

Overview

The purpose of our research conducted this fall was to research, analyze, and report the amount of “real food” purchased and the sustainability measures enacted by Carolina Dining Services within the dining halls at UNC, Chapel Hill. Additionally, this research attempted to measure the levels of transparency of the institutions relevant to CDS and its contracted partners (including, but not limited to, Aramark, Sysco, Freshpoint, and Inland Seafood). Our efforts were partnered with Carolina Dining Services, from whom we were advised and from whom we were given the weekly purchasing invoices, and the Real Food Challenge, from whom we received the criteria to measure “real food” and the programming software for our invoice database. Carolina Dining Services has had extreme success in the past in consistently raising their percentage of “real food” with each coming year. With this report, we aspire to facilitate the continuation of that growth with cost-effective recommendations, the identification of shortcomings on both CDS’ side and our own, and provide the university campus with a third party critical analysis of the sustainability of a five week purchasing period during the month of September. While we recognize that this period is not entirely indicative of the dining service’s “real food” sourcing year-round, it does give us a clear snapshot of CDS’ efforts to become a more sustainable enterprise.

What is “Real Food”?

For this audit, we followed criteria of “real food” as defined by the Real Food Challenge, a nationally recognized non-profit that dedicates their mission to shift university investment towards, ideally, triple bottom line agricultural companies as well as farmers with sustainability as an innate moral. Their metric includes the separation into four distinct categories that are all considered as “real food”: Local and Community Based, Ecologically Sound, Fair, and Humanely Raised. The Calculator then further measures the dining service’s progress on a more individualized basis. Each item that is considered as “real food” or not is sectioned off into a “green light,” “yellow light,” or “red light” standard based on the level of certifications the product has. The “green light” standard is the most representative of “real food” and includes certifications deemed by RFC that are the most comprehensive. Products given the “yellow light” standard, although they still count as “real food,” have not acquired as reputable certifications as the “green light” criterion. Finally, the “red light” standard is given to products that are close to being considered as “real food,” but do not have the satisfactory characteristics needed to be fully counted. If an item satisfies either the “green light” or the “yellow light” standard in one of the four categories, the item is considered to be Real Food B. If a product satisfies two or more of the four categories, then the product is considered to be Real Food A, the highest classification that the Real Food Challenge gives to individual food items. With these categorizations, our research can be represented with increased clarity and depth.

Local and Community Based:

The Real Food Challenge defines Local and Community Based food in two different tracks, adhering to the standards mentioned above of “green light” and “yellow light.” To be considered a “green light,” Local and Community Based product, a “producer must be a privately-traded or cooperatively owned business that grosses less than 1% of the industry leader” (Real Food Challenge). If the producer is independently owned, they must have full autonomy in their decision-making as well as produce, process, and distribute their product within 150 miles of the institution. If the vendor is cooperatively owned, it must be a “true co-op” rather than contractors to a larger corporation. As a “yellow light” producer, the above requirements still apply; however, the mileage between the facility and the institution from where the product is served must be within 250 miles.

Fair:

Fair food is also separated into the “green light” and “yellow light” standards. To satisfy the “green light” criteria, a product must acquire one of the following certifications: Ecocert Fair Trade, Fair Food Standards Council Fair Food Program, Fair for Life Certified by IMO, Fair Trade Certified by Fair Labeling Organization, Fair Trade Certified by Fair Trade USA, and Food Justice Certified by Agricultural Justice Project. Additionally, a product can be confirmed as “green light” if the company it comes from has living wages, right to benefits, day of rest and overtime, seniority, equal pay for equal or equivalent work, right to return to seasonal position, and right to freedom of association for ALL employees. To be a “yellow light” product, 50% of the ingredients in the product must meet the above standards or it must be a Fair Trade Certified Ingredient by Fair Trade USA.

Ecologically Sound:

There are many different certifications for Ecologically Sound. While RFC still separates them into “green light” and “yellow light” standards, each of those are separated further by product. Overall products that are “green light” have to be Biodynamic Certified by Demeter, Food Alliance Certified, USDA Organic, Protected Harvest Certification, or Rainforest Alliance Certified. For fish, if the product is Marine Stewardship Council verified or on the Monterey Bay Aquarium Seafood Watch Guide for “Best Choices,” the standard is satisfied. For coffee, the product must be certified as Bird Friendly by the Smithsonian Migratory Bird Center. Additionally, if produce is grown in a farm/garden at the institution and if the research can confirm the use of organic practices, it will be considered under the “green light” standard. For “yellow light” products, they must fall under one of the following: Fair Trade Certified by Fair Trade USA, Monterey Bay Aquarium Seafood Watch Guide “Good Alternatives” Salmon Safe, or Transitional Organic by OIA. For multi-source products, the producer and 50% of the ingredients must meet all of the above criteria.

