

From the Editor's Desk: Trends and Innovation in Dietary Supplements

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INFORMING BUSINESS GROWTH



May 24, 2017

A changing food retail environment...



Vitamin Shoppe

- Functional food - increasingly important
- Protein pantry launched Fall 2015
- Clean label supplements PLNT – launched 2014
- Wellness centers with beverage bars, perishables
- Tieraona Low Dog, MD – Chief Wellbeing Enthusiast





DARK CHOCOLATE RICE CAKES



MILK CHOCOLATE RICE CAKES



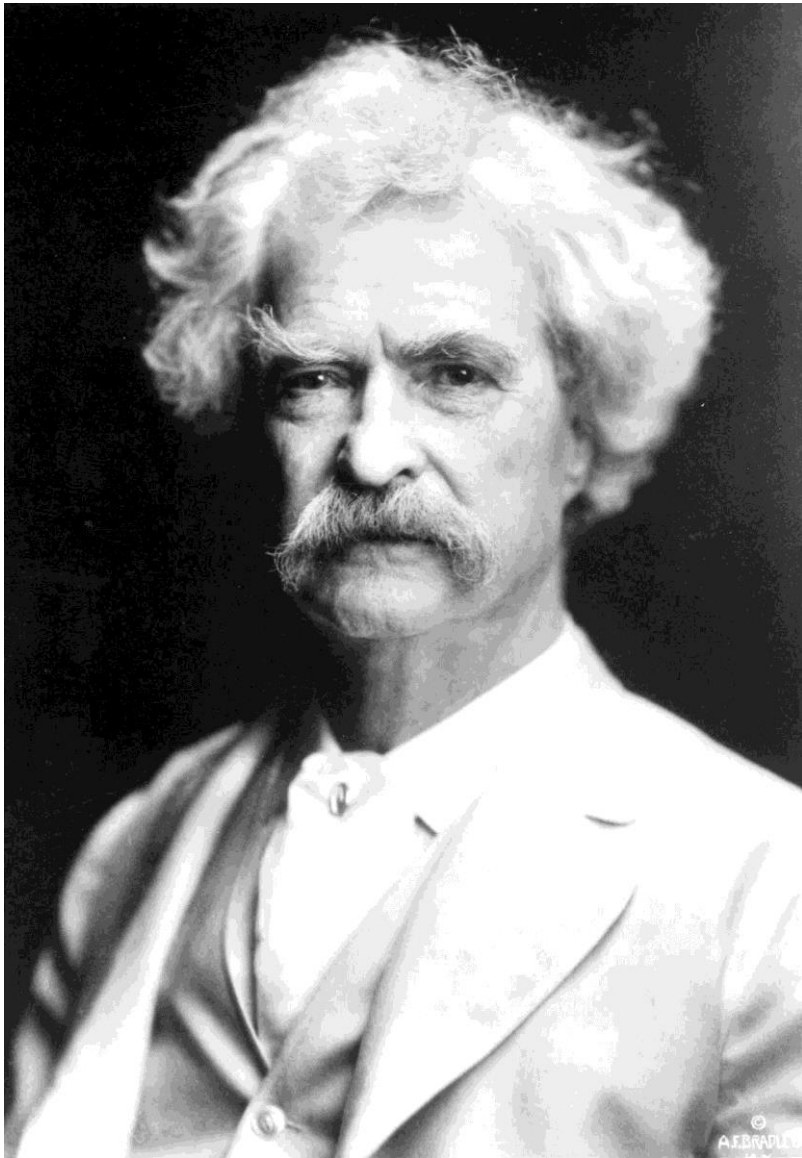
Where's the innovation in Dietary Supplements?

Colin Watts, CEO of The Vitamin Shoppe, November 2015

“I think the issue that we are facing this year is [...] the rate of new ingredients, new products, new forms that are coming into the market are less than we've seen in the past. And so when there isn't a lot of new in this category in particular, especially the retailer ends up taking a little bit earlier of a hit in that front, because the customer just doesn't have a reason to come in and see something new that's going on”



“The report of its death was an exaggeration”



Colin Watts, CEO of The Vitamin Shoppe,
March 2017

“Do I see any new fish oil ingredients or some blockbuster ingredient showing up on the calendar over the next 12 months? I would say no. On the other hand, what we are actually seeing is some very, very strong new news against some of the products that are in the market.”

