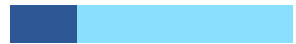


Joint Health Innovations for the Action Era

December 2018

Lonza



Consumer Health and Nutrition



We are a Swiss based company and leading supplier to the Pharmaceutical, Biotech & Specialty Ingredient Markets with over **\$5 Billion** in sales in 2017

BY THE NUMBERS



15 production sites in **10 countries**
(9 capsule sites and 6 ingredients sites)



More than **70 billion capsules** produced annually



Partner with more than **5,000 customers** around the world



More than **30 product offerings**



Ingredients: **over 50 patent families**



Capsules and Dosage forms: **over 50 patent families**



More than **100 successful regulatory audits**

A Vision and a Mission to Help You Succeed

Science-backed Specialty Ingredients and Cutting Edge Delivery Systems

We create unique, innovative and consumer preferred solutions for Consumer Health and Nutrition companies.

Ingredients backed by **clinical research** to support claims

Extensive **formulation** know-how and leading **capsule and encapsulation** technologies

Global **manufacturing and processing** capabilities



We are uniquely positioned to leverage our **technology** platforms and **pharmaceutical delivery** science

To help our customers improve **bioavailability, targeted delivery, taste-odor masking, and swallowability**

While also enabling **combination** products, providing visually **appealing dosage forms** and meeting the expectations of the **clean label** consumer.



We bring to our customers a wealth of **consumer** research, **clinical** insight and truly innovative **product concepts** and **solutions**

We have an unparalleled team of **business development** professionals, dedicated **customer service**, and industry leading **quality, technical service** and **regulatory expertise**.



■ Generations and Health

- Pioneering generation
- Trends and Influential factors

■ Game-Changing Innovation

- Genetic testing and identity technology
- 3D printing and personalized nutrition

■ The Action Era

- Getting in shape is more of a priority than ever
- Millennials are busier than ever
- Fitness is changing

■ Mobility Innovations

- Evolving wearable tech
- Advances in digital health

■ Joint Health Market

- Major Trends and Change Factors

■ Joint Health Consumer Perspective

- NMI research

■ UC-II[®] Undenatured Type II Collagen

- Innovation that performs
- Proposed mechanism of action
- Performance in the market
- Dosage delivery technology

Introduction

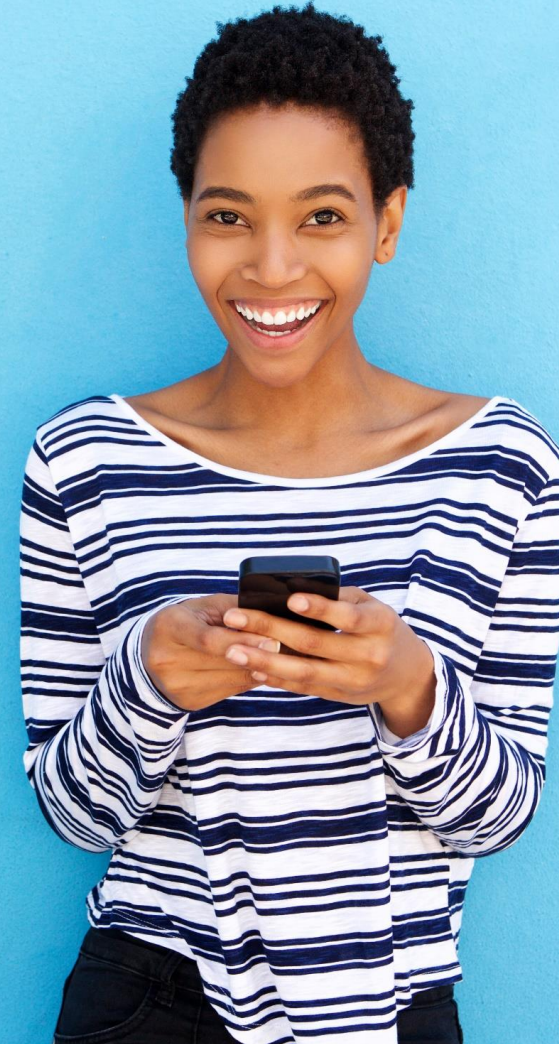
The Pioneering Generation

Lonza

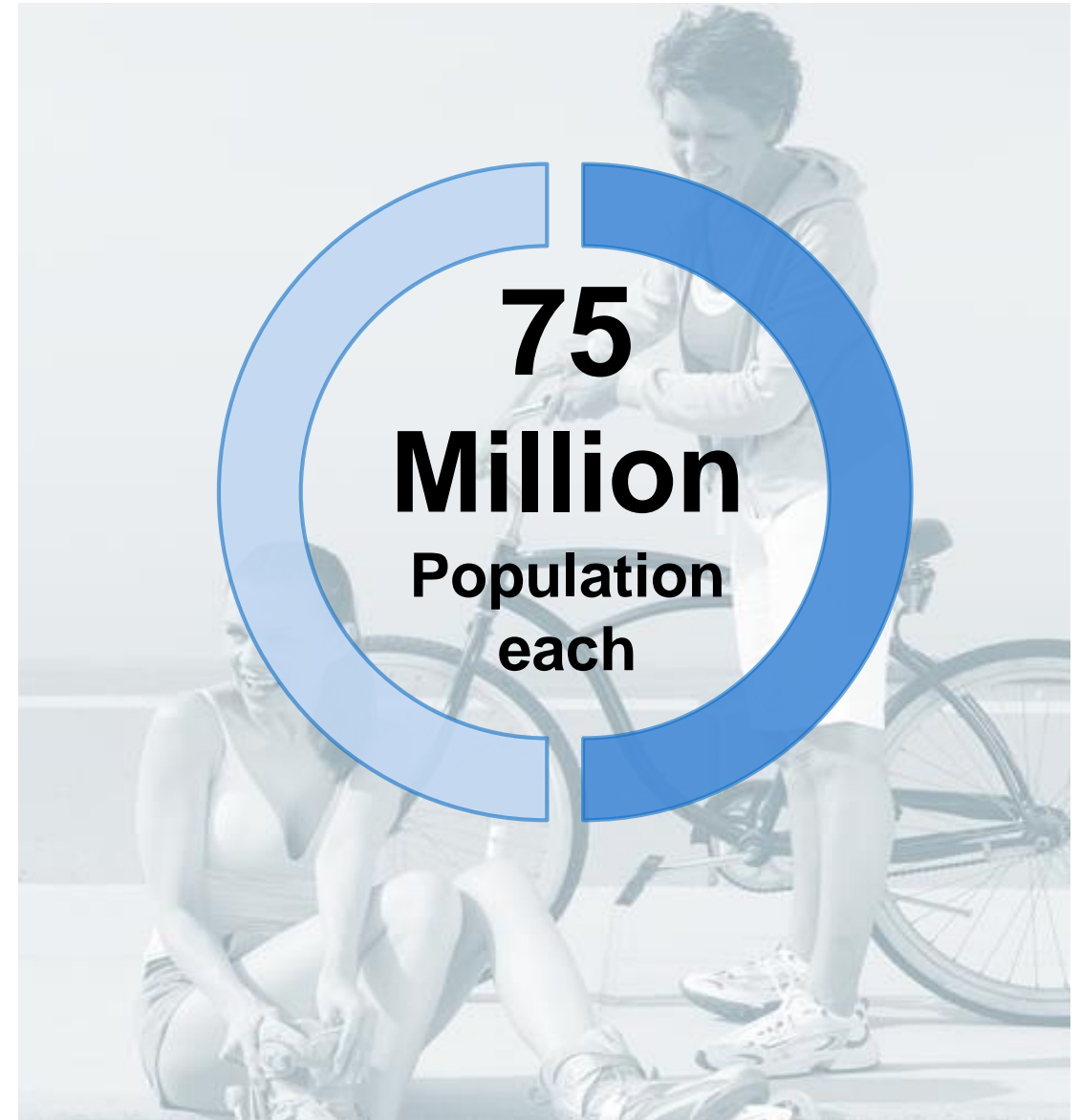
- Today's “**natural lifestyle movement**” has its roots planted by a still thriving generation, the **Baby boomers** (age 54 -72).
- **Baby boomers**’ who started their own dietary supplement companies, **seeded and cultivated an industry that led to the landmark passage of 1994’s DSHEA.**