Humanely Raised:

This category, while equally as important as the other three, only applies to certified eggs, meat, and poultry. To be considered as “green light,” the products must satisfy one of the following: Animal Welfare Approved by Animal Welfare Institute, Biodynamic Certified by Demeter, Global Animal Partnership Steps 4-5+, and Certified Humane by Humane Farm Animal Care. The “yellow light” standard is separated by species. For general certifications, all species can be Certified Organic by USDA-AMS, Food Alliance Certified, or Global Animal Partnership Step 3. For ruminants only, they can be AGA Grassfed, “Process Verified Grassfed” by USDA-AMS, “Never Ever 3 by USDA-FSIS”, or “Naturally Raised” by USDA-AMS. For hogs, they can only be considered “yellow light” if they are Certified Humane by the Humane Farm Animal Care. Finally, for Egg-Layers Only, they can be considered if they are American Human Certified or “Cage-Free” by USDA-AMS.

Disqualifiers:

Even though some companies may satisfy one or more of the categories above, if they also contain a disqualifier characteristic, they automatically do not count towards the percentage of “real food.” This is because the Real Food Challenge and us, as interns, do not want to celebrate companies that still are partaking in harmful practices that contribute to the poor health of animals, the environment, and even to the human population itself. These disqualifiers include if the producer is known to be found guilty of

criminal charges of slave labor or indentured servitude within the previous 10 years or if the producer is known to have been found guilty of, been cited, or settled a case relating to an OSHA, FLSA, or NLRB violation within the last 3 years. They include if a producer is known to be a Concentrated Animal Feeding Operation (CAFO), if the product is likely to contain GMOs, or if the product contains any of the following: Acesulfame-Potassium, Butylated Hydroxyanisole (BHA), Caramel Coloring, Olestra (Olean), Partially Hydrogenated Oil (trans-fats), Propyl Gallate, rGBH/rBST, Saccharine, sodium nitrate additive, sodium nitrite additive, or dyes: Red #3, Yellow #5, Yellow #6, or Blue #3.

Why Real Food?

Real food is more than just a percentage on paper. It affects lives of both human and animal, of both producer and consumer, and of both people and planet. The shift from conventionally grown and raised food to “real food” will not only bring finances back to the working class and local economies, but also ensure that human lives are not being taken advantage of and the planet is being protected to the best of our ability.

Why Local?

Local food hits on many different aspects of sustainability. Real Food Challenge’s reasoning behind local food includes:

“These foods can be traced to nearby farms and businesses that are locally owned and operated. Sourcing these foods supports the local economy by keeping money in the community and builds community relations. The food travels fewer miles to reach consumers. The food is seasonal, and when it is fresh, it often has a higher nutrient content. “

But that is just a synopsis of the impact local food makes when purchased. By buying food within a community, the money goes straight back to the people that live in it. A person is directly supporting their neighbor and their neighbor’s product. Additionally, when purchasing local food, a customer is reducing the “food miles” a product embarks on its transport from one place to another. This both reduces the resources needed to transport a product and allows the product to not require as many preservatives and/or be harvested prior to peak nutritional value.

Why Fair?

Fair food standards are perhaps the most forgotten aspect of agricultural sustainability on the “real food” scale. Nevertheless, it is the sole category that is exclusively related to social welfare and equity. It surpasses the idea of profit as the only priority and assures that every human worker is taken care of on a financial and a personal basis. Around 20 million people work in the food system in the United States alone (this does not include imported goods). Fair food aids to address that all of those workers are given access to their rights without fear of being laid off, given high enough wages to live on, and are not being retroactively treated as if they were a slave. Here is Real Food Challenge’s reasoning behind Fair food:

“Individuals involved in food production, distribution, preparation--and other parts of the food system—work in safe and fair conditions; receive a living wage; are ensured the right to organize and the right to a grievance process; and have equal opportunity for employment. Fair food builds community capacity and ensures and promotes socially just practices in the food system.”

Why Ecologically Sound?

