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Abstract:

In this paper we estimate the price premium associated with organic baby food by applying a hedonic model to price and characteristic data for baby food products collected in two cities: Raleigh/Durham, North Carolina and San Jose, California. We use price per jar of baby food as the dependent variable and control for a number of baby food characteristics (e.g., brand, type, and stage) as well as store characteristics (e.g. type of retail establishment). We find the price premium associated with the organic characteristic to be approximately 12 cents per jar. To the extent this premium reflects parents' preferences regarding the reduction of their baby's exposure to pesticide residues, our results could be paired up with risk data to estimate the value of the health benefits associated with reduced exposure.

Subject Area Classifications:
63 Children's Health
62 Valuation
9 Toxic Substances

Keywords:
Organic Foods, Hedonic Model, Willingness to pay, Children

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I. INTRODUCTION

The use of agricultural pesticides is beneficial to the quantity and quality of agricultural commodities produced by reducing damage from pests. However, because of their inherent toxicity, most pesticides create some risk to humans, animals, or the environment. Exposure to pesticides has been linked to numerous health problems such as birth defects, lymphoma, reproductive tract cancer, Hodgkins' disease, leukemia, brain cancer and infertility (Blair et al., 1985; Colborn et al., 1993; Blair et al., 1997; Zahm and Ward, 1998). Individuals may turn to organic foods as a way to avoid these residues. Recently, the baby food market has expanded to include more organic varieties, suggesting that individuals are in fact consuming more of these products. We measure the value of avoiding pesticide residues by using hedonic methods to measure the premium consumers pay for baby food that is designated as organic.

While exposure to pesticides comes from a variety of sources, diet is one of the most important sources of exposure and is perhaps the source of greatest concern for the general public.[2] The Environmental Protection Agency (EPA) regulates approximately 600 pesticides by setting tolerances, or legal limits for allowable pesticide residues on foods. The Food Quality Protection Act requires EPA to consider the susceptibility of

[2] Other exposure pathways include hand to mouth contact with exposed flora and fauna and consumption of contaminated groundwater.

children to exposure and/or to adverse health effects when setting limits. While limits are set under a "reasonable certainty of no harm" standard to minimize risks, residues below the tolerance levels often remain on the harvested crops.[3] In fact, Kuchler, et al. (1996, 1997) report pesticide residue detection rates between 40% to 60% for a variety of fruits and vegetables commonly consumed in the average U.S. diet.[4]

Infants and children may be particularly at risk from pesticide exposure because they are growing and developing. As such, their body composition, metabolism and physiological and biochemical processes differ from those of adults, resulting in greater vulnerabilities to the toxic effects of pesticides (National Research Council, 1993; Zahm and Ward, 1998). Additionally, children's diets are much more specialized than are those of adults. Per unit of body weight, children consume more food and water than do adults. For example, the average 1-year old consumes approximately eight times as many apples and four times as many peaches as the average adult (Kuchler et al., 1996, 1997).

Perhaps in part because of concern regarding exposure to pesticide residues in recent years, the general public has expressed a desire for safer foods (Huang, et al., 1990; Weaver, et al., 1992). Organic foods are generally seen as being pesticide free and therefore safer than conventionally grown foods. New USDA guidelines go into effect October 2002, requiring producers and handlers to be certified by a USDA-accredited agent to sell, label, or represent their products as "100 percent organic," "organic," or "made with organic (specified ingredients or food groups)" (USDA, 2002). Even though the new guidelines are not yet binding, a wide and growing variety of organic foods, both

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[3] Food Quality Protection Act of 1996 (FQPA; Public Law 104-170)

[4] Only 1% of the samples were above legal limits. Prior to testing, foods were handled as consumers would. Produce was washed, peeled and cored as appropriate before measuring pesticide residues.

processed and fresh, are available. Baby food is one notable recent addition to the organic market.

