



Coffee: New Trends That Capture **Value**

Loretta Zapp, CEO
Applied Food Sciences Inc.

Applied Food Sciences Inc.

Health & Wellness company dedicated to providing nutritional solutions to the food, beverage and supplement industries via plant based natural selections.



Applied Food Sciences Inc.



Functional
Ingredients



Custom
Formulations



Product
Development



Research &
Clinical
Efficacy
Testing

Nutritional Solutions

Agenda

Top Trends

- Increase in Health & Wellness
- More individuals are Self-Treating and focusing on prevention
 - **ANTIOXIDANT AWARENESS**
- Incidence of Disease continues to increase – **Weight Management**
- Consumers are Searching for **Healthy ENERGY**
- Increase in Topicals from plant based origins & beauty from within - **NutriCosmetics**

Case Studies

- HealthyRoast® – Caffe Sanora



- GCA® – Green Coffee Extract

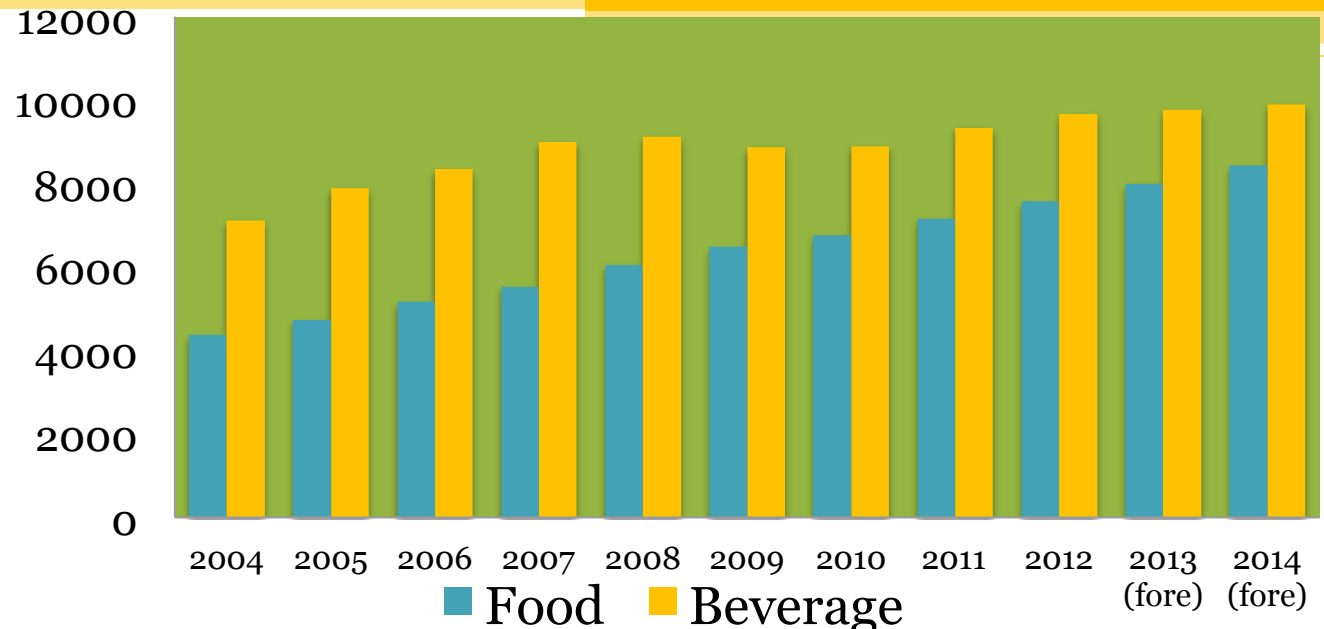


TREND 1

Antioxidant Demand continues to increase

COFFEE ANTIOXIDANTS POLYPHENOLS

Functional Foods/Beverages
(\$MM), 2004-14



Consumer Awareness

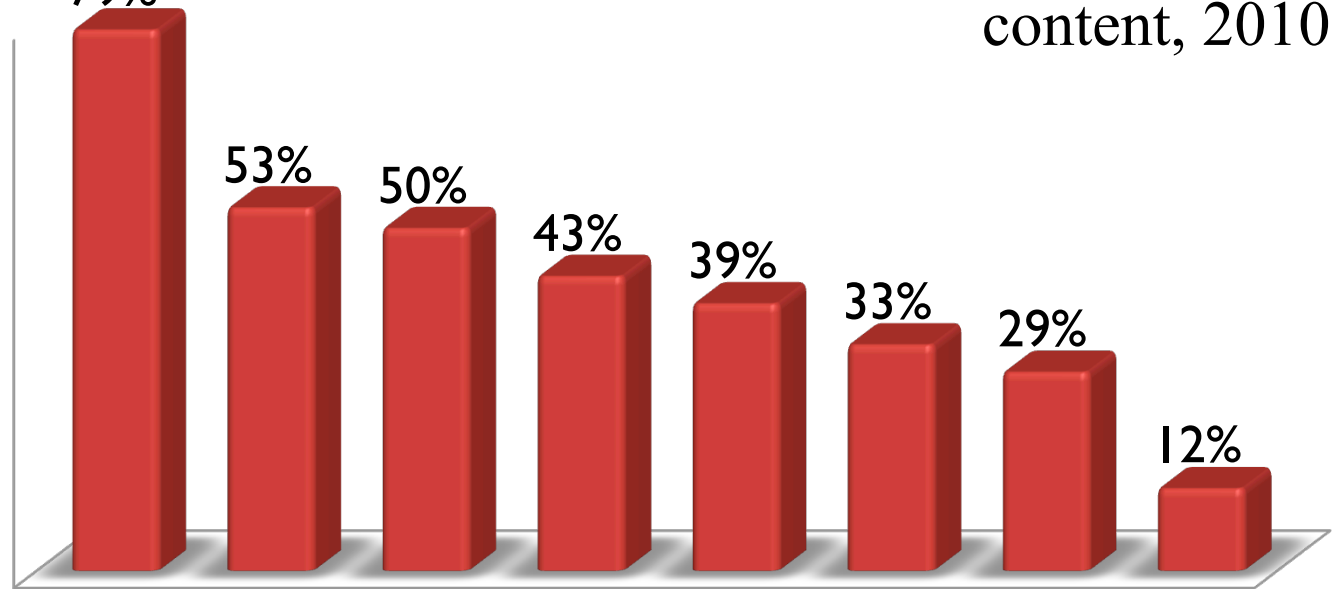
Percent of US Consumers who have purchased food & beverage products in the last 12 months because of specific nutritional content, 2010

86%
GET IT

60%
BUY IT

68%
WANT MORE OF IT

80%
70%
60%
50%
40%
30%
20%
10%
0%



Any

Antioxidants

Vitamins / Minerals

Calcium

Fiber

Protein

Omega's

Probiotics / Prebiotics

Coffee's Natural Antioxidants

- Green coffee beans contain on average between 6% - 10% polyphenol antioxidants
- These water soluble antioxidants have primary and secondary benefits to human health
- Coffee's antioxidants are called polyphenols.
- These polyphenols are water soluble making them readily available for physiological utilization
- Quickly absorbed into the blood stream for abrupt antioxidant activity
- Have secondary mechanisms of action by mediating glucose metabolism
- Emerging science is unfolding the scientific story

Coffee's Antioxidants: Polyphenols

What are polyphenols?

- Polyphenols are a group of antioxidants that are capable of neutralizing free radicals before they cause harm to our body's cells and primary organs by protecting our DNA against oxidative damage (aka **Oxidative Stress**)
 - Polyphenol bioactives affect vascular function, signaling and anti-inflammation activity
 - Reduce Blood Pressure (aka hypertension) increase endothelial function
 - Increase Cell Longevity and reduce negative cell growth by reducing negative gene expression
- Oxidative stress, the consequence of an imbalance of prooxidants and antioxidants in the organism



Oxidative Stress Drives:

- CELL DAMAGE AND DEATH
- DNA DAMAGE
- HEART DISEASE
- NEUROLOGICAL DISEASE
- CANCER
- AGING
- INJURY=INFLAMMATION

Coffee Antioxidants: Polyphenols

Why are Polyphenols good for us?

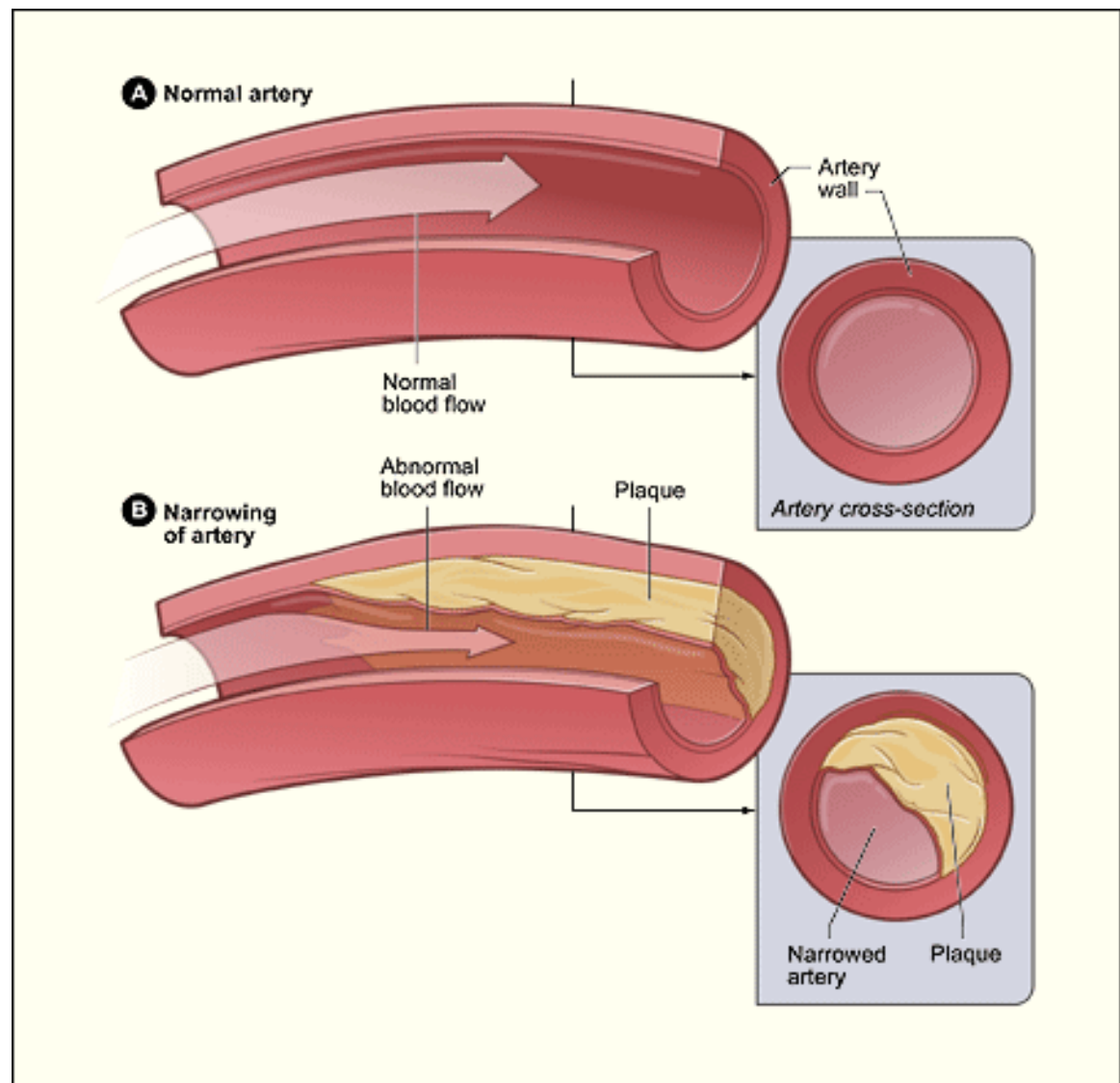
- Neutralize Free Radicals
- Reduce the Risk of Disease
- Prevent Cellular Damage
- Increase Glucose Efficiency
- Decrease LDL Oxidation
- Increase Heart Health
- Reduce Inflammation

