

# The Business of Food as Medicine

*EPEMED Webinar*

*November 16, 2011*

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2011  
Scientia Advisors, LLC  
Boston ■ San Francisco

- Definitions
- What's driving the growth of this field?
- Examples of products
- Background data: market size and growth rate
- Examples: food companies doing business in Food as Medicine
- Examples: food companies making venture investments in Food as Medicine

# Definition of “Functional Foods”

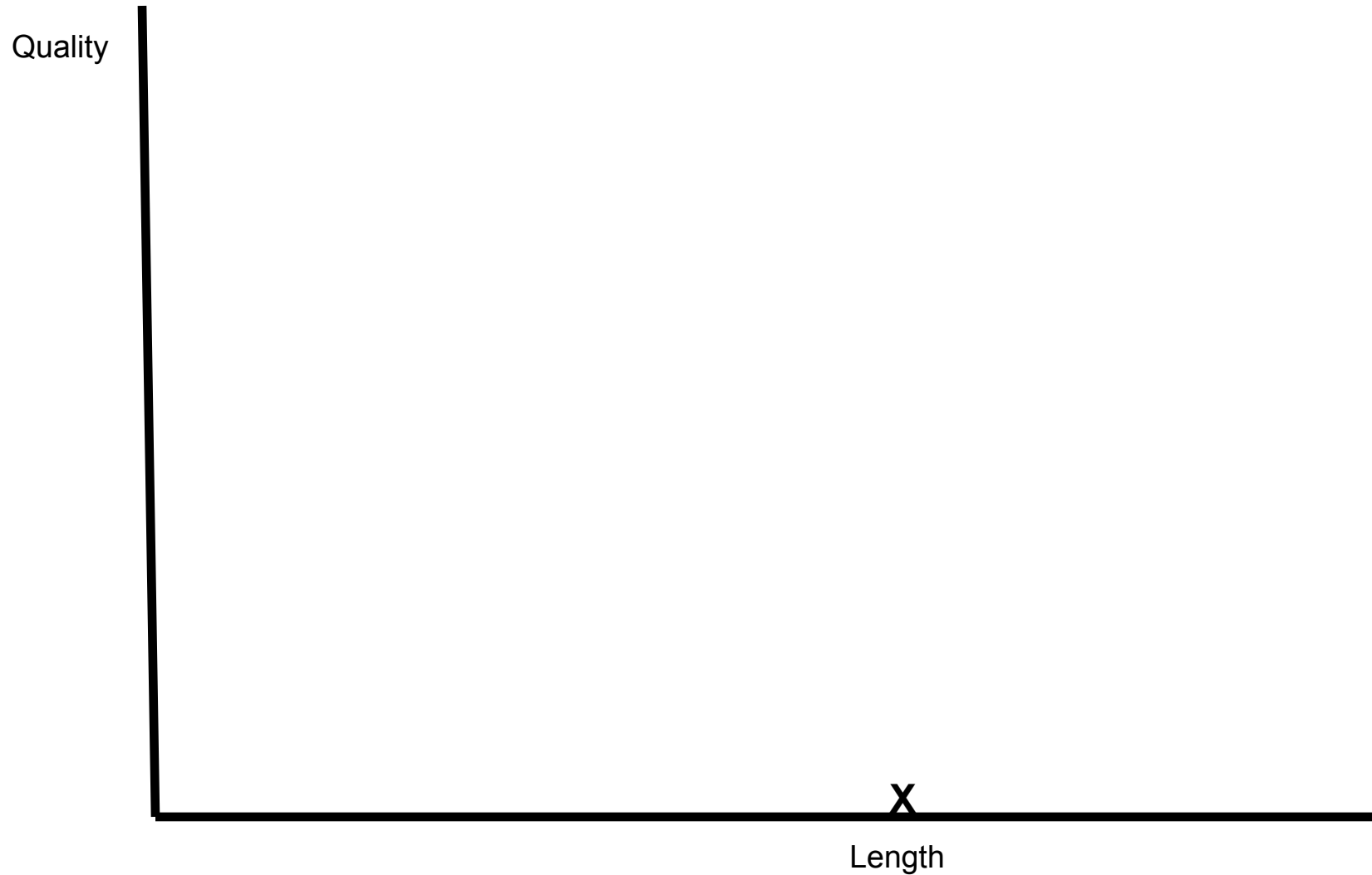
*“Let thy food be thy medicine, and thy medicine be thy food” – Hippocrates*

- **Functional Foods provide a health benefit beyond basic nutrition**
- **Examples:**
  - » They can enhance health & well-being  
*(for example, assist in weight loss, reduce risk of disease)*
  - » They can enhance the ability to perform physically and/or mentally  
*(athletic performance, memory and other cognitive functions)*
  - » They can help manage a chronic medical condition  
*(diabetes, heart disease)*