As the food marketplace changes, it is interesting to examine how consumers value these changes, particularly in light of new regulatory guidelines. Several studies have investigated the willingness to pay for organic produce (Hammitt, 1990; Estes and Smith, 1996; Fu, 1999), other food characteristics, such as nutrition (Stanley, et al., 1991), and organic products (Nimon and Beghin, 1999). In general, results show that individuals are willing to pay more for organic products or more healthful products, though the heterogeneity in products makes it infeasible to generalize to other markets. Little work has been conducted, however, analyzing baby food specifically. Claims have been made that consumers are willing to pay a premium for organic baby food; but, the supporting analysis to date has been limited (Harris, 1997). This paper attempts to fill this gap. We estimate the price premium associated with organic versus conventional baby food, controlling for other baby food characteristics (e.g., brand) as well as store characteristics (e.g. type of retail establishment). To the extent this premium reflects parents' preferences regarding the reduction of their baby's exposure to pesticide residues, our results could be used to estimate the value of the health benefits associated with reduced exposure. We rely upon a hedonic framework and data collected in the Raleigh/Durham, North Carolina and San Jose, California areas to estimate this premium.

The remainder of the paper is organized as follows: Section II provides the history of the organic baby food market as well as pertinent details regarding the packaging of baby food products. Section III describes the methodology employed in this paper while section IV focuses on the data used in the analysis and summary statistics. Results of our hedonic analysis are presented in section V and section VI concludes.

II. The structure of the Baby Food market

Most parents purchase jarred baby food for their child as a convenient method for introducing solid, table food, although some parents opt for making their own baby food using food grinders or mashers or using frozen varieties. Jarred baby food is offered by "stage" which is directly related to the developmental stage or age of the baby. Generally, there are three stages within each brand. Stage 1 baby food consists of simple, single flavor foods, such as peas or peaches that serve as a baby's first introduction to "solid" food. Stages 2 and 3 often combine flavors (e.g., blueberries and pears) and offer increasingly complex flavors by combining food groups (e.g., beef and pasta). As stage increases, so does the texture of the food, with stage 3 providing chunkier foods for children with teeth.

Within stage, baby foods can be categorized according to seven types: cereal, fruit, vegetable, fruit-vegetable combination, meat, dinner, dessert. Not all types are offered in each stage. The meat category consists of jars with single ingredients (e.g., beef), whereas the dinner category consists of more traditional dinner-like flavors (e.g., beef noodle dinner). The other categories are self-explanatory. There are a variety of flavors available within each stage and type. For example, common stage 2 fruits include, pears, plums with apples, and apple-blueberry.

In the United States, there are five major brands of baby food available at retail outlets: Beechnut, Gerber, Earth's Best, Heinz, and Organic Baby. Beechnut and Heinz offer conventional baby food only, Earth's Best and Organic Baby are exclusively organic baby foods, while Gerber offers both conventional and organic varieties. In 2000, Gerber had a 70 percent market share, Beechnut a 13 percent market share, and Heinz an 11 percent market share of the total baby food market (US Business Reporter, 2001) .[5]

Introduced in 1988 in Vermont, for many years Earth's Best was the only nationally available organic baby food and initially was only available in health food stores. By 1996, Earth's Best was sold in approximately 45 percent of supermarkets in the United States (Harris, 1997). In the late 1990's, Gerber introduced Tender Harvest, an organic line of baby food. While initially available only in stage 2 varieties, Tender Harvest is now available for all three stages of a baby's development.

Ready-to-eat jarred baby food is sold in major grocery stores in the U.S., as well as smaller convenience stores, drug stores, and other specialty markets. Both organic and conventional baby foods are sold in most of the larger venues.