Vasodilation – Blood Flow Restrictions

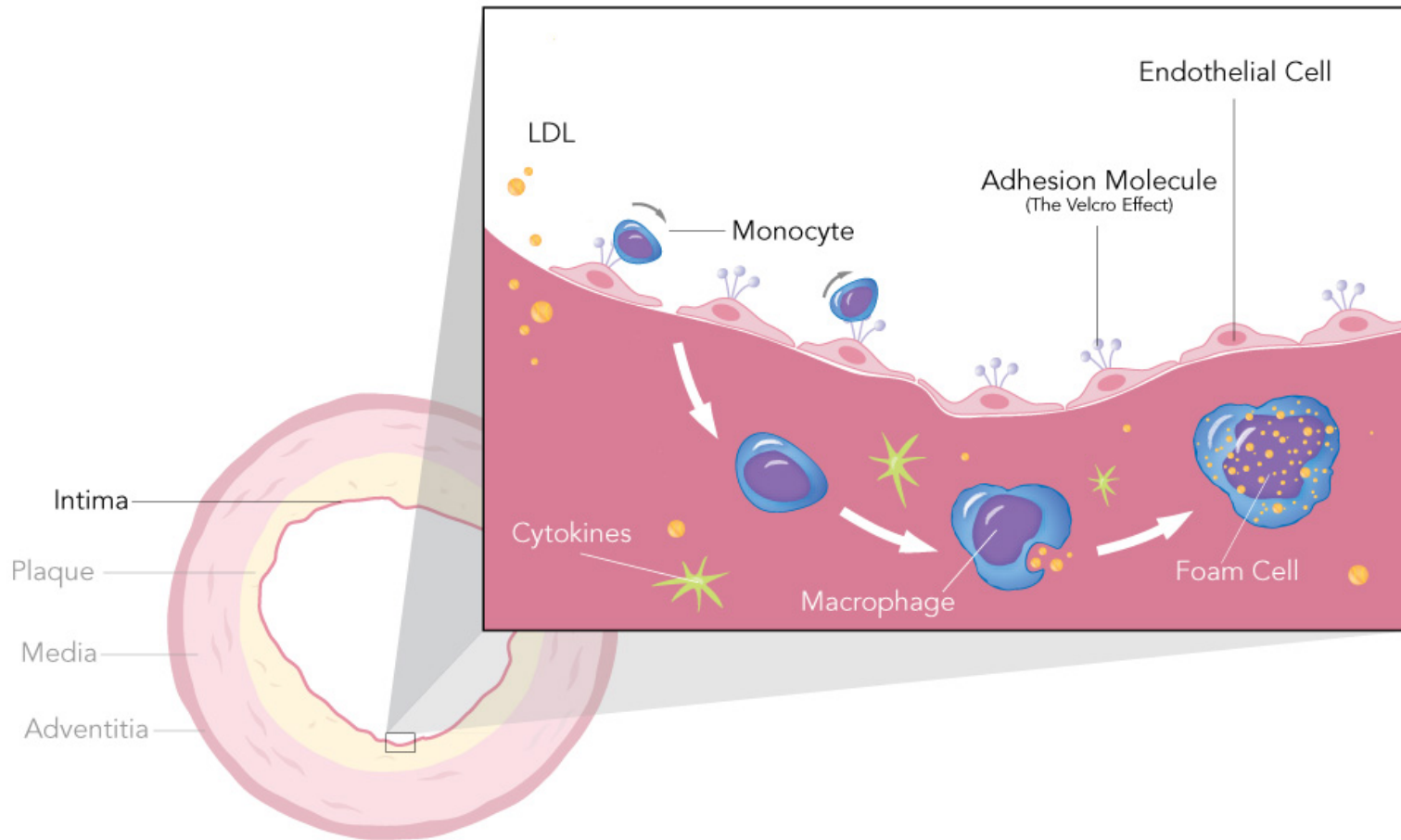
Vasodilation refers to the widening of the blood vessels resulting from relaxation of smooth muscle cells within the vessel walls, particularly in the arteries and large veins.

Vasoconstriction is a narrowing of the blood vessels. When vessels dilate, the flow of blood is increased due to a decrease in vascular resistance.

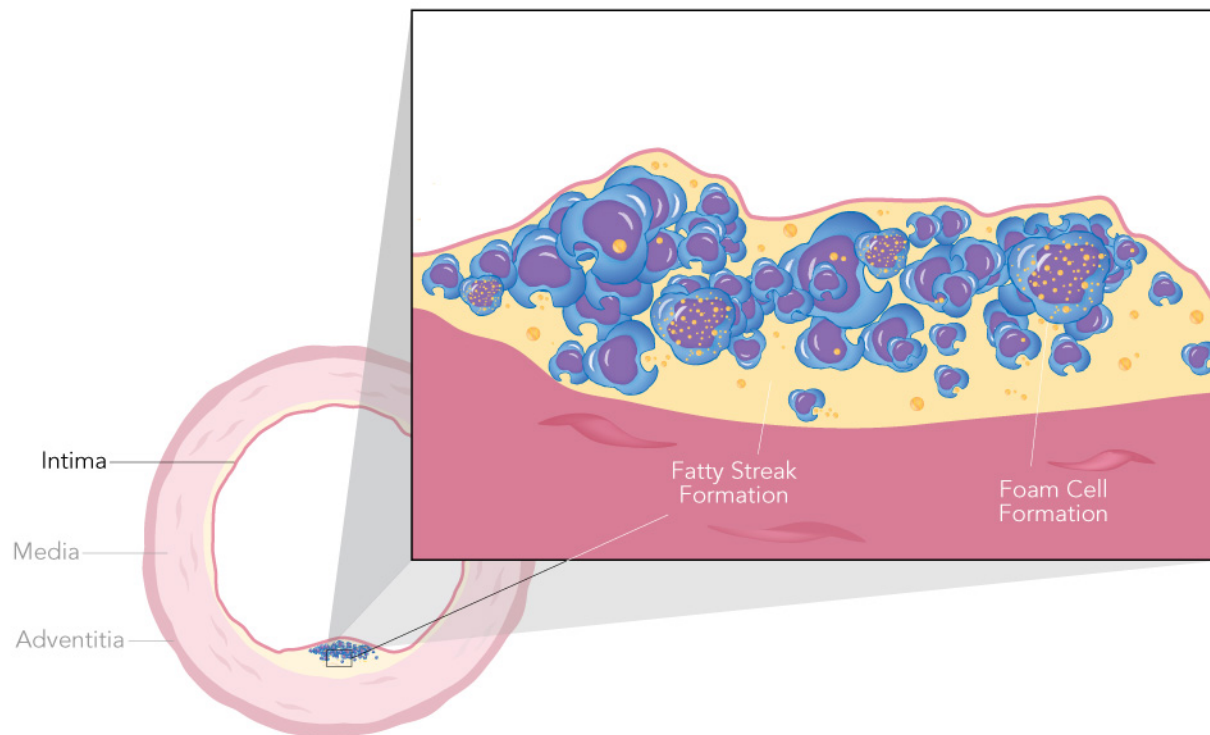
Vasodilators' assist with blood flow in hypertensive individuals.



