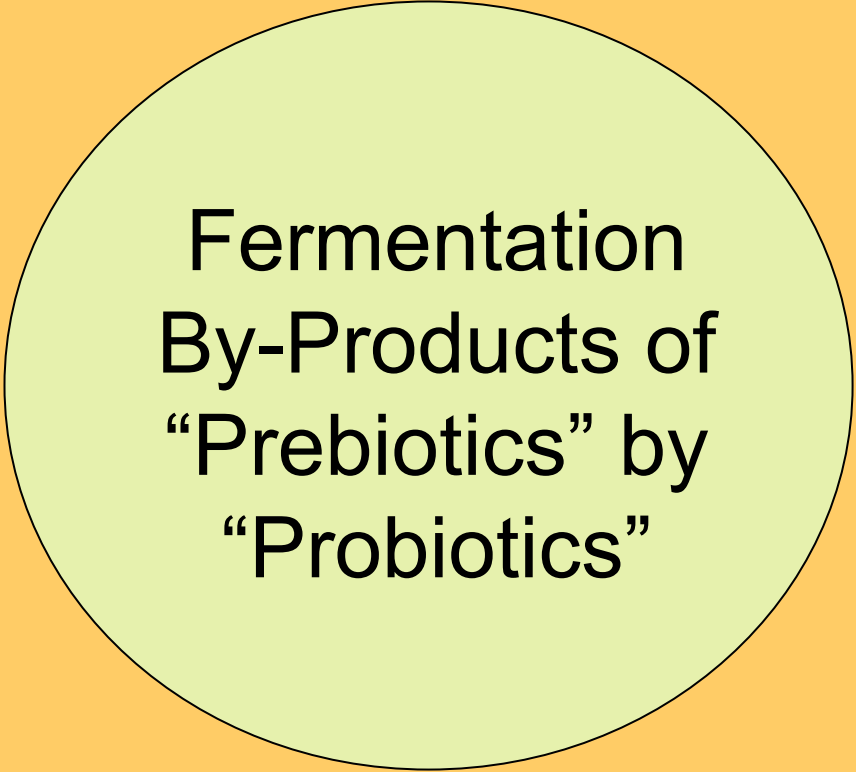
Western Diet: 2 gms/day

# Possibly Useful Pre-biotics

Arabinogalactose	Palatinose
Fructooligosaccharides	Polydextrose
Inulin	Pyrodextrin
Isomatooligosaccharides	Raftiline
Lacitol	Sorbitol
Lactulose	Soybean oligosaccharide
Manitol	Xylooligosaccharides/ Xylitol
Oligomate	

## Short Chain Fatty Acids (SCFA)

- Acetic
- Propionic
- Butyric
- Lactic
- Succinic



Fermentation  
By-Products of  
“Prebiotics” by  
“Probiotics”

# Pre-biotic Benefits

- Improve Calcium Absorption
- Improve Lipid Levels
- Inflammatory Bowel Disease
- Gallstone
- Colon Cancer Protection
  - VFA's
  - Mucosal secretion
  - Enzyme Stimulation (Gs-Trans)

# Pre-biotics and Infant Diarrhea

Four Days Treatment  
(62 Infants, Ages 5-12 Months)

Cooked Bananas	78% Improvement
Pectin	82% Improvement
Rice Based Diet	23% Improvement

# SCFA BENEFITS

- Supply Energy to Epithelial Cells (70%!)
- Up to 10% of Total Body's Energy Needs (Liver, Muscle)
- SCFA = Recovered, Recycled Energy Not Lost in Stool
- Supply Energy to Bacteria
- Amounts and Ratios of SCFA Depend Upon
  - Diet!
  - Bacterial Species
  - Length of Time Food is in Gut
- SCFA in Large Intestine (Colon): Have Constant Amounts and Types Because of Many Bacterial Species
- Lowers Blood Sugar and Blood Cholesterol