III. Methodology/Hedonic Model

In order to estimate the value, or willingness to pay for a reduction in exposure to pesticides from organic baby food, we rely on the hedonic framework. This framework has been applied to a vast number of scenarios to assess the implicit price associated with specific characteristics of differentiable market goods. For instance, hedonic models of the labor market have been extensively employed to examine price premiums associated

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[5] This includes all baby food products, including cereals and juices, and therefore does not represent the market shares for jarred foods exclusively. It is likely that the market shares for jarred foods differ slightly since the smaller baby food manufacturers offer less in the way of non-jarred choices.

with safer occupations (e.g. Thaler and Rosen, 1976 -- one of the first studies of this nature). Hedonic models of both housing markets and labor markets have yielded premiums associated with better air quality (Palmquist 1984; Portney 1981; Bayless 1982), while models of automobile markets have resulted in implicit values of improved quality and safety (Griliches 1988). Hedonic models have also been applied to agricultural products to assess implicit prices associated with eco-labels in the apparel industry (Nimon and Beghin 1999) and various food product characteristics (Price et al. 1990; Estes 1986; Estes and Smith 1996). To our knowledge, this study is the first to examine the implicit price of the organic component of jarred baby foods using a hedonic model.

The hedonic price function shows the relationship between the price of a good and its component characteristics. The partial derivative of the hedonic price function with respect to a component gives the implicit price associated with that characteristic, the premium or value of interest. A formal derivation of the hedonic price function can be found in Freeman (1993, 1995). Briefly, this function is generated through the intersection of demand and supply equilibrium points.

On the demand side of the market, consumers maximize utility, u, subject to a budget constraint, where utility is a function of a composite good, x, and a differentiated good of interest, y, which is composed of components, q_j. The maximization problem yields first order conditions, as follows:

$$\frac{\partial u / \partial q_j}{\partial u / \partial x} = \frac{\partial p_y}{\partial q_j} \qquad (1)$$

where p_y is the price of good *y*. Equation 1 shows that utility is maximized when the marginal rate of substitution between q_j and the composite good (left side of equation 1) is equal to the marginal price of q_j (right side of equation 1). That is, individuals will consume a component characteristic (as revealed through their purchase of good *y*) up to the point where the relative value of that characteristic is equal to its marginal price.

On the supply side of the market, producers maximize their profits, π, such that the marginal cost of producing a characteristic, q_i, is equivalent to the price of that characteristic, as follows:

$$\frac{\partial p_y}{\partial q_j} = \frac{C_{qj}}{y} \tag{2}$$

where C_{qj} is the marginal cost of producing q_j. Equation 2 states that the profit maximizing level of production occurs where the per-unit marginal cost of producing q_j (right side of 2) is equal to the marginal price of that component (left side of 2). We can now see from equations 1 and 2 that equilibrium occurs when the value or willingness to pay for a characteristic is equal to the marginal cost of that same characteristic, as follows:

$$\frac{C_{qj}}{y} = \frac{\partial u / \partial q_j}{\partial u / \partial x} \tag{3}$$

The hedonic price function for good *y*, differentiable in its *j* characteristics, is given by

$$p_y = h(q_{1y}, q_{2y}, \ldots, q_{jy}). \tag{4}$$

Based on the exposition above, we know that in equilibrium the following relationship holds:

$$\frac{\partial p_y}{\partial q_{jy}} = MC_{qj} = MWTP_{qj}\,. \tag{5}$$

where MC represents the marginal cost of producing q_j and MWTP represents the marginal willingness to pay for q_j.

Applying this general model to the market for baby food, we assume that preferences are separable in baby food characteristics. That is, the value of jarred baby food consists of different components, including flavor, brand, and an organic component. Parents are able to choose baby food with varying quantities of these characteristics. The hedonic price function for this market can be expressed as follows:

$$P_i = h(S_i, F_i, O_i) \tag{6}$$

where P_i is the price of the ith jar of baby food, S_i are store characteristics, F_i are characteristics associated with the ith jar of baby food other than organic (e.g., brand, type and stage), and O_i represents the organic component of the baby food.[6] We assume that consumers are aware of the different characteristics of the baby foods and weigh them accordingly in making their purchasing decisions. We also assume that the various characteristics fo the baby food are separable and additive, suggesting a linear

[6] To the extent that there are differences in production methods between conventional and organic baby foods, these would be captured by the organic variable.

relationship for estimation purposes. We estimate this model using data collected in two metropolitan areas as described below.