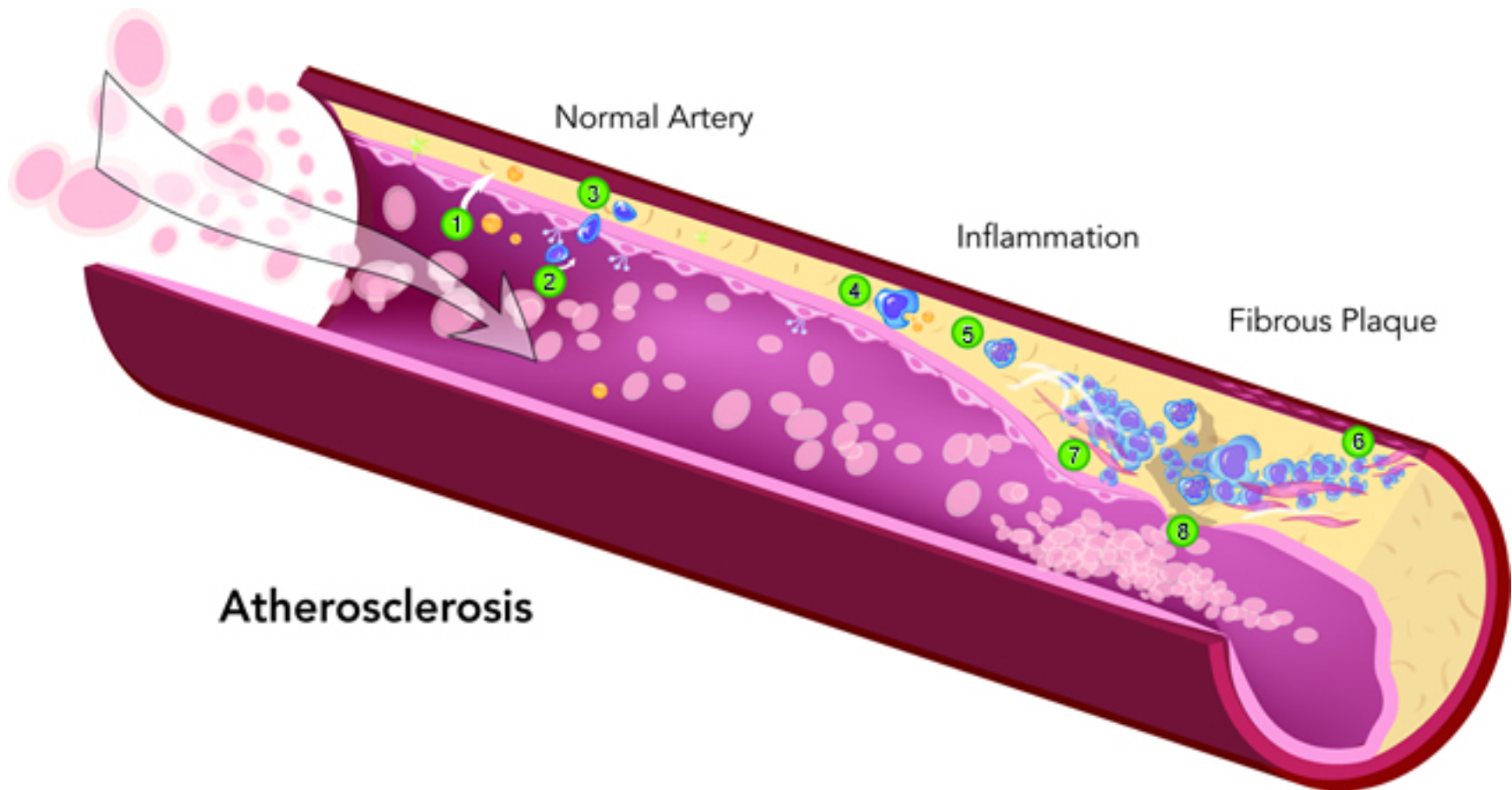
Plaque Build – LDL Oxidation



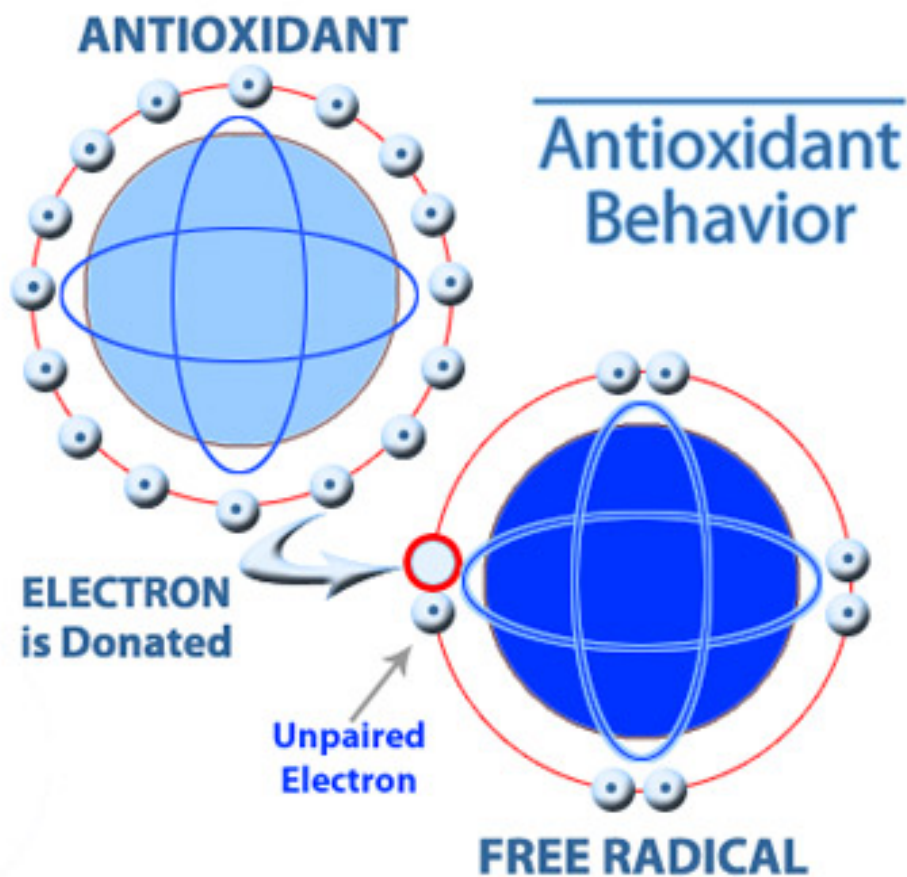
Plaque Build up - Fatty Streak in Blood Vessel Lining - Reduced Flow



Leads to Atherosclerosis - hardening of the arterial wall



Coffee Antioxidants Aid in CVD reduction



Antioxidants donate an electron to the low density lipoprotein to prevent the onset of oxidation

