

Salad Bar Study: Time to Eat and Fruit and Vegetable Intake

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1 Demographic Characteristics

*note - restricted to: - pre (selected) > post (waste) - time to eat is not NA and is > 0 - pre (selected) is not NA - post (waste) is not NA - missing data for any covariates used in models (age not included in models)

Table 1: Demographic Characteristics and Variables of Interest

Group	Characteristic	Full Sample		School Type				p-value
		N	Overall	N	Elementary	Middle School	High School	
	Gender	2,369		2,369				0.748
	F		1,100 (46%)		342 (45%)	336 (47%)	422 (47%)	
	M		1,269 (54%)		413 (55%)	381 (53%)	475 (53%)	
	Grade	2,369	7.1 (3.1)	2,369	3.3 (1.3)	7.0 (0.8)	10.4 (1.1)	0.000
	Age, yr	2,274	12.2 (3.2)	2,274	8.5 (1.4)	12.2 (1.0)	15.6 (1.3)	0.000
	Unknown		95		0	0	95	
	Race/Ethnicity	2,369		2,369				0.000
	Hispanic or Latino		1,498 (63%)		439 (58%)	458 (64%)	601 (67%)	
	White		557 (24%)		184 (24%)	153 (21%)	220 (25%)	
	Other		180 (7.6%)		71 (9.4%)	64 (8.9%)	45 (5.0%)	
	Black or African American		134 (5.7%)		61 (8.1%)	42 (5.9%)	31 (3.5%)	
	Free-Reduced Lunch	2,369		2,369				0.000
	Free/Reduced		1,875 (79%)		562 (74%)	589 (82%)	724 (81%)	
	Paid		494 (21%)		193 (26%)	128 (18%)	173 (19%)	
	F/V Selected	2,369		2,369				0.000
	N		352 (15%)		6 (0.8%)	101 (14%)	245 (27%)	
	Y		2,017 (85%)		749 (99%)	616 (86%)	652 (73%)	
	Lunch Period	2,369	27.8 (9.6)	2,369	23.7 (9.1)	24.8 (7.7)	33.7 (8.3)	0.000
	Time in Line	2,369	5.3 (3.2)	2,369	5.6 (3.4)	4.5 (2.7)	5.7 (3.2)	0.000
	F/V Consumed Any	2,017		2,017				0.025
	N		243 (12%)		78 (10%)	68 (11%)	97 (15%)	
	Y		1,774 (88%)		671 (90%)	548 (89%)	555 (85%)	
	F/V Self-Served, g	2,017	136.9 (70.6)	2,017	121.7 (64.6)	152.9 (72.9)	139.3 (71.5)	0.000
	Lunch Period	2,017	26.9 (9.7)	2,017	23.8 (9.1)	23.9 (7.6)	33.4 (8.9)	0.000
	Time in Line	2,017	5.3 (3.2)	2,017	5.6 (3.4)	4.6 (2.8)	5.7 (3.1)	0.000
	Eating Duration	2,017	10.6 (4.1)	2,017	10.3 (4.1)	9.9 (3.3)	11.7 (4.6)	0.000
	F/V Consumed, g	2,017	57.5 (55.3)	2,017	43.4 (49.4)	66.6 (56.2)	65.2 (57.5)	0.000
	F/V Waste, g	2,017	79.5 (66.7)	2,017	78.4 (56.3)	86.4 (75.2)	74.1 (68.8)	0.002
	F/V Percent Waste (post/pre), %	2,017	56.3 (35.1)	2,017	65.0 (31.7)	52.7 (35.8)	49.6 (36.0)	0.000

¹ n (%); Mean (SD)

² Pearson's Chi-squared test; Kruskal-Wallis rank sum test

*intake data means and standard deviations restricted to those who selected F/V. Means for consumed restricted to those with FV consumption > 0 is in text with that model.

Negative eating duration values:

```
salad_bar_dat[!is.na(salad_bar_dat[["time_to_eat"]]) & salad_bar_dat[["time_to_eat"]] < 0, "time_to_eat"]
```

[1] -0.4

1.1 Follow-up Tests by School Type

1.1.1 gender

Pearson's Chi-squared test

```
data: xtabs(~school_type + gender, data = salad_bar_dat_use)
X-squared = 0.57945, df = 2, p-value = 0.7485
```

1.1.2 age

Anova Table (Type III tests)

Response: age

	Sum Sq	Df	F value	Pr(>F)
(Intercept)	54625	1	34920	< 2.2e-16 ***
school_type	19832	2	6339	< 2.2e-16 ***
Residuals	3553	2271		

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

contrast	estimate	SE	df	t.ratio	p.value
Elementary - High School	-7.14	0.0634	2271	-112.597	<.0001
Elementary - Middle School	-3.69	0.0652	2271	-56.567	<.0001
High School - Middle School	3.45	0.0643	2271	53.699	<.0001

P value adjustment: tukey method for comparing a family of 3 estimates

1.1.3 race/ethnicity

Pearson's Chi-squared test

```
data: xtabs(~school_type + race_ethnicity, data = salad_bar_dat_use)
X-squared = 35.559, df = 6, p-value = 3.358e-06
```

1.1.4 free-reduced lunch

Pearson's Chi-squared test

```
data: xtabs(~school_type + paid_free_reduced, data = salad_bar_dat_use)
X-squared = 15.394, df = 2, p-value = 0.0004543
```

1.1.5 fruit/veg selected

Pearson's Chi-squared test

```
data: xtabs(~school_type + fv_selected, data = salad_bar_dat_use)
X-squared = 228.37, df = 2, p-value < 2.2e-16
```

1.1.6 lunch duration

Analysis of Deviance Table (Type II Wald F tests with Kenward-Roger df)