- **Generation X** and **Millennials** have now joined the industry – as part of the business or as **consumers**
- **Consumers** are now used to a growing **array of products** geared to preserve health, all available to them through a **tap, swipe or click**



- **Boomers** are far older than their **Millennial** counterparts (18-34 year-olds).
- The size of the two generations' **populations** are almost equal, at about **75 million** each.



Game-Changing Innovation

Trends and Influential Factors

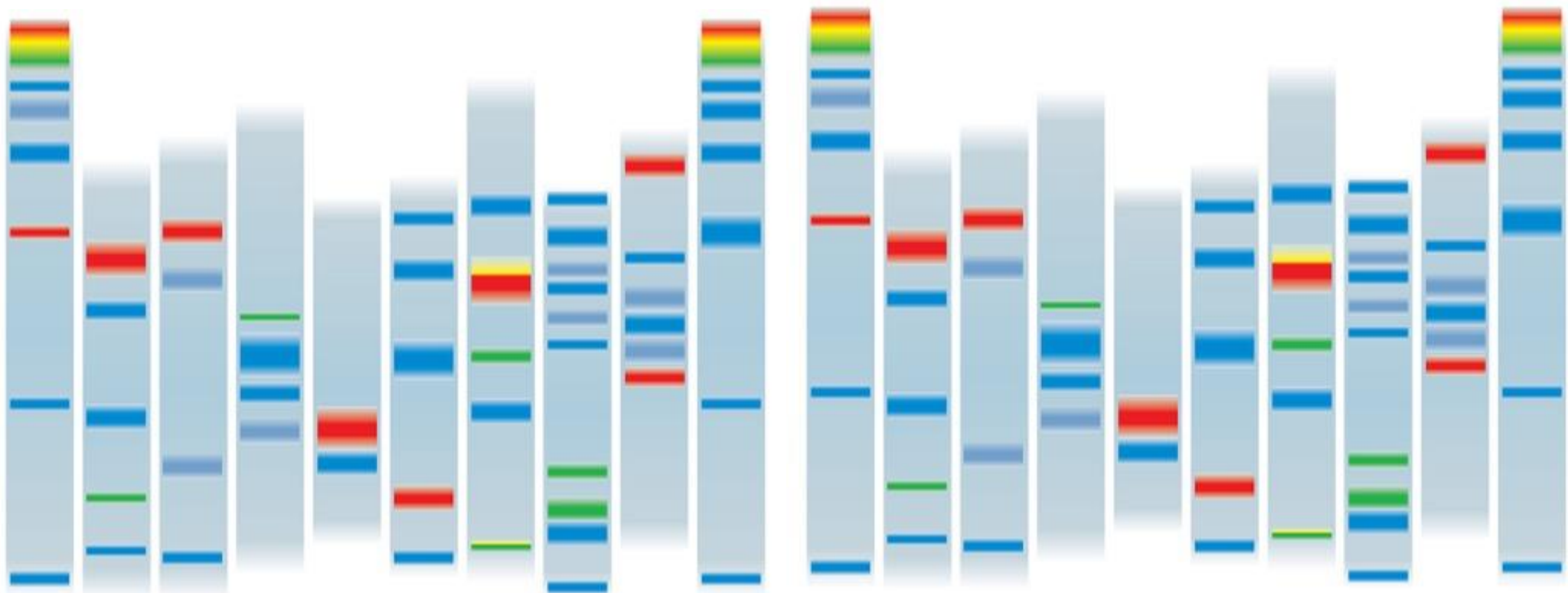
- Innovation in ingredients are needed.
- However, innovation in the industry is not solely in the realm of ingredients.