HealthyRoast®



Patented roasting
process

**Heart Healthy
Antioxidants in
Every Single Cup**

US Patent 6,723,368

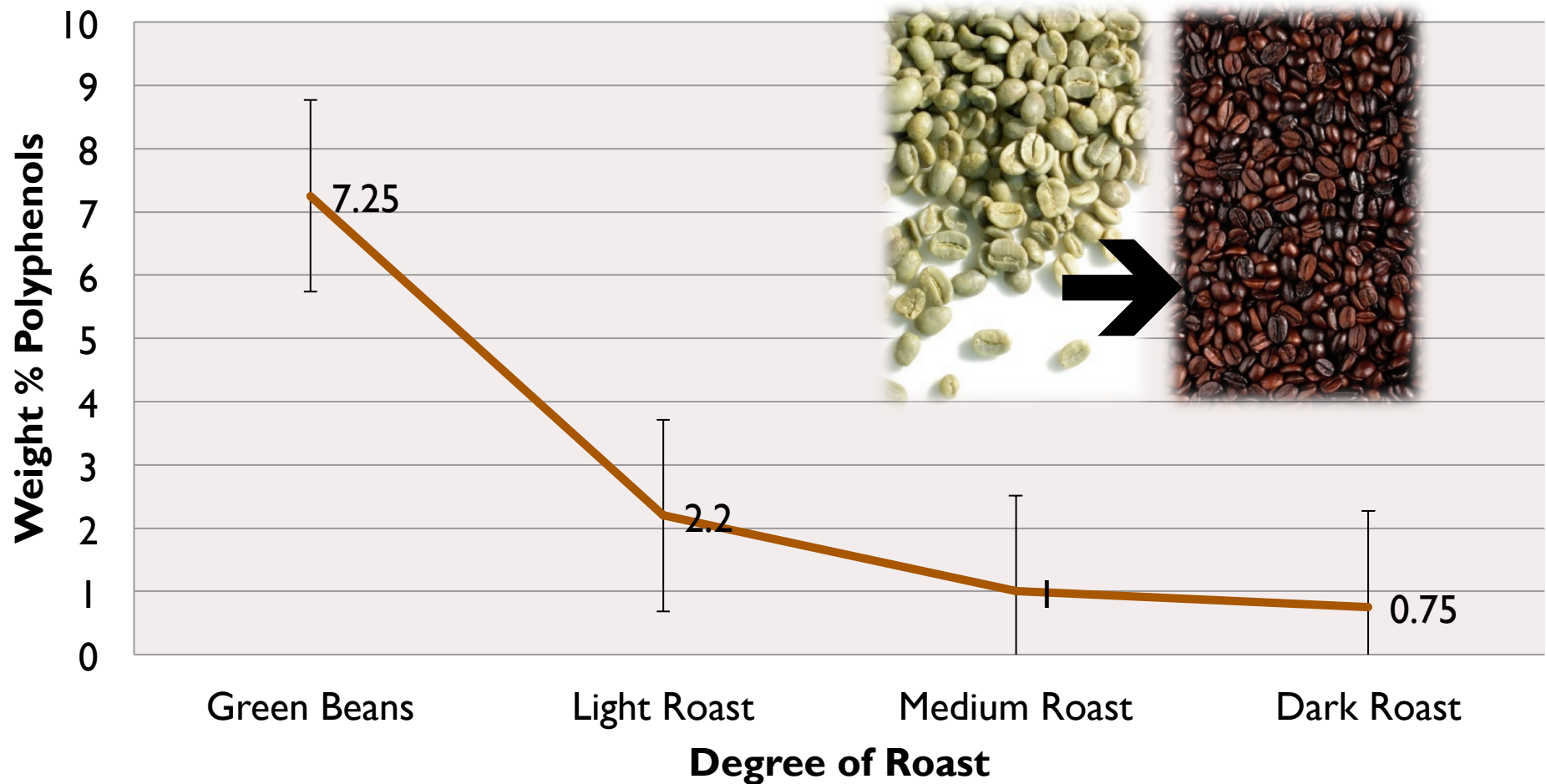
US Patent 7,713,566

US Patent 8,357,419

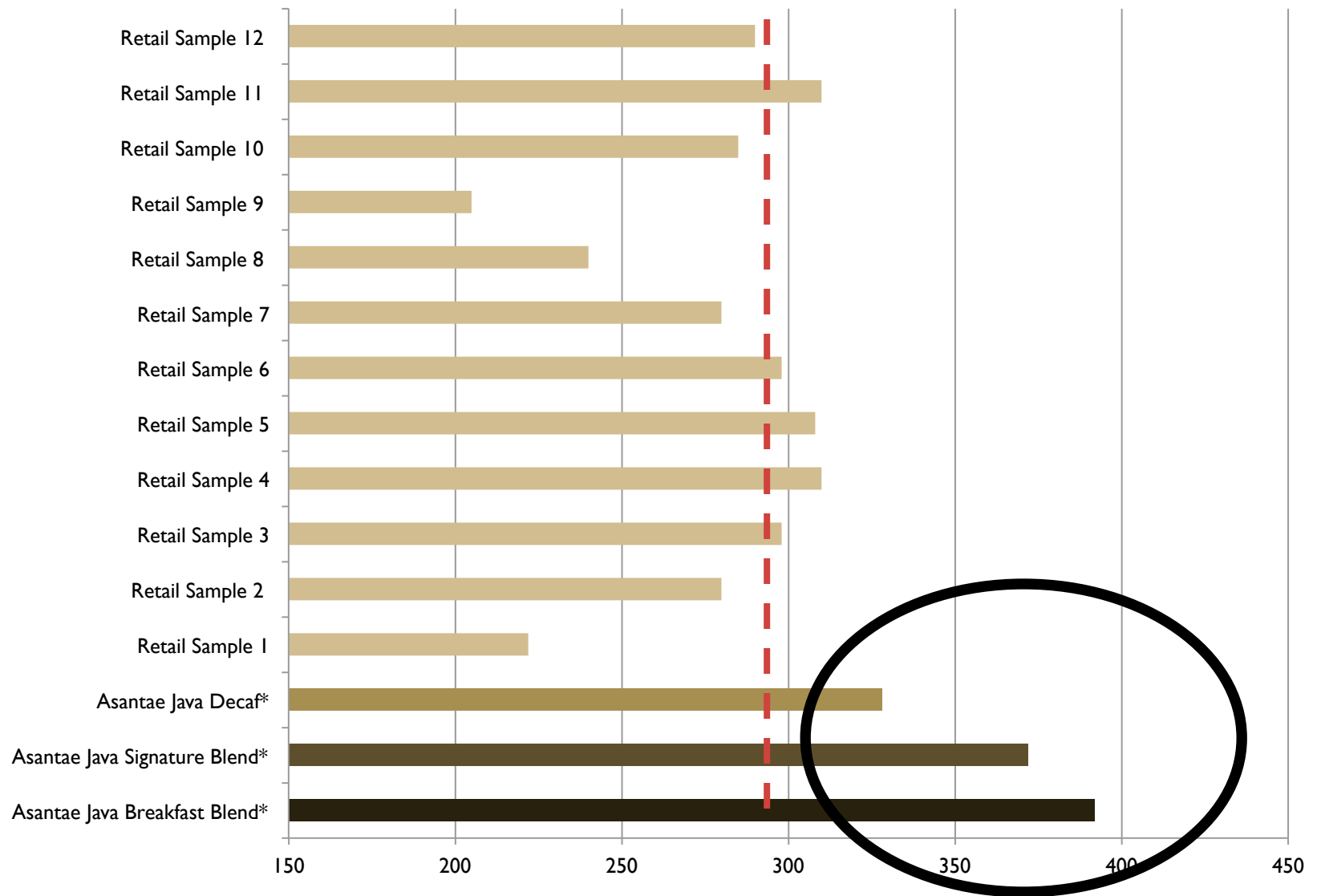
European Patent No. 1355536

Roasting Coffee

Polyphenol Level with Roast Temperature



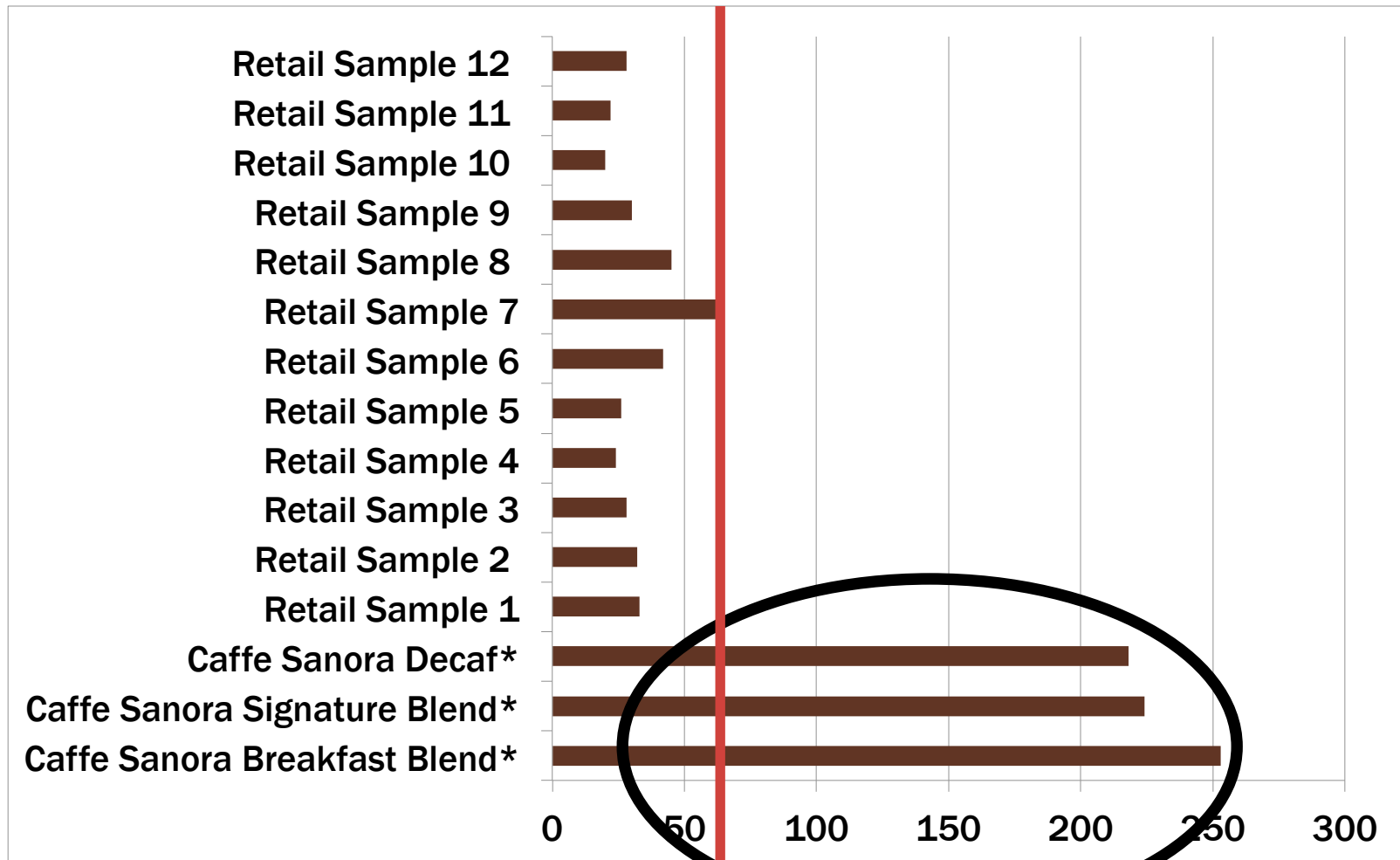
HealthyRoast[®] Coffee Technology – Antioxidant Lift



mg/serving

*Average consisting of 12 batches

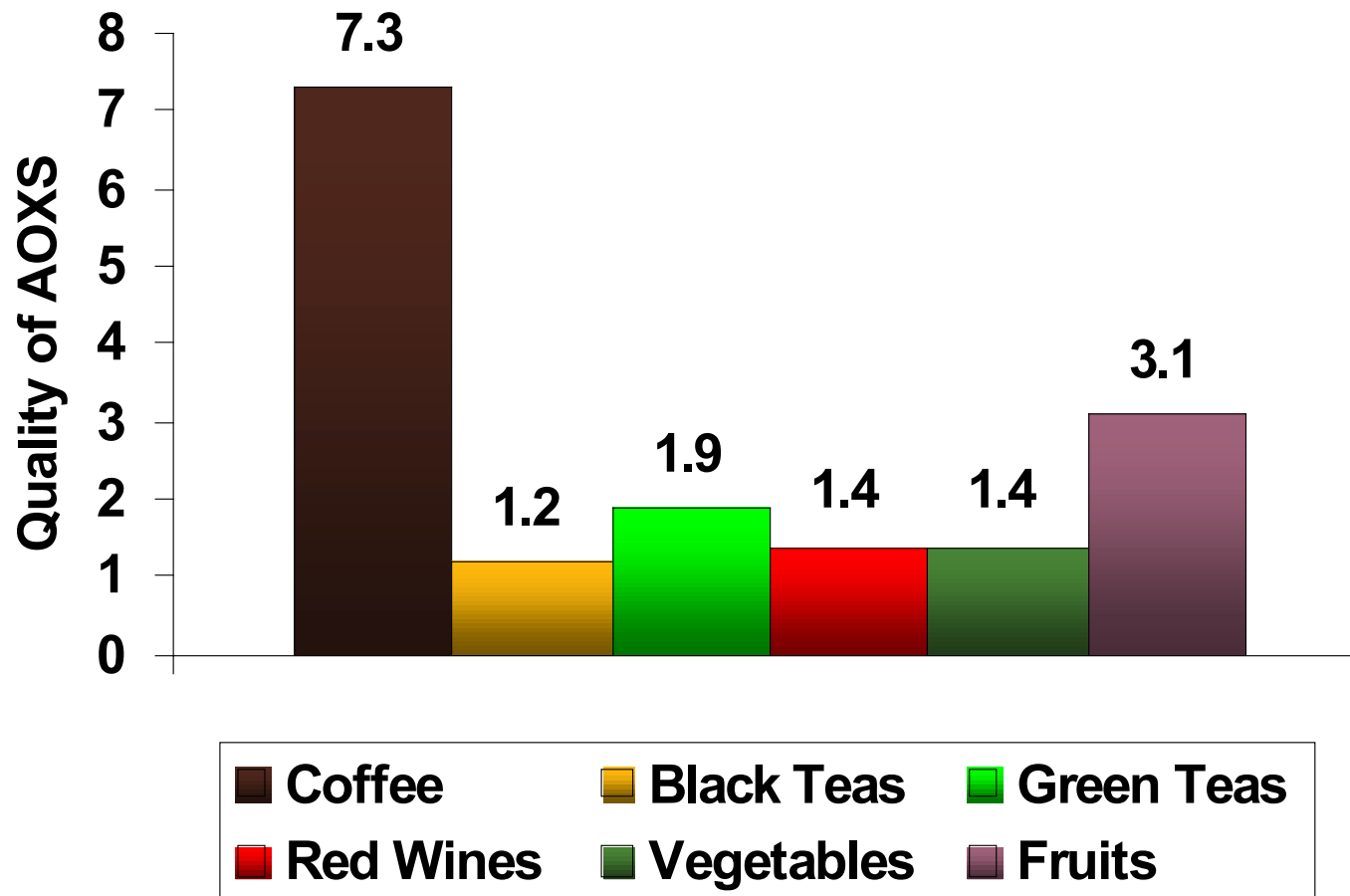
HealthyRoast® Coffee Technology – Chlorogenic Acid Increase