Ecologically Sound products are directed towards environmental stewardship and human health. The effect of pesticides and herbicides on the human population in large quantities is not yet known. However, farm workers around the world that are in direct contact with them have shown that there are serious consequences to their own health and their children's. Pesticides and other toxins used in agricultural practices also affect the health of nearby ecosystems including water resources and the atmosphere. Ecologically Sound products assert that the effort to have a cleaner and more sustainable world is necessary. Real Food Challenge's reasoning for Ecologically Sound food is as follows:

"Farms, businesses, and other operations involved with food production practice environmental stewardship that conserves biodiversity and preserves natural resources, including energy, wildlife, water, air, and soil. Production practices should minimize toxic substances as well as direct and indirect petroleum inputs."

Why Humane?

Animal rights are not the only reason why raising something humanely is important. Although welfare is an aspect of food sustainability that is the first priority for some activists, many other benefits come into play. The use of medication in animals has been a long-standing controversy in the food system for quite some time. It can lead to antibiotic resistance in humans and unnatural life patterns for the animal itself. Here is Real Food Challenge's reasoning for Humanely Raised food:

"Animals can express natural behavior in a low-stress environment and are raised with no hormones or unnecessary medication."

Why Here at UNC?

The overall community of the Chapel Hill/Carrboro area is very supportive of "real food." With places such as Weaver Street Market and the Carrboro Farmers' Market (which is the oldest Farmers' Market in the area), it is not difficult to observe the movement towards "real food" in progress. Other organizations that are doing great work in terms of sustainable agriculture in the community and that are creating a hub of innovation in the food movement include Carrboro Greenspace, a non-profit that encourages a "do-it-yourself" lifestyle, Triangle University Food Studies, an alliance of Duke University, UNC-CH, and NC State to discuss sustainable food practices, and Vimala's Curryblossom Café, a local restaurant that both supports the community through purchasing "real" ingredients but also holds events to discuss the current status of the movement. But the community isn't the only part of Chapel Hill that supports the ideas of sustainable agriculture. Many student groups on campus also work towards providing more "real food" to the campus and to the community. Alianza is a group on campus that works toward better conditions for Latino workers in North Carolina; FLO Foods works to shift investment in the university's dining hall to more "real food" and interacts closely with nearby farmers to hold a farmers' market on campus every semester; HOPE Gardens has its own urban farm close to campus and provides food to nearby members of the community whom are under privileged; and the Campus Community Garden is a garden within walking distance to campus that holds a CSA program to members of the community.

These are just some of the groups on campus that prove that this university is perfect to facilitate this type

of change. There is a student desire and it is strong. We are in a unique position as a large university in the Southeast region of the United States to enact extremely influential and incredible change. We are in a unique position to be a leader in the movement towards a more sustainable food system. The current system will not last into the future, so why not be at the forefront of the movement? We know that Carolina Dining Services is already making incredible strides towards our mutual goals concerning “real food” and we hope that they will continue to grow and prove to the rest of the country that UNC-CH is a leader in the food movement.

Methodology

Real Food Challenge provided us with a comprehensive tracking program that would allow us to input information such as product codes, vendor names, cost, and product type into a computer database called the Real Food Calculator. With this digital organization, and the metrics and criteria also provided from RFC, we were able to compute the total percentage of “real food” in both Lenoir and Ram’s Head and cross-compare this year’s results to both the previous year’s and other campus’. Finally, these percentages led us to compile all relevant data for future recommendations on how to increase that total even further in future years.

Invoices

At the beginning of the semester, we were given invoices that showed different aspects of the products sourced in the dining halls. At first, we only received the weeks allotted to one dining hall, but as the semester progressed we were given the invoices for the other. Each week contained around 30-45 invoices from various vendors including Sysco, Firsthand Foods, and Tropical Fruit and Nut Co. The individual invoice would contain information such as the product code, the product name, and the cost of each product. Due to the confidentiality of Aramark Corporate, the unit price and quantity purchased was blacked out and we were not given access to that particular information. This was a change from year’s prior.

The Calculator

The Calculator itself was a major change from last year. Instead of working out of Microsoft Excel, the Real Food Challenge developed an entire computer program out of their own website. While this program was much more presentable than the Excel process, there were a few obstacles that we as interns had to overcome. These will be mentioned in a future section. To input data into the system, we would enter the information for each individual line item. The biggest benefit to this change was that the system would memorize each product by its code. This meant that once we entered a repeated product code (which was frequent), the computer would input the rest of the information needed. Additionally, the entire database of products could be organized in order of cost, locality, humaneness, fairness, ecologically soundness, product name, product type, product code, and vendor name. The intention of this attribute was to ease the input of data, as well as the output in the forming of trends.

