

Opportunities and challenges of using the CE Microdata to study food deserts in North Carolina

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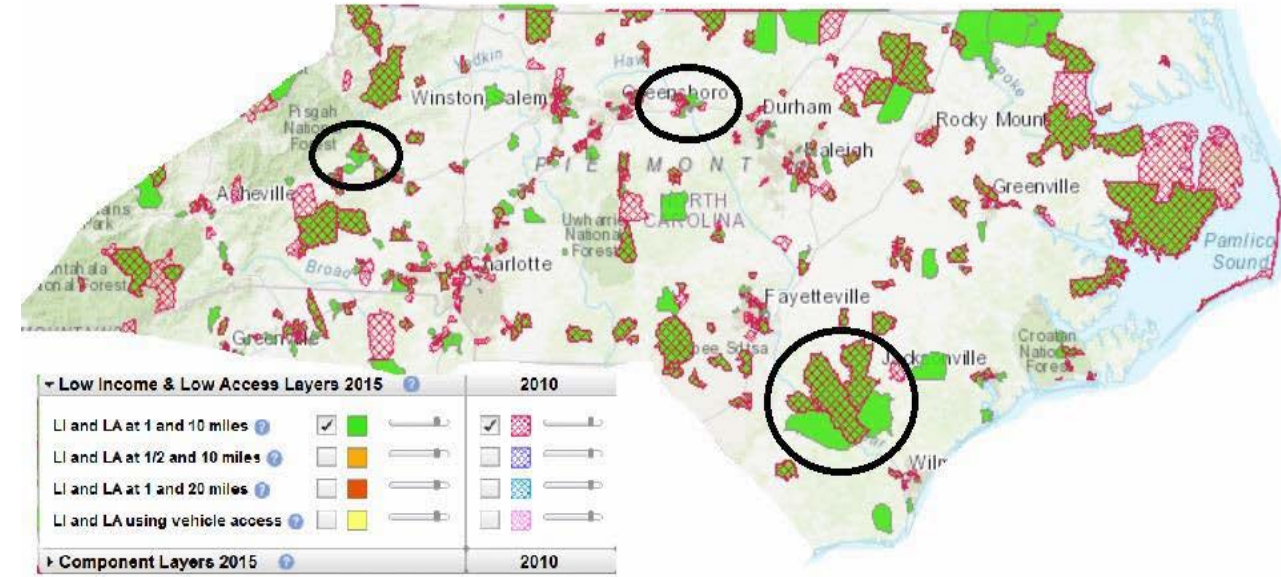
AGGIESDO

Outline

- *Food deserts*
- *CES data for North Carolina – overview*
- *Understanding food expenditures – progress to date*
- *Challenges and barriers*

Food deserts and CE Microdata

- *NSF/CNH- funded project on the dynamics of food deserts in North Carolina*
- *We had hoped to find in the CE Microdata:
Long time series, by NC sub-regions*
- *What we found:*
 - Short time series,
 - No geographic identifiers finer than state,
 - No rural respondents
- *Change in plans:*
 - Working towards a predictive model: food consumption patterns as functions of
 - Data from CE: Income, family size, occupation, ethnicity, race,
 - Other data: prices, indicators of economic well-being



North Carolina food deserts in 2010 and 2015, and project study areas



North Carolina CE Microdata
number of observations

Year / Quarter	Individuals	Households
2015 / 1	270	149
2015 / 2	296	124
2015 / 3	363	125
2015 / 4	346	120
2016 / 1	286	112
2016 / 2	242	109
2016 / 3	254	120
2016 / 4	350	139
2017 / 1	315	121
2017 / 2	328	130
2017 / 3	340	135
2017 / 4	247	144

- Diary survey files only, FMLD, MEMD, EXPD
- Interpretation:
 - ❖ *If observations have the same NEWID and CUID, then these correspond to the same family – same food purchase decision-maker*
 - ❖ *If observations have the same CUID, but differ by NEWID, these correspond to the different food purchase decision-makers*
 - ❖ *We refer to the food purchase decision-makers as **households***

