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How to cite this manuscript

If you make reference to this version of the manuscript, use the following information:


Published Version Information


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Digital Object Identifier (DOI): doi:10.1016/j.foodqual.2012.01.005

Publisher’s Link: http://www.sciencedirect.com/science/journal/09503293/25
Predicting success for new flavors with information known pre-launch: a flavored snack food case study

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Abstract

Success in the marketplace is the goal of every product launch. Knowing what data to collect before launching a product that could predict success would be valuable to companies. Thus, the objective of this study was to determine whether success of new line extensions for a multi-flavored snack product available internationally could be predicted from information available before launch. Staff from 15 countries completed a questionnaire for each product and included questions related to authenticity, familiarity, and capturing current trends, packaging and market place issues such as product competition and pricing. Using 63 flavors, a discriminant function correctly identified 75.8% successful products as successful and 66.7% unsuccessful products as unsuccessful. Stepwise comparison determined the variables necessary to correctly categorize the snack products: being a trendy flavor, new to the category, based off foods from restaurants or traditional foods. These variables assisted in predicting in market success for this product category.

Keywords: success, discriminant analysis, product development, stepwise regression
Introduction

Predicting success in the market, prior to a launch is difficult. Designing a strategy to allow continuous introduction of new products into the marketplace before competitors will increase the chance of success (Fortuin, Batterink and Omta, 2007). New products can come from different paths to the marketplace including new concepts, new raw materials, line extensions, reviving old products and targeting a new audience (Hanchate, 2006). As these new products are created, the decision making processes in the innovation phase are used to help ensure that the product is headed towards a successful launch (Vatthanakul, Jangchud, Jangchud, Therdthai and Wilkinson, 2010; Jones and Jew, 2007). These processes include working in cross-functional teams with other areas contributing to the development of the product (Wilson, 1994), creating as many different innovative ideas as possible (Jones et al. 2007), conducting comprehensive market assessment and determining what the consumer wants (Bogue, Seymour and Sorenson, 2006).

When completing a comprehensive market assessment it is critical to evaluate 10 factors to define the definition of the product and improve the chance of success. Wilson (1989, p 14) identified these factors as: “strategic alignment, customer need, competitive analysis, compliances, product positioning, select project priorities, identify technical and process risks, identify appropriate market channels, management leadership, and human and financial resources.” For Hewlett-Packard (HP) if any of these portions were skipped, they found projects fell short of projections and failed in the marketplace. However, when the cross-functional teams worked together and these factors were considered and agreed upon, HP saw more organized launches (Wilson, 1994).
As product ideas are developed and continue into the product development life cycle it is necessary that all preliminary information from the consumer marketplace be collected. Starting the product development phase without gathering knowledge of what needs the product must satisfy will not lead to a project focused on success (Buisson, 1995). The biggest challenge is the tedious job of collecting all necessary information from the consumer marketplace and knowing which requirements are the most critical to consumers for success. Because consumer needs often change slowly it is possible to collect the necessary information from the consumer and then only update or confirm the information previously collected (Krieg, 2004).

Predicting whether or not a product will be successful in the marketplace is determined based on calculating risk (Penn State, 2007). These risks include timing of launch, product price, competitors, marketing support (Chomka, 2003), focus on consumers wants and needs (Ottesen and Grønhaug, 2005) and adaptability to market changes. Creating flavor fusions in new markets using export opportunities requires adaptability since the ethnic flavors may be familiar and acceptable in the country it was developed in but may be unfamiliar to the new target country. In order to increase the chance of success it is important to learn about acceptable variables by product testing and looking at the product as part of the new country’s daily life (Tuorila, Andersson, Martikainen and Salovaara, 1998).

Timing of launch is also important to consider in order to reduce risk of failure. If an appropriate time/season does exist for the product (e.g. launch of white chocolate and cinnamon flavors at Christmas time coinciding with a movie release, Watson, 2003), then launching the product at that time will increase consumer awareness of the product (Wilson and Norton, 1989).

Product pricing also is critical for success. Sometimes new products are priced higher or promoted as premium products in order to pay for the innovations used to create the product.
Other times, companies will take a decrease in profit short-term to maintain a more reasonable price to encourage first time buyers to try the product (Rajagopal, 2008).