The Calculator measures progress by setting the total budget as a final goal. At the beginning of the process, the worker enters in the total budget spent during that allotted month. As products are entered, a percentage is shown indicating the progress made towards 100% of the total finances entered. This gave us a steady identifier on where we were in terms of finishing. Once that 100% was hit, the Calculator

gave us access to a separate page entitled “Reports”. This page contained generated visuals of our total “real food” percentage, “real food” broken down by category (Local and Community Based, Humane, Fair, and Ecologically Sound), and “real food” broken down by product type (meat, eggs, dairy, produce, etc.). This gave us an overview of the progress Carolina Dining Services has made in the past year and where areas of improvement lied.

Results

Table 1. Real Food as Percentage of Total Food Purchased by CDS during 5 Weeks in Fall 2013

Real Food versus Conventional Food	%-age of Total Food Purchased, Fall 2013
Conventional Food	76.86%
Real Food	23.14%

Table 2. Real Food Purchases by Category as Percentage of Total Food Purchased by CDS, Fall 2013

Table 3. Real Food Purchases Breakdown by RF A and RF B by Category, Fall 2013

Table 4. Real Food Purchases By Category in Order of Expenditure

Table 5. Real Food Purchases Comparison between 2012 and Fall 2013 Purchasing Periods

Analysis

This year's calculator results show a continued increase in Real Food Purchases. The total percentage for the Fall 2013 audit was made up of 4.7% Real Food A and 18.5% Real Food B. This means that 4.7% of all food purchases were considered "real" in two or more categories, while the remaining 18.5% of Real Food was only "real" in one category. Figure 1 shows the percentage of Real Food purchased between 2010 and 2013, and Figure 2 breaks down the percentage of Real Food by category.

Figure 1: Real Food Percentages

Observations by Category

As Figure 3 shows there were a variety of changes in Real Food purchases in comparison with the previous three years of data collection. Increases of Real Food were seen in the categories of poultry, dairy, eggs, and fish/seafood, with purchases of dairy having the most dramatic increase. Decreases were seen in meat and produce purchases as well as a complete loss in the “real” coffee/tea category. Looking closer at each category’s contribution towards the total Real Food percentage, the gains made in dairy for the Fall 2013 audit did not make up for the losses in coffee/tea, meat, and produce, as evidenced in figure 4.

Meat

A fluctuation in purchases of “real” meat is evidenced in figure 3. Despite the initial observation of a decrease in “real” meat purchases in comparison to the 2012 audit, the “real” meat purchases are relatively consistent with audits from 2010 and 2011. This could suggest that the 2012 audit was an unusually large purchase of meat, and therefore a deviation from the average. After comparing data between the 2012 Calculator and Fall 2013 Calculator, it is clear that there was a shift in vendors from Grayson Natural Farms to Firsthand Foods. In 2012, Grayson was making up 88.1% of the “real” meat percentage, whereas in Fall 2013, this percentage was reduced to 51.6%, with Firsthand Foods sourcing the remaining 48.4%.

Poultry

Since 2012, the poultry category experienced an increase in percentage points as “real” food. Examining the data from the Fall 2013 audit in comparison to the 2012 audit, it is noted that there were changes in product sourcing. In 2012, 95.1% of the “real” poultry was sourced from Albert’s Organics, which sells Organic and Certified Humane chickens. However, in this semester’s audit, “real” poultry was almost entirely sourced (94.8%) from Inland Seafood. This vendor had Certified Humane chicken from Springer Mountain Farms. Yet, with the farm’s distance (300+ miles) and the lack of any organic standards, this product only fit one of the Real Food criteria, limiting it to a Real Food B labeling. So, while there was an increase in the percentage of “real” poultry, there was a lowering of standards of all “real” poultry (see table 3, row 4 for more details).

Dairy

Purchases of “real” dairy increased significantly as shown in figure 4. The increase was influenced by the shift from PET Milk to Maola Milk & Ice Cream Company, which qualifies as local and was a recommendation from the 2012 Internship team.

In 2012, the products that were considered “real” dairy included Organic Stonyfield Yogurt and Local Hoop Cheese, which were sourced from Albert’s Organics/Sysco and Freshpoint. This year, Maola alone

accounted for 4.4% of the total budget, and, because it is considered local, accounted for 4.4% of the total real food percentage. In Fall 2013, with the continued purchase of Organic Yogurt and Local Hoop Cheese, the purchase of Maola products increased the percentage from 18% to 56.5% “real” dairy (see Table 3).

