Student food choice and climate change: a dining hall labeling experiment at UCSB

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Project ;
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Problem

- Dietary choices determine a large proportion of individuals' contribution to greenhouse gas emissions

- Among food choices, animal products especially **red meat**, make a highly disproportionate contribution to GHGE in their production (Eshel and Martin 2006, Koneswaran and Nierenberg 2008, Stehfest et al. 2009) (Goodland and Anhang 2009)

- **Highly processed foods** make a highly disproportionate contribution to GHGE post production.
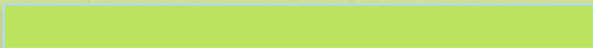
Problem cont.

- **UCSB Dining Services is committed to increasing its sustainability** but wants to do more

- **A key opportunity is changing students diets to reduce their overall GHGE, but a major obstacle is assumed to be student resistance to change.**

Theory

- **Many people are unaware of the contribution of their dietary choices to GHGE** and global warming, and many have called for greater awareness (Carlsson-Kanyama and González 2009, Pachauri 2008).

- **There is some evidence indicating that increased knowledge can result in changed dietary choices** in grocery stores or restaurants that reduce GHGE (Rosenthal 2009), although there is also evidence that labeling does not change behavior, e.g. in labeling content in fast food restaurants in California.
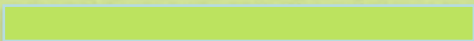
What motivates food choice?

1) A student's concern for her/him self? (nutrition, taste),

2) A student's concern for the well-being of environment and society,

3) A student's concern for his/her peers? (concern to be like those they emulate).

Why the Dining Commons made an ideal place for the study

- Motivators cost/convenience are constant
- Data is constantly being collected on number of meals prepared and served

Hypothesis

- H1**: Posting signs with ranking of foods based on the GHGE of their main ingredients in three UCSB treatment dining halls (DHs) will lead students to change food choices** compared with the control DH. This change in food choice will **result in lower average GHGE.** The change will increase during the 1 week treatment period as a result of the new knowledge acquired by students.

- H2: There will be differences in students' food choice between the 3 treatments
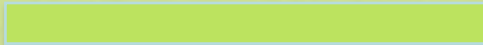
Assumptions

- We assume that results will not be substantially biased by:

    a) communication among students eating in different DHs,

    b) voluntary rotation of students among different DHs,

    c) out side sources of information such as classes at UCSB or news events.