Many studies have evaluated critical product attributes for consumers through various procedures (see e.g. Chung et al., 2011; Parente, Manzoni and Ares, 2011; Chrea et al., 2011, and Lee et al., 2010). Although it is known that keeping the end-user in mind will require staying in touch with the consumer through the whole project, it is sometimes difficult to do this, especially if there is not funding to support such extensive testing (Harmsen, Grunert and Declerck, 2000). If this is the case, looking at previously collected data or information that could be known prior to launch of the product could lead to enhanced decision making. The objective of this study was to determine whether success could be predicted from information available before launch.

**Materials and Methods**

An international food manufacturer was contacted and agreed to provide information for this study. The study was conducted using a flavored snack food available in many international markets. Conversations with product development and marketing teams in the company generated various options for market and product selection. Ultimately, a flavored snack food product made from a similar base product was selected because it is widely available in many international markets on all continents. Additional discussions related to market selection consisted of factors such as product development activities for the country (an active product development program for the country was needed), whether information would be readily available (e.g., markets with major recent staff turnover were excluded because new staff might be unable to provide some answers on past products), and market breadth (a wide range of countries was desired).
For the study 15 countries provided a list of successful and unsuccessful flavors launched in the past 5 years. Countries contacted were: Argentina, Australia, Brazil, China, Egypt, India, Mexico, Poland, Russia, Spain, South Africa, Thailand, Turkey, United Kingdom (UK) and the United States (US). Initial data was requested on three successful and three unsuccessful flavors from each of the countries, some countries responded with more products than were requested while other responded with less. Each flavor was identified and classified by the country as either successful, having been in the market longer than 1 year, or unsuccessful, having been removed from the market in less than 1 year. To be included in the study, each product had to have met initial liking hurdles set by the international company, with local input, for launch. The products each country selected were to include only problems perceived as product related rather than ones the company felt were unsuccessful because of in-market launch execution problems. For example, products introduced with minimal marketing or promotional support after launch products introduced with poor market timing, or seasonal products that were intentionally introduced only for a short time. Initial questions were asked to assure that all products were accurately chosen:

- Was this product successful or unsuccessful?
- Was the introduction and marketing of this product executed well?
- Where there any cost issues affecting the product (e.g. premium pricing)?
- Was the product released with appropriate after-market support?

Any product that was not introduced well into the market area, had cost issues or did not have appropriate market support were excluded from the study because the intent was to focus on product characteristics that were known before launch that could help determine longer-term (i.e., more than 1 year) success. There were 63 products that were selected for further evaluation on the full questionnaire.
A questionnaire was developed to collect as much information as possible about the products that were launched into the marketplace. Figure 1 shows the questionnaire that was to be completed on each of the products in the study. It included multiple choice questions, as well as, yes/no and 5-point scales to collect information on the products.

In order to assure that data was collected on market (e.g., in-market sales and competitive situation), product (e.g., liking, aftertaste and authenticity) and concept (e.g., purchase interest) data, additional information was needed aside from the questionnaire. Since each product was launched into the marketplace prior to the testing, actual data was collected on the performance in the marketplace. These are the categories that market data was collected on:

- Product summary (SKU, target consumers, etc.)
- Time of launch and location
- Product concept fit
- Label information
- Percent share
- Trial and repeat
- Distribution
- Consumer testing

After developing the questionnaire it was distributed to product developers and/or flavor scientists in each country to gather the requested information. Some of the questions were easily answered by the product developer/flavor scientist, but others required assistance from other departments within the company (e.g., marketing research). All questions were to be answered in order to collect as much information as possible to be used for the data analysis.

For each of the successful/unsuccessful products, a questionnaire was sent to the contact in each country by email in a word document. Countries then sent back the questionnaires for each of the products as well as an excel file with the additional data information requested. Most data was collected via email, but additional information was obtained by phone calls when
necessary. Extensive follow-up ensured as much data as possible was collected. Three countries were unable to fully complete the questionnaires: Argentina, India and the US.

Data Analysis

Data from all countries were combined into a single data file. Scaled questions remained as numbers and categorical questions were changed into 0/1 dummy variables. For example, a yes/no question received a 0 for no and a 1 for yes. A question with four multiple choice answers was converted to four dummy variables responses with one of the four responses receiving an 1 and the other three answers receiving a 0. A stepwise discriminant analysis (PROC STEPDISC in SAS® 9.2, Cary, NC, USA) was used to determine specific questions that best classified the data into the successful and unsuccessful categories. Wilks’ Lambda multivariate test was used to determine significant differences between variables. The PROC DISCRIM function then was used to give a classification table of correct and incorrect estimates of the data into the two groups.

