EARTHLIGHT®
WHOLE FOOD VITAMIN D

Formulating a cost-effective, whole food source of Vitamin D

Earthlight’s ingredient technology sets the standard for Vitamin D and allows you to do more than ever before

Today's Presentation

1 Introduction

2 Earthlight® Ingredient Overview

3 Earthlight® vs. Other Ingredients

4 Top Applications

5 The Earthlight® Origin Story

6 Glimpse into the Future: Market Trends

Before we start: let’s quickly review some realities

The surge in Vitamin D interest over the last few years opened the door for opportunity and innovation

- **Since 2020, the global market response to Vitamin D has been fantastic**
- **Earthlight’s technical profile allows for many formulation developments**
- **Global supply and commercial Earthlight quantities are available**

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Ingredient development review

A cost-effective, real vegan, whole food source that won’t affect your taste or texture

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100% natural and minimally processed

How Earthlight® Whole Food Vitamin D is made

1

Wholesome White Button & Portobello mushrooms are harvested from farms in Pennsylvania.

2

Mushrooms are blended using an innovative process.

3

Blended mushrooms are exposed to safe UV light (just like the sun). This dramatically increases Vitamin D content.

4

The high Vitamin D product is dried and converted into a powder.

5

The powder undergoes final quality checks, including Vitamin D concentration.

1000 µg of Vitamin D per gram

Non-GMO

No extraction solvents

Formulation and manufacturing overview

Earthlight® is a highly concentrated source of Vitamin D that is the perfect option for formulating consistent and quality products

- ✓ Certified organic grades available
- ✓ Reproducible nutrient composition
- ✓ Two-year shelf life
- ✓ Low use levels and excellent economics
- ✓ Little to no impact on organoleptic properties of food
- ✓ Little to no impact on food manufacturing processes

Earthlight (mg)	Vitamin D µg	Vitamin D IU
1 mg	1 µg	40 IU
15 mg	15 µg	600 IU
20 mg	20 µg	800 IU

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Customer targeting opportunities

Earthlight® delivers unique value as the most highly-touted Vitamin D mushroom powder in the food and supplement market segments

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Market segmentation and sizing for Earthlight®

A sizeable market that ranges from major retailers to emerging start-up brands

Big Food Brands

- Competition for attention
- High applications - before
- Slow to launch
- Price sensitive

Volume: Large

Food Service

- Actively seeking
- Looking for ideas
- Will do development
- Multiple systems

Volume: Large

Food Retailers

- Motivated to differentiate
- Less price sensitive
- High applications
- Multiple systems

Volume: Medium

Private Label Companies

- Actively seeking
- Looking for ideas
- Will do development
- Can reach multiples

Volume: Medium

Emerging Food

- Actively seeking
- Looking for ideas
- NEED development

Volume: Medium

Supplement Companies

- Actively seeking
- Looking for ideas
- LOW development

Volume: Medium

What are the European food opportunities for Earthlight?

Earthlight® delivers unique value as the only Vitamin D mushroom powder allowed in the market

European Food Safety Authority

Approved uses and use levels of Earthlight® in EU

Food Category	Maximum Level of Vitamin D2
Breakfast cereals	2.25 µg of vitamin D2/100 g
Yeast-leavened bread & pastries	2.25 µg of vitamin D2/100 g
Grain products & pastas	2.25 µg of vitamin D2/100 g
Fruit juice and fruit/vegetable blend beverages	1.125 µg of vitamin D2/100 mL
Milk & dairy products (excluding fluid milks)	2.25 µg of vitamin D2/100 g/1.125 µg of vitamin D2/100 mL (beverages)
Cheese (excluding cottage cheese. ricotta cheese and hard-grating cheeses)	2.25 µg of vitamin D2/100 g
Meal replacement bars & beverages	2.25 µg of vitamin D2/100 g/1.125 µg of vitamin D2/100 mL (beverages)
Dairy analogues	2.25 µg of vitamin D2/100 g/1.125 µg of vitamin D2/100 mL (beverages)
Meat analogues	2.25 µg of vitamin D2/100 g
Soups & broths	2.25 µg of vitamin D2/100 g
Extruded vegetable snacks	2.25 µg of vitamin D2/100 g
Foods for Special Medical Purposes as defined under Regulation (EU) No 609/2013 excluding those intended for infants	15 µg/day
Food supplements as defined in Directive 2002/46/EC intended for the general population excluding infants	15 µg/day

What are the USA food opportunities for Earthlight?