Game-Changing Innovation

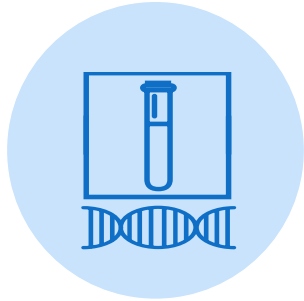
Genetic Testing and Identity Technology

DNA Testing & Personalized Nutrition

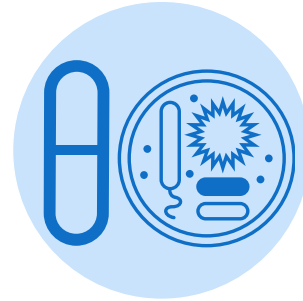


Game-Changing Innovation

Genetic Testing and Identity Technology



Segterra's GoalGetter,
mail-in saliva sample,
which **reveal one's total
health profile.**



**Capsules that analyze the
state of one's microbiome
and how nutrition intake
and habits affect it.**



**PureGenomics® – website
app identifies common
genetic variations that are
clinically relevant.**

Genetic Testing and Identity Technology Expands

Game-Changing Innovation

3D Printing – Impact on Personalized Nutrition and Supplement Industry

- **3-D printing** creates a “printed” three-dimensional image of an object, including **dietary supplements**.
- Soon you might see a **completely personalized supplement pack** that is **designed** and **3-D printed exclusively** for each **individual**.



The Action Era | Trends and Change Factors



- Evidenced by the increasing number of **dietary supplements, healthier-for-you foods / beverages, and new fitness centers.**
- International Health, Racquet & Sportsclub Association – were **38,477 health clubs** in the U.S. in 2016 – that’s **up 26%** from 2012.

The Action Era

Getting in Shape is a Top Priority

Millennials are Busier Than Ever

- Now in their early 40s, many **Millennials** are still growing their families and **driving trends** in **keeping fit** between fulfilling numerous obligations and responsibilities.



The Action Era

Getting in Shape is a Top Priority



Growing fitness trends

- **Peloton** fuses exercise with a social interaction of a trainer in your own home space.
- **Technogym: 77% of millennials** say they would like their workout to be **interactive** and **fun...**
 - **High-intensity interval training (HIIT)**
 - **Group training** is appealing to those who **like being motivated** and for the **social element**.
- And **65%** say **important to track & monitor their progress.**

The Action Era

Getting in Shape is a Top Priority

- According to a ACSM survey, **yoga** is now **more of “a thing”** once again.
- **Baby boomers**, are enjoying group fitness, says **SilverSneakers**—the **leading adult fitness program available for free** for those over 65.

ACSM’s report also shows a growing market of older adults who are now retiring healthier than other generations.



Mobility Innovation

Evolving Wearable Tech

- Wearable technology now includes **activity trackers, smart watches, heart rate monitors, GPS tracking devices....**
- Trending now are **smart glasses,** with a predicted **\$1.5 billion** in sales.



Mobility Innovation

Advances in Digital Health



- The **2018 Consumer Electronics Show (CES)** featured advances in **digital health** – the industry is estimated at about **\$200 billion annually**.
- Other companies showcased **virtual** and **augmented reality**, adapted to **rehabilitation** and **pain management**.
- **InteraXon** showcased its Muse headband which uses “neurofeedback” to **improve exercise** and **athletic performance**.

- **Compression wear and Kinesio Taping® Method** are also gaining strongholds in mobility enhancement.
- Kinesio® Tex Tape helps **facilitate the body's natural healing process while providing support and stability.**
- It's wearable for several days and is said to **successfully manage** a variety of **orthopedic, neuromuscular, neurological** and other medical conditions.



Maintaining Mobility

Older adults want to be independent, strong and active.

Maintaining mobility with age.



- In the last five years, the percent of older adults who take **condition-specific supplements** has **grown by 53% in Boomers** and **25% in Matures**.
- Consumers want **easy-to-consume delivery formats**.
- Older consumers need **easy-to-swallow** products.

Millennials, Athletes, Active Adults

Customers are clamoring for **new** and **different** ways to take **supplements**.



- The demand brings younger consumers into the category – Products like **gummies** get **Millennials** to buy.
- Formulations like **shakes** and **drinks** are important to athletes, who want to be able to crank at the gym for hours.

Now More Than Ever
Unique (non-generic)
ingredients pave the
way to Innovation.



- For the mobility space, **UC-II® undenatured type II collagen** represents an innovation in collagen-based ingredients.
- Not only for **supplements but also for foods and beverages** – producing results with as little as **40 mg daily**.



nmi

natural marketing institute

Joint Health

The Consumer Perspective

Presented by:

Diane Ray

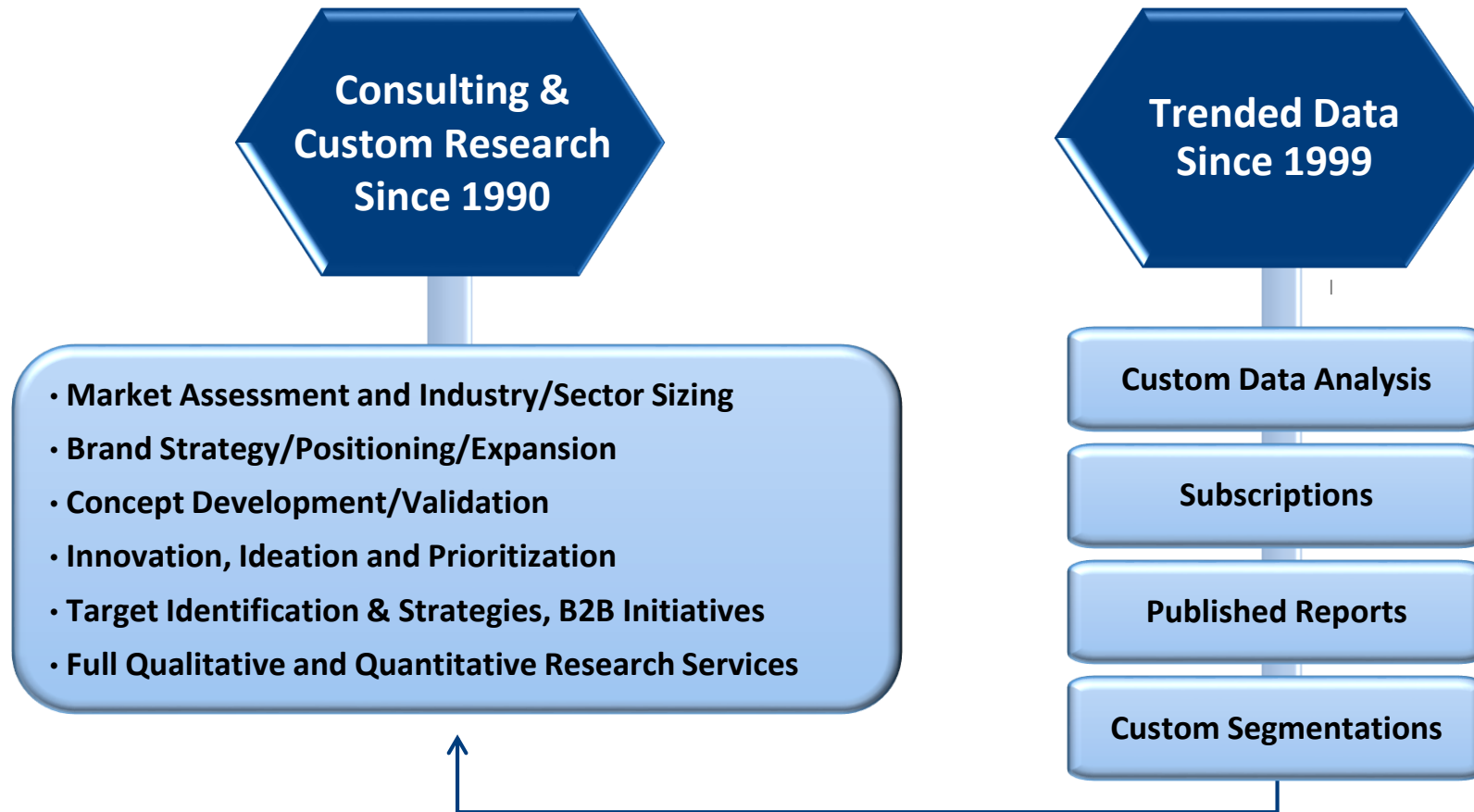
VP Strategic Innovation

Natural Marketing Institute - NMI

October 2018



Consultative Insight and Services Fueled by a Wealth of Global Data



Joint Health Consumer & Market Insights



Anyone Can Develop Osteoarthritis



Osteoarthritis is most common among **adults over 65 years old**

Prevalence rises significantly *after age 50 in men* and *after age 40 in women*.

70% of people over the age of 70, have x-ray evidence of osteoarthritis.

The **tidal wave of Boomers** will increase the prevalence.

Cost of U.S. Medical Care Remain a Top Concern

Influential Factors

- A recent health survey found that health care costs remain the top concern for consumers - **43%** said **reducing out-of-pocket expenses** is most important.
- As a result of rising health care costs, in 2015, **27% of Americans** asked their doctor or pharmacist about **less expensive alternatives** to prescriptions.

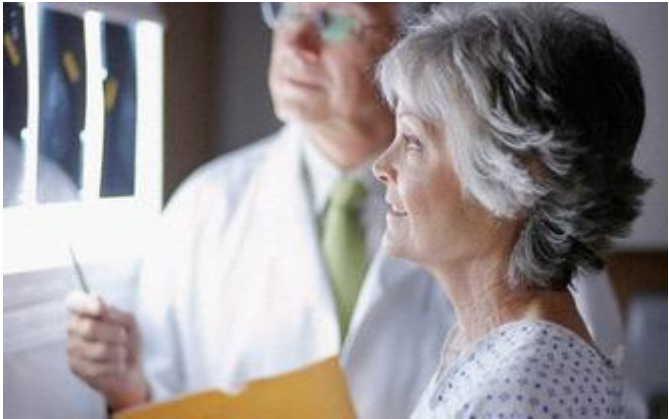
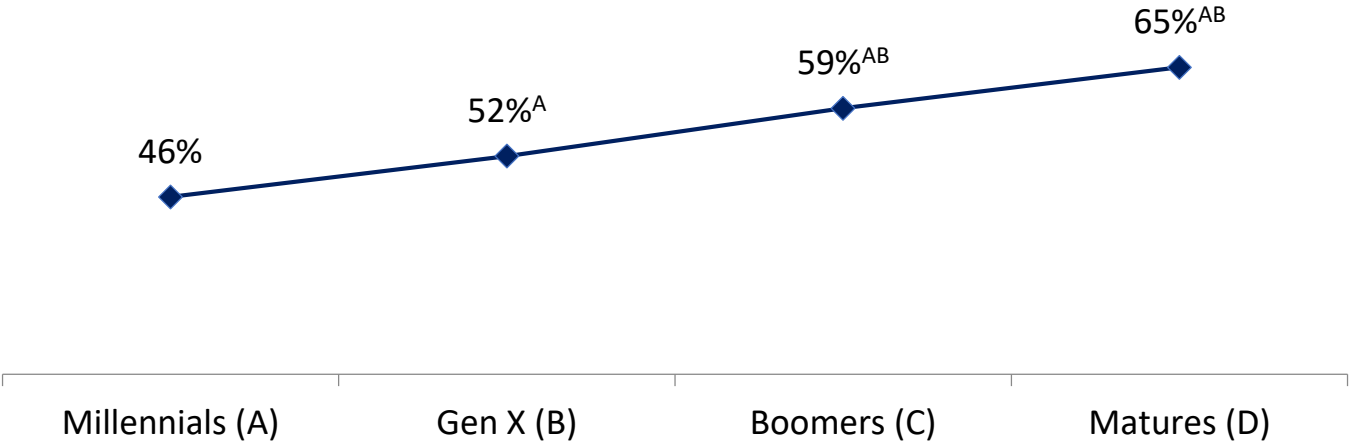


Cost of U.S. Medical Care for Osteoarthritis

Medical care for osteoarthritis in the United States costs **\$185.5 billion** a year.