Delivery

Supply chain / transparency

Customization/ personalization

Science

Delivery – Sticks, Straws, Capsules, Tablets



Transparency



MegaFood
Fresh From Farm To Tablet™



Supply Chain Management

Initiatives

- ABC-AHP-NCNPR Botanicals Adulterants Program
- Botanical Raw Materials GMPs
- Supplement Safety and Compliance Initiative (SSCI)
- Global Retailer and Manufacturer Alliance (GRMA)
- Illumina-Institute of Medicinal Plant Development (IMPLAD) - ‘world’s first’ catalogue of genomic references for 1,000 TCM medicinal plants
- NHP Research Alliance - University of Guelph, Canada
- Indena’s NGS program (Hyris)

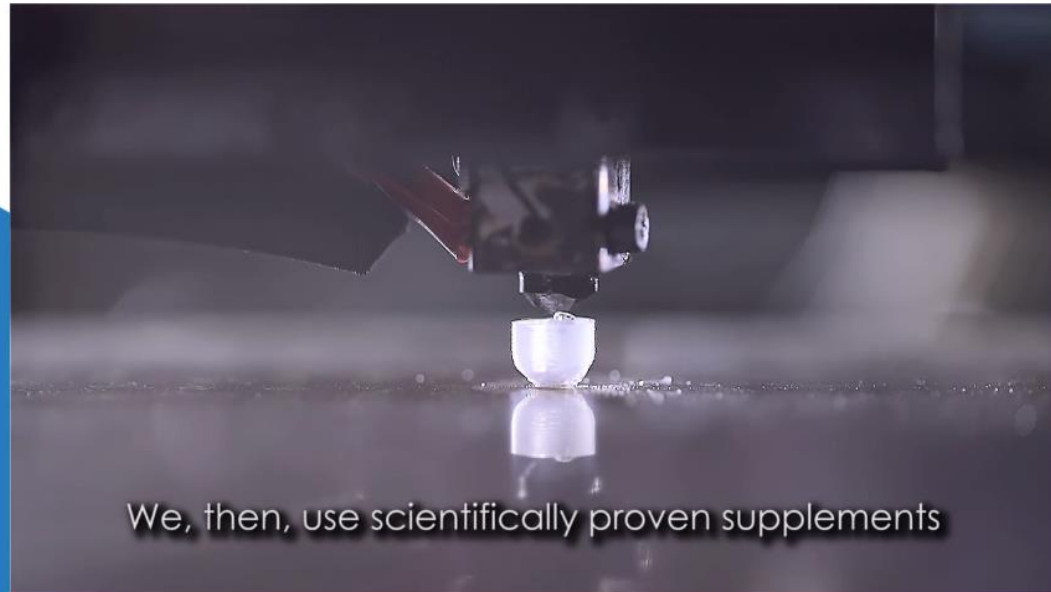


Customization/personalization



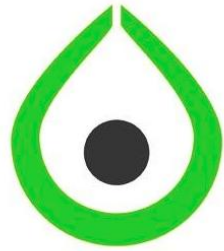
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PERSONALIZED SUPPLEMENT PILLS



<https://www.multiplylabs.com/>

The quantified self



InsideTracker



DNAFit[®]
ACHIEVE YOUR GENETIC POTENTIAL

NUTRIGENOMIX[®]

PureGenomics[®]



ADVANCED
Nutrigenomics

Regulatory hurdles... medical device?
Potential legal (class action) minefield...

A black box for the 'habit' Nutrition Test Kit stands next to a tall glass filled with a white liquid. The box features the 'habit' logo and the tagline 'FOOD. PERSONALIZED'. The glass has a black spoon-shaped graphic with a white 'h' inside.

