Does free student meals mean an increase in Ala Cart sales?

Developing Analytics Application in R

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**Problem and its Significance**

With meals being free, have students taken the funds that would have normally been used for those meals and are now using them to buy Ala Cart items? With the increase in reimbursement as well as students spending money otherwise used for meals, the school district is attempting to be more profitable now than when the pandemic started. With the possibility of meals becoming permanently free districts are looking to capitalize on this emerging trend.

**Literature Review**

The loss of revenue from the reimbursement the schools received from the USDA has generated Food Service Directors looking to new places to try and compensate from the loss of meals served. It has been estimated that between March and November of 2020 schools nationwide served 1.7 billion fewer meals compared to the same timeframe in 2019, equating to a 2.1 billion loss in federal funding for the school meal programs (Pratt-Heavner, 2021).

With the loss of revenue from the meal program itself many schools begin to look elsewhere for the funding. “We must help schools offset these meal program losses, which will impact education budgets at the local level, cutting in to necessary funds for teachers, textbooks and technology,” (Pratt-Heavner, 2021). Many schools from my professional experience have had to downsize their staff due to not having the funding to pay their wages. As well as deal with the Covid guidelines and scheduling for meal sessions for the students. Federal regulations state that “schools must offer lunches between 10:00 am and 2:00 pm. Schools may request an exemption from these times from the state agency.” SNA’s State of School Nutrition 2018 survey, which included responses from 1,550 SNA member school districts nationwide, revealed that the typical lunch period length is about half an hour, with a median of 25 minutes reported for elementary schools and 30 minutes for middle and high schools. (SNA, 2021)

**Research Question(s)**

• Has the school district seen an increase in Ala Cart spending compared to a pre-covid year?

**Theory**

H0: (X) Money spent on extra meal items has increased by (Z) percentage due to school meals now being 0 H1: Money spent on extra meal items has decreased or stayed the same

**Data**

The data that I will be using will come from a current school district that I will call School District so as to keep their information confidential. This information will come from my current line of work as technical support representative, this will be a sample of actual sales information between a designated time period of July 01 – November 01 of the school year 18/19 and 21/22. I will not use data from 19/20 school year as most school districts had 0 in person attendance during this time and the variables for the different meal services would go well beyond the scope of the project.

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#### School Year 18-19

x

## Menu\_Product Sold\_Count Account Cash Check Credit\_Card Charge Total  
## 1 Bfst Entree 27 33.75 0.0 0 0 0.00 33.75  
## 2 Extra Milk 1040 513.95 0.5 0 0 5.55 520.00  
## 3 Large Drink 2973 4459.50 0.0 0 0 0.00 4459.50  
## 4 PopTart 16 20.00 0.0 0 0 0.00 20.00  
## 5 Small Drink 75 93.75 0.0 0 0 0.00 93.75  
## 6 Snacks 11977 8982.75 0.0 0 0 0.00 8982.75  
## 7 Yogurt Parfait 6 12.00 0.0 0 0 0.00 12.00  
## 8 Cheese Stick 1 0.50 0.0 0 0 0.00 0.50  
## 9 Chips/Snacks 2 0.50 0.0 0 0 0.00 0.50  
## 10 Cookies 424 424.00 0.0 0 0 0.00 424.00  
## 11 Desserts 8 4.00 0.0 0 0 0.00 4.00  
## 12 Dinner Roll 82 41.00 0.0 0 0 0.00 41.00  
## 13 Domino's Pizza 1 1.75 0.0 0 0 0.00 1.75  
## 14 Extra Cup 1 0.50 0.0 0 0 0.00 0.50  
## 15 Extra Juice 32 16.00 0.0 0 0 0.00 16.00  
## 16 Fresh Fruit 17 12.75 0.0 0 0 0.00 12.75  
## 17 Fruit Cup 11 22.00 0.0 0 0 0.00 22.00  
## 18 Lunch Entree 7325 12815.25 0.0 0 0 3.50 12818.75  
## 19 Veggie Cup 77 57.75 0.0 0 0 0.00 57.75