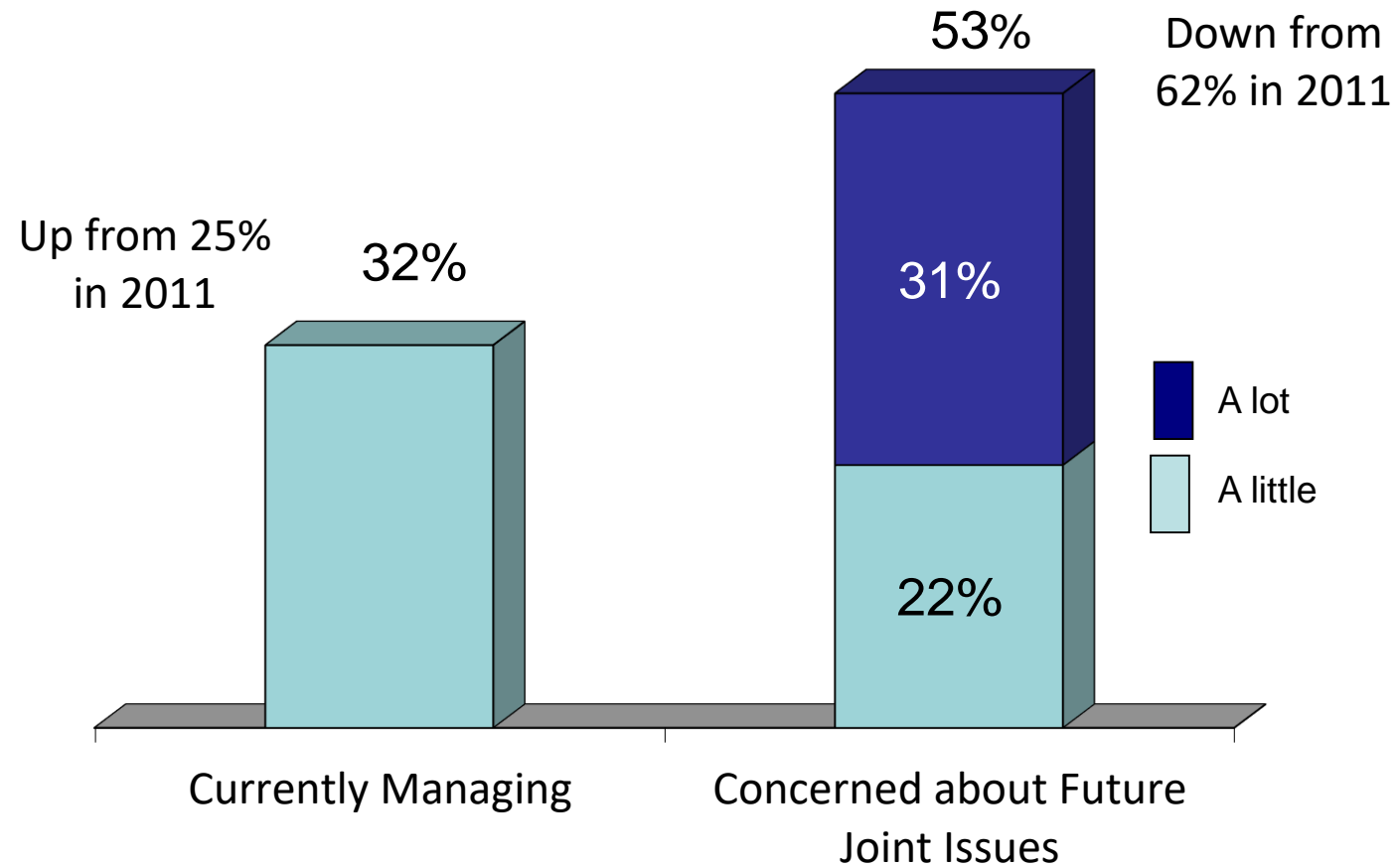
Maintaining joint health is a major concern for many Americans:

- 53% of the GP is concerned about maintaining their joint health
- 32% of the GP is self-managing

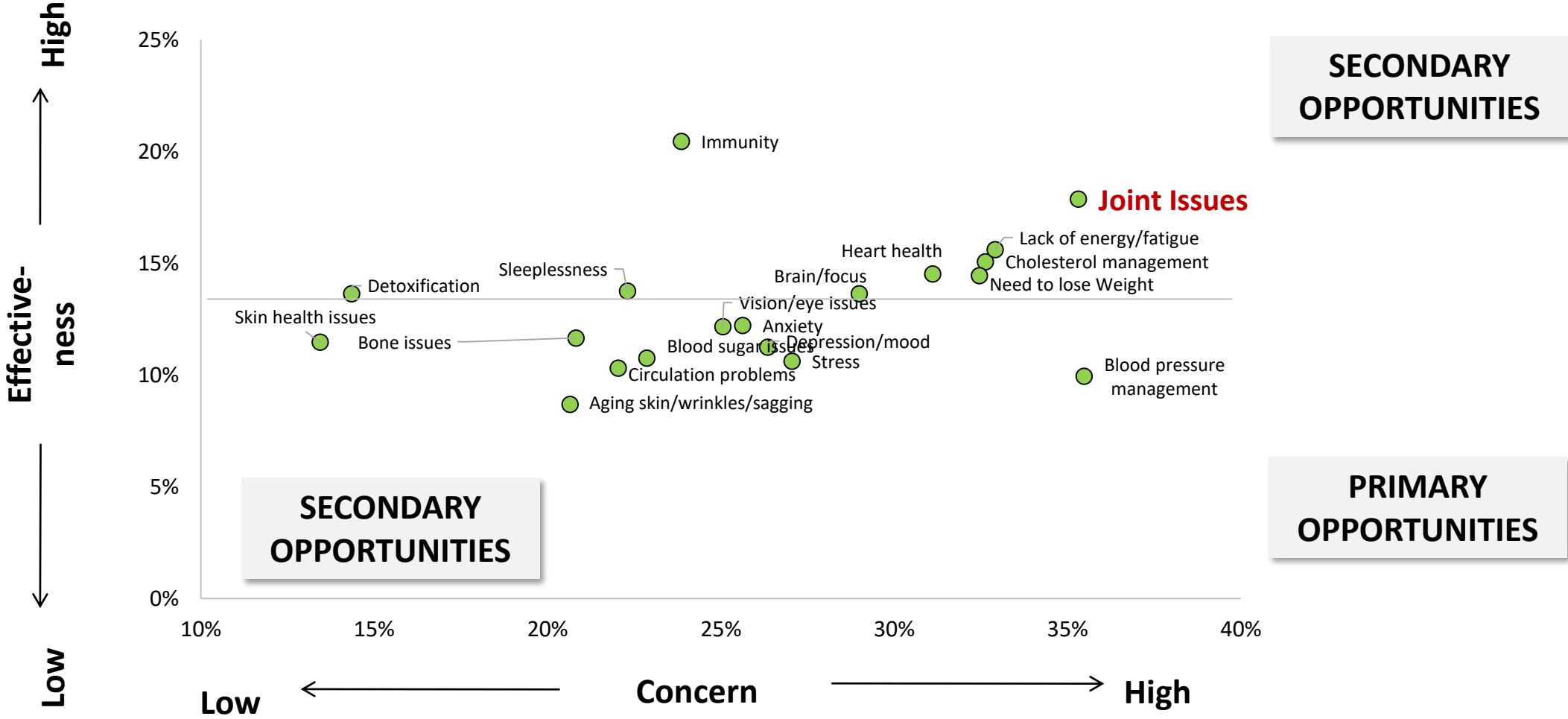


Women across all generations are more concerned than are men.