Response: lunch_dur

	F	Df	Df.res	Pr(>F)
school_type	6.9866	2	32.958	0.002954 **

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

contrast	estimate	SE	df	t.ratio	p.value
Elementary - High School	-11.51	3.24	33.0	-3.551	0.0033
Elementary - Middle School	-2.52	3.25	33.2	-0.778	0.7191
High School - Middle School	8.98	3.23	32.7	2.779	0.0237

Degrees-of-freedom method: kenward-roger

P value adjustment: tukey method for comparing a family of 3 estimates

1.1.7 time to eat

Analysis of Deviance Table (Type III Wald F tests with Kenward-Roger df)

Response: time_to_eat

	F	Df	Df.res	Pr(>F)
(Intercept)	346.7029	1	31.892	<2e-16 ***
school_type	1.8761	2	32.013	0.1696

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

contrast	estimate	SE	df	t.ratio	p.value
Elementary - High School	-1.147	0.754	31.2	-1.520	0.2954
Elementary - Middle School	0.197	0.768	32.7	0.256	0.9645
High School - Middle School	1.344	0.753	32.1	1.783	0.1912

Degrees-of-freedom method: kenward-roger

P value adjustment: tukey method for comparing a family of 3 estimates

1.1.8 fruit/veg amount selected

Analysis of Deviance Table (Type III Wald F tests with Kenward-Roger df)

Response: fv_pre

	F	Df	Df.res	Pr(>F)
(Intercept)	85.9538	1	32.164	1.33e-10 ***
school_type	0.6189	2	32.439	0.5448

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

contrast	estimate	SE	df	t.ratio	p.value
Elementary - High School	-12.03	19.2	32.1	-0.626	0.8068
Elementary - Middle School	-21.44	19.3	32.6	-1.110	0.5150
High School - Middle School	-9.41	19.2	32.6	-0.490	0.8764

Degrees-of-freedom method: kenward-roger
P value adjustment: tukey method for comparing a family of 3 estimates

1.1.9 fruit/veg consumed

Analysis of Deviance Table (Type III Wald F tests with Kenward-Roger df)

Response: fv_consumed

	F	Df	Df.res	Pr(>F)
(Intercept)	54.1494	1	29.709	3.592e-08 ***
school_type	3.6329	2	31.078	0.03821 *

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

contrast	estimate	SE	df	t.ratio	p.value
Elementary - High School	-22.3	8.79	30.5	-2.534	0.0427
Elementary - Middle School	-18.3	8.91	31.0	-2.053	0.1166
High School - Middle School	4.0	8.89	31.8	0.449	0.8951

Degrees-of-freedom method: kenward-roger
P value adjustment: tukey method for comparing a family of 3 estimates

1.1.10 fruit/veg waste

Analysis of Deviance Table (Type III Wald F tests with Kenward-Roger df)

Response: fv_post

	F	Df	Df.res	Pr(>F)
(Intercept)	44.2277	1	31.787	1.73e-07 ***
school_type	0.5834	2	32.269	0.5638

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

contrast	estimate	SE	df	t.ratio	p.value
Elementary - High School	12.69	17.1	31.9	0.743	0.7399
Elementary - Middle School	-5.23	17.2	32.5	-0.304	0.9504
High School - Middle School	-17.92	17.1	32.5	-1.048	0.5523

Degrees-of-freedom method: kenward-roger
P value adjustment: tukey method for comparing a family of 3 estimates

1.1.11 fruit/veg waste proportion

*restricted to selected only

Analysis of Deviance Table (Type III Wald F tests with Kenward-Roger df)

Response: fv_prop_waste

	F	Df	Df.res	Pr(>F)
(Intercept)	199.6413	1	30.280	7.192e-15 ***
school_type	3.7703	2	31.457	0.03406 *

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

contrast	estimate	SE	df	t.ratio	p.value
Elementary - High School	17.57	6.42	30.9	2.736	0.0269
Elementary - Middle School	10.19	6.50	31.5	1.568	0.2740
High School - Middle School	-7.38	6.47	32.1	-1.140	0.4970

Degrees-of-freedom method: kenward-roger

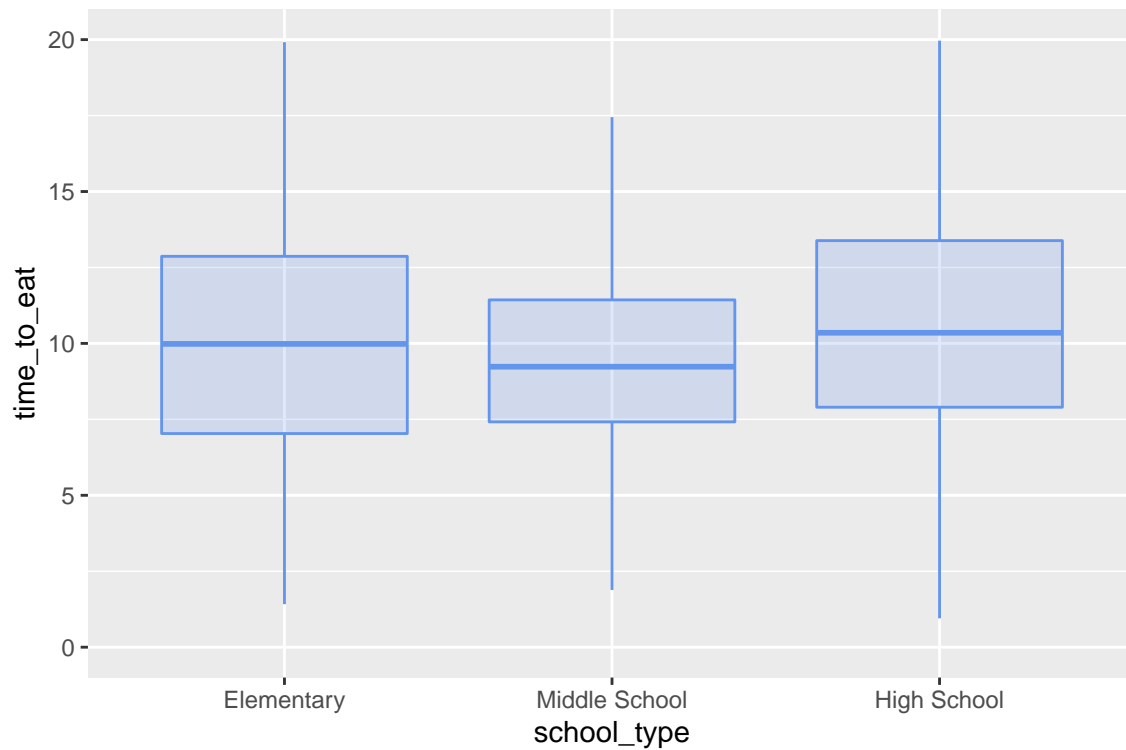
P value adjustment: tukey method for comparing a family of 3 estimates

