



Study of Consumer Preferences: Solid Oral Dosage Forms



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Research by CAPSUGEL® for OTC, Dietary Supplement and Pharmaceutical Marketers

Effective brand recognition is persuasive in forming consumer preferences. But not all line extensions succeed, even among highly recognized brands. In some cases line extensions cannibalize existing lines, drawing consumers from one flavor to the next.

Line extensions and new product introductions are more likely today to include new types of dosage forms. But many new products and extensions are still manufactured in forms that are selected for manufacturer's reasons – speed-to-market considerations, formulation requirements, and economies of scale.

While effective brand recognition is critical in forming consumer perceptions, consumer preferences are influenced by other factors as well. Because consumers have many more choices of dosage forms than they did just a decade ago, knowledge of their preferences is a strategic weapon. Brands can easily “get stuck” making products one way while consumer tastes and expectations are changing and as product innovations continue. The ability for brands to act and react to consumer preference changes can ultimately determine their long-term success.

In an effort to help over-the-counter, dietary supplement and pharmaceutical marketers understand how consumers manage their choices regarding the products they take, Capsugel commissioned a study to investigate consumers' usage, perceptions and preferences of a variety of solid oral dosage forms. The study was designed to provide sound, genuinely projectable information regarding consumers' attitudes and usage toward all of the products they take – including prescription drugs, over-the-counter products and dietary supplements.



Methodology

The first study was conducted in 2002 and was followed by a duplicate study completed in 2009 which allowed us to benchmark consumer habits and attitudes and then gauge the change that had occurred.

More than 750 consumers in 25 major U.S. markets were asked what they used, what they preferred, and what they were willing to pay more for. The study also mapped which attributes of dosage forms were most important and which forms were linked to the attributes they identified as most important.

In 2002 seven product categories were tracked including antacids, acid reducers, cold/flu/allergy/sinus, laxatives/anti-diarrheals/probiotics, OTC pain relievers, vitamin/mineral/herbal supplements and weight loss products. The second study added sleep aids, tracking a total of eight categories. Areas of questioning covered current dosage form usage and perceptions, form preference and interest in other dosage forms. Questioning was aided by the use of a display board showing a variety of solid oral dosage forms, including: tablets, capsules, chewable tablets, caplets, liquid-filled gels and gelcoats which now include the rapid-release gelcoat technologies.

Overall, Capsugel's updated study found that consumers are purchasing and preferring a wider variety of dosage forms than they did earlier in the decade. They are responding more positively to dosage forms that are easy to swallow, they perceive work more quickly, and that appear to preserve the strength of the medication or the ingredient. Dosage forms such as capsules, liquid-filled gels and gelcoats are more likely to deliver those perceptions. At the same time, usage as well as preference for both tablets and chewable tablets have declined significantly – a major change for the dosage form community.

Summary of Key Findings

While tablets are still a major solid oral dosage form used by consumers, capsules and liquid-filled gels are now nearly as predominant.

Consumer preference for liquid-filled, gelcoats and capsules has significantly exceeded the preference for tablets, a major change from 2002.

Consumers still cite ease of swallowing as the most important attribute with speed of action and gentleness on the stomach increasing in importance.

Attributes closely affiliated with specific dosage forms in the first study, now link to several forms, but no attributes are linked to tablets – they have become more generic. The top attribute “easy to swallow” is still closely linked to capsules.

Consumers are willing to pay more for certain medications if those medications are available in a preferred dosage form. Solid oral dosage form preferences varies by product category.

Conclusion

OTC, dietary supplement and pharmaceutical industries offer diverse solid oral dosage forms, which compete for consumer preferences. Over the past few years, consumers have started the process of moving away from more traditional tablet forms with a strong preference for other dosage forms and a willingness to pay more for them.

By identifying consumer preferences and offering more diverse product lines, marketers can take advantage of significant market opportunities while responding to currently unmet consumer needs and limiting the potential cannibalization of existing product forms.

An understanding of consumers’ choices – and the motivations behind those choices – provides opportunities for line extensions and for other marketing decisions based on preferences. Launching a new product with a form consumers prefer, are willing to pay more for and affiliate with important attributes may make the difference between a successful launch or creating a commodity. Addressing these choices also has an impact on compliance in the medications consumers take, which is important for patient health and safety as well as ongoing business.



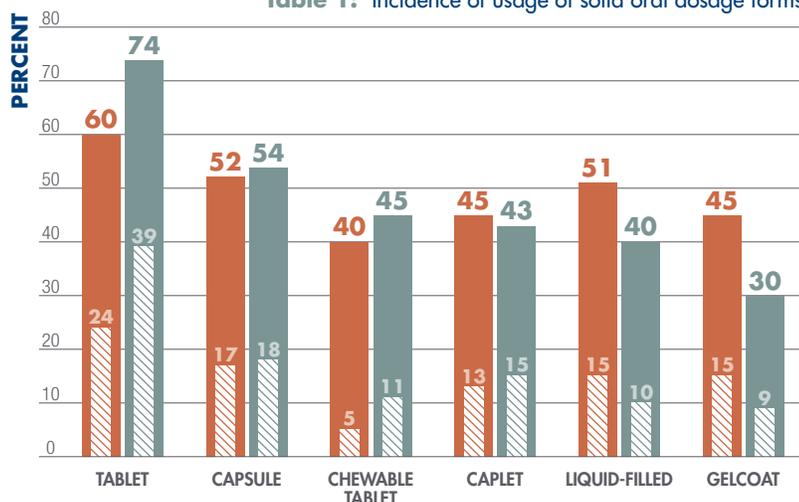
Why is dosage form so important to consumers?

Research indicates that the majority of consumers have preferences when it comes to the medications and supplements they ingest. Some consumers prefer tablets, others prefer capsules and liquid-filled capsules and gelcoats. How do pharmaceutical, over-the-counter and dietary supplement marketers meet these diverse preferences? The answer lies in understanding that consumers demand choices, formulations require choices and today's businesses must offer choices to remain competitive.