NUTRITION TEST KIT

- At-home test kit to understand how your body uniquely responds to food
- Personalized nutrition plan
- Biology reports based on your test results

INTRODUCTORY PRICE: \$299

[ADD TO CART](#)

The microbiome



Moving beyond “digestive health”

Blood sugar management (*Cell*, 2015, Vol. 163, pp. 1079–1094)

Gut-brain axis (eg. *Gastroenterology*, 2013, Vol. 144, pp. 1394–1401.e4)

Weight management (eg. *Obesity*, 2015, Vol. pp. 2364–2370)

Oral care: BLIS M18 (eg. *Clin Cosmet Investig Dent*, Vol. 7, pp. 107-113)

Skin health (eg. *J. Microbiol Biotech*, 2016, Vol. 25, pp. 2160-2168)

Cardiovascular health: *L. reuteri* NCIMB 30242 (eg. *Br. J. Nutr*, 2012, Vol. 107, pp. 1505-1513)

Sports nutrition: Immune support, post-exercise inflammation & recovery, protein absorption

Prebiotics – colon health, bone health, weight management

Human Milk Oligosaccharides (2'-fucosyllactose, lacto-N-neotetraose - eg Glycom A/S, Abbott)

Synbiotics – optimal synbiotics? (eg. <http://www.nutraingredients-usa.com/Research/Optimal-synbiotics-new-study-unlocks-the-ideal-pre-and-probiotic-combinations>)



Next generation probiotics

Altering the microbiome is an ecological problem

Are we using the wrong types of microbes?

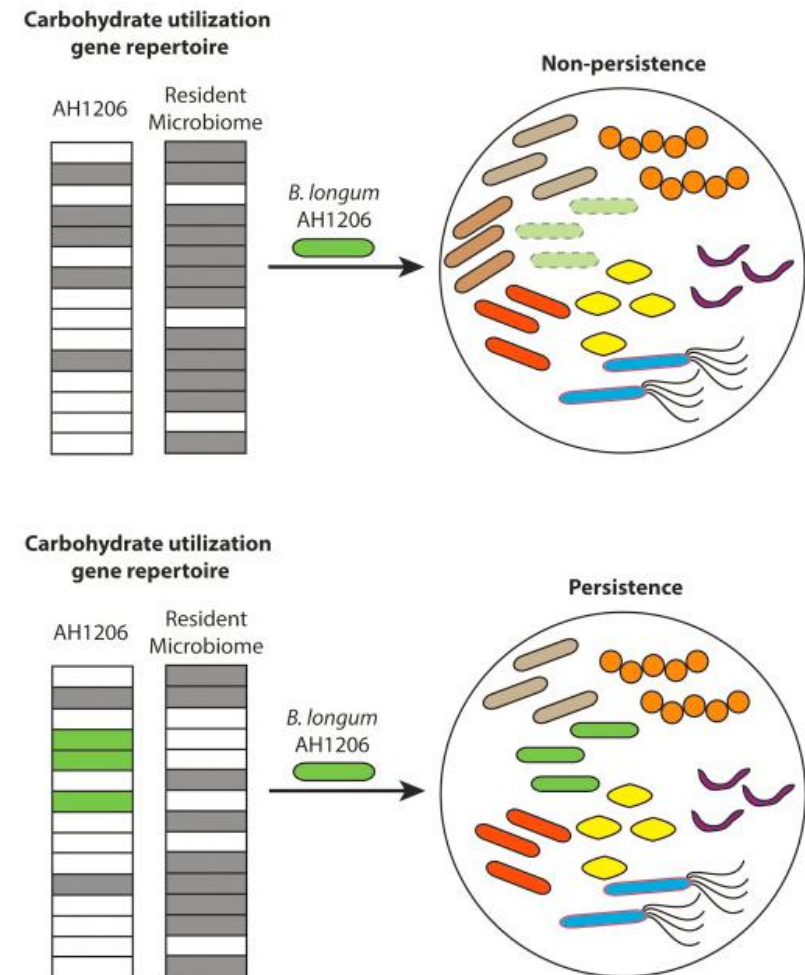
What's dominant and where?

Inter-individual variations?

Freter's nutrient-niche concept: The abundance of members of the intestinal microbiota is determined by the availability of certain limiting nutrients.