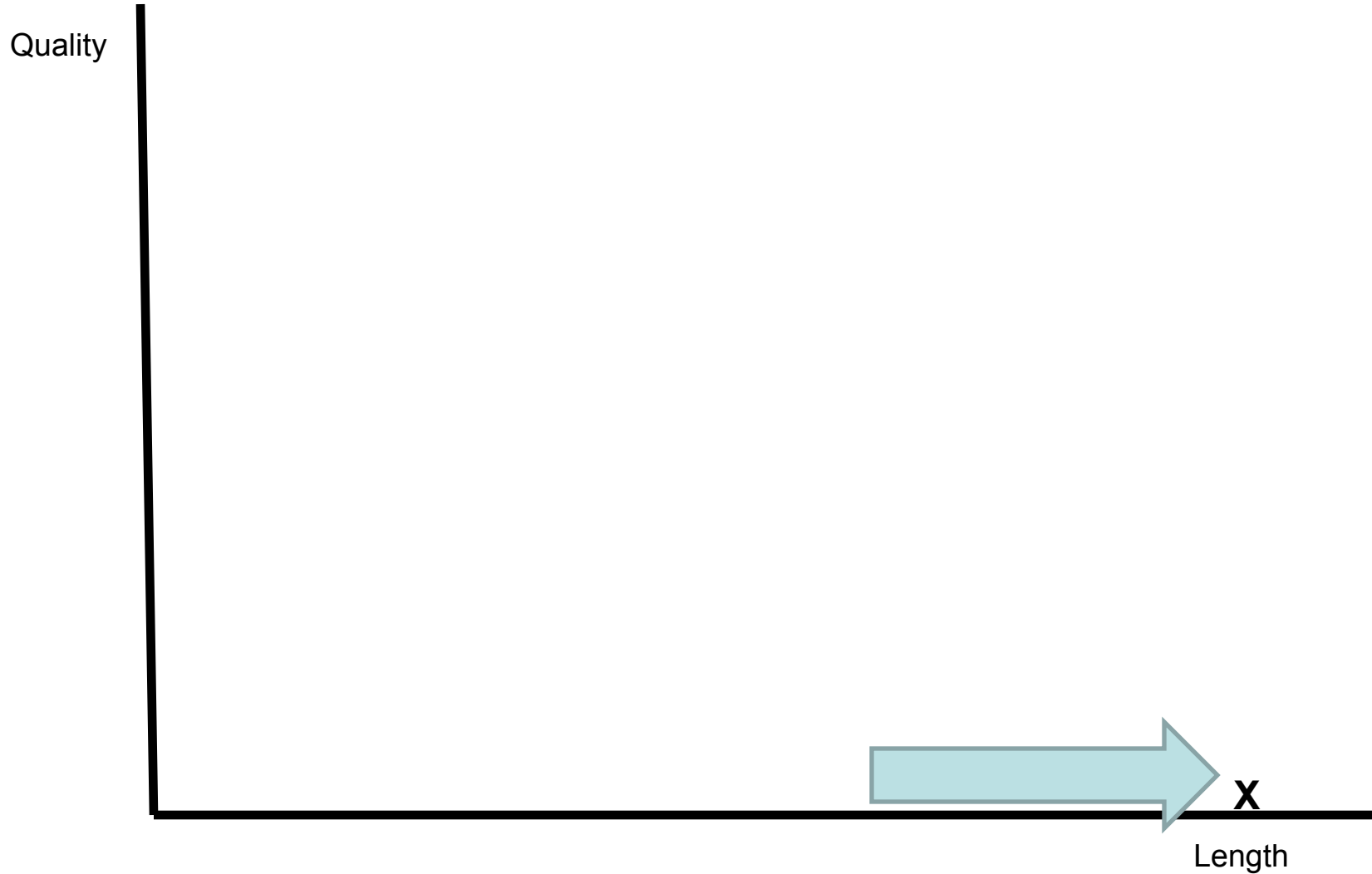
# What's Driving the Growth of This Field?

