Paying the price: a comparison of pricing in a capital and regional city

Dr Phil Bretherton (corresponding author)
Assoc Dean, Research
Faculty of Business and Law
Central Queensland University
Rockhampton
Queensland 4702
Australia
Tel: 61 4723 2707
Fax: 61 4723 2641
Email: p.bretherton@cqu.edu.au

Assoc Professor John Rolfe
School of Management
Faculty of Business and Law
Central Queensland University

Professor Paul Hyland
School of Management
Faculty of Business and Law
Central Queensland University

Stream Z, A

Paying the price: a comparison of pricing in a capital and regional city

Abstract

There is an increasing divide between capital cities and region centres throughout Australia. None the less the major retailers are attempting to set a national price for grocery lines claiming it makes product management easier. This paper examines a study for a major fresh fruit and vegetable supplier that set a price point for a range of fresh cut and packaged fruit. The study shows that the market perceived the value of the product differently in a regional centre compared to a capital city. In maximising their returns for new products and reducing wastage in fresh food products this study has important implications for managing a new product launch.

Keywords: pricing strategy, new product launch, fresh food industry

Introduction

The fresh food industry is under pressure to meet the continuously changing demands of consumers as well as developing and packaging products that have unique characteristics which have the ability to increase their company's market share. This problem is further exacerbated in Australia which is dominated by two large retailers, where food suppliers have to satisfy these chain stores and convince their management that the new products are worthy of shelf space, are appropriately priced and meet the needs of consumers. Consumers are expecting more fresh convenience foods and consequently food producers cannot stand still, they must seize the opportunities available to improve their position and profitability. Kotler and Armstrong (1991) argue producers and suppliers need to be proactive because the rapidly changing and dynamic market means they can not rely on a suite of existing products; more demanding customers want and expect new and improved products. These improvements may have improved taste or texture or improved accessibility and convenience, but to hold the consumers' attention long enough for them to consider purchasing a product it must be packaged and presented in a way that captures the consumers' interest. However, wanting to meet the consumer's needs and doing so are not easily achieved. If new products fail to make sufficient inroads into the market and return a profit they are soon off the self and withdrawn from the marketplace. This paper reports on the launch of a family of products by an Australian firm and the efforts made to implement a new approach to pricing.

The case

The Harvest Company is a produce supply manager, in the fresh fruit and vegetable category, aiming to take on products which offer a significant point of difference in the market place in terms of eating quality, thereby adding value. The company specifically focuses on products for which it can control and influence the length of the supply chain. This has been achieved by acquiring rights to superior eating quality genotypes, such as Bethonga Gold pineapple, and using non-invasive infra-red sensing technology that allows the identification of ripe, sweet fruit. and separation of superior eating quality items. The major lines carried by the company are seedless watermelon, pocket watermelon, "Guaranteed Sweet" melons, "Guaranteed Sweet" stone fruit, Bethonga Gold pineapple and B74 mango. These products are primarily marketed through Woolworth's, a leading supermarket in Australia. In 2004 it is planned that the products will be sold under the Woolworth's brand 'Naturally Sweet'.

A sister company, Harvest Fresh Cuts, produces fresh cut salad packs, sales of which have increased dramatically in recent years, indicative of a change in consumer attitudes. It is now intended to introduce a line of fresh cut, premium, and sweet fruit. In order to develop a marketing strategy, key consumer demands for the products and pricing issues need to be addressed. In this study, the analysis of a marketing survey which investigates these issues, carried out in regional centre and a capital city in December 2003 and January 2004 is outlined.