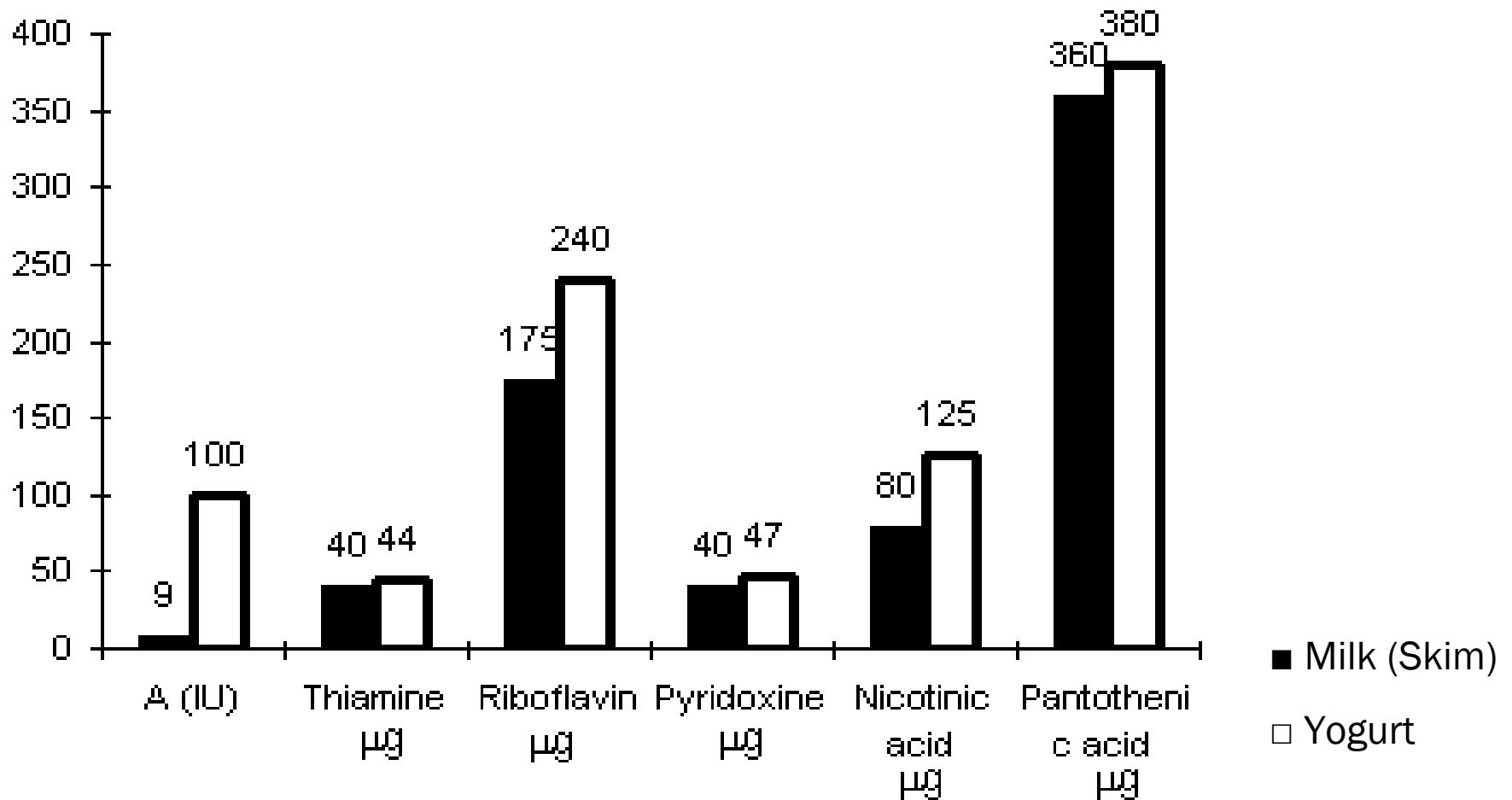
# Beneficial Butyric Acid

- Modulates and Stimulates Intestinal Cell Growth
- Maintains Intestinal Homeostasis
- Vital Role in Cell Differentiation
- Growth Inhibitor of Cancer Cells
- Facilitates Cell Migration and DNA Repair (Prevents Cancer Mutations)
- Regulates Gene Expression
- Programs Apoptosis