IV. Data Collection and Descriptive Statistics

Baby food price and characteristic data were collected from a total of 83 retail establishments in Raleigh, North Carolina and San Jose, California over two three-day periods in February 2001 and August 2001, respectively. Stores in each city were randomly selected from a list of all retail food establishments generated from current local on-line consumer yellow pages.[7] We stratified our samples across establishment type based on the distribution of food purchased by location for consumers in the U.S. (ERS, 2000). Although specific information is not available on the distribution of jarred baby food sales by location, we use the ERS (2000) data as a basis for our stratification and reallocate the sample to more accurately reflect likely baby food retail venues.[8] Table 1 summarizes the distribution of establishments as reported by ERS and the distribution used in our two-city sample.

In each of the stores in our two-city sample, we recorded data on all jarred baby food offered for sale. Because price varies only rarely across flavors within a stage/type cell, we chose baby food type (e.g. fruit, vegetables, dinner) within stage and brand as our unit of observation.[9] For example, Beechnut stage 1 fruits is an observation, as is

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[7] The consumer yellow pages can be found at http://yp.yahoo.com, accessed on January 29, 2001 and again on July 31, 2001.

[8] For example, specialty stores and mass merchandisers in Raleigh, North Carolina and San Jose, California did not sell jarred baby food, while drug stores and baby super centers did sell baby food, but were not part of the ERS (2000) distribution. We re-allocated the sample accordingly.

[9] When price did vary within observation we took a weighted average of the prices of all flavors to derive an observation price.

Heinz stage 2 dinners.[10] Prior to our data collection efforts, we developed a template for each brand of baby food that allowed us to record the price of each observation, the number of flavors offered for sale, as well as the shelf space allocated to the observation and relevant store characteristics. In addition, we recorded within brand variations in product labeling that had potential for influencing price. For example, Beechnut offers a 'Simple Recipes' line, which has fewer additives than its regular line. Furthermore, jarred baby food is sometimes provided in type-specific "multi-packs" (e.g. four jars of stage 2 fruits packaged together). Recognizing that multi-packs could be priced differently than single jars, we chose to treat multi-packs as separate observations, noting the number of jars packaged together and the baby food type and stage. As data collection progressed, we developed several detailed categories for grocery store type, including ethnic groceries, small groceries and upscale groceries.

Our data collection effort resulted in 1,697 useable observations, with 933 observations from Raleigh, NC and 764 observations from San Jose, CA. Detailed descriptions of relevant variables are provided in table 2, whereas summary statistics are provided in table 3. The data consist of price and organic designation, other product characteristics, and store characteristics. As noted in Table 3, there are significantly more organic observations in San Jose (28%) compared to Raleigh (15%). In addition, the prices of both organic and conventional baby foods are higher in San Jose than in Raleigh. The price of organic baby foods is higher than conventional baby foods in both Raleigh and San Jose, as expected. Gerber baby foods were the most prevalent in both

[10] We noted the number of flavors within each observation, though we have no expectations that this variable will influence price.

markets we sampled. We include dummy variables for each brand of baby food in our analysis. These variables capture factors such as brand loyalty, quality variations, and other characteristics individuals may value that we do not measure. We also include variables for the various types of stores, accounting for the impact of point of purchase on price. There is a wider variety of store types in San Jose with ethnic and small grocery stores not represented in Raleigh.

V. Results and Discussion

We now turn to the empirical estimation results. We present the results for four models to account for alternative specifications of the dependent variable and the model. Because most of our independent variables are dichotomous variables our selection of functional form for the hedonic model is limited to a linear model. Model 1 is estimated as follows:

$$\begin{aligned} &price = \alpha + \beta_1(organic) + \beta_i(store_i) + \beta_j(brand_j) + \\ &\beta_2(meat) + \beta_3(stage1) + \beta_4(stage2) + \beta_5(sqft) + \beta_6(label) + \\ &\beta_7(multi) + \beta_8(city) + v \end{aligned} \tag{7}$$

where $store_i$ indicates the i^{th} store type (e.g., grocery store, upscale market, etc.) and $brand_j$ indicates the j^{th} brand of baby food (e.g., Gerber, Beechnut, etc.). All other variables are defined above in table 2. In this model the dependent variable is the per jar price of the observation.