Incidence of usage of solid oral dosage forms

Table 1: Incidence of usage of solid oral dosage forms



All Forms Used by Consumers in the Past 12 Months

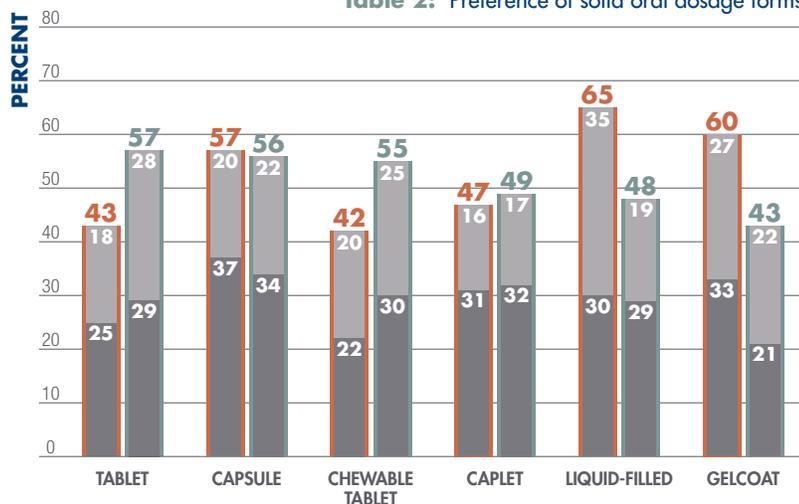
Form usage is much more varied than in 2002 and tablet use, in general, has declined substantially.



When consumers reported what forms of medications they took – including prescription drugs, OTC products and dietary supplements – tablets were reported as the predominant in 2002 but have fallen significantly as other dosage forms have gained in usage. Remember, incidence of usage may be indicative of product availability, oftentimes driven by manufacturers’ operational choices and not necessarily by consumer preferences.

Despite the fact that tablets are still the largest form in use, consumers report liking capsules, liquid-filled and gelcoats even more. Capsules have maintained their position while liquid-filled and gelcoat versions have grown. What could marketers achieve if they provided what consumers prefer? By indentifying consumer preferences and offering more diverse product lines, marketers can take advantage of significant market opportunities and respond to current unmet needs without the potential of cannibalization.

Table 2: Preference of solid oral dosage forms



Consumer Liking of Each Form*

The appeal of the liquid-filled and gelcoat forms has increased significantly in the past 7 years.



*Top-two rating on a 5-point liking scale

How willing are consumers to pay more for the dosage form they prefer?

The growth of the variety of dosage forms has demonstrated that many consumers are willing to pay more for medication that is available in a solid oral dosage form they prefer. These preferences vary among product categories. The following table consolidates the incidence of use, the preferred form and the forms worth paying more for by specific categories.

Summary of Key Dosage Form Information by Product

| *Higher than tablets at a 90% confidence level | Incidence of Use | Preferred Forms* | Worth Paying More For* |
|---|--|---|---|
| ORAL ANALGESICS/ANTI-INFLAMMATORY | Tablet 66% | Liquid-filled 65% Capsule 62% Gelcoat 61% | Liquid-filled 61% Gelcoat 55% Capsule 44% |
| VITAMIN/HERBAL | Tablet 64% | Liquid-filled 70% Capsule 60% Gelcoat 60% | Liquid-filled 60% Gelcoat 50% Capsule 44% |
| COLD/ALLERGY/SINUS | Capsule 64% Tablet 64% Liquid-filled 63% | Liquid-filled 67% Gelcoat 63% Capsule 61% | Liquid-filled 60% Gelcoat 50% Capsule 44% |
| ANTACID | Chewable Tablets 74% | Liquid-filled 65% Gelcoat 59% Capsule 58% Chewable Tablets 49% | Chewable Tablets 59% Liquid-filled 59% Capsule 45% Gelcoat 45% |
| LAXATIVE/ANTI-DIARRHEAL/ PROBIOTIC/FIBER | Tablet 66% | Liquid-filled 66% Gelcoat 63% Capsule 58% | Liquid-filled 59% Gelcoat 54% Capsule 54% |
| WEIGHT CONTROL | Capsule 63% | Capsule 70% Liquid-filled 66% Gelcoat 64% | Liquid-filled 58% Gelcoat 56% Capsule 46% |
| ACID REDUCERS | Tablet 73% | Liquid-filled 70% Gelcoat 62% Capsule 61% | Liquid-filled 57% Capsule 49% Gelcoat 48% Chewable Tablets 45% |
| SLEEP AID | Tablet 66% Capsule 64% Liquid-filled 63% | Liquid-filled 69% Gelcoat 64% Capsule 64% | Liquid-filled 58% Capsule 52% |



Perceptions of Solid Dosage Forms

What do consumers want in a solid oral dosage form?

When considering all medications, including prescription drugs, over-the-counter products and dietary supplements, consumers rate characteristics associated with swallowability, efficacy, taste and quality to be the most important in a dosage form. Ease of swallowing is cited as the most important. Of moderate importance are characteristics related to product integrity, ease of use and aesthetics. Of lesser importance to consumers are characteristics related to cost, uniqueness and being natural or vegetarian – attributes which while small, still offer an opportunity.

Most Important Qualities in a Dosage Form

| Characteristic | Importance* 2009 |
|---|------------------|
| Is generally easy to swallow | 74% |
| Doesn't get stuck in your throat | 69% |
| Works quickly | 69% |
| Leaves no bad aftertaste | 61% |
| Are easy to swallow even for those who have difficulty swallowing | 60% |
| Works the quickest out of all forms | 60% |
| Is gentle and easy on the stomach | 59% |
| Are manufactured to the highest quality assurance standards | 55% |
| Will not repeat or cause acid indigestion | 55% |

Moderately Important Qualities in a Dosage Form

| Characteristic | Importance* 2009 |
|--|------------------|
| Won't dissolve in your mouth before swallowing | 54% |
| Helps maintain strength or efficacy of medication | 53% |
| The most effective way to take medication | 51% |
| The form is tamper-resistant | 50% |
| Doesn't break-up in the bottle | 48% |
| Easy to handle and put in your mouth | 48% |
| Is a convenient way to take medicines | 48% |
| Is a very simple way to take medications | 48% |
| Has no unpleasant odor | 42% |
| Is modern/up-to-date | 40% |
| Is a good value for the money but not necessarily the cheapest price | 38% |

Lesser Important Qualities in a Dosage Form

| Characteristic | Importance* 2009 |
|--|------------------|
| Is worth paying more for | 34% |
| Is natural | 30% |
| Is the cheapest price | 25% |
| Is vegetarian, doesn't contain any animal products | 22% |
| Is unique, that is, different than other forms | 21% |

*Percentage of consumers who said this characteristic was important in a solid oral dosage form.