The discriminate function was first performed on all data collected on the products, including data known pre- and post-launch., to determine the ability of the function to predict success. A second discriminate function was calculated using only the information that would have been known prior to or during the early stages of product development. For example, is the product, a) new to the overall product category, b) a new variation in the category, c) a new variation to the country, d) a familiar flavor, e) whether the flavor appears “authentic” to the culture, f) based on a traditional dish, g) a dish found in most restaurants, h) a trendy flavor (following an in-market trend flavor), i) promoting a ‘healthy’ concept, or j) being made with problem ingredients.

Results and Discussion
Data Gathering

One difficulty in conducting this type of study is gathering the data and the determining the impact that information can have on overall information. Data was gathered from the global company's corporate headquarters and emails were sent to contact persons in each country requesting them to return the information within one month. Only three countries responded within the requested amount of time with complete data. Reminder emails, multiple telephone calls, and corporate assistance in requesting information ultimately was necessary to get most of the information. In total the time frame for gathering the data was approximately six months.

Of the 15 original countries selected, two of the countries did not provide enough information to be included in the analysis, and one country did not provide any information that was requested. Thus from the original set of 102 products from 15 countries data gathered from the 12 responding countries resulted in a total of 63 products with adequate information.

Internal Validation of the Information Gathered

When looking at all data collected the discriminant analysis estimated 100% of the successful products as successful and 90% of the unsuccessful products as unsuccessful (Table 1). Thus, using information available both before and immediately after launch this study was able to almost completely predict success or failure. This analysis serves as an internal validation that the information collected was useful and could predict success in future studies.

Of course, using all data collected would not help predict success prior to a launch because the product would need to be in the marketplace to collect some of the information.

Predicting Success with Information Known Pre-Launch
When limiting the collected information to the questions where information could be known prior to launch the discriminant analysis estimated 75.8% of the successful flavored snack products as successful and 66.7% of the unsuccessful products as unsuccessful (Table 2).

This prediction was found after the stepwise regression procedure reduced the 13 original variables to four significant pieces of information that could make the data more easily interpreted: 1) flavors new to snacks category in the country, 2) trendy, 3) traditional flavors and 4) flavors found in restaurants (Table 3).

It is important to recognize that some of the significant variables have a positive impact on success and others a negative impact. In general, products that were successful were not new flavors to the general snack food category. However, successful products could and often were traditional or currently trendy flavors commonly found in restaurants. These findings suggest that creating an entirely new flavor category within a product category can be a difficult task. However, sometimes new products are focused on a segment of the population (e.g., specific ethnic groups or diabetics) or may be flavor fusions (i.e. the restaurant connection) of products from other countries (Kühne, Vanhonacker, Gellynck and Verbeke, 2010; Watson, 2003) creating success in a smaller group that can expand into the larger population. Taking a successful product of one country and developing it to be acceptable in another country, unfamiliar to that flavor, can create opportunities for new food flavors (Tuorila et al. 1998). However, success using this approach may require substantially more market support.

New successful products were sometimes based on food that is traditional, has been around in the country a long time, or is a trendy concept or idea. Traditional flavors can sometimes catch the attention of an interested consumer and create impulse purchasing, then repeat purchase (Jones et al. 2007; Watson, 2003). Trendy flavors tag onto current market trends (e.g., health)
often generating trial purchases, and when well executed can become staple flavors over time. When a trendy flavor is matched with quality ingredients and carefully developed it can become the right flavor at the right time (Anon, 1999). The interest that customers have for a trendy flavor can stimulate the product in the market and create success (Bartels and Reinders, 2010; Rajagopal, 2008; Sheldrake, 2008). However, trendy flavors also can be difficult because “trends” are often fads that change rapidly and make it difficult to stay at the marketplace top (Fortuin et al. 2007).

Conclusions

Predicting successful and unsuccessful products is key to achieving better success rates for new product. Collecting as much information as possible prior to launch can help make a better prediction. This information includes collecting data even before the product is developed (i.e., whether the flavor is new to the overall category, a new variation in the category, based on a dish found in most restaurants, a trendy flavor, promote ‘healthy’ concepts, etc.). The process of collecting this information is not easy, and it requires patience and considerable communication between researchers and departments with the needed information. However, based on this case study coordinating analysis of such knowledge may be able to guide future projects to successful fruition.