FDA approval covers Earthlight's use in a broad range of food and beverage products, ranging from breakfast cereals and bakery products to juices and meal replacements

Earthlight Fortification Applications (per USFDA CFR)

- Breakfast cereals
- Grain products & pastas
- Plant milks
- Plant yogurts
- Soy-based beverages
- Soy-based spreads
- Soy-based cheeses & cheese products
- Soy-protein based meal replacement beverages
- Fortified fruit juices
- Fortified juice drinks
- Meal replacement beverages
- Meal replacement bars (for weight management)
- Baked goods & baked snacks

NEW PRODUCT CATEGORIES!

- Vegetable snacks
- Fruit smoothies
- Vegetable juices
- Plant-based meats
- Soups & soup mixes (non-meat)

Proven stability that promotes quality

Earthlight® has been proven to show stability in storage up to three years

Granola Bars

- Room temperature for 3 months
- Minor reduction of D2 content of time
- No difference in taste compared to control

Key Finding

- EFSA feels Earthlight is not expected to behave differently than other vitamin D sources

Certifications and approvals

Formulating Earthlight® creates advanced labeling opportunities

EARTHLIGHT® WHOLE FOOD VITAMIN D

- USDA GAP and GMP
- Certified organic grade available
- Kosher, Halal
- Made in the USA
- US FDA FAP – 21 CFR 172.382
- EFSA Novel Food
- US Patent #8,545,915
- EU Patent EP2900089B1

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We can enhance YOUR label

What would these designations do for you?

All 7 at once *only* possible with Earthlight

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Comparison vs. other Vitamin D ingredients

Earthlight® delivers unique value as the most highly-touted Vitamin D mushroom powder in the food and supplement market segments

Background on Vitamin D sources

Consumers prefer getting their nutrients from the ‘kitchen cabinet’

Lanolin (Wool)

Liver

Synthetic

Lichen

Yeast

OR

Vitamin D Applications – Code of Federal Regulations

Chart developed based on Food Additive Petition

Application Category	Earthlight Whole Food D2	Yeast-Based D2	Lichen-Based D3	Perennial-Based D3	Commodity D2	Commodity D3
Breakfast cereals	✓	✓	X	X	✓	✓
Grain products & pastas	✓	✓	ONLY SUPPLEMENTS	ONLY SUPPLEMENTS	✓	✓
Milk (animal-based)	X	✓			✓	✓
Milk products (animal-based)	X	✓	X	X	✓	✓
Plant milks	✓	✓	X	X	✓	X
Plant yogurts	✓	✓	X	X	✓	X
Soy-based beverages	✓	✓	X	X	✓	X
Soy-based spreads	✓	✓	X	X	✓	X
Soy-based cheeses & cheese products	✓	✓	X	X	✓	X
Fortified fruit juices	✓	X	X	X	X	✓
Soy-protein based meal replacement beverages	✓	X	X	X	X	✓
Meal replacement beverages	✓	X	X	X	X	✓
Meal replacement bars (special diet)	✓	X	X	X	X	✓
Fruit juice drinks	✓	X	X	X	X	✓
Cheese & cheese products	X	X	X	X	X	✓
Baked goods & baked snacks	✓	✓	X	X	X	
NEW PRODUCT						
Vegetable snacks	✓	X	X	X	X	X
Fruit smoothies	✓	X	X	X	X	X
Vegetable juices	✓	X	X	X	X	X
Plant-based meats	✓	X	X	X	X	X
Soups & soup mixes (non-meat)	✓	X	X	X	X	X
		Lallemand	Vitashine	VegD3		

What's on your label?

Label-friendly, trend forward Vitamin D features

Feature	Earthlight Whole Food D2	Yeast-Based D2	Lichen-Based D3	Algae-Based D3	Commodity D2	Commodity D3
Non-GMO	✓	✓	✓	✓	✓	✓
Solvent-Free	✓	X	X	✓	X	X
No carriers or binders	✓	Only in oil	Only in oil	Only in oil		
Organic Grades available	✓	✓	✓	✓	✓	✓
Vegan/plant-based	✓	✓	✓	✓	✓	X
Whole Food	✓	X	X	X	X	X
Made in USA	✓	✓	X	X	X	X
		Lallemand	Vitashine	VegD3		

This applies to both USA and EU

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Top applications and case studies

We make existing products better.
We help create new product forms.