How well do specific solid oral dosage forms deliver those characteristics consumers report as being important?

The following chart outlines how consumers rank solid dosage forms against a variety of characteristics. In many cases, consumers rank dosage forms other than tablets as delivering better against certain characteristics. These incidences where a dosage form other than tablets is ranked higher than tablets at the 90% level of confidence are noted in bold. For instance, capsules and liquid-filled outperform other solid oral dosage forms on important benefits associated with swallowability – even for those who have difficulty swallowing – and speed of action.

| Characteristic | Importance | Tablet | Capsule | Gelcoat | Chewable | Liquid-Filled | Caplet |
|--|------------|--------|------------|------------|------------|---------------|------------|
| Is generally easy to swallow | 74% | 31% | 38% | 52% | 25% | 57% | 29% |
| Doesn't get stuck in your throat | 69% | 23% | 29% | 41% | 32% | 48% | 22% |
| Works quickly | 69% | 26% | 29% | 37% | 34% | 51% | 20% |
| Leaves no bad aftertaste | 61% | 23% | 29% | 41% | 19% | 52% | 23% |
| Are easy to swallow even for those who have difficulty swallowing | 60% | 18% | 25% | 42% | 28% | 43% | 16% |
| Works the quickest out of all forms | 60% | 18% | 21% | 27% | 26% | 49% | 15% |
| Is gentle and easy on the stomach | 59% | 23% | 23% | 33% | 30% | 44% | 19% |
| Are manufactured to the highest quality assurance standards | 55% | 34% | 39% | 45% | 36% | 52% | 33% |
| Will not repeat or cause acid indigestion | 55% | 21% | 21% | 30% | 29% | 38% | 19% |
| Won't dissolve in your mouth before swallowing | 54% | 25% | 33% | 43% | 16% | 49% | 23% |
| Helps maintain strength or efficacy of medication | 53% | 28% | 34% | 42% | 24% | 52% | 27% |
| The most effective way to take medication | 51% | 23% | 26% | 37% | 28% | 51% | 21% |
| The form is tamper-resistant | 50% | 32% | 30% | 38% | 30% | 43% | 32% |
| Doesn't break-up in the bottle | 48% | 23% | 38% | 44% | 18% | 54% | 24% |
| Easy to handle and put in your mouth | 48% | 39% | 42% | 46% | 36% | 54% | 35% |
| Is a convenient way to take medicines | 48% | 29% | 32% | 41% | 38% | 50% | 25% |
| Is a very simple way to take medications | 48% | 29% | 32% | 40% | 35% | 48% | 26% |
| Has no unpleasant odor | 42% | 27% | 33% | 39% | 26% | 47% | 26% |
| Is modern/up-to-date | 40% | 20% | 26% | 43% | 23% | 55% | 20% |
| Is a good value for the money but not necessarily the cheapest price | 38% | 27% | 24% | 35% | 24% | 42% | 20% |
| Is worth paying more for | 34% | 14% | 17% | 28% | 18% | 42% | 13% |
| Is natural | 30% | 17% | 13% | 16% | 17% | 23% | 12% |
| Is the cheapest price | 25% | 35% | 14% | 16% | 21% | 19% | 11% |
| Is vegetarian, doesn't contain any animal products | 22% | 14% | 13% | 16% | 14% | 21% | 10% |
| Is unique, that is, different than other forms | 21% | 10% | 15% | 26% | 20% | 43% | 8% |

Bold numbers are significantly higher than tablets at the 90% level of confidence. **Red colored** numbers are significantly lower than tablets at the 90% level of confidence.

Perceptual Maps

The following charts show the link consumers make between solid oral dosage forms and those characteristics they perceive as benefits. They are a multi-dimensional space rather than calibrated axes – those forms and characteristics that appear closer together are associated in the mind of consumers. Forms and characteristics that appear further apart are less or distantly associated. This form helps to visually represent and summarize the associations of dosage forms and their benefits or characteristics.

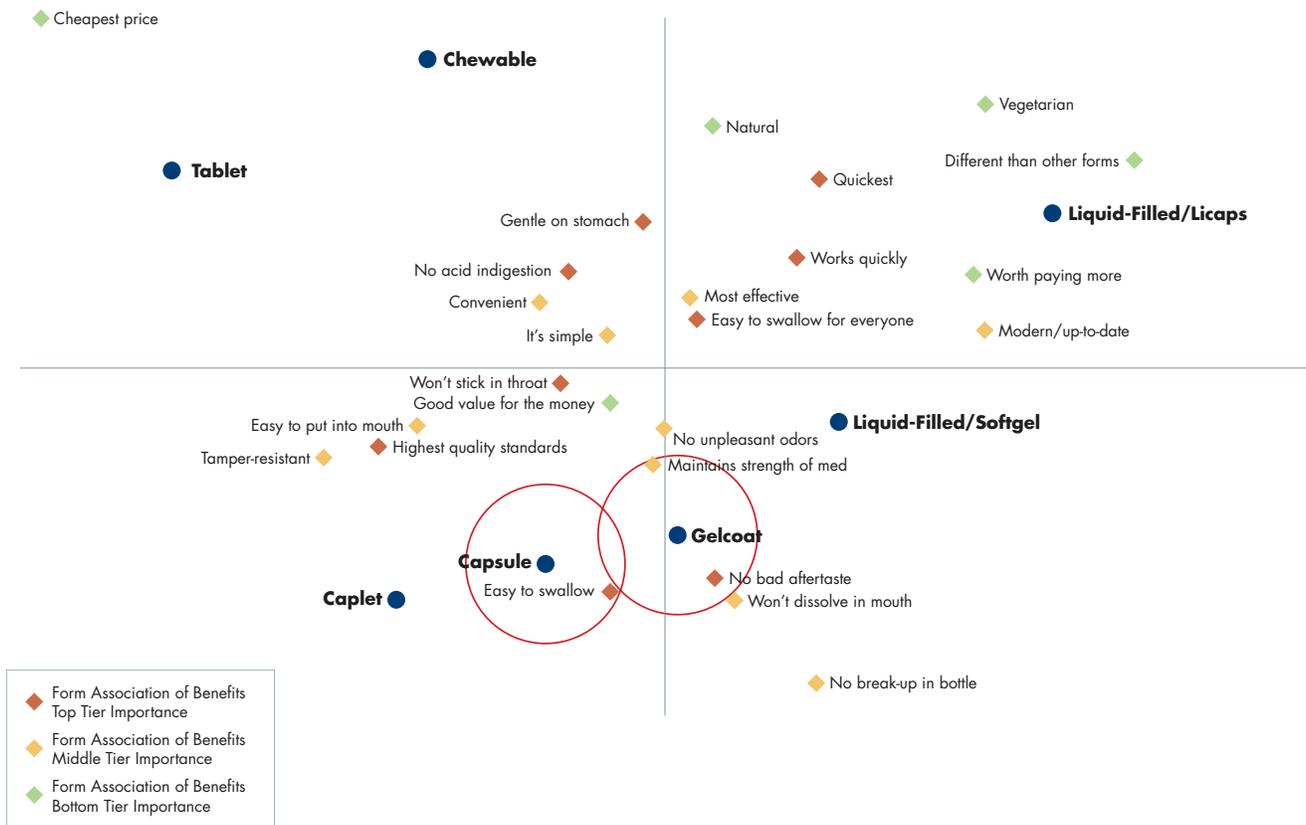
For example, as noted in the encircled area within the first perceptual map, capsules are very closely associated with “easy to swallow” while gelcoats are affiliated with “no bad aftertaste, won’t dissolve in mouth.” On this map, tablets and chewables are not closely affiliated with any characteristic except cheapest price.

