



# The Economic Contribution of the Dietary Supplement Industry

*Analyses of the Economic Benefits to the U.S. Economy*



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Submitted to:

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Submitted by:

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## Summary of Findings

There are three major findings from this study.

### The Dietary Supplement Industry Contributes Nearly \$61 Billion to the Economy Through Direct and Ripple Effects.



The dietary supplement industry directly produced **\$22.5 billion** in 2006.

A “ripple effect” of another **\$38 billion** is produced through the indirect effect (nearly \$16 billion) and induced effect (\$22 billion).

The total tax contribution of the industry is **\$10.1 billion**. This is split between federal (\$5.3 billion) and state/local (\$4.7 billion).

For every dollar spent by the dietary supplement industry, the economic contribution to the US economy is **\$2.71**.

**The Dietary Supplement Industry is Responsible for Nearly Half a Million Jobs Across 100 Different Industries.**

For every one job created by the dietary supplement industry, **2.29 jobs** are created in the U.S. economy.



**The Dietary Supplement Industry has Represented a Consistent Proportion of Health Expenditures Over Time.**

The industry has maintained itself at more than **1 percent of total U.S. health expenditures** for at least the last 10 years. This means that as health expenditures grow, the dietary supplement industry also shows steady growth, becoming an economic engine for jobs and income.





## Introduction

The dietary supplement industry comprises a diverse set of products, turning in annual consumer sales of over \$20 billion every year since 2004.<sup>1</sup> Dietary supplements represent approximately 25 percent of the overall \$94 billion nutrition industry. Despite two major legislative changes in 2007 — the good manufacturing practice (GMP) rules and the serious adverse event reporting (SAER) law — and a faltering U.S. economy, the dietary supplement industry grew from \$22.5 in 2006 to \$23.7 billion in 2007, turning in growth of 5.9 percent.<sup>2</sup>

According to recent statistics from the Food and Drug Administration (FDA), there are 29,000 dietary supplement products on the market, up from 25,000 in 1993. Industry estimates, however, are nearly double the FDA's estimate at 50,000. Dietary supplements are produced by a large number of manufacturers and distributed through a variety of channels, such as retail, mail order, and internet.<sup>3</sup> The supply chain involves raw materials sales by growers, harvesters, refiners, and extractors to approximately 900 wholesalers, who then support direct marketing sales, and retail sales.

Wellness has become an important trend among Americans, with consumers showing ever greater interest in a more holistic approach to their health<sup>4</sup>. Healthy consumers use supplements to decrease their risk of heart disease, boost their immune systems, prevent vision loss, build strong bones, or prevent birth defects.<sup>5,6</sup> Less healthy or ill consumers turn to supplements as an alternative to traditional medical treatments, to either complement prescription drugs they may be taking or substitute supplements for prescription drugs they either cannot afford or do not trust.<sup>7</sup> Many studies have found that dietary supplements can provide a positive health impact on Americans — now we have learned they also have a positive effect on the U.S. economy.

A positive economic trend for the industry is that consumer supplement use has remained steady over the last few years, with 80 percent of adults buying supplements at least once per year.<sup>8</sup> The economic **contribution** of the industry, however, extends well beyond direct employment, purchase of goods and services, and tax payments. Dobson | DaVanzo & Associates, LLC, a health economics consulting firm based in the Washington, D.C. metropolitan area, was commissioned by the Natural Products Foundation's Dietary Supplement Information Bureau (DSIB) to determine the direct and the "ripple" or downstream effects of the industry on the national economy.

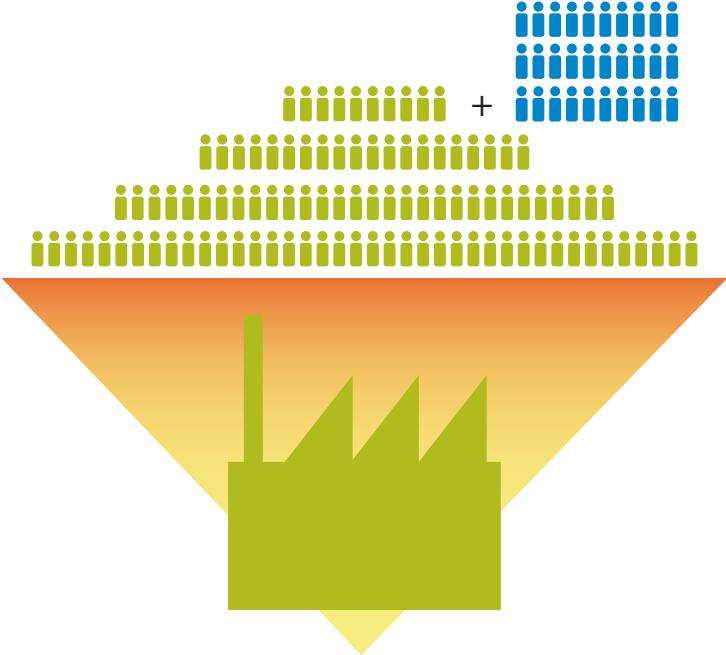
*This study is designed to answer the question:*

## What is the current economic contribution of the dietary supplement industry to the U.S. economy?

Research shows the substantial positive impact dietary supplements can have on health care spending.<sup>9,10</sup> But the impact of the dietary supplement industry on the U.S. economy is rarely mentioned. This study uses a mathematical input-output (I-O) model (IMPLAN) to examine the economic output, labor income, and employment of the dietary supplement industry, and show how the flow of dollars affects the economic output and employment in other industries.<sup>11</sup> We also calculate a tax impact. We show how \$1 million in direct dietary supplement industry expenditures multiplies, as it “ripples” through the national economy. We chose to use IMPLAN in this study because this modeling system is widely accepted, cost-effective, and well suited to our study objectives.

In expressing the flow of dollars through the national economy, the IMPLAN model assumes fixed relationships between producers and their suppliers based on demand.

**Exhibit 1: Multiplier effect**



**A factory employs 100 people, but actually supports an extra 30 jobs because of the employee multiplier effect.**

The model also omits any dollars spent outside of the national economy — say, by producers who import raw goods from overseas, or by employees who commute and do their household spending in another country.

By expanding the analysis beyond the direct impacts, IMPLAN provides a more complete picture of the economic effects of industry transactions. Simply put, an I/O model is based on the theory that when new money enters a community through investment, revenues, or income, some of it is re-spent one or more times in the local economy, thereby creating additional economic impact. This impact is most often measured in terms of employment (jobs) and income.

