capsules

The go-to dietary supplement dosage form

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As the dietary supplement market continues to grow, capsules have become the preferred dosage form. This article explores the factors contributing to capsules' popularity in the nutraceutical industry.

The nutraceutical market has grown swiftly in recent years as the public's awareness of the nutritional benefits of dietary supplements has increased. Dietary supplements are available across all retail and online channels in a variety of dosage forms including tablets, capsules, powders, liquids, and energy bars [1]. Analysis of available estimates suggests that the global dietary supplement market is worth $200 billion and is growing at a compound annual growth rate of 6 to 7 percent [2,3]. North America—and primarily the US—accounts for about 40 percent of this market, presenting significant growth opportunities for local players [3]. Additionally, the Council for Responsible Nutrition reports that about 76 percent of US adults take some form of health dietary supplement [4].

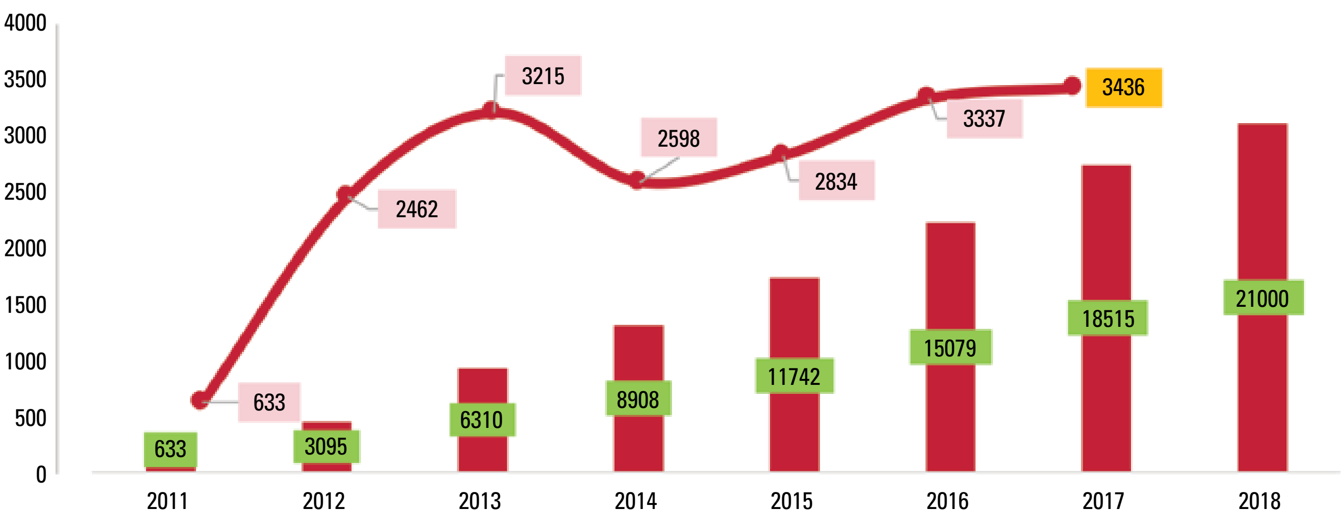
In this highly competitive market, most dietary supplement manufacturers offer large product portfolios and launch multiple products every year. When bringing a new product to market, nutraceutical companies must identify the most suitable oral delivery form by considering factors such as ease of swallowing, taste, odor, size, and adherence. Manufacturers predominantly choose tablets, capsules, gummies, powders, and liquids, and each has its own set of benefits and drawbacks related to product size and consumer preference [5]. However, as Figure 1 shows, each year for the last 5 years, about 3,000 to 3,200 capsule-based products were launched in the US. This is more than any other single dosage form, suggesting that capsules are the "go-to" choice for dietary supplements in the US.