NC data manipulation

- *We could identify NC residents from 2015 on only, hence we are only working with the data for 12 quarters*
- *For every quarter*
 - We first merged FMLD & MEMD by NEWID (left join in R)
 - Then filtered for NC only (state == 37)
 - Then selected only ~20 variables we are interested in
 - Then we kept only one observation (the first one) for each NEWID
- *Then we combine the 12 quarterly files, 2015/1 to 2017/4 (bind_rows in R)*



*Households by income class;
Different colors indicate groupings used in our analysis;
Median NC household income is \$50,320 +- \$204 (2013-17 ACS)*

Year/ quarter	Count	Income class									Median income class
		1 <5K	2 5K to <10K	3 10K to <15K)	4 15K to <20K	5 20K to <30K	6 30K to <40K	7 40K to <50K	8 50K to <70K	9 >70K	
2015 / 1	149	8	14	7	13	12	21	7	21	46	6
2015 / 2	124	3	2	6	8	11	17	9	16	52	8
2015 / 3	125	5	3	5	6	14	16	12	21	43	8
2015 / 4	120	4	0	9	12	10	12	12	29	32	8
2016 / 1	112	3	3	2	10	5	9	2	21	57	9
2016 / 2	109	4	2	4	9	14	12	10	13	41	7
2016 / 3	120	0	2	4	14	11	11	11	15	52	8
2016 / 4	139	6	4	8	5	20	20	5	17	54	8
2017 / 1	121	4	6	5	6	13	11	20	13	43	7
2017 / 2	130	4	5	3	6	17	18	9	20	48	8
2017 / 3	135	3	1	5	10	14	8	20	18	56	8
2017 / 4	144	1	2	6	12	12	23	10	17	61	8



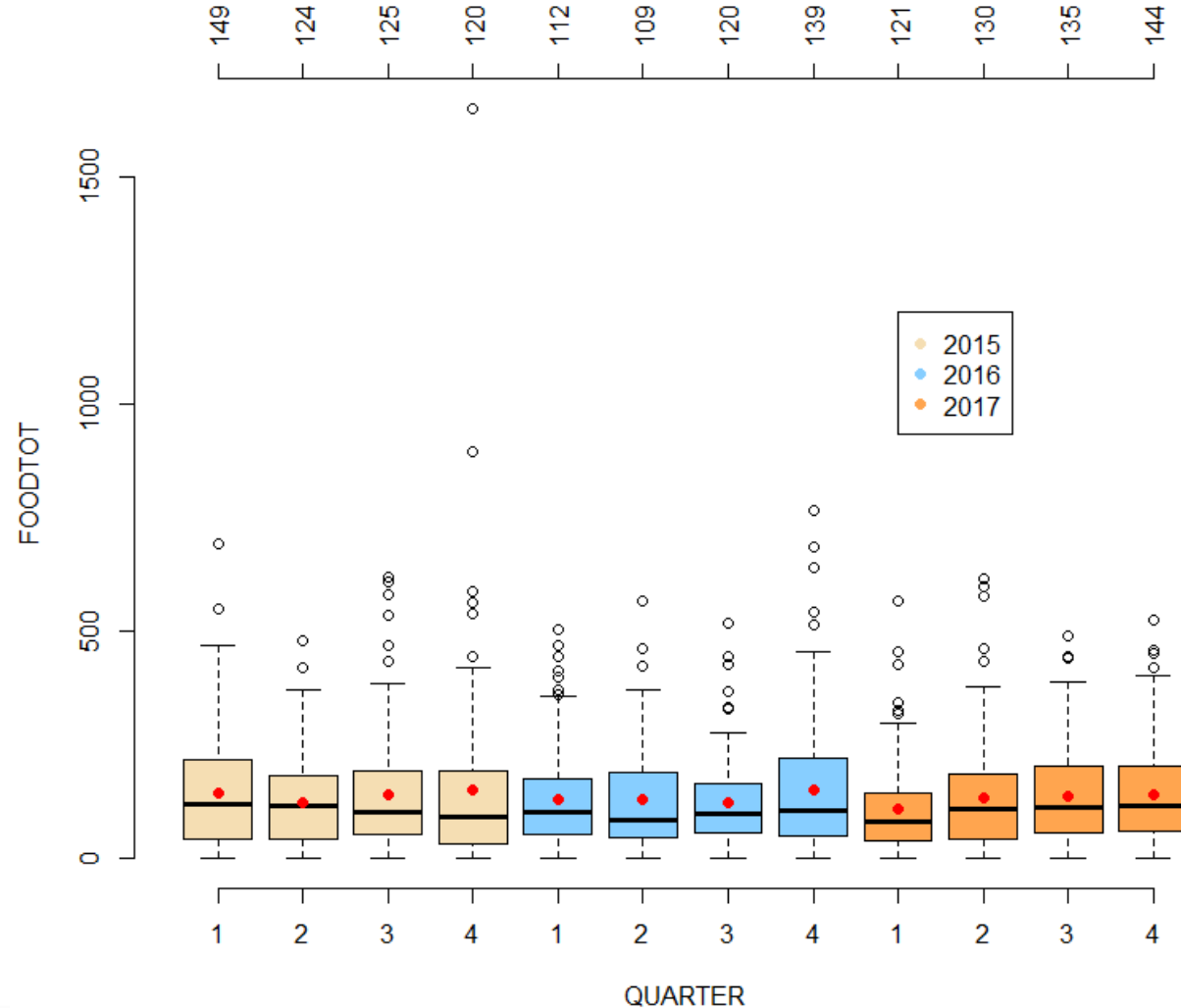
Year/ Quarter	Count	Family type								
		1 Married couples, no children	2 Married couples, child <6	3 Married couples, child>6, <18	4 Married couples, child > 17	5 All other married couples	6 Single dad, child < 18	7 Single mom, child < 18	8 Single consumers	9 All other families
2015 / 1	149	33	8	21	8	2	0	5	58	14
2015 / 2	124	28	11	16	5	12	2	8	22	20
2015 / 3	125	41	6	13	8	6	2	4	22	23
2015 / 4	120	17	8	9	2	4	2	4	51	23
2016 / 1	112	20	8	26	8	4	2	7	27	10
2016 / 2	109	32	5	12	2	2	2	8	31	15
2016 / 3	120	32	4	19	6	2	0	1	41	15
2016 / 4	139	41	12	20	7	6	0	2	29	22
2017 / 1	121	38	6	20	4	2	0	8	28	15
2017 / 2	130	38	6	16	4	2	2	1	31	30
2017 / 3	135	30	18	23	4	8	2	6	28	16
2017 / 4	144	44	6	28	10	2	0	4	32	18