The New Product Development Process

Kotler and Armstrong (1991) put forward a new product development process with eight steps and acknowledge that in

manufactured and elaborately transformed products such as pharmaceuticals the process has been implemented in an orderly sequence, starting with idea generation and ending in the commercialisation of a product. While this is the traditional approach it is seen as slow and in the fresh food sector once you have grown the product there is strong inputs to cut the process short and launch the product rather than test market it and determine the price. Given the dynamic nature of the consumer food market suppliers are keen to take a more flexible approach that will enable them to get their new product to market in the shortest possible time. For this reason many suppliers have taken a concurrent approach where they overlap stages rather than adopt a strictly linear approach. In the study reported here the firm, both by design and chance, took a concurrent approach to new product launch, where they test marketed and collected pricing data before the product was ready to be launched. Rudder, Ainsworth and Holgate (2001) argue that other factors need to be considered which embrace the product's likely price, initial marketing budget and factors affecting distribution. While these factors are regarded as fairly short term, Kotler and Armstrong (1991) maintain that most long-term factors should be included as part of any marketing strategy statement and can best be described as "planned long-run sales, profit goals, and marketing mix strategy".

This study is concerned with Kotler and Armstrong's (1991) third fourth and fifth stages. Their third stage, concept developing and testing involves developing a concept and defining parameters for a product. In the products considered here the firm had conducted some sort of testing of the concept and were finalising details to meet health and food safety regulations. At this stage suppliers usually ask potential consumers whether they would purchase the product and how they feel about the product attributes such as texture and taste. In the past the firm had used focus groups but were seeking a different approach that would give them harder data on a price point and the demographics of key consumers. Any feedback gained at this stage would be assessed. The marketing strategy development stage provides for a detailed strategy to be developed and addresses such points as the target market, the planned product positioning, the pricing strategy and how the product will be rolled out.

The fourth stage revolves around undertaking some form of business analysis, looking at factors such as sales, costs, and profit projections, in order to ascertain whether the company's objectives are being met. The company had conducted detailed market analysis based on scan records of their major customer, Australia's largest supermarket chain. This gave them an indication of demand for the fresh fruit product in its natural state, the company had also been involved in the supply, processing and packaging of salad vegetables and, based on the growth in this product family, were aware that there was an increasing demand for conveniently package fresh food. The next stage, test marketing, usually occurs after products have passed through the previous stages. Kotler and Armstrong (1991) maintain that it is most suitable for testing a new product in that it launches a product into a small trial market area in order to gain some insight into what the outcome would be if the product was launched nationally or globally. This is particularly important when introducing a new product that requires a large investment or when the firm is unsure about the product and can not afford a costly mistake. Many companies do little or no market testing, particularly when they are introducing products that are minor modifications to existing products or are products that have been launched successfully by other firms in other markets. Commercialisation is seen as the stage at which the new product is launched and a commitment to supply, marketing and promotion occurs.

Schilling and Hill (1998) argue that to optimise the new product development process requires addressing four strategic issues (see Figure 1) technology strategy, or the process by which the company constructs its new product development portfolio; the organizational context within which a NPD project is embedded; the construction and use of teams, and the use of tools for improving the NPD process. In this study we have used statistical analysis tools developed for pricing commodities to determine the price point for fresh fruit products at market launch. In line with Schilling and Hill's (1998) strategic approach it is important to follow a process but seek new tools to improve the efficacy of that process.

According to Bergstein and Estelami (2002) new products have become critical in maintaining revenue levels and market share in increasingly competitive markets. The dynamics of the market and consumers changeability are providing competitive pressure, forcing product managers to aggressively pursue, develop, and launch new products in record times. The race to reduce product launch times is apparent in the significantly shortened product development time of innovative organizations such as 3M, Apple, and Microsoft, with product development cycles measured in months rather than in years At the same time it is estimated that, of the approximately 16,000 new products introduced each year, less than one in ten are successful (Ayers et al., 1997). Increasingly suppliers are seeking to find ways to reduce the risk of product failure and to reduce the costs associated with product development and product launch whilst at the same time there are pressures to increase margins and returns by setting a high price point on launch.

One of the fundamental decisions which helps determine the success of a new-to-the-world product is the correct pricing of the product on market introduction. An array of information sources is being developed that provide brand managers with the ability quickly to gauge the potential for new product success. These tools enable the test marketing of new product prices, segment-based pricing, and instantaneous competitive price benchmarking, at a fraction of the time and cost associated with these activities in conventional practice (Aaker et al., 2001). The emerging technologies are also enabling consumers to visualize better and experience new products prior to their introduction and electronic delivery has made it possible for products to be created, modified, and delivered in record times.