The model performs well, with an overall adjusted R^2 of 0.79. With the exception of the ORGANIC BABY and MULTI variables, all variables are highly significant. Among the product characteristics, we find that the price of STAGE1 and STAGE2 baby food is 21 cents and 16 cents less per jar, respectively relative to stage 3 (the omitted category). A number of factors could be driving this result, including size of jar and availability of substitutes. Typically, jar size increases with the age of the child, with stage 1 jars 2.5 ounces in size, stage 2 jars 4 ounces in size, and stage 3 jars 6 ounces in size.

In order to examine the effect of jar size more closely, we estimate model 2 in which we normalize the price of an observation by the number of ounces in the jar. In this model, we find that stage is still highly significant; however, the magnitude and sign of the coefficients have changed. Stage 1 varieties are priced at 5 cents more per ounce compared to stage 3, while stage 2 varieties are offered at a price premium of 1 cent per ounce compared to stage 3.

This result makes sense when one considers the number of substitutes available for the jarred baby foods by stage. Stage 1 varieties serve as an introduction to solid foods for younger babies (once they have mastered cereal) and are only available in two types -- fruits and vegetables. As such, the number of varieties available is small (typically 5 or 6 flavors by type). Stage 1 foods are also processed until extremely smooth, making them easier for the child to swallow. Parents are encouraged to introduce one stage 1 flavor at a time and to continue introducing one new flavor approximately every 3 days. Once eating jarred foods, babies may move past the stage 1 varieties fairly quickly into stage 2, which is comprised of a much larger number of combinations and types of foods as described in section 2 above. Stage 2 baby foods have more texture than stage 1 varieties. Stage 3 foods, on the other hand, are even chunkier, and are intended for babies learning to mash and chew with their new teeth. It is not unreasonable to suspect that many parents simply skip using the stage 3 varieties altogether, feeding the baby foods that other family members are consuming at meal time rather than continuing with jarred foods. In short, stage 1 varieties seem to have the fewest number of readily available substitutes since processing of foods at home to the desired texture for a young baby may be cumbersome and time consuming. Stage 3 foods, on the other hand, have the largest number of substitutes as children in this developmental stage could simply consume foods from their parents' plates.

Looking at both models 1 and 2, we find that other characteristics are significant factors in determining price. Brand name, for instance, is significant. Relative to Beechnut (the omitted category), GERBER and EARTHS BEST are priced slightly higher, while HEINZ is priced slightly less. MEAT flavors of baby food, defined above, are also significant predictors of price, commanding a price premium of 26 cents per jar (9 cents per ounce) compared to other types of baby food.

We also examine the impact of several store characteristics on the price of baby food. We control for the venue in which observations are sold via dummy variables for store types (e.g., grocery store, ethnic food market, etc.).[11] We tried controlling for other variables in our models, including store name, under the notion that consumers may favor a particular chain of stores. Although these latter models performed well, model 1 performed slightly better. In addition, features of the store types are likely to result in more variation in prices than features of a particular chain. For example, upscale grocery

[11] An F-test rejected the hypothesis that all store coefficients, except grocery, were equal to zero.

stores tend to have wider aisles, fewer quantities of each product, and more elaborate displays as compared to traditional grocery stores. We omit the OTHER STORE type (representing uncategorized stores, such as drug stores and supercenters) and find that prices are slightly lower in GROCERY stores, ETHNIC markets, and DEPARTMENT stores. As expected prices are higher in UPSCALE stores, SMALL GROCERIES, and CONVENIENCE stores.

Regional differences in pricing are also apparent as we find that baby food is $0.03 less per jar in Raleigh, NC than San Jose, CA. This difference could be due to cost of living differences in the two regions and/or differences in the structure of the grocery/food markets. One cost of living index (http://cgi.money.cnn.com/tools/costofliving/costofliving.html) indicates that groceries, in general, are 21% higher in the northern California area as compared to Raleigh, NC. This could in part be driven by the fact that there are more small neighbor stores and ethnic stores in San Jose, which do not enjoy the same economies of scale as the larger stores.