It is important to note, as these perceptual maps indicate, that a number of characteristics remain unassociated with any of the dosage forms. These gaps in association between dosage forms and certain characteristics offer an opportunity to claim these characteristics when positioning a dosage form within a product category. In this study we were able to separate the liquid-filled products into liquid-filled softgels and liquid-filled Licaps® capsules. Licaps capsules are two piece capsules that are liquid-filled and then fused shut.

Perceptual Map – Combined

Total Random Perception Map: Form Association of Benefit All Tiers of Importance

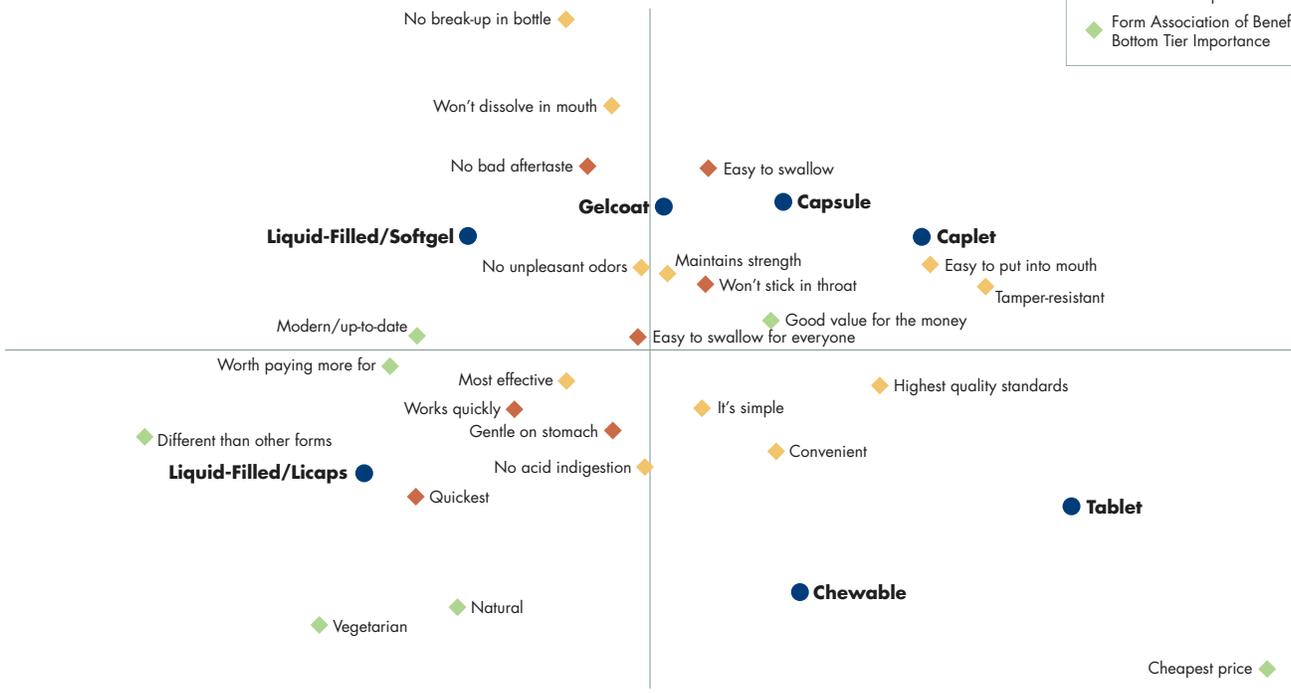
N=114



Perceptual Map – Oral Analgesics

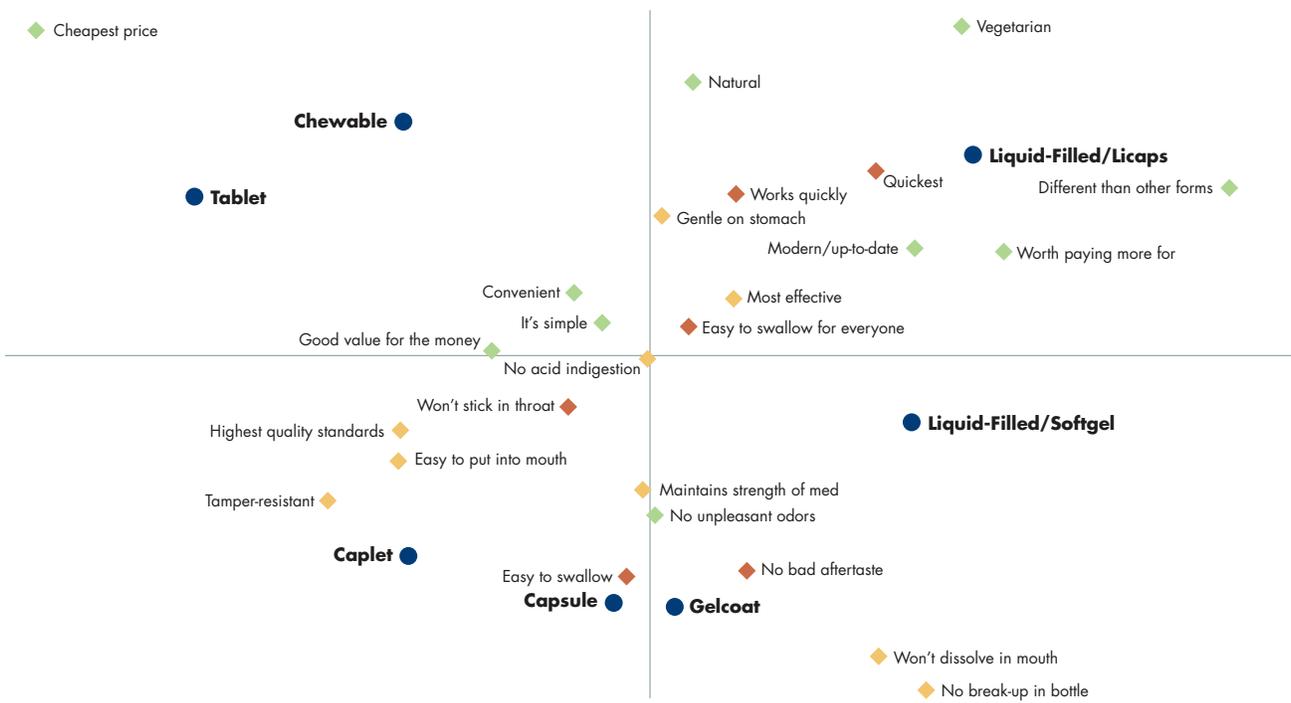
N=506

- ◆ Form Association of Benefits Top Tier Importance
- ◆ Form Association of Benefits Middle Tier Importance
- ◆ Form Association of Benefits Bottom Tier Importance