Methods

Hello all Dining Commons Students

For one week, starting next Monday, Professor David Cleveland and his research team of the Environmental Studies Program in collaboration with Residential Dining will be **conducting research** on how students make food choices. During the week foods and beverages will be **labeled** in the Dining Commons at lunch and dinner only. **None of the menus will change**; we are just offering more information so that you can make more informed food choices if you wish.
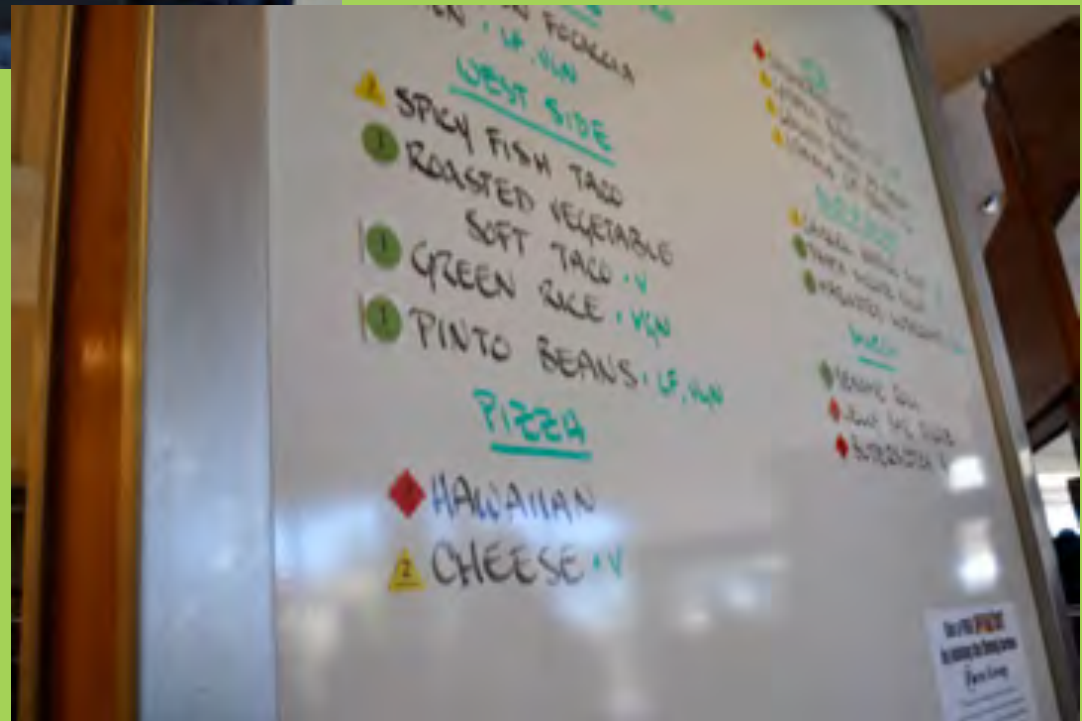
Research assistants and interns will be tabling at the entrances of the dining commons to survey your opinions about food choice during dinner on Thursday before the labels and the Monday after they are taken down. The research assistants and interns will also be tabling Monday, Wednesday, and Friday when the labels are up to give you more information about the labeling system and other information on the food served. Also, fliers with fast facts about food choices will be dispersed though out the tables.

This study is a collaborative work between Residential Dining staff and students and researchers from Environmental Studies. If you have any questions please contact Professor David Cleveland at cleveland@es.ucsb.edu.

UCSB

Labels on menu and explanation of categories posted at DLG entrance

Number Labels printed into signs at DLG
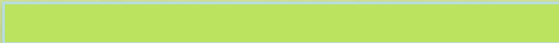

◆ Cheeseburger

⚠ Garden Burger
(Low Fat, Vegan)

⚠ Grilled Swiss
on Wheat (Vegetarian)

⚠ Crinkle Cut Fries
(Vegan)

Posters and Tabling at Portola

Labels at Portola

The Signs – Social Treatment
Environmental Information only – Carrillo

1 Eat More

= Eat More
Foods in this category are generally considered to have the lowest environmental impact (Lowest greenhouse gas emissions, water usage, pollutant emissions, and land degradation). They include fruits, vegetables, leguminous plants, and whole grains.

2 Eat Moderately

= Eat Moderately
Foods in this category should not be consumed as often as those in Category 1. They include white meat, cheese, and other dairy products. These foods have high rates of greenhouse gas emissions, water usage, pollutant emissions, and land degradation.

3 Eat Less

=Eat Less
Foods in this category are generally considered to have the most negative environmental impact. They include highly processed foods, foods high in refined sugar, and red meat. These foods account for the highest rates of greenhouse gas emissions, water usage, pollutant emissions, and land degradation.

Flyer for Environmental Treatment Carrillo

Dining Commons Food Choice

The Numbers

For one week beginning this coming Monday, each meal and food choice in the Dining Commons will be labeled "1", "2" or "3". This numbering system will provide you with more information about the foods served, so you can make more informed choices if you wish. There will be **NO CHANGE** in the menus or food choices in the Dining Commons.

1 — Eat More
Foods in this category are generally considered to have the lowest environmental impact (Lowest greenhouse gas emissions, water usage, pollutant emissions, and land degradation). They include fruits, vegetables, leguminous plants, and whole grains.

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3 — Eat Less
Foods in this category are generally considered to have the most negative environmental impact. They include highly processed foods, foods high in refined sugar, and red meat. These foods account for the highest rates of greenhouse gas emissions, water usage, pollutant emissions, and land degradation.