Top Earthlight® Applications

Based on PLT market research and experience – where we want to sell first and can succeed fastest

Plant Milks / Drinks

Plant-Based Meats

Soups & Soup Mixes

Plant-Based Snacks

Meal Replacement Bars

Supplements

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Case Study

Sunfood Super Foods

Immunity and wellbeing powder that works optimally with Earthlight®

Sunfood SUPER FOODS

Nutrition Facts

Approx. 32 Servings Per Container

Serving Size 2.5 tsp (6g)

Amounts Per Serving

Calories 20

	% Daily Value*
Total Fat 0g	**0%**
Saturated Fat 0g	**0%**
Trans Fat 0g	
Cholesterol 0mg	**0%**
Sodium 0mg	**0%**
Total Carbohydrate 5g	**2%**
Dietary Fiber 1g	**4%**
Total Sugars 0g	
Includes 0g Added Sugars	**0%**
Protein 0g	

Vit. D 25.4mcg	130%	• Calcium 0mg	0%
Iron 0.2mg	2%	• Potas. 20mg	0%
Vit. C 23mg	26%		

*The % Daily Value tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

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Case Study

JuicePlus+

Formulated into delicious shakes that come in a variety of flavor options

Juice PLUS+®

Nutrition Facts

About 15 servings per container

Serving size **1 scoop (37.5g)**

Amount per serving

Calories **140**

	% Daily Value*
Total Fat 1g	**1%**
Saturated Fat 0g	**0%**
Trans Fat 0g	
Cholesterol 0mg	**0%**
Sodium 250mg	**11%**
Total Carbohydrate 20g	**7%**
Dietary Fiber 7g	**25%**
Soluble Fiber 5g	
Insoluble Fiber 2g	
Total Sugars 10g	
Includes 10g Added Sugars	**20%**
Protein 14g	**28%**
Vitamin D 4.0mcg	20%
Calcium 440mg	35%
Iron 2.4mg	15%
Potassium 140mg	4%
Vitamin C 22mg	25%
Thiamin 0.6mg	50%
Riboflavin 0.7mg	50%
Niacin 8.0mg NE	50%
Vitamin B_6 0.8mg	50%
Vitamin B_{12} 2.4mcg	100%

* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

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Case Study

Uplift Foods

Digestive + mood organic plant based prebiotic fiber powder - gut happy vanilla flavor

UPLIFT
GOOD • MOOD • FOOD

Supplement Facts

Serving Size: 13.83g (Approx. 1 Scoop)
Servings Per Container 14

Amount Per Serving	
Calories 50	
	% Daily Value
Total Fat 0g	0%
Saturated Fat 0g	0%
Cholesterol 0mg	0%
Sodium 0mg	0%
Total Carbohydrate 11g	4%
Dietary Fiber 7g	25%
Sugars 0g	0%
Added Sugars 0g	0%
Protein 2g	
Vitamin D (as Ergocalciferol) 8mcg**	40%
Iron 0.49mg	3%
Magnesium 30mg	7%
Prebiotic Blend 10.46g	†
Soluble Tapioca Fiber Powder	
Resistant Potato Starch	
Green Banana Flour	
Xylooligosaccharides (XOS)	
Probiotic Mood Blend 30mg**	†
Bifidobacterium longum	
Lactobacillus helveticus	
High Vitamin D Mushrooms 9.6mg	†
Pumpkin Seed Protein 2.46g	†
Sacha Inchi Seed Protein 300mg	†

* Percent Daily Values are based on a 2,000 calorie diet.
† Daily Value not established.
** At the time of manufacture.

Other Ingredients: Natural Flavors, Rebaudioside A (From Stevia Leaf Extract)

Ingredients:
Prebiotic Blend (Soluble Tapioca Fiber Powder, Resistant Potato Starch, Green Banana Flour, Xylooligosaccharides (XOS)), Pumpkin Seed Protein, Sacha Inchi Seed Protein, Probiotic Mood Blend (Bifidobacterium longum, Lactobacillus helveticus), High Vitamin D Mushrooms, Natural Flavor, Rebaudioside A (From Stevia Leaf Extract). .

Made with ingredients from the USA and worldwide.

Contains NO: Dairy, Gluten, Soy, Peanuts, Tree Nuts, Fish, Shellfish, Eggs, GMOs, Artificial Additives, Preservatives, Added Sugars or Artificial Sweeteners.