The concept of a new product has a variety of manifestations. Many products are not entirely new, rather they are considered new, because the firm has had no prior experience of producing and supplying them. This is often the case in Australia where products that are tried and tested in European or North American markets are introduced. It is also becoming the case for many products, particularly food products, from Asia that are introduced by the new wave of Asian migrants. Other new products are minor modifications or improvements to existing product designs, which do not necessarily represent radical advances in the product itself while others are modifications to suit the regulatory requirements of the local food authorities. Given the size, scale and dispersion of the Australian marketplace products have to be shipped long distances, in relatively small quantities, to highly dispersed and small markets. This dispersion and irregular supply means that fresh food products need to have an extended shelf-life and this requires innovation in packaging, that produces what are regarded as new products. . Bergstein and Estelami (2002) argue that the biggest challenge facing developers launching such new products is the determination of the launch price as the price of the product largely depends on the incremental utility provided by the unique attributes of the product over any comparable existing products.

There are several methods that have been conventionally used to set product price points. Clearly intuition has often played a major role in new product pricing but often does not accurately represent the product's true price potential. A more systematic methodology relying on formal processes of market inquiry is needed to more accurately predict price points. Existing approaches use either or both qualitative and quantitative forms of data collection and analysis. According to Bergstein and Estelami (2002) three general approaches have been heavily used in this area: direct questioning, conjoint analysis and market experimentation. Direct questioning involves communicating with the consumer to directly elicit the level of value the consumer places on the new product. Since eliciting prices directly, as in the direct questioning approach, is likely to increase response biases, an alternative approach, that does not require soliciting prices, is to provide product information, including price, and to ask consumers, instead, for their preferences through conjoint analysis (Green and Wind, 1975). According to Bergstein and Estelami (2002) a limitation of both the direct questioning and the conjoint analysis approaches is that the link between consumers' self-reported responses and their actual purchase behaviour has been found to be weak. As a result, price response estimates obtained from these two approaches may have limited external validity. A practical solution, based on the market experimentation approach, is to take the data collection approach one step further by actually experimenting with various price points in the marketplace.

Methodology

The survey was conducted in-stores close to the fruit and vegetable displays using a structured questionnaire completed by the researchers. Shoppers who came into that area were asked if they would participate in the survey. The surveys involved a taste test, feedback on the product, questions on appearance and pricing options, and collection of socio-economic data. The three products that were taste tested were sweet seedless watermelon, sweet rockmelon and sweet pineapple. The sample size of the survey is small, but allows relationships to be generally drawn for the Brisbane region. The sample size for each location is too small to allow specific relationships to be estimated for each store location.

Results

Statistical analysis (cross tabulation and chi-square) indicates that significant differences do exist between shopper characteristics and purchasing patterns across the different locations. Significant differences were found for gender, household type, location and purchase frequency.

Figures in parentheses are the ones from the survey in regional centre for comparison purposes, 124 (173) people were interviewed, with the average person was being 35-44 (45-54) years old.

Figure 2: Age of Survey respondents

95% (93%) were satisfied with the fruit they tasted, 63% (64%) preferred the bite size pieces, 20% (36%) the chunky pieces, 21% were prepared to pay a price of Aus $2.50, 31% Aus $2.95, 21% of Aus $3.50, and 20% a price of Aus $3.95 for a 300g pack, 63% (57%) were and 34% (43%) were not interested in buying a 300g pack in the future, the fruit most often tasted was the sweet pineapple (44%), followed by the sweet rockmelon (28%)

The following figure shows the percentage of people willing to pay a specific price

Figure 3: Price for 300g pack, in Aus $'s

The following table shows how many people would by the different fruit packages:

Table 1: Future purchase of 300g packs

	Sweet Seedless Watermelon	Sweet Rockmelon	Sweet Pineapple	Sweet Melon Medley	Sweet Fruit Salad
yes	33% (47%)	42% (48%)	48% (40%)	27% (33.5%)	36% (33%)
no	67% (53%)	58% (52%)	52% (60%)	73% (66.5%)	64% (67%)

Relationships to Price Offered

A number of potential relationships with the prices offered by respondents were tested. The pricing information could be coded as both a categorical variable (category for each price offered) and a continuous variable (actual price offered), which allowed a wider range of statistical techniques to be applied.