2 Association between TTE and Lunch Duration

Pearson's product-moment correlation

```
data: salad_bar_dat_use[["time_to_eat"]] and salad_bar_dat_use[["lunch_dur"]]
t = 1.5492, df = 2367, p-value = 0.1215
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 -0.008456398  0.072006624
sample estimates:
      cor
0.03182668
```

There is no association between time to eat and lunch duration for the whole sample ($r = 0.03$, $p = 0.172$).



3 Fruit/Vegetable Selected

Histogram of Selected Fruits/Vegetables,

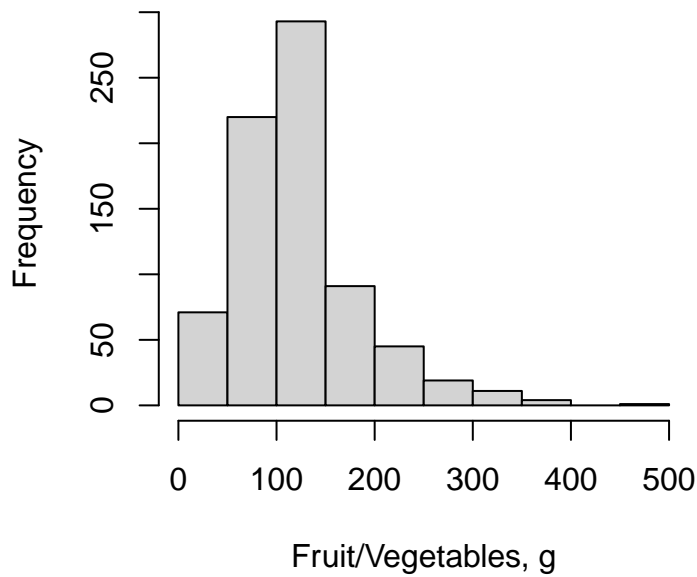


3.1 Overall

	Estimate	Std. Error	df	t value
(Intercept)	8.522	0.700	174.302	12.178
grade	-0.014	0.063	397.128	-0.217
genderM	-0.479	0.161	2334.094	-2.984
race_ethnicityWhite	-0.334	0.249	2342.535	-1.345
race_ethnicityOther	0.335	0.322	2354.711	1.039
race_ethnicityBlack or African American	-0.164	0.361	2353.143	-0.454
paid_free_reducedPaid	0.294	0.269	2273.815	1.091
lunch_dur	0.064	0.018	670.700	3.530
fv_pre	0.005	0.001	2271.704	3.589
	Pr(> t)			
(Intercept)	0.000			
grade	0.829			
genderM	0.003			
race_ethnicityWhite	0.179			
race_ethnicityOther	0.299			
race_ethnicityBlack or African American	0.650			
paid_free_reducedPaid	0.275			
lunch_dur	0.000			
fv_pre	0.000			

3.2 Elementary

Histogram of Selected Fruits/Vegetables,



	Estimate	Std. Error	df	t value
(Intercept)	8.017	1.262	36.254	6.351
grade	-0.350	0.093	738.644	-3.779
genderM	-0.474	0.240	735.848	-1.973
race_ethnicityWhite	0.058	0.370	743.174	0.158
race_ethnicityOther	0.290	0.440	737.130	0.659
race_ethnicityBlack or African American	0.084	0.469	738.857	0.180
paid_free_reducedPaid	0.235	0.345	742.409	0.682
lunch_dur	0.113	0.032	569.280	3.571
fv_pre	0.006	0.003	745.999	2.435
	Pr(> t)			
(Intercept)	0.000			
grade	0.000			
genderM	0.049			
race_ethnicityWhite	0.875			
race_ethnicityOther	0.510			
race_ethnicityBlack or African American	0.857			
paid_free_reducedPaid	0.496			
lunch_dur	0.000			
fv_pre	0.015			

3.3 Middle School

Histogram of Selected Fruits/Vegetables,



	Estimate	Std. Error	df	t value
(Intercept)	8.870	1.377	277.432	6.443
grade	0.117	0.157	705.807	0.744
genderM	-0.177	0.248	703.429	-0.711
race_ethnicityWhite	-0.316	0.383	671.056	-0.824
race_ethnicityOther	0.031	0.480	705.404	0.066
race_ethnicityBlack or African American	-0.537	0.536	707.755	-1.001
paid_free_reducedPaid	0.103	0.426	624.551	0.241
lunch_dur	0.009	0.029	132.309	0.306
fv_pre	0.001	0.002	562.063	0.703
	Pr(> t)			
(Intercept)	0.000			
grade	0.457			
genderM	0.477			
race_ethnicityWhite	0.410			
race_ethnicityOther	0.948			
race_ethnicityBlack or African American	0.317			
paid_free_reducedPaid	0.809			
lunch_dur	0.760			
fv_pre	0.482			