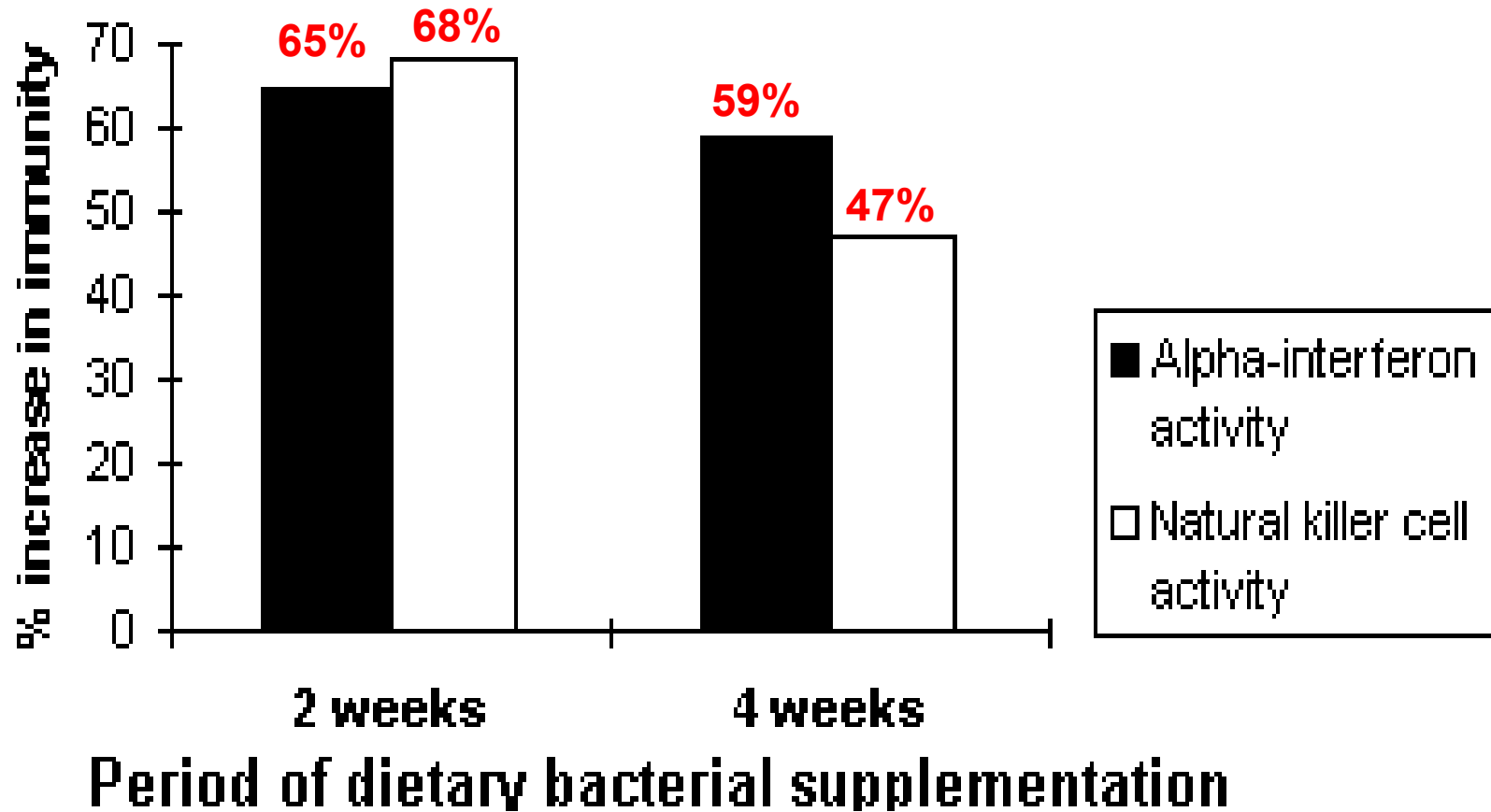
# BACTERIOCINS ISOLATED FROM DIFFERENT LACTOBACILLUS SPECIES

<b>Substance</b>	<b>Producing species</b>	<b>Substance</b>	<b>Producing species</b>
<b>Acidolin</b>	<b>L. acidophilus</b>	<b>Lactolin</b>	<b>L. plantarum</b>
<b>Acidophilin</b>	<b>L. acidophilus</b>	<b>Plantaricin B</b>	<b>L. plantarum</b>
<b>Lactacin B</b>	<b>L. acidophilus</b>	<b>Lactolin 27</b>	<b>L. helveticus</b>
<b>Lactacin F</b>	<b>L. acidophilus</b>	<b>Helveticin J</b>	<b>L. helveticus</b>
<b>Bulgarin</b>	<b>L. bulgaricus</b>	<b>Reuterin</b>	<b>L. reuteri</b>
<b>Plantaricin SIK-83</b>	<b>L. plantarum</b>	<b>Lactobrevin</b>	<b>L. brevis</b>
<b>Plantaricin A</b>	<b>L. plantarum</b>	<b>Lactobacillin</b>	<b>L. brevis</b>

