

**DETERMINING HOW TO INCREASE  
PREMIUM HONEY SMOKED TURKEY'S  
SELLING POTENTIAL BASED ON FLAVOR  
REFORMULATION**

by

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## ABSTRACT

Under the leadership of the Van Eekeren family, Land O' Frost has become one of the fastest growing meat processing manufacturers in the United States. "Premium" is Land O' Frost's flagship brand which makes up 57% of the company's total sales dollars. Of the line of Premium lunchmeats, Honey Smoked Turkey is ranked #3 in total sales dollars. However, if you rank the product's performance by dividing its all commodity volume (ACV) by the number of pounds sold, it is ranked #7 out of the nine single pack flavors offered in retail. There has been internal speculation that the Honey Smoked Turkey's sales performance is related to a lack of honey/sweetness flavor in the lunchmeat. As a result, Land O' Frost needed to determine if the current level of honey/sweetness flavor of the Honey Smoked Turkey needs to be increased in order to stimulate higher growth in sales.

A third party consultant conducted a consumer test between Land O' Frost's honey smoked turkey and their top two competitors' honey smoked turkey. Based on the results, the Land O' Frost product was the least likely preferred and was rated as having the lowest sweetness flavor profile among the three products. In an effort to develop a sweeter tasting honey turkey, different test formulations were developed using different honeys, levels of honey and sweeteners. The lighter the honey grade the less flavor impact was present in the turkey. As a result, a test formula containing twice the amount of light amber honey and the maximum amount of sugar was developed to be sweeter and to offer better marketing claims to potentially attract more customers.

Due to product process differences between the Land O' Frost's honey smoked turkey and its competitor's, the decision was made to conduct another consumer test between the current control and the newly formulated test product. The data determined that there was not a significant difference between the two products tested. A triangle test was conducted via a third party and it also confirmed the same conclusion. With the test formula having a slightly higher cost per pound than the current control formula, it was decided internally that the test formula could replace the current formula if the test formula price per pound can be adjusted to the same cost as the control.

I would recommend that the level of sugar in the new test formula be slightly decreased until the formula cost per pound is the same as the control. The cost of meat raw materials used by Land O' Frost often changes due to market price conditions. The new formulated honey smoked turkey's selling potential would still have a positive impact by utilizing claims such as "double the honey" and "lower sodium" on the package. In this case, the selling potential increase would be more heavily executed from a marketing perspective than from flavor development.

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## **DEDICATION**

This thesis is dedicated to my children Justice L. Jenkins, Derrick T. Coleman II, Phoenix M. Coleman and nephew Jason D. Hall. You can achieve anything you put your mind towards. Dream big, believe that you can do it and let your faith guide you on your journey towards success.... I did.

## CHAPTER 1: INTRODUCTION

Throughout the past 50 years, there have been only a few meat processing manufacturers that have achieved the level of growth and success as Land O' Frost. Founded by the late Antoon Van Eekeren, the company originally began conducting business as a frozen food locker on the South Side of Chicago. With high demand for freezer space, largely fueled by World War II, the business thrived for a time. At the end of the war, the demand for industrial freezer space began to suffer a steep decline so Antoon decided to convert part of the plant into a manufacturing facility. The first meat product that was produced was roast beef and gravy sold in frozen tubs to local restaurants and taverns.

Unfortunately, within three years, a fire destroyed the processing section of the plant. The plant was rebuilt with even more production space to accommodate the manufacturing of frozen meat pies and TV dinners for area retail stores. These frozen meals bore the name, "Land O' Frost" and shortly afterwards, wafer sliced beef was also manufactured under the name, "Land O' Frost".

In 1958, Antoon and his eldest son, Henry, reorganized the business with a new focus to manufacture smoked sliced beef, ham and turkey. Within the next ten years, the product line was expanded also to include corned beef, pastrami, white and dark turkey, chicken and turkey ham. Antoon's youngest son Paul also joined the company within this timeframe. Due to both Antoon and Henry's unfortunate deaths in the early and mid seventies, Paul became the new leader of the company. Land O' Frost experienced

tremendous growth under Paul's leadership, which included the purchase of a vegetable processing plant converted to a USDA inspected meat plant in Searcy, Arkansas.

In 1987, Land O' Frost acquired a financially struggling competitor, Leo's. Leo's had a more diverse product offering than Land O' Frost and they were also selling in the foodservice market. One of the best things that Land O' Frost got out of the acquisition was a 1-pound lunchmeat filled gas flushed package that was primarily sold as a foodservice item. The idea of a Land O' Frost deli-pouch was well received and in 1990, Land O' Frost launched their first one pound deli-pouch under its "Premium" brand.

Today, Land O' Frost has become one of the fastest growing meat processing manufacturers in the United States. It is currently ranked as the number one, 1-pound deli pouch manufacturer and the third largest deli meat manufacture in the country, just trailing Oscar Mayer and Hillshire Farms (Sara Lee). The "Premium" brand is the flagship brand within the company with the total brand sales making up 57% of the company's total sales dollars. There are 11 products that are sold in the Premium brand category: Breast of Chicken, Brown Sugar Ham, Honey Ham, Cooked Ham, Smoked Ham, Honey Smoked Breast of Turkey, Smoked Breast of Turkey, Oven Roasted Breast of Turkey, Roast Beef, Honey Ham and Honey Turkey Variety Pack and an Oven Roasted Turkey and Smoked Ham Variety Pack.

In 2009, Land O' Frost launched a companywide campaign to double its dollar sales by the year 2014. To meet this goal several measures have and will be put into place across all the departments of the company. Some of the measures that the research and development retail team are responsible for is to develop innovative, successful retail items and to troubleshoot retail products that have shown little to moderate sales growth.

One form of marketing research data that is used by Sales and Marketing to track industry sales and distribution is A/C Nielsen. All Commodities Volume (ACV) measures the total dollar volume (all categories) of retail sales for a particular outlet in a given market. It includes all items that are sold by that store type. Nielsen calculates ACV by first taking the all commodity dollar volume/total dollar volume of each store in a chain (or geographic market, total U.S., etc.). Next they drill into a specific item (can be a category, segment, brand or UPC) and put a percentage on that item based on the number and type of stores in the chain in which it is selling.

When looking at the products sold within Land O' Frost's Premium brand, Honey Smoked Turkey is ranked third in total sales dollars and makes up about 17.3% of the total sales in Land O' Frost's Premium product line. However, if you rank the product's performance by dividing its ACV by the number of pounds sold, it is ranked seventh out of the nine single pack flavors offered in retail. What this means is the Honey Smoked Turkey has a nationwide store penetration of approximately 56% ACV; There are other items with lower ACV percentages in the Land O' Frost product line that are selling higher quantities on a per store basis.

There have been some internal company opinions suggesting that the flavor of the Honey Smoked Turkey isn't as sweet as it needs to be and that the lack of sweetness is what is contributing to the product's mediocre growth in sales. In order to not rely on potentially biased internal company opinions, it was decided to compare the Land O' Frost Honey Smoked Turkey using a third party taste test to its top two main competitors. Land O' Frost's top two main competitors are Oscar Mayer and Hillshire Farm. Both competitors have their own versions of Honey Smoked Turkey lunchmeat. Hillshire Farm sells a Honey

Smoked Turkey lunchmeat under their Premium Deli brand and Oscar Mayer has a Honey Smoked Turkey lunchmeat sold under their Deli Fresh brand. The potential taste test data would allow Land O' Frost to determine if the current level of honey/sweetness flavor of the Honey Smoked Turkey needs to be increased in order to stimulate higher growth in sales.

We acknowledge that there are other potential factors that may contribute to the honey smoked turkey's sluggish per store sales such as advertising dollars and packaging design. However we believe that the price and number of stores merchandising this product do not impact honey smoked turkey consumer purchase intent for two reasons. First, all of the lunchmeats in the Premium product line are line priced. Regardless if it's cooked ham, brown sugar ham or oven roasted breast of turkey, they all sell for the same price. Secondly, there are products such as smoked breast of turkey that have a smaller store penetration of 23% but are out selling honey smoked turkey on a store to store basis. For the purposes of identifying a single area to investigate, we chose to evaluate flavor impact and how it may influence sales growth for honey smoked turkey.

## **CHAPTER 2: LITERATURE REVIEW**

### **2.1 Sensory Test Methods**

There are three classes of test methods that are commonly used in sensory evaluation; Discrimination, Descriptive and Affective tests. Discrimination tests help reveals if the products are different in any way. Analysis is based on frequencies and proportions (counting right and wrong answers). The second major class of sensory test methods is those that quantify the perceived intensities of the sensory characteristics of a product. These procedures are known as descriptive analyses (Lawless and Heymann, 1998). The third class of sensory test methods is called hedonic or affective testing. Otherwise known as “Consumer Testing”, this type of testing is concerned with obtaining subjective data, or how well products are likely to be accepted as explained in the Sensory Analysis Encyclopedia. Each of these three classes of test methods were used in this study and are described in more detail in the following sections.

#### ***2.1.1 Discrimination Test***

If the sensory test is designed to detect a difference then it's a discrimination test. Discrimination test are usually preformed when there are only two samples. (Lawless and Heymann, 1998) There are a number of different discrimination tests available including triangle tests, duo-trio tests, paired comparison tests, n-alternative forced choice tests, and tetrad tests (Frijters, 1984). The triangle taste test is used primarily for "difference testing." Each participant is presented with three products and asked to taste all three and choose the one that is different from the other two. The triangle taste test is used to

determine who can discriminate (i.e., consistently identify the one product that's different), and who cannot (Product Testing Designs, 2010). These discriminators are in turn used as members of small expert panels (sometimes called sensory panels) to assist research and development in formulating and reformulating products, using the triangle design to determine if a particular ingredient change, or a change in processing, creates a detectable difference in the final product. (Product Testing Designs, 2010)

### ***2.1.2 Descriptive Analysis Test***

The key question descriptive tests ask is, “How do products differ in specific sensory characteristics?” (Lawless and Heymann, 1998). Descriptive analysis is a useful tool for determining the appearance, aroma, flavor and texture profile of a product. The results from a descriptive analysis test can be used in product development and reformulation work to optimize desirable qualities.