mg/serving

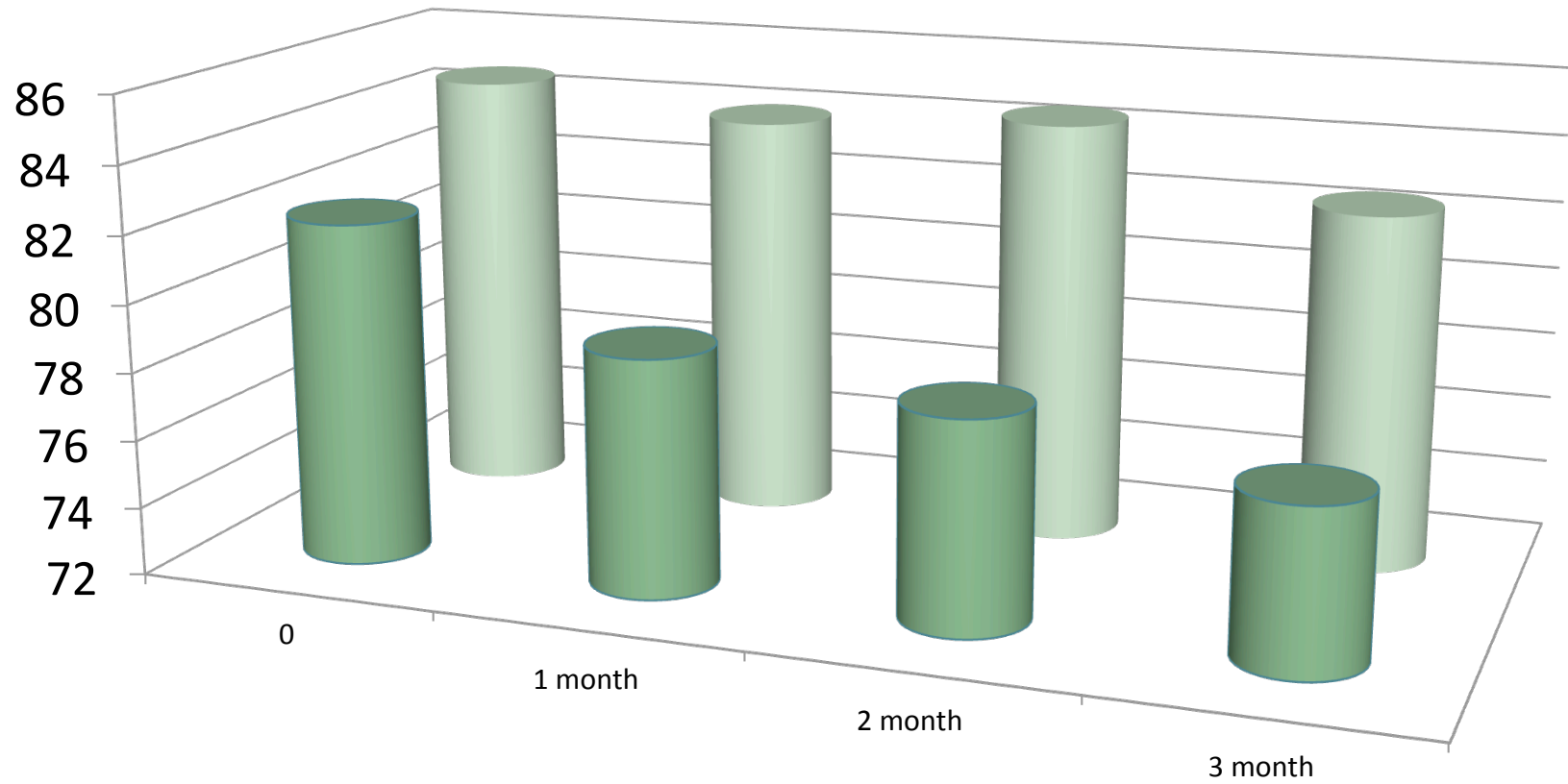
*Average consisting of 12 batches

Comparison of lipoprotein protection

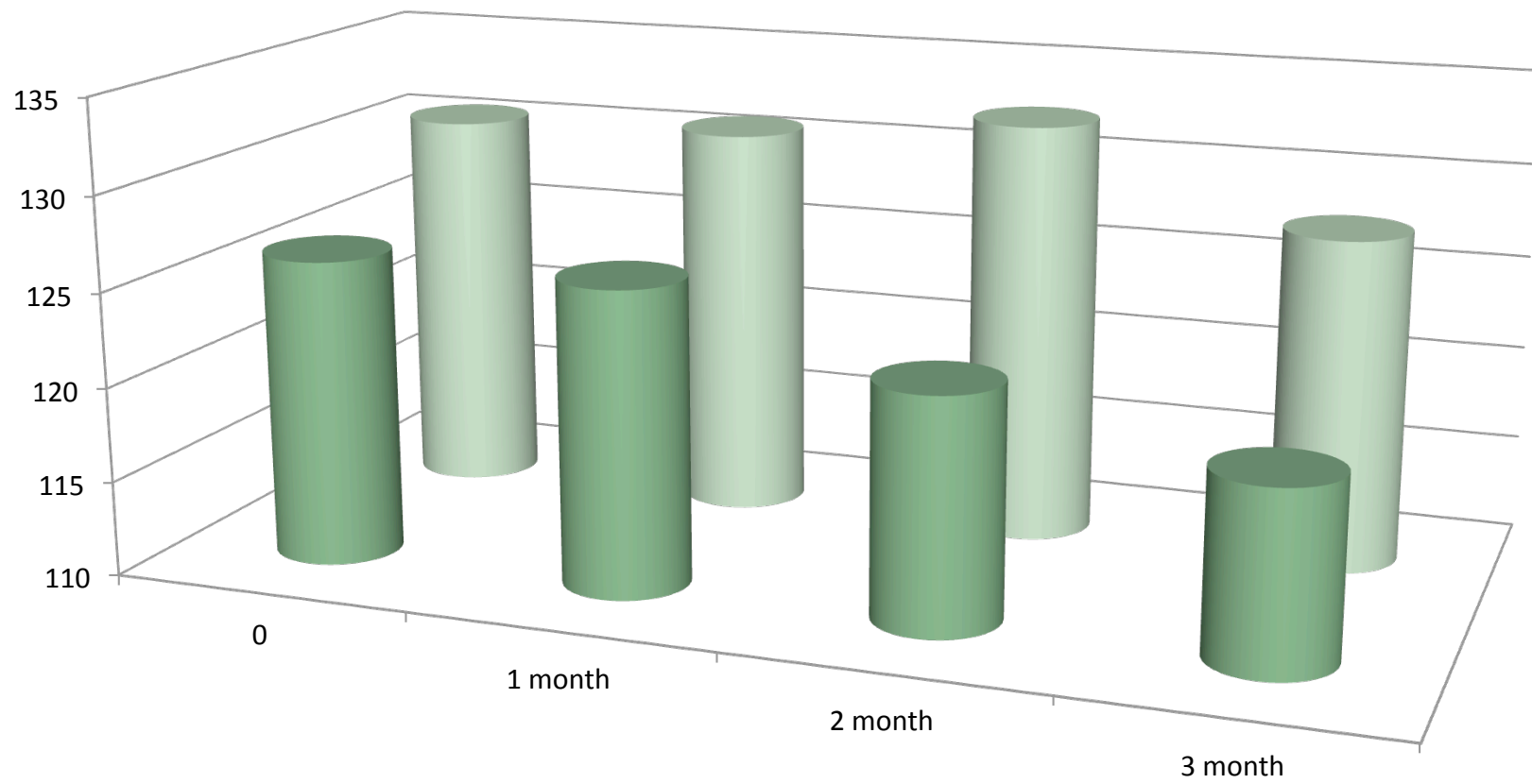


Vinson 2003

HealthyRoast[®] Coffee Reduction on Diastolic Blood Pressure (mmHg)



HealthyRoast[®] Coffee on Reduction of Systolic Blood Pressure (mmHg)





Coffee & Hypertension

Supporting Science

Coffee May Combat High Blood Pressure

Phytochemicals in Coffee Appear to Combat Blood Vessel Aging



Coffee may have perks for longer living

Supporting Science:

Drinking up to **six cups of coffee a day** may lower the overall odds of dying prematurely, mainly because it cuts the risk of dying from heart disease, a study released today suggests...

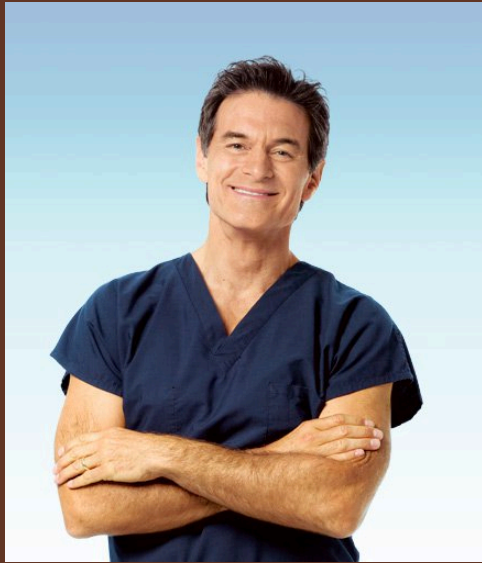
Men's Health

Coffee The Repetition Builder

Supporting Science:

“How it builds muscle: Fueling your workout with caffeine will help you lift longer. A recent study published in *Medicine and Science in Sports and Exercise* found that men who drank 2 1/2 cups of coffee a few hours before an exercise test were able to sprint 9 percent longer than when they didn't drink any.

Oxidative damage happens when your body is working through physical exertion. Having higher levels of recirculating antioxidants can decrease oxidative damage within the blood cells and primary organs.



Harvard Cohort Study

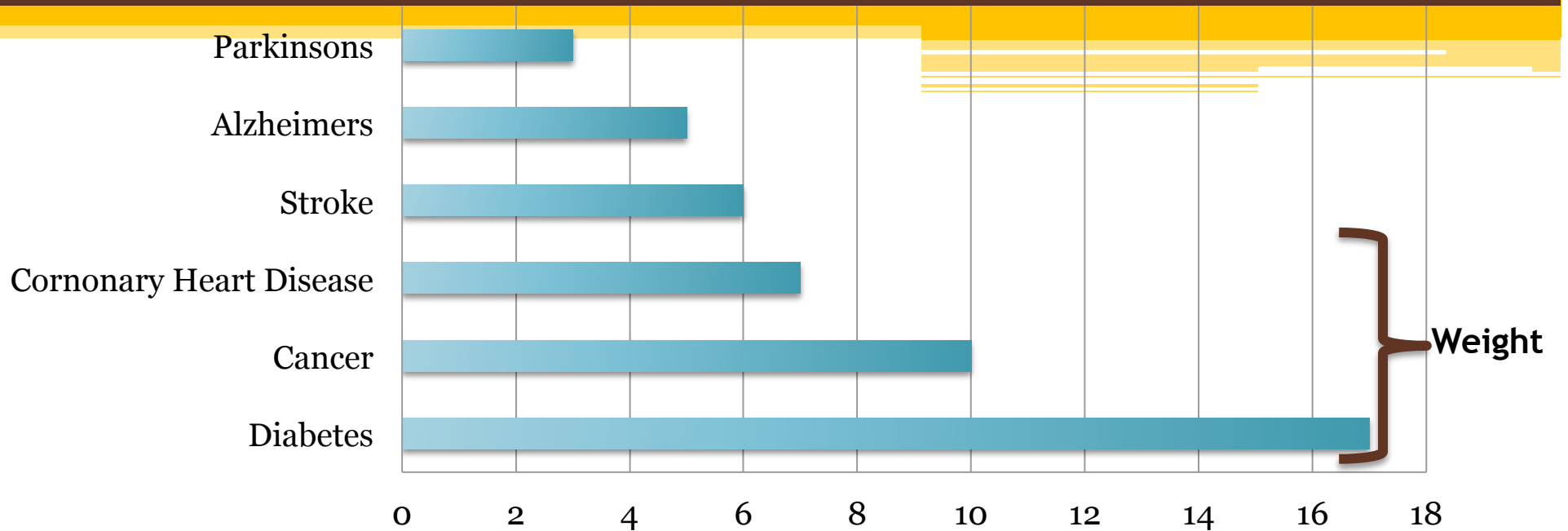
Supporting Science **Reducing Disease Risk**

