Consumer Preference for Edible-flower Color, Container Size, and Price

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Abstract. Two surveys were conducted to determine characteristics important in containerized edible flowers that could be sold in retail outlets. Self-selected participants at Bloomfest at Cobo Hall, Detroit, were assigned to one group that rated the importance of attributes such as color of pansy (*Viola xwittrockiana* Gams. 'Accord Banner Clear Mixture'), color combinations, container size, and price. Participants assigned to a second group rated color, color combinations, and container size. Flower color was allocated the most points in the purchasing decision (63% for the first group and 95% for the second), with a mixture of all three colors (blue, yellow, and orange) being the most desirable. Responses were subjected to Cluster Analysis (SPSS Inc., Chicago), which resulted in the formation of three distinct groups. The groups were labeled "Likely Buyer" (those who had eaten and purchased edible flowers before and rated characteristics of edible flowers favorably); "Unlikely Consumer" (those who had eaten edible flowers before and had rated characteristics of edible flowers unfavorably); and "Persuadable Garnishers" (those who had not eaten edible flowers before, but were very likely to purchase edible flowers for a meal's garnish).

Edible flowers can be used to add color, fragrance, and flavor to food such as salads, soups, entrees, desserts, and drinks (Barash, 1998a, 1998b). Since the late 1980s, there has been a resurgence in the popularity of edible flowers used by chefs and people entertaining at home. Consumers have been exposed to an increasing number of edible-flower cookbooks, culinary magazine articles, and television segments (Rusnak, 1999). Potential consumers who do not have the space, patience, or time to grow edible flowers can purchase them.

Small, rigid, plastic packages of edible flowers are now available in some retail stores in the United States. Discussions with produce managers have revealed that many of these packages are not sold before the expiration date. Reasons for this may include flower

color, species assortment, package size, price, package design, or some other attributes. If unfavorable opinions predominate, marketing efforts can improve an item's appearance, taste, or portion size, or replace it with a more desirable one. Although edible flowers are not one of the top sellers in the produce department, a greater number of baby boomers are using them in entertaining (Rusnak, 1999).

To promote sales, retailers must educate customers about the uses of edible flowers and their ability to enhance food at holiday dinners and other special occasions (Rusnak, 1999). Successful marketing and advertising techniques used to promote sales of culinary herbs can also be used for edible flowers. Rusnak (1999) reported that consumers who purchase fresh herbs are likely to purchase edible flowers. Signage, point-of-purchase material, and storage-condition or recipe information included in the package can draw consumers' attention and attempt to inform them (Moore, 1998).

Marketers also need to understand potential consumers' needs and concentrate on characteristics that should be included in the final product (Food Product Development, 1979). Conjoint analysis is a tool that helps researchers determine the importance of various factors that affect the consumers in their purchase decision (Behe et al., 1999; Gineo, 1990; Hardy et al., 2000; Price et al., 1980; Robertson and

Chatfield, 1982; Shafer and Kelly, 1986; Townsley-Brascamp et al., 1995). Marketers are interested in understanding the components of the edible-flower package and determining changes that should be made to encourage other marketing segments to purchase the product. To date, no data are available regarding consumers' preferences for edible flowers' color, package size, and price. The objective of this analysis was to address this deficiency.

Materials and Methods

Two surveys were conducted at Bloomfest at the Cobo Hall Center in Detroit on 9 and 10 Apr. 1999. Detroit was chosen as a survey site based on articles that defined the Detroit metropolitan area as a suitable test market (Waldrop, 1992). Bloomfest, a highly advertised event, allows garden enthusiasts to view the offerings of garden center exhibits, non-profit booths, and various vendors. Participants pay a fee to enter the 4-d event. Participants who agreed to complete a survey were self-selected. Thus, this sample may be more reflective of a population that is more interested in gardening and flowers than is the general public.