### ***2.1.3 Affective/Hedonic Test***

Many types of scales or scoring systems are used for preference evaluations. Affective testing often refers to either the paired preference test or the 9-point hedonic scale, i.e. a measure of liking (Stone & Sidel, 2004). The 9-point hedonic scale (see Figure 2.1) is more useful when testing many products and/or prototypes, and is often used in product development to guide the progress of research projects. According to the Society of Sensory Professionals, the 9-point Hedonic scale is the most widely used scale for measuring food acceptability. The 9-point hedonic scale ranges from 9 (extremely like) to 1 (extremely dislike).

**TABLE 2.1: HEDONIC SCALE**

9 – Extremely Like	8 – Like Very Much	7 – Like Moderately
6 – Like Slightly	5 – Neither Like or Dislike	4 – Dislike Slightly
3 – Dislike Moderately	2 – Dislike Very Much	1 – Extremely Dislike

#### ***2.1.4 ANOVA & Tukey Test***

Analysis of variance is often referred to “ANOVA” in the sensory science arena. ANOVA is a statistical analysis allowing a person to evaluate the differences among several products while considering multiple factors, like replications and panelist effects. Basically, ANOVA compares the variability about the means of products tested instead of the means. Two products may have very different means for honey flavor, but the variability (rather the evaluation of the panelists’ scores about that mean) is large about each of the product means. Therefore, the products are similar even though the mean values are different. ANOVA will show these differences by calculating a p-value for the comparisons. When a p-value shows a significant treatment effect, it indicates that at least two of the products compared are significantly different from each other. It does not indicate which of the products is different. (Fritsch, 2010)

If there is a significant difference found among the three samples, a mean separation test will be used to determine which samples are significantly different from the others. The mean separations test used by Dr. Penfield’s sensory software was the Tukey test. The Tukey test also known as Tukey’s Honestly Significant Difference Test is a single step multiple comparison procedure and statistical test generally used in conjunction with an ANOVA to find which means are significantly different from one another. The test



compares the means of every treatment to the means of every other treatment and identifies where the difference between two means is greater than the standard error would be expected to allow.

## 2.2 Honey Background & Usage Level

There are as many flavors of honey as there are of flowers, since the flavor of the honey is directly influenced by the type of nectar gathered by the bees from various floral sources. In the United States, there are more than 300 varieties of honey. (Fillipone, 2010) However, only a small percentage of those honeys are popular. As a general rule, light colored honeys are usually mild in taste, and dark colored honeys have a stronger more robust flavor profile. According to the United States Standards for Grades of Extracted Honey (1985), honey is classified into seven color categories: *Water White, Extra White, White, Extra Light Amber, Light Amber, Amber and Dark Amber.*

Honey color is measured on a "Pfund Grader". The scale for this is called the "Pfund" Scale and is measured in millimeters. The scale is actually a metric ruler measuring the point along a calibrated amber glass wedge where the sample (placed in a glass wedge shaped trough) matches the amber wedge. The scale starts at 0 mm (colorless) and finishes at 140 mm (black) (Airborne Honey, 2010).

**TABLE 2.2: COLOR DESIGNATIONS OF EXTRACTED HONEY**

USDA Color		Color Range	Optical
Standards	Color Range USDA Color Standards	Pfund Scales	Densit
Designation		Millimeter	y <sup>3</sup>

Water White	Honey that is Water White or lighter in color.	8 or less	0.0945
Extra White	Honey that is darker than Water White, but not darker than Extra White in color.	Over 8 to and including 17	0.189
White	Honey that is darker than Extra White, but not darker than White in color.	Over 17 to and including 34	.378
Extra Light Amber	Honey that is darker than White, but not darker than Extra Light Amber in color.	Over 34 to and including 50	.595
Light Amber	Honey that is darker than Extra Light Amber, but not darker than Light Amber in color.	Over 50 to and including 85	1.389
Amber	Honey that is darker than Light Amber, but not darker than Amber in color.	Over 85 to and including 114	3.008
Dark	Honey that is darker than Amber.	Over 114	..... .....

<sup>3</sup>Optical Density (absorbance) =  $\log (100/\text{percent transmittance})$ , at 560 nm for 3.15 cm thickness for caramel - glycerin solutions measured versus an equal cell containing glycerin. United States Standards for Grades of Extracted Honey (1985).

There are three main factors that determine the grade of honey: Flavor/Aroma, Absence of Defects and Clarity. The clarity of honey can be achieved by either filtering or

straining. Filtered honey is honey of any type defined in these standards that has been filtered to the extent that all or most of the fine particles, pollen grains, air bubbles, or other materials normally found in suspension, have been removed. Strained honey is honey of any type defined in these standards that has been strained to the extent that most of the particles, including comb, propolis or other defects normally found in honey, have been removed. Grains of pollen, small air bubbles, and very fine particles would not normally be removed according to the United States Standards for Grades of Extracted Honey (1985). Raw honey is simply honey that has not been heated and filtered, but instead has been strained to remove debris before bottling.

According to the U.S. Department of Agriculture's Food Standards and Labeling Policy Book (2003), a claim can be made or implied on a product label if the product contains at least 3 percent honey. When other sweeteners, (sugar, dextrose, maltose, invert sugar, corn syrup solids, and similar ingredients) are used, the quantity may not exceed one-half that of the honey. Based on each competitor's honey smoked turkey ingredient statement, both are using a combination of honey and sugar to achieve a sweet flavor profile.

In an effort to try and create a sweeter honey flavored turkey lunchmeat, the thought was to explore other honeys that could provide a sweeter flavor profile. Currently, Land O' Frost uses a blend of "Light Amber" honeys that come from the following countries: US, Vietnam, India, Brazil and Argentina. Each country's honey has its own flavor characteristics ranging from eucalyptus to butterscotch to slightly acidic flavor profiles.

### **2.3 Sodium Limits In The Industry**

In 2010, the Institute of Medicine has released a report on recommended strategies for reducing sodium intake to levels recommended in the Dietary Guidelines for Americans. Americans consume unhealthy amounts of sodium in their food, far exceeding public health recommendations, the report finds. (Hoyland, 2010). “Limiting salt in packaged and restaurant foods is perhaps the single most important thing that the Food and Drug Administration could do to save hundreds of thousands of lives and save billions of dollars in health-care expenses,” said Center for Science in the Public Interest executive director Michael F. Jacobson. “The FDA and U.S. Department of Agriculture should quickly implement the Institute of Medicine’s recommendations, starting with mandatory limits on salt, which could be phased in gradually over time.” (CSPI, 2010)

According to the Centers for Disease Control and Prevention, Americans currently consume about 4,000mg of sodium per day, far more than the 2300 mg limit recommended by public health experts. The Institute of Medicine puts average consumption at 3,400mg a day, or about 50 percent more than the recommended maximum. (Scott-Thomas, 2010) Companies that recently publicly pledged to expand their low-sodium options include Kraft, Sara Lee, ConAgra and Sadler's Smokehouse (Keefe, 2010).

Land O’ Frost’s premium honey smoked lunchmeat currently contains a total of 650mg of sodium on a per serving basis, compared to Oscar Mayer and Hillshire Farm products of having, 470mg and 580mg per serving, respectively. Given the increased emphasis on sodium consumption in the United States, the level of salt in the honey smoke turkey formula could be adjusted to reduce the overall sodium level on a per serving basis.

## **CHAPTER 3: CONSUMER TESTING PART 1**

### **3.1 Introduction**

The Land O' Frost team has tremendous knowledge of meat processing and formulation development. The majority of mid to upper management employee's roots extend back into Production and Quality Control. Considering that the majority of the decision makers within the company work closely with the products, the suggestion of having an internal sensory panel could potentially yield biased results.

Land O' Frost has had a historical relationship with Marjorie Penfield Consultant, Inc. who has conducted many sensory and consumer preference panels for the company. Marjorie Penfield is an Emeritus Professor of Food Science and Technology from the University of Tennessee who operates a sensory analysis consulting firm. Most of the third party panels with Dr. Penfield have been conducted on the University of Tennessee campus.

The three items used in the consumer sensory panel were: Land O' Frost's Premium Honey Smoked Turkey 16 oz., Hillshire Farm Premium Deli Smoked Honey Turkey 9 oz. and Oscar Mayer Deli Cuts Honey Smoked Turkey 9 oz (Appendix C).

### **3.2 Methodology**

The lunchmeat samples were evaluated organoleptically for sensory attributes by an untrained consumer for appearance, flavor, sweetness, texture and overall likeability. All of the panelists were gathered from within the campus of the University of Tennessee. The consumer test consisted of 100 panelists. Of these, 61 were female and 39 were male. The

age of the panelists ranged from 17-70 and 74% of the panelists ate turkey lunchmeat at least once every two to three weeks. Each panelist received two slices of each of the lunchmeat samples. The slice thickness and the slice size of the turkey samples were not considered since the slices were selected directly from their respective retail package. All three samples were labeled with a coded number to conceal the identity of the three manufacturers' products and to help eliminate any brand preference or brand awareness any panelists may have during evaluation. Each panelist was also given water and crackers to cleanse their palettes between evaluating each sample.

The panelists tasted samples of honey smoked turkey from the three different manufacturers and responded to questions listed on a computer screen about product flavor, texture, preference, product use, frequency of consumption of like products and age and gender.

All 100 panelists were also asked to rate the three different lunchmeats in the order of their purchasing preference. The answers that the panelists could choose from ranged from; *Most likely to buy*, *Intermediate* and *Least likely to buy*. Each panelist could choose the same answer for each of the three lunchmeats.

For this particular test, panelists were asked to rate how intense each of the three honey smoke lunchmeats rated in sweetness, honey flavor, saltiness, turkey flavor and smoked flavor. The intensity scale for the consumer test ranged from 9 (extremely intense) to 1 (not intense at all) in Table 3.1. Panelists were also asked to describe what they liked about each of the three samples and what would they change to make any of the three samples better.