3.4 High School

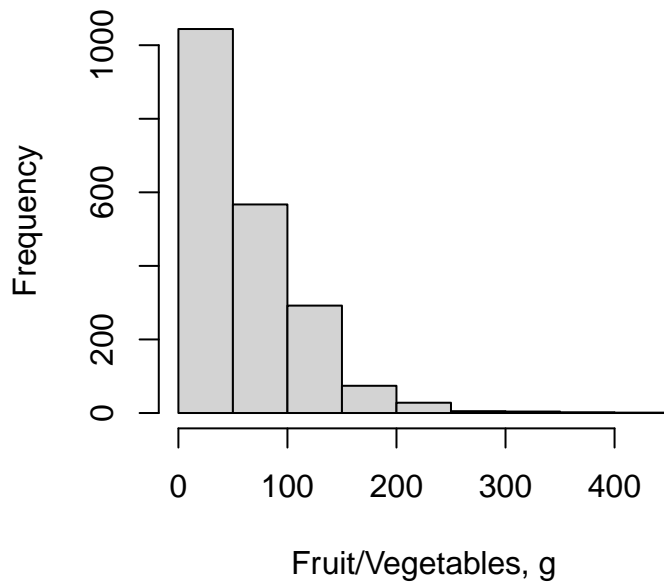
Histogram of Selected Fruits/Vegetables,



	Estimate	Std. Error	df	t value
(Intercept)	5.834	1.652	542.397	3.532
grade	0.266	0.147	814.817	1.812
genderM	-0.725	0.315	885.262	-2.302
race_ethnicityWhite	-0.704	0.478	736.151	-1.472
race_ethnicityOther	0.676	0.731	882.778	0.926
race_ethnicityBlack or African American	-0.076	0.873	887.092	-0.087
paid_free_reducedPaid	0.559	0.579	254.281	0.965
lunch_dur	0.076	0.027	53.193	2.787
fv_pre	0.005	0.002	808.772	2.409
Pr(> t)				
(Intercept)	0.000			
grade	0.070			
genderM	0.022			
race_ethnicityWhite	0.142			
race_ethnicityOther	0.355			
race_ethnicityBlack or African American	0.931			
paid_free_reducedPaid	0.335			
lunch_dur	0.007			
fv_pre	0.016			

4 Fruit/Vegetable Consumed

Histogram of Consumed Fruits/Vegetables



-mean and sd for participants that consumed F/V

```
[1] 65.39177
```

```
[1] 54.37011
```

Total Sample Sizes: Full N = 2226, Elementary N = 630, Middle School N = 699, High School N = 897

4.1 Overall

Call:

```
mixed_model(fixed = fv_consumed ~ grade + gender + race_ethnicity +  
  paid_free_reduced + lunch_dur + time_to_eat, random = ~1 |  
  school_name, data = salad_bar_dat_use[salad_bar_dat_use$fv_selected ==  
  "Y", ], family = zi.negative.binomial(), zi_fixed = ~grade +  
  gender + race_ethnicity + paid_free_reduced + lunch_dur +  
  time_to_eat, zi_random = ~1 | school_name)
```

Data Descriptives:

Number of Observations: 2017

Number of Groups: 36

Model:

family: zero-inflated negative binomial
link: log

Fit statistics:

log.Lik	AIC	BIC
-9744.07	19532.14	19566.98

Random effects covariance matrix:

	StdDev	Corr
(Intercept)	0.3005	
zi_(Intercept)	0.6843	0.1530

Fixed effects:

	Estimate	Std.Err	z-value	p-value
(Intercept)	3.4169	0.1632	20.9380	< 1e-04
grade	0.0587	0.0150	3.9062	< 1e-04
genderM	0.1072	0.0440	2.4386	0.0147431
race_ethnicityWhite	0.0368	0.0704	0.5225	0.6013536
race_ethnicityOther	0.2442	0.0871	2.8033	0.0050581
race_ethnicityBlack or African American	0.1540	0.0984	1.5651	0.1175705
paid_free_reducedPaid	-0.0848	0.0749	-1.1326	0.2573745
lunch_dur	-0.0032	0.0046	-0.7041	0.4813462
time_to_eat	0.0305	0.0061	4.9577	< 1e-04

Zero-part coefficients:

	Estimate	Std.Err	z-value	p-value
(Intercept)	-1.5583	0.4661	-3.3431	0.00082853
grade	0.0233	0.0468	0.4965	0.61956449
genderM	-0.1326	0.1538	-0.8622	0.38860077
race_ethnicityWhite	0.1904	0.2321	0.8206	0.41186744
race_ethnicityOther	0.3995	0.2751	1.4523	0.14640913
race_ethnicityBlack or African American	0.3221	0.3230	0.9971	0.31869656
paid_free_reducedPaid	0.1092	0.2596	0.4208	0.67391683
lunch_dur	0.0084	0.0129	0.6528	0.51389271
time_to_eat	-0.1026	0.0232	-4.4225	< 1e-04

log(dispersion) parameter:

Estimate	Std.Err
0.2332	0.0361

Integration:

method: adaptive Gauss-Hermite quadrature rule

quadrature points: 11

Optimization:

method: hybrid EM and quasi-Newton

converged: TRUE

4.1.1 IRR

	[,1]
(Intercept)	30.4740707
grade	1.0604055
genderM	1.1131966

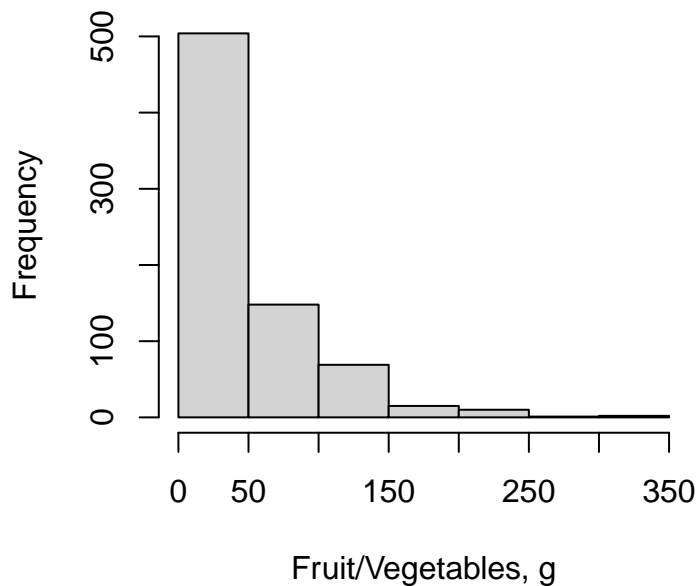
race_ethnicityWhite	1.0374888
race_ethnicityOther	1.2766420
race_ethnicityBlack or African American	1.1665310
paid_free_reducedPaid	0.9186679
lunch_dur	0.9967788
time_to_eat	1.0309214

4.1.2 OR

	[,1]
(Intercept)	0.2105035
grade	1.0235261
genderM	0.8758023
race_ethnicityWhite	1.2097755
race_ethnicityOther	1.4910833
race_ethnicityBlack or African American	1.3800261
paid_free_reducedPaid	1.1154296
lunch_dur	1.0084779
time_to_eat	0.9024934

4.2 Elementary

Histogram of Consumed Fruits/Vegetables



-mean and sd for participants that consumed F/V

```
[1] 48.40089
```

```
[1] 0
```

Call:

```
mixed_model(fixed = fv_consumed ~ grade + gender + race_ethnicity +  
  paid_free_reduced + lunch_dur + time_to_eat, random = ~1 |  
  school_name, data = salad_bar_dat_use[salad_bar_dat_use$fv_selected ==  
  "Y" & salad_bar_dat_use$school_type == "Elementary", ], family = zi.negative.binomial(),  
  zi_fixed = ~grade + gender + race_ethnicity + paid_free_reduced +  
  lunch_dur + time_to_eat, zi_random = ~1 | school_name)
```

Data Descriptives:

Number of Observations: 749

Number of Groups: 12

Model:

family: zero-inflated negative binomial

link: log

Fit statistics:

log.Lik	AIC	BIC
-3435.307	6914.613	6925.281

Random effects covariance matrix:

	StdDev	Corr
(Intercept)	0.3996	
zi_(Intercept)	0.4349	0.9285

Fixed effects:

	Estimate	Std.Err	z-value	p-value
(Intercept)	3.4270	0.3144	10.8985	< 1e-04
grade	0.0155	0.0316	0.4897	0.624344
genderM	0.1754	0.0808	2.1714	0.029899
race_ethnicityWhite	0.0354	0.1229	0.2882	0.773192
race_ethnicityOther	0.2124	0.1479	1.4365	0.150854
race_ethnicityBlack or African American	-0.0860	0.1569	-0.5479	0.583729
paid_free_reducedPaid	-0.0996	0.1161	-0.8582	0.390803
lunch_dur	-0.0124	0.0088	-1.4062	0.159676
time_to_eat	0.0506	0.0125	4.0295	< 1e-04

Zero-part coefficients:

	Estimate	Std.Err	z-value	p-value
(Intercept)	-0.4289	0.9677	-0.4433	0.657578
grade	-0.0914	0.1222	-0.7475	0.454776
genderM	0.1268	0.3265	0.3883	0.697774
race_ethnicityWhite	0.1693	0.4427	0.3826	0.702043
race_ethnicityOther	0.4395	0.4996	0.8797	0.379036
race_ethnicityBlack or African American	0.4136	0.5578	0.7415	0.458374
paid_free_reducedPaid	0.2515	0.4205	0.5980	0.549807
lunch_dur	-0.0455	0.0298	-1.5289	0.126287
time_to_eat	-0.1028	0.0452	-2.2755	0.022878

log(dispersion) parameter:

Estimate	Std.Err
-0.0255	0.0639

Integration:

method: adaptive Gauss-Hermite quadrature rule

quadrature points: 11

Optimization:

method: hybrid EM and quasi-Newton

converged: TRUE

4.2.1 IRR

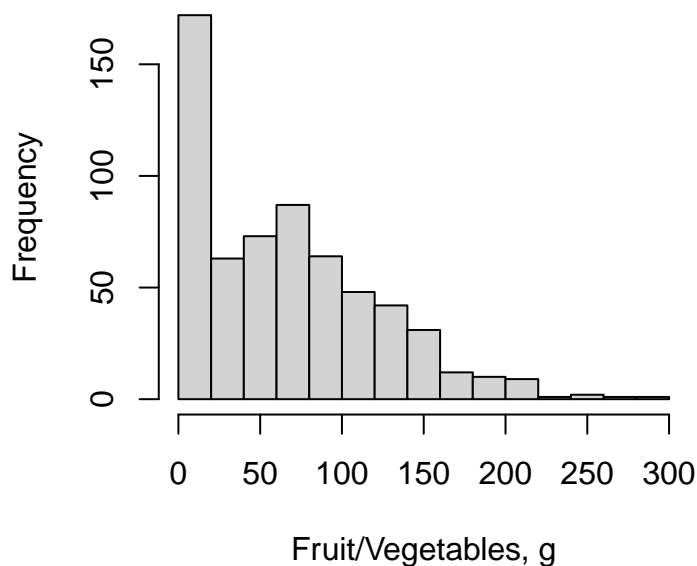
	[,1]
(Intercept)	30.7843919
grade	1.0156132
genderM	1.1917511
race_ethnicityWhite	1.0360589
race_ethnicityOther	1.2366532
race_ethnicityBlack or African American	0.9176227
paid_free_reducedPaid	0.9051634
lunch_dur	0.9876837
time_to_eat	1.0518556