Correlations

The first relationships to be tested were correlations between the price offered and other variables (with price coded as a categorical variable). Several significant relationships were found: males were more likely to pay higher prices than females (Chi-square = 18.68 with 5 d.of.f); people who shopped several times a week (as against weekly) were more likely to pay higher prices (Chi-square = 12.92 with 5 d.of.f); people who preferred the bite size pieces over the chunky pieces were more likely to pay higher prices (Chi-square = 30.77 with 10 d.of.f); people who were interested in the pack were more likely to pay higher prices (Chi-square = 29.18 with 10 d.of.f); people who were interested in purchasing sweet seedless watermelon were more interested in paying higher prices (Chi-square = 10.48 with 5 d.of.f); location of the store is significant, but sample size is not large enough to identify specific differences between stores. One relationship was not significant at the 10% level, but was significant at the 12% level, people from shared accommodation households and family households were more likely to pay higher prices (Chi-square = 22.2 with 15 d.of.f).

Of interest was the fact that some expected relationships did not emerge. For example, no significant relationships could be found between weekly expenditure on grocery shopping and interest in paying higher prices for fresh-cut fruits and weekly expenditure on fruit and vegetables and interest in paying higher prices for fresh-cut fruits.

Standard regressions

When price was coded as a continuous variable (actual prices), it allowed regression relationships to be tested. In these tests, a number of the other variables were regressed against the prices people nominated to determine which ones were significant explanators.

A simple regression identified several variables in the capital city dataset that were significant explanators of price. The regression equation that was identified is as follows (with standard errors in brackets):

Price nominated = 3.056 Constant (.431) – 0.126 Fruit sampled (0.075) + 0.369 Interest in pack (0.126) + 0.213 Future purchase of sweet seedless watermelon (0.130) – 0.361 Gender (0.173) + 0.340 Purchase frequency (0.123).

The relationship indicates that people who are prepared to pay higher prices are those sampling the sweet seedless watermelon, rockmelon or pineapple; those interested in buying a pack; those interested in sweet seedless watermelon; males; and people who shop more frequently. For example, a female shopper who tasted the watermelon, was interested in a pack, was interested in purchasing watermelon and who shopped several times a week would be prepared to pay Aus \$3.81 per pack. If there is no taste test, and nothing is known about the preferences for a pack or the fruit type, the female shopper who shopped several times a week would be prepared to pay Aus \$3.35 per pack. In contrast, females who shop weekly would be prepared to pay Aus \$3.01 per pack, and males who shop weekly would be prepared to pay Aus \$3.38 per pack.

While the regression equation is significant, the overall model fit, as represented by the r-square statistic, is very poor. The r-square statistic of 0.23 means that the model explains only 23% of the variation in prices between survey respondents.

Similarly for the regional city dataset a simple regression identified only two variables that were significant explanators of price, these being "Interest in the pack" and "Gender". The significance of the "Gender" variable indicates that women are more likely than men to pay higher prices for the packs. For example, the regression equation predicts that women who nominated an interest in purchasing a pack would be prepared to pay an average price of Aus \$2.75, while men who did not express an interest would be prepared to pay an average price of Aus \$1.82 per pack. While the regression equation is significant, the overall model fit, as represented by the r-square statistic, is very poor. The r-square statistic of .205 means that the model explains only 21% of the variation in prices between survey respondents.