For example, a 100-person company might have a total employment impact of 130 jobs in a community. In addition to the original 100 jobs, 30 additional jobs are supported throughout the community as a result of the spending of the company and its employees. In this example, the “employment multiplier” for the industry in this particular community would be 1.3 — the ratio of the total employment impact to the initial impact (130/100). IMPLAN estimates these impacts using specific data on the inputs that are needed to produce the products or services for some 500+ industries, and community-specific data on what industries are available locally from which to purchase those inputs. (Both of these data are available from secondary sources and are included in the model.)

Therefore, the multipliers for any given industry in any given location are unique, and are based on industry composition and geographic area. Further, the larger the area under examination, the larger the “multiplier effect” since there will be more opportunities to purchase inputs within the study area. Therefore, it is not surprising

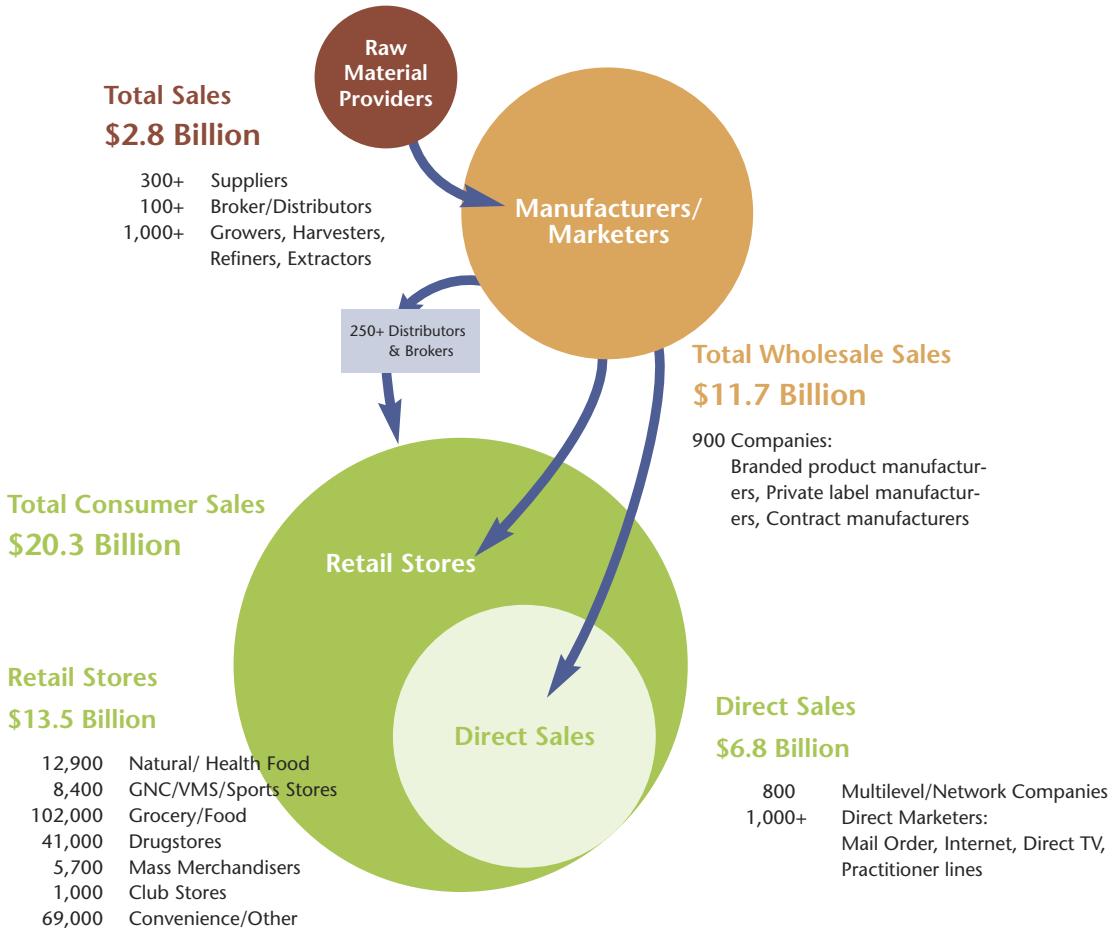
that an industry multiplier for a state would be larger than that for a multi-county region and that the multiplier for a multi-county region would be larger than that for an individual county.

Numerous economic impact studies using IMPLAN have recently been conducted for other industries. For example, the economic contributions of the dairy farming and product manufacturing industries were analyzed for the southeast United States in 2005. This analysis found that these states combined (Ala., Fla., Ga., S.C., and Tenn.) have a combined output contribution of \$8.5 billion. Approximately 49,081 jobs were realized as a result of the dairy farms and product manufacturers. These jobs are largely distributed across the agriculture, forestry, fish and hunting, government and wholesale trade sectors.<sup>12</sup>

While the forestry industry is economically impacted by the dairy farm industry, it also has a large impact on the other industries. Of the \$16.5 billion total economic impact, almost half (\$7.7 billion) is distributed across other industries. Furthermore, of the 133,475 total jobs impacted in Florida, almost two-thirds (84,545) are in other industries. Those industries most affected (by output and employment) include wholesale, health and social services, and government.<sup>13</sup>

These few examples demonstrate the reliance on, and interconnectedness of, one industry to other industries. This study for the dietary supplement industry aims to determine how its direct economic impacts “ripple” through other industries in terms of economic activity and employment. This can be seen in Exhibit 2 containing the industry supply chain.

**Exhibit 2: The U.S. Dietary Supplement Industry Supply Chain, 2004**



Products: Supplements (Vitamins, Minerals, Herbal & Botanical, Sports Nutrition, Liquid Meal Supplements, Specialty)  
Source: Nutrition Business Journal



## Study Findings

More than 1,460 businesses across the country manufacture, package, label, or hold dietary supplements. Approximately 774 of these firms (53%) employ 20 people or less and are classified as “very small” by the Small Business Association.<sup>14</sup> There are approximately 13,000 health food stores.<sup>15</sup> Although the industry boasts large multinational corporations, it remains largely entrepreneurial. It should be noted that many of the small businesses which dominate the industry were created by individuals who wanted to turn their belief in a healthy lifestyle into a business.

Our findings are organized into three categories: 1) the total economic contribution and tax effects of the dietary supplement industry to the nation’s economy, 2) industry-specific and across-industry contribution, wherein we examine the output and employment that is produced in other industries through the ripple effects of the dietary supplement industry, and 3) the proportion of U.S. health expenditures that the dietary industry represents.