*We used to be primarily concerned about increasing life span*



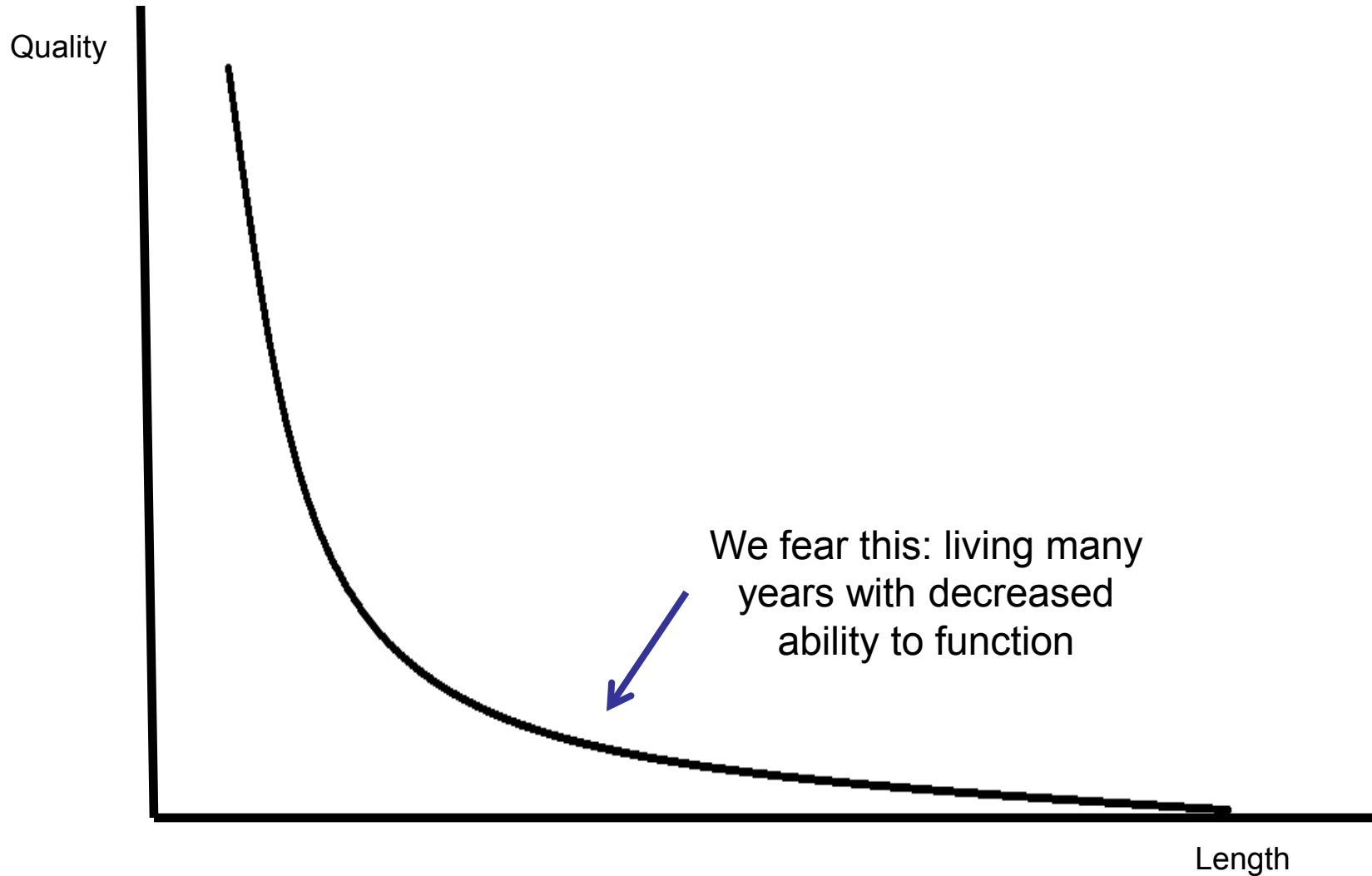
# Length of Live vs. Quality of Life

*We used to be primarily concerned about increasing life span*



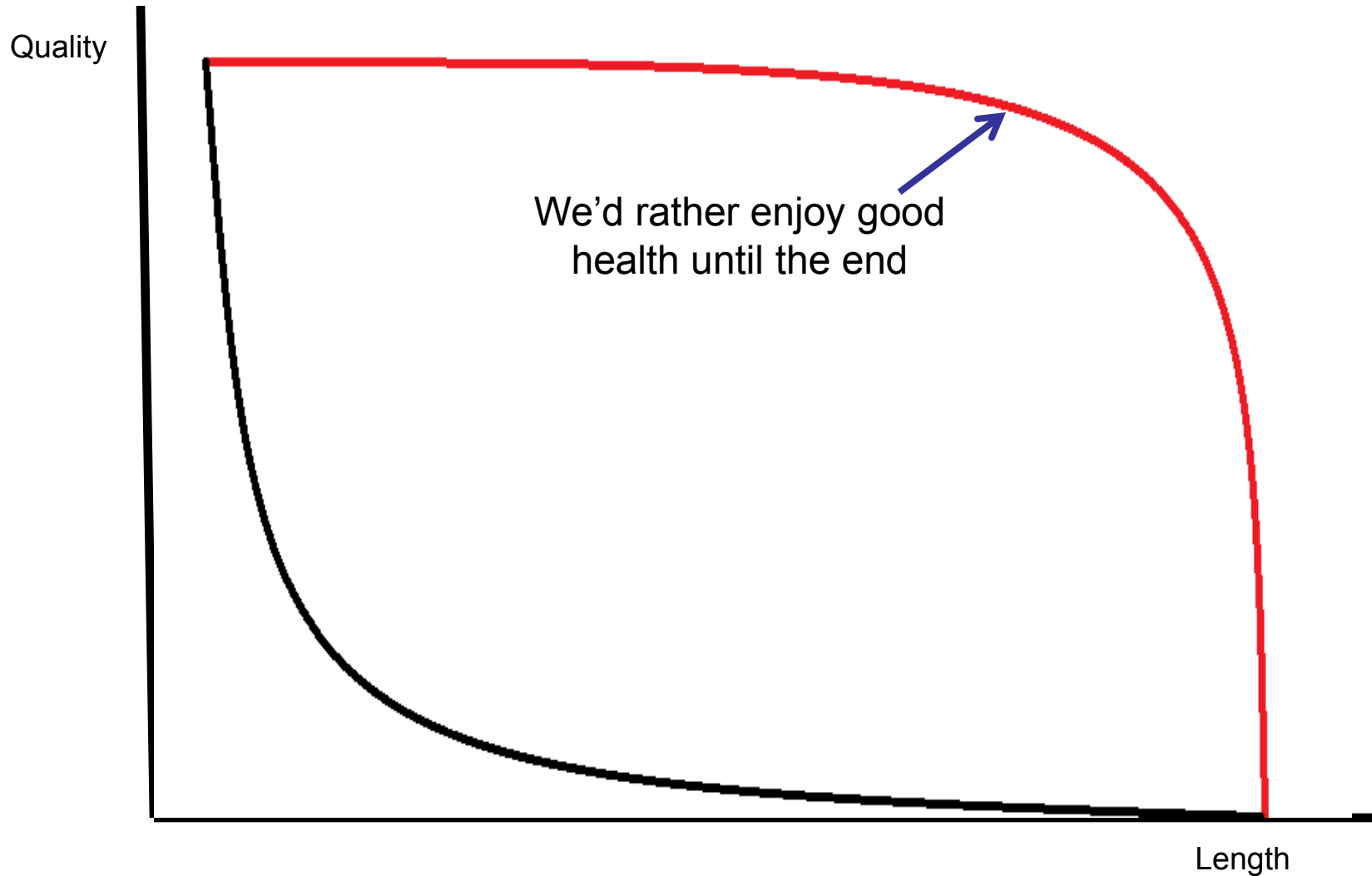
# Life Span vs. Health Span

*Now there's growing interest in increasing health span*



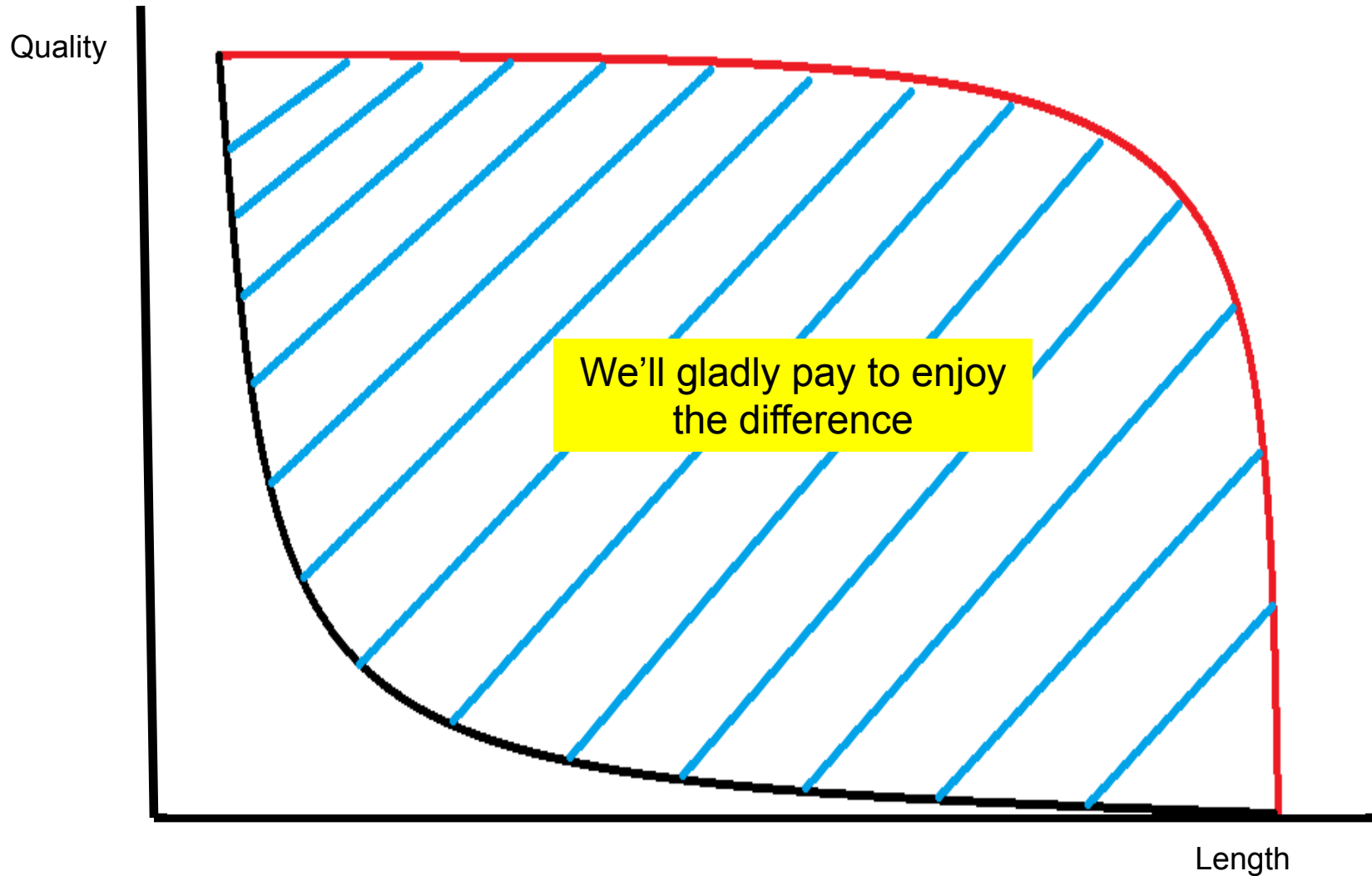
# Life Span vs. Health Span

*Now there's growing interest in increasing health span*



# Life Span vs. Health Span

*Now there's growing interest in increasing health span*





# Examples of Functional Nutritional Ingredients

*Functional ingredients provide health benefits to vital systems of the body*



## Brain Health

### Docosahexaenoic Acid (DHA)

*Promotes healthy brain/eye development in infants; also being studied in adults*