Dietary supplement categories

Dietary supplements can be broadly categorized as vitamins, minerals, herbals, probiotics, amino acids, and omega fatty acids, as shown in Figure 2. Analysis of all these categories based on data from the US FDA's Dietary Supplements Label Database (DSLD) reveals that approximately 50,000 dietary supplement capsule, softgel, tablet, powder, liquid, gummy, and packet products are available [5]. Most of these products are various dosage forms of amino acids, herbals, single vitamins, multi-vitamins, single minerals, and multi-minerals. The product categories in which capsule products are available are shown in Table 1.

FIGURE 1

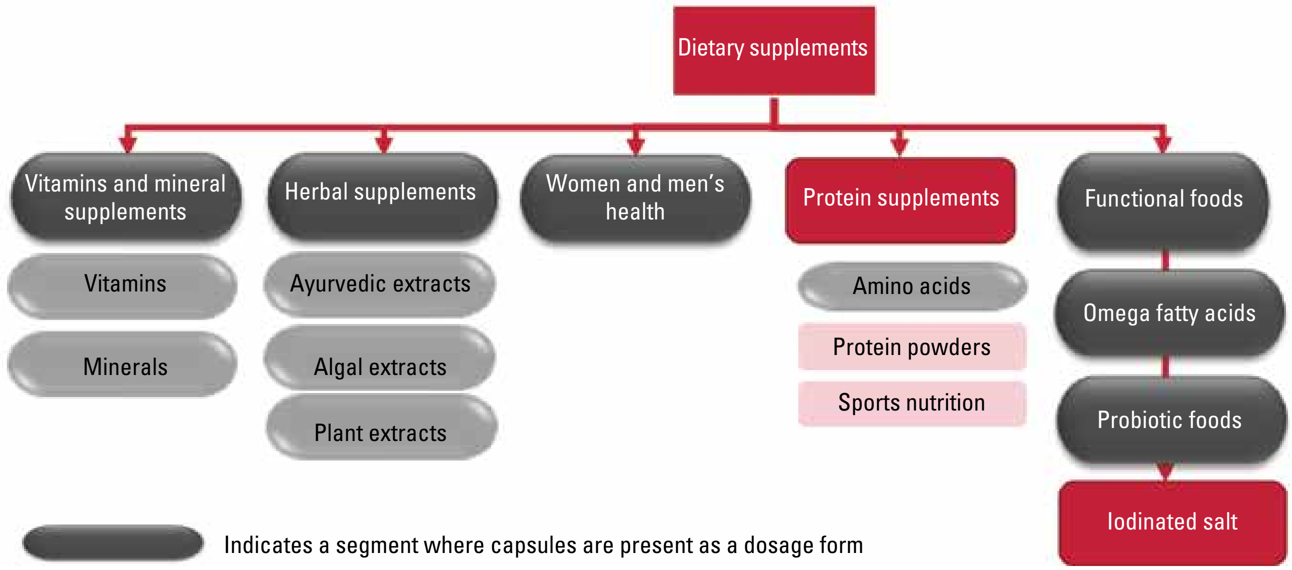
Year-on-year launch of capsule products in the US between 2011 and 2018



Source: DSLD website; ACG analysis

FIGURE 2

Dietary supplement categories



Source: EY white paper; Frost & Sullivan-FICCI; DSLD website; ACG analysis

Table 1

Dietary supplement categories in which capsules are available as a dosage form

Vitamins and minerals	Functional foods	Protein supplements
• Single vitamins • Single minerals • Multi-vitamins/ multi-minerals	• Probiotics • Omega fatty acids	• Amino acids