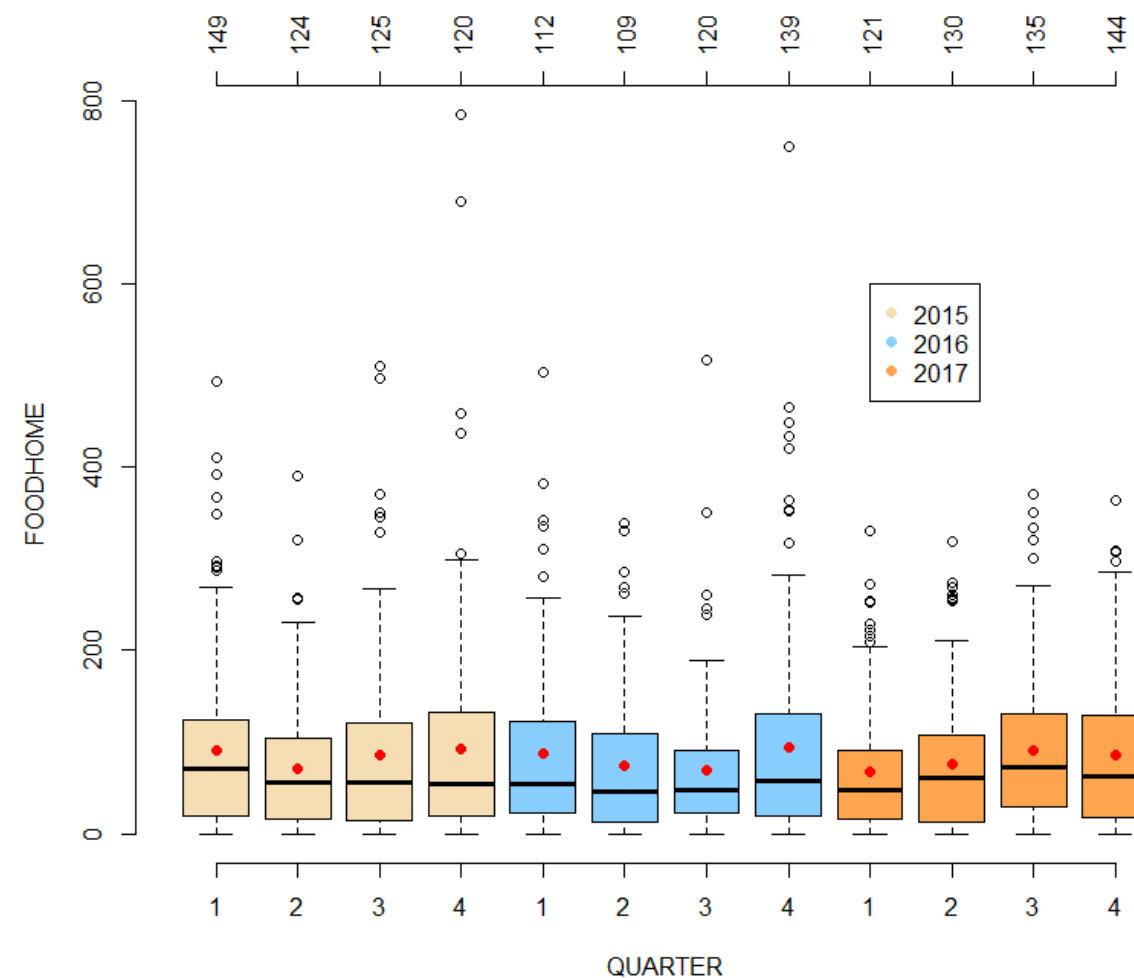
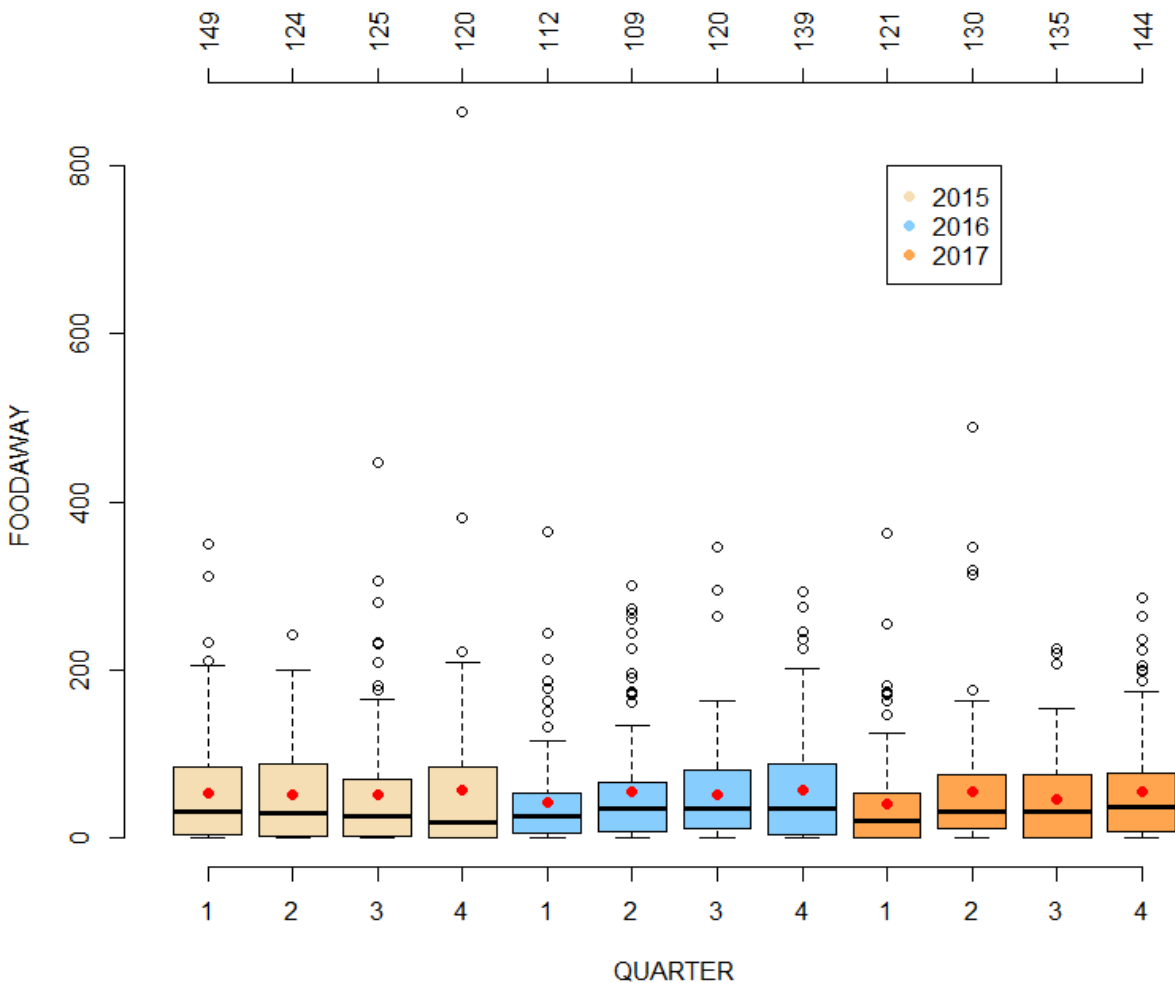
Year/ Quarter	Count	FAMILY SIZE								
		1	2	3	4	5	6	7	8	9
2015 / 1	149	58	48	21	18	0	2	2	0	0
2015 / 2	124	22	44	30	18	6	2	2	0	0
2015 / 3	125	22	51	18	16	10	8	0	0	0
2015 / 4	120	51	34	16	15	4	0	0	0	0
2016 / 1	112	27	30	31	18	4	0	2	0	0
2016 / 2	109	31	44	21	7	4	2	0	0	0
2016 / 3	120	41	46	17	10	6	0	0	0	0
2016 / 4	139	29	53	28	16	11	2	0	0	0
2017 / 1	121	28	55	24	10	4	0	0	0	0
2017 / 2	130	31	60	17	16	6	0	0	0	0
2017 / 3	135	28	44	27	20	14	0	0	2	0
2017 / 4	144	32	58	24	26	2	2	0	0	0