Fast Facts

The United Nations Food and Agriculture Organization (FAO), estimates that 18% of annual worldwide greenhouse gas (GHG) emissions are attributed to foods in Category 3.[1] Other studies estimate that number could be as high as 51% if emissions from byproducts are included.[2]

By replacing Category 3 meals with Category 2 meals 1 day a week you would reduce greenhouse gas emissions by the same amount as driving 1,160 miles less per year. Replacing #3 meals with #1 meals 1 day a week you would reduce greenhouse gas emissions by the same amount as driving 8,100 miles less per year.[3]

The production of #3 foods requires more than 10 times as much fossil fuel as the production of foods in category #1.[4]

Choosing #1 foods would contribute to freeing up large areas of land that could be reforested, thus reducing CO2 in the atmosphere by pumping carbon into the soil.

You can save 890 gallons of water by choosing #1 meals over #3 meals 1 day a week. (This is the equivalent to filling up your bathtub 22.25 bathtubs per week.) Pumping and distributing water uses fossil fuel.[5]

There are larger amounts of #3 foods and by-products of #3 foods disposed than the other categories, all of which emit high amounts of greenhouse gasses in landfills, incinerators, and waterways.[6]

Foods in category #1 require less cooking, refrigeration, and packaging compared to foods in category #3. This decreases fluorocarbons and energy use, which also decreases emissions of greenhouse gases.[7]

1 Jacobson, M. F. (2009). "Livestock's Long Shadow." Nutrition Action Health Letter 36(5): 2-2
2 Goodland, R. and J. Anhang (2009). "Livestock and Climate Change." World Watch 22(6): 10-19. Pimentel, David and Marcia Pimentel, "Sustainability of Meat-Based and Plant- Based Diets and the Environment." American Journal of Clinical Nutrition, September 2003.
3 Weber, Christopher L. and Matthews, H. Scott. Food-Miles and the Relative Climate Impacts of Food Choices in the United States. Environmental Science Technology, 2008, 42 (10), pp 3508–3513
4 Pimentel, David and Marcia Pimentel, "Sustainability of Meat-Based and Plant- Based Diets and the Environment", American Journal of Clinical Nutrition, Vol. 78, No. 3, September 2003, pp. 660S-663S.
5 Kreith, M., Water Inputs in California Food Production. 1991, Water Education Foundation: Sacramento, CA and Hoekstra A. Y. Chapagain, A. K., Water footprints of nations: Water use by people as a function of their consumption pattern. 2006, Water Resource Management.
6 Goodland, R, Anhang, J. 2009. Livestock and Climate Change. WorldWatch Magazine, Nov/Dec, 2009.
7 Ibid.

The Signs – Personal Treatment
Nutritional Information only – Portola

= Eat More
Foods in this category are generally considered to be **best** for your health. They include fruits, vegetables, leguminous plants, and whole grains. These foods are rich in vitamins, nutrients and fiber, as well as natural sugars, proteins and healthy fats.

= Eat Moderately
Foods in this category are generally considered healthy when consumed in **moderate** amounts. They include white meat, fish, and dairy products. These foods can be rich in protein, vitamins, and nutrients, however many dairy products are also high in saturated fat and cholesterol.

Eat Less
Foods in this category are generally considered **worse** for your health and should make up a smaller portion of your daily caloric intake. They include highly processed foods, red meat, and foods high in sugar and fat content. When consumed too often, these foods can add high levels of sodium, saturated fat, and cholesterol to the diet.

Flyer for Personal Treatment, Portola

Student Food Choice

The Numbers

For one week beginning this coming Monday, each meal and food choice in the Dining Commons will be labeled "1", "2" or "3". This numbering system will provide you with more information about the foods served, so you can make more informed choices if you wish. There will be NO CHANGE in the menus or food choices in the Dining Commons.

1 — Eat More

Foods in this category are generally considered to be best for your health. They include fruits, vegetables, leguminous plants, and whole grains. These foods are rich in vitamins, nutrients and fiber, as well as natural sugars, proteins and healthy fats.