Coffee/Tea

Between the 2012 audit and 2013 audit there was a drastic decline in “real” coffee/tea (figure 4). This was due to an unintentional change in purchasing, a miscommunication during the hiring of a new culinary staff member. While this was unintentional, it did have a large impact on the total percentage of Real Food. In the 2012 audit 65% of the coffee/tea purchased was considered Real Food, which was largely based on the purchase of Starbucks Fair Trade coffee. If this same percentage of Fair Trade coffee were purchased during the Fall 2013 audit than the total percentage of Real Food would increase by 0.55%.

Produce

In the Fall 2013 audit there was also an observable decrease in “real” produce. Whether this audit is the anomaly or the 2012 audit has yet to be determined and will be cleared up in further reports, however as of now our produce percentage lies around the same as 2011 and around 11% lower than September, 2012. By comparing last year’s invoice spreadsheet to this year’s, it seems that the decrease could stem from the absence of Albert’s Organics in the purchasing of produce. In 2012, Albert’s was a large presence in sourcing for the real food produce category; however, this year’s period seems to be more reliant on Freshpoint to make up the ground. This is quite interesting because Albert’s Organics attributed exclusively to the Ecologically Sound category, while Freshpoint shifts that attribution to the Local and Community Based. As we see in Figure 3 and Figure 4, this shift did not continue the gains made in 2012.

Recommendations

We are happy to report that the overall percentage of real food purchases increased since last year's report. We congratulate Carolina Dining Services on their progress and highlight some sources of success this semester. However, we feel the real food percentage should continue to increase as long as comparable options are available to CDS. As we outline some recommendations to direct these purchases, we keep in mind that a top priority when selecting suppliers is the reliability of a good. CDS is a business responsible for feeding thousands of students on meal plans, so they seek to work with organized, consistent suppliers with enough products to meet our university's demand. In making decisions we could not estimate the extra cost of substitutions because we do not have access to the unit prices of goods for this period's invoices; that said, we suggest goods to replace existing purchases, and we provide estimates on the substitutes' effect on the real food percentage.

To begin, we seek to build upon the areas we already see as strengths in CDS purchasing.

1. The majority of our real food classifies as such because it is local. CDS makes local purchases in the dairy, meat, and produce categories, making it one of the most diverse approaches to real food. While we have acknowledged seasonal availability of produce can be a hindrance to real food purchases because many foods can only be locally grown in August-September period, instead of backing away from the

challenge posed by off-season months, we encourage CDS to take advantage of seasonality. The amount of real food produce should no longer decrease but increase to seize the plentiful opportunities North Carolina agriculture provides. This suggestion proposes it may be beneficial to look at the real food percentage in an annualized view so that harvesting months with higher results may make up for out-of-season lower real food percentages.

2. This year, to our knowledge, CDS helped out Firsthand Foods by purchasing some excess meat that otherwise might have gone to waste. We applaud such efforts as they really display the good communication between businesses; additionally we are excited that the meat from Firsthand Foods qualifies as Real Food A, both local and humane, and it provides around 22% of meat purchases. Changing a few products in the meat category has a much greater impact than changing the same number of goods in other fields because of the high prices of meat. Additionally, meat is available and needs to be purchased year-round. We recommend increasing purchases from Jennifer Curtis of Firsthand Foods so that “real” meat makes up more than 21% of meat purchases. Curtis has informed us that Firsthand has the capacity to supply two or three times the amount of sausage that they currently supply weekly to Carolina. Additionally they could provide more of a shoulder cut from which a homemade bar-be-que dish could be made.

3. Similarly, CDS currently purchases organic yogurt from Stonyfield. We strongly recommend the expansion of Stonyfield purchases. Evidently, we already have a reliable supplier and students will always demand yogurt in the dining halls. In 2012, we were purchasing both French Vanilla and Strawberry Yoghurt from Stonyfield. Since then, we have scaled our purchasing down to just one of those two: French Vanilla. From the high demand of students to the proven reliability of this vendor, we believe that the return to the increased purchasing of this product is one of the best routes CDS can take to increase their real food percentage, especially in non harvest months.