#### School Year 21-22

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## Menu.Product Sold.Count Account Cash Check Credit.Card Charge Total  
## 1 Bagel 1 1.00 0.00 0 0 0.00 1.00  
## 2 Bfst Entree 30 37.50 0.00 0 0 0.00 37.50  
## 3 Cheese Stick 153 76.50 0.00 0 0 0.00 76.50  
## 4 Cream CheeseCup 1 0.50 0.00 0 0 0.00 0.50  
## 5 Extra Juice 19 9.50 0.00 0 0 0.00 9.50  
## 6 Extra Milk 660 320.50 7.00 0 0 2.50 330.00  
## 7 Fresh Fruit 92 69.00 0.00 0 0 0.00 69.00  
## 8 Large Drink 4667 6999.00 1.50 0 0 0.00 7000.50  
## 9 PopTart 6 7.50 0.00 0 0 0.00 7.50  
## 10 100% Fruit Juic 640 318.50 0.50 0 0 1.00 320.00  
## 11 BBQ Pork Sandwi 204 357.00 0.00 0 0 0.00 357.00  
## 12 Beef Haystacks 66 115.50 0.00 0 0 0.00 115.50  
## 13 Bosco Sticks 261 456.75 0.00 0 0 0.00 456.75  
## 14 Bottled Water 748 1122.00 0.00 0 0 0.00 1122.00  
## 15 Breadstick 18 9.00 0.00 0 0 0.00 9.00  
## 16 Brownie 3 1.50 0.00 0 0 0.00 1.50  
## 17 Buff. Chckn Tot 41 71.75 0.00 0 0 0.00 71.75  
## 18 Chckn Drumstick 144 250.25 1.75 0 0 0.00 252.00  
## 19 Cheeseburger 1328 2323.00 1.00 0 0 0.00 2324.00  
## 20 Cheeseburger Ma 121 208.25 3.50 0 0 0.00 211.75  
## 21 Chicken Nuggets 350 612.50 0.00 0 0 0.00 612.50  
## 22 Chips/Snacks 5924 4443.00 0.00 0 0 0.00 4443.00  
## 23 Cntry Frd Stk 276 483.00 0.00 0 0 0.00 483.00  
## 24 Cookie 6 3.00 0.00 0 0 0.00 3.00  
## 25 Cookies 4072 3098.25 0.00 0 0 0.00 3098.25  
## 26 Corndog 256 448.00 0.00 0 0 0.00 448.00  
## 27 Crspy Chckn Snd 333 581.00 0.00 0 0 1.75 582.75  
## 28 Deep Dish Pizza 399 698.25 0.00 0 0 0.00 698.25  
## 29 Dessert Bar 1211 908.25 0.00 0 0 0.00 908.25  
## 30 Dinner Roll 41 20.00 0.50 0 0 0.00 20.50  
## 31 Domino's Pizza 3875 6781.25 0.00 0 0 0.00 6781.25  
## 32 Doritos 24 18.00 0.00 0 0 0.00 18.00  
## 33 Frnch Brd Pizza 875 1531.25 0.00 0 0 0.00 1531.25  
## 34 Fruit 96 71.25 0.75 0 0 0.00 72.00  
## 35 Fruit Cup 538 1076.00 0.00 0 0 0.00 1076.00  
## 36 Fruit Snacks 4489 3366.75 0.00 0 0 0.00 3366.75  
## 37 Grab & Go Salad 46 110.55 0.00 0 0 1.70 112.25  
## 38 Grab & Go Sandw 31 71.00 0.00 0 0 0.00 71.00  
## 39 Grilled Cheese 183 320.25 0.00 0 0 0.00 320.25  
## 40 Grlld Chckn Snd 325 568.75 0.00 0 0 0.00 568.75  
## 41 Hamburger 105 183.75 0.00 0 0 0.00 183.75  
## 42 Hot Dog 185 323.75 0.00 0 0 0.00 323.75  
## 43 Ice Cream Bar 929 929.00 0.00 0 0 0.00 929.00  
## 44 Lunch Entree 5 8.75 0.00 0 0 0.00 8.75  
## 45 Milk 354 176.00 0.50 0 0 0.50 177.00  
## 46 PB&J Uncrustabl 49 85.75 0.00 0 0 0.00 85.75  
## 47 Quesadilla 286 500.50 0.00 0 0 0.00 500.50  
## 48 Ranch Dip Cup 68 34.00 0.00 0 0 0.00 34.00  
## 49 Rice Krispie 1929 1446.75 0.00 0 0 0.00 1446.75  
## 50 Spag & Meat Sce 64 112.00 0.00 0 0 0.00 112.00  
## 51 Turkey & Cheese 77 134.75 0.00 0 0 0.00 134.75  
## 52 Vegetable 312 232.50 0.00 0 0 1.50 234.00  
## 53 Veggie Cup 1 2.00 0.00 0 0 0.00 2.00  
## 54 Wffls & Sg Link 257 449.75 0.00 0 0 0.00 449.75  
## 55 Yogurt 51 38.25 0.00 0 0 0.00 38.25  
## 56 Yogurt Parfait 636 1272.00 0.00 0 0 0.00 1272.00