- Magnesium from Pumpkin Seed Protein Powder
- Vitamin D from High Vitamin D Mushroom Powder
- Prebiotic Resistant Starch from Green Banana Flour, Resistant Potato Starch and Soluble Tapioca Fiber
- Prebiotics from XOS
- 4B CFU Probitoics

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Case Study

Nutrilite (Amway)

Straightforward Vitamin D supplement, sourced from Earthlight® – "one of nature's most concentrated botanical sources of vitamin D"

NUTRILITE™

Nutrilite™ Vitamin D
11-9346

SUGGESTED USE: Take one tablet a day, with or without a meal.

Supplement Facts
Serving Size: 1 Tablet
Servings Per Container: 90

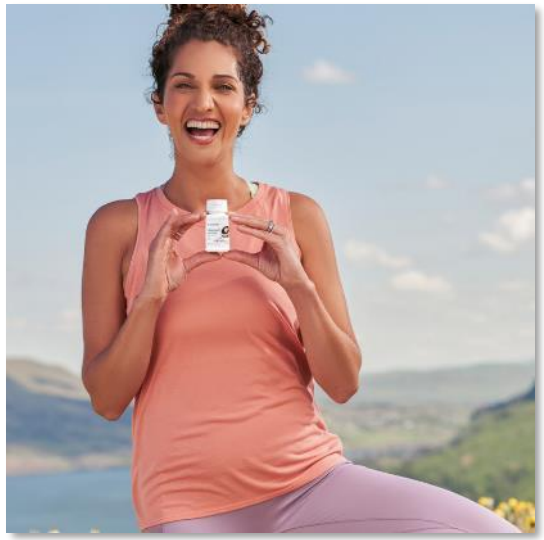
	Amount per Tablet	% Daily Value*
Vitamin D (as Vitamin D3 and Vitamin D2)	50 mcg	250%
Vitamin K2	20 mcg	17%

* Percent Daily Values are based on a 2,000 calorie diet.

OTHER INGREDIENTS: Maltodextrin, Microcrystalline Cellulose, Starch Sodium Octenyl Succinate, Glycerol Monostearate, Mushroom Powder, Sodium Starch Glycolate, Sucrose, Silicon Dioxide, Hydroxypropyl Methylcellulose, Stearic Acid, Sodium Ascorbate Crystalline, Medium Chain Triglycerides, Glycerin, dl-Alpha Tocopherol, Carnauba Wax.

Mushrooms

One of nature's most concentrated sources of essential vitamin D, these flavorful fungi help support bones and heart and immune health.



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An origin story that's great to tell

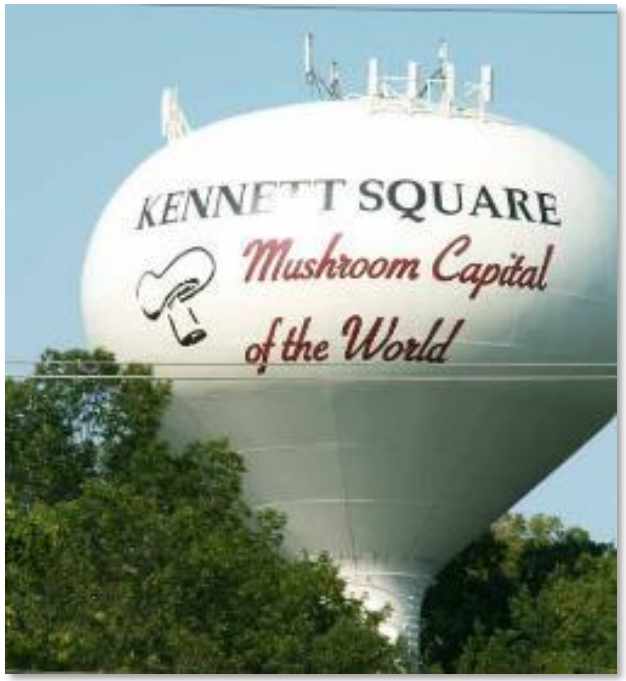
Sustainability. And a 30-year love affair with mushrooms led to the world's most innovative Vitamin D ingredient

Kennett Square, Pennsylvania

The Mushroom Capital of the World

Evolution of the Mushroom Story

- First mushrooms introduced to the town by Quaker carnation growers in the 1880s
- Today, the area produces over 500 million pounds of mushrooms per year
- This area accounts for more than 50% of the mushrooms grown in the United States today
- Over 100,000 people attend annual Mushroom Festival each year