Perceptual Map – Vitamins/Minerals/Supplements

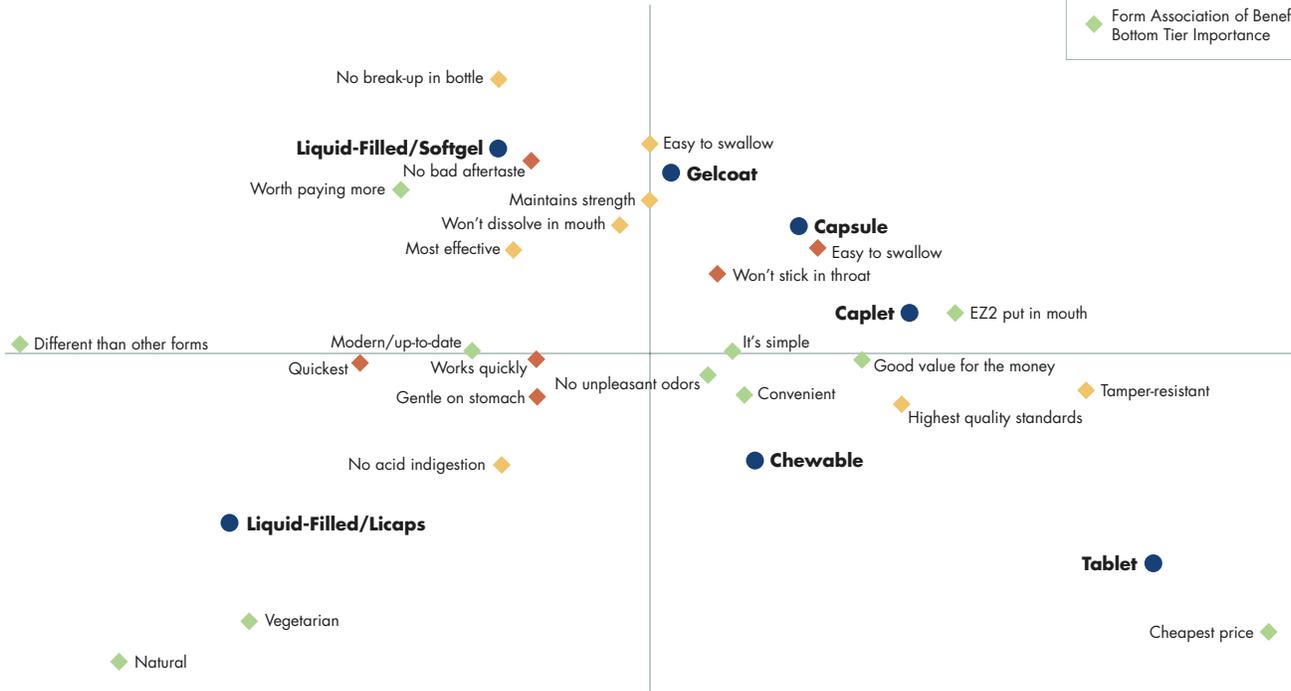
N=390



Perceptual Map – Weight Control

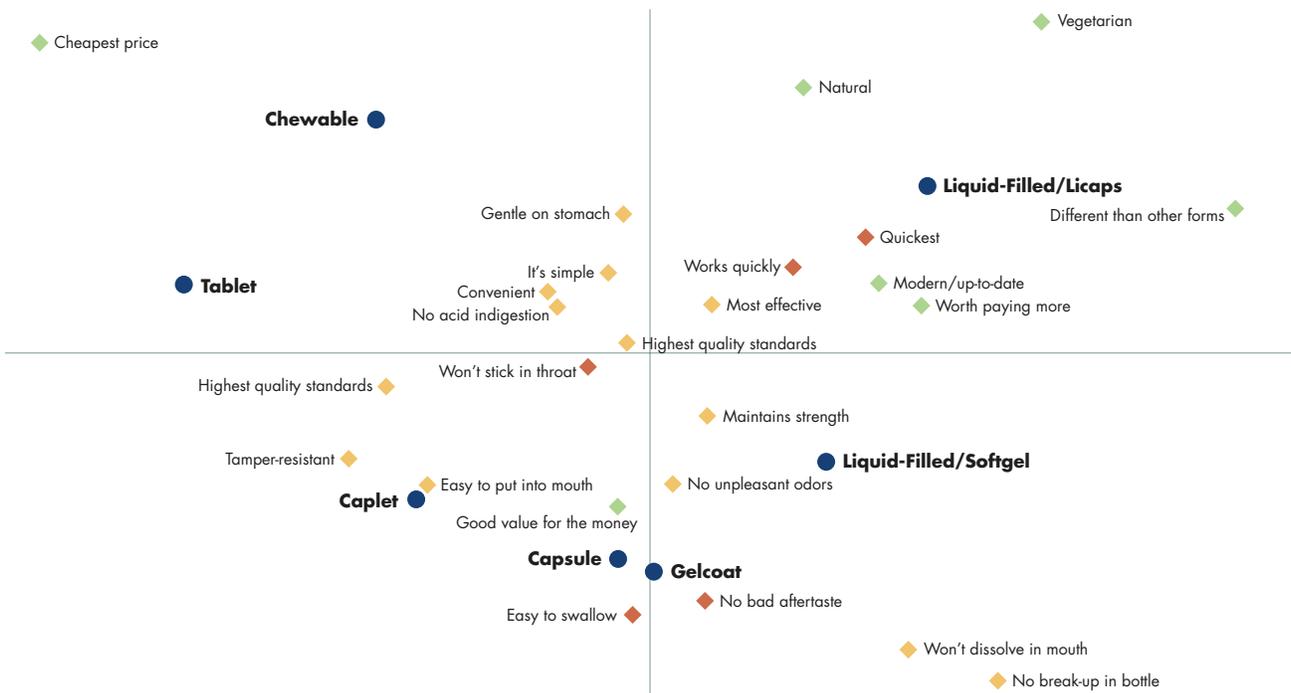
N=160

- ◆ Form Association of Benefits Top Tier Importance
- ◆ Form Association of Benefits Middle Tier Importance
- ◆ Form Association of Benefits Bottom Tier Importance