Tobit regression function

To address the problems of the standard regression models, more specialised regression functions were performed. These were Tobit functions, which allow the price function to be censored at both minimum and maximum levels. Essentially this means that the regression function is only estimated for the relevant price range. A relevant Tobit mode for the capital city is shown in figure 3, where price has been regressed against the proportion of respondents supporting each price level between a censored price range of Aus \$0.00 to Aus \$7.95 per pack. (Standard errors are shown in brackets).

Price = 2.261 (0.029) + 0.0200 * Respondents (0.0005).

The model was significant, with a log-likelihood value of -49.06 and an adjusted r-square value of .92657. The median bid level that was estimated from the model was Aus \$3.26 per pack. The proportion of respondent support at each price level is shown in the figure below. For example, the model indicates that 25% of customers will pay Aus \$3.78 per pack, and 75% will pay Aus \$2.78 per pack.

A Tobit model was also used to calculate the regional city price, where price has been regressed against the proportion of respondents supporting each price level between a censored price range of Aus \$0.00 to Aus \$7.95 per pack. (Standard errors are shown in brackets).

Price = 1.23 (.663) + 0.0232 * Respondents (0.00114)

The model was highly significant, with a log-likelihood value of -109.9. The median bid level that was estimated from the model was Aus \$2.39 per pack. The proportion of respondent support at each price level is shown in the figure below. For example, the model indicates that 25% of customers will pay Aus \$2.99 per pack, and 75% will pay Aus \$1.83 per pack.

Clearly capital city consumers will pay significantly more Aus \$3.78 compared to regional city consumers Aus \$2.99 and the target group in each case is 25% of the population

Other tobit regression models were also tested, as shown below.

$Price^2$ = 5.3685 (.213) + 0.1016 * Respondents (.013)   (Adjusted r-square = 0.89544)

LN Price = .860 (.008) + .0061*Respondents (.0001) (Adjusted r-square = .93912).

While the logarithmic model generated the highest model fit, there was very little difference in the prices predicted between the three models estimated (Figure 1). The results show that most customers are prepared to pay slightly more than Aus \$2 per pack for the product, but that demand falls to zero at around a price level of Aus \$4 per pack.

Figure 4: Tobit model for support at different price levels, all in Aus \$'s.

These models have been generated from the prices that respondents to the survey indicated that they would be prepared to pay for the product. However, many respondents indicated in another question to the survey that they would not be prepared to purchase the packs, preferring to cut up the fruit themselves. It is notable in the model that respondents who tasted the watermelon, and who have higher levels of expenditure on fruit and vegetables, were more inclined to indicate higher prices for the future purchase of the sweet fruit packs. However, the adjusted R-square statistic of .330 indicates that the model is explaining 33% of the data variation, and that overall model fit is not very strong.

Both the price-square and exponential model functions were tested, with the former generating an adjusted R-square value of .483, and the latter an R-square value of .299. The results of the three models are depicted in Figure 4. The price-square model indicates that there may be strong support for the product at higher prices, while the exponential model suggests that support at higher prices may be weaker.

The following table summarizes the interrelations and their significance found above:

Table 2: Summary of interrelationships

Variables	Interrelationship	Signif.Capital	Signif.Region
interview location & age	--	no	yes
household size and grocery expenses	people living with their family are spending more money	yes	no
household size and fruit and vegetable expenses	people living with their family are spending more money	yes	yes
fruit tasted and product comments	--	No	weak
piece size and age	--	No	no
Grocery/fruit and vegetable expenses and interest in a 300g pack	--	No	no
expenses for grocery/fruits and vegetables and price	--	No	no
location and price	shoppers at WW Garden City, WW Bullimba and WW Capalaba are more reluctant to pay a higher price, while shoppers at WW Parker Ridge and WW Paddington are most likely to pay higher prices	yes	no
gender and interest in buying a 300g pack	--	No	no
gender and price	male shoppers are generally prepared to pay more	yes	no
shopping frequency and interest in a 300g pack	--	no	no
shopping frequency and price	trend that weekly shoppers are less prepared to pay higher prices	yes	no
satisfaction with the fruit and interest in 300g pack	consumers who were satisfied with the fruit are more likely to purchase a 300g pack	no	no