Management of Joint Health



Joint Health Market Shows a High Need with High Perceived Effectiveness; Differentiation is Key



Source: NMI SORD Study 2017

Top Conditions Managing with Top Three Supplements Used

Multivitamin/mineral (75% use)		Vitamin D (38% use)		Calcium (30% use)	
General overall health	84%	General overall health	56%	Bone health	55%
Lack of energy/fatigue	11%	Bone health	23%	General overall health	36%
Need to boost immunity	10%	Lack of energy/fatigue	12%	Joint health	23%
Heart health	7%	Joint health	10%	Loss of muscle	8%
Brain health	7%	Need to boost immunity	9%	Need to boost immunity	5%
Joint health	6%	Heart health	7%	Digestive health	5%

% Based on users of the specific supplement

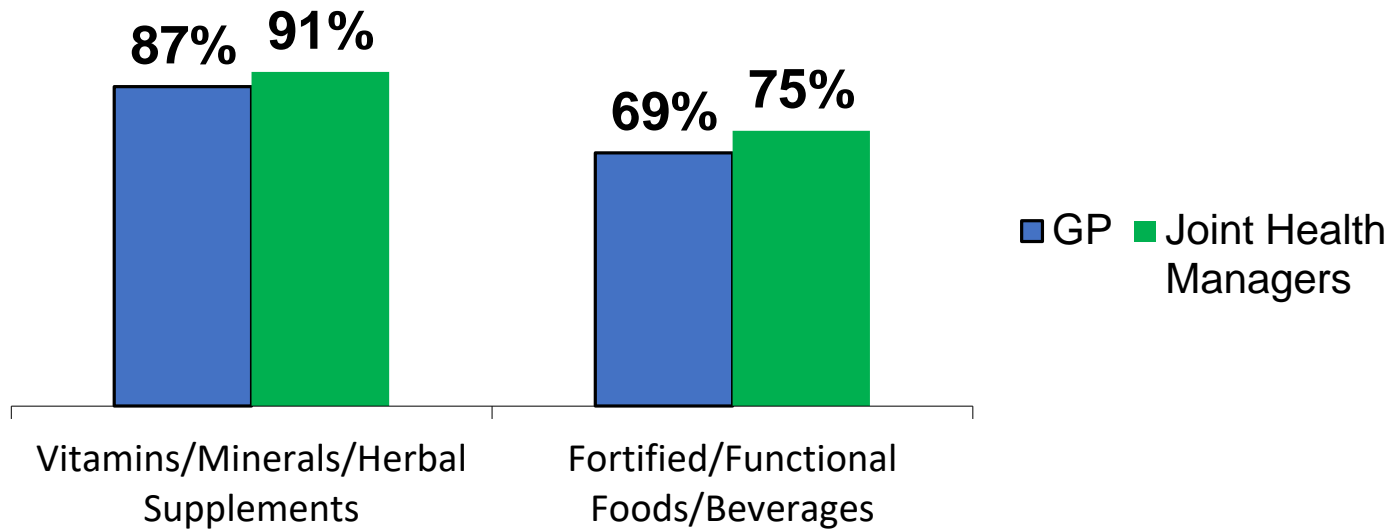
Perceived Effectiveness of Available Supplements for Joint Health Management

% Supplement Users who feel currently available supplements are very/somewhat effective in managing the following health issues

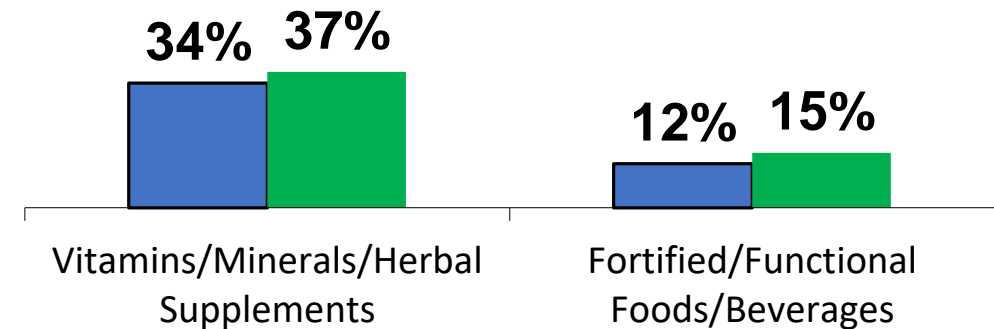


Increases in Usage of Vitamins/Minerals/Herbal Supplements and Fortified/Functional Foods/Beverages