**TABLE 3.1: INTENSITY SCALE**

9 – Extremely Intense	7 – Very Intense	5 - Moderately Intense
3 – Slightly Intense	1 – Not At All Intense	

### **3.3 Consumer Test Data**

The data from the consumer test were reported by using hedonic and intensity scales, a preference question and descriptive answering. All 100 panelists were also asked to provide a descriptive answer for each of the following questions for the three lunchmeats tested: “What do you like about this sample?” and “What would you change to make this sample better?”

**TABLE 3.2: SUMMARY OF MEANS OF HEDONIC SCORES**

Attribute	Means <sup>a</sup> and ANOVA results <sup>b</sup>				Percent of panelists who liked		
	Land O' Frost	Oscar Mayer	Hillshire	p-value for difference between means	Land O' Frost	Oscar Mayer	Hillshire
Overall	5.6C	6.5B	7.3A	<0.0001	62	77	92
Appearance	5.9B	7.1A	7.4A	<0.0001	64	89	91
Flavor	5.8C	6.4B	7.2A	<0.0001	64	80	91
Texture	4.6B	7.0A	7.5A	<0.0001	36	88	91

<sup>a</sup>hedonic scale—9=like extremely; 8=like very much; 7=like moderately; 6=like slightly; 5= neither like nor dislike; 4=dislike slightly; 3=dislike moderately; 2=dislike very much; 1 = dislike extremely.

<sup>b</sup>Means in a row with like letters do not differ at p-value shown in table.

The Land O' Frost honey turkey trailed in all four categories: flavor, appearance, texture and overall likeability. In Table 3.2, the overall likeability data showed that there were significant differences between Land O' Frost, Oscar Mayer and Hillshire Farm's honey turkey. The data also revealed that only 64% of the panelists liked the flavor of the Land O' Frost honey turkey compared to 80% and 91% who liked Oscar Mayer and Hillshire Farm's honey turkey, respectively. Both Oscar Mayer and Hillshire Farm shared similar ratings in texture and appearance but still rated higher in both categories compared to Land O' Frost.

In Table 3.2, the data also shows the percent of panelists who liked the attributes associated with the three lunchmeats. The widest margin of likeability between Land O' Frost and its competitors was for texture. Both competitors' lunchmeat had more of a whole muscle appearance. This kind of appearance is associated with large meat cuts being used in the forming process. The larger meat cut allow the texture of the lunchmeat to be closer to whole muscle. On the contrary, Land O' Frost honey smoked turkey goes through



an emulsification process. This emulsification process helps incorporate value added fresh and frozen raw materials into the formulation without allowing any noticeable changes in the appearance of the lunchmeat. Emulsified lunchmeats do not display any whole muscle appearances in the meat and the texture is more homogeneous similar to bologna.

**TABLE 3.3: SUMMARY OF INTENSITY SCORES**

Attribute	Means and ANOVA results			
	Land O' Frost	Oscar Mayer	Hillshire	p-value for difference between means
Turkey flavor	4.5B	4.9A	5.1A	0.0277
Sweet	3.7B	3.8B	5.7A	<0.0001
Salty	4.6A	3.7B	3.4B	<0.0001
Honey	3.4B	3.6B	5.4A	<0.0001
Smoke	3.4B	5.4A	4.0B	<0.0001

<sup>a</sup>intensity scales—9=extremely intense; 7=very intense; 5=moderately intense; 3=slightly intense; 1=not at all intense.

<sup>b</sup>Means in a row with like letters do not differ at p-value shown in table.

Table 3.3 showed that there were significant differences for the five attributes tested with intensity scales. Those five attributes were Sweetness, Honey flavor, Turkey flavor, Saltiness and Smoke flavor. The only category that the Land O' Frost product showed as being more intense than the other two samples was for saltiness. The Land O' Frost honey smoked turkey had a salty intensity rating of 4.6, which is closer to being rated as moderately salty compared to the Oscar Mayer and Hillshire Farms products rating of 3.4 and 3.5 respectively. Both sweet and honey categories showed a significant difference between Land O' Frost and Hillshire Farm. Hillshire Farm's sweet and honey attributes were rated moderately intense compared to the slightly intense ratings of Land O' Frost's honey turkey.

**TABLE 3.4: SUMMARY OF INTENSITY SCORES INCLUDING IDEAL**

Attribute	Means and ANOVA results				
	ideal	Land O' Frost	Oscar Mayer	Hillshire	p-value for difference between means
Turkey flavor	5.7A	4.5C	4.9B	5.1B	<0.0001
Sweet	4.6B	3.7C	3.8C	5.7A	<0.0001
Salty	3.7B	4.6A	3.7B	3.4B	<0.0001
Honey	4.9B	3.4C	3.6C	5.4A	<0.0001
Smoke	5.3A	3.6B	5.4A	4.0B	<0.0001

<sup>a</sup>intensity scales—9=extremely intense; 7=very intense; 5=moderately intense; 3=slightly intense; 1=not at all intense.

<sup>b</sup>Means in a row with like letters do not differ at p-value shown in table.

The panelists were also asked to rate the five intensity attributes to what they consider their “ideal” honey smoked turkey in Table 3.4. Those results were then compared to how they rated each of the three honey smoked turkey samples. In 4 out of the 5 attributes, the Land O’ Frost sample fell significantly below the scores of the ideal level of Sweetness, Honey flavor, Turkey flavor and Smoke flavor. In contrast, the saltiness intensity of the Land O’ Frost sample was significantly above the ideal sample. The Hillshire Farm and Oscar Mayer samples at least had two attributes that were parallel with what the ideal product was projecting. Hillshire Farm’s honey smoked turkey lunchmeat rated the closest to replicating what the panelists thought the ideal sweet and honey intensity should be in a honey smoked turkey.

**TABLE 3.5: RATING FOR PURCHASE INTENTION**

PREFERENCE	Land O' Frost	Oscar Mayer	Hillshire
Most likely to buy	11	33	56
Intermediate	25	45	30
Least likely to buy	64	22	14
Rank sum	253A	189B	158B
p-value for difference	<0.0001		

The panelists rated the Hillshire Farm honey smoked turkey their highest preference for purchasing, as shown in Table 3.5. Only 11% of the panelists were most likely to buy Land O' Frost compared to 33% and 56% of Oscar Mayer and Hillshire Farm, respectively. Oscar Mayer and Hillshire Farm's percentage of "least likely to buy" rating were 22% and 14% respectively. Out of the three lunchmeats evaluated for purchase preference, Land O' Frost lunchmeat rated significantly lower than the other two competitors' lunchmeats.

**TABLE 3.6: DISTRIBUTIONS OF HEDONIC SCORES FOR TEXTURE LIKING**

Attribute	Scale (value)	Frequency		
		Land O' Frost	Oscar Mayer	Hillshire
Texture	like extremely (9)	4	13	16
	like very much (8)	9	22	52
	like moderately (7)	14	37	16
	like slightly (6)	9	16	7
	neither like nor dislike (5)	10	4	3
	dislike slightly (4)	18	5	4
	dislike moderately (3)	16	2	1
	dislike very much (2)	9	0	0
	dislike extremely (1)	11	1	1
	Percentage who assigned "like" scores to sample	36	88	91
	Mean	4.6	7.0	7.5
	± standard deviation	2.3	1.5	1.4

Each of the three honey smoked turkey samples were rated by panelists on the degree of texture likeability. Table 3.6 illustrates the results for each sample. The mean for Land O' Frost honey smoked turkey texture was 4.6 which falls between "neither like or dislike" and "dislike slightly". Oscar Mayer and Hillshire Farm had a likeability mean rating of 7.0 and 7.5, respectively, equivalent to "like moderately". When panelists were asked if they like the texture of each of the three samples, 36% responded they liked the Land O' Frost texture while 88% liked the Oscar Mayer texture followed by 91% preferring the Hillshire Farms texture.

For the descriptive portion of the consumer test, 28% of the 100 panelists surveyed thought that the saltiness of the Land O' Frost turkey should change to improve the product better. Thirty two percent of the panelists thought that the flavor/honey flavor was lacking and 37% thought that the product's texture needed improvement in order to make the sample better. Based on the data provided by the panelists, the Hillshire Farm turkey appeared to be the benchmark of how a likeable honey smoked turkey should taste.

### **3.4 Why Not Develop A "Me Too" Product?**

The Land O' Frost's organization has always been dedicated to improving its current product offerings and constantly searching for new products to meet the needs of their consumers. However, one position Land O' Frost has taken to support its consumer base is to be a "value added" lunchmeat provider. Both Oscar Mayer and Hillshire Farm's honey smoked turkey lunchmeats are packaged into 9 oz. retail packages and sold at Wal Mart for \$3.98. Land O' Frost's honey smoked turkey lunchmeat is offered for the same

price in a 16 oz. package. That's value for the customer to get an extra 7 ounces of product for the same price!

Even with the consumer data pointing towards the Hillshire Farms product as the benchmark, the opportunity to produce the same likeness of product isn't cost effective for Land O' Frost at the current package weight.

### **3.5 Raw Material Cost Differences**

The company has been very successful as a private label manufacturer by employing skilled meat scientists who are capable of duplicating competitive products and by utilizing cost effective raw materials. However, if Land O' Frost developed an item that specifically mimicked Hillshire Farm's honey smoked turkey, the raw material cost combined with a revised manufacturing process would increase the per pound cost by an estimated 30%. In order to achieve the same texture profile of the Hillshire Farm turkey, fresh raw materials such as turkey breast and/or turkey breast trim are more expensive per pound compared to frozen turkey breast and/or turkey breast trim. Land O' Frost's process of making lunchmeat is more similar to making sausage, which involves a grinding, mix and stuff process.