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Oakshire Mushroom Farms

Founded by Gary Schroeder in 1985

Oakshire NATURALS

- First commercial shiitake mushrooms in the United States
- First commercial portobello mushrooms in the United States
- Supplier to Dole Mushrooms

The journey to discovering Earthlight®

Mushroom innovation took a leap

i. Mushrooms have inherent Vitamin D in them – just not very much

ii. When exposed to UV light – just like people – mushrooms manufacture Vitamin D

iii. Experimentation with different light sources – how to get commercially-viable levels of D?

iv. Proprietary process was able to achieve 40,000 IU

Earthlight® was born

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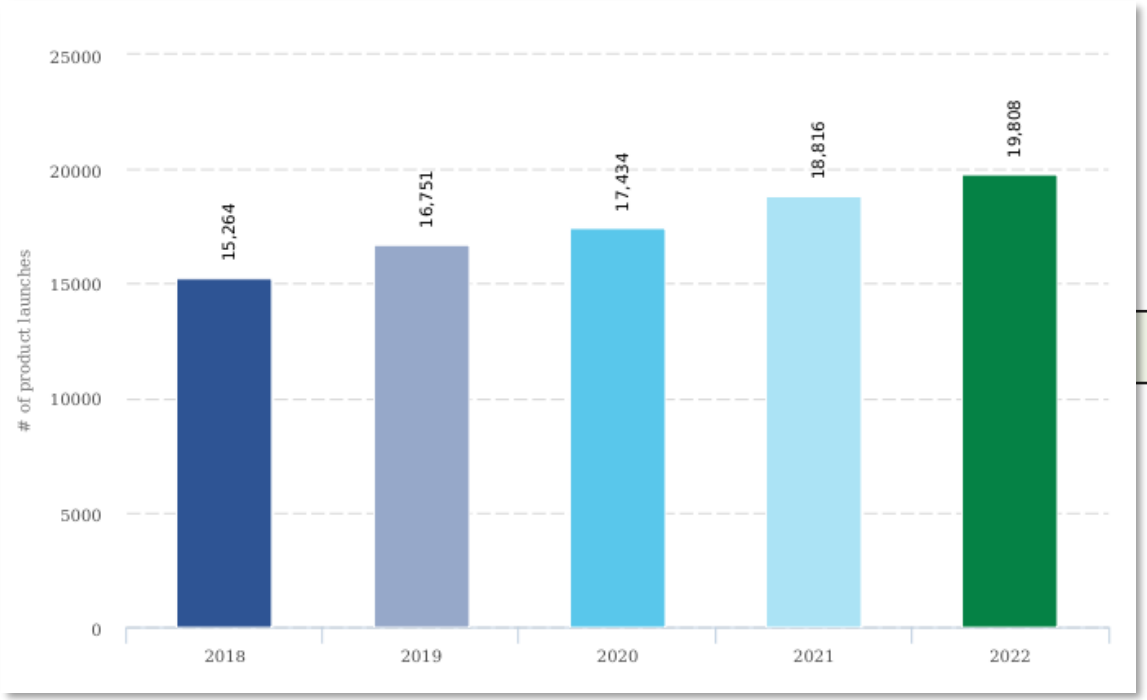
Vitamin D / clean label market trends

Whole food products are trending, with Vitamin D leading the way

Vitamin D new product launches continue to climb

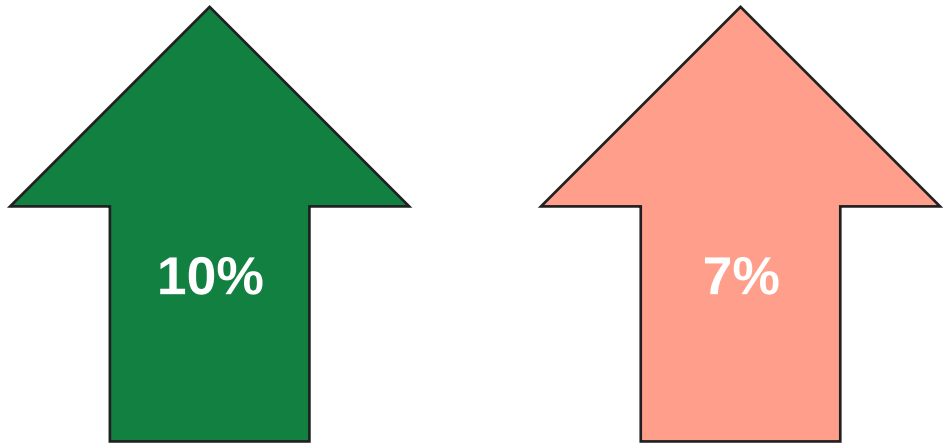
As vitamin D usage and awareness grows, new product launches featuring the ingredient have increased steadily – with D2 growing the fastest