A nonorthogonal design was developed by using OrthoPlan, a computer software program component of the SPSS software package (SPSS Inc., Version 8.0, Chicago). The survey was developed by using three single-color and four multicolor combinations of pansy (blue, yellow, orange, blue and yellow, blue and orange, and all three colors); two sizes [nine pansies per package, 8-oz (227-g) container; and 18 pansies per package, 16-oz (454-g) container] of a clear, rigid, plastic container; and three prices, basing the first price on packages seen in the retail market by the researchers (\$2.99). Doubling the \$2.99 price would have created an increment that was between what retailers consider a psychological price barrier (Mason and Mayer, 1984), so it was reduced to the nearest perceived increment (\$4.98) and doubled (\$9.95). The three colors of pansies were chosen to best reflect contrasting, natural colors. The total number of possible container combinations (color $\times$ container size $\times$ price) was 42. An orthogonal arrangement was developed with OrthoPlan (SPSS Inc.) by using 27 of the possible combinations to reduce participant fatigue while providing data for the complete orthogonal design. Equal weight was given to color, size, and price, and each color and color combination was featured.

Photographs of a single edible-flower package that measured 10.2 $\times$ 15.2 cm accurately and reliably portrayed the real objects (Daniel and Boster, 1976; Shafer and Richards, 1974). These were glued onto foam core board and placed in a random layout on four adjacent boards covered with black cloth. Each board measured 0.61 $\times$ 0.92 m and was placed on a metal easel on one of the 0.61-m sides. The four boards were placed on a 0.61 $\times$ 1.83 m table along the 1.83-m side. On the two outer boards, six photographs were arranged at equal

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intervals. On one of the two inner boards, seven photographs were arranged. Eight photographs were arranged on the other inner board.

A description of the number of flowers in the package and the price was affixed to a piece of foam core board 5.1 cm tall $\times$ 15.2 cm wide and placed under each of the photographs. On the upper right corner next to the photograph, black, vinyl, self-sticking letters from A to AA were placed on 3.8×3.8 -cm pieces of foam core board. Each letter corresponded to an item on the survey. Small pieces of velcro on the back of each picture, description, and letter board secured the foam core board to the black cloth board.

Experiment I. The arrangement of the pictures on the board corresponded with a schematic that was placed on a two-page survey sheet. In each box of the schematic, a letter from A to AA corresponded to the letter next to the pictures on the board. The experiment was a 100-point exhaustion designed to determine which color or color combinations, price, and size the participants would choose to purchase if shopping for a package of edible flowers to serve to family and friends. Participants were told to assign the 100 points to the containers of edible flowers, giving their favorite the most points, and to continue to assign points until all had been used. Participants did not need to assign points to all the containers, but just the ones they liked. Participants were asked 21 questions, including which edible flowers they had eaten, what their food shopping and gardening habits were, and their demographic status. Demographic questions included year of birth, gender, education level, income (using nine discrete \$20,000 categories), family status, number of persons in the household, and zip code. Participants answered questions regarding purchasing edible flowers: 1) to be used for garnishes and salads; 2) that were insect-damaged; and 3) that were grown without pesticides. A semantic differential on a seven-point Likert scale (7 being the highest rating) was used.

Experiment II. Another arrangement of the pictures was used to ask participants who did not participate in Expt. I. about color, color combinations, and container size. A total of 14 pictures were randomly arranged on the black boards. A description of the package size was placed under the picture and a letter from A to N was placed to the upper right of the photograph. Eighty-six participants filled out the survey and a schematic that corresponded to the arrangement of pictures on the board was on the survey form. Participants who rated these photographs also used the 100-point exhaustion process and answered the 21 questions asked in Expt. I. Participants' answers to both 100-point exhaustion surveys were analyzed with Conjoint Analyzer software (SPSS Inc); other questions were analyzed with a two-tailed *t* test and the Kruskal-Wallis test.

Results

Experiment I. Participants who viewed and rated the 27 pictures of containers indicated that color was the most influential factor (63%

of the decision) when deciding which package they would purchase (Table 1). Price was the next most important factor (24%), with container size having the least importance (13%). The utility for all factors (Table 1), indicates a preference that is more or less over an average or ideal. A negative utility for price indicates that participants valued the container less than an ideal or average because of its higher price. The container combinations of color, price, and size were ranked by points allocated by the participants. The nine-count container with all three colors and a price of \$2.99 received the most points, with a mean of 13.1. The 18-count container with all three colors and a price of \$4.98 received the next highest number, with a mean of 11.7, followed by the 18-count container with blue flowers and a price of \$4.98, with a mean of 7.0.