4. CDS has had a lot of success in their marketing of sustainability in the dining halls. Green Theme Meals have caught the attention of many students as have the increased labeling on the TV screens and at the serving stations. To expand on this marketing campaign for the real food movement, we make a recommendation of our own: Healthy Hump Day Breakfast. Each Wednesday, to help get students to the end of the week, we implore them to start their days fresh local and organic. At breakfast, Lenoir and Rams Head dining halls could serve organic yogurt, humane/local sausage and breakfast meat, local pancakes (made from local flour, likely from Lindley Mills, who CDS has been known to purchase from), organic berries, and organic fruit juice. A real food breakfast sounds delicious and may invite more students to consider healthy habits, reminding them the importance of breakfast and sustainable foods. The items listed are just some suggestions that we see as realistic for perhaps once-a-week consumption and we see as a way to begin implementing some real food improvements in a practical, tangible way.

We continue to remain enthusiastic about the progress Carolina Dining Services has made towards real food. Again, we applaud the aforementioned successes and recommend ways in which we can build on those positives. However, we must never feel complacent towards our accomplishments in the real food movement, and we must not settle for “enough.” Despite the progress reported, several concerns caught our attention as well. Now we suggest how we may address these concerns.

1. As mentioned during our analysis, last year CDS purchased fair trade Starbucks coffee. From what we've been told was an accidental reason, CDS discontinued this purchase this year, leaving us with 0% of purchases qualified as "fair trade." One of our most significant recommendations is to buy Starbucks fair trade coffee again. To take this decision one step further though, we also suggest switching to fair trade or organic tea as well. There are plenty of fair and/or organic tea options on the market. If all of the dining hall's coffee and tea became real food, the total Real Food percentage would increase by 0.85%.

2. The lack of fair trade coffee may have been a mistake, but the fact that it was even possible to zero out the fair trade category with one purchasing shift was disconcerting. We don't want to see a lack of diversity/ tightening breadth in our purchasing within categories. One supplier shouldn't make up an entire category; it makes the real food system prone to lapses should that vendor fail. To strengthen the real food system we must look to source from all angles.

We suggest a few viable products that would draw from a variety of vendors.

1. Annie's organics has the ability to provide the black bean and other veggie burgers we demand and the products are vegan as well as vegetarian, expanding the consumer base. This was a recommendation from the 2012 intern team and was found to be comparable in pricing to the current veggie burger option served in both Lenoir and Ram's Head: Morning Star. This addition would add to the Ecologically Sound category, allow vegans to eat the veggie burgers as well (expanding the options for restricted eaters and adding to the marketing of CDS' effort to provide for all), and change the real food percentage, as calculated by both the 2012 and 2013 intern team, by around .60%. This increase by just one product with similar pricing is huge.

2. We would like to look into any options for organic deli meats as well because this is the one portion of meat that has perhaps so far has slowed the expansion of real meat. While local deli meat is very expensive and most likely unable to meet our demand, we believe more research on a larger scale organic deli meat producer, such as Applegate, is worthwhile. Meat is a huge source of our purchasing in the dining halls and it is unrealistic for us to believe that a large university campus would forgo the heavy consumption of it. By reducing the impact of all types of meat, fresh and processed, we can address the issue across many fields.

3. Tofu is a wonderful example of something that can be changed easily and continually impact the real food percentage all year long. CDS has mentioned that they are planning to add fresh tofu to the salad bar in the Spring 2013 semester to serve alongside the bacon, eggs, and also newly added grilled chicken. With this expansion of purchasing of this product, we believe that the switch to organic tofu would make a large impact on the percentage. While we can't foresee as of now how big that impact will be considering CDS has not piloted their tofu addition just yet, we believe that even the addition of a non-GMO product like soy that also falls under the Ecologically Sound category could be huge for the sustainability marketing of CDS. A brand of organic tofu that is widely distributed (even to department stores such as Target) that is relatively cheap and has been voted the "Best Tofu in America" is Nasoya Tofu. We believe that this product could serve as a comparable swap in pricing to the tofu currently purchased from Sysco.

4. Finally, the last recommendation we have for CDS in terms of new vendors and items includes the

addition of Foster Caviness as a produce distributor. They are GAP certified and only serve to North Carolina, ensuring that all of their produce supplied is local. They seem as a perfect addition to CDS to diversify its produce intake and make up for the losses in real produce from last year to this year.

SOURCES OF ERROR

As to be expected for any experiment or systematic process, imprecision and inaccuracies in the data were derived from human and systematic error. The total percent error of this semester's calculator equals 0.46%, determined from the difference between the expected total budget and calculated total budget. The expected total budget was calculated by adding the total expenditures from all ten invoice packets. The calculated total budget was the sum of all items after each entry of each invoice was input into the calculator. In other words, after completely entering the invoices, we were \$3,702 short of the expected total budget.