“The ability of AH1206 to colonize indicates, unexpectedly, that even in healthy individuals there are vacant or under-exploited nutrient niches”

Cell Host & Microbe, 2016, Vol. 20, No. 4, pp. 415–417 & 515–526



(Anti-)Aging

Mitochondrial (dys)function / myopathy

Resveratrol – from French Paradox to Sirt 1 activation

Urolithin A – boost lifespan in *C. elegans*;
increases muscle function in rodents – Amazentis
(*Nature Medicine*, 2016, Vol. 22, pp. 879–888)



Phase 1 trial supporting the safety, bioavailability, and biological activity
Singh et al., 2017, International Conference on Frailty and
Sarcopenia Research (ICFSR), Barcelona, Spain.

NR – Niagen (ChromaDex) – a precursor to NAD⁺ (nicotinamide adenine dinucleotide) to boost
mitochondrial performance and energy metabolism.

References:

Cell, 2013, Vol. 155, pp. 1625-1638

Science, 2015, Vol. 350, pp. 1208-1213

EMBO Molecular Medicine, 2014, Vol 6, pp. 721–731

Nature Communications, 2016, 7, Article number: 12948



Beauty from within

Collagen – science is building

Ceramides – lipids from wheat

Antioxidants - cocoa flavanols, vitamin E, lutein, zeaxanthin, lycopene, superoxide dismutase, rosemary or grapefruit extracts, astaxanthin

Biotin ?

HA ?

GLA

Product positioning - HUM

Skin Pharmacology and Physiology

Original Paper

Oral Supplementation

Berlin
Place
Hindawi Publishing Corporation
Oxidative Medicine and Cellular Longevity
Volume 2016, Article ID 4389410, 14 pages
<http://dx.doi.org/10.1155/2016/4389410>

Proks

Au

Keyw

Skin P

<https://doi.org/10.1155/2016/4389410>

Clinical Study

Skin Antiageing and Systemic Redox Effects of Supplementation with Marine Collagen Peptides and Plant-Derived Antioxidants: A Single-Blind Case-Control Clinical Study

3

The effect of oral collagen peptide supplementation on skin moisture and the dermal collagen network: evidence from an *ex vivo* model and randomized, placebo-controlled clinical trials

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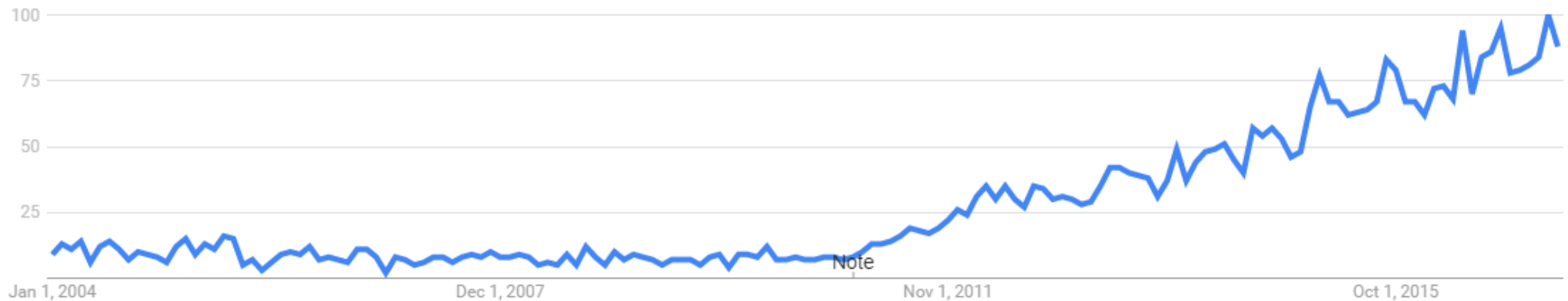
³Dermatology Clinic "Orthobiotiki Clinical", 3-5 Sorou Street, 15125 Athens, Greece

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⁵Centre of Innovative Biotechnological Investigations (CIBI-Nanolab), 197 Vernadskogo 1



Sports Nutrition – focus... Nootropics



Citicoline (Cognizin, Kyowa Hakko) – eg. *Journal of Attention Disorders*, doi: 10.1177/1087054715593633

Teacrine (Compound Solutions) - *J Int Soc Sports Nutr.* 2014; 11(Suppl 1): P49

Phosphatidylserine (PS), Phosphatidic acid (PA) – *Advances in Therapy*, 2014; 31: 1247–1262.