# Vitamin Content of Milk & Yogurt



# Effect of Dietary *L. brevis* on the Immune System Response



# Enhanced Nutrient Content of Selected Dairy Foods (Fermentation)

Fermentation = Exogenous Digestion, or Pre-Digestion

Original Food	Fermented/Cultured Food	Increased Nutrition
Milk	Cheddar Cheese	Vitamin B1, 3X
Milk	Cottage Cheese	Vitamin B12, 5X
Milk	Yogurt	Vitamin B12, 5-30X
Milk	Yogurt	Vitamin B3, 50X
Skim Milk	Low-fat yogurt	Vitamin A, 7-14X

# Probiotic Effects on Cold & Influenza Symptoms in Children

## 326 Children (3-5yrs); 2x/Day for 6 Months vs. Placebo

	Fever Reduction Incidence	Coughing Incidence	Rhinorrhea Incidence	Fever Duration	Antibiotic Use	Days Absent In Childcare
L.acidophilus NCFM (Alone)	↓ 53%	↓ 41.4%	↓ 28.2%	↓ 32%	↓ 68.4%	↓ 31.8%
Bifidobacterium (+) L. acidophilus NCFM animalis lactis (Bi-07)	↓ 72.7%	↓ 62.1%	↓ 58.8%	↓ 48%	↓ 84.2%	↓ 27.7%

# Food Allergies in Children in US

- 2007: 3.9% Children <18
- 1997-2007: 18% Increase
- 2003-2006: Estimated 317,000 food allergy visits to physicians, hospitals
- 1998-2000: 2,600 hospital discharges
- 2004-2006: 9,500 hospital discharges



Pediatrics 2009; 124: 1549-1555

# Pro & Synbiotics Control Inflammation & Infection

## 72 patients/15 day administration

- L. paracasei, paracasei; L. plantarum; P. pentosadeus; Leuconostoc mesenteroides; inulin, pectin, betaglucan
  - Effective eliminator of C. difficile
  - Reduction in Liver Transplant Infections: 3% vs 51% controls
  - Reduction in pancrea to duodenectomy infections: 12.5% vs 40% controls
  - Reduction in infection rate in severe pancreatitis: 7% vs 52% controls
  - Reduction in infection in abdominal cancer surgery: 7% vs 20% controls
  - Septic phenomena reduced: 49% vs 77% controls
  - Reduced number of days on mechanical ventilation: 16.7 days vs 29.7 days control
  - Reduced number of days in ICU: 27.2 days vs 41.3 days

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# Testing

- CSDA (Comprehensive Digestive & Stool Analysis)
  - Levels & Types of bacteria, Candida
  - Efficiency of Protein, Fat, Carbohydrate Digestion
  - Levels of Pancreatic Enzymes
  - Short Chain Fatty Acids & Butyric Acid
  - Dysbiosis Index
- Leaky Gut Syndrome/Intestinal Permeability
  - Mannitol & Lactulose Test
  - Mannitol/Lactulose Mixture Followed by Urine Collection for (6) Hours

# Digestive Relief For Distress

- Betaine HCl (200-300 mg) & Pepsin (100 mg Pepsin)
- Apple Cider Vinegar (1) tsp/glass of water
- Digestive Enzymes
  - Digestitol (Pancreatic) (National Enzyme Co): 1 capsule per meal. Mega-Zyme (Enzymatic Therapy), Wobenzyme (Douglas Labs)
  - N-Zimes (Plant Enzymes) (National Enzyme Co.): 1-2 capsules per meal and 1 capsule in between meals (Omega-Zyme)
- Pro-biotics: First thing in the morning or in between meals
  - Nature's Biotic
  - Primal Defense, Thera-Lac
  - Kefir, Yogurt
- Swedish Bitters: 30 minutes prior to eating stimulates HCl and Liver
- Sauerkraut, kim chi, miso, etc.
- Zinc aspartate: 40-50 mg Zn; necessary for HCl synthesis
- Chew Thoroughly