A. Human Error

Human error was caused by any typos during data entry. Though it would seem easy enough to read a number then type it into the blank, after hours of repetitive data entry, there were numerous occasions where a number was mistyped. Sometimes we were able to identify and correct these entries; however, the remaining typos make up a large portion of our error. Input error could have been the result of fatigue or of distraction. To improve, each intern would have needed to show up to each calculating session well rested and ready to focus. This in itself could pose a challenge because of the busy, taxing lifestyle of a UNC-CH student. During calculation, at certain specified time intervals during input, the interns should have stood up and moved around to make themselves more alert and attentive to detail. Similarly, the work environment itself could have entertained fewer distractions. While playing music created a happier work environment, conversation often strayed away from the calculator. In the future, interns should set short work-breaks to talk about any topic of their choice, however, when working, should concentrate on the data.

Additionally, to minimize error we should improve documentation. As we input invoice data into the calculator online, we worked line-by-line and invoice-by-invoice. After all items on a specific invoice were accounted for, the intern was supposed to check off the invoice number on the master sheet that was provided each week. Sometimes though, if we got in a rhythm on the computer, we opted to continue working through the detailed invoices and, just before we ended work for the day, checked off the completed invoice numbers on the master sheet all at once. There was, however, one major occasion when an intern forgot to document on the master sheet which invoices were completely entered into the calculator. As a result, the information from about fifteen invoices was input into the system twice. The following week, the group attempted to estimate the remaining money that needed to be input into the calculator to reach our total budget. With the duplicate entries raising the current working total, the value we approximated far exceeded our goal budget. It took a few hours for us to determine what happened and why the values of our projected total and actual total did not match up. Fortunately, we were able to locate the error and remove the duplicate entries, but this error was a definite setback to the progress of the calculator project.

In the future we suggest that interns agree on a very specific methodology--perhaps agree on marking the completion of an invoice on the master sheet immediately after entry--so that there is a smaller likelihood that such errors occur. Additionally, when we marked on the invoices for reference, instead of writing

directly on the invoice (so that we have to check every page to find the note again), we should have used sticky notes as tabs to more quickly refer back to highlighted material. Also, as much as possible, if we come across items which we have questions or notes on (ie. “double check organic standards,” “how far away is farm?”), we should address the issue immediately. Because a week would pass between each of the team’s regular meetings, it was easy to forget to return to a specific question or to understand exactly what we meant by the abbreviated note. In the future, we should emphasize the importance of making clarifications as soon as possible. Proper documentation is essential for the organization of a data-based group project, especially when working on a long time-frame that challenges the team to manage a greater aggregation of material.

B. Calculator Error

Next, we address calculator error. The 2013 Calculator group, as mentioned previously, was the first set of interns to work with the online calculator system set up by the Real Food Challenge. In this regard, the interns sometimes acted as the guinea pigs, troubleshooting errors in the system at every step of the way. The setbacks during the project, in terms of how we spent our time and whether or not our goals were met, are addressed in the next section. Here, we detail the effect of calculator error on the hard data of the project (the 0.46% budget error).

The online calculator system did not reveal the results of the food audit (real/conventional food percentages, real food by sector, etc.) as the invoice information was input. Instead, we could only view the project results once all purchases on all invoices were entered. While we understand this design was made to inspire the calculator group to finish all of the data entry, it was difficult to check our work as we progressed. Had we been able to view the progress of the calculator with every entry, the invoices which dramatically boosted or lowered the total running budget would have been more evident; that way, we may have caught when and where a data point was illogical and we would have fixed any incorrect information.

Similarly, we were not able to correct all error because, as we searched to correct some of this inaccurate data, there were no unique identifiers for entries in the system. This, in fact, may have been the greatest hindrance in the 2013 internship. There was no way to search the entire calculator spreadsheet to locate one specific entry. The calculator provided a space that recorded each product code; however, whenever CDS purchased a product more than once (which happens every week), we had no way of keeping track when each of those products were purchased. Specifically during our calculator process, as we checked over some of our work, Claire realized that some of the purchases had been inputted twice. This simple mistake was made due to lack of communication between interns as we documented which invoices had been completed. However, the problem became more extreme—requiring more time and concentration on correction efforts—because it was incredibly difficult to exactly locate which items exactly were duplicated.

To improve the system, it is essential for the real food calculator to have a unique tag on each entry. We recommend that, to really be thorough with data entry, the calculator should document the date of each entry as well as the invoice number on which the product can be located. The combination of these characteristics will presumably make the data easier to sort through to observe trends in the data over time and/or purchasing week as well as to rectify incorrect data. Additionally, the name of the inputter would be helpful in labeling each item so that we may have a place to start when tracking down errors. With all of this additional information, it would be much easier to locate duplicate entries or mistyped information.