Resveratrol - *Nutrients* 2017, 9(1), 27

Ashwagandha - *BMC Complement Altern Med.* 2017, 17(1):136

Bacopa – Meta-analysis: *J Ethnopharmacol.* 2014;151(1):528-35

Inositol-stabilized arginine silicate (Nitrosigine, Nutrition 21) - *Nutrients*, 2016, 8(11), 736

Spearmint (eg. Kemin's Neumentix) - *The FASEB Journal*, Vol. 29, No. 1 Supplement 900.15

Exciting ingredients



Curcumin/turmeric (118% growth in the mass channel, 32% growth in the natural channel, overall sales > \$50 million, *HerbalGram* 111).

Lutein & cognitive health

Adaptogens – Ashwagandha, Shatavari, Shilajit, Holy Basil, Licorice

Mushroom extracts

L-ergothioneine



Google Trends – region US. 2004 onwards

Green coffee extract

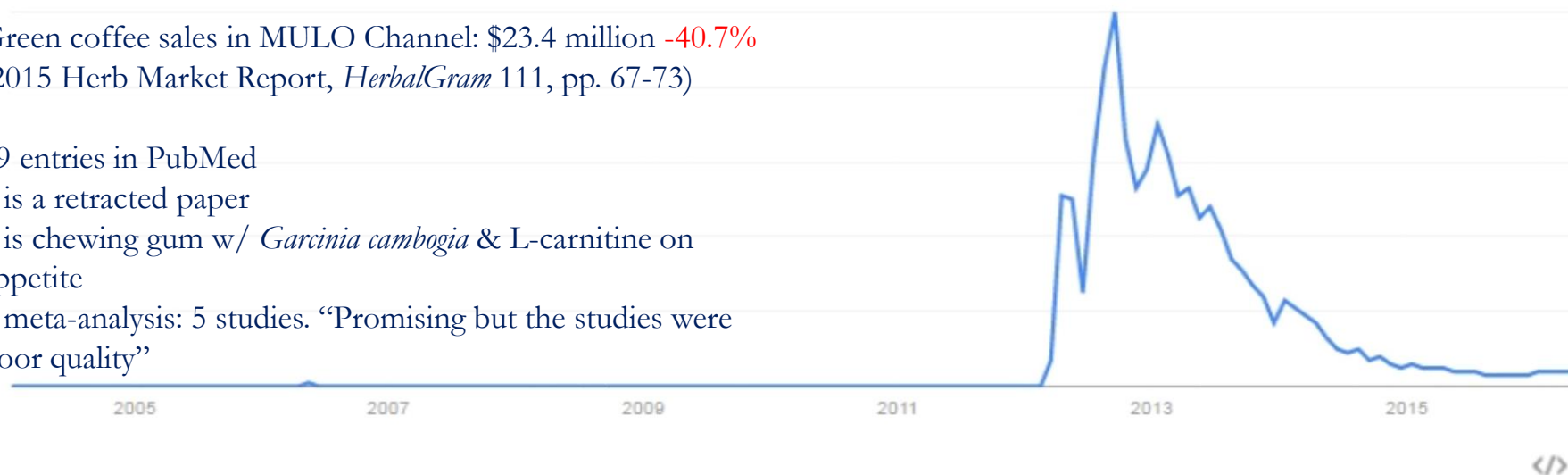
Green coffee sales in MULO Channel: \$23.4 million **-40.7%**
(2015 Herb Market Report, *HerbalGram* 111, pp. 67-73)