**Methodology**

Once the sales data is imported into R I will perform the necessary clean-up of the data. Namely combing the different item sales information into a summary for the given time period. This will be done so that I have the sales data to better be able perform my testing on.

I will then perform a t-test analysis to see how the changing of meal pricing has impacted the overall sales within the district.

**Analysis**

#### T-Test

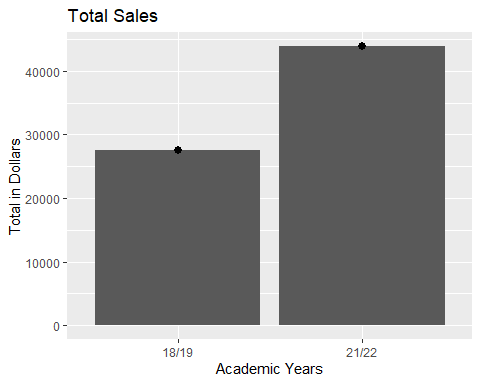
t.test(mydf, mu = 0)

##   
## One Sample t-test  
##   
## data: mydf  
## t = 4.3565, df = 1, p-value = 0.1436  
## alternative hypothesis: true mean is not equal to 0  
## 95 percent confidence interval:  
## -68463.78 139905.28  
## sample estimates:  
## mean of x   
## 35720.75

#### Bargraph

ggplot(mydf2, aes(x = b, y = df2$Total)) +  
 stat\_summary(fun = mean, geom = "bar") +  
 stat\_summary(fun.data = mean\_cl\_boot, geom = "pointrange") +  
 labs(y = "Total in Dollars", x = "Academic Years") +  
 labs(title = "Total Sales")

## Warning: Removed 2 rows containing missing values (geom\_segment).



**Results**

The bargraph shows that the total sales have increased over the previous “Pre-Covid” sales. Looking at the sales figures in the graph, the sales of Ala Cart items has almost doubled since the pandemic.

**Implication**

These results would substantiate that this districts food service departments is actually being more profitable than before Covid began. These finding show that though many districts are struggling in these times, this district in paticular is thriving from a financial sense.

**Conclusion**

In conclusion based on the confidence level of the t-test, the p-value being greater than .05 we cannot reject the hypothesis. This shows that this particular school district though they no longer have meals that they charge for, they have increased sales of Ala Cart or “extra” items. Though this may not be correct for every district, these results show that there is a larger transference of cash in the school K-12 food service industry than before.

**References**

USDA (2021) USDA Issues Pandemic Flexibilities for Schools and Day Care Facilities through June 2022 to Support Safe Reopening and Healthy, Nutritious Meals, Press Release No. 0075.21 <https://www.usda.gov/media/press-releases/2021/04/20/usda-issues-pandemic-flexibilities-schools-and-day-care-facilities>

Pratt-Heavner (2021) New USDA Data: Fewer Meals Served, $2B Loss for School Meal Programs <https://schoolnutrition.org/news-publications/press-releases/2021/new-usda-data-fewer-meals-served-2b-loss-for-school-meal-programs/>

SNA (2021) School Meal Trends & Stats <https://schoolnutrition.org/aboutschoolmeals/schoolmealtrendsstats/>