Turning to the variable of ultimate interest, ORGANIC, we find that organic baby food is 12 cents more per jar (3 cents more per ounce) than conventional baby food. As discussed earlier, this represents both individual willingness to pay for the organic characteristic, as well as the marginal production costs that may be associated with organic baby food.[12] Previous research has indicated that individuals pay 21 cents per jar

[12] We recognize that it is likely that organic baby food is more costly to produce than conventional baby food. However, assuming the hedonic framework applies, this premium represents willingness to pay for a characteristic, regardless of the additional production costs. If individuals valued organic baby food at less than the market price, then we would likely see changes in the market, such as producers exiting the market. In fact, the opposite has occurred. Per Price, et al. (1990) a disequilibrium between the supply price and individual values is possible, but not in a long-run equilibrium. The authors

more for organic baby food (Harris, 1997) and Earth's Best itself states that its baby food costs approximately 50% more than conventional baby food (http://www.earthsbest.com/news_faq.asp). It is unclear how these results were derived and in fact, our analysis finds a much lower premium than previously cited.

In order to test the robustness of this premium, we also estimate 2 additional models. Model 3 estimates equation 7 by city in order to more readily identify regional differences associated with these results where they occur. It could be the case that variations in preferences or costs exist between the east and west coasts. While modest differences exist in some of the product and store characteristics across the two cities, we find virtually no difference in the organic premium between Raleigh and San Jose. The premium in both cities is between 12 and 13 cents per jar.

Finally, we also estimate the model for Gerber observations only. Gerber is the only brand available in both organic and conventional varieties. For the non-Gerber brands, the brand and organic variable are collinear. An issue, then, is the degree to which brand loyalty is driving the results. In order to investigate this issue, we estimate our model using only Gerber observations, in which the brand loyalty issue is held constant. Indeed, we find that the premium is identical among the Gerber observations to what it is when all data points are included. The premium for Gerber organic baby food (i.e., the Tender Harvest label) is 12 cents per jar. This is not necessarily surprising, given that Gerber organic observations represent 79% of the total organic observations. It is difficult to discern if Gerber is able to exert market power and drive the price above

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suggest that the premiums should be "interpreted as...individual consumer valuations of characteristics." (p. 11).

marginal cost. Nevertheless, we can be comforted by the stability of the price premium across all brands.

VI. Conclusion

For parents interested in reducing their baby's exposure to pesticide residues, organic baby food offers a natural alternative. While federal regulations regarding organic labels for all foods are not yet binding, there are several organic baby food producers offering "certified" organic varieties. It is interesting to analyze the extent to which individuals value these organic designations. Previous research has focused on values for organic produce (Hammitt, 1990; Estes and Smith, 1996) and clothing (Nimon and Beghin, 1999), but it is infeasible to extend these results to the baby food market given the heterogeneity in products and consumers across these markets.

We combine a unique data collection method with a tried and true model to estimate how individuals (specifically, parents of babies) value reductions in pesticide exposure, as evidenced through the organic baby food market. We find that, in fact, the value associated with these pesticide reductions is less than the value, or premium for organic foods, asserted in previous work. Individuals are willing to pay 12 cents per jar more for organic baby food as opposed to conventional varieties. Previously, research has asserted that this premium is 21 cents per jar (Harris, 1997) and 50% more than conventional varieties (www.earthsbest.com).

It is important to note that the premium for organic baby food may not be equivalent to the value for reducing exposure to pesticide residues. It could in fact be the case that individuals value other features of the organic baby food than just its health effects. For example, individuals may purchase organic foods because of a preference for environmentally friendly farming practices or a concern for farm worker exposure to pesticides. Within this research, we are unable to discern these competing effects; we merely assert that the premium reflects a desire to avoid pesticide residues. To the extent that individuals do in fact value organic baby food for its health effects, these results could be used to infer the overall value of health benefits associated with reduced risks -- a subject for future research.