**Table 1: Impact of the Dietary Supplement Industry**  
(2006)

Impact	Direct	Indirect	Induced	Total	Multiplier
Total Economic Output	\$22.460 b	\$15.979 b	\$22.318 b	\$60.757 b	2.71
Labor Income	\$8.255 b	\$5.032 b	\$6.884 b	\$20.171 b	2.44
Employment (Jobs)	199,052	93,439	163,291	455,782	2.29

*Source: Dobson / DaVanzo analysis of the Dietary Supplement Industry using IMPLAN software and data from the Nutrition Business Journal.*

# Dietary Supplement Industry Contributes Nearly \$61 Billion to the Economy Through Direct and Ripple Effects

Table 1 shows the economic contribution of the dietary supplement industry to the overall economy of the United States. As can be seen, the dietary supplement industry produced \$22.5 billion in direct output in 2006.

The indirect effect (nearly \$16 billion) and the induced effect (\$22 billion) of the dietary supplement industry are combined to show the “ripple” effect in the figures in the next section of the report. This results in a total economic contribution (direct effect plus ripple effect) by the dietary supplement industry of nearly \$61 billion, or about 1 percent of U.S. health expenditures.

What this means is that for every dollar of direct expenditure by the dietary supplement industry, the economic contribution to the U.S. economy is \$2.71. As for employment, for every job produced in the dietary supplement industry, 2.29 jobs are produced across the whole U.S. economy.

### *Summary of Overall Economic Contribution*

**Total Economic Output** In 2006, the dietary supplement industry direct output (consumer sales) was \$22.5 billion, or about **1 percent** of U.S. health care expenditures.

**Overall Economic Contribution** For every \$1 of direct expenditure by the dietary supplement industry, the economic contribution to the U.S. economy is \$2.71. Thus the direct consumer sales for 2006 of \$22.5 billion produces **\$60.7 billion** of total economic output.

**Direct Labor Income Impact** For every \$1 of direct expenditure by the dietary supplement industry on labor, the U.S. economy realizes \$2.44 in labor income. Thus the direct labor income expenditure by the dietary supplement industry is \$8.3 billion, while the total labor income effect is **\$20 billion**.

**Job creation and impact:** We determined that the dietary supplement industry is responsible for approximately 199,052 jobs. For every one job created by the dietary supplement industry, 2.29 jobs are created across the U.S. This employment multiplier of 2.29 produces a total employment impact of 455,782 jobs, or nearly one half million jobs.



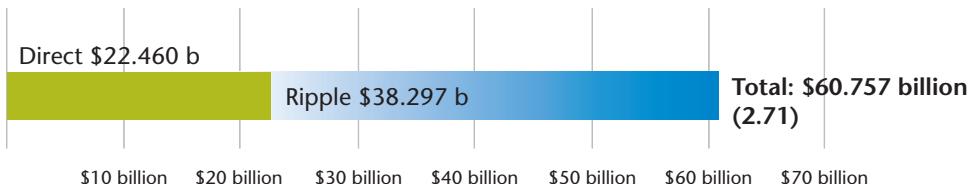
**Figure 1: Taxes Resulting from the Dietary Supplement Industry**

**Total: \$10.073 billion**

*Source: Dobson / DaVanzo analysis of the Dietary Supplement Industry using IMPLAN software and data from the Nutrition Business Journal.*

Figure 1 shows the taxes paid to Federal, State and local governments as a result of the dietary supplement industry. The total tax contribution of the industry is \$10.1 billion. This is split between federal (\$5.3 billion) and state/local (\$4.7 billion).

**Figure 2: Output**

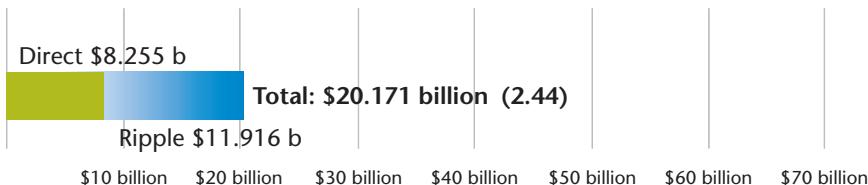


Source: Dobson / DaVanzo analysis of the Dietary Supplement Industry using IMPLAN software and data from the Nutrition Business Journal.

A comparison of the direct impact, ripple effect, and total impact of the dietary supplement industry on economic output can be seen above in Figure 2. The direct impact of \$22.5 billion in 2006 is seen in the green bar. The ripple effect (indirect plus induced) is seen in the blue bar, and the total economic impact of \$60.8 billion is represented by the two combined.

By way of context, the U.S. nutrition industry (of which dietary supplements are a part) grew to \$85 billion in 2006, and to \$94 billion in 2007.

**Figure 3: Labor Income**

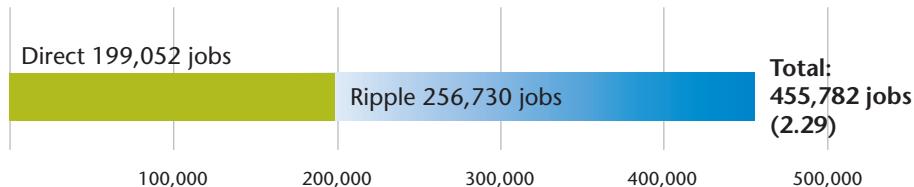


Source: Dobson / DaVanzo analysis of the Dietary Supplement Industry using IMPLAN software and data from the Nutrition Business Journal.

The economic impact of the dietary supplement industry also affects individual workers. The labor income effect of the industry is clearly illustrated in Figure 3. The direct impact on labor income is \$8.3 billion. The ripple effect is \$11.9 billion, and the total impact of the dietary supplement industry on labor income in the U.S. is \$20.2 billion. The labor income multiplier is 2.44. This means that for every one dollar of labor impact generated, there is \$2.44 of total labor income attributable to the dietary supplement industry.

Figure 4 below shows the direct, ripple and total impact of the dietary supplement industry on employment (jobs). More than 199,000 people are directly employed in the dietary supplement industry. Another 257,000 jobs are related to the industry. Added together, this produces a total employment impact of 455,782 jobs. The employment multiplier is 2.29. Additionally, we estimate that these jobs, on average, have annual incomes of over \$40,000.

**Figure 4: Employment**



Source: Dobson / DaVanzo analysis of the Dietary Supplement Industry using IMPLAN software and data from the Nutrition Business Journal.