In comparison, it is more typical for whole muscle textured lunchmeats to use larger fresh muscle cuts that are injected with a solution, macerated, tumbled and then stuffed in a casing for cooking purposes. The injection process uses needles to penetrate the muscle and deposit a liquid solution made of various functional ingredients. If the muscle is frozen, the needles will not penetrate through and the ingredients ranging from flavors to antimicrobials will not be included within the muscle structure of the meat.

**TABLE 3.7: RAW MATERIAL COST DIFFERENCES**

Description	Land O' Frost	Hillshire Farms <sup>1</sup>	
MEAT	\$ 110.46	\$ 146.19	Meat Cost/100 lbs of Meat (CWT)
NON MEAT INGREDIENTS	\$ 16.79	\$ 18.64	
	<b>\$ 0.87</b>	<b>\$ 1.14</b>	Per Pound Formula Cost

<sup>1</sup> Meat components and dry ingredients estimated by D. Coleman to match the current ingredient statement, flavor and texture profile of Hillshire Farm Premium Deli Honey Smoked Turkey Breast.

## CHAPTER 4: FLAVOR DEVELOPMENT

After reviewing the results from the first sensory test, there were three areas that we felt needed to be reviewed: (1) The sweetness characteristics of the honey smoked turkey, (2) the amount of salt in the formulation and (3) our ingredient statement compared to the other two competitors'. Changing too many variables at once would not only change the honey smoked turkey's characteristics but could also dramatically change the product cost. The texture of the turkey lunchmeat was not a consideration at this point due to the fact that doing so would increase cost and Land O' Frost's desire to stay a value-based competitor. We started to focus immediately on our product's honey sweetness flavor profile.

According to the input of our ingredient distributor, most meat processing manufacturers use the Light Amber grade of honey for their meat formulations. Considering that we wanted to differentiate and improve our current product, we decided to explore replacing our current honey with raw honey, extra light amber honey or increasing the current honey usage level in our formulation.

Raw honey is honey derived directly from the beehive and is not pasteurized. Since this honey is unpasteurized; the honey often contains small particles of wax, pollen and other debris that is typically filtered out if it were processed. Extra light amber honey is one grade higher on the color scale than what the industry typically uses. With the extra light amber honey's clarity and filtering being closer to retail grade honey, its cost is 14 % more per pound than the light amber honey Land O' Frost currently uses.

The first round of testing consisted of a control and two test formulations. Both test formulas consisted of the current control light amber honey being replaced with either raw unprocessed honey or extra light amber honey on a 1:1 basis. The sweetness level between the current control and tests were nearly undetectable. The physical appearance of the turkey formulated with the raw honey was slightly darker than the control due to the raw honey being physically darker in color. The option of pursuing tests using raw honey was eliminated due to potential contamination of bee parts, bees wax, pesticides and other chemicals.

After comparing Land O' Frost's ingredient statement with the competitors' ingredient statements, two things immediately stood out in both competitors' products. The location of "salt" for Oscar Mayer and Hillshire Farm's honey turkey was located after "less than 2%" in the ingredient statement and sugar was used as a secondary sweetener indicated in Figure 4.1.



## FIGURE 4.1: Ingredient Statement Comparisons

### **Land O' Frost: Premium Honey Smoked Turkey**

TURKEY BREAST, WATER, HONEY, SALT, LESS THAN 2% OF DEXTROSE, MODIFIED CORN STARCH, BROWN SUGAR, MALTODEXTRIN, SODIUM ERYTHORBATE, SODIUM PHOSPHATES, SODIUM NITRITE.

### **Hillshire Farm: Premium Deli Honey Smoked Turkey<sup>a</sup>**

TURKEY BREAST, WATER, HONEY, CONTAINS 2% OR LESS OF SUGAR, SODIUM LACTATE, SALT, SODIUM PHOSPHATE, SODIUM DIACETATE, SODIUM ERYTHORBATE, SODIUM NITRITE.

### **Oscar Mayer: Premium Honey Smoke Turkey<sup>b</sup>**

TURKEY BREAST, WATER, HONEY, CONTAINS LESS THAN 2% OF MODIFIED CORN STARCH, SODIUM LACTATE, SUGAR, SALT, SODIUM PHOSPHATES, CARRAGEENAN, SODIUM DIACETATE, POTASSIUM CHLORIDE, SODIUM ASCORBATE, SODIUM NITRITE.

<sup>ab</sup> Ingredient statements obtained from products purchased from Wal Mart Searcy, AR on 12/8/09

In addition to both competitive products using less salt, they both also use the ingredient sodium lactate. Sodium lactate has many functional properties when used in various meat products. Sodium lactate is frequently added to meat and poultry products; it is recommended as a flavor enhancer in fresh and cooked meat and poultry products and as a pH control agent. (Guerrero-Legaretta and Alarcon-Rojo, 2009) Since sodium lactate has a slightly acid taste, salt levels in all formulations should be reduced by 0.25-0.50%. (Pearson and Gillett, 1996) Sodium lactate being added to the competitor products may also act as a sodium potentiator, which may increase the flavor of the turkey while maintaining a lower sodium profile.

Over the years, Land O' Frost has taken a non-traditional stance in the industry by not using any antimicrobial ingredients in their products. One of the reasons why is due to our Vice President of Research, Dr. John Butts. Dr. Butts is recognized throughout the food industry for his work on developing the "Seek and Destroy" program of sanitation, equipment design and maintenance. He also is accredited to co-authoring the American Meat Institute's Listeria Prevention and Control Program. Due to the control processes Dr. Butts has put in place for all of the Land O' Frost manufacturing plants, our products are able to meet an extended shelf life without additional ingredients being added. This allows for our products to typically have cleaner ingredient statements than our competitors. In Figure 4.1, you'll see that Land O' Frost's ingredient statement is much shorter than the other two competitors'.

Land O' Frost's salt content exceeds 2% percent and uses a combination of sweeteners such as honey, honey solids, dextrose and a very low percentage of brown sugar. Based on that information, we believed that the increased level of salt in the Land O' Frost product was partially responsible for blocking sweet flavor notes that were more easily detected in Hillshire Farms honey smoked turkey.

We concluded that in addition to adjusting the percent of salt used in the formula, the level of sweetness could be increased to help give the honey smoked turkey a sweeter flavor profile. Three more rounds of testing were conducted between the test honey (extra light amber) and the control honey (light amber) at different percent levels. The first two rounds of testing involved the test and control turkey formulations to use 4.1 and 4.8 percent of honey, respectively. After internal sensory testing, we concluded that there was no difference in the level of sweetness compared to the control formula. After taste testing

the product made with the extra light amber honey, we determined that the test honey or extra light amber honey flavor wasn't as pronounced as the control amber light honey. Since the price of the test honey cost more per pound and yet did not deliver an increased sweetness profile, further testing of the extra light amber honey were suspended.

In order to keep track of tests, Land O' Frost systematically stores tests by first labeling the year a test was conducted followed by the chronological order of all tests initiated by the research and development department that year. Our final test formula #10-062, reached the desired sweetness level by increasing the amount of control honey, maximizing the amount of white sugar and decreasing the salt content below 2% percent. Lowering the amount of salt used in the formula lowered the sodium per serving level from 650 mg to 470 mg, a 27% decrease. This decrease in sodium not only will find favor with an industry who is being asked to lower product sodium content, but also will allow Land O' Frost to offer a more health friendly lunchmeat. By lowering the salt level in the formula, it also allowed the honey/sweetness flavor to become more pronounced in the lunchmeat.

**FIGURE 4.2: Sodium Comparisons**

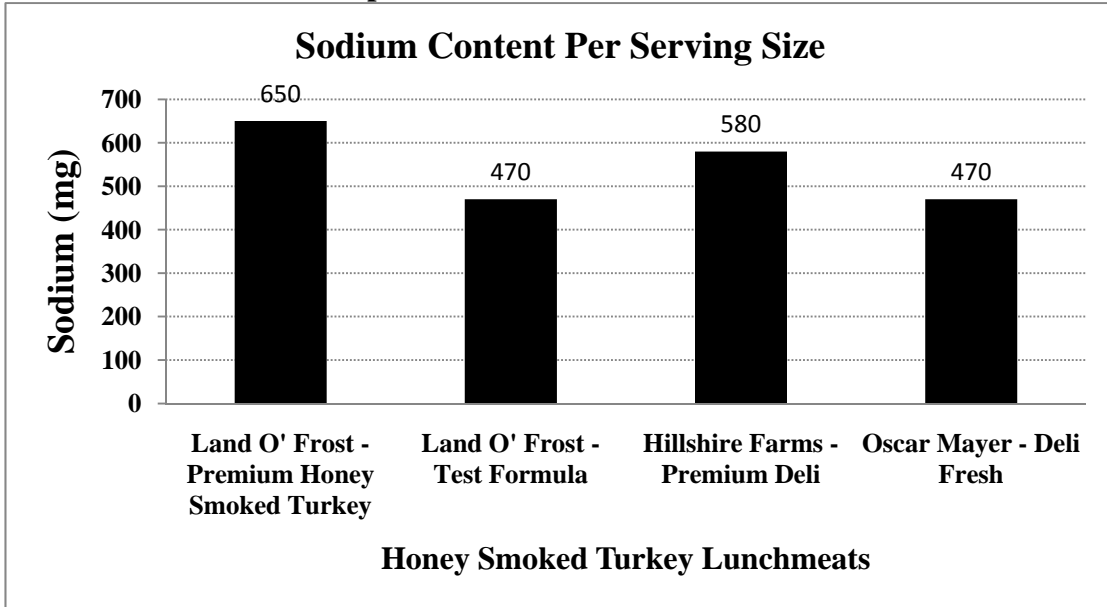


Figure 4.2 shows that the current Land O Frost’s smoked honey turkey product leads its competitors in sodium content on a per serving basis. By decreasing the amount of salt in the test formula, the amount of sodium per serving is lowered to the same level as the Oscar Mayer product.