Table 1: Distribution of Sample Data Across Venues*		
Venue Type	**ERS**	**Percent of Sample**
Grocery store	69	71
Mass merchandiser	8	11
Specialty Food Stores	4	--
Convenience store	4	11
Drug store	--	5
Baby supercenter	--	2
Other**	13	--

* Table provides the percent of food purchased for home consumption by type of establishment as provided by ERS, 2000 and the distribution of stores in the sample.

** Consists of warehouse clubs, home delivery, farmers, processors, and miscellaneous locations.

Table 2: Variable Description	
Variable	**Description**
ORGANIC CHARACTERISTIC	
ORGANIC	= 1 if an organic product, = 0 otherwise
PRODUCT CHARACTERISTICS	
MEAT	= 1 if a meat product, = 0 otherwise
LABEL	= 1 if a special label within brand, = 0 otherwise
STAGE1	= 1 if a stage 1 product, = 0 otherwise
STAGE2	= 1 if a stage 2 product, = 0 otherwise
STAGE3	= 1 if a stage 3 product, = 0 otherwise
GERBER	= 1 if a Gerber product, = 0 otherwise
BEECHNUT	= 1 if a Beechnut product, = 0 otherwise
EARTHS BEST	= 1 if an Earth's Best product, = 0 otherwise
HEINZ	= 1 if a Heinz product, = 0 otherwise
ORG BABY	= 1 if an Organic Baby product, = 0 otherwise
MULTI	= 1 if sold in a multi-pack, = 0 otherwise
STORE CHARACTERISTICS	
GROCERY	= 1 if sold in a grocery store, = 0 otherwise
UPSCALE	= 1 if sold in a specialty grocery store, = 0 otherwise
ETHNIC	= 1 if sold in an ethnic grocery store, = 0 otherwise
DEPARTMENT	= 1 if sold in a department store (e.g. Target, Kmart), = 0 otherwise
SMALL GROCERY	= 1 if sold in a small neighborhood market, = 0 otherwise
CONVENIENCE	= 1 if sold in a convenience store, = 0 otherwise
OTHER STORE TYPE	= 1 if sold in other store type (e.g. drug store, super store), = 0 otherwise
SQFT	number of square feet of shelf space
RALEIGH	= 1 if sold in Raleigh, NC, = 0 is sold in San Jose, CA

Table 3: Descriptive Statistics[1]			
Variable	**All Data**	**Raleigh**	**San Jose**
PRICE AND ORGANIC CHARACTERISTIC			
ORGANIC	0.21 (0.40)	0.15 (0.36)	0.28 (0.45)
PRICE_CONV	0.57 (0.12) n=1356	0.55 (0.12) n=794	0.60 (0.12) n=552
PRICE_ORGANIC	0.70 (0.11) n=351	0.67 (0.07) n=139	0.72 (0.12) n=212
PRODUCT CHARACTERISTICS			
MEAT	0.05 (0.21)	0.05 (0.22)	0.04 (0.21)
LABEL	0.22 (0.42)	0.20 (0.40)	0.25 (0.43)
STAGE1	0.19 (0.39)	0.21 (0.41)	0.16 (0.37)
STAGE2	0.56 (0.50)	0.53 (0.50)	0.60 (0.49)
STAGE3	0.25 (0.43)	0.26 (0.44)	0.23 (0.42)
GERBER	0.61 (0.49)	0.41 (0.49)	0.48 (0.50)
BEECHNUT	0.26 (0.44)	0.37 (0.48)	0.13 (0.33)
HEINZ	0.09 (0.28)	0.06 (0.25)	0.11 (0.32)
EARTHS BEST	0.04 (0.20)	0.02 (0.14)	0.07 (0.25)
ORG BABY	0.003 (0.06)	0.003 (0.06)	0.004 (0.06)
MULTI	0.08 (0.27)	0.09 (0.28)	0.06 (0.25)
STORE CHARACTERISTICS			
GROCERY	0.82 (0.38)	0.89 (0.31)	0.74 (0.44)
UPSCALE	0.03 (0.17)	0.01 (0.12)	0.05 (0.21)
ETHNIC	0.03 (0.17)	n/a	0.07 (0.25)
DEPARTMENT	0.05 (0.21)	0.06 (0.24)	0.03 (0.17)
SMALL GROCERY	0.02 (0.15)	n/a	0.05 (0.21)
CONVENIENCE	0.01 (0.12)	0.01 (0.11)	0.02 (0.13)
OTHER STORE TYPE	0.07 (0.26)	0.03 (0.18)	0.12 (0.32)
SQFT	1.16 (0.93)	1.24 (0.99)	1.08 (0.86)
Observations	1697	933	764