# Bone Broth Miracle

1. Beef, Lamb, Fish, Poultry or Pork bones
    - Include attached meat, skin, fat, fish heads, chicken feet
    - Pasture, ecologically raised –not CAFO meats!
  2. Cover desired amount of bones with water in a covered pot (stainless steel or porcelain)
    - Add (2) Tbl. of Apple Cider Vinegar, Red Wine Vinegar, or Lemon Juice per Quart of Water
    - Allow to sit at room temp. for 30(+) minutes to let acids “work”
  3. Bring to a boil; immediately reduce heat to simmer
  4. Cover and simmer for:
    - 4-6 hours for Fish
    - 6-8 hours for Poultry
    - 12-18 hours for Lamb, Beef, Pork
  5. Decant liquid and consume immediately as:
    - Tea, soup or gravy
    - Use as liquid to cook rice, beans, grains (after soaking them overnight to remove phytates)
- OR
6. Add vegetables of choice and simmer with meats the last 30 minutes
  7. Add preferred seasonings, salt, pepper, butter, olive oil to taste
  8. Storage
    - Refrigerator for 5 days
    - Store in Freezer (e.g. (1) quart jars [leave 2” from top of jar to allow for expansion] store for several months)
    - **Do not reheat in Micro-wave:** Conversion of Amino Acids to Toxic Forms (Lancet 89;2(8676):1293-93)

# Galactic Glycine

- Most Common of all Amino Acids
- Non-Essential Amino Acid - Made By Essentials
- Synthesis of Glycine Requires High Quality Dietary Protein Containing Essential Amino Acids (e.g. Eggs!)
- Found in Whey Protein Concentrate/Isolate
  - Whey Protein Protects GI Tract from Ulcers!  
(Biosci Biotechnol Biochem 01;65(5):1104-1111)
- Gelatin is a Rich Source of Glycine
  - Glycine Stimulates Stomach Acid Secretion!  
(J Clin Invest 76;58:623-631)
- Dr. Francis Pottenger, MD: Adding Gelatin to Meals Improved Digestion of all Foods
- Edgar Cayce: Gelatin Assists Digestion of Raw Vegetables and Salads
- Gelatin: A Great Source of Hyaluronic Acid
  - Makes up Synovial Fluid in Joints