% Used in past year

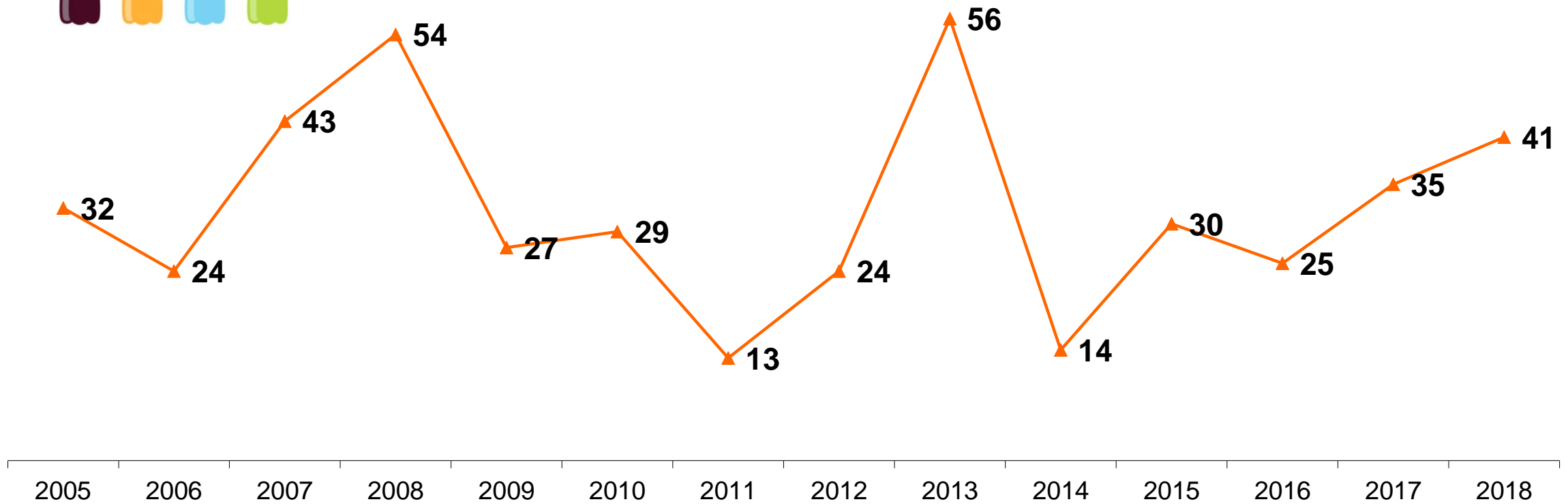


% Increased use in past year

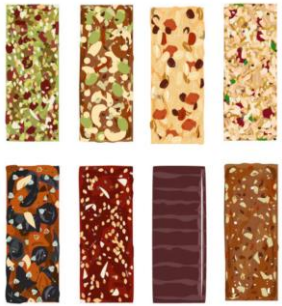


Beverages Launched Worldwide With Claim of Promoting Joint Health

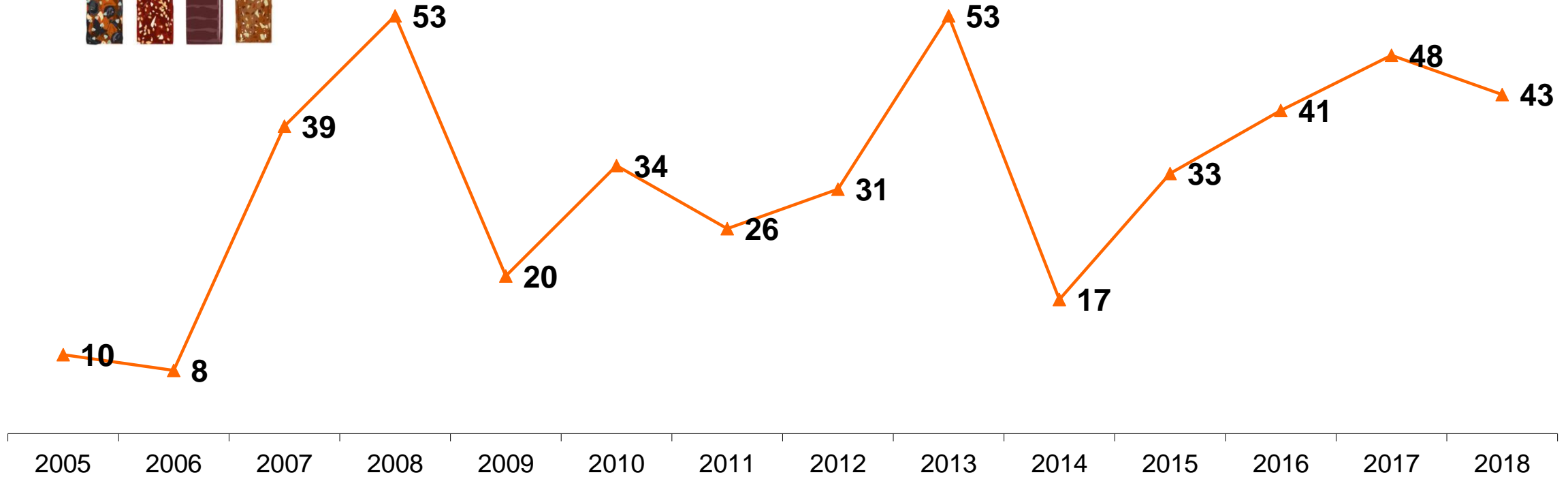
Total Worldwide Joint Health Beverage Introductions 2005-present: 447



Foods Launched Worldwide With Claim of Promoting Joint Health



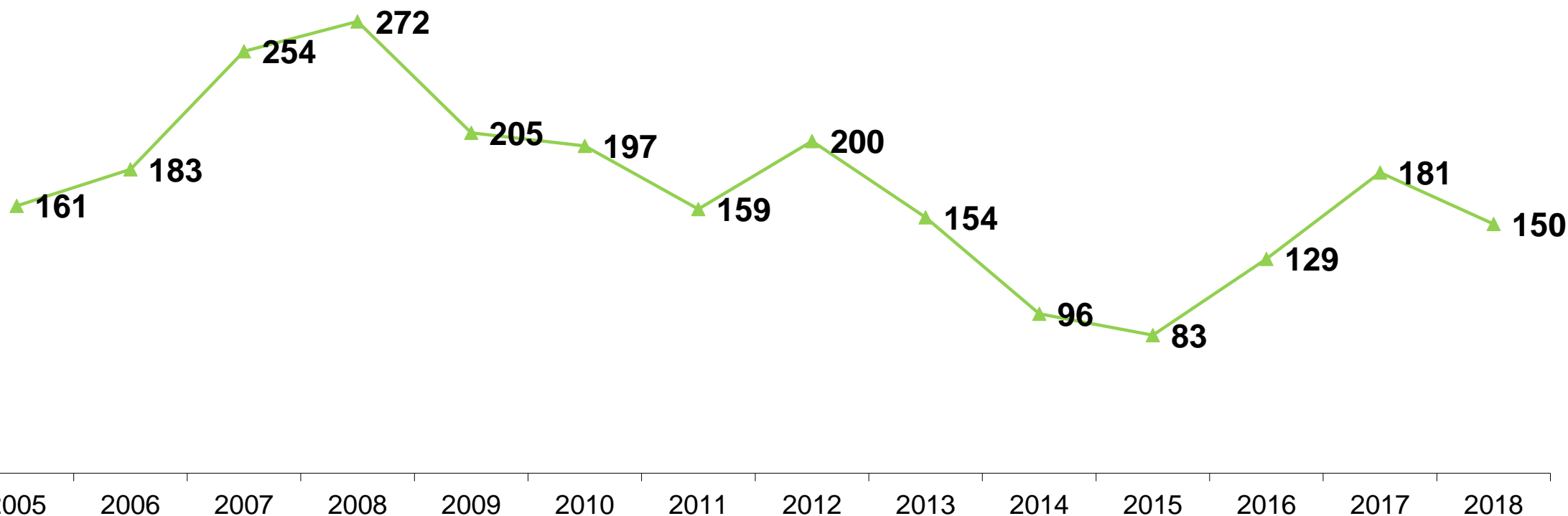
Total Worldwide Joint Health Food Introductions 2005-present: 456



