

FINAL PERFORMANCE REPORT

A Final Performance Report must be received within 90 days after the end of the grant agreement. Final Performance Reports are required to fulfill the terms of the grant agreement, and are an important vehicle for sharing research findings with other interested groups and the public. The completed Final Performance Report will be posted to the AMS website.

GRANT INFORMATION

AGREEMENT

AMS Agreement Number:	# 14-FSMIP-FL0003		
Project Title	Measuring the impact of product differentiation in orange juice		
Period of Performance:	Start Date:	10/1/2015	End Date: 9/30/2017
Award Amount:	\$43,700		
Match Amount (if applicable):	\$43,700		

RECIPIENT

Recipient Organization Name:	University of Florida
Recipient's Project Contact	
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PERFORMANCE NARRATIVE

PROJECT BACKGROUND

Provide enough information for the reader to understand the importance or context of the project. This section may draw from the background and justification contained in the approved project proposal.

Orange juice consumption has gradually decreased. The USDA-FAS (Foreign Agricultural Service) data shows that U.S. domestic orange juice consumption per capita was highest in 1998 at 5.8 gallons (tied with 1983). In 2012, per capita consumption of orange juice fell by nearly half to 3.2 gallons (a decrease of 45% since 1998). The industry as a whole, but particularly the Florida industry, is very concerned about this decrease. Possible reasons for the decrease in orange juice consumption include increasing prices, decreasing breakfast consumption (Leidy, 2013), increasing concerns about sugar, and increasing beverage substitutes. Of these, growing attention to sugar content (related to health concerns) of orange juice is a major issue (Buffard 2013). Sugar is one of the top ingredients for consumers concerned about health related issues (IFIC, 2008), and although the sugar content in orange juice is natural (as opposed to added), it is still a concern for consumers (Kim et al, 2012). Given this background, this project sought to provide the struggling industry with marketing information to boost consumer demand for orange juice, as understanding consumer attitudes is vitally important to developing future market strategy.

ACTIVITIES PERFORMED

Address the below sections as they relate to the grant's period of performance.

OBJECTIVES

Provide the approved project's objectives.

#	Objective	Completed?	
		Yes	No*
1	Identify primary shopper purchase behaviors and preferences regarding NFC orange juice and factors leading consumers to avoid purchasing orange juice by segmentation of orange juice purchase trends: 1) I used to purchase orange juice regularly but I stopped, 2) I regularly purchase orange juice but have reduced the amount, 3) I regularly purchase orange juice and the amount of orange juice purchased has not changed, and 4) I did not purchase orange juice but I started to purchase orange juice recently.	Y	
2	Identify how aware primary shoppers are of various attributes of orange juice and how the following attributes influence consumer selection: percent of juice, levels of sugar, calories, pulp, nutritional claims, health claims, brand, promotions, and prices.	Y	
3	Determine willingness to pay (WTP) for NFC orange juices with 100% juice/no added sugar compared to NFC orange juices with less than 100% juice/ half calories and sugar and the effect of information treatment (control: no information, treatment: provide the information about less than 100% juice and added natural sweetener) on consumers' WTP.	Y	
4	By segmentation of consumers in #1 and based on the choice experiments in #3, determine the effect of newly developed less than 100% NFC orange juice on current 100% NFC orange juice consumers and consumers who stopped purchasing NFC orange juice, as well as simulate the potential effect of recently introduced differentiated products on market share, in particular NFC orange juice market.	Y	

*If no is selected for any of the listed objectives, you must expand upon this in the challenges and lessons learned sections.

ACCOMPLISHMENTS

List your accomplishments for this reporting period and indicate how these accomplishments assist in the fulfillment of your project's objective(s), outcome(s), and/or indicator(s). This listing should identify your project's partners and their contributions.

#	Accomplishment	Relevance to Objective, Outcome, and/or Indicator
1		
2		
3		
4		

CHALLENGES AND DEVELOPMENTS

Provide any challenges to the completion of your project or any positive developments outside of the project's original intent that you experienced during this reporting period. If those challenges or developments resulted or will result in corrective actions and/or changes to the project, include those in the space below.

#	Challenges or Developments	Corrective Action and/or Project Change(s)
1	N/A	
2		
3		
4		

LESSONS LEARNED

Provide recommendations or advice that others may use to improve their performance in implementing similar projects.

The subject was complicated by our desire to understand how language about sugar impacted consumer perception of orange juice and the reduced calorie drinks. This made the survey design complicated, and a little difficult for the level of graduate student we hired. Though we ended up with good results and data to continue working on, keeping it simple might have resulted in faster publication.

CONTINUATION AND DISSEMINATION OF RESULTS (IF APPLICABLE)

Describe your plans for continuing the project (sustainability; capacity building) and/or disseminating the project results.

We have plans to continue the dissemination of the project. Our goal continues to be to pursue publication of these results in an academic journal. Although the results have been shared with industry already, we often are asked to continue this discussion and plan to use this work as information for the industry, and also to drive future research.