Perceptual Map – Cold/Allergy/Sinus

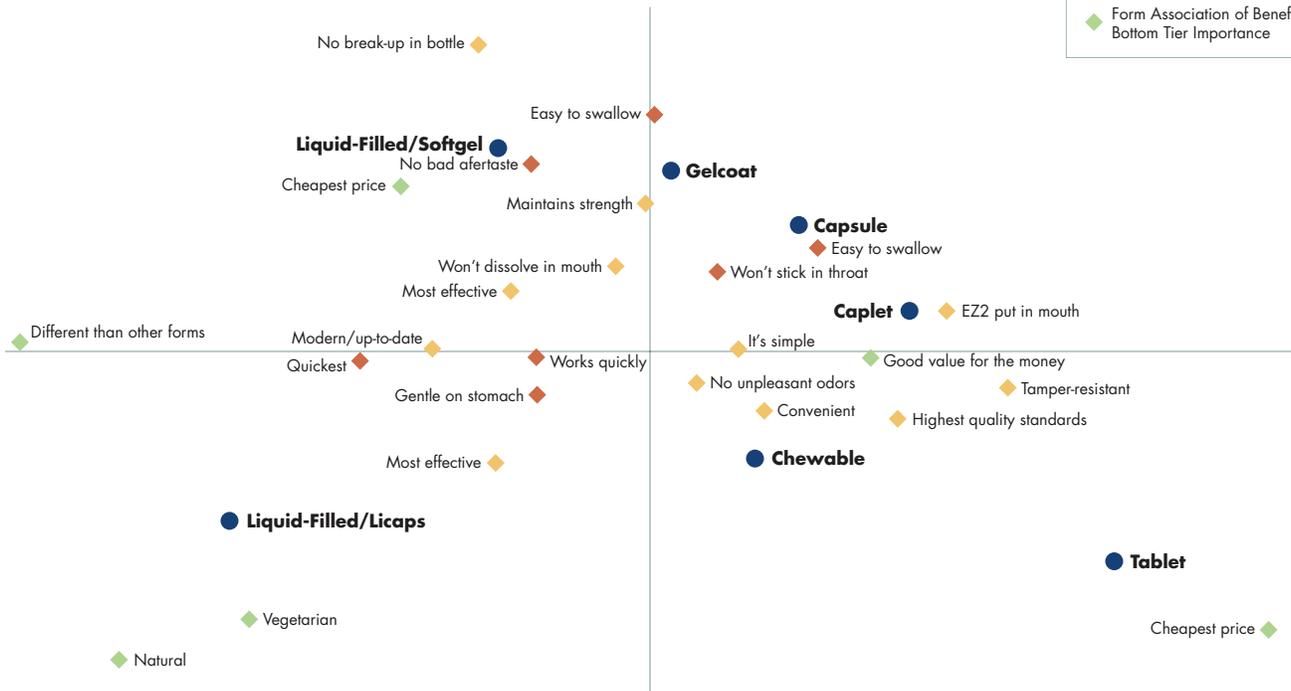
N=347



Perceptual Map – Laxative/Anti-diarrheal/Probiotic/Fiber

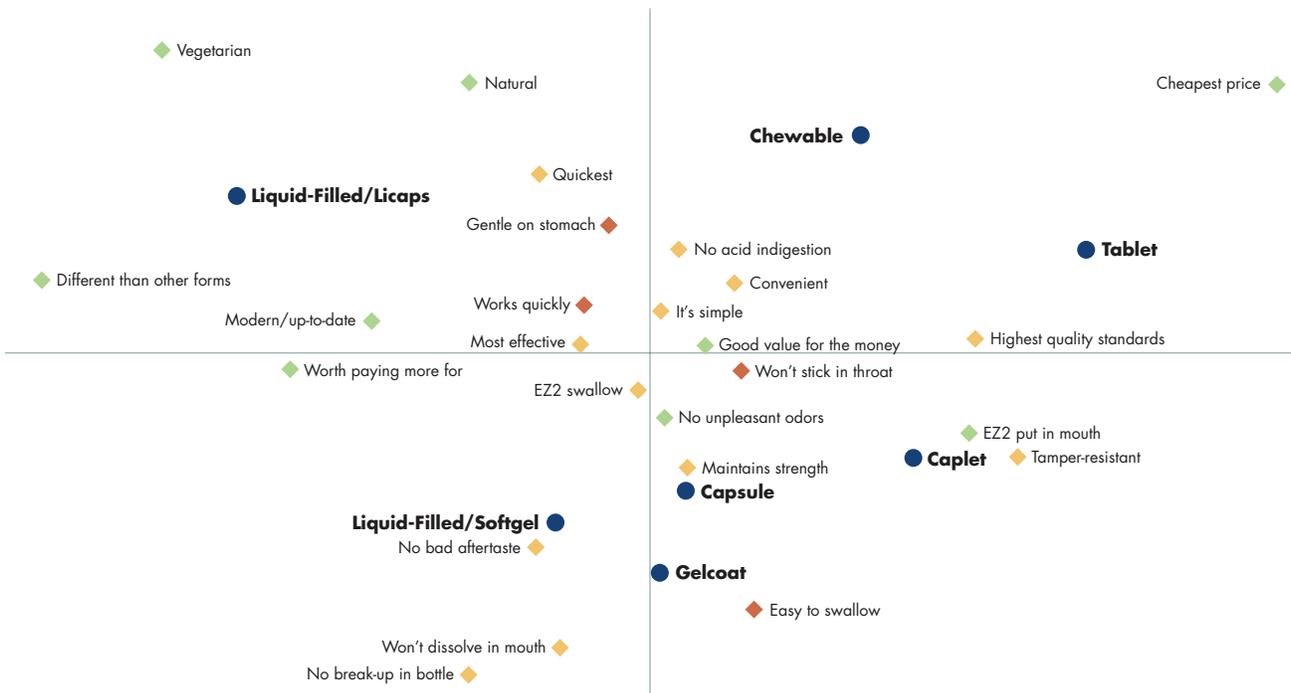
N=184

- ◆ Form Association of Benefits Top Tier Importance
- ◆ Form Association of Benefits Middle Tier Importance