Supplements Launched Worldwide With Claim of Promoting Joint Health



Total Worldwide Joint Health Supplement Introductions 2005-present: 2424



Opportunities for Joint Health

- ✓ **Consumers are wanting to stay active as long as possible**
- ✓ **Consumers are open to nutritional solutions/aids in keeping joints healthy**
- ✓ **New Science can increase participation and strengthen believability**
- ✓ **Opportunities in single/combination ingredients**
- ✓ **Opportunities in functional ingredients in many delivery forms**

Innovation that Performs

Breaking Barriers



- **UC-II[®]** research has shown benefits compared to **glucosamine + chondroitin**
- Studied in **healthy, active adults**
- **Unique** mechanism of action
- **Small, once-a-day**

Proposed Mechanism of Action

UNIQUE MODE OF ACTION

UC-II® UNDENATURED TYPE II COLLAGEN:
MAY TRIGGER THE NATURAL REBUILD OF CARTILAGE
IN YOUR JOINTS

WEAR & TEAR

Daily activities, exercise, or normal stress
could lead to joint wear and inflammation

REPAIR

UC-II® product
triggers anti-
inflammatory
cascade



CLEAN

Enzymes are
upregulated
to remove
damaged
cartilage

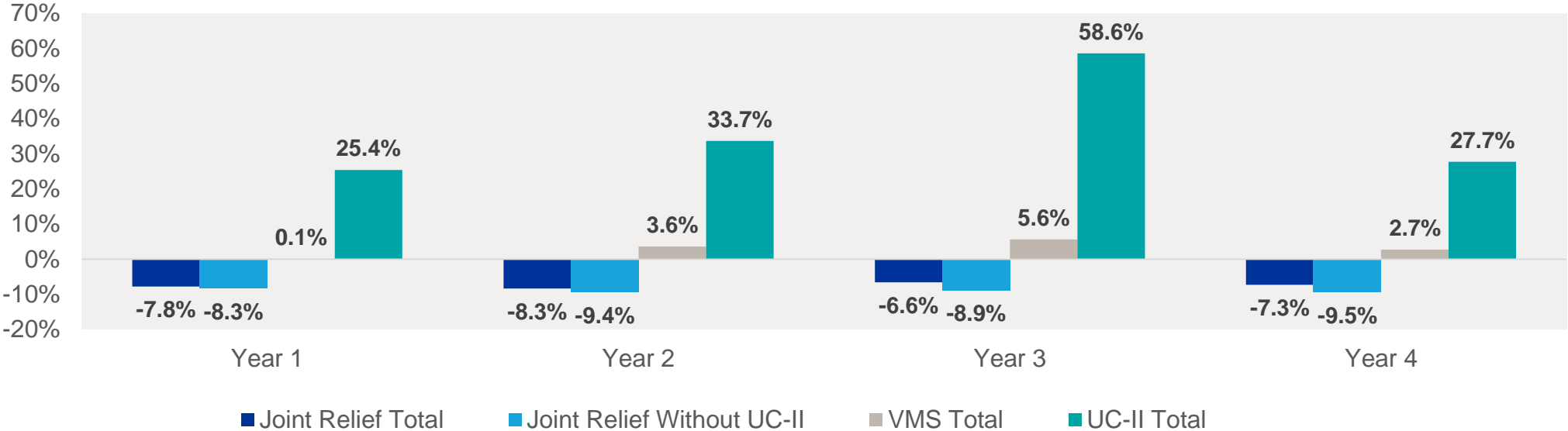
UC-II® Undenatured Type II Collagen

New Breakthrough UC-II® Ingredient Revived the Sluggish US Joint Health Market



UC-II® brand is a major success in the US Markets

Annual Growth Rates



- New Products with UC-II® have outpaced category growth and helped stem declines in Joint Relief
- Without UC-II® products, the Joint Relief category would be down -9.5% driven by G/C
- Growth rates seen only with items like probiotics and fish oil.

Nielsen xAOC 52 Wks Ended 6/25/17

Dosage and Delivery Solution Forms

Improving the Function and Form for Differentiated Products



Advanced Solutions to Address Customer and Consumer Needs

Product Performance

- Fast absorption (speed)
- Enhanced bioavailability (efficacy)
- Product stability – shelf life
- Multi-function for combo products

Modified & Targeted Release

- Extended release
- Protection for acid-sensitive ingredients
- Dual release for combo products

Consumer Experience

- Taste / odor-masking
- Reflux reduction
- Easy to swallow
- Clean Label: vegetarian, non-GMO, organic
- Unique appearance

Product Solutions

Liquid Fill Hard Capsules			Capsule Solutions				Lipid Multi-Particulates		
Beadlets	Cap-in-Cap	Acid Protection	Gelatin	Vegetarian	Acid Protection	Gelcaps	Sprinkle Caps	LMP in Capsule	LMP in Bulk Powder

Joint Health Innovation for the Action Era



- Most adults of all ages know that engaging in healthy habits will allow them to remain healthy and active
- Innovation is happening on a vast scale – from personalized nutrition to how we exercise
- The action era is upon us, which is centered on maintaining and improving mobility, and this is the goal desired by several large population groups
- From wearable technology to ingredient research, there is a lot occurring in technology for mobility and fitness enhancement
- New delivery forms can help you develop UC-II® joint-health solutions among your target market



Thank you!



Lonza

UC-II

THE FREEDOM FOR ACTIVE ADULTS TO REMAIN ACTIVE

UC-II® UNDENATURED TYPE II
COLLAGEN FOR JOINT-HEALTH
SUPPORT

DO YOU HAVE
QUESTIONS?

For more information, please contact
Juliana Erickson at Juliana.Erickson@lonza.com
or visit www.UC-II.com

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