

# **Role and Challenges of Increasing Vitamin D in the Food Supply**

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# Outline

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1. Identifying the Problem
  - Personal and Economic Burden of Hidden Hunger
2. Finding a Solution
  - Ensuring a Sustainable Regulatory Environment
3. Establishing a Plan of Action
  - Importance of Partnering with Industry

# 1. Identifying the Problem

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## Vitamin D Status in India

- 30% of urban Indians have  $s25(OH)D_3 < 5.0$  nmol/L
- Hypovitaminosis D is prevalent among all age groups, including school children, pregnant women and neonates
- While rural Indians with longer sunshine exposure have better  $s25(OH)D_3$  values than urbans, 70% are  $< 50$  nmol/L

Source: Goswami et al. J Assoc Physicians India, 2008:56,755

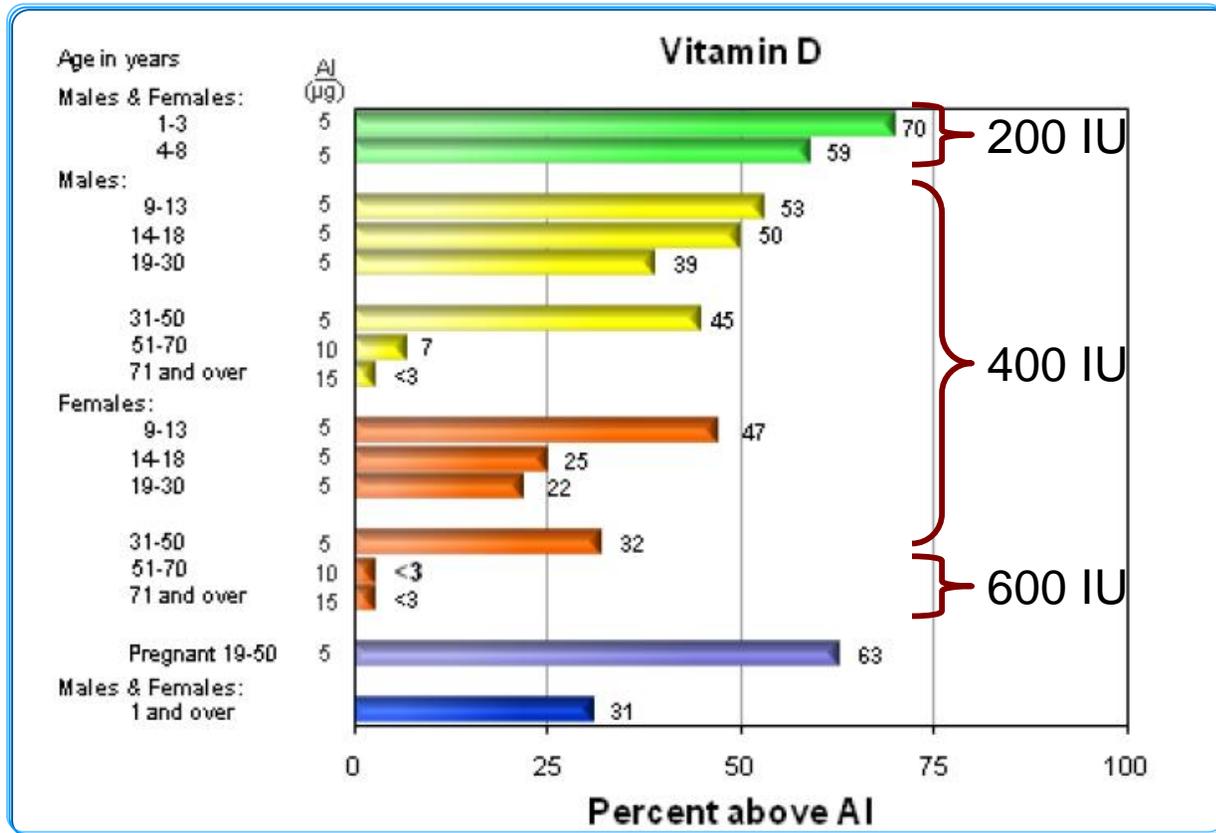
Available at: [http://www.japi.org/october\\_2008/o\\_755.pdf](http://www.japi.org/october_2008/o_755.pdf)