**Table 2: Top 20 Industrial Sectors Impacted by Dietary Supplement Industry (in jobs)**

<b>IMPLAN Sector</b>	<b>Total Output Impact</b>	<b>Total Employment (Jobs) Impact</b>	<b>National Employment</b>	<b>Dietary Supplement Employment (Jobs) as a Percent of National Employment</b>
Manufacturing	\$13.1875 b	22,268	14,516,893	0.2%
<b>Retail Trade</b>	<b>\$13.1649 b</b>	<b>189,051</b>	<b>18,720,654</b>	<b>1.0%</b>
Wholesale Trade	\$7.8406 b	43,112	6,433,406	0.7%
Finance and Insurance	\$3.3725 b	15,884	8,190,349	0.2%
Professional, Scientific, and Technical Services	\$3.1880 b	22,746	11,824,963	0.2%
Real Estate and Rental and Leasing	\$3.1371 b	15,888	6,784,313	0.2%
Information	\$2.5442 b	8,377	3,496,398	0.2%
Health Care and Social Assistance	\$2.2431 b	26,396	17,427,419	0.2%
Management of Companies and Enterprises	\$1.6015 b	7,601	1,868,293	0.4%
Administrative and Support and Waste Management and Remediation Services	\$1.5194 b	26,306	10,732,183	0.2%
Transportation and Warehousing	\$1.4908 b	14,716	6,628,850	0.2%
Accommodation and Food Services	\$1.2128 b	20,821	11,789,074	0.2%
Other Services (except Public Administration)	\$988.5 m	17,063	10,077,370	0.2%
Utilities	\$747.3 m	1,142	579,311	0.2%
Agriculture, Forestry, Fishing and Hunting	\$457.3 m	5,675	3,694,283	0.2%
Arts, Entertainment, and Recreation	\$384.1 m	6,757	3,535,474	0.2%
Educational Services	\$341.8 m	6,040	3,592,537	0.2%
Logging	\$38.9 m	159	127,997	0.1%
Video tape and disc rental	\$13.4 m	258	159,953	0.2%
Other	\$3.2831 b	5,523	34,543,281	0.0%
<b>Total</b>	<b>\$60.7569 b</b>	<b>455,782</b>	<b>174,723,001</b>	<b>0.26%</b>

Source: Dobson / DaVanzo analysis of the Dietary Supplement Industry using IMPLAN software and data from the Nutrition Business Journal.

# The Dietary Supplement Industry is Responsible for Nearly Half a Million Jobs Across 100 Different Industries

As with any economic enterprise, the dietary supplement industry impacts many different sectors of the U.S. economy. The total employment impact (including indirect and induced) represents one percent of the total retail sector, and nearly three quarters of a percent of the wholesale sector. The top 20 industry sectors impacted by the dietary supplement industry can be found in Table 2. The list is very diverse, and includes industries like real estate and agriculture. More than one quarter of a percent of all jobs in the nation are created by the dietary supplement industry.

In an effort to demonstrate how the economic impact of the dietary supplement industry compares to seemingly unrelated industries, we selected two industries that affect dietary supplements, but also have a large impact on other industries. While veterinary medicine and computer systems design are not contained within the top 20 industries that are impacted by the dietary industry, we use these industries to show how the multiplier for the dietary industry compares to that in other industries.

### *Veterinary Medicine*

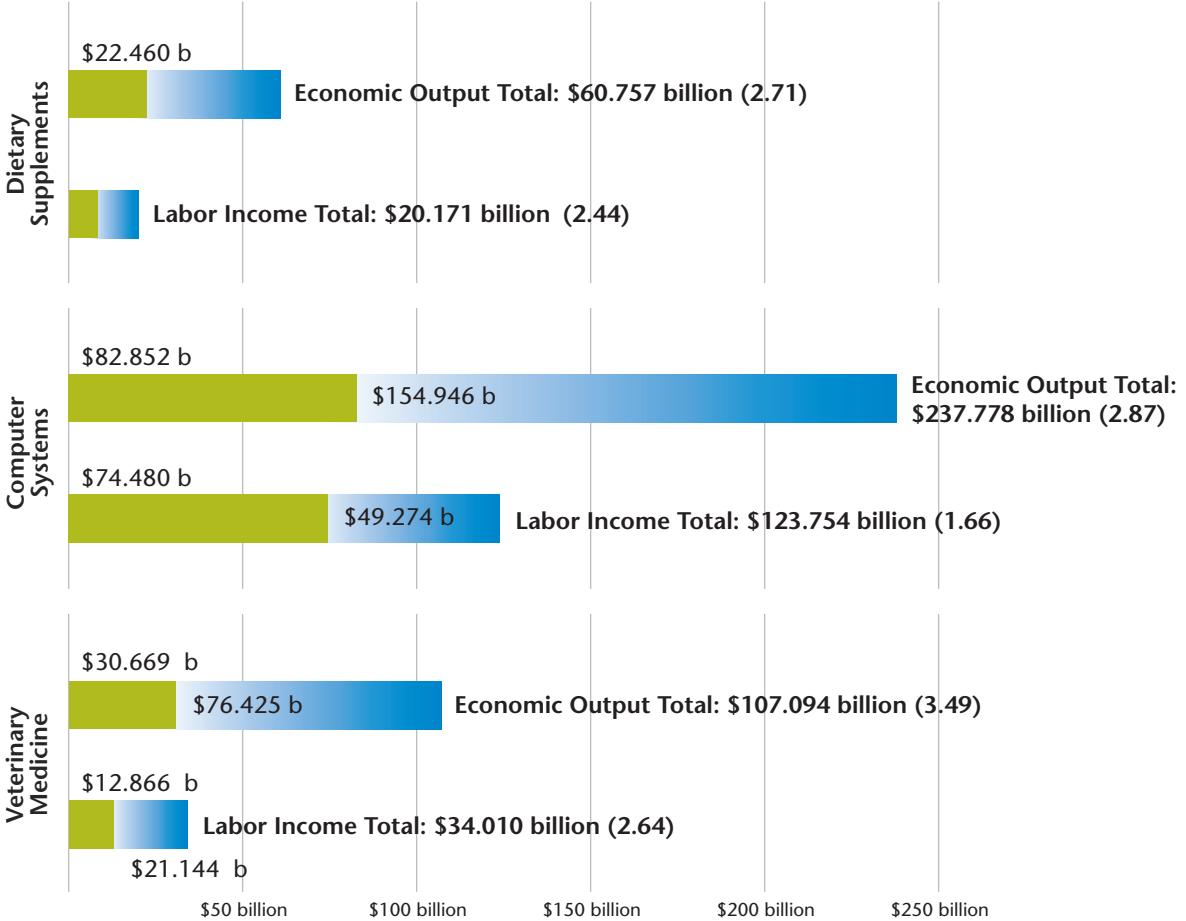
Veterinary medicine is the application of medical, diagnostic, and therapeutic principles to companion, domestic, exotic, wildlife, and production animals. Veterinary science is vital to the study and protection of animal production practices, herd health and monitoring the spread of disease. It requires the acquisition and application of scientific knowledge in multiple disciplines and uses technical skills directed at disease prevention in both domestic and wild animals. Veterinary science helps human health through the careful monitoring of livestock, companion animal and wildlife health.