### Ginkgo Biloba

*Studies suggest it may enhance memory/concentration*

### Valerian Root

*Studies suggest it may treat sleeping disorders, epilepsy*

## Heart Health

### Eicosapentaenoic Acid (EPA)

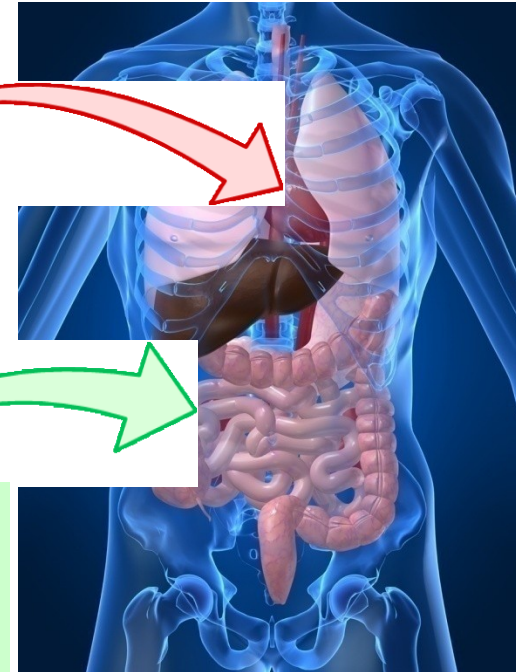
*Anti-inflammatory*

### Beta-Glucans

*Reduces cholesterol (LDL)*

### Phytosterols

*Reduces cholesterol (LDL)*



## Gut Health

### Probiotics

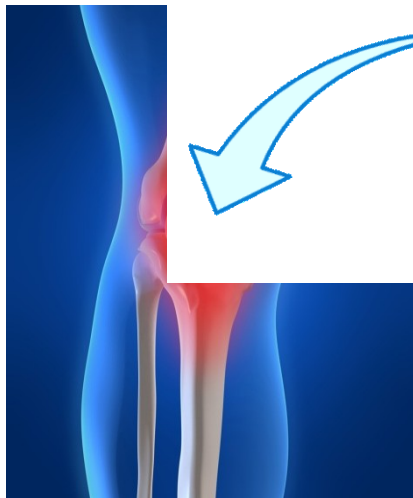
*Restore regular intestinal flora*

### Prebiotic Fibers

*Stimulate growth of intestinal flora*

### Ginger Root

*Anti-diarrheal*



## Bone/Joint Health

### Calcium

*Healthy bone formation/maintenance*

### Glucosamine

*Mixed data: may be helpful in cartilage strengthening or treatment of arthritis*