4.2.2 OR

	[,1]
(Intercept)	0.6512001
grade	0.9126923
genderM	1.1351731
race_ethnicityWhite	1.1845262
race_ethnicityOther	1.5519640
race_ethnicityBlack or African American	1.5122330
paid_free_reducedPaid	1.2859331
lunch_dur	0.9555210
time_to_eat	0.9023387

4.3 Middle School

Histogram of Consumed Fruits/Vegetables



-mean and sd for participants that consumed F/V

```
[1] 74.84307
```

```
[1] 54.13259
```

Call:

```
mixed_model(fixed = fv_consumed ~ grade + gender + race_ethnicity +  
  paid_free_reduced + lunch_dur + time_to_eat, random = ~1 |  
  school_name, data = salad_bar_dat_use[salad_bar_dat_use$fv_selected ==  
  "Y" & salad_bar_dat_use$school_type == "Middle School", ],  
  family = zi.negative.binomial(), zi_fixed = ~grade + gender +  
  race_ethnicity + paid_free_reduced + lunch_dur + time_to_eat,  
  zi_random = ~1 | school_name)
```

Data Descriptives:

Number of Observations: 616

Number of Groups: 12

Model:

```
family: zero-inflated negative binomial  
link: log
```

Fit statistics:

log.Lik	AIC	BIC
-3076.799	6197.598	6208.266

Random effects covariance matrix:

	StdDev	Corr
(Intercept)	0.2365	
zi_(Intercept)	0.6013	-0.8728

Fixed effects:

	Estimate	Std.Err	z-value	p-value
(Intercept)	2.9598	0.4247	6.9686	< 1e-04
grade	0.1157	0.0495	2.3363	0.019476
genderM	0.1237	0.0751	1.6477	0.099422
race_ethnicityWhite	-0.0577	0.1210	-0.4765	0.633731
race_ethnicityOther	0.2229	0.1426	1.5627	0.118133
race_ethnicityBlack or African American	0.4109	0.1626	2.5268	0.011509
paid_free_reducedPaid	0.0529	0.1387	0.3816	0.702773
lunch_dur	0.0018	0.0077	0.2335	0.815345
time_to_eat	0.0311	0.0121	2.5687	0.010207

Zero-part coefficients:

	Estimate	Std.Err	z-value	p-value
(Intercept)	-1.9138	1.4390	-1.3300	0.183532
grade	-0.1150	0.1779	-0.6462	0.518140
genderM	-0.0696	0.2828	-0.2461	0.805579
race_ethnicityWhite	0.1218	0.3927	0.3103	0.756363
race_ethnicityOther	0.2355	0.5027	0.4685	0.639449
race_ethnicityBlack or African American	-0.0011	0.5906	-0.0019	0.998498
paid_free_reducedPaid	-0.1103	0.4562	-0.2418	0.808899
lunch_dur	0.0595	0.0242	2.4558	0.014057
time_to_eat	-0.0984	0.0471	-2.0879	0.036808

log(dispersion) parameter:

Estimate	Std.Err
0.364	0.0628

Integration:

method: adaptive Gauss-Hermite quadrature rule

quadrature points: 11

Optimization:

method: hybrid EM and quasi-Newton

converged: TRUE

4.3.1 IRR

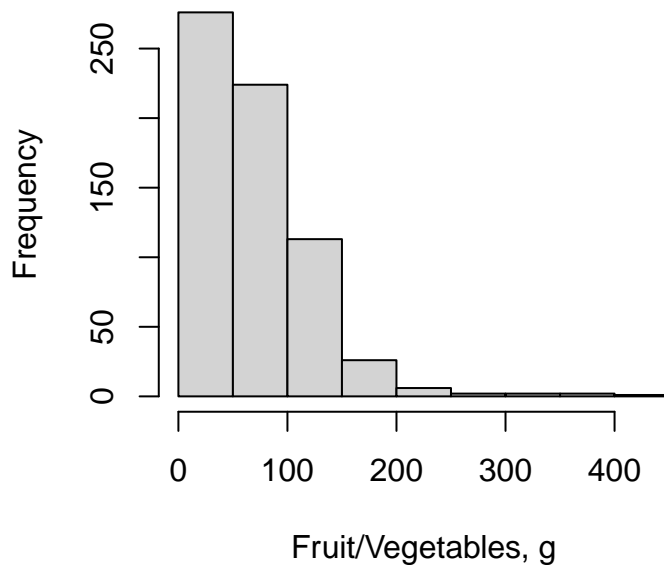
	[,1]
(Intercept)	19.2932706
grade	1.1227015
genderM	1.1317019
race_ethnicityWhite	0.9439655
race_ethnicityOther	1.2496623
race_ethnicityBlack or African American	1.5081521
paid_free_reducedPaid	1.0543572
lunch_dur	1.0017969
time_to_eat	1.0315388

4.3.2 OR

	[,1]
(Intercept)	0.1475122
grade	0.8913978
genderM	0.9327563
race_ethnicityWhite	1.1295846
race_ethnicityOther	1.2655461
race_ethnicityBlack or African American	0.9988888
paid_free_reducedPaid	0.8955366
lunch_dur	1.0613235
time_to_eat	0.9062708