2 — Eat Moderately

Foods in this category are generally considered healthy when consumed in moderate amounts. They include white meat, fish, and dairy products. These foods can be rich in protein, vitamins, and nutrients, however

3 — Eat Less

Foods in this category are generally considered worse for your health and should make up a smaller portion of your daily caloric intake. They include highly processed foods, red meat, and foods high in sugar and fat content. When consumed too often, these

Fast Facts

• Category 1 foods and others rich in fiber make you feel full with fewer calories, resulting in lower calorie intake and less tendency to overeat.

• On average, Americans get less than half the recommended daily quantity of fiber. A plant-based diet (consisting of Category 1 foods) is a great source of fiber, which is absent in animal products.[1]

• Many of the pigments responsible for the color of fruits and veggies are potent antioxidants. These antioxidants may help protect skin cells from damage by free radicals which are especially rampant in the skin due to environmental exposure.[2]

• Eating too many Category 3 foods, adds high amounts of saturated fat and salt to the diet, which increase risk of heart disease, diabetes, stroke, cancer and obesity.[3]

• Diets where Category #1 foods dominate are associated with lower body weight, greater longevity and a lower rate of chronic diseases like diabetes, heart disease, and some cancers.[4]

• The Dietary Guidelines for Americans, the USDA Food Guide Pyramid, and the nutrition guidelines from both the American Heart Association and the American Cancer Society advocate eating a diet high in category #1 foods.[5]

• A healthy diet that is rich in category 1 foods and has a variety of foods along with regular physical activity help most people maintain weight loss and a healthy cardiovascular system.

• The Mediterranean diet, which has long been considered the optimal diet for preventing disease and preserving good health, is characterized by high levels of category #1 foods and moderate levels of category 2 foods.[6]

1 What Diet is Best For Your Skin (2011). Retrieved 15 January, 2011, from http://www.smartskincare.com/nutrition/diet.html
2 Thomas, Pat. Healthy Planet Eating. How lower meat diets can save lives and the planet. Friends Of the Earth. October 2010. 3 ibid.
4 J.A. See, M.M. Gall, & the Executive Health Nutrition Committee. Eating Plants For Health: From Fiber to Phytochemicals. Journal of the American Dietetic Association - September 1997 (Vol. 97, Issue 9, Supplement, Page A60, DOI: 10.1016/S0002-8223(97)00521-X)
5 Sofi F, Abbate R, Gensini F, Casini A. " Accruing evidence on benefits of adherence to the Mediterranean diet on health: an updated systematic review and meta-analysis." The American Journal of Clinical Nutrition. 2010; 92:1189-96.
6 The Nutrition Source: Protein moving closer to center stage (2011). Retrieved January 23, 2011, from http://www.hsph.harvard.edu/nutritionsource/what-should-you-eat/protein-full-story/index.html#protein_disease

The Signs – Peer Treatment
Peer Pressure Information only –DLG

= Eat More
Purchase and consumption of foods in this category are generally increasing the most at University of California's 10 campuses. They include fruits, vegetables, leguminous plants, and whole grains. All of the UC campuses are trying to incorporate more of these foods into their dining commons.

= Eat Moderately
Purchase and consumption of foods in this category are generally **not increasing** at University of California's 10 campuses. They include white meats, cheese and other dairy products. All of the UC campuses are trying to moderate use of these foods.

=Eat Less
Purchase and consumption of foods in this category are generally **decreasing** at University of California's 10 campuses. Foods in this category include red meats, highly processed foods, and foods that are high in fat and sugar. All UC campuses are trying to significantly reduce consumption and purchase of foods in this category.

Student Food Choice

The Numbers

For one week beginning this coming Monday, each meal and food choice in the Dining Commons will be labeled "1", "2" or "3". This numbering system will provide you with more information about the foods served, so you can make more informed choices if you wish. There will be NO CHANGE in the menus or food choices in the Dining Commons.

The Dining Commons does a very good job adjusting the amount and variety of food bought based on student consumption. Your choices directly affect the food the University provides....your choices matter.