Experiment II. Ratings made by participants who rated containers by color and package size alone were similar to those of the group that rated the containers on all three attributes. Again, color was the most important characteristic in the decision (95%) in choice of container (Table 1), whereas container size had little (5%). Again, the nine-count container with all three colors received the most points, with a mean of 18.2. The ranking of the second and third containers, however, differed from those chosen by the group that viewed all 27 photographs. The second highest number of points was assigned to the 18-count container with blue flowers, with a mean of 13.7, followed by the nine-count container with blue flowers.

To increase the sample size for segmentation analysis, the similarity of both groups was tested. Considering six demographic questions, we decided to combine samples if there were no differences on four of the six demographic questions (Behe et al., 1999). Kruskal-Wallis tests revealed that only gender distribution was significantly different, so samples were combined for a cluster analysis on common variables. Of the 224 participants, 146 had eaten them before, and 33 of them had purchased edible flowers before. The participants had eaten a total of 21 different species, including nasturtium (*Tropaeolum majus* L.) (eaten by 45% of participants), pansy (28%), and violets (*Viola tricolor* L.) (21%). A few of the participants reported that they had eaten flowers that are not recognized as being safe, which supports the current belief that consumers should be told what is edible and what is not (Barash 1998a, 1998b). Participants were asked how much they would pay for a nine- or 18-count container if they purchased it in a well-known grocery store. For a nine-count container, 3% would pay up to \$10.00, with 27%, the highest percentage of participants, willing to pay \$2.99. For the 18-count container, 2.9% of the participants would pay \$15.00, with the greatest percentage of participants, 20%, willing to pay \$5.00. These results are consistent with those of Expt. I.

Participants were asked about their purchasing habits. We hypothesized that if they were likely to purchase prepared salad mixes, they might purchase other packaged items or

salad mixes with edible flowers as an ingredient. Edible flowers can add value to the product and increase the price that can be charged for the mix. Participants purchased an average of two salad mixes a month and were more likely to eat salad in the summer (91%), but were more likely to purchase separate salad ingredients (70%) than salad mixes (30%).

We asked the participants to answer questions about their gardening habits in a broad sense, including lawn care. They reported that they either did not garden (4.3%), or gardened between 1 and 9 (45%), 10 and 19 (30%), 20 and 45 (20.2%), or 54 h each week (0.5%). Of those who gardened, their gardening area averaged 16.3% vegetables, 51.6% lawn, and 40.7% flowers. Participants who are active gardeners and grow vegetables may be a marketing segment that could be targeted. If edible-flower consumers grow vegetables, they may grow edible flowers for consumption.

Pest management strategies may impact consumer preferences for edible flowers. The percentages of participants who were very likely to purchase edible flowers was 62% if they were grown pesticide-free, 52% as a garnish for a meal, and 47% to eat in a salad. Only 14% were likely to purchase edible flowers if they had 10% insect damage, and 75%

Table 1. Conjoint analysis of two groups of participants who viewed and rated either: 1.) flower color, color combination, container size, and price in 27 photographs or 2.) flower color, color combination, and container size in 14 photographs.

Factor	Relative importance ^z	Utility ^y
<i>Group 1</i>		
Price (\$U.S.)	23.89	
2.99		1.36*
4.98		0.52 ^{NS}
9.95		-1.87*
Size	12.77	
9-count container		-0.86*
18-count container		0.86*
Color	63.34	
Blue		-0.87*
Yellow		-3.12*
Orange		-2.75*
Blue and yellow		0.81 ^{NS}
Blue and orange		1.21
Yellow and orange		-0.73 ^{NS}
All three colors		5.45*
Pearson's R = 0.919	Significance < 0.00001	
<i>Group 2</i>		
Size	5.04	
9-count container		0.28 ^{NS}
18-count container		-0.28 ^{NS}
Color	94.96	
Blue		4.67*
Yellow		-4.17*
Orange		-4.70*
Blue and yellow		-0.33 ^{NS}
Blue and orange		1.51 ^{NS}
Yellow and orange		-2.95*
All three colors		5.98*
Pearson's R = 0.870	Significance < 0.00001	

^zA higher value indicates a greater importance.

^yA more positive value is more desirable.

^{ns},*Nonsignificant or significantly different from 0 at *P* ≤ 0.05, as based on a two-tailed *t* test.

were very unlikely to purchase such flowers.