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# Vitamin D Dietary Intakes in US

## What We Eat in America, NHANES 2005-2006



### Conclusions

- Most Americans have woefully inadequate dietary vitamin D intakes
- Need to increase consumption of Vitamin D rich foods & beverages
- 1000-2000 IU per day may be more appropriate

See: [http://www.ars.usda.gov/SP2UserFiles/Place/12355000/pdf/0506/usual\\_nutrient\\_intake\\_vitD\\_ca\\_phos\\_mg\\_2005-06.pdf](http://www.ars.usda.gov/SP2UserFiles/Place/12355000/pdf/0506/usual_nutrient_intake_vitD_ca_phos_mg_2005-06.pdf)

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## 2. Finding a Solution

### Foods Naturally Containing Vitamin D

Food	Serving	Vitamin D	
		IU	µg
Cod liver oil	1 tbsp	1,360	34
Salmon, cooked	3.5 oz	360	9
Sardines, canned in oil	1.75 oz	250	6
Tuna fish, canned in oil	3 oz	200	5
Egg yolk	1 large	21	0.5
Liver, beef, cooked	3.5 oz	15	0.37

Source: NIH Office of Dietary Supplements Dietary Supplement Fact Sheet: Vitamin D  
Available at <http://dietary-supplements.info.nih.gov/factsheets/vitamind.asp#h3>

# Food Fortification

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## Cod Liver Oil is Added to Milk by New Process Cannot Detect Taste, Scientists Say

“Cod liver oil bread and cod liver oil milk, two new health foods, products of 10 years research at Columbia University, were described in detail tonight for the first time at a meeting of the American Institute of Chemists.”

Abstracted from article in Chicago Daily Tribune, Dec 17, 1932

### 3. Establishing a Plan of Action

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There may be a public health need to fortify Indian foods with vitamin D.

Source: Harinarayan & Joshi. J Assoc Physicians India 2009: 57;45.  
Available at: [http://japi.org/january\\_2009/R-1.pdf](http://japi.org/january_2009/R-1.pdf)



JAPI

Editor : Dr. Siddharth N. Shah

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# Professional Associations Establish Recommendations

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**American Academy of Pediatrics**  
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**\* FEATURED**

**New Vitamin D Guidelines**  
The AAP recommends doubling the amount of Vitamin D for children. [More](#)

**ABC Spotlights Autism**  
Parents and pediatricians talk frankly about autism with ABC's Dr. Timothy Johnson. The hour-long discussion is

**Vaccine Groups Urge Action**  
The nation's leading medical and advocacy groups have joined to raise the public's confidence in vaccines.

Autism  
Car Safety Seats  
Disaster Preparedness  
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Immunization Information  
Internet Safety

## **AAP doubles vitamin D recommendation for children**

The American Academy of Pediatrics has doubled its recommended dose of vitamin D for children, to 400 international units a day. The group says the dose should begin in the first few days of life and continue through adolescence to ward off rickets and other bone problems.

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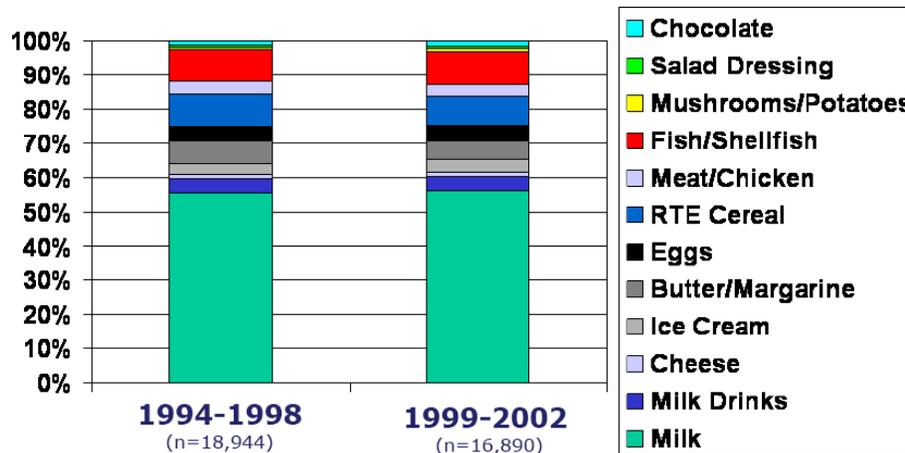
# Governments Provide a Regulatory Framework