In our analysis, we came across another calculator error rooted in how exactly the real food percentages and other resultant data are computed. In order to view the results of the calculator after we had input all of the purchases, the calculated total budget needed to match the expected total budget. As explained, this is where we found our 0.46% error. After documenting the discrepancy, we changed the expected total budget to match the calculated total budget so that we could view RFC's final statistical report. The first time we entered the expected total budget as a certain value which caused the Real Food Calculator to display 100.0% complete. We then, interestingly enough, realized an error in our calculations and altered the total budget to its correct value \$801,117. Again, the Real Food Calculator displayed 100.0% complete. No line items were altered between these two adjustments so the total calculated budget could not have changed yet the system interpreted the project as complete in both instances. To our knowledge, the difference between the two numbers is great enough that this cannot be attributed to normal rounding. The "completion" of the report at two different budget values has implications of the programming of the online RFC calculator system. We suspect there is a built-in range of error. In other words, if our total calculated budget falls within a certain margin around our total estimated budget, the system will complete some internal rounding and accept the real food audit as complete. Unfortunately, we are not sure exactly what formulas were used in the creation and execution of the online Real Food Calculator system, therefore, it is impossible to make assumptions that will allow us to find the correct exact total.

C. Setbacks

The entire process of the Fall 2013 calculator internship required a lot of advanced planning and goal setting. Conversely, because of the very nature of the project, we worked in a constantly changing environment. Even though we established a working timeline and to-do list in September, we couldn't move on to the next step until the previous one was completed. For instance, we dealt with periods of unproductivity as a result of the time-lapses from communication over email. First, we needed to set up a time where all group members and our RFC coordinator could conduct a conference call to complete our calculator orientation. Yet, in order to get access to the computer system, we needed approval from a CDS supervisor. Two interns were later unexpectedly locked out of the RFC system so only one group member could input data at a time instead of all three as planned. Each of these hiccups necessitated communication between the interns, RFC, and CDS to determine the solution. It was also important to keep the project supervisors in the loop. In total, the time spent sorting out these unforeseen details delayed the start of data input by three or four weeks.

By putting in extra hours of work during future weeks, the group was able to make up for the lost time and complete the calculator and its report for the semester. We note though the steep learning curve that came as the first interns to use the online system. The reason we were able to overcome these challenges is rooted in our sincere interest for our food system and our relationship with CDS. We encouraged one another as well as held each other accountable in meeting our goals and seeking out answers to enhance our understanding of the material.

Future

As we look to the future of the real food calculator, we must keep in mind that this report was conducted with regard to one specific purchasing period--that of August 26-September 30. While much of the information is relevant to any real food calculation (background, real food explanation, sources of error), the meat of the report--including data and recommendations--applies only to this purchasing period and

location. We may assume that inferences based off this data for two purchasing periods after this one may be reasonable; however, that is about as far as we can reach. Calculator trials from other purchasing periods of the year should have quite different conclusions as a result of the seasonality of food production. Fall is perhaps the best harvesting time in North Carolina, when farmers can grow produce like apples, figs, grapes, pears, potatoes, cucumber, lettuce, eggplant, squash, zucchini, and tomatoes locally. Obviously this would make it much easier for the dining hall to purchase real food when it is plentiful within 250 miles.

Therefore, we remain enthusiastic about exceeding the goal of 20% of real food, but we do not let statistics from this report speak for the entire year of CDS purchases. We have planned to run the calculator again for the February purchasing period, a time of year with little to no fresh produce availability. We predict the real food percentage may decrease by potentially over 50%. As we make purchasing recommendations to the CDS staff, we must take into account which products are more or less variable by season. For example, if we concentrate our sustainable purchases on meat, the percentage may remain more consistent throughout the year because the industry is not so dependent on the weather. On the other hand, since we cannot realistically guarantee all of the real food options will be available year-round, we can also consider making suggestions by the season; in other words, we may research real food that is available to CDS each season. This approach, of course, encounters the issue that CDS might want to minimize the interchanging and rotation of their purchases. One of their top priorities is reliability of a provider and it makes their jobs more difficult to constantly adjust the order list. Like us, future calculators must do their best to find a happy medium as they work to improve the amount of fairly traded, ecologically sound, humanely raised, and locally grown food in our dining halls.