Growth of Global Vitamin D Product Launches *(2018 – 2022)*



CAGR: 7%

Compound Annual Growth Rate Breakdown of Product Launches with D2 vs. D3 *(2018 – 2022)*



Vitamin D2

Vitamin D3

The clean label trend

Consumers are more interested in Vitamin D than ever – but they want more than what the market offers today

2 in 5 consumers globally

are more open to buying products are that developed through plant-based technologies

70% of consumers globally

are likely to seek out products that meet clean label requirements

+93% growth in food & beverage

launches with a plant-based claim

(Global, Nov 2019 to Oct 2020 vs Nov 2020 to Oct 2021)

Source: *Innova Market Insights* and *MannaTree Partners*

A need across all age groups

Recent analyses of Vitamin D deficiency globally

~1 bil

Of people globally have low vitamin D levels

Palacios C, Gonzalez L. Is vitamin D deficiency a major global public health problem?. *J Steroid Biochem Mol Biol*. 2014;144 Pt A:138-145. doi:10.1016/j.jsbmb.2013.11.003

~40%

Of Europeans are vitamin D deficient

Amrein, K., Scherkl, M., Hoffmann, M. *et al.* Vitamin D deficiency 2.0: an update on the current status worldwide. *Eur J Clin Nutr* 74, 1498–1513 (2020).

~42%

Of the US population is vitamin D deficient

Cleveland Clinic Mercy Hospital – 42% Percent of Americans Are Vitamin D Deficient. Are You Among Them?

Consumers want Vitamin D in more products

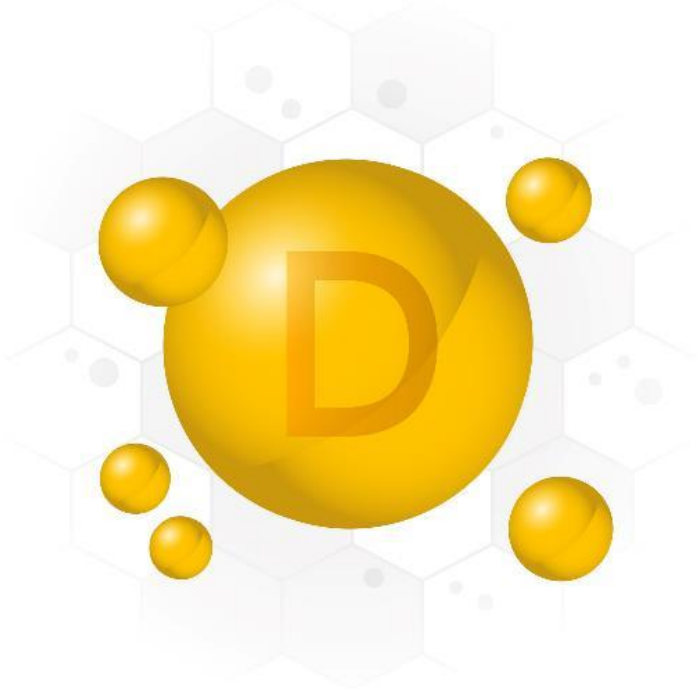
Vitamin D is a household name and consumers are relying on brands to address their needs through unique solutions

With consumer insight soaring on Vitamin D, supplement sales are responding very well

- In the overall mainstream channel, Vitamin D sales grew 34.4% to $544 million (*SPINS*)
- Furthermore, in the natural channel overall, vitamin D sales grew 36.5% to $40 million (*SPINS*)

Vitamin D is set to continue climbing – from the consumer and product development level

- In CRN's (*Council for Responsible Nutrition*) annual consumer survey last year, they found the 42% of respondents used Vitamin D
- According to their VP of Scientific and Regulatory Affairs, Luke Huber, "It is likely that vitamin D usage will continue to grow in 2021 and in future years"



The best Vitamin D solution today

An ingredient solution that checks all the boxes

- ✓Whole food
- ✓Minimally processed
- ✓High nutrient content
- ✓Clean label
- ✓Plant-based, non-GMO
- ✓Won’t affect taste or texture
- ✓Excellent economics

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Thank you.

Questions?

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