### *Computer Systems Design*

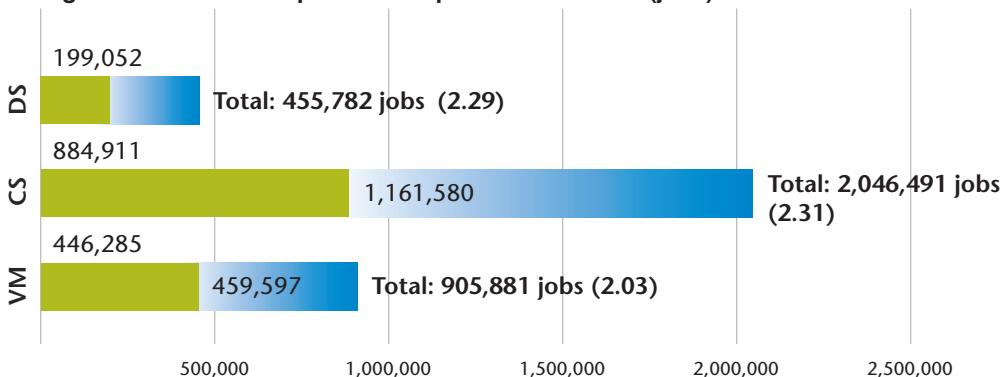
All organizations today rely on computer and information technology to conduct business and operate more efficiently. Often, however, these institutions turn to the computer systems design and related services industry to meet their specialized needs when they cannot meet them internally in their organizations. The computer systems design and related services industry is expected to experience rapid growth, adding both professional and related workers, reflecting continuing demand for higher level skills needed to keep up with changes in technology. Computer specialists accounted for 54 percent of all employees in this industry in 2006.

Figure 5 shows the economic impact of the computer systems design and veterinary medicine industries. The dietary supplement industry has a total output of \$22.46 billion in 2006 and a multiplier of 2.71. While the economic impact is about one quarter of that of computer systems design, the dietary supplement industry has a similar multiplier (2.71 vs. 2.87). Veterinary medicine has a much higher multiplier than both industries (3.49). Furthermore, the dietary supplement industry

**Figure 5: Economic Impact of Comparable Industries**



**Figure 6: Economic Impact of Comparable Industries (jobs)**



has almost the same employment multiplier as the computer systems design industry (2.29 vs. 2.31), shown in Figure 6.

These comparisons demonstrate the power of the dietary supplement industry to realize jobs across industries in a similar way as computer systems design and veterinary medicine industries.

### *Within-Sector Contribution: Retail Trade*

An example of the power of the dietary supplement industry to provide jobs within a given sector of the economy can be seen in the category “health and personal care stores.” Retail trade jobs impacted by the dietary supplement industry total 189,051 out of national employment in retail trade of 18.7 million jobs.

Health and personal care store employment attributable to the dietary supplement industry represents 85.8 percent of the retail trade jobs attributable to the dietary supplement industry (162,139 out of 189,051 jobs).

**Table 3: Dietary Supplement Industry Contribution to Retail Trade Sector**

Category	Dietary Supplement Industry Total Output Impact	Percent of Jobs from Dietary Supplement Industry	National Employment	Dietary Supplement Employment (Jobs) as a Percent of National Employment
Building material and garden supply stores	2,169	1.1%	1,400,594	0.2%
Clothing and clothing accessories stores	2,543	1.3%	1,650,147	0.2%
Electronics and appliance stores	800	0.4%	618,946	0.1%
Food and beverage stores	4,584	2.4%	2,978,964	0.2%
Furniture and home furnishings stores	1,037	0.5%	668,383	0.2%
Gasoline stations	1,412	0.7%	911,830	0.2%
General merchandise stores	4,699	2.5%	3,042,170	0.2%
<b>Health and personal care stores</b>	<b>162,139</b>	<b>85.8%</b>	<b>1,169,678</b>	<b>13.9%</b>
Miscellaneous store retailers	2,420	1.3%	1,585,021	0.2%
Motor vehicle and parts dealers	3,291	1.7%	2,138,632	0.2%
Non-store retailers	2,657	1.4%	1,706,869	0.2%
Sporting goods- hobby- book and music stores	1,301	0.7%	849,420	0.2%
<b>Total</b>	<b>189,051</b>	<b>100.0%</b>	<b>18,720,654</b>	<b>1.0%</b>

Source: Dobson / DaVanzo analysis of the Dietary Supplement Industry using IMPLAN software and data from the Nutrition Business Journal.

Out of a total 1.2 million jobs nationally in the “health and personal care stores” category (Table 3), the dietary supplement industry is responsible for 13.9 percent of them, or 162,139. Table 3 shows this impact.

Figure 6 shows the relative proportion of dietary supplement industry jobs within the retail sector, and within health store jobs.