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3 Eat Less

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Fast Facts

•All UC's are in the process of increasing the percentage of food purchased that is grown or raised within 100 miles of campus. UCI is at 6.2% of foods purchased; UCD at 10%, UCM 10%, UCSC 20%, UCSD 20%, and UC Berkeley is at 22%![1]

•All packaged foods at Cal Berkeley are now trans-fat free, natural, and organic to reduce category #3 due to student requests.[2]

•About 60-80% of all meals at UC Merced, UC SD, UCI, and UCD contain category #3 foods. Each campus is working to reduce this number.[3]

•UCR is aiming towards ~30% of all food purchased to be sustainable by the year 2020. Sustainable is defined as local and organic to reduce green house gas emissions.[4]

•UC Berkeley had the nations' first certified organic dining hall on a college campus and is working to increase purchases of category #1 foods and decrease purchases of category #3 foods.[5]

•UC Riverside is on track to have only seasonal menus to reduce green house gas emissions from transporting produce out of season.[6]

•Out of the total food purchases at UCSC about 36% are category #3 foods and 21% are category #1 foods. UCSC is trying to reduce the percentage of #3 foods purchased.[7]

•Princeton Review ranked UCLA as #15 for "2010 Best Campus Food Ranking".[8]

•UCSD, UCLA, UCR, UCSC, and UCD participate in Meatless Monday's. This helps lower the consumption of category 3 foods and cuts costs to have more money to spend on other higher quality foods. All campuses offer vegan and vegetarian options that are usually high in category #1 foods.[9]

1 Sierra Rankings.
2 University of California Berkeley Website.
3 Sierra Rankings
4 University of California Riverside Sustainability Report. 2010.
5 Sierra Rankings
6 University of California Riverside Sustainability Report. 2010.
7 University of California Santa Cruz Sustainability Report.
8 Sierra Rankings
9 University of California Davis Website

Example Poster

What are we doing?

For one week beginning this coming Monday, each meal and food choice in the Dining Commons will be labeled "1", "2" or "3". This numbering system will provide you with more information about the foods served, so you can make more informed choices if you wish. There will be **NO CHANGE** in the menus or food choices in the Dining Commons.

1 — Eat More
- Foods considered to be best for your health.
- Includes fruits, vegetables, leguminous plants, and whole grains.
- Rich in vitamins, nutrients and fiber, as well as natural sugars, proteins and healthy fats.

2 — Eat Moderately
- Foods considered healthy when consumed in moderate amounts.
- Includes white meat, fish, and dairy proucts.
- Can be rich in protein, vitamins, and nutrients, but many dairy products are also high in saturated fat and cholesterol.

3 — Eat Less
- Foods considered to be worse for your health and should make up a smaller portion of your daily caloric intake.
- Includes highly processed foods, red meat, and foods high in sugar and fat.
- When consumed too often, these foods can add high levels of sodium, saturated fat, and cholesterol to the diet.

UCSB

Examples of Post Survey Questions

5.   Do you consider yourself to be well-informed about the food you eat? ___Yes;   ___No
If YES, Where to you get most of your information?

6.   Did you learn anything new about food from the information presented in this dining
        commons during the last week? ___Yes;   ___No
If YES, What are the most important things you learned?

7.   Did this information affect your choice of foods in the Dining Commons during the last
        week?
___Yes;   ___No
[**IF YES**] About how many times did you choose a different food because of new
        information?_____