We also eliminated brown sugar from the test formula due to its having a very minimal impact on the sweetness profile of the turkey, and honey solids were eliminated. Honey solids consist of a 50-50 liquid honey and maltodextrin blend. The solids are small granules that do not offer the same sweetness impact as liquid honey. Since the granules are very light in density, Land O’ Frost’s equipment would tend to have problems blending honey solids into the product formulation on a consistent basis.

The cost per pound comparison between the Land O’ Frost test and control lunchmeats amounted to a \$0.02 per pound increase in the 10-062 formulation. The honey percentage was doubled in the test formula, which caused the increase in formula cost.

Both test and current honey smoked turkey lunchmeats were blindly evaluated by a small group of Land O' Frost management including our Vice President of Operations and Vice President of Marketing. After tasting both samples side by side, all participants unanimously agreed that the test product containing double the amount of honey was the sweeter of the two products. Everyone felt as if we had a new product to potentially market but this needed to be verified through an outside consumer test panel.

## **CHAPTER 5: CONSUMER TESTING PART II**

### **5.1 Introduction**

The first consumer test discussed in Chapter 2 identified Land O' Frost's honey smoked turkey was less preferred compared to its competitors. With that understanding, management believes that we have a dedicated customer base and rather than try to revamp our lunchmeat to be similar to the competitors, we would focus on improving the sweetness profile of our current product. In order to verify our internal conclusion on developing a sweeter tasting honey smoked turkey lunchmeat, the sensory evaluation services of Marjorie Penfield Consultant, Inc. were used. Dr. Penfield decided to use around the same number of panelists and test methods explained in Chapter 2. The next round of consumer test consisted of comparing our existing retail product also known as the control product against a reformulated test product that is thought to have a sweeter flavor profile.

### **5.2 Consumer Test Data 2**

The data from this consumer test was reported using hedonic and intensity scales, a preference question and descriptive answering. For this test, 109 untrained panelists were recruited to participate in this consumer test. The panelist's demographics for this test were similar to the first consumer test. Of the 109 panelists, 59 percent were female and 41 percent were male. The age of the panelists ranged from 18-69 and 66 percent of the panelists ate turkey lunchmeat at least once every two to three weeks. Each panelist received two slices of each of the Land O' Frost test and control lunchmeats that were labeled with a coded number for evaluation. The code numbers concealed the identity of

both products. Each panelist was also given water and crackers to cleanse their palettes between evaluating each sample.

All 109 panelists were asked to provide a descriptive answer for each of the following questions for both test and control lunchmeats: “What do you like about this sample?” and “What would you change to make this sample better?” The data collected from this consumer test was intended to evaluate if our test product was significantly different from our control product and if there was a preference for it over our current honey smoked lunchmeat.

**TABLE 5.1: SUMMARY OF MEANS OF HEDONIC SCORES**

Attribute	Means <sup>a</sup> and ANOVA results <sup>b</sup>			Percent of panelists who liked	
	Test	Control	p-value for differences between means	Test	Control
Overall	6.2A	6.3A	0.6794	76	73
Appearance	6.4A	6.4A	0.6278	72	78
Flavor	6.4A	6.5A	0.4906	80	79
Texture	4.8A	4.6A	0.1472	39	35

<sup>a</sup>hedonic scale—9=like extremely; 8=like very much; 7=like moderately; 6=like slightly; 5= neither like nor dislike; 4=dislike slightly; 3=dislike moderately; 2=dislike very much; 1 = dislike extremely.

<sup>b</sup>Means in a row with like letters do not differ at p-value shown in table.

The panelists were asked to rate how much they liked appearance, flavor, texture and overall likeability between the test and control formulations. Results in Table 5.1 show that 76% of panelists liked the test sample compared to 73% of panelists who liked the control product. The mean score for test and control formulations were similar with like slightly. Both flavor and texture panelists’ ratings for test and control were only separated

by 1% in Table 5.1. All four attribute ratings between the test and control samples were viewed as not significantly different based on the Tukey’s test.

**TABLE 5.2: SUMMARY OF INTENSITY SCORES**

	Means and ANOVA results		
Attribute	Test	Control	p-value for difference between means
Turkey flavor	3.9A	4.1A	0.3298
Sweet	5.4A	5.1A	0.1072
Salty	3.0A	3.2A	0.0646
Honey	4.8A	4.6A	0.4461
Smoke	3.5A	3.2A	0.1286

<sup>a</sup>intensity scales—9=extremely intense; 7=very intense; 5=moderately intense; 3=slightly intense; 1=not at all intense.

<sup>b</sup>Means in a row with like letters do not differ at p-value shown in table.

In Table 5.2, the five attributes mean scores for intensity indicated that there was no significant difference between the test and control honey smoke turkey lunchmeat.

**TABLE 5.3: SUMMARY OF INTENSITY SCORES INCLUDING IDEAL**

	Means and ANOVA results			
Attribute	Ideal	Test	Control	p-value for difference between means
Turkey flavor	5.7A	3.9B	4.1B	<0.0001
Sweet	4.7B	5.3A	5.1A	0.0012
Salty	3.6A	3.0B	3.2B	<0.0001
Honey	4.9A	4.8A	4.6A	0.4674
Smoke	5.0A	3.5B	3.2B	<0.0001

<sup>a</sup>intensity scales—9=extremely intense; 7=very intense; 5=moderately intense; 3=slightly intense; 1=not at all intense.

<sup>b</sup>Means in a row with like letters do not differ at p-value shown in table.

All 109 panelists were asked to rate the intensity of each of the five attributes based on what they considered to be their ideal honey smoked turkey lunchmeat. Those ideal intensity results were then compared to the test and control intensity results as shown in



Table 5.3. Starting with turkey flavor, the panelists' ideal rated significantly higher in intensity than both test and control turkey lunchmeats. In the next category, the test and control intensity scores for sweet were significantly higher in intensity compared to the ideal formulation. The panelists thought that the ideal honey smoked turkey's saltiness should be more intense than test and control formulation. The only attribute that yielded similar intensity ratings for the ideal, test and control was for honey. The panelists thought that the ideal product's honey intensity should be moderate. The largest intensity gap between ideal product and test and control was reflected in the smoke intensity attribute. The ideal honey smoked turkey was rated by the panelists to have a moderate intense smoke flavor profile, yielding a score of 5.0. Both test and control samples were rated as having only a slightly intense smoke profile. Despite formulation differences between the test and control, both samples were cooked using the same smoke cook cycle.

**TABLE 5.4: DISTRIBUTIONS OF HEDONIC SCORES FOR FLAVOR LIKING**

Attribute	Scale (value)	Frequency	
		Test	Control
Flavor	like extremely (9)	2	2
	like very much (8)	27	31
	like moderately (7)	26	31
	like slightly (6)	32	22
	neither like nor dislike (5)	12	10
	dislike slightly (4)	6	9
	dislike moderately (3)	3	4
	dislike very much (2)	1	0
	dislike extremely (1)	0	0
	Percentage who assigned like scores to sample	80	79
	Mean	6.4	6.5
	± standard deviation	1.4	1.4

In Table 5.4, the panelists used a 9-point Hedonic scale to rate the flavor likability of each control and test honey smoked turkey lunchmeat. The percentage who assigned like scores to test and control samples were 80% and 79%, respectively. There were no significant differences between the mean scores or likeable percentages for the flavor of the test and control samples.

**TABLE 5.5: OVERALL PREFERENCE**

PREFERENCE	Test	Control
Sample like best	56	53
Number of concurring responses needed to show preference	66	
p-value for difference	0.8482	

The number of concurring responses needed to show preference is 66 for any given sample in order to be significantly different as illustrated in Table 5.5. The test sample was rated higher than the control sample with 56% of panelists preferring this sample. However, because the preferred percentage was below 66%, the results of the preference test are inconclusive. Based on the data in Table 5.5, neither the test nor control samples can be looked at as significantly preferred over the other.

There were no conclusive results from the second consumer test that suggested one form of honey smoked turkey was significantly preferred over the other. Despite the panelists choosing the test honey turkey in the preference test and overall liking the test version of honey smoked turkey based on the Hedonic test, the margin of preference was

very narrow yielding insignificant results. The data could be interpreted as it being a draw between test and control honey smoked turkey lunchmeats.

### **5.3 Triangle Test**

Panelists receive three coded samples in a triangle test. They are told that two of the samples are the same and that one is different. Panelists are asked to identify the odd sample. This discriminatory testing method is often used in product development studies to determine if various ingredient substitutions or changes in processes will result in adverse product effects. After receiving the second consumer test report and reviewing the data, a triangle test was asked to be performed by Dr. Penfield between the test and control honey smoked turkey lunchmeats to provide a definitive answer on if a difference between the two lunchmeats could be detected. There were a total of 60 panelists chosen for this round of testing. The demographic profile for each of the panelists was not recorded for this test.

The triangle test procedure consisted of half of the panelists receiving the control as the odd sample, while the other half received the test sample as the odd sample. Samples were prepared by stacking 6 slices of the turkey and cutting it into  $\frac{3}{4}$ " squares. Three slices of the stack were placed in a 2-oz portion control cup. Each panelist was given a cup per sample and a stainless steel fork. They were asked to cleanse their palate with water and oyster crackers between samples.

Of the 60 panelists, who completed the triangle test between the control and test honey smoked turkey, 21 correctly identified the odd sample. This is very close to chance (20 correct). The p-value for the result is 0.4397. With 60 panelists to confirm a difference between the two samples, 27 correct answers are needed at  $p=0.05$ . Because there was not

a significant detectable difference between the two samples, a difference in liking would not be expected if the test sample was compared to the competitive products discussed in Chapter 3.

#### **5.4 Comparing Test Data 1 & 2**

The intensity data for sweet, salty and honey attributes listed in Table 3.3 was compared to the same intensity data listed in Table 5.2. The purposes for comparing these two tables were to see if the control product rated the same in two different consumer tests. Land O' Frost's control honey smoked turkey lunchmeat was the same retail product used for both tests. Starting with the salty intensity scores, Table 3.3 had a salty ranking of 4.6 and Table 5.2 had a salty ranking of 3.2. The first consumer test rated the control honey smoked turkey's salty attribute of being just below moderately intense with the second consumer test rating it as only slightly intense. The sweet intensity ratings showed the first consumer test data to rate the control of having a 3.7 in sweet intensity and the second test reflected a rating of 5.1. The last attribute to be compared is the honey intensity. Table 3.3, shows the control product of have a 3.4 rating intensity for honey and Table 5.2 has a 4.6 rating intensity for honey.