### Vitamins K & D

*Healthy bone formation/maintenance*

## Examples of other Functional Ingredients with possible benefits

### Antioxidants (resveratrol, lutein, Coenzyme Q10, etc.)

*Anti-inflammatory, anti-cancer, pro-metabolic, others – all under clinical investigation*

### Soy Protein

*Reduce cholesterol; under investigation for various anti-cancer benefits*

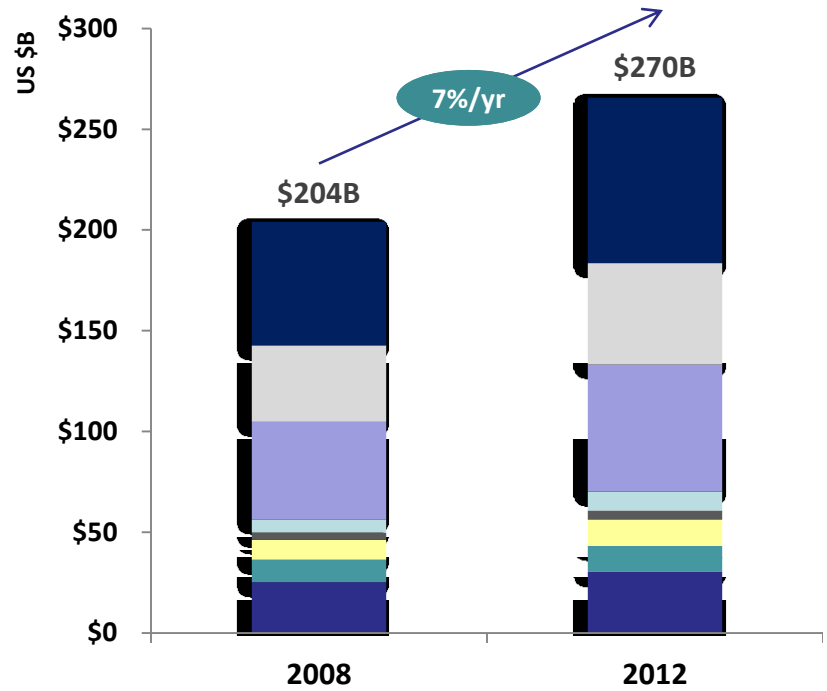
### Green Tea Extract

*Anti-cancer, insulin regulation, alleviating neurodegenerative disease benefits – all under clinical investigation*

# Worldwide Functional Foods Market

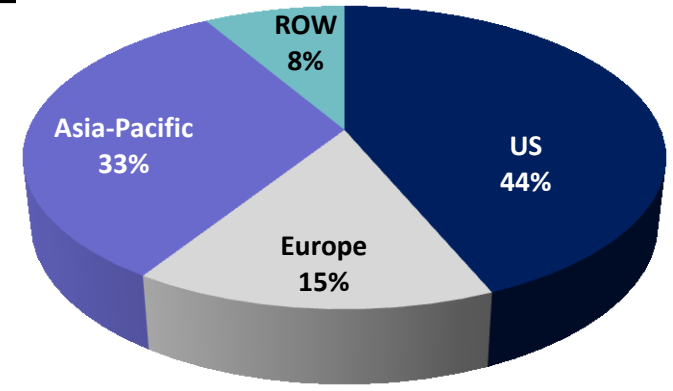
*The market is growing rapidly, and is geographically dispersed*

**THE GLOBAL FUNCTIONAL FOODS MARKET: \$204B**

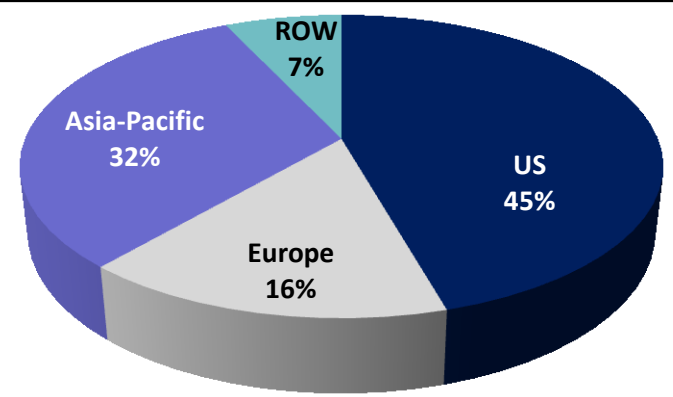


- Enabler Foods
- Beverages
- Foods
- Meal Replacements
- Sports Nutrition
- Other Supplements
- Herbs & Botanicals
- Vitamins & Minerals

**2008 TOTAL WW FUNCTIONAL FOODS MARKET: \$204B**



**2012 TOTAL WW FUNCTIONAL FOODS MARKET: \$270B**



Source: Scientia Analysis, DataMonitor/Euromonitor, HighBeam IRI Data, Kalorama, Nutrition Business Journal

*Examples of food companies  
growing their business of  
Food as Medicine*

Abbott's Interest in Medical Nutrition of Specific Disorders

## CANCER

During your treatment, Abbott Nutrition has the support you need. Protein and calories to help you stay strong.

**Take Charge During Cancer**

Ensure® Clinical Strength—when you need to maintain and rebuild muscle and support immune health.

Ensure Restore—when you need a satisfying full flavored drink instead of a shake.

Glucerna®—if you have diabetes.