Cluster analysis (SPSS Inc.) was used to determine whether meaningful customer segmentations, based on participants' answers to several questions, could be created. These groups could then be targeted by producers or retailers. Variables were used for clustering based on attitudes about edible flowers. By using K-Means, clusters of size 2, 3, and 4 were examined by using six cluster algorithms. After examination of each cluster size, the three-cluster solution was selected to develop the customer market segments. Because of nonresponse of several participants to several questions, only answers from 175 of the 224 participants could be used to create the segments.

Of the three segments that were created, the one labeled "Likely Buyer" comprised 61% of the sample (Table 2). The "Likely Buyer" had eaten edible flowers before, but had not purchased them before taking part in the survey. "Likely Buyers" were likely to purchase edible flowers for use as a garnish and were very likely to use edible flowers in a salad; 80% were very likely to purchase edible flowers because they were grown pesticide-free. They showed a significantly greater preference for pesticide-free products and were more willing to buy insect-damaged products than the other two segments.

"Likely Buyers" spent a mean number of 12 h in the garden each week, with 40% of their garden planted with flowers, 17% with vegetables, and 53% with lawn. This segment awarded the nine-count container of flowers with all three colors the highest mean number of points (18), which was significantly different from zero. When the demographics of the segments were analyzed, groups were similar with regard to education level, family size and status, income, and number of dependents. The group of "Likely Buyers" contained a greater percentage of males than did "Persuadable Garnishers."

The second segment, "Unlikely Consumer," contained 23% of the sample. They had eaten edible flowers before, yet had never purchased them. However, they were unlikely to purchase edible flowers for a garnish (93%) or a salad ingredient (73%). When compared with the combined responses of the other two segments, their response was significantly different for the question of purchasing edible flowers as a garnish.

"Unlikely Consumers" were people who were the least "very likely" to purchase edible flowers because they were grown pesticide-free (26%). This response was also significantly different from the combined responses of the other two segments. Only 3% of the respondents were very likely to purchase the flowers with 10% insect damage. This segment included individuals who would also pay the least amount of money for an 18-count container of edible flowers at a major grocery store chain. Other differences between the "Unlikely Consumer" segment and the other two were that they spent the least time gardening each week (8 h), allocated the least garden space to flowers (37%), and assigned the least

Table 2. Description of three consumer segments derived from cluster analysis based on participant's responses to variables, including attitudes about edible flowers and salad consumption

Variable	Consumer segment			Significance ^a
	Likely Buyers	Unlikely Consumer	Persuadable Garnisher	
n	106	40	29	
%	60	23	17	
Have eaten edible flowers before (1 = yes, 2 = no) %	1	1	2	1, 3*
	89	63	76	
Purchased edible flowers before (1 = yes, 2 = no) %	2	2	2	2, 3*
	75	95	93	
Intent to purchase edible flowers for a garnish for a meal				
Unlikely	5	93	0	2, 3*
Moderately likely	14	7	31	
Very likely	81	0	69	
Intent to purchase edible flowers for a salad ingredient				
Unlikely	0	93	73	4*
Moderately likely	19	7	27	
Very likely	81	0	0	
Very likely to purchase edible flowers because they were grown pesticide-free (%)	80	26	46	2, 3*
Very likely to purchase edible flowers with 10% insect damage (%)	20	3	3	2, 3*
Mean price (\$ U.S.) willing to pay for a container of edible flowers at a major grocery store chain				
9-count	3.09	3.50	4.20	NS
18-count	5.07	2.42	7.42	NS
Mean time spent gardening each week (h)	12	9	12	NS
Mean area percent of garden in:				
Flowers	40	37	38	NS
Vegetables	17	17	16	NS
Lawn	53	56	52	NS
Mean number of total points allocated to a 9-count container with:				
All three flower colors (blue, yellow, and orange)	18	10	11	3*
Yellow flowers	≤1	≤1	≤1	NS
Likely to (1 = yes, 2 = no) :				
Eat more salad during the summer months	1	1	1	NS
Buy prepackaged salad mixes	2	2	2	NS
Mean number of packages of salad mixes purchased in a month	2	2	3	NS
Age (mean)	48	51	42	NS
Gender (% female)	78	78	97	1*
Education (% college/tech. graduates)	68	54	61	NS
Family size (% with two people)	38	43	55	NS
Income (% with \$40,000–60,000)	22	22	25	NS
Status (% married)	63	70	75	NS
Dependents (% with dependents)	43	35	39	NS