8.   What are the reasons you choose different foods during the last week?
[CIRCLE ONE NUMBER, 0 = not considered, 1= least important, 3 = most important]
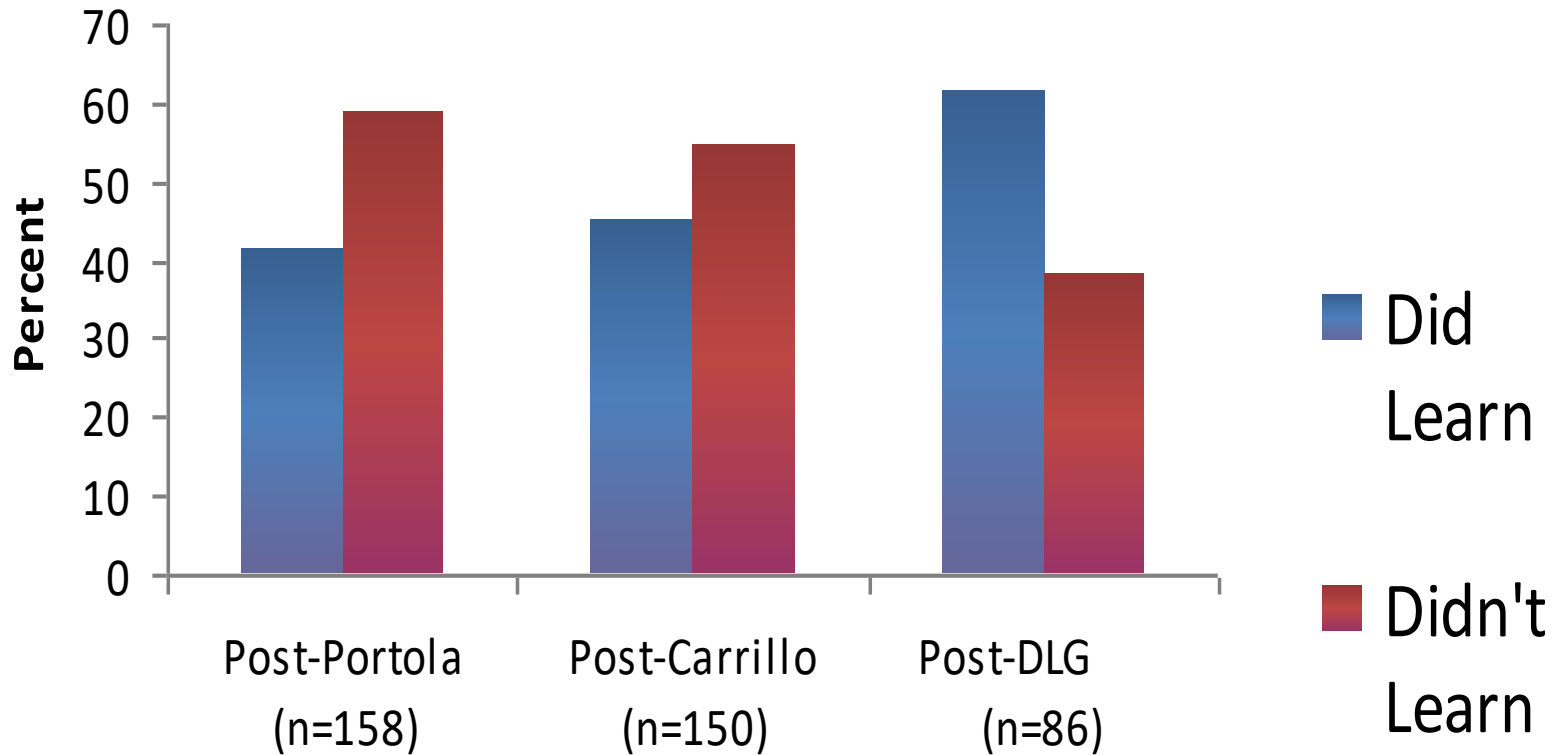

nutrition of the food?
environmental impact of the food?
trends at other UC campuses?