- ◆ Form Association of Benefits Bottom Tier Importance



Perceptual Map – Antacid

N=234



Perceptual Map – Acid Reducer

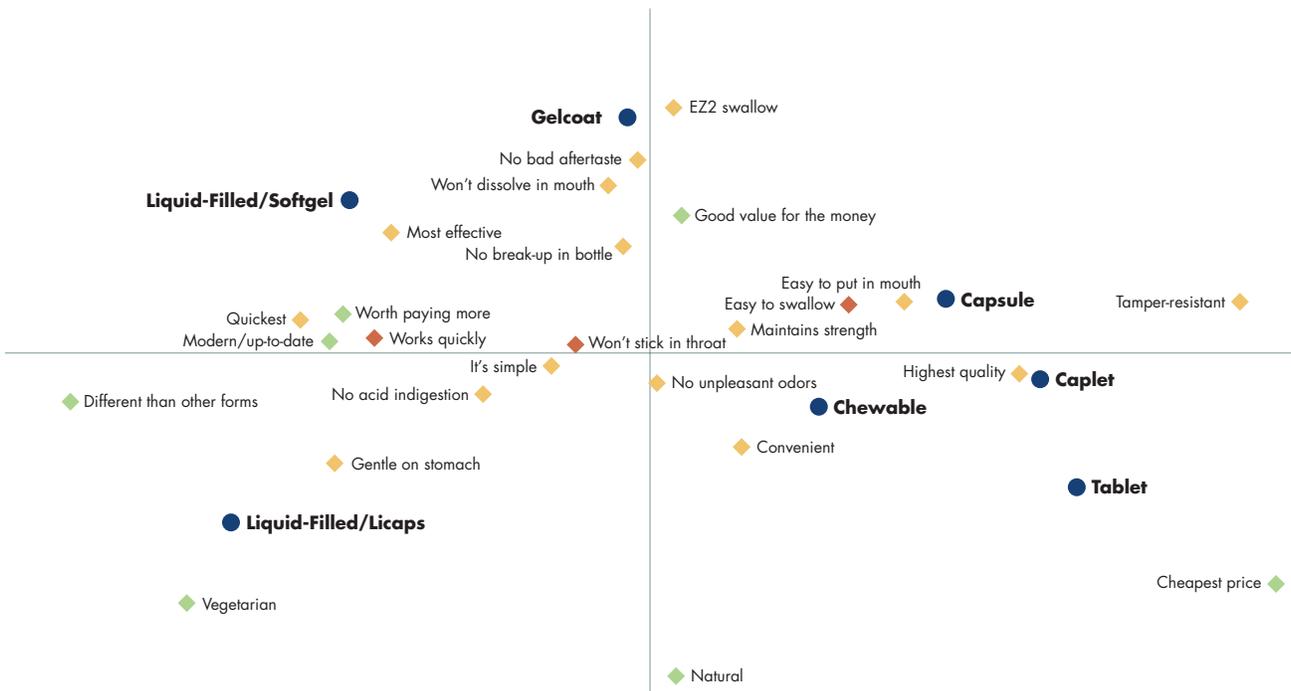
N=122

- ◆ Form Association of Benefits Top Tier Importance
- ◆ Form Association of Benefits Middle Tier Importance
- ◆ Form Association of Benefits Bottom Tier Importance