NS, "Nonsignificant or significantly (*) different at $P = 0.05$ as based on a two-tailed t test and Kruskal-Wallis test. 1 = cluster 1 and 2 combined and tested against 3, 2 = 1 and 3 combined and tested against 2, 3 = 2 and 3 combined and tested against 1, 4 = all cluster comparisons significant.

amount of points to the nine-count container of edible flowers with all three colors (10).

The third segment, "Persuadable Garnishers," comprised 17% of the sample. The participants in this segment had never tasted edible flowers but would be very likely to use them as a garnish. Forty-six percent of the "Persuadable Garnishers" segment would be very likely to purchase edible flowers because they were grown pesticide-free and, as with the "Unlikely Consumers," only 3% would be very likely to purchase edible flowers with 10% insect damage. Participants in this segment were likely to pay the highest mean price for a nine- or 18-count container of edible flowers at a grocery store, (\$4.20 and \$7.42, respectively). This group had the highest percentage of females. "Persuadable Garnishers" purchased a mean number of three packages of salad mixes in a month vs. two for the other two segments.

Marketing Implications

Results of this study suggest there are several approaches that edible-flower producers must use to effectively market the product. Eating food involves more than simply oral senses, flavor, and texture; it also involves color, appearance, and stimulation of the visual senses (Little, 1980). We eat first with our eyes and then our mouths. Food must be visually appealing if consumers are expected to eat it. Consumers are likely to reject food based on appearance, even if the food is considered appealing and pleasing (Little, 1980). Food is selected on variables such as color and defects or the lack thereof (Little, 1980). This selection may be done consciously; however, color and similar characteristics are associated with every object that consumers see in their daily lives (Food Product Development, 1979). Choosing which color of edible pansies to sell

is not a trivial matter. If the wrong color is used, consumers may be less likely to purchase the product, and the package may remain on the shelf until the product is no longer marketable.

The same attention must be paid to color combinations in the package. The potential consumer's preference for a package that contains one vs. three colors of pansy must be determined. This preference may be based on the situation. Several participants stated that they would purchase a certain color or color combination of edible flowers to use as decoration on a cake, while they would use a completely different color or color combination in a salad. Results here suggest that a mix of flower colors is preferred over single colors, and some specific color contrasts preferred over others. The mix of blue, yellow, and orange pansies was much more highly valued than any other combination or single color. Research should emphasize what situation is more likely to occur or whether equal numbers of packages would be purchased in either situation. The greater the understanding of what potential edible-flower consumers want in their proposed packages, the greater the probability that packages will be purchased.

Defining the consumer segments with cluster analysis makes it possible to target those segments that are more likely to purchase edible flowers, and is an effective use of marketing dollars. When targeting potential consumers, limited resources, such as time and money, may be used on the consumers who fit this profile only. Coupons or special advertisements might be mailed or otherwise distributed to "Likely Buyers" who have not purchased edible flowers before, but are very likely to purchase the edible flower for use as a garnish or in a salad. The coupons and other inducements may persuade these potential consumers to purchase the item.

Similar marketing efforts can be used to increase the number of packages of edible flowers purchased by segments such as "Persuadable Garnishers." Though the participants in this segment have never eaten edible flowers, they are very likely to purchase edible flowers for use as a garnish and could be as valuable as customers as those in the "Likely Buyer" category. By purchasing the flowers

for a garnish, those in this segment might experiment with the edible flowers and begin to use them in food items, possibly becoming "Likely Buyers" more willing to purchase the flowers more often. Edible flowers can be packaged and promoted as a garnish, much as baking soda is used as a refrigerator deodorizer rather than in baking, its traditional use.

In order to convince the "Unlikely Consumer" to buy edible flowers, marketers may have to spend a great deal of time and energy, which may not be an effective strategy. Conversations with several gardening groups indicate that personal production of edible flowers may be more desirable than purchase of them. This segment may purchase edible flowers for applications other than use in salads and garnishes. Future marketing studies will be implemented to address such issues.