“After analyzing data on 126,000 people for as long as 18 years, Harvard researchers calculate that compared with not partaking in America's favorite morning drink, downing one to three cups of caffeinated coffee daily can reduce diabetes risk by single digits. But having **six cups or more each day** slashed men's risk by 54% and women's by 30% over java avoiders”

Delete trend 2

TREND 2: Incidence of Disease Continues to Rise

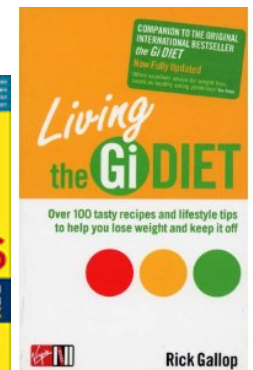
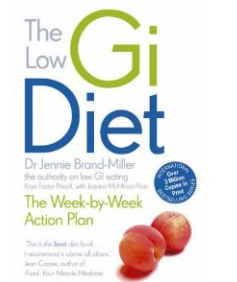
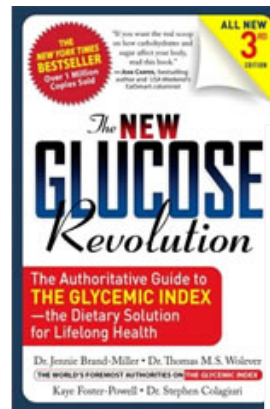
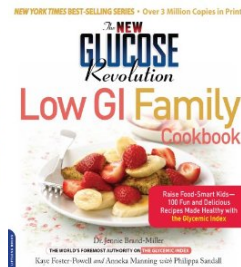
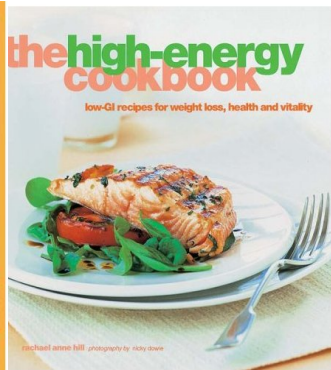
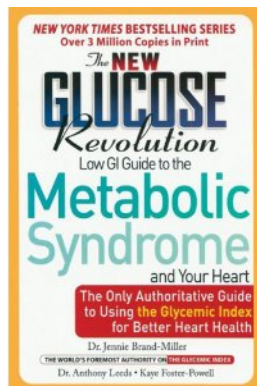
Annual US Prevalence Stats for Chronic Disease (MM)



trending



Glycemic Control



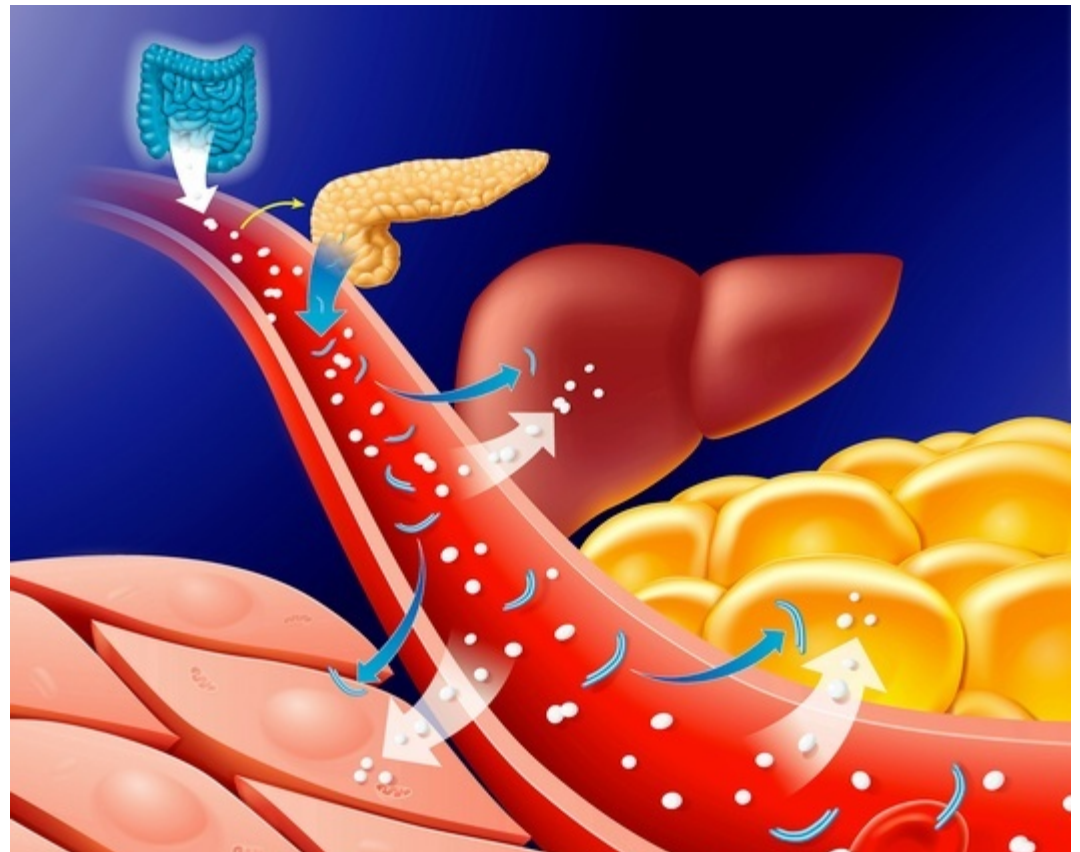
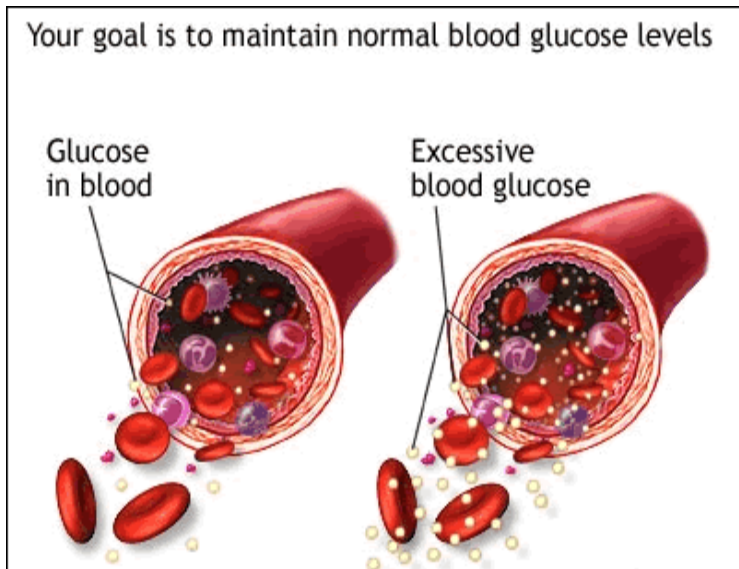
Health Benefits of Managing GI

- Help lose and manage weight
- Increase the body's sensitivity to insulin
- Improve diabetes management
- Reduce the risk of heart disease
- Improve blood cholesterol levels
- Reduce hunger and keep you fuller for longer
- Prolong physical endurance

Positive Affect on Decreasing the GI of Foods



Glucose Metabolism & Insulin Activity



By controlling the activity of insulin in our systems we can dictate how much glucose is stored in the liver as glycogen, how much is transferred to the muscle tissue and ultimately how much is stored in the adipose tissue as fat.

Weight Management

Energy

Glucose Regulation

Metabolic
Hormones

Fatty Acid
Synthesis

Enhanced
metabolism

Carbohydrate
metabolism

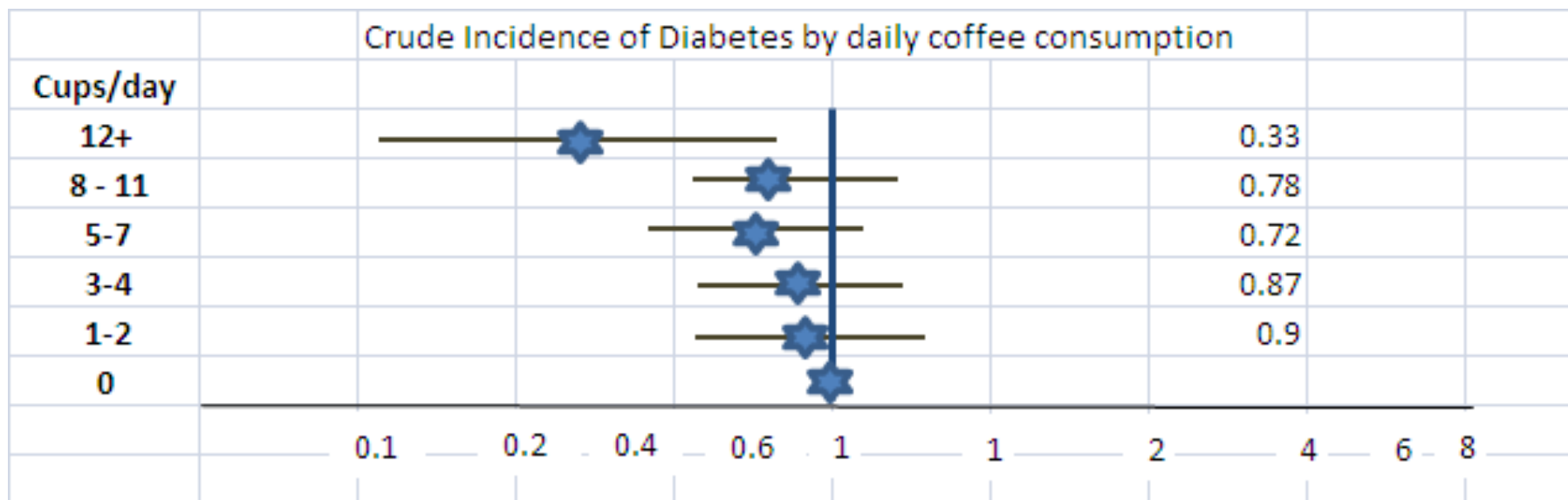
Insulin
Activity

Satiety, Rate
of Absorption

Lipase
Activity
Liver
Function



Coffee's Inverse Association with Diabetes in Men & Women



Strong Heart Study:

Nutrition, Metabolism & Cardiovascular Diseases (2009)

Categories adjusted for age, gender, smoking, alcohol, family history, physical activity and BMI.