With the control product formula being essentially unaltered there may be a few reasons why the results varied between the two tests. The first reason may be due to the control product for both tests were from two different lots. Meaning that there is some variation from day to day in the fat content, sweetness and saltiness of the honey smoked turkey lunchmeat. Secondly, depending on the time of day the tests was given to the panelists could reflect the receptiveness of their taste buds. The last reason may be due to

the panelists being untrained. If the panelists did not properly cleanse their pallet after evaluating every sample, then the results could be slightly skewed.

## CHAPTER VI: CONCLUSION

Both the second consumer test and triangle test revealed that there is no significant difference between the test and control honey smoked turkey lunchmeats. Despite the increased levels of honey and sugar and the decrease in salt, the flavor likability wasn't significant enough in the test sample to be chosen over the control product. Based on the information gathered from the first consumer test, the Hillshire Farm's honey smoked turkey flavor profile set the benchmark of likability and overall sweetness preferred. Land O' Frost's honey smoked turkey flavor profile needs to either be the same or exceed Hillshire Farms sweetness profile to yield a higher preference rating.

A final review of the test and control honey smoke turkey was analyzed by Land O' Frost's New Product Committee. They too thought that the test honey smoked turkey tasted sweeter than the current control product. With the consumer and triangle tests revealing inconclusive differences between the test and control formulas, the company may still move towards revamping the control product with the test product formulation. The thought coming out of the New Product Committee meeting was if the test product could be made at the same price as the control product, a product change would be implemented.

The test formulation could still lead to incremental sales growth because it offers; a significant lower sodium profile than control, marketing slogans can be introduced to the packaging such as "lower sodium", "doubled the honey", "sweeter tasting" or "new and improved". In addition, the test formula's ingredient statement is slightly shorter which could also attract those customers who are looking for a lunchmeat with a cleaner ingredient statement. By Land O' Frost maintaining a strategic business decision of staying

as a low cost producer and being a value brand, price concessions for the honey smoked turkey must be traded off against potential product improvements.

## APPENDIX A

### Consumer Testing: Land O' Frost vs. Competitors

Provided by: Dr. Marjorie Penfield Consultant Inc.

#### Smoked Honey Turkey LOF vs. Oscar Mayer and Hillshire January 19, 2010

#### SAMPLES:

- LOF Premium Honey Smoked Turkey Breast 16 oz. (1 lb) (B2 SELL BY Mar 12 10 LOT 9343T P-501)
- Hillshire Farm Premium Deli Honey Smoked Turkey Breast – Thin Sliced 9 oz.(Mar 15 10 AF2 P-2435)
- Oscar Mayer Deli Fresh Honey Smoked Turkey Breast – Shaved 9 oz. (13MAR2010 431)

Samples (2 slices) were served in 4-oz portion control cups with lids. Panelists were given a stainless steel fork, and spring water and low-sodium oyster crackers for palate cleansing.

#### PANELISTS

The invitation to participate indicated that those who participate should be consumers of turkey luncheon meat Characteristics of the panelists are shown in Table 4.

#### RESULTS

##### Hedonic scales

- There were significant differences among the three samples for all attributes tested with hedonic scales (Table 1).
- For overall liking LOF was liked less than OM which was like less the HS.
- For liking of flavor LOF was liked less than OM which was like less the HS.
- The appearance of LOF was like less than that of OM and HS, which were liked equally.
- The texture of LOF was like less than that of OM and HS, which were liked equally

##### Intensity scales

- Four patterns were found for differences among intensities of the samples for five attributes (Table 2A).



- Sweetness and honey flavor were equally sweet in LOF and OM. Those samples were perceived to have lower levels of the attributes than HS.
- The intensity of turkey flavor was equal in LOF and OM as well as in OM and HS. LOF turkey flavor was less intense than turkey flavor in HS.
- LOF was saltier than OM and HS, which were equally salty.
- OM had a higher smoke level than did LOF and HS, which were equally smoky.

**Comparison of intensities in samples to “ideal” intensities (Table 2B and 2C and Figure 1)**

- Turkey flavor in all samples was perceived to be lower in intensity than the ideal. The deviation for LOF was significantly greater than for OM and HS.
- LOF and OM were significantly less sweet than the ideal while HS was significantly sweeter than the ideal.
- LOF was significantly saltier than the ideal. OM and HS had the same salt level as the ideal.
- LOF and OM had significantly less honey flavor than the ideal while HS was significantly more intense in honey flavor than the ideal
- The intensity of smoke flavor in OM equaled that of the ideal whereas LOF and OM had lower than ideal levels of smoke flavor.

The deviations from the ideal are plotted in Figure 1.

**Panelists were asked to rank the sample according to likelihood of purchase.**

Results are shown in Table 3. Panelists were less likely to purchase LOF than they were to purchase OM or HS.

Panelists were asked to explain their ranking. Those comments start on page 12.

Panelists were asked to explain what they liked about the product and what they would change to make the product better. These comments start on page 17. The comments are arranged according to hedonic scores.

**Additional comments about data**

Distributions of hedonic scores are included in Tables 6A-D. Intensity distributions are in Tables 7A-E.

**Table 1—Summary of means of hedonic scores**

Attribute	Means <sup>a</sup> and ANOVA results <sup>b</sup>				Percent of panelists who liked		
	Land O' Frost	Oscar Mayer	Hillshire	p-value for difference between means	Land O' Frost	Oscar Mayer	Hillshire
Overall	5.6C	6.5B	7.3A	<0.0001	62	77	92
Appearance	5.9B	7.1A	7.4A	<0.0001	64	89	91
Flavor	5.8C	6.4B	7.2A	<0.0001	64	80	91
Texture	4.6B	7.0A	7.5A	<0.0001	36	88	91

<sup>a</sup>hedonic scale—9=like extremely; 8=like very much; 7=like moderately; 6=like slightly; 5= neither like nor dislike; 4=dislike slightly; 3=dislike moderately; 2=dislike very much; 1 = dislike extremely.

<sup>b</sup>Means in a row with like letters do not differ at p-value shown in table.

**Table 2A—Summary of intensity scores**

Attribute	Means and ANOVA results			
	Land O' Frost	Oscar Mayer	Hillshire	p-value for difference between means
Turkey flavor	4.5B	4.9A	5.1A	0.0277
Sweet	3.7B	3.8B	5.7A	<0.0001
Salty	4.6A	3.7B	3.4B	<0.0001
Honey	3.4B	3.6B	5.4A	<0.0001
Smoke	3.4B	5.4A	4.0B	<0.0001

<sup>a</sup>intensity scales—9=extremely intense; 7=very intense; 5=moderately intense; 3=slightly intense; 1=not at all intense.

<sup>b</sup>Means in a row with like letters do not differ at p-value shown in table.

**Table 2B—Summary of intensity scores including ideal scores**

	Means and ANOVA results				
Attribute	ideal	Land O' Frost	Oscar Mayer	Hillshire	p-value for difference between means
Turkey flavor	5.7A	4.5C	4.9B	5.1B	<0.0001
Sweet	4.6B	3.7C	3.8C	5.7A	<0.0001
Salty	3.7B	4.6A	3.7B	3.4B	<0.0001
Honey	4.9B	3.4C	3.6C	5.4A	<0.0001
Smoke	5.3A	3.6B	5.4A	4.0B	<0.0001

<sup>a</sup>intensity scales—9=extremely intense; 7=very intense; 5=moderately intense; 3=slightly intense; 1=not at all intense.

<sup>b</sup>Means in a row with like letters do not differ at p-value shown in table.

**Table 2C—Summary of deviations from ideal scores**

	Means and ANOVA results			
Attribute	Land O' Frost	Oscar Mayer	Hillshire	p-value for difference between means
Turkey flavor	1.2A	0.6B	0.8B	0.0277
Sweet	0.9A	-1.1B	0.8A	<0.0001
Salty	-0.9B	0.2A	0.3A	<0.0001
Honey	1.6A	1.3A	-0.4B	<0.0001
Smoke	1.6B	-0.1A	1.3B	<0.0001

<sup>a</sup>Deviation = score for ideal – score for sample. Positive number means ideal has higher level than sample. Negative number means ideal has lower level than sample.

<sup>b</sup>Means in a row with like letters do not differ at p-value shown in table.

Figure 1—Deviations of scores from scores for the ideal HST. Positive number means ideal has higher level than sample. Negative number means ideal has lower level than sample.