- In USA, the FDA regulates food ingredients as either:
  - “Generally Recognized as Safe” (GRAS)
  - “Food Additives”
- FDA oversees the addition of vitamin D to foods with specific limitations

Name	Form	Source
D2 (Ergocalciferol)	Crystalline	UV irradiation of ergosterol from yeast & fungi, purified by crystallization
	Resins	Concentrated from irradiated ergosterol
	Crystals	Meeting specifications of Food Chemicals Codex
D3 (Cholecalciferol)	Crystalline	1) Isolated from fish liver oils 2) Irradiation from 7-dehydrocholesterol produced from cholesterol
	Resins	Concentrated from irradiated 7-dehydrocholesterol
	Crystals	Meeting specifications of Food Chemicals Codex

# Fortified Food Products Enter the Marketplace

Category of Food	Maximum level in food (as served)	Form
Breakfast cereals	350 IU/100gm	D <sub>2</sub> or D <sub>3</sub>
Grain products & pastas	90 IU/100gm	D <sub>2</sub> or D <sub>3</sub>
Milk	42 IU/100gm	D <sub>2</sub> or D <sub>3</sub>
Milk products	89 IU/100gm	D <sub>2</sub> or D <sub>3</sub>
Margarine	1,500 IU/lb	D <sub>2</sub> or D <sub>3</sub>
Infant formula	100 IU/100 kcal	D <sub>2</sub> or D <sub>3</sub>



- ### Conclusions
- 65% of vitamin D comes from Milk, Milk Drinks & Cheese
  - 10-15% of vitamin D comes from ready-to-eat breakfast cereals

From: Moore et al. 2003 J Am Diet Assoc 2003;107:1916

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# Regulations Need to be Adaptable

Category of Food	Maximum level in food (as served)	Form		
Breakfast cereals	350 IU/100gm	D <sub>2</sub> or D <sub>3</sub>	GRAS*	
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100% Fruit Juices & fruit juice drinks, 10% DV calcium	100 IU/204 mL	D <sub>3</sub>		2003
Soy-protein based meal replacement beverages (powder & liquid)	140 IU/240 mL	D <sub>3</sub>		2005
Meal replacement bars	100 IU/40gm	D <sub>3</sub>		2005
Cheese & cheese products, excludes cottage, ricotta, Parmesan, and Romano	81 IU/30gm	D <sub>3</sub>		2005
Soy beverages	50 IU/100gm	D <sub>2</sub>		2009
Soy beverage products	89 IU/100gm	D <sub>2</sub>		2009
Soy-based butter substitute spreads	330 IU/100gm	D <sub>2</sub>		2009
Soy-based cheese substitutes & substitute products	270 IU/100gm	D <sub>2</sub>		2009

Food Additive\*

# Vitamin D “Call Outs” on Pack (2004 to Q3 Year-to-Date, 2009)



Below average Above average

	2004	2005	2006	2007	2008	2009
White Milk	49	68	100	184	175	112
Spoonable Yogurt	18	49	51	103	70	66
Flavoured Milk	35	20	85	88	80	44
Drinking Yogurts & Liquid Cultured Milk	5	20	28	60	65	25
Cheese	1	7	13	56	56	45
Soy Based Drinks	9	12	15	22	35	17
Margarine & Other Blends	8	11	10	12	11	16
Bread & Bread Products	9	10	24	12	12	0
Cold Cereals	0	4	3	12	11	19
Malt & Other Hot Beverages	7	4	3	6	22	4
Nectars	7	0	12	5	16	5
Juice	6	2	4	7	17	9
Chilled Desserts	1	1	11	11	1	20
Savoury Biscuits/Crackers	4	2	8	8	12	6
Oils	2	5	7	9	7	9
Sweet Biscuits/Cookies	4	1	6	12	3	10
Beverage Mixes	6	5	2	5	11	6
Rice/Nut/Grain & Seed Based Drinks	4	3	0	6	8	13
Evaporated Milk	0	4	6	12	7	3
Baby Cereals	3	1	3	3	14	7