Targeted nutrition for breast cancer.

Ensure® Targeted Nutrition for Breast Cancer—Strong nutritional choices during your fight.

Take charge of your nutrition with products from Abbott Nutrition. Abbott Nutrition makes it easy to get the nutrition you need. You can find these Ensure, Ensure Restore, and Glucerna products at your local grocery store or by calling toll free 1-800-355-7127. Ensure and Glucerna are also available at most online retailers. Ensure is available in 24 oz. and 8.4 oz. cans, 12.3 oz. and 3.6 oz. packets, and 1.5 oz. and 0.5 oz. packets.

## DIABETES

### Glycemic Response of Glucerna® Shake Using a Meal Tolerance Test in Subjects With Type 2 Diabetes\*

**Study Purpose**

The study was performed comparing:

- Ensure®
- Glucerna Shake

The study was a randomized, double-blind, single-center and meal tolerance test (MTT) to compare the glucose response of nutritional products in people with type 2 diabetes.

**Study Design**

The study was a three-way crossover (the third arm was an experimental nutritional formula that is not included in this summary). Thirty-five subjects between the ages of 18 and 75 years were enrolled. Subjects had diagnosed type 2 diabetes and were taking oral antidiabetic medications; none, however, used insulin to manage blood glucose. Antidiabetic medications were withheld during the morning of each MTT to minimize any confounding effects due to variability in pharmacotherapy. Each subject consumed all study products, thereby serving as his/her own control. The MTT was conducted in subjects who fasted for 10 hours (other than water allowed overnight), subjects consumed a single 8 oz. nutritional beverage, and blood samples for postprandial glucose analysis were taken at defined intervals up to 180-minute postprandial.

**Results**

Data were analyzed on 37 subjects who consumed all products and completed all MTTs. The graphs below show the adjusted mean change in blood glucose over time and area under the curve blood glucose values of study subjects during the MTT (mean ± SEM).

Adjusted peak glucose was 46% lower for Glucerna Shake than for Ensure (p < 0.003). Adjusted area under the curve blood glucose level was 25% lower (p < 0.003).

**Conclusions**

Glucerna Shake, containing a unique blend of slowly digested carbohydrates, produced a lower postprandial rise in blood glucose in subjects with type 2 diabetes compared to a leading standard nutritional beverage.

\*Study With: Optavia, Replenish Shakes & Meal Replacements, Total of a Spoonful Nutrition Products and Two Spoonful Sports Products in Regions With Opti-Sports, Two Spoonful Nutrition, Abbott Laboratories, January 2017. Glucerna products are for use under medical supervision as part of a diabetes management plan.

## WOUND HEALING

Rebuilding Muscle, Rebuilding Lives.™

### Therapeutic Nutrition Drink Mix

Shown to Support Tissue Repair and Help Build Muscles!

Abbott introduces New Targeted Nutrition Therapy to Support Wound Healing

Abbott's line of Ensure, Ensure Restore and Ensure Clinical Strength Protein Nutrition products is now being used to support wound healing. Research has shown that wound healing is a complex process that involves many factors, including protein, calories, and vitamins. Research has shown that wound healing is a complex process that involves many factors, including protein, calories, and vitamins. Research has shown that wound healing is a complex process that involves many factors, including protein, calories, and vitamins.

## SARCOPENIA

Sarcopenia: A Promising New Approach  
Professor Jürgen M. Bauer

International Academy of Nutrition & Aging and Abbott Nutrition invite you to participate in a webconference:

October 16, 2017 10:00 AM EDT  
(GMT-05:00) London, (GMT-04:00) Toronto, (GMT-08:00) Chicago, (GMT-07:00) Dallas, (GMT-06:00) Mexico City, (GMT-05:00) Sao Paulo

October 16, 2017 09:00 AM EDT  
(GMT-05:00) London, (GMT-04:00) Toronto, (GMT-08:00) Chicago, (GMT-07:00) Dallas, (GMT-06:00) Mexico City, (GMT-05:00) Sao Paulo

Program Outline

Dr. Jürgen M. Bauer will discuss the importance of protein and amino acids in the prevention and treatment of sarcopenia in older adults, and how the available scientific evidence supports the use of protein supplements in this population.

About the Speaker

Dr. Jürgen M. Bauer is a professor of geriatrics and director of the Center for Geriatrics and Gerontology at the University of Bonn, Germany. He is also a member of the International Academy of Nutrition and Aging (IAGG) and the European Society for Clinical Investigation in Geriatrics (ESCG).

About the Moderator

Dr. Jürgen M. Bauer is a professor of geriatrics and director of the Center for Geriatrics and Gerontology at the University of Bonn, Germany. He is also a member of the International Academy of Nutrition and Aging (IAGG) and the European Society for Clinical Investigation in Geriatrics (ESCG).

## KIDNEY DISEASE

Malnutrition and Chronic Kidney Disease: Addressing Nutritional Needs

This educational document will help healthcare professionals in:

- Identify the pathophysiology and progression of protein-energy malnutrition (PEM) in the adult chronic kidney disease (CKD) population.
- Recognize the symptoms and signs of PEM in the CKD population, and strategies from this practice.
- Understand the treatment interventions that are available.

Chr Hansen's Study of Probiotic Strains for Specific Diseases

KEYNOTE ADDRESS

Characterisation of *Bifidobacterium animalis* subsp. *lactis* BB-12 and other probiotic bacteria using genomics, transcriptomics and proteomics

Introduction

Probiotics are bacteria which are consumed in foods or food supplements to improve human health. A number of beneficial effects have been ascribed to probiotic products, including immune modulation, anti-hypertensive effects, lowering of blood cholesterol, anti-cancer effects and relief of the symptoms of irritable bowel syndrome (Ouvérad *et al.* 2002). The most commonly used probiotic products normally contain viable bacteria of various species of *Bifidobacterium* and *Lactobacillus* among others. Characterisation of the health effects and the bacteria that provide them is an area of intensive research. One approach is to use genomics and the associated experimental techniques to get a better understanding of the biology of the relevant bacteria both in the products they are delivered in and in the host where they exert their probiotic effect.