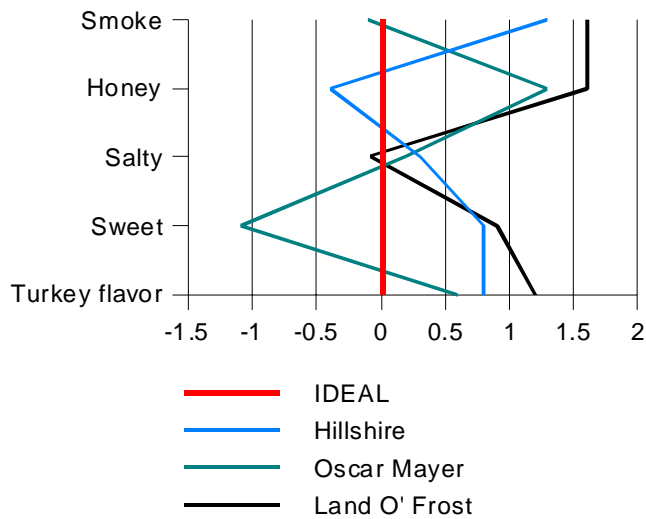


Table 3—Ranking for purchase

PREFERENCE	Land O' Frost	Oscar Mayer	Hillshire
Most likely to buy	11	33	56
Intermediate	25	45	30
Least likely to buy	64	22	14
Rank sum	253A	189B	158B
p-value for difference	<0.0001		

**Table 4—Panel characteristics**

		Frequency
Gender	Male	39
	Female	61
Age	younger than 20	3
	20-29	43
	30-39	15
	40-49	19
	50-59	14
	60-69	6
	70 and older	0
How often do you eat turkey luncheon meat?	never	0
	Once every six months	3
	Once every 2-3 months	11
	Once a month	12
	every 2-3 weeks	24
	once a week	32
	3 times a week	14
	every day	4
How often do you eat smoked turkey luncheon meat?	never	3
	Once every six months	2
	Once every 2-3 months	18
	Once a month	25
	every 2-3 weeks	25
	once a week	21
	3 times a week	4
	every day	2
Several brands of luncheon meats are listed below. Check all that you buy and/or consume  * Kroger (28); Food City (6); Wal-Mart (7); Food Lion (1)	Bar S	3
	Boar's Head	27
	Butterball	39
	Carl Buddig	6
	Hillshire Farms	38
	Hormel	22
	John Morrell	1
	Land O' Frost	22
	Oscar Mayer	46
	Sara Lee	30
	Smithfield	11
	Store brands	35*
	Other	2
	Don't know	15
Don't eat	0	

		Frequency
<p>Several brands of luncheon meats are listed below. Indicate the brand that you buy and/or consume MOST OFTEN</p> <p>**Kroger (10); Wal-Mart (2); Food City (2).</p>	Bar S	1
	Boar's Head	14
	Butterball	3
	Carl Buddig	1
	Hillshire Farms	8
	Hormel	2
	John Morrell	1
	Land O' Frost	7
	Oscar Mayer	22
	Sara Lee	8
	Smithfield	2
	Store brands	17**
	Other	3
	Don't know	11
Don't eat	0	

**Table 6A—Distributions of hedonic scores for overall liking**

Attribute	Scale (value)	Frequency		
		Land O' Frost	Oscar Mayer	Hillshire
Overall	like extremely (9)	1	5	10
	like very much (8)	15	24	41
	like moderately (7)	22	32	28
	like slightly (6)	24	16	13
	neither like nor dislike (5)	8	7	3
	dislike slightly (4)	12	9	5
	dislike moderately (3)	12	5	0
	dislike very much (2)	6	2	0
	dislike extremely (1)	0	0	0
	Percentage who assigned like scores to sample	62	77	92
	Mean	5.6	6.5	7.3
	± standard deviation	1.8	1.6	1.2

**Table 6B—Distributions of hedonic scores for appearance liking**

Attribute	Scale (value)	Frequency		
		Land O' Frost	Oscar Mayer	Hillshire
Appearance	like extremely (9)	4	8	18
	like very much (8)	15	32	41
	like moderately (7)	26	37	21
	like slightly (6)	19	14	9
	neither like nor dislike (5)	8	4	4
	dislike slightly (4)	16	4	6
	dislike moderately (3)	7	0	0
	dislike very much (2)	4	1	1
		dislike extremely (1)	1	0
	Percentage who assigned like scores to sample	64	91	89
	Mean	5.9	7.1	7.4
	± standard deviation	1.9	1.2	1.4

**Table 6C—Distributions of hedonic scores for flavor liking**

Attribute	Scale (value)	Frequency		
		Land O' Frost	Oscar Mayer	Hillshire
Flavor	like extremely (9)	3	5	9
	like very much (8)	14	18	40
	like moderately (7)	26	39	27
	like slightly (6)	21	18	15
	neither like nor dislike (5)	9	4	2
	dislike slightly (4)	12	5	5
	dislike moderately (3)	9	8	1
	dislike very much (2)	6	2	1
	dislike extremely (1)	0	1	0
	Percentage who assigned like scores to sample	64	80	91
	Mean	5.8	6.4	7.2
	± standard deviation	1.8	1.7	1.4

**Table 6D—Distributions of hedonic scores for texture liking**

Attribute	Scale (value)	Frequency			
		Land O' Frost	Oscar Mayer	Hillshire	
Texture	like extremely (9)	4	13	16	
	like very much (8)	9	22	52	
	like moderately (7)	14	37	16	
	like slightly (6)	9	16	7	
	neither like nor dislike (5)	10	4	3	
	dislike slightly (4)	18	5	4	
	dislike moderately (3)	16	2	1	
	dislike very much (2)	9	0	0	
		dislike extremely (1)	11	1	1
		Percentage who assigned like scores to sample	36	88	91
	Mean	4.6	7.0	7.5	
	± standard deviation	2.3	1.5	1.4	



**Table 7A—Distributions of intensity scores for turkey flavor**

Attribute	Scale (value)	Frequency			
		Land O' Frost	Oscar Mayer	Hillshire	Ideal
Turkey flavor	extremely intense(9)	0	2	0	0
	(8)	1	4	3	3
	Very intense (7)	20	15	19	28
	(6)	12	15	18	22
	Moderately intense (5)	25	30	34	39
	(4)	7	10	8	3
	Slightly intense(3)	18	11	8	4
	(2)	6	6	6	0
Not at all intense(1)	11	7	4	1	
	Mean	4.5	4.9	5.1	5.7
	± standard deviation	2.0	1.9	1.7	1.2

**Table 7B—Distributions of intensity scores for sweetness**

Attribute	Scale (value)	Frequency			
		Land O' Frost	Oscar Mayer	Hillshire	Ideal
Sweet	extremely sweet(9)	1	0	1	1
	(8)	1	2	8	1
	Very sweet (7)	6	5	36	10
	(6)	11	11	14	10
	moderately sweet (5)	20	22	22	38
	(4)	10	8	4	9
	Slightly sweet(3)	25	29	11	27
	(2)	8	10	2	3
Not at all sweet(1)	18	13	2	1	
	Mean	3.7	3.8	5.7	4.6
	± standard deviation	1.9	1.8	1.7	1.5

**Table 7C—Distributions of intensity scores for saltiness**

Attribute	Scale (value)	Frequency			
		Land O' Frost	Oscar Mayer	Hillshire	Ideal
Saltiness	extremely salty(9)	3	1	0	0
	(8)	6	0	0	0
	Very salty (7)	16	2	3	4
	(6)	13	11	8	5
	moderately salty (5)	15	16	23	24
	(4)	6	15	6	10
	Slightly salty(3)	23	23	29	42
	(2)	10	17	17	10
	Not at all salty(1)	8	15	14	5
	Mean	4.6	3.5	3.4	3.7
	± standard deviation	2.2	1.7	1.7	1.4

**Table 7D—Distributions of intensity scores for honey flavor**

Attribute	Scale (value)	Frequency			
		Land O' Frost	Oscar Mayer	Hillshire	Ideal
Honey flavor	extremely intense(9)	2	0	1	0
	(8)	1	2	5	4
	Very intense (7)	6	10	26	13
	(6)	6	5	15	19
	moderately intense (5)	13	16	29	31
	(4)	11	11	10	9
	Slightly intense(3)	23	26	9	19
	(2)	15	13	1	4
	Not at all intense(1)	23	17	4	1
	Mean	3.4	3.6	5.4	5.0
	± standard deviation	2.0	1.9	1.7	1.6

**Table 7E—Distributions of intensity scores for smoked flavor**

Attribute	Scale (value)	Frequency			
		Land O' Frost	Oscar Mayer	Hillshire	Ideal
Smoke flavor	extremely intense(9)	1	10	1	0
	(8)	1	9	0	2
	Very intense (7)	11	21	8	18
	(6)	6	8	12	19
	moderately intense (5)	19	18	27	38
	(4)	8	8	10	12
	Slightly intense(3)	21	13	17	10
	(2)	12	6	11	1
	Not at all intense(1)	21	7	14	0
	Mean	3.6	5.4	4.0	5.3
	± standard deviation	3.7	5.4	4.0	1.3

## APPENDIX B

### Consumer Testing: Control Formula vs. Test Formula

Provided by: Dr. Marjorie Penfield Consultant Inc.

#### REPORT Smoked Honey Turkey Control vs. Test

##### SAMPLES:

- Control - LOF Premium Honey Smoked Turkey Breast 16 oz. (1 lb) (A1 SELL BY Jul 02 10 LOT 009BR P-501)
- Test - LOF Premium Honey Smoked Turkey Breast 16 oz. (1 lb) (A6 SELL BY Jul 02 10 LOT 009BR P-501)

Samples (3 slices) were served in 4-oz portion control cups with lids. Panelists were given a stainless steel fork, and spring water and low-sodium oyster crackers for palate cleansing.

##### PANELISTS

The invitation to participate indicated that those who participate should be consumers of turkey luncheon meat Characteristics of the panelists are shown in Table 4.

##### RESULTS

###### Hedonic scales (Table 1 and Tables 6A-6D)

- No significant differences in liking for any of the attributes were found.

###### Intensity scales (Table 2A)

- No significant differences in the intensities of any of the attributes were found.
- It should be noted that the p-value for saltiness was close to 0.05 suggesting a trend toward a higher intensity of salt in the control.

###### Comparison of intensities in samples to “ideal” intensities (Table 2B and 2C)

- The samples had less intense turkey flavor, saltiness, and smoke flavor than the “ideal.”
- The samples had higher sweetness than the “ideal”.
- The samples did not differ from the “ideal” in level of honey flavor.
- The two samples did not differ from each other in size of the deviations from the ideal for any character note.

**Panelists were asked to rank the sample according to preference (Table 3)**

- No preference was shown for either sample.

**Additional comments about data**

- Panel characteristics are summarized in Table 4.