**Figure 6: Dietary Supplement Industry Jobs within Retail Sector**

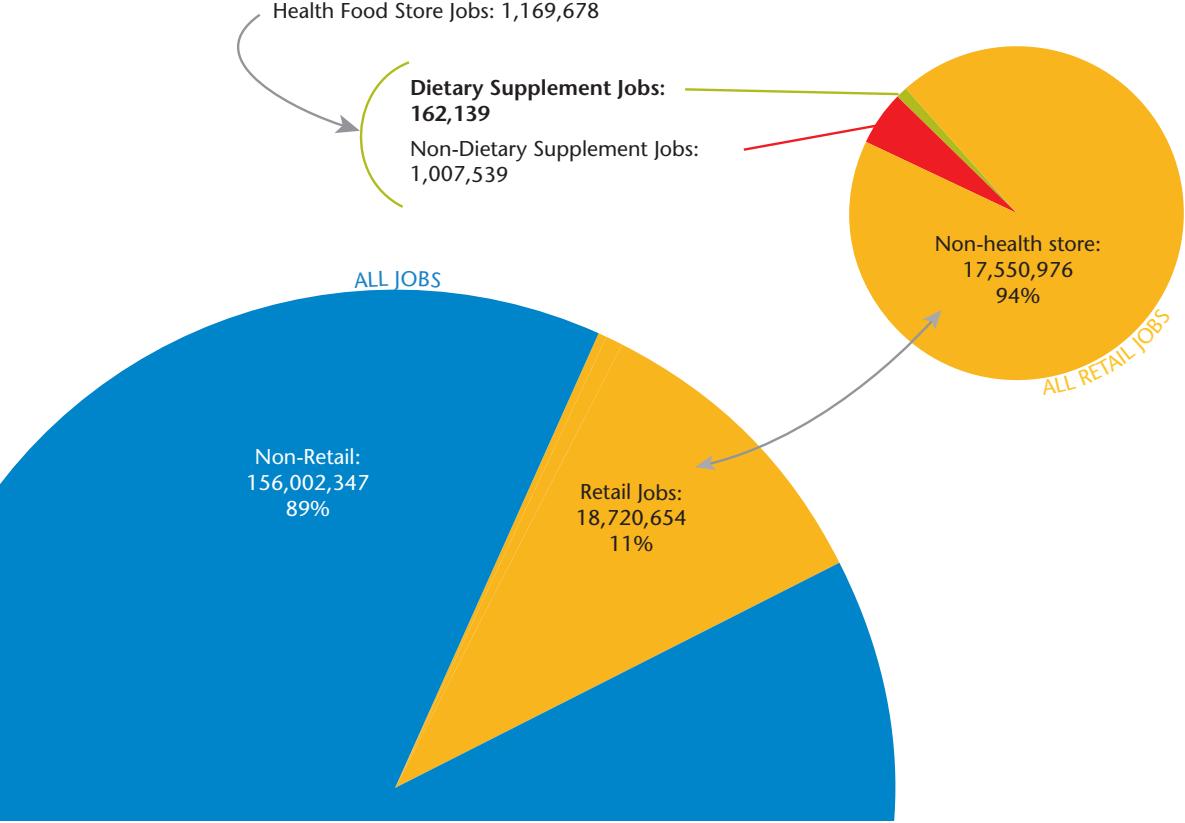
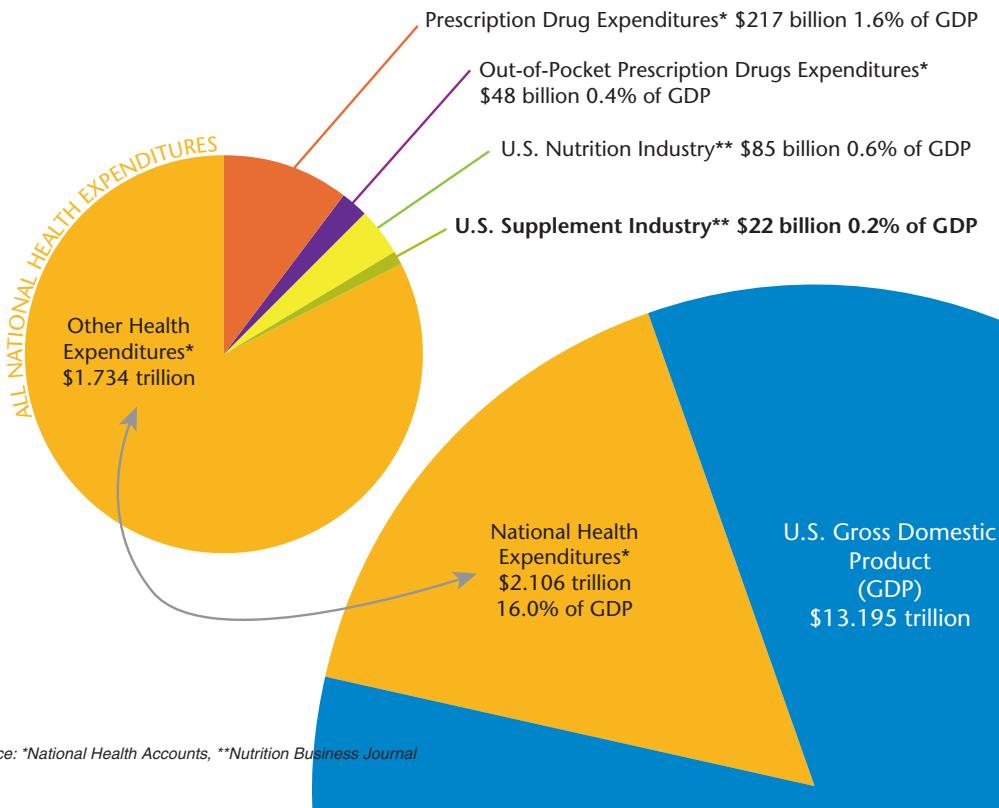


Figure 7 places the dietary supplement industry in context with both the overall and other health related sectors of the U.S. economy. As can be seen, the total health care sector is 16 percent of the total economy. Prescription drugs are 1.6 percent and out-of-pocket prescription drugs are 0.4 percent. Nutrition-related industries represent 0.6 percent of the total economy. The dietary supplement industry is 0.2 percent. This does not take into account any of the ripple effects.

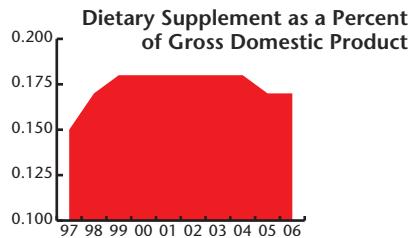
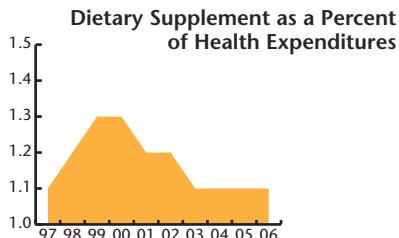
**Figure 7: Relative Size of the Dietary Supplement Industry (2006)**



Source: \*National Health Accounts, \*\*Nutrition Business Journal

**Table 4: The Dietary Supplement Industry as Compared to the Total U.S. Economy and the Health Care Sectors through Time**

Year	Gross Domestic Product*	National Health Expenditures**	Dietary Supplement Industry***	Dietary Supplement as a Percent of Health Expenditures	Dietary Supplement as a Percent of Gross Domestic Product
1997	\$8.18240 t	\$1.12530 t	\$12.60 b	1.1%	0.15%
1998	\$8.62790 t	\$1.19050 t	\$14.50 b	1.2%	0.17%
1999	\$9.12530 t	\$1.26560 t	\$16.00 b	1.3%	0.18%
2000	\$9.70980 t	\$1.35360 t	\$17.10 b	1.3%	0.18%
2001	\$10.05790 t	\$1.46960 t	\$17.90 b	1.2%	0.18%
2002	\$10.37740 t	\$1.60340 t	\$18.70 b	1.2%	0.18%
2003	\$10.80860 t	\$1.73240 t	\$19.80 b	1.1%	0.18%
2004	\$11.51750 t	\$1.85230 t	\$20.30 b	1.1%	0.18%
2005	\$12.26580 t	\$1.97330 t	\$21.38 b	1.1%	0.17%
2006	\$13.06110 t	\$2.10550 t	\$22.46 b	1.1%	0.17%