FOODTOT

- *Per week household food purchases, dollars*
- *Large number of outliers (errors?) in every quarter*



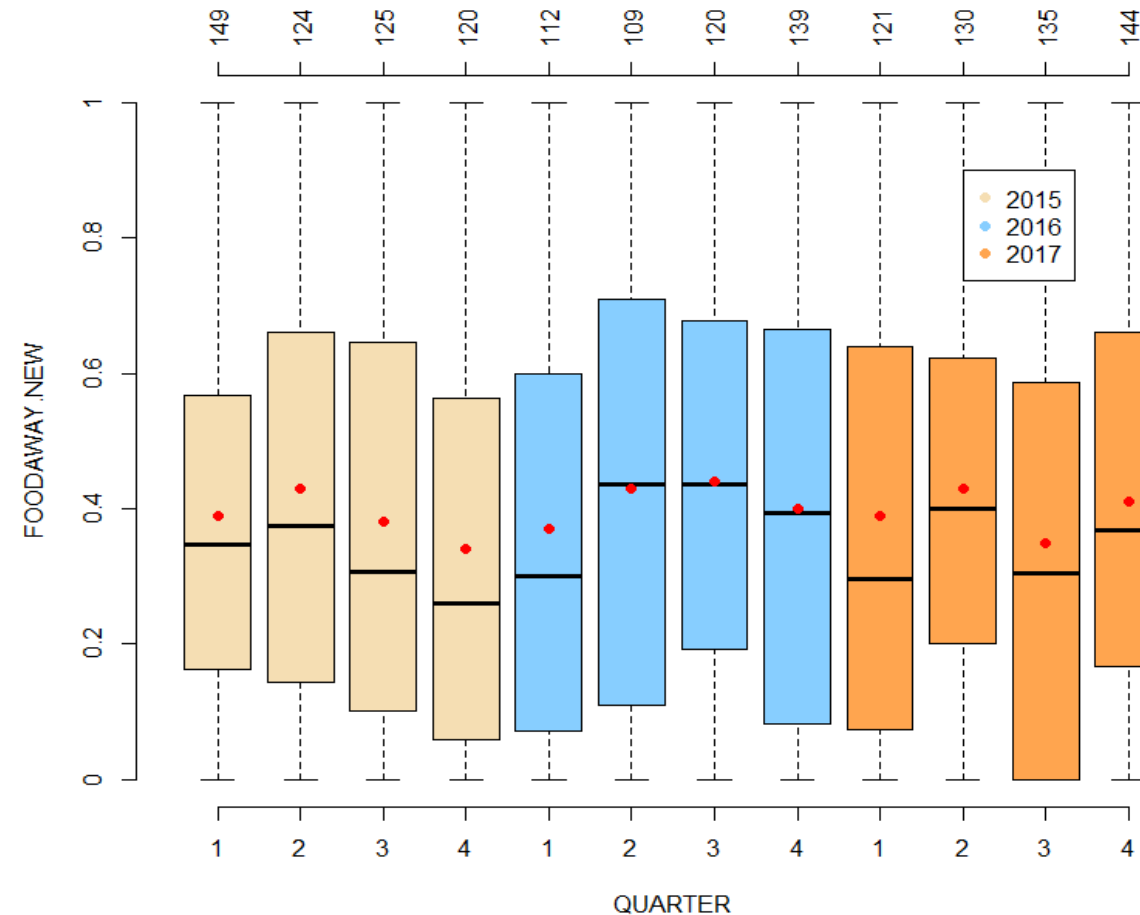