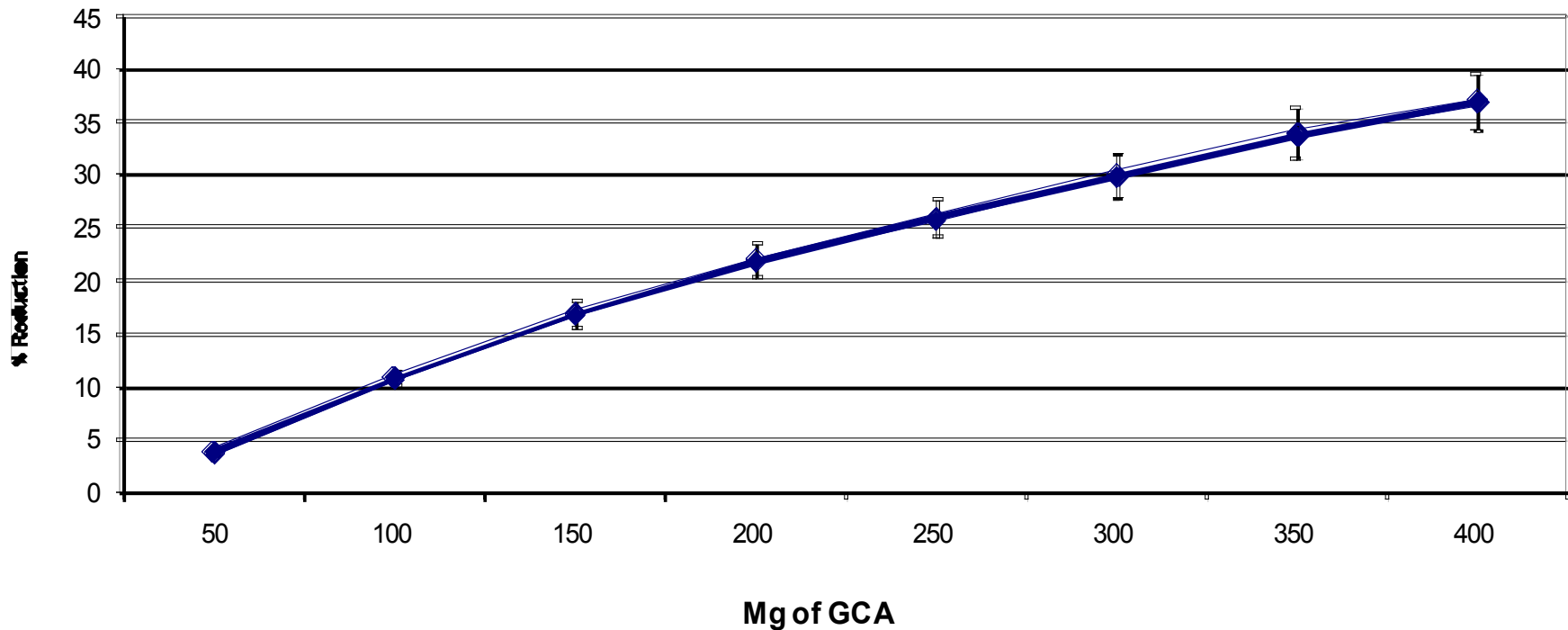
Case study 2

GCA[®] Extract: Capitalizes on the nutritional value in Coffee



- Demand for Natural / Plant Based Ingredients continues to grow
- GCA[®] Extract = Healthy Antioxidants in concentrated form

Percent Reduction of Blood Glucose Upon GCA[®] Ingestion



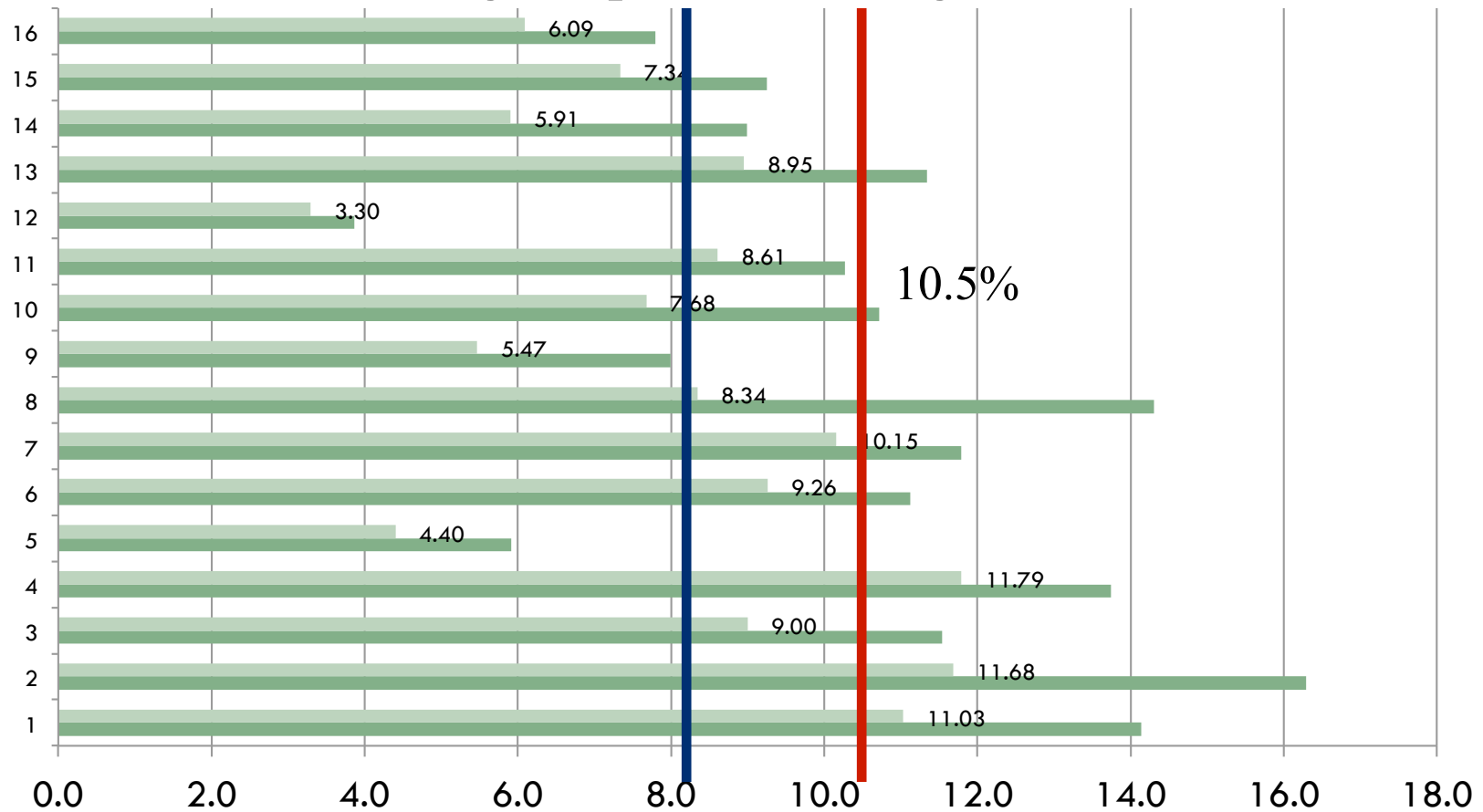
Source:

"Effectiveness of GCA, Green Coffee Bean Extract containing high levels of chlorogenic acids, on Plasma Glucose", Asiatic Life Sciences, Dr M.V.Nagendran 2003, Bangalore, India

Dose Dependent Response Rate
Optimum Dosage = 300 – 350 mg



Percent Reduction in Weight Upon GCA[®] Ingestion



Dose Dependent Response Rate
Optimum Dosage = 350 mg/3X
Average Weight Lost = 8 kg (17 lbs.)



Summary of the Data

- Coffee consumption is proving to have many significant health benefits
- Higher coffee consumption >5 cups per day seems to have the most overwhelming evidence
 - Diabetes Prevention
 - Glucose Management
 - LDL Oxidation Reduction
 - Inflammation Biomarkers
- Caffeine seems to be the main culprit to the hypertensive effects and if tolerated can have positive health benefits

Caffeine – It can be good too!

- ❖ Increase Mental Alertness
- ❖ Enhance Endurance
- ❖ Increase Metabolism
- ❖ Cognitive Performance
- ❖ Combat Fatigue
- ❖ Enhance Athletic Performance & Precision



Trend 3: Healthy Energy Solutions



Center Store Top Growth Categories

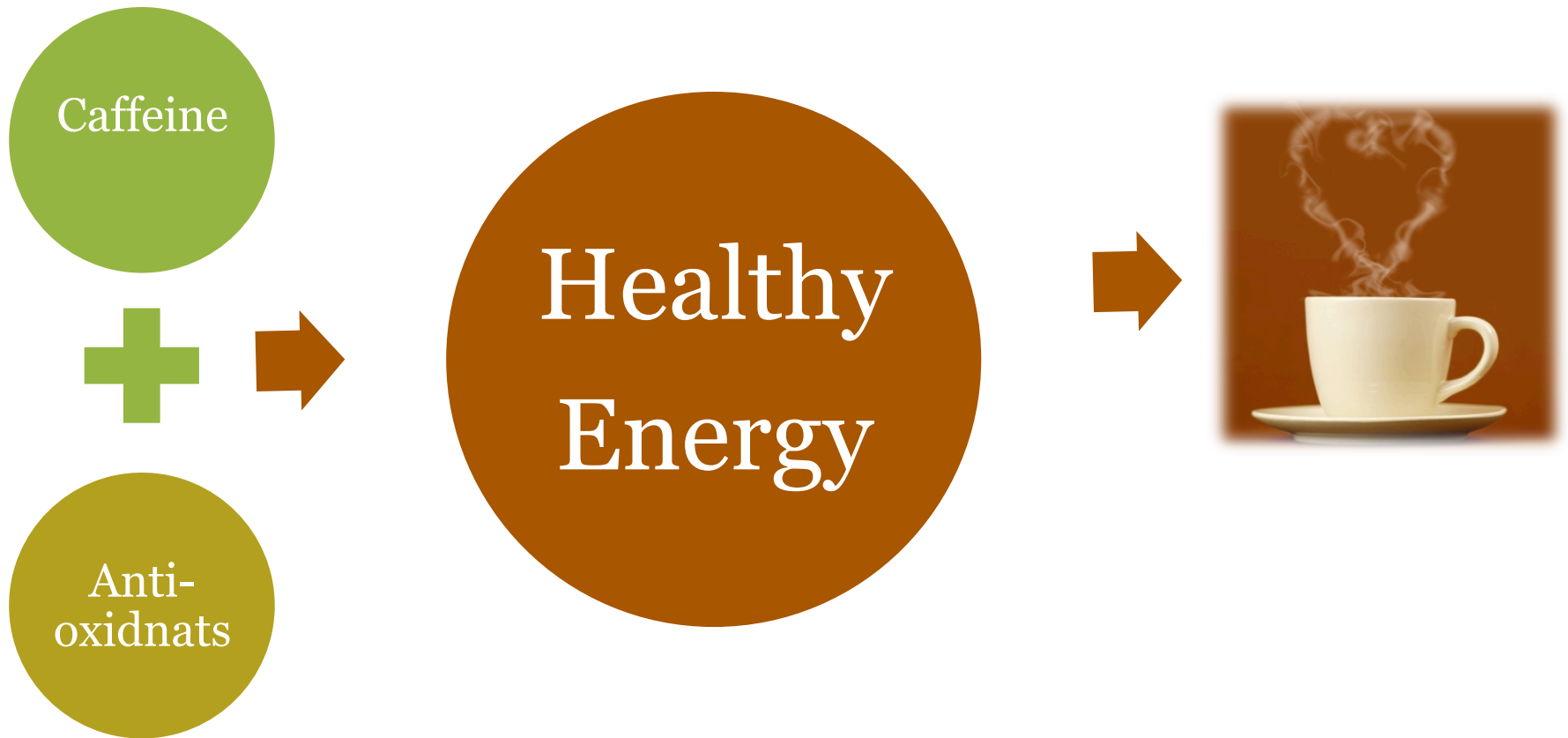
Category	Dollar Sales	Unit Sales
Energy Drinks	17.20%	18.70%
Weight Con/Nutrition Liq. Pow	17%	15.10%
RTD Coffee/Tea	7%	7.80%
Crackers	7.40%	5.10%
Air Fresheners	5.50%	4.70%
Bakery Snacks	9.90%	4.60%
Bottle Water	6.70%	4.60%
Vitamins	4.70%	4.50%
Coffee	17.70%	4.50%
Snack / Granola / Bars	7.30%	4.30%