Genomics is the determination and analysis of the complete genome sequence of an organism. This is a relatively new scientific discipline with tremendous potential for allowing us to understand the properties of all living organisms. Initially, genomics research on bacteria focused on pathogens such as *Haemophilus influenzae* (Fleischmann *et al.* 1995) and *Escherichia coli* (Blattner *et al.* 1997). Recently, however, a number of genome sequencing projects on beneficial micro-organisms have been initiated (Klaenhammer *et al.* 2002), including several involving probiotic bacteria (Delgado *et al.* 2005; Kluge *et al.* 2005).

An examination of a complete genome sequence allows the prediction of all the genes possessed by the organism, which in turn allows an estimation of the metabolic potential of the cell. This information can be used to understand the behaviour of the organism in various environments. For probiotic bacteria, these environments include the fermentation vessels in which the strains are produced, the products in which these strains are consumed and the gastrointestinal tract (GIT) where these strains are expected to exert their beneficial effect. Ultimately, experiments based on genomics information will lead to an increased insight into the physiology of probiotic bacteria and may lead to an understanding of the mode of action of various probiotic products.

The genomics approach

Possession of a complete or nearly complete genome sequence allows a number of experimental approaches to understanding the biology of the organism in question. These include transcriptomics,

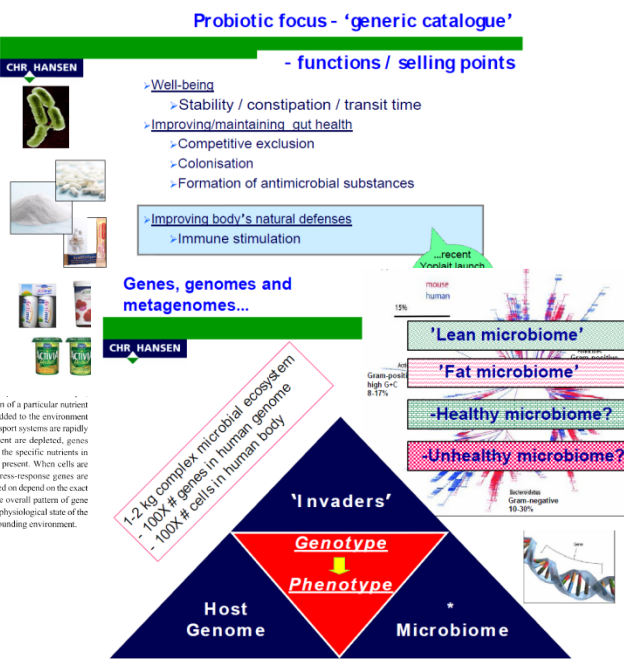
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Abstract

Determination of the complete genome sequence allows a number of new insights into the biology of the bacterium and its beneficial effects obtained through its genomic information for B. animalis that have been used to create micro-organisms of this important probiotic strain used to characterise other Bifidobact. a better understanding of the stresses industrial-scale production. In an expression when cells are grown in D fructooligosaccharides have been used information derived from the genome information derived from the published other probiotic bacteria is also provided

The rapid response bacteria shown to be facilitated by rapid changes in gene genes that are required for the production of a particular nutrient are quickly repressed if the nutrient is added to the environment and the genes for the corresponding transport systems are rapidly induced. As nutrients in the environment are depleted, genes encoding the biosynthetic pathways for the specific nutrients in question are induced, if these genes are present. When cells are stressed by an environmental factor, stress-response genes are activated. The specific genes that are turned on depend on the exact nature of the stress. Thus, analysis of the overall pattern of gene expression reveals a great deal about the physiological state of the cell, as well as the conditions in the surrounding environment.



Chr Hansen is pursuing eight indication areas:

- Intestinal balance
- Diarrhea
  - Antibiotic associated
  - Traveler's
- Constipation
- Children's well-being
- Infant health
- Immune support
- Bacterial vaginosis



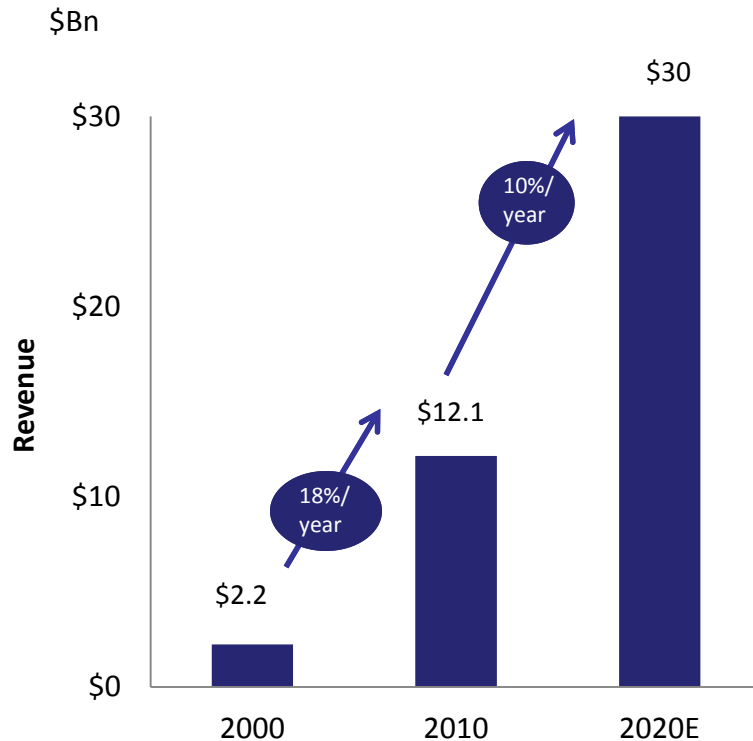
Customers Buying Chr Hansen's Probiotics