satisfaction with the fruit and price	--	no	no
piece size and interest in a 300g pack	people who prefer the bite size pieces of the fruits are more likely to purchase a 300g pack	no	no
piece size and price	people who prefer the bite size pieces want to pay less	yes	no
household size and interest in a 300g pack	--	no	very weak
household size and price	Trend that people living with partners are more reluctant to pay higher prices	no	no
age and interest in a 300g pack	younger people up to 44 years are more likely to be interested in the 300g pack	very weak	no
age and price	the age group of 35-44 is more prepared to pay higher prices	no	no
interest in a 300g pack and price	people who are interested in buying a 300g pack are prepared to pay higher prices.	yes	no
Fruit tasted and interest	people who tasted the sweet watermelon are less interested, while those who tasted the sweet pineapple are most likely to be interested in the ready cut fruit pack.	weak	no
Fruit tasted and price	--	no	yes

Conclusions and managerial implications

At the strategic marketing level clear conclusions can be drawn about the key demographic, the price and the main product offering. Price should be set in the range Aus $2.50 to Aus $2.95 in the regional centre and between Aus $3.25 and Aus $3.95 in the capital city in order to maximise both volume sales and profitability. Below this range profit is not being maximised and above it demand falls rapidly. The critical two products, at least initially are sweet seedless watermelon and sweet rockmelon, interest in the other fruits is apparent but not at the same level. The key purchasers will be women under 34, living with their families and spending above average on groceries. This knowledge should considerably facilitate developing an appropriate marketing plan for the product, particularly with reference to the critical decision of launch price.

The next conclusion is that using rigorous statistical techniques and methods of analysis is worthwhile as they are capable of delivering better information to the marketing manager. This reduces the risk of product failure at the critical early launch stage and helps to achieve both optimal volume and contribution. The concurrent approach discussed in the literature has been used in this case with actual launch occurring in some stores whilst this research was being carried out. Actually sales

data will be analysed next to help in planning the marketing mix before the next phase of the roll-out occurs. Finally, this study indicates that using all three approaches suggested by Bergstein and Estelami (2002) can lead to the gleaning of critical information for the development of marketing strategy and can be done expediently so that launch times are not extended.

Furthermore this study demonstrates that using consumer surveys it possible to identify the demographics of consumers most interested in purchasing a product and to set differential price points for different demographics and locations. It is also possible using relatively simple statistical tests to describe the significant differences within the sample. Further using regression analysis a price point can be set that maximises the price that a group of consumers are prepared to pay. By establishing a price point before market launch much of the trial and error associated with price setting is removed from the launch process. If the price point for perishables such as fresh fruit and vegetables is struck accurately then producers and retailers will minimise the waste of unsold or under-priced products and maximise their return on the products. Market research is more than simply asking the consumer what they want and what they will pay for it. Market research involves appropriate analysis of data that provides the producers and the consumers with the best data.

References

Aaker D, Day G and Kumar, V 2001, *Marketing Research*, 7th Edn, John Wiley & Sons, New York, NY.

Ayers D, Dahlstrom R and Skinner, S J, 1997, An exploratory investigation of organizational antecedents to new product success, *Journal of Marketing Research*, vol. 34 no. 4, pp. 107-16.

Bergstein H and Estelami H 2002, A survey of emerging technologies for pricing new-to-world products*, The Journal of Product and Brand Management*, Vol. 11 No. 4/5, pp. 303-318.

Kotler P and Armstrong G 1991*, Principles of Marketing,* 5th Edn, Prentice-Hall, Englewood Cliffs, NJ.

Rudder A, Aimsworth P and Holgate D 2001, New Food Product Development: Strategies For Success, *British Food Journal,* Vol. 103 No. 9, pp. 657-670.

Schilling M and Hill C 1998, Managing the new product development process: Strategic imperatives*, The Academy of Management Executive*, Vol. 12 No. 3, pp. 67-82.