[1] Mean (standard deviation) displayed for each variable.

Table 4: Results					
Variable	**Model 1 (y=price)**	**Model 2 (y=price/oz)**	**Model 3 (y=price)**		**Model 4 (y=price)**
			Raleigh	**San Jose**	**Gerber ONLY**
Intercept	0.71*** (0.01)	0.13*** (0.004)	0.64*** (0.02)	0.76*** (0.01)	0.75*** (0.01)
ORGANIC	0.12*** (0.01)	0.03*** (0.003)	0.13*** (0.01)	0.12*** (0.01)	0.12*** (0.01)
MEAT	0.26 *** (0.01)	0.09*** (0.003)	0.26*** (0.01)	0.26*** (0.01)	0.23*** (0.01)
LABEL	0.01** (0.01)	0.005** (0.003)	0.01 (0.01)	0.03*** (0.01)	0.02* (0.01)
STAGE1	-0.21*** (0.004)	0.05*** (0.002)	-0.19*** (0.01)	-0.25*** (0.01)	-0.23*** (0.01)
STAGE2	-0.16 *** (0.004)	0.009*** (0.002)	-0.15*** (0.01)	-0.18*** (0.01)	-0.16*** (0.005)
GERBER	0.03*** (0.004)	0.01*** (0.002)	0.04*** (0.005)	-0.002 (0.01)	--
HEINZ	-0.04*** (0.006)	-0.004 (0.003)	-0.03*** (0.01)	-0.06*** (0.01)	--
EARTHS BEST	0.04*** (0.01)	0.02*** (0.005)	0.02 (0.02)	0.03** (0.02)	--
ORG BABY	-0.02 (0.03)	0.002 (0.01)	-0.12*** (0.05)	0.03 (0.03)	--
MULTI	0.01 (0.01)	-0.01*** (0.003)	0.01* (0.01)	0.01 (0.01)	0.01 (0.01)
RALEIGH	-0.03*** (0.003)	-0.009*** (0.001)	--	--	-0.02*** (0.004)
GROCERY	-0.02*** (0.01)	-0.01*** (0.004)	-0.004 (0.02)	-0.04*** (0.01)	-0.02** (.01)
UPSCALE	0.04*** (0.01)	0.002 (0.005)	0.10*** (0.03)	0.02 (0.01)	0.03** (0.02)
ETHNIC	-0.02** (0.01)	-0.01*** (0.005)	--	-0.04*** (0.01)	-0.01 (0.01)

DEPARTMENT	-0.02** (0.01)	-0.005 (0.005)	-0.003 (0.02)	-0.04*** (0.02)	-0.02* (0.01)
SMALL GROC	0.17*** (0.01)	0.03*** (0.01)	--	0.16*** (0.01)	0.16*** (0.01)
CONVENIENCE	0.29*** (0.01)	0.06*** (0.01)	0.35*** (0.02)	0.25*** (0.02)	0.28*** (0.02)
SQFT	-0.01*** (0.002)	-0.003*** (0.001)	-0.01*** (0.002)	-0.01** (0.003)	-0.01*** (0.003)
R^2	0.79	0.64	0.75	0.83	0.76
Observations	1688	1688	931	758	1129

Parameter estimates (standard errors) are displayed for each variable and model. Significance is indicated as follows: *** 99 percent level of significance, ** 95 percent level of significance, * 90 percent level of significance.

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