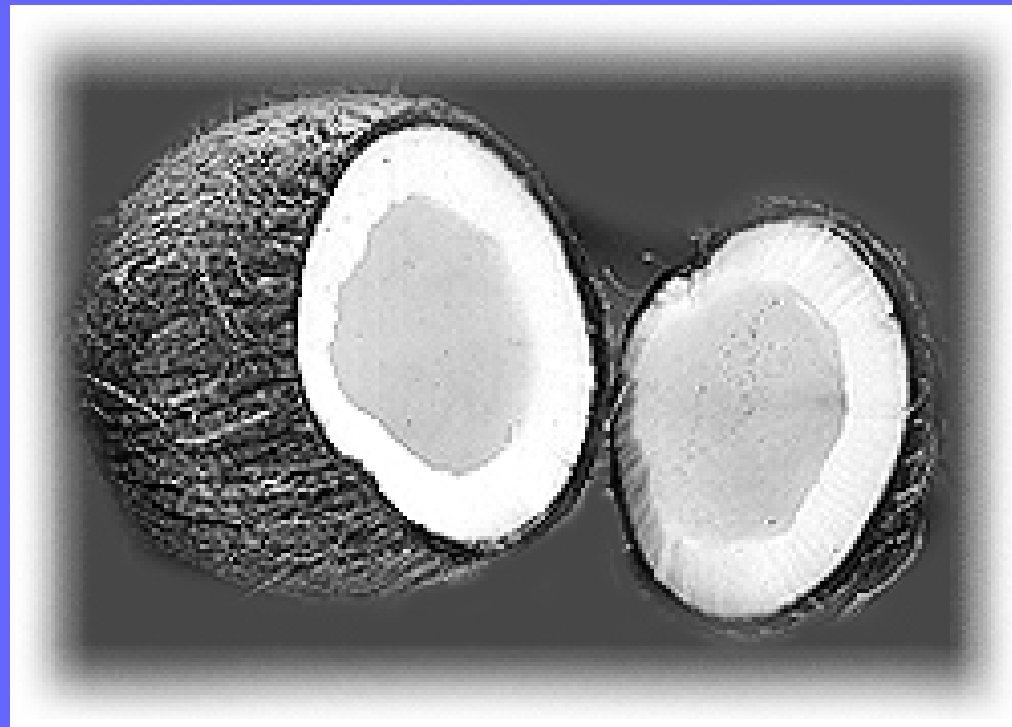


# Digestive Healing Modalities

- Licorice DGL: increases healing prostaglandins for mucous secretion, cell proliferation. Chew 2-4 tablets 3X/day
- Aloe Vera Juices
- Gamma-Oryzanol (from rice bran oil)
  - 100 mg 3X daily for 3-6 weeks (minimum dose/minimum duration)
  - Very effective for ulcers, gastritis, IBS
  - Normalizes TG, cholesterol
- Cabbage Juice: one quart daily for two weeks
- Glutamine: 8 grams/day for four weeks

# COCONUT OIL

- **Contains medium chain fatty acids**
- **Rich in anti-microbial lauric acid**
- **92% saturated = very resistant to rancidity**



# Coconut Complexity

- Medium Chain Fatty Acids (63%)
  - Lauric Acid (48%) → Monolaurin (Lauricidin)
  - Caprylic Acid (8%)
  - Capric Acid (7%)
  - MCFA: Anti-yeast, anti-viral, anti-bacterial, anti-parasitic
  - MCFA → stomach portal vein → liver → energy
  - Thermogenesis increases by up to 50%
  - 5-6 Tbsp. daily

# Some Beneficial Constituents in Butter

(Source: Fallon, 1995)



Benefit	Description
Wulzen (anti-stiffness) factor	Protects against degenerative arthritis, hardening of the arteries & cataracts
Short & Medium Chain Fatty Acids	About 15% of butterfat. Absorbed directly by the small intestine without emulsification by the bile. Antimicrobial, anti-tumor, immune stimulating, antifungal
Conjugated Linoleic Acid	Anticancer
Glycosphingolipids	Protect against gastrointestinal infections
Trace Minerals	Chromium, iodine, manganese, selenium & zinc

# Candida Remedies

- Tanalbit (Plant tannins)
- Mathake (South American Herb)
- Lactoferrin-300 mg 1-3X/day
- Cilantro Extract
- Samento
- Silver (Hydrosol or Ionized- Argentyn 23/Sovereign Silver)
- Garlic (Raw)
- Grapefruit Seed Extract
- Oil of Oregano (Oregacillin)
- Monolaurin (Lauricidin)
- Caprylic Acid

# Summary Suggestions For GERD

- Avoid Simple Carbohydrates, Grains, High Fiber Diets
- Consume Fermented Foods (Kefir, Yogurt: dairy or coconut)
- Take Enzymes & probiotics
- Eat Slowly
- Eat Small, but more frequent meals
- Regular, moderate exercise
- Minimize Stress (!)
- Sleep 8 hours
- Avoid Fried Foods
- Avoid meals 2-3 hours before bedtime
- Candida-Free Diet
- Bone Broth Soups!
- Eat Healthy Fats (e.g. coconut, butter, pastured lard)
- Correct Hiatal Hernia with Chiropractic/Acupuncture
- Meditation/Yoga/Prayer

# Reading Bibliography

- Gut and Psychology Syndrome by Natasha Campbell-McBride, M.D.
- Bacteria For Breakfast by Kelly Dowhower Karpa, PhD.
- Why Dirt is Good by Mary Rue Bush, PhD.
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- Enzymes, The Key to Health by Howard Loomis, D.C.
- Ferment and Human Nutrition by Bill Mollison
- Digestive Wellness by Elizabeth Lipski, M.S.
- Natural Stomach Care by Anil Minocha, M.D.
- Healing Digestive Disorders by Andrew Gaeddert
- Optimal Digestive Health by Trent Nichols, M.D. & Nancy Faass, MSW
- Normal Blood Test Scores Aren't Good Enough by Ellie Cullen, RN
- Stop Inflammation Now by Richard Fleming, M.D.
- Truly Cultured by Nancy Lee Bentley
- Wild Fermentation by Sandor Katz
- The Body Ecology Diet by Donna Gates
- Nourishing Traditions by Sally Fallon
- Nutrition and Physical Degeneration by Weston A. Price, DDS

# The End