19 entries in PubMed

1 is a retracted paper

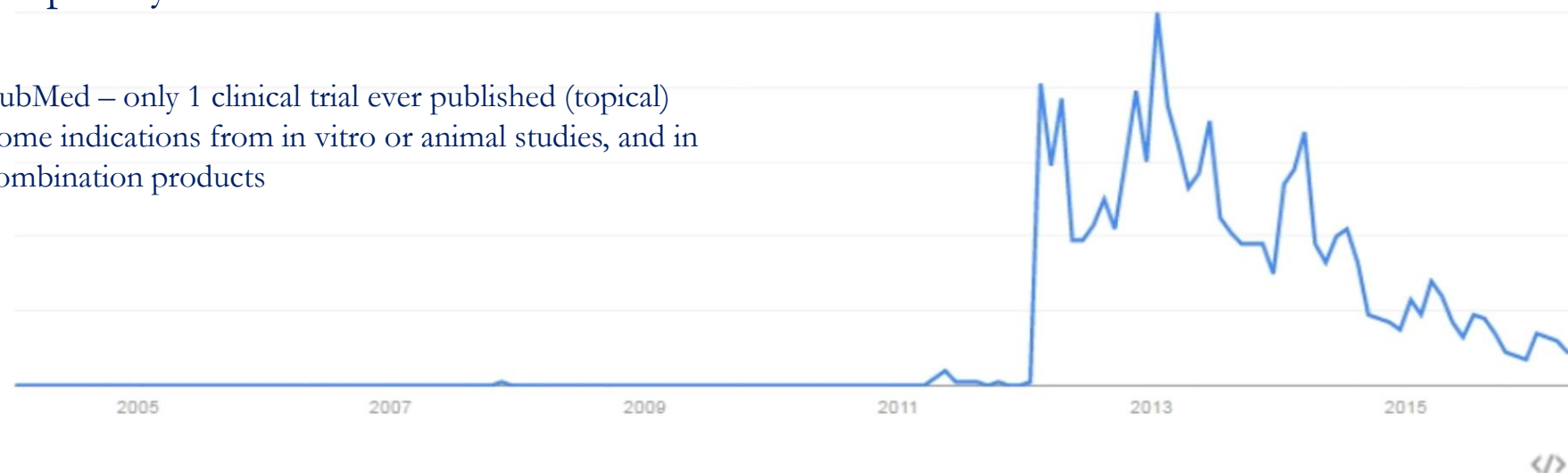
1 is chewing gum w/ *Garcinia cambogia* & L-carnitine on
appetite

1 meta-analysis: 5 studies. “Promising but the studies were
poor quality”