Vitamin D references increase in both Dairy and beyond most notably in 2008

Source:  
2009 Mintel International Group

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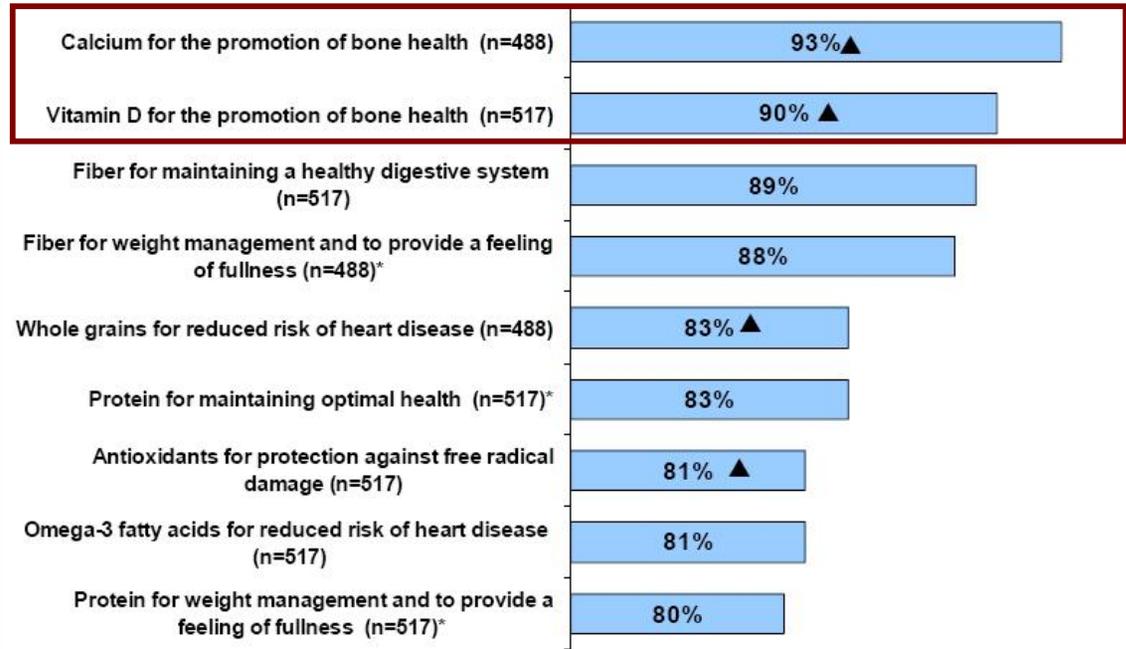
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# Partnerships Build Consumer Awareness



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International  
Food  
Information  
Council

## Awareness of Food Component/Health Pairs



For each of the following food components or nutrients, please tell us whether you are aware that that food component or nutrient is thought to provide each of the following health benefits.

\*Added in 2009

(split sample)

▲ / ▼ Significant increase/decrease from 2007

2009 IFIC Functional Foods/Foods for Health Consumer Trending Survey

# Partnerships Help Build Consumer Awareness

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## Most Americans Can Name a Specific Food and Its Associated Benefit

**92%** can name a food and its associated benefit

(stable from 92% in 2007, 91% in 2005;  
up from 84% in 2002, 82% in 2000, and 77% in 1998)

What is the (first/second/third) food or food component that comes to mind that is thought to have health benefits beyond basic nutrition? (n=1005)

And, what type of health benefit (beyond basic nutrition) is that food component good for? (n=927)

2009 IFIC Functional Foods/Foods for Health Consumer Trending Survey

### Conclusions

- Fortified Juices in 2003
  - Minute Maid
- Fortified cheese in 2005
  - Kraft
- Meal-replacements & bars in 2005
  - SlimFast