Perceptual Map – Sleep Aid

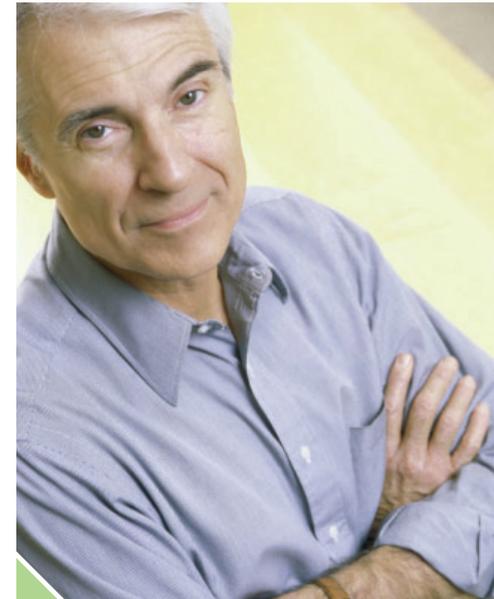
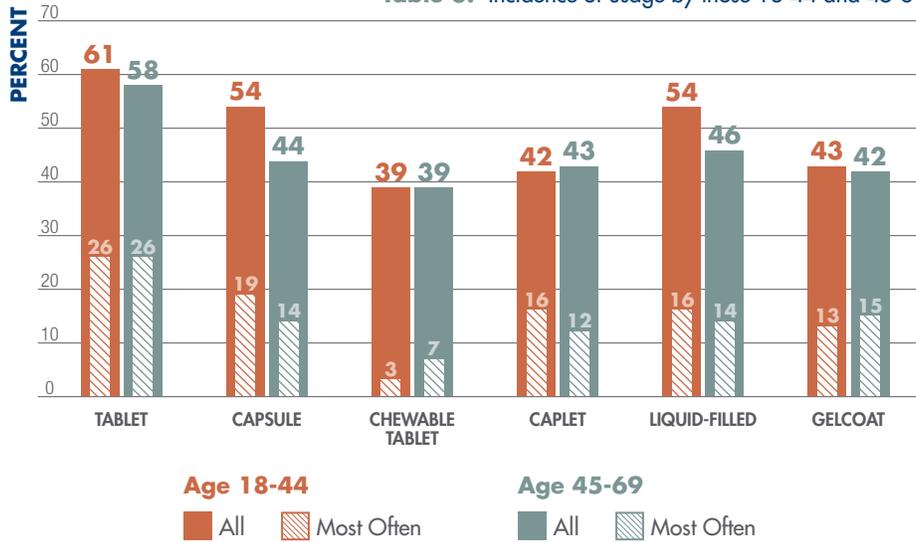
N=104



Age Differences and Perceptions

The age of the consumer did not make a great difference among usage of forms, with the exception of capsules. Today capsule use is significantly higher among the younger group. There is also a higher preference for chewable tablets among the older segment. Importance of attributes didn't differ much among the age groups except that "Works Quickly" was significantly more important to the 18-44 year old group.

Table 3: Incidence of usage by those 18-44 and 45-69



Importance of Attributes Among Age Groups

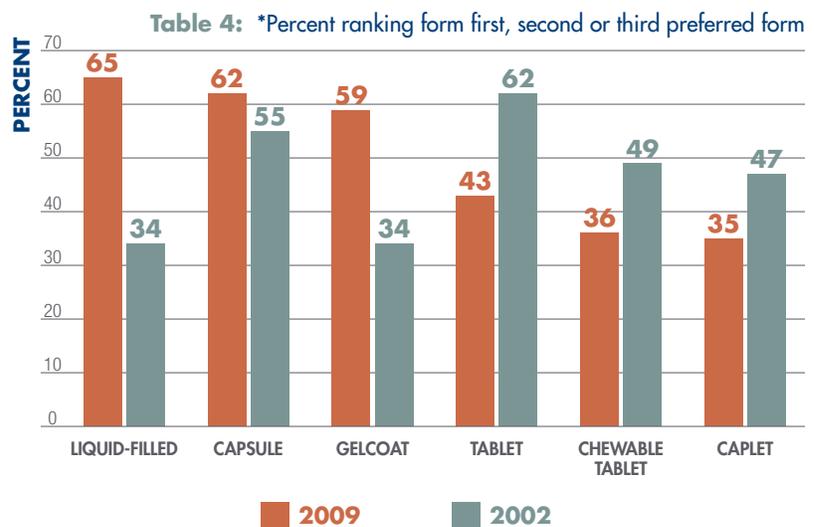
| Attributes | Age 18-44 | Age 45-69 |
|---|-----------|-----------|
| Is generally easy to swallow | 76% | 71% |
| Doesn't get stuck in your throat | 67% | 69% |
| Works quickly | 71% | 62% |
| Are easy to swallow even for people who have difficulty swallowing | 60% | 60% |
| Leaves no bad aftertaste | 64% | 56% |
| Works the quickest out of all forms | 59% | 56% |
| Is gentle and easy on the stomach | 59% | 55% |
| Are manufactured according to the highest quality assurance standards | 54% | 55% |
| Won't dissolve in your mouth before swallowing | 54% | 54% |
| Will not repeat or cause acid indigestion | 57% | 50% |
| Helps maintain strength or efficacy of medication | 52% | 50% |
| The most effective way to take medication | 51% | 50% |
| Easy to handle and put in your mouth | 50% | 46% |
| Is a convenient way to take medicines | 47% | 48% |
| The form is tamper-resistant | 49% | 45% |
| Doesn't break-up in the bottle | 44% | 50% |
| Is a very simple way to take medications | 45% | 43% |
| Has no unpleasant odor | 45% | 40% |
| Is modern/up-to-date | 45% | 37% |
| Is a good value for the money, but not necessarily the cheapest price | 36% | 38% |
| Is worth paying more for | 35% | 34% |
| Is natural | 30% | 29% |
| Is the cheapest price | 26% | 23% |
| Is vegetarian, doesn't contain any animal products | 21% | 20% |
| Is unique, that is, different than other forms | 18% | 21% |

Why Capsule Forms are Preferred

Consumers perceive capsules as:

- ▲ Easy to swallow
- ▲ Potent in action
- ▲ Helping to maintain the strength or efficacy of the medication
- ▲ Won't dissolve in your mouth until you are ready to swallow
- ▲ Won't break up in the bottle
- ▲ Has no unpleasant taste or odor
- ▲ Leaves no bad aftertaste

About 6 in 10 consumers rank liquid-filled gelcaps, capsules or gelcoats among their top three preferred* dosage forms. Tablets have declined in ranking over time.



About Capsugel

Capsugel is a leading provider of innovative dosage solutions to the pharmaceutical, dietary supplement and consumer health product categories. Capsugel is also the world's leading supplier of capsules for pharmaceutical and dietary supplement products.

From idea generation to commercialization, Capsugel offers the products and service to help maximize business opportunities, strengthen product portfolios and quickly take advantage of emerging trends.

References

- "Dosage Form Attitude and Usage Study." Guideline, New York, NY, 2009.
- "Perceptual Maps of Dosage Form Ratings." Guideline, New York, NY 2009.



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