# PepsiCo: Adding H&W to Its Core Business

*PepsiCo has steadily increased its portfolio of healthy snacks and beverages*

## PEPSI'S "GOOD-FOR-YOU" PRODUCTS



## KEY TAKEAWAYS

- PepsiCo expanded the healthy food and beverage portfolio because **rising awareness of health and wellness** was putting pressure on the carbonated soft drink and salty snack businesses
- Pepsi's "Good for You" products have **higher margins** than salty snacks and carbonated soft drinks
- PepsiCo has considerable experience in multiple retail channels for snacks and beverages → The **existing distribution and marketing channels** support the distribution of new healthy products

## Nestle's Investment in Personalized Nutrition



*Opened in January 2011 with plans to develop personalized nutrition products for specific diseases*

*Prometheus specializes in treatments and tests for IBS, Crohn's disease, and cancer*

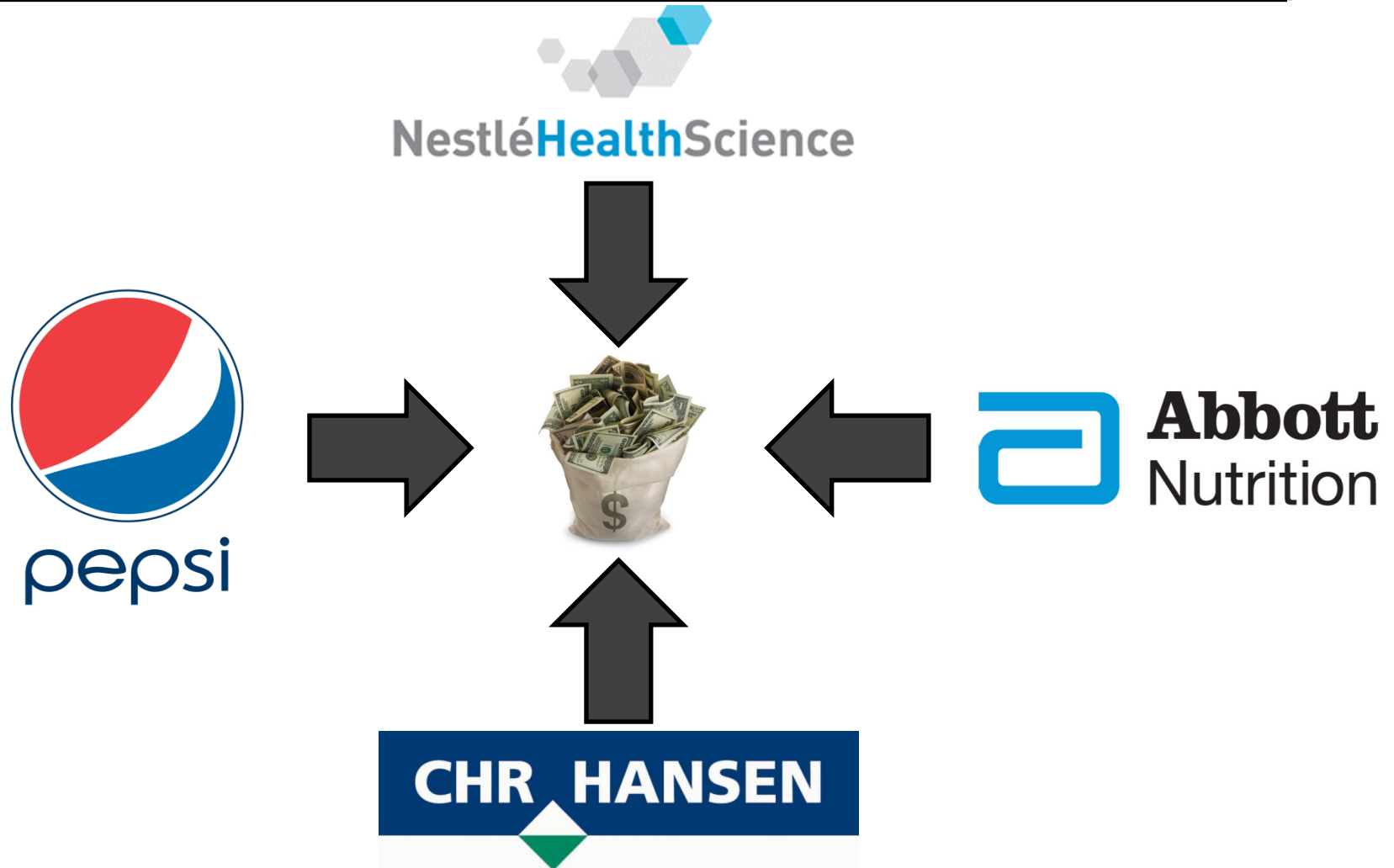
*Nestle aims to become the world leader in health-science nutrition in 10 years*



# Examples of Companies Pursuing Food as Medicine

*From major CPG companies to ingredient manufacturers*

## Various Personalized Nutrition Approaches



# Big Food Companies And Venture Capital

*Many are now investing in H&W / nutrition focused funds*

- Nutrition Capital Network lists these companies as investors:



- The traditional food industry long defined their market as, “Everyone who needs to eat”
- Health & Wellness was viewed as a collection of unappealing niche markets
- But Health & Wellness is sustaining attractive growth rates
- Those niche markets are now looking increasingly attractive:
  - » Better margins
  - » Higher purchase rates per customer
- Major food companies are beginning to leverage their distribution channels and their existing brands to put Health & Wellness products on retail shelves
- Many food companies are also investing in venture funds → primary goal: get an early look at innovation

THANK YOU!