Growers should be aware of consumers' attitudes toward the use of pesticides on food items and the consumers' greater inclination to purchase edible flowers grown pesticide-free. Although this sample was drawn from what appeared to be a population interested in gardening and flowers, gardening is the hobby in which the largest percentage of Americans engage (Gallup Organization, Inc., 1999). Consumers' opinions and feelings about the use of pesticides coincide with current production trends, and edible-flower growers are aware that consumers prefer pesticide-free products (Whitman, 1991). Each year, more food products are grown using organic methods (DiMartino, 1999), and the demand for such items will continue to grow in other areas of production (DiMartino, 1999). Edible flowers must not be sprayed with chemicals (Kosztolnyik, 1996), since no pesticides are labeled for their production.

Literature Cited

- Barash, C.W. 1998a. The flavors of flowers. *Herb Companion* 10(4):32-37.
- Barash, C.W. 1998b. Please eat the flowers. *Horticulture* 95(5):36-40.
- Behe, B., R. Nelson, S. Barton, C. Hall, C.D. Safley, and S. Turner. 1999. Consumer preferences for geranium flower, color, leaf variegation, and price. *HortScience* 34:740-742.
- Bunn, D., G.W. Feenstra, L. Lynch, and R. Sommer. 1990. Consumer acceptance of cosmetically imperfect produce. *J. Consumer Affairs* 24(2):268-279.
- Daniel, T.C. and R.S. Boster. 1976. Measuring landscape esthetics: The scenic beauty estimation method. U.S. Dept. Agr. For. Serv. Res. Paper RM-167.
- DiMartino, C. 1999. Organics growing in foodservice. *Produce Business* 15(3):41-42.
- Food Product Development. 1979. Market research system keys on product "personality." *Food Prod. Dev.* 13(4):54-55.
- Gallup Organization, Inc. 1999. National gardening survey 1998-1999. Natl. Gardening Assoc., Burlington, Vt.
- Gineo, W.M. 1990. A conjoint/logit analysis of nursery stock purchases. *Northeastern J. Agr. Resource Econ.* 19:49-58.
- Hardy, J., B.K. Behe, T.J. Page, Jr., and R. Schutzki. 2000. Consumer segmentation based on perceived plant knowledge and gardening involvement. Southern Nurserymen's Assoc. Res. Conf. Proc. 44:529-532.
- Kosztolnyik, L. 1996. Selling edible flowers. *Natural Food Merchandiser* 17(7):74.
- Little, A.C. 1980. The eyes have it. *J. Amer. Dietetic Assoc.* 77(6):688-691.
- Mason, J.B. and M.L. Mayer. 1984. Modern retailing: Theory and practice. Business Publ. Plano, Texas.
- Moore, C. 1998. Sales can rise with education. *Packer* 106(25):6D-7D.
- Price, T.L., J.L. Robertson, and L.H. Chatfield. 1980. Factors affecting the marketability of roses. *J. Amer. Soc. Hort. Sci.* 105:388-393.
- Robertson, J.L. and L.H. Chatfield. 1982. Fresh flower merchandising in loose bunches. *HortScience* 17:593-595.
- Rusnak, J. 1999. Overcoming organic supply issues. *Produce Business* 15(6):60, 63-64.
- Shafer, B.S. and J.W. Kelley. 1986. The influence of cultivar, price, and longevity on consumer preferences for potted chrysanthemums. *HortScience* 21:1412-1413.
- Shafer, E.L., Jr. and T.A. Richards. 1974. A comparison of viewer reactions to outdoor scenes and photographs of those scenes. U.S. Dept. of Agr. For. Serv. Res. Paper NE-302.
- SPSS Inc. 1998. SPSS Base 8.0 for Windows user's guide. Chicago.
- Townsley-Brascamp, W., N.E. Marr, E. Matsuo, and P.D. Relf. 1995. Evaluation and analysis of consumer preferences for outdoor ornamental plants. *Acta Hort.* 391:199-206.
- Whitman, A.T. 1991. Edible flowers and culinary herbs: New uses for traditional crops, new crops for traditional growers. *GrowerTalks* 54(13):22-23, 25, 27, 31, 33.
- Waldrop, J. 1992. All-American markets. *Amer. Demographics* 14(1):24-30.