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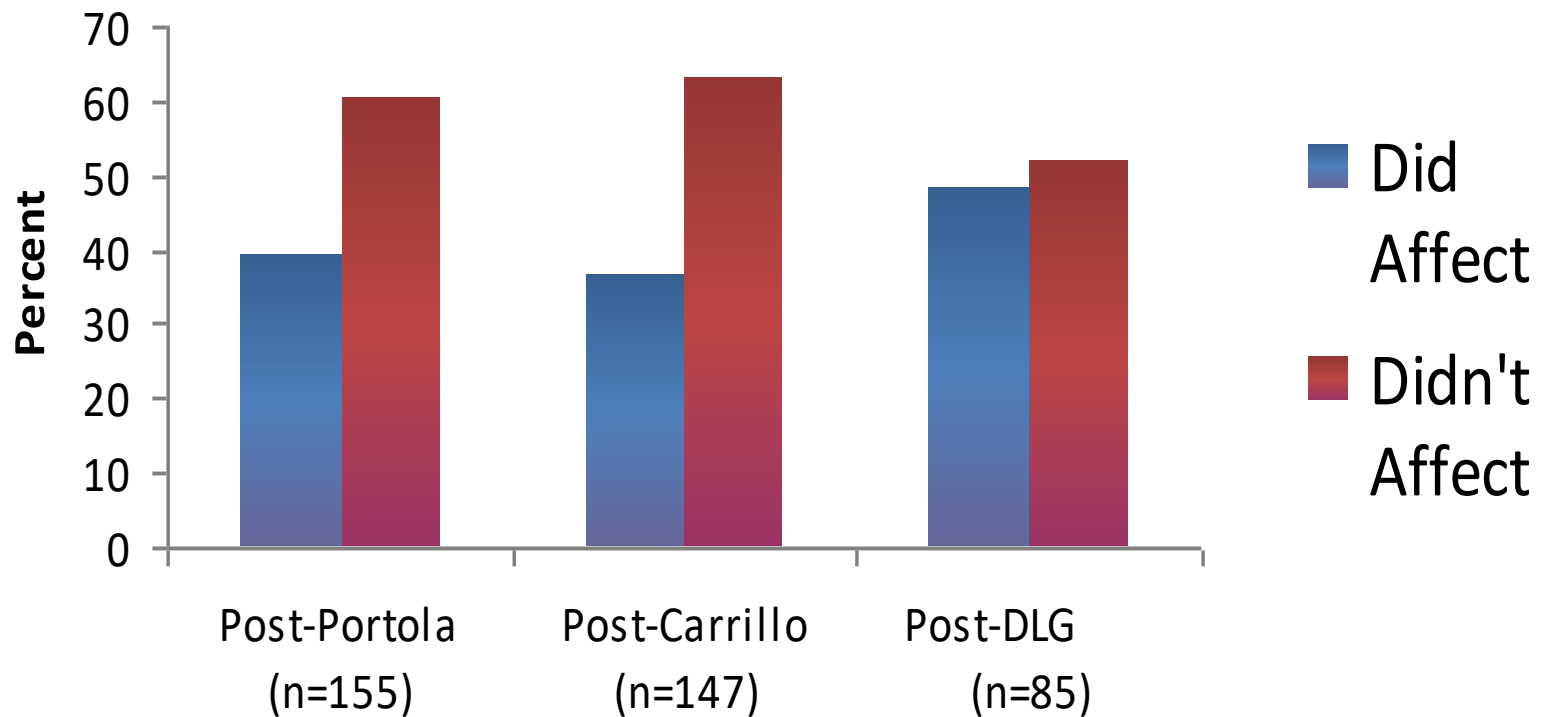*If YES*, What are the most important things you learned?