FOODAWAY & FOODHOME





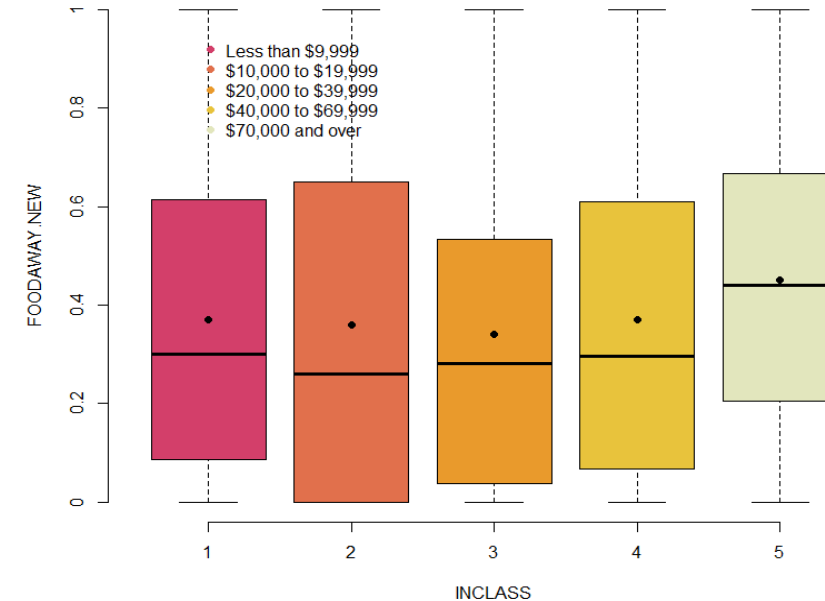
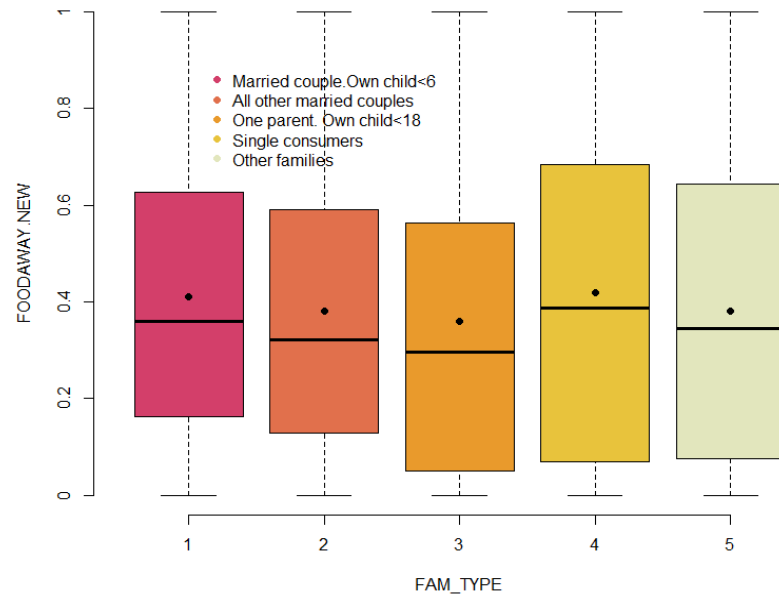
Share of food away in total food purchases