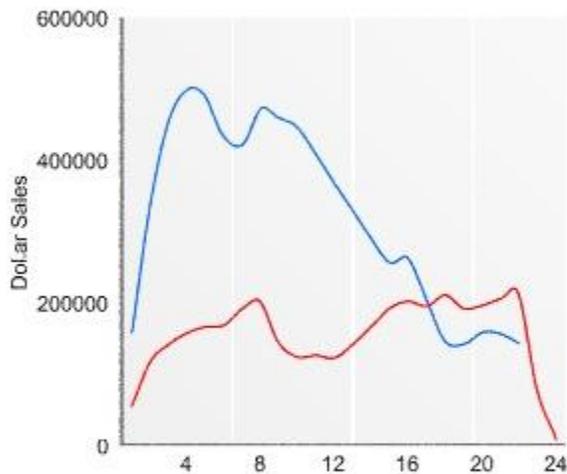
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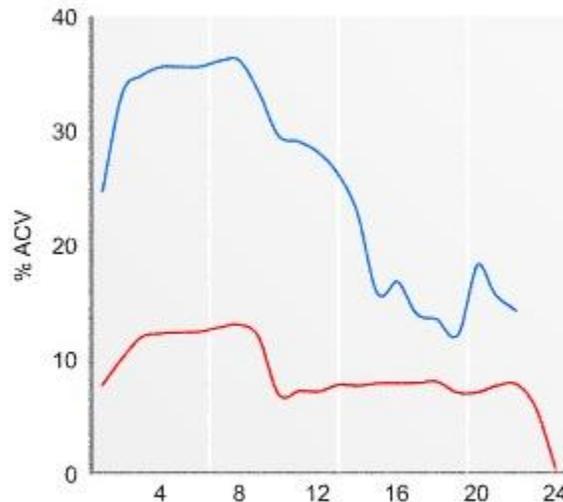
# Introduction of New Yogurt Products

## Vitamin D Fortified Yogurt Launches Generally Outperform other Yogurt Introductions

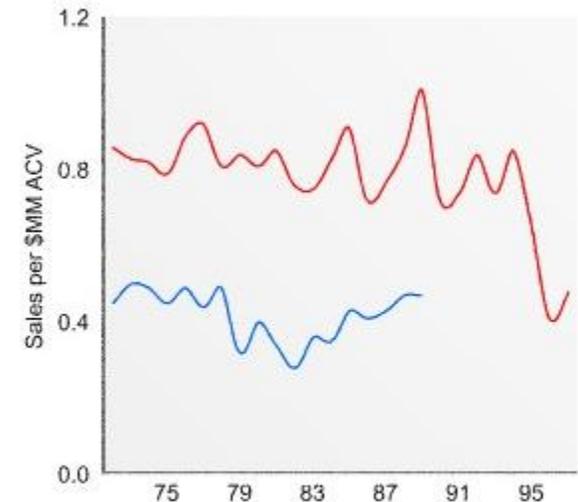
Movement - Dollar Sales



Distribution - % ACV



Performance - Sales per \$MM ACV



Quad Weeks

Quad Weeks

Latest 26 weeks, ending week: 97

USE UNIT MEASURES

Benchmark: US Yogurt (69 SKUs)

Benchmark: US Vitamin D launches (50 SKUs)