OUTCOME(S) AND INDICATOR(S)/SUB-INDICATOR(S)

Provide the results of the project outcome(s) and indicator(s) as approved in your application or approved amendment to your application.

OUTCOME AND INDICATOR RESULTS TO DATE

Quantify the overall progress on the outcomes and indicators of your project.

#	Outcome/Indicator	Quantifiable Results
1	Develop an online survey and collect data.	We developed the online survey and collected data from approximately 3,000 participants (2,896 were used in our final analysis). This data was used to achieve the objectives of this grant.
2	Present research results including possible market strategies to the industry and other stakeholders	We presented results of the study to the International Citrus Beverage Conference, reaching over 400 attendees from industry and government who work in the area of citrus beverages. This occurred in September, 2016. We have also discussed results from this survey with the Florida Department of Citrus in personal meetings with their economic and market research and marketing staff.
3	Present and publish	We presented results to the Food Distribution Research Society Annual meetings in September, 2016. A Master's thesis was published based on this research.
4		

DISCUSSION OF RESULTS

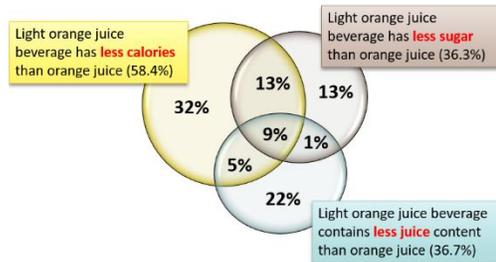
If necessary, include further explanation of the quantifiable results to date.

An online survey was conducted to collect primary data from consumers in order to identify how aware consumers are of various attributes of regular 100% orange juice (ROJ) and light orange juice beverage (LOJ). In addition, we designed the survey to learn how information about percent of juice, levels of sugar, calories, pulp, nutritional claims, health claims, brand, promotions, and prices impacted consumer choices. To achieve this, we designed a survey with a choice experiment and multiple information treatments. Participants were randomly assigned to different information treatment groups where they learned about one or more orange juice characteristics comparing ROJ and LOJ (calories (numeric); half calories; half sugar; half sugar and calories; juice content). This data was used to determine willingness to pay (WTP) for NFC orange juices with 100% juice/no added sugar compared to NFC orange juices with less than 100% juice/ half calories and sugar.

Conditional logit models were used to analyze the choice experiment behavior (other models proved to be

less robust in testing). Additionally, choice proportion and market share were calculated. In addition to the choice experiment, general information was collected on consumption of ROJ and LOJ. Results showed 80% of participants had consumed ROJ in the past 6 months, compared to 28% for LOJ. For a comparison, 72% and 52% reported drinking regular and light soft drinks in the same period, respectively. When purchasing orange juice, participants reported the most important factors included pulp and juice content, followed by amount of sugar. These concerns reinforce the need to understand the demand for LOJ, which has a lower juice content (less desired by consumers) and a lower sugar content (more desired by consumers) and how these influence decisions.

One issue that we wanted to understand is what consumers currently understand about LOJ. The product typically has a lower juice content, a lower sugar content, and some type of sweetener (one major brand uses artificial sweetener and another uses Stevia, a natural sweetener). Results showed few people were aware of the characteristics of the product (shown in the Venn diagram to the right). This is an issue for future research as consumer are purchasing a product that is clearly labelled with this information, but do not seem to be aware of (or considering) the information, even though they report the information to be important to them.



Consumers reacted most strongly to the information treatment with information about juice content. In this case, in all of the choices they were presented with (the choices were always a LOJ, a ROJ, or neither product, with the attributes of price, whether or not the product was from Florida, and sweetener type were varied), no orange juice was selected only 11% of the time. In all other information treatments, including the control, no juice was selected 17-20% of the time. Additionally, the information on juice content was the only information treatment that significantly influenced how important consumers reported price being, with price only being important 44% of the time, compared to 52% across other treatments. This indicates the information on percent of juice is very important to consumers, and drives them towards selecting 100% orange juice more frequently (and potentially at higher prices). This is particularly important as only 1/3 of consumers seemed aware that LOJ contains less than 100% juice, indicating if there is a change in knowledge, there would be a change in behavior in the LOJ market (note that the information is currently on the package, but is typically shown on the back of the package where information about sugar and calories tends to be highlighted on the front). The results from this study enabled us to provide information to the U.S. orange juice industry about the demand for orange juice in relation to information about sugar and juice content. Consumers who did prefer light orange juice beverage were attracted almost equally between a reduction in sugar and a reduction in calories. However, as noted, only 1/3 associated this beverage with being less than 100% orange juice, suggesting if they were to recognize this more, demand for the lighter beverage might decrease. Another finding of our study that matches previous research is that consumers are confused about the difference between added and naturally occurring sugars. This is of particular importance since the new nutrition facts panel is providing information on added sugars now. Although light orange juice beverage did appear to reach different consumers, as the price of 100% orange juice increased relative to the price of light orange juice beverage, the probability of purchasing light orange juice beverage increased, indicating some substitutability.