- *Distinct quarterly patterns, especially for 2015 and 2016: lower shares of food away in the 1st & 4th quarters*
- *Skewed distributions, as seen from the relationships between means (dots) and medians (bars)*





Share of food away in total food purchases



- *Work in progress: investigation of the time patters by family type and income class categories*

Fruits and vegetables: large shares of zeros in the sample

- *Work in progress:
investigation of the time
patters*
- *By family type and
income class*
- *Per person*

Year/ Quarter	Count	FRSHFRUT zeros	FRSHVEG zeros	PROCFRUT zeros	PROCVEG zeros
2015 / 1	149	74	65	99	76
2015 / 2	124	58	59	79	77
2015 / 3	125	59	59	84	68
2015 / 4	120	57	55	67	65
2016 / 1	112	44	52	72	62
2016 / 2	109	52	52	62	61
2016 / 3	120	55	60	86	80
2016 / 4	139	61	69	85	72
2017 / 1	121	59	59	83	68
2017 / 2	130	57	57	90	81
2017 / 3	135	56	62	87	76
2017 / 4	144	70	64	95	74



Food away from home: “Good” food vs. “Bad” food

- 190112: Lunch at full service restaurants.
- 190114: Lunch at employer and school cafeterias.
- 190115: Lunch at Board.
- 190212: Dinner at full service restaurants.
- 190214: Dinner at employer and school cafeterias.
- 190215: Dinner at Board.
- 190312: Snacks and nonalcoholic beverages at full service restaurants.
- 190314: Snacks and nonalcoholic beverages at employer and school cafeterias.
- 190322: Breakfast and brunch at full service restaurants.
- 190324: Breakfast and brunch at employer and school cafeterias.
- 190325: Breakfast at Board.
- 190902: Catered affairs.
- 190914: Board at employer/school.
- 190922: Catered Affairs at full service.
- 190924: Catered affairs at catered affairs.
- 190111: Lunch at fast food, take-out, delivery, concession stands, buffet and cafeteria (other than employer and school cafeteria).
- 190113: Lunch at vending machines and mobile vendors.
- 190211: Dinner at fast food, take-out, delivery, concession stands, buffet and cafeteria (other than employer and school cafeteria).
- 190213: Dinner at vending machines and mobile vendors.
- 190311: Snacks and nonalcoholic beverages at fast food, take-out, delivery, concession stands, buffet and cafeteria (other than employer and school cafeteria).
- 190313: Snacks and nonalcoholic beverages at vending machines and mobile vendors.
- 190321: Breakfast and brunch at fast food, take-out, delivery, concession stands, buffet and cafeteria (other than employer and school cafeteria).
- 190323: Breakfast and brunch at vending machines and mobile vendors.
- 190911: Board at fast food.
- 190921: Catered affair at fast food.
- 190923: Catered Affairs at vending machine.

Preliminary summary

- *The CE Microdata has notable limitations for studying food desert issues in North Carolina:*
 - *Sample*
 - *Covers only 3 years, 2015-2017*
 - *Does not permit consideration of NC sub-regions, e.g., Coastal vs. Piedmont vs. Mountains*
 - *Disproportionately urban: 28% of NC population lives in rural areas (2013-17 ACS), but no CE Microdata respondents have been identified as living in a rural area*
 - *Variables*
 - *We continue identifying variables that are useful for understanding food purchases*
- *Work in progress:*
 - *Building a predictive model of food purchases*

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