**Table 1—Summary of means of hedonic scores**

Attribute	Means <sup>a</sup> and ANOVA results <sup>b</sup>			Percent of panelists who liked	
	Test	Control	p-value for differences between means	Test	Control
Overall	6.2A	6.3A	0.6794	76	73
Appearance	6.4A	6.4A	0.6278	72	78
Flavor	6.4A	6.5A	0.4906	80	79
Texture	4.8A	4.6A	0.1472	39	35

<sup>a</sup>hedonic scale—9=like extremely; 8=like very much; 7=like moderately; 6=like slightly; 5= neither like nor dislike; 4=dislike slightly; 3=dislike moderately; 2=dislike very much; 1 = dislike extremely.

<sup>b</sup>Means in a row with like letters do not differ at p-value shown in table.

**Table 2A—Summary of intensity scores**

Attribute	Means and ANOVA results		
	Test	Control	p-value for difference between means
Turkey flavor	3.9A	4.1A	0.3298
Sweet	5.4A	5.1A	0.1072
Salty	3.0A	3.2A	0.0646
Honey	4.8A	4.6A	0.4461
Smoke	3.5A	3.2A	0.1286

<sup>a</sup>intensity scales—9=extremely intense, sweet, or salty; 7=very intense, sweet, or salty; 5=moderately intense, sweet, or salty; 3=slightly intense, sweet, or salty; 1=not at all intense, sweet, or salty

<sup>b</sup>Means in a row with like letters do not differ at p-value shown in table.

**Table 2B—Summary of intensity scores including ideal scores**

Attribute	Means and ANOVA results			
	ideal	Test	Control	p-value for difference between means
Turkey flavor	5.7A	3.9B	4.1B	<0.0001
Sweet	4.7B	5.3A	5.1A	0.0012
Salty	3.6A	3.0B	3.2B	<0.0001
Honey	4.9A	4.8A	4.6A	0.4674
Smoke	5.0A	3.5B	3.2B	<0.0001

<sup>a</sup>intensity scales—9=extremely intense, sweet, or salty; 7=very intense, sweet, or salty; 5=moderately intense, sweet, or salty; 3=slightly intense, sweet, or salty; 1=not at all intense, sweet, or salty

<sup>b</sup>Means in a row with like letters do not differ at p-value shown in table.

**Table 2C—Summary of deviations from ideal scores**

Attribute	Means and ANOVA results		
	Test	Control	p-value for difference between means
Turkey flavor	1.76	1.59	0.5091
Sweet	-0.70	-0.39	0.2320
Salty	-0.68	0.40	0.2179
Honey	-0.09	0.24	0.5933
Smoke	1.55	1.84	0.3009

<sup>a</sup>Deviation = score for ideal – score for sample. Positive number means ideal has higher level than sample. Negative number means ideal has lower level than sample.

<sup>b</sup>Means in a row with like letters do not differ at p-value shown in table.

**Table 3—Preference question results.**

PREFERENCE	Test	Control
Sample like best	56	53
Number of concurring responses needed to show preference	66	
p-value for difference	0.8482	

**Table 4—Panel characteristics**

		Percent of judges (Percent of answers)
Gender	Male	41
	Female	59
Age	younger than 20	4
	20-29	49
	30-39	15
	40-49	15
	50-59	14
	60-69	5
	70 and older	0
How often do you eat turkey luncheon meat?	never	0
	Once every six months	1
	Once every 2-3 months	16
	Once a month	17
	every 2-3 weeks	19
	once a week	21
	3 times a week	23
	every day	3
How often do you eat smoked turkey luncheon meat?	never	4
	Once every six months	6
	Once every 2-3 months	26
	Once a month	22
	every 2-3 weeks	18
	once a week	20
	3 times a week	5
	every day	0
Several brands of luncheon meats are listed below. Check all that you buy and/or consume  * Kroger (27); Food City (4); 9)	Bar S	1 (4)
	Boar's Head	9 (25)
	Butterball	10 (28)
	Carl Buddig	4 (10)
	Hillshire Farms	15 (44)
	Hormel	6 (17)
	John Morrell	2(5)
	Land "O Frost	9 (26)
	Oscar mayer	12 (35)
	Sara Lee	9 (27)
	Smithfield	6 (17)
	Store brands	11 (33)
	Other	2 (6)
	Don't know	5 (14)
	Don't eat	0 (0)



		Percent of judges (Percent of answers)
Several brands of luncheon meats are listed below. Indicate the brand that you buy and/or consume MOST OFTEN  **Kroger (17); Wal-Mart (2); Food City (1).	Bar S	1
	Boar's Head	9
	Butterball	8
	Carl Buddig	0
	Hillshire Farms	16
	Hormel	5
	John Morrell	1
	Land "O Frost	5
	Oscar mayer	12
	Sara Lee	10
	Smithfield	4
	Store brands	17
	Other	3
	Don't know	12
	Don't eat	0

**Table 6A—Distributions of hedonic scores for overall liking**

Attribute	Scale (value)	Frequency	
		Test	Control
Overall	like extremely (9)	2	0
	like very much (8)	22	25
	like moderately (7)	26	38
	like slightly (6)	33	17
	neither like nor dislike (5)	10	9
	dislike slightly (4)	11	16
	dislike moderately (3)	2	1
	dislike very much (2)	3	3
	dislike extremely (1)	0	0
		Percentage who assigned like scores to sample	76
	Mean	6.2	6.3
	± standard deviation	1.5	1.6

**Table 6B—Distributions of hedonic scores for appearance liking**

Attribute	Scale (value)	Frequency	
		Test	Control
Appearance	like extremely (9)	3	1
	like very much (8)	28	29
	like moderately (7)	30	32
	like slightly (6)	18	23
	neither like nor dislike (5)	15	9
	dislike slightly (4)	8	8
	dislike moderately (3)	4	5
	dislike very much (2)	3	2
	dislike extremely (1)	0	0
	Percentage who assigned like scores to sample	72	78
	Mean	6.4	6.4
	± standard deviation	1.6	1.5

**Table 6C—Distributions of hedonic scores for flavor liking**

Attribute	Scale (value)	Frequency	
		Test	Control
Flavor	like extremely (9)	2	2
	like very much (8)	27	31
	like moderately (7)	26	31
	like slightly (6)	32	22
	neither like nor dislike (5)	12	10
	dislike slightly (4)	6	9
	dislike moderately (3)	3	4
	dislike very much (2)	1	0
	dislike extremely (1)	0	0
	Percentage who assigned like scores to sample	80	79
	Mean	6.4	6.5
	± standard deviation	1.4	1.4

**Table 6D—Distributions of hedonic scores for texture liking**

Attribute	Scale (value)	Frequency	
		Test	Control
Texture	like extremely (9)	0	0
	like very much (8)	16	15
	like moderately (7)	17	16
	like slightly (6)	10	7
	neither like nor dislike (5)	11	13
	dislike slightly (4)	21	19
	dislike moderately (3)	15	18
	dislike very much (2)	13	12
	dislike extremely (1)	6	9
	Percentage who assigned like scores to sample	40	35
	Mean	4.8	4.6
	± standard deviation	2.2	2.2

**Table 7A—Distributions of intensity scores for turkey flavor**

Attribute	Scale (value)	Frequency		
		Test	Control	Ideal
Turkey flavor	extremely intense(9)	0	1	1
	(8)	1	0	0
	Very intense (7)	5	9	32
	(6)	15	15	21
	Moderately intense (5)	29	28	47
	(4)	11	14	4
	Slightly intense(3)	23	16	3
	(2)	12	14	0
	Not at all intense(1)	13	12	1
	Mean	3.9	4.1	5.7
	± standard deviation	1.8	1.9	1.2

**Table 7B—Distributions of intensity scores for sweetness**

Attribute	Scale (value)	Frequency		
		Test	Control	Ideal
Sweet	extremely sweet(9)	1	0	1
	(8)	0	1	0
	Very sweet (7)	29	27	15
	(6)	24	17	15
	moderately sweet (5)	32	35	32
	(4)	8	5	13
	Slightly sweet(3)	10	14	29
	(2)	3	7	3
Not at all sweet(1)	2	3	1	
	Mean	5.4	5.1	4.7
	± standard deviation	1.5	1.7	1.5

**Table 7C—Distributions of intensity scores for saltiness**

Attribute	Scale (value)	Frequency		
		Test	Control	Ideal
Saltiness	extremely salty(9)	0	0	0
	(8)	1	0	0
	Very salty (7)	1	4	1
	(6)	3	4	6
	moderately salty (5)	14	15	20
	(4)	14	15	23
	Slightly salty(3)	36	35	46
	(2)	15	24	10
Not at all salty(1)	25	12	3	
	Mean	3.0	3.2	3.6
	± standard deviation	1.5	1.5	1.2

**Table 7D—Distributions of intensity scores for honey flavor**

Attribute	Scale (value)	Frequency		
		Test	Control	Ideal
Honey flavor	extremely intense(9)	2	0	2
	(8)	1	1	2
	Very intense (7)	21	21	17
	(6)	17	15	18
	moderately intense (5)	27	28	25
	(4)	9	8	15
	Slightly intense(3)	18	23	26
	(2)	8	7	4
	Not at all intense(1)	6	6	0
	Mean	4.8	4.6	4.9
	± standard deviation	1.9	1.8	1.6

**Table 7E—Distributions of intensity scores for smoked flavor**

Attribute	Scale (value)	Frequency		
		Test	Control	Ideal
Smoke flavor	extremely intense(9)	0	1	2
	(8)	1	0	2
	Very intense (7)	5	3	20
	(6)	14	6	17
	moderately intense (5)	15	22	31
	(4)	10	15	14
	Slightly intense(3)	28	19	14
	(2)	16	16	9
	Not at all intense(1)	20	28	0
	Mean	3.5	3.2	5.0
	± standard deviation	1.9	1.8	1.7

## APPENDIX C

### Honey Smoked Turkey Lunchmeats Used In Consumer Test 1

Hillshire Farm Premium Deli Honey Smoked Turkey Breast



(purchased from Wal Mart in Searcy, AR on 12/08/10)

Oscar Mayer Deli Fresh Honey Smoked Turkey Breast



(Purchased from Wal Mart in Searcy, AR on 12/08/10)

Land O' Frost Premium Smoked Honey Turkey Breast



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