Symphony / IRI
Market Advantage,
52 weeks ending
09.09.2012

Java – Healthy Energy Solution

Natural Caffeine + Antioxidants



Example of using natural healthy energy



Natural energy from green coffee extract

**Energy Market =
\$7 BB Industry**

**Healthy,
Sustained Energy**



Supplement examples using GCA®



ESSENTIAL AMINO ENERGY

- HELPS BUILD MUSCLES WITH BCAAs & AMINO ACIDS
- INTENSIFY ENERGY WITH ONLY 10 CALORIES
- BOOST NITRIC OXIDE PRODUCTION
- IMPROVED ENERGY AND FOCUS

GRAMS OF AMINO ACIDS	MILLIGRAMS OF CAFFEINE	CALORIES PER SERVING
5	100	10



STOMACH FRIENDLY



1 in 5
Consumers

HealthyRoast® reduces the stomach irritating compounds in coffee

40 million people don't drink coffee due to stomach irritation

\$20 MM



Trend 4: NutriCosmetics & Cosmeceuticals Beauty from the inside out

\$4.24 billion by the end of 2017

Manufacturers are focusing on the development of natural and organic products





NutriCosmetics

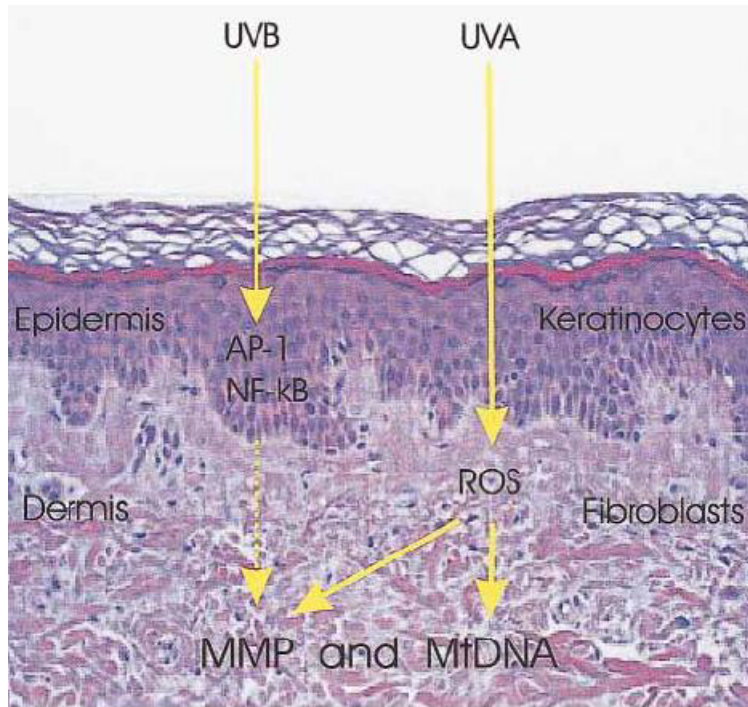
- Demand for Natural / Plant Based Ingredients \$6.8 BB Global Industry
- 100% Organic
- Allergen Free
- Sustainable Product / Socio - Economic

Natural Anti-Aging Solution

- Hyperpigmentation
- Inflammation
- Overall skin health



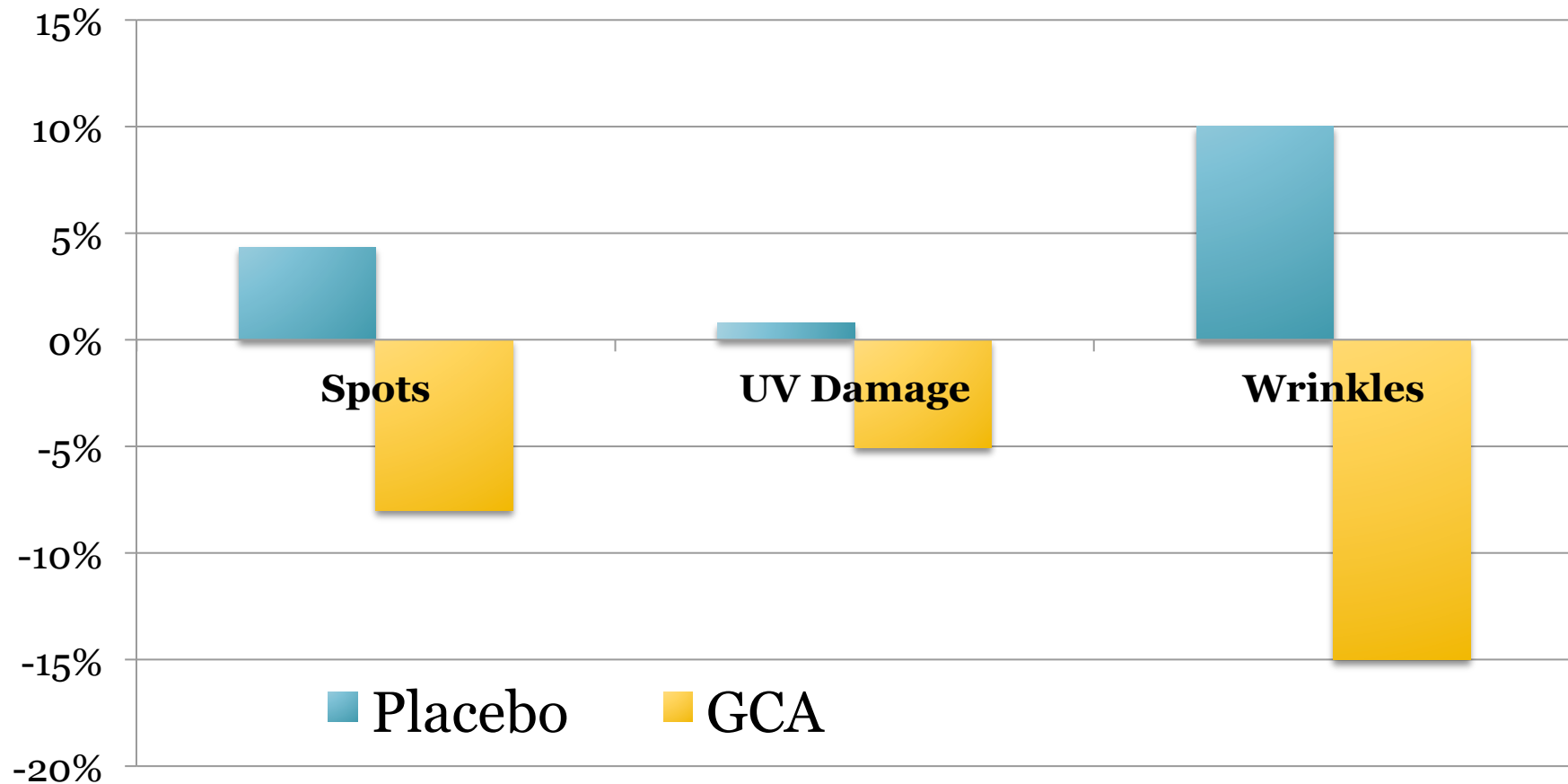
PhotoDamage - Aged Skin



Berneburg M et al. Photodermatol
Photoimmunol Photomed 2000; V16

Topical Applications

Inflammation+Hyperpigmentation:



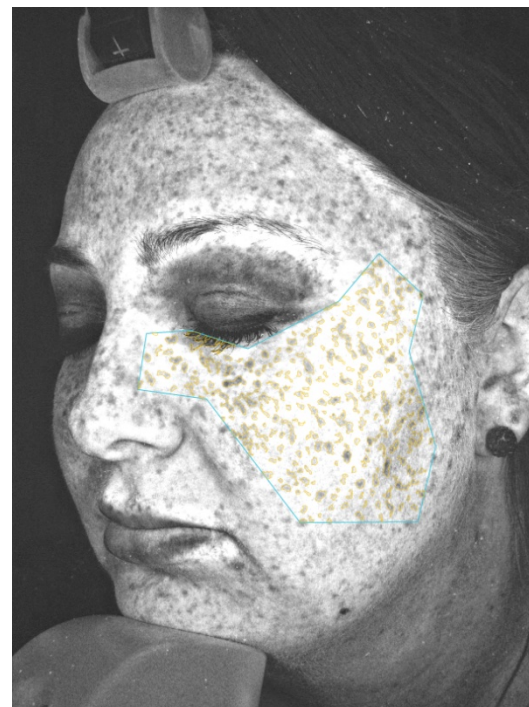
Dr. Raval, MD Raval Facial Aesthetics, Rocky Mountain Laser Clinic, 2011
GCA® = Green Coffee Extract (50% CA) 3 w/w%

Visia Results

Topical Treatment with GCA[®]- 4 weeks



Baseline



4 weeks

Examples

Skin Damage



Inflammation Control



Skin Appearance





Summarizing the Ideal Equation to Harness the Value of Coffee

Identify Value Proposition

Determine Application

Complete Commercial Viability

Build Scientific Support / Increase Credibility

Partner with Current Market Experts (Ideal Brand)

Generate multiple sources of income



Summarizing the Ideal Equation to Harness the Value of Coffee

Articulate unmet needs

Create a lifestyle antidote - health solution w out sacrifice taste or convenience

Be ecologically thoughtful - food choices as activism



Thanks!

Loretta Zapp
Applied Food Sciences, Inc.
www.appliedfoods.com
303-579-1023
Lzapp@appliedfoods.com