For flavored snack products (using only limited general information available to the product developers) success rates of approximately 70% could be predicted. For this product category, being a completely new flavor for the market generally predicted failure, but being traditional, trendy, or a flavor commonly found in restaurants within a country often predicted success. Considering half the products (50%) used in this study were unsuccessful, that data
improves the potential prediction of success from 50 to approximately ~70%, a major increase. Using prior known information is potentially an easy way to increase the likelihood for success. It is possible that additional specific information on the products (i.e., the specific sensory characteristics of products) could improve that equation further, but such information was not available in most countries. These questions worked well for the flavored snack products category but may not be the exact same questions needed for another category. This research identified a procedure including the kinds of questions that can be used to obtain successful prediction in a category.
References


Tables


TABLE 1. DISCRIMINANT TABLE FOR PERCENTAGE OF SUCCESSFUL AND UNSUCCESSFUL FLAVORS CLASSIFIED USING ALL RESPONSES FROM THE QUESTIONNAIRE.

<table>
<thead>
<tr>
<th></th>
<th>Unsuccessful</th>
<th>Successful</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unsuccessful</td>
<td>90.0%</td>
<td>10.0%</td>
</tr>
<tr>
<td>Successful</td>
<td>0.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
### TABLE 2. DISCRIMINANT TABLE FOR PERCENT OF SUCCESSFUL AND UNSUCCESSFUL FLAVORS CLASSIFIED USING INFORMATION KNOWN PRIOR TO LAUNCH.

<table>
<thead>
<tr>
<th></th>
<th>Unsuccessful</th>
<th>Successful</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unsuccessful</td>
<td>66.67%</td>
<td>33.33%</td>
</tr>
<tr>
<td>Successful</td>
<td>24.24%</td>
<td>75.76%</td>
</tr>
</tbody>
</table>

### TABLE 3. IMPACT ON PREDICTION OF SUCCESS FOR SNACK FOOD FLAVORS BASED ON DISCRIMINANT ANALYSIS FUNCTION

<table>
<thead>
<tr>
<th>Variables</th>
<th>Impact on Prediction</th>
</tr>
</thead>
<tbody>
<tr>
<td>New to product category</td>
<td>NE</td>
</tr>
<tr>
<td>New to salty category</td>
<td>NE</td>
</tr>
<tr>
<td>New to snack foods</td>
<td>Negative</td>
</tr>
<tr>
<td>Nothing like it on the market</td>
<td>NE</td>
</tr>
<tr>
<td>Familiarity</td>
<td>NE</td>
</tr>
<tr>
<td>New flavor dish to the country</td>
<td>NE</td>
</tr>
<tr>
<td>Regional flavor dish to the country</td>
<td>NE</td>
</tr>
<tr>
<td>Common flavor in Restaurants</td>
<td>Positive</td>
</tr>
<tr>
<td>Traditional flavor that has been around a while</td>
<td>Positive</td>
</tr>
<tr>
<td>Trendy flavor</td>
<td>Positive</td>
</tr>
<tr>
<td>Problem ingredients on the label</td>
<td>NE</td>
</tr>
<tr>
<td>Promoting a ‘healthy’ concept</td>
<td>NE</td>
</tr>
</tbody>
</table>

NE=No Effect
TABLE 4. WILKS’ LAMBDA TEST FOR SIGNIFICANT VARIABLES FOR ATTRIBUTES FROM STEPWISE REGRESSION

<table>
<thead>
<tr>
<th>Variables*</th>
<th>Wilks’ Lambda</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>New to snacks</td>
<td>0.92</td>
<td>0.03</td>
</tr>
<tr>
<td>Trendy</td>
<td>0.87</td>
<td>0.02</td>
</tr>
<tr>
<td>Traditional to country</td>
<td>0.78</td>
<td>0.00</td>
</tr>
<tr>
<td>Found in restaurants</td>
<td>0.73</td>
<td>0.00</td>
</tr>
</tbody>
</table>

*Table only shows variables that were significant at $P \geq 0.05$. 
Figures

Figure 1: Questionnaire Distributed to Obtain More Product Information