Source: CRN website; EY white paper; Frost & Sullivan–FICCI; ACG analysis

Table 2

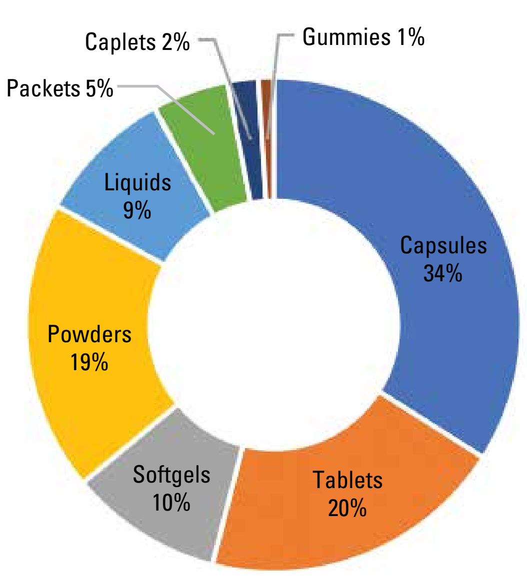
US dietary supplement dosage forms by number of products

Capsules	17,000
Tablets	10,000
Powders	9,766
Softgels	5,250
Liquids	4,322
Packets	2,388
Caplets	1,161
Gummies	427

Source: DSLD website; ACG analysis

Figure 3

US dietary supplement dosage forms by percentage



The DSLD data suggests that capsules and tablets are the most widely available dosage forms under all the categories and that dietary supplement manufacturers prefer capsules overall. As Table 2 and Figure 3 show, more than 17,000 products are available as capsules under various categories, accounting for a 34 percent share among all dosage forms [6]. Tablets are the second most popular dosage form, with nearly 10,000 dietary supplement products (20 percent), followed by powders with 9,766 products (19 percent), softgels with 5,250 products (10 percent), and liquids with 4,322 products (9 percent). Although usage of caplets, packets, and gummies is growing fast, they are still the least-used dosage forms. Analysis of the availability of products under various categories indicates that capsules lead the specialty, herbals, digestion, and single mineral categories; tablets dominate the single vitamin and multi-vitamins categories; and softgels are mostly available in the fat/oil/fatty-acid category.

Why capsules dominate the market

Capsules, especially hard capsules, dominate the dietary supplement market because they offer manufacturers formulation flexibility. Capsules are available in several sizes (000 to 5), providing manufacturers with numerous dosing options. Many types of active ingredients can be encapsulated with minimal excipient use, which helps companies market their products to end users concerned with a product's clean-label status. Tablet formulations, on the other hand, require more excipients to provide optimal compression results. Also, capsules accept a range of filling materials besides powders, such as granules, pellets, and liquids. Additional advantages that capsules offer over other dosage forms include attractive color combinations, printing options, and ease of handling.

The future of dietary supplement dosage forms

While tablets and capsules offer formulation flexibility, they can be difficult to swallow for the elderly and children. It is essential for companies to ensure that their dietary supplement products are user friendly to children and elderly too. In a highly competitive market with low barriers to entry, dietary supplement manufacturers are not shying away from experimenting with other unique dosage forms to provide consumers of all age groups with more options. However, analysis of the DSLD data shows that their application is often limited to a few supplements, for example, lozenges are a unique dosage form, but their availability is limited to minerals like zinc. Similarly, gummies are available, but they are mostly available for vitamins (calcium, D3, and B12), fatty acids (omega-3) and probiotics [5].

Available in a variety of flavors, colors, and textures, gummies and lozenges offer convenient dosing options for children and the elderly. Driving factors behind this solid dosage trend include: taste, perceptions of onset of action, intended benefit, and consumer compliance. However, such unique dosage forms often present challenges related to ingredient interaction and stability. These challenges, coupled with the unique manufacturing processes required, can make developing dietary supplements using such novel dosage forms difficult in terms of formulation, finished-product quality, and cost [6].

Although it is important to consider all available options, its highly likely that tablets and especially capsules will continue to remain the most preferred dosage for dietary supplement manufacturers. Analysis of the DSLD data shows that capsules are the preferred dosage form for most of the dietary supplement manufacturers selling dietary supplements in the US [5]. The primary attributes that make capsules appealing for manufacturers are ease of formulation, availability in numerous sizes, attractive color options, and formulation flexibility. T&C

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