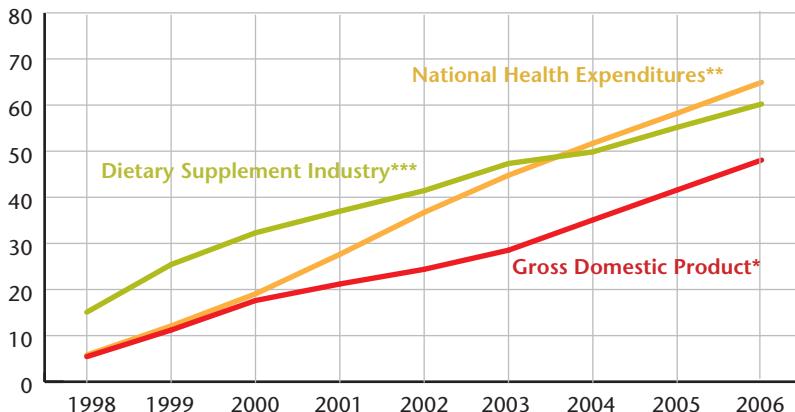


Source: \*President's Proposed Budget, 2008. \*\*CMS, Office of the Actuary. \*\*\*Nutrition Business Journal and calculations by Dobson / DaVanzo.

# The Dietary Supplement Industry has Represented a Consistent Proportion of Health Expenditures Over Time

The dietary supplement industry has consistently represented a substantial part of U.S. health expenditures. As health expenditures have risen, the dietary supplement has grown as well. The industry has maintained itself at more than 1 percent of the total U.S. health expenditures for at least the last 10 years. See Table 4. Results are shown graphically in Figure 8.

**Figure 8: Percentage Increase**



Source: \*President's Proposed Budget, 2008, \*\*CMS, Office of the Actuary, \*\*\*Nutrition Business Journal and calculations by Dobson / DaVanzo.



*This study is designed to answer the question:*

## What is the current economic contribution of the dietary supplement industry to the U.S. economy?

### Discussion and Conclusion

As the year 2008 ended, the economic recession that began earlier that year intensified. The nation was losing increasing numbers of jobs each month. This was the worst job loss in a U.S. economic recession since 1974.

Our estimate of total jobs associated with the dietary supplement industry is just short of one half million jobs. We make this comparison to show the importance of the dietary supplement industry to the U.S. economy in terms of the sheer number of jobs both within the industry and in the many industries that depend on the dietary supplement industry.

In this study, we used the IMPLAN input-output model to determine the direct and ripple effects of the industry's economic output of \$22.4 billion. We found that the total economic contribution of the dietary supplement industry is equal to **\$60.7 billion**, or 0.5 percent of the national GDP. Direct expenditures of the industry

are 0.2 percent of the GDP. The industry paid approximately \$10 billion in taxes in 2006. Put another way, expenditures by the dietary supplement industry are just over 1 percent of the U.S. national health expenditures, and as large as nearly half of out-of-pocket prescription drug spending. Thus the industry is an important force within the national economy.

### **The Dietary Supplement Industry is Integrally Connected to Many Industries**

Not only does the dietary supplement industry represent an important and growing component of the U.S. economy, it is interconnected in essential ways with many other industries. For example, the dietary supplement industry contributes to output (or spending) in other industries, such as retail and wholesale trade; real estate, rental and leasing; finance and insurance; professional, scientific, and technical services; and manufacturing, among others. The dietary supplement industry is responsible for jobs in at least 100 other industries.

On the manufacturing and production side, industry sectors that we used in the modeling as inputs include soybean processing, coffee and tea manufacturing, other inorganic chemical manufacturing, pharmacological preparation and manufacturing, wholesale sales, and health and personal care stores (direct to consumer sales).

## **The Dietary Supplement Industry is and has been a Growing Force for More Than 10 Years**

The dietary supplement industry is an expanding one, growing at a rate that exceeds the rate of inflation. By way of comparison, health care providers are often given a “market basket” increase by payers to account for medical and other inflation. This amount is usually between two and three percent. The dietary supplement industry is growing at a rate of over 5 percent, a rate that outpaces general inflation. At the time this report was written, industry experts forecast consumer sales of dietary supplements of \$23.6 billion in 2007, a compound annual growth rate of 5 percent. Actual sales were later found to be \$23.7 billion in 2007.<sup>16</sup>

**In summary, dietary supplements have been seen as benefiting health and potentially saving health care dollars. Many of the nutritional benefits of vitamins and minerals are known and well-documented. For example, the Dietary Guidelines for Americans, 2005 state that dietary supplements can be used to help meet the recommended intakes of vitamin B12 (folic acid) and vitamin D. Now, however, the dietary supplement industry is seen as being an economic engine for the nations, consistently producing industry jobs, as well as jobs in at least 100 other industries.**

## Appendix A:

### Study Methods

We used IMPLAN to estimate the multiplier effects of changes in final demand for the dietary supplement industry, on all other industries within the national economy. IMPLAN is a software package commonly used to measure economic impact. IMPLAN incorporates data from 508 industry sectors to estimate the impact of one industry on all other industries in a state, region or the nation. Multipliers were estimated based upon actual economic activity (i.e., consumer sales).

The input data utilized in this study are from a market research study entitled “Economic Impact of Dietary Supplements in the United States.”<sup>17</sup> This study showed the various commercial channels through which supplements are marketed and sold. This was the primary source of aggregate industry data, as it contained recent consumer sales data, as well as information on the size and economic scope of the dietary supplement industry. (These 2004 data were updated to 2006, using the IMPLAN inflation factor. However, when we confirmed the update using other data, we found that the industry estimates of final output exceeded the IMPLAN inflation calculation by approximately \$1 billion, suggesting the industry is growing faster than inflation.<sup>18</sup>)

### *Definitions of Key IMPLAN Components as Applied to this Study*

**Total economic effects:** the combined effect or sum of the dietary supplement industry's direct, indirect, and induced effects.

**Direct effect:** the initial change in revenue, earnings, and employment (jobs) for the dietary supplement industry.

**Indirect effect:** a change in inter-industry transactions, as supplying industries respond to the direct effects of the dietary supplement industry.

**Induced effect:** the change in downstream household spending caused by the direct and indirect effects on household income.

**Multipliers calculated by IMPLAN** show the relationship between the *direct effect* and the *total economic effect*. The *direct effect* times the *multiplier* produces the *total economic effect*.

**Tax effects** represent State and local, as well as federal taxes on the total economic effect.

## *Modeling Economic Impact of the Dietary Supplement Industry*

Our analyses with IMPLAN enabled us to estimate the multiplier effects of final demand for products of the dietary supplement industry, and how this demand impacts the economic output, labor income, and employment (jobs) in all other industries within the national economy.