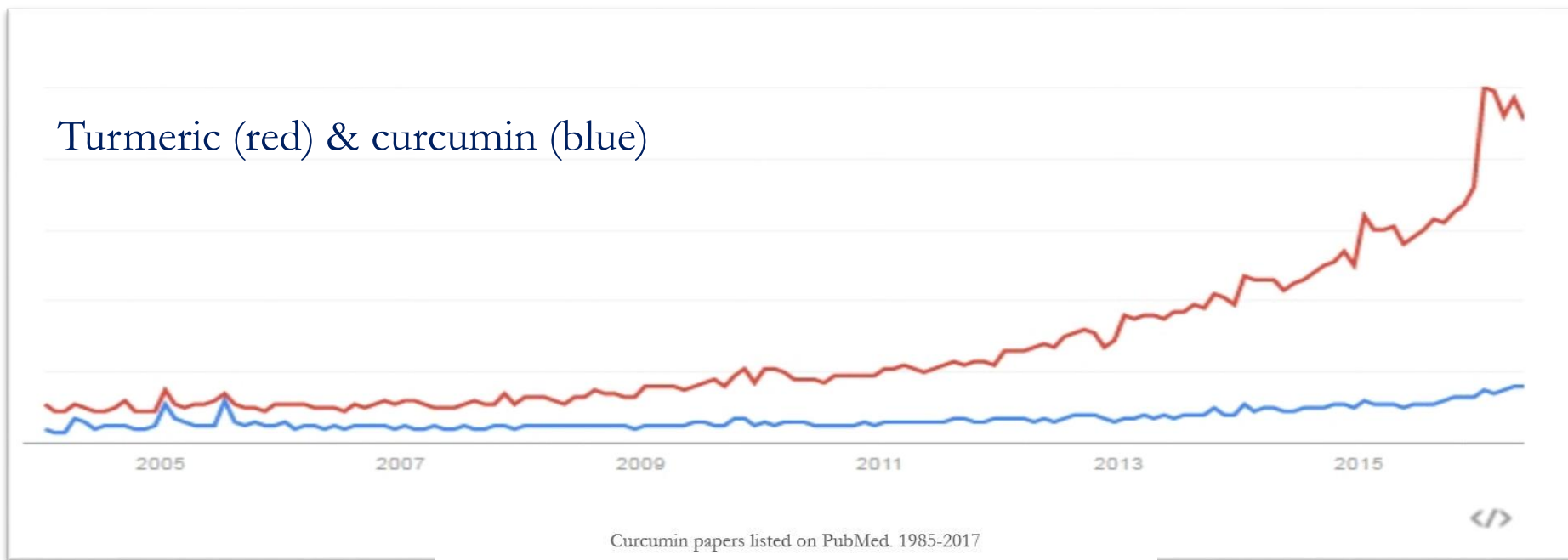
Raspberry ketones

PubMed – only 1 clinical trial ever published (topical)
Some indications from in vitro or animal studies, and in
combination products

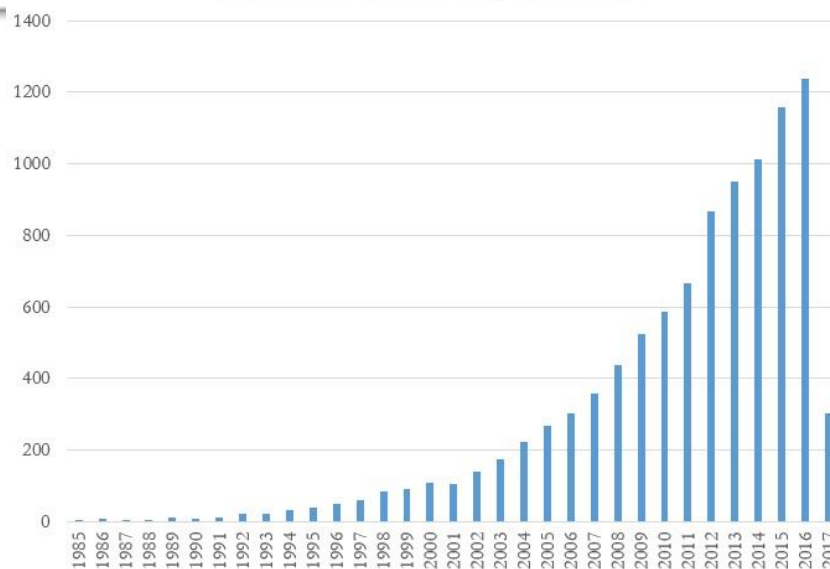


Google Trends – region US. 2004 onwards

Turmeric (red) & curcumin (blue)