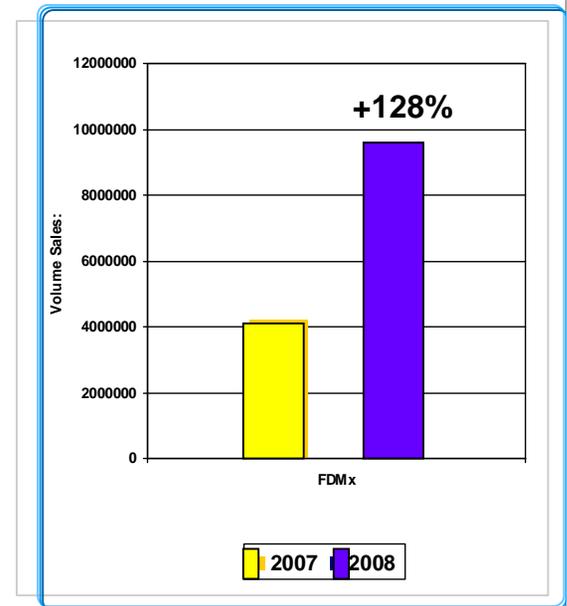
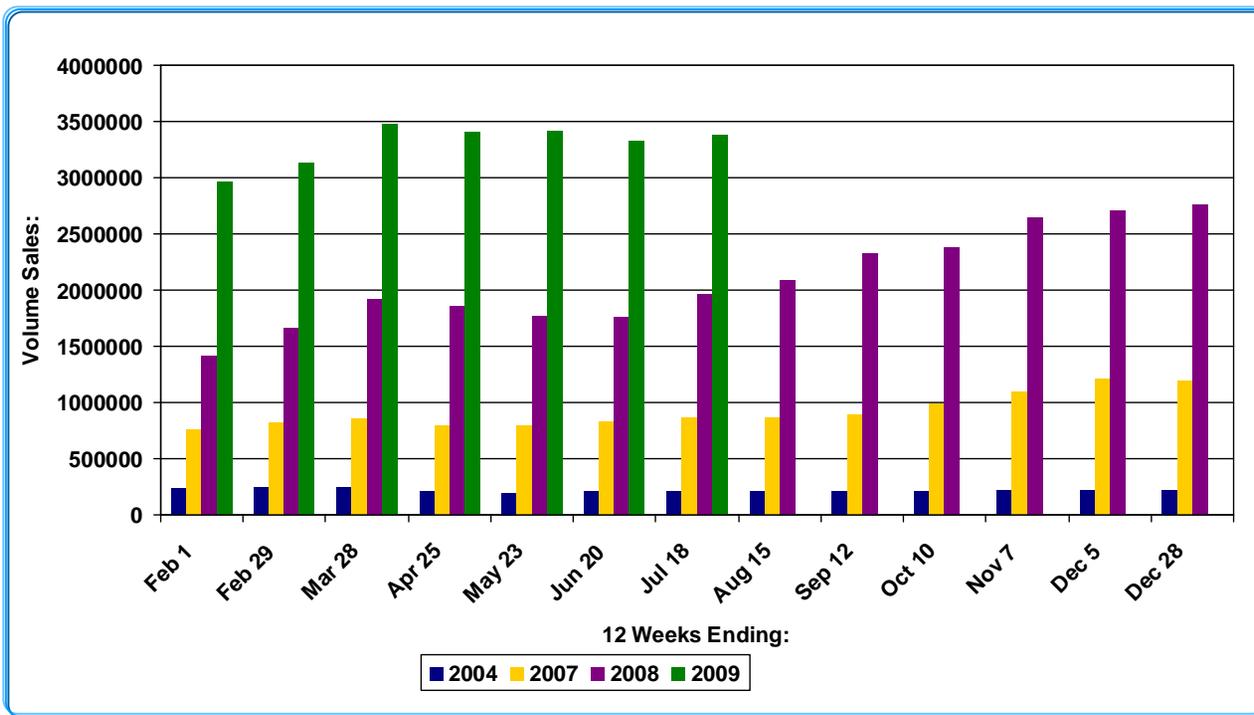
Source: 2009 Mintel International Group

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# Consumers are Trying to Improve Vitamin D Status

## Retail Sales of Vitamin D supplements 2004 - 2009 (excluding Wal-Mart Projection Data)



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Source: IRI data 2008

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# Conclusion

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## 1. The Problem is Identified

- Vitamin D Inadequacy Exists
- There is a Personal and Economic Burden of Vitamin D Inadequacy

## 2. A Solution is Available

- Set Dietary Guidelines for Vitamin D
- Establish a Robust Regulatory Framework
  - Dietary Reference Intakes
  - Good Manufacturing Practices

## 3. Establishing a Plan of Action

- Increase Population Awareness of the Importance of Vitamin D
- Partner with Food, Supplement, and Health Care Industries to Provide Consumer-valued Solutions