Increased demand for dietary supplements positively affects the producer of the supplement, the producer's employees, the producer's suppliers, the supplier's employees, and so on, ultimately generating a total effect in the economy that is greater than the initial change in demand.<sup>19</sup> The term "multiplier" expresses the ratio of overall effect to initial change by one of three measures: economic output (dollars' worth of production or final sales), labor income, or jobs generated. So we estimated economic output multipliers, labor income multipliers, and employment multipliers in order to calculate this impact.

In short, every dollar spent in a given locale does not disappear the moment it is expended. It ripples through the economy as it is being spent. A properly constructed input-output model captures the effects of all of the economic activity that this dollar undergoes during its several generations of spending in a local economy.

When we modeled the dietary supplement industry, we used component industries as a basis for our analytic work. Industry sectors we selected were drawn from an RTI study entitled "Economic Characterization of the Dietary Supplement Industry."<sup>20</sup> This study identified several categories from the North American Industrial Classification System (NAICS) and the Standard Industrial Classification (SIC) codes as being components of the dietary supplement industry. (The NAICS and SIC

codes are the standard used by federal statistical agencies in classifying business establishments for the purposes of collecting, analyzing, and publishing statistical data related to the U.S. business economy.)

Using NAICS and SIC codes allowed us to recognize the different economic situations and outcomes associated with each component industry. IMPLAN sectors that we used are as follows:

#### NAICS Code Description

52	Soybean Processing
80	Coffee and Tea Manufacturing
150	All Other Inorganic Chemical Manufacturing
151	All Other Basic Organic Chemical Manufacturing
160	Pharmacological Preparation and Manufacturing
390	Wholesale Sales
406	Health and Personal Care Stores (Direct to Consumer Sales) <sup>21</sup>

### *Validating the Model*

As an alternative way of looking at the break-out of industrial sectors which impact the dietary supplement industry as a whole, we looked at an RTI report entitled, “Dietary Supplement Sales Information.”<sup>22</sup> This report gave of the Standard Industrial Classification (SIC) codes for retail sectors represented by the dietary supplement industry.

#### SIC Code Descriptions

405	Food stores
406	Health and Personal Care Stores
412	Non-retail
465	Physicians Offices

We also returned to the recent study entitled “Economic Impact of Dietary Supplements in the United States” to determine the proportions of sales by year for these industries. This break-down of the direct to consumer sales portion of our model supported this alternative modeling effort. The results of this alternative analysis indicated that our prior analytic method of determining industry economic output was sound, since the results from the two analyses were not significantly different (e.g. \$60.7 billion vs. the validation finding of \$58.8 billion on total economic output).

- 1 *Economic Impact of Dietary Supplements in the United States. Special Report.* (2005). Dietary Supplement Education Alliance, Nutrition Business Journal, The Coalition to Preserve DSHEA.
- 2 *Nutrition Business Journal* 2008-2009 Sample Issue: "U.S. Nutrition Industry Prospers in 2007, Despite Economic Slump."
- 3 Institute of Medicine. (2004) *A Framework for Evaluating Safety.* Washington DC: Institute of Medicine.
- 4 *Nutrition Business Journal*: "Consumer Research in the Nutrition Industry" V. October, 2007.
- 5 <http://www.oig.hhs.gov/oei/reports/oei-01-00-00180.pdf>
- 6 DaVanzo JE, Dobson A, et al. (2004) *A Study of the Health and Cost Effects of Five Dietary Supplements.* Falls Church, VA: The Lewin Group.
- 7 Dwyer JT, French S. "Motivations for supplement usage among Americans." Paper presented at: Supply Side East, May 4, 2005; Baltimore, MD.
- 8 Natural Marketing Institute, 2009.
- 9 DaVanzo JE, Dobson A, et al. (2006) *An Evidence-Based Study of the Role of Dietary Supplements in Helping Seniors Maintain their Independence.* Falls Church, VA: The Lewin Group.
- 10 DaVanzo J, Dobson A. (2006) "Studies of Cost-Effectiveness of Multivitamin/Mineral Supplements for Prevention of Chronic Disease in Adults." Presented at NIH State-of-the-Science Conference on Multivitamin/Mineral Supplements and Chronic Disease Prevention. May 15-17, 2006.
- 11 IMPLAN is a software package used to measure economic impact which incorporates data from 508 industry sectors to estimate the impact of one industry on all other industries in a state, region or the nation.
- 12 Stevens TJ, Hidges AW, Mulkey WD. (2007). "Economic Contributions of the Dairy Farming and Product Manufacturing Industries in the Southeast United States in 2005." University of Florida, Institute of Food and Agriculture Sciences, December 14.

- 13 Hodges AW, Mukley WD, Alavalapati JR, et al. (2005). "Economic Impacts of the Forest Industry in Florida, 2003" University of Florida, Institute of Food & Agricultural Sciences. January 7.
- 14 72 FR 34751. June 25, 2007.
- 15 *Nutrition Business Journal* 2008-2009 Sample Issue: "U.S. Nutrition Industry Prospers in 2007, Despite Economic Slump."
- 16 *Nutrition Business Journal*, October 2007, and 2008-2009 Sample Issue.
- 17 *Economic Impact of the Dietary Supplements in the United States*, Dietary Supplement Education Alliance, Nutrition Business Journal, Coalition to Preserve DSHEA
- 18 Industry information that was obtained from recent editions of *Nutrition Business Journal* was used in the final modeling to update the 2004 numbers.
- 19 The implicit change in demand for this study is the scenario "if the dietary supplement industry were to disappear," what would be the full economic impact?
- 20 Muth MK, Anderson DW, Domanico JL, Smith JB, Wendling B. (1999) "Economic Characterization of the Dietary Supplement Industry." Report prepared by Research Triangle Institute Center for Economics Research for the DHHS/Food and Drug Administration under Contract No. 223-96-2290: Task Order 3.
- 21 SIC codes listed in the reports are: 2075-Soybean Oil Mills, 2099-Food Preparation, otherwise not classified, 2819-Industrial Inorganic Chemicals, otherwise not classified, 2833-Medicinal Chemicals and Botanical Products, 2834-Pharmaceutical Preparations, 2869-Industrial Organic Chemicals, not elsewhere classified, 2899-Chemical and Chemical Preparations, not elsewhere classified, 5399-General Merchandising Store, 5411-Grocery Store, 5499- Miscellaneous Food Stores, and 5912-Drug Stores and Proprietary Stores.
- 22 Muth, Mary, Domanico, Jean, Anderson, Donald, Siegel, Peter, and Bloch, Laura; "Dietary Supplement Sales Information," Research Triangle Institute, October 1999.





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