Curcumin papers listed on PubMed. 1985-2017



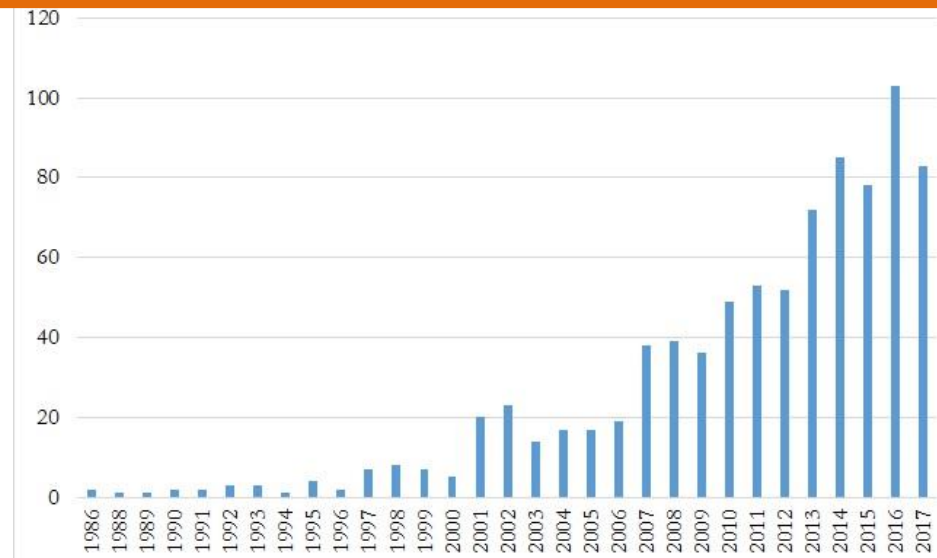
Google Trends – region US. 2004 onwards

Interest over time

Ashwagandha



Investment in science builds consumer interest & ultimately market success



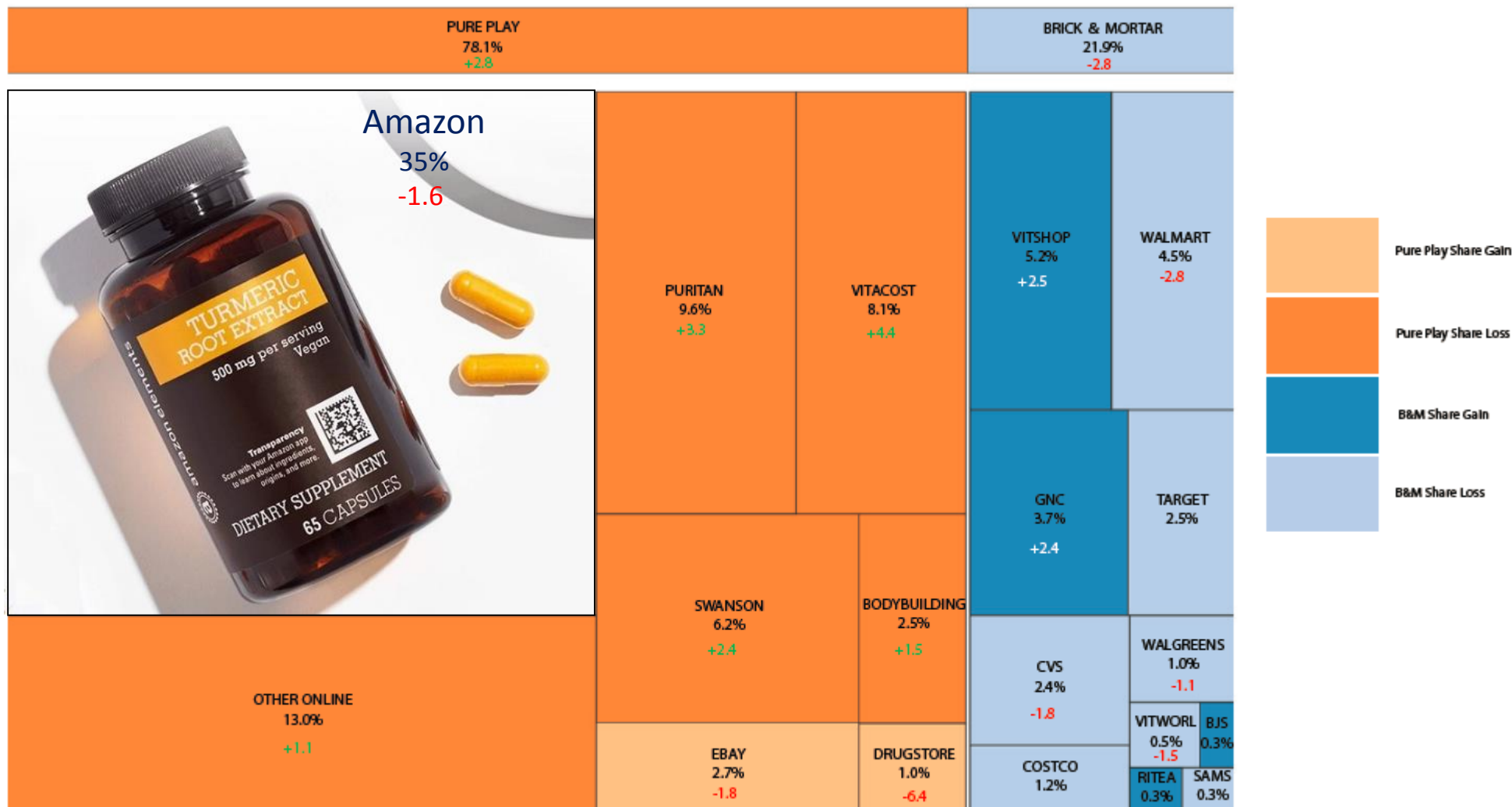
Thank you for your attention!

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The Dietary Supplements Industry in 2017

Online = ~11%

Categories with high purchase price but low purchase frequency tend to do better online



Source: TABS Analytics