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Did the information affect choices?
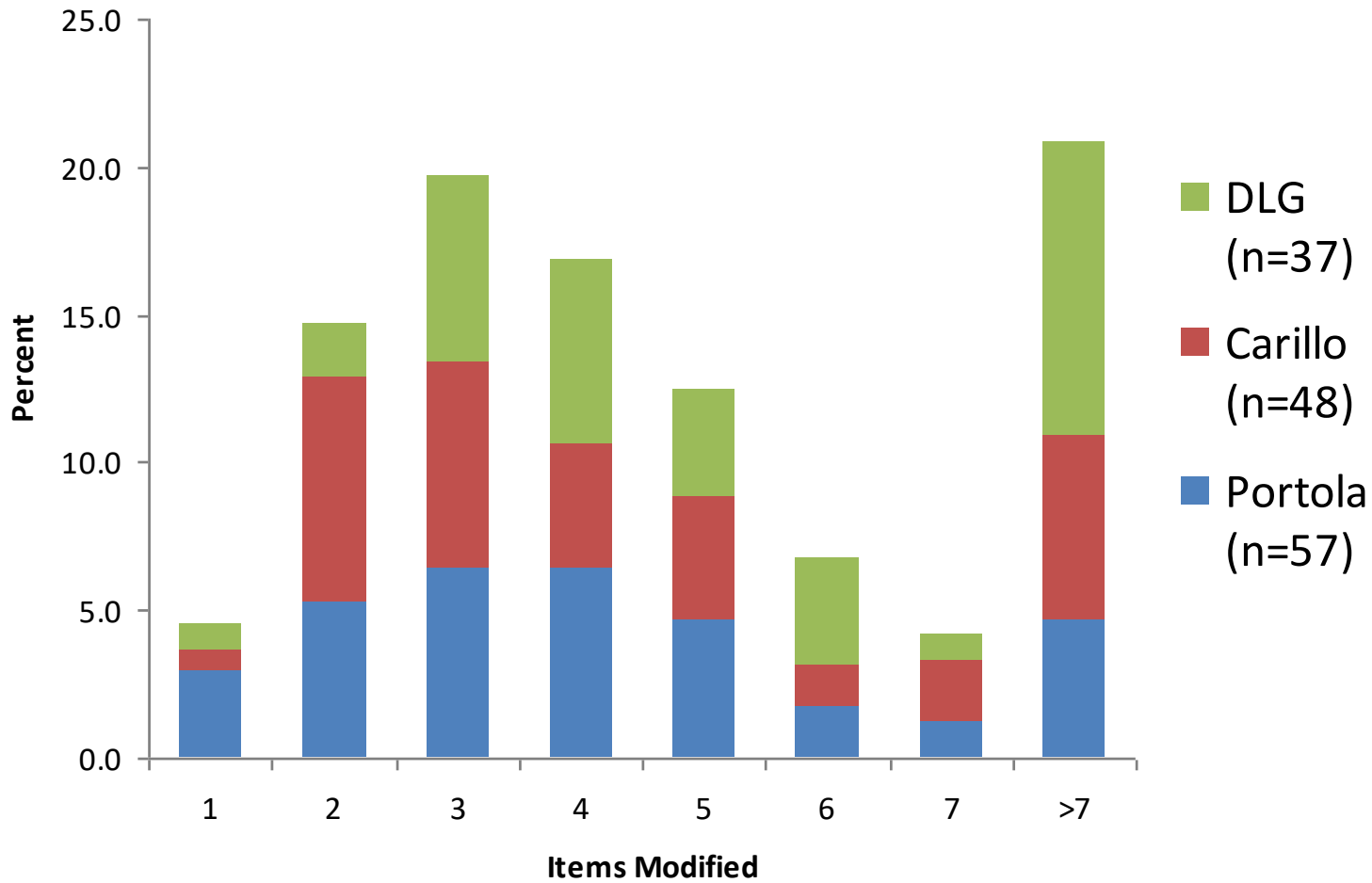
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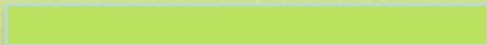*environmental impact of the food?*
trends at other UC campuses?
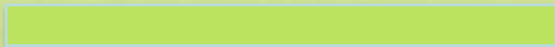
Student/Staff Feedback

- People liked the coloring and the numbering; said it made them think more and helped them make better decisions when deciding between two choices to eat.

- Hamburger chef at DLG said he made only 3 boxes of hamburgers at lunch instead of the usual 5-6

- "I don't care about the environment in terms of food. I am only one person and my food choices wont have any impact on the environment"

- "The environment is very important, I think the labels should stay."

More Feedback

- "even though I personally did not change the foods I ate, I feel like it was a great way to raise awareness of the impact that foods have on the environment and us"

- "labels on healthiness would get my attention more"

The End

Questions?