4.4 High School

Histogram of Consumed Fruits/Vegetables



-mean and sd for participants that consumed F/V

```
[1] 65.20552
```

```
[1] 57.46868
```

Call:

```
mixed_model(fixed = fv_consumed ~ grade + gender + race_ethnicity +  
  paid_free_reduced + lunch_dur + time_to_eat, random = ~1 |  
  school_name, data = salad_bar_dat_use[salad_bar_dat_use$fv_selected ==  
  "Y" & salad_bar_dat_use$school_type == "High School", ],  
  family = zi.negative.binomial(), zi_fixed = ~grade + gender +  
  race_ethnicity + paid_free_reduced + lunch_dur + time_to_eat,  
  zi_random = ~1 | school_name)
```

Data Descriptives:

Number of Observations: 652

Number of Groups: 12

Model:

```
family: zero-inflated negative binomial  
link: log
```

Fit statistics:

log.Lik	AIC	BIC
-3183.798	6411.597	6422.265

Random effects covariance matrix:

	StdDev	Corr
(Intercept)	0.0906	
zi_(Intercept)	0.7317	-0.1799

Fixed effects:

	Estimate	Std.Err	z-value	p-value
(Intercept)	3.4447	0.3740	9.2101	< 1e-04
grade	0.0720	0.0321	2.2426	0.024923
genderM	0.0208	0.0700	0.2971	0.766411
race_ethnicityWhite	0.1958	0.1155	1.6957	0.089939
race_ethnicityOther	0.2236	0.1656	1.3507	0.176803
race_ethnicityBlack or African American	0.2442	0.2163	1.1290	0.258907
paid_free_reducedPaid	-0.2199	0.1394	-1.5775	0.114688
lunch_dur	-0.0029	0.0052	-0.5532	0.580104
time_to_eat	0.0162	0.0081	2.0001	0.045493

Zero-part coefficients:

	Estimate	Std.Err	z-value	p-value
(Intercept)	-0.9231	1.2098	-0.7630	0.4454722
grade	0.0338	0.1145	0.2949	0.7680934
genderM	-0.3680	0.2433	-1.5125	0.1304135
race_ethnicityWhite	0.2400	0.3836	0.6257	0.5315215
race_ethnicityOther	0.5325	0.4662	1.1423	0.2533245
race_ethnicityBlack or African American	0.5934	0.6396	0.9279	0.3534797
paid_free_reducedPaid	-0.1929	0.6067	-0.3180	0.7504960
lunch_dur	-0.0042	0.0195	-0.2182	0.8272622
time_to_eat	-0.1054	0.0327	-3.2175	0.0012931

log(dispersion) parameter:

Estimate	Std.Err
0.4549	0.0615

Integration:

method: adaptive Gauss-Hermite quadrature rule
quadrature points: 11

Optimization:

method: hybrid EM and quasi-Newton
converged: TRUE

4.4.1 IRR

	[,1]
(Intercept)	31.3330496
grade	1.0746213
genderM	1.0210273
race_ethnicityWhite	1.2163148
race_ethnicityOther	1.2505981
race_ethnicityBlack or African American	1.2766146
paid_free_reducedPaid	0.8026330
lunch_dur	0.9971233

time_to_eat	1.0162881
-------------	-----------

4.4.2 OR

	[,1]
(Intercept)	0.3972965
grade	1.0343515
genderM	0.6920972
race_ethnicityWhite	1.2712934
race_ethnicityOther	1.7032431
race_ethnicityBlack or African American	1.8102048
paid_free_reducedPaid	0.8245423
lunch_dur	0.9957618
time_to_eat	0.9000012

5 Fruit/Vegetable Percent Waste

histogram of Percent Fruits/Vegetables Was



5.1 Overall

-mean and sd for participants that wasted some F/V but not 100%

```
[1] 55.39093
```

```
[1] 30.44688
```

Call:

```
mixed_model(fixed = fv_prop_waste ~ grade + gender + race_ethnicity +  
  paid_free_reduced + lunch_dur + time_to_eat, random = ~1 |  
  school_name, data = salad_bar_dat_use[salad_bar_dat_use$fv_selected ==  
  "Y" & salad_bar_dat_use$fv_prop_waste < 100, ], family = zi.negative.binomial(),  
  zi_fixed = ~grade + gender + race_ethnicity + paid_free_reduced +  
  lunch_dur + time_to_eat, zi_random = ~1 | school_name)
```

Data Descriptives:

Number of Observations: 1774

Number of Groups: 36

Model:

```
family: zero-inflated negative binomial  
link: log
```

Fit statistics:

log.Lik	AIC	BIC
-8193.533	16431.07	16465.9

Random effects covariance matrix:

	StdDev	Corr
(Intercept)	0.2265	
zi_(Intercept)	1.2853	-0.6368

Fixed effects:

	Estimate	Std.Err	z-value	p-value
(Intercept)	4.4531	0.1162	38.3369	< 1e-04
grade	-0.0276	0.0103	-2.6829	0.00729948
genderM	-0.1088	0.0316	-3.4424	0.00057660
race_ethnicityWhite	0.0304	0.0497	0.6108	0.54136062
race_ethnicityOther	-0.1711	0.0655	-2.6132	0.00896969
race_ethnicityBlack or African American	-0.1093	0.0725	-1.5084	0.13146399
paid_free_reducedPaid	0.0116	0.0545	0.2130	0.83131415
lunch_dur	-0.0039	0.0031	-1.2473	0.21227434
time_to_eat	-0.0147	0.0042	-3.5218	0.00042867

Zero-part coefficients:

	Estimate	Std.Err	z-value	p-value
(Intercept)	-5.3141	0.7693	-6.9077	< 1e-04
grade	0.0705	0.0627	1.1238	0.2610882
genderM	0.4765	0.1874	2.5431	0.0109876
race_ethnicityWhite	-0.2225	0.3143	-0.7080	0.4789306
race_ethnicityOther	0.8876	0.2996	2.9631	0.0030453
race_ethnicityBlack or African American	0.6080	0.3707	1.6400	0.1009998
paid_free_reducedPaid	0.2548	0.3086	0.8257	0.4089933
lunch_dur	0.0436	0.0226	1.9280	0.0538526
time_to_eat	0.0317	0.0210	1.5117	0.1306036

log(dispersion) parameter:

Estimate	Std.Err
1.0059	0.0371

Integration:

method: adaptive Gauss-Hermite quadrature rule

quadrature points: 11

Optimization:

method: hybrid EM and quasi-Newton

converged: TRUE

5.1.1 IRR

	[,1]
(Intercept)	85.8937968
grade	0.9727505
genderM	0.8969426
race_ethnicityWhite	1.0308366
race_ethnicityOther	0.8427063
race_ethnicityBlack or African American	0.8964752
paid_free_reducedPaid	1.0116725

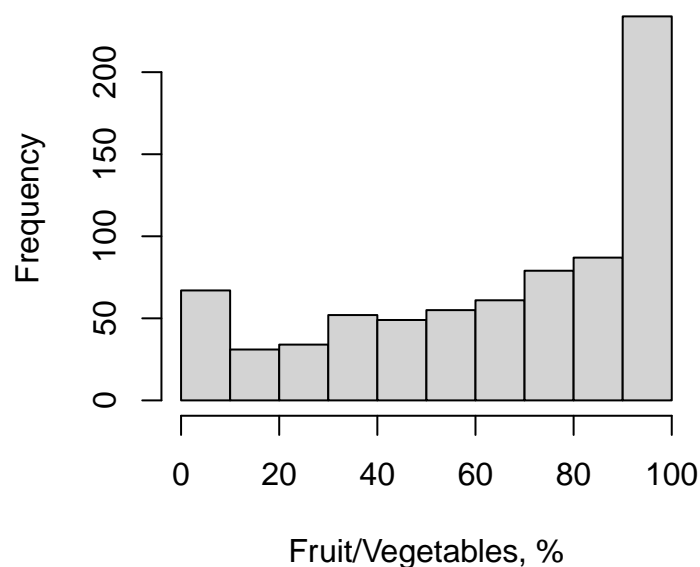
lunch_dur	0.9960816
time_to_eat	0.9854565

5.1.2 OR

	[,1]
(Intercept)	0.004921635
grade	1.073034003
genderM	1.610432501
race_ethnicityWhite	0.800480521
race_ethnicityOther	2.429389127
race_ethnicityBlack or African American	1.836796262
paid_free_reducedPaid	1.290225209
lunch_dur	1.044552440
time_to_eat	1.032251780

5.2 Elementary

Histogram of Percent Fruits/Vegetables Was



-mean and sd for participants that wasted some F/V but not 100%

```
[1] 100
```

```
[1] 27.74745
```

Call:

```
mixed_model(fixed = fv_prop_waste ~ grade + gender + race_ethnicity +  
  paid_free_reduced + lunch_dur + time_to_eat, random = ~1 |  
  school_name, data = salad_bar_dat_use[salad_bar_dat_use$school_type ==  
  "Elementary" & salad_bar_dat_use$fv_selected == "Y" & salad_bar_dat_use$fv_prop_waste <  
  100, ], family = zi.negative.binomial(), zi_fixed = ~grade +  
  gender + race_ethnicity + paid_free_reduced + lunch_dur +  
  time_to_eat, zi_random = ~1 | school_name)
```

Data Descriptives:

Number of Observations: 671

Number of Groups: 12

Model:

family: zero-inflated negative binomial
link: log

Fit statistics:

log.Lik	AIC	BIC
-3183.878	6411.757	6422.425

Random effects covariance matrix:

	StdDev	Corr
(Intercept)	0.0801	
zi_(Intercept)	1.2869	-0.3920

Fixed effects:

	Estimate	Std.Err	z-value	p-value
(Intercept)	4.2812	0.1290	33.1817	< 1e-04
grade	-0.0091	0.0158	-0.5739	0.5660289
genderM	-0.0662	0.0416	-1.5933	0.1111036
race_ethnicityWhite	0.0182	0.0619	0.2934	0.7692083
race_ethnicityOther	-0.0630	0.0764	-0.8240	0.4099674
race_ethnicityBlack or African American	-0.0287	0.0838	-0.3428	0.7317594
paid_free_reducedPaid	0.0377	0.0582	0.6481	0.5168989
lunch_dur	0.0047	0.0034	1.3572	0.1747254
time_to_eat	-0.0177	0.0060	-2.9616	0.0030604

Zero-part coefficients:

	Estimate	Std.Err	z-value	p-value
(Intercept)	-4.9520	1.4301	-3.4626	0.00053493
grade	0.1645	0.1314	1.2514	0.21080061
genderM	0.4403	0.3652	1.2056	0.22798179
race_ethnicityWhite	0.6998	0.5136	1.3626	0.17302268
race_ethnicityOther	0.0764	0.5722	0.1335	0.89378933
race_ethnicityBlack or African American	0.8986	0.5185	1.7331	0.08308152
paid_free_reducedPaid	-0.6770	0.6240	-1.0850	0.27790048
lunch_dur	0.0076	0.0447	0.1711	0.86416872
time_to_eat	0.0360	0.0516	0.6969	0.48587549

log(dispersion) parameter:

Estimate	Std.Err
1.3869	0.0607

Integration:

method: adaptive Gauss-Hermite quadrature rule
quadrature points: 11

Optimization:

method: hybrid EM and quasi-Newton
converged: TRUE

5.2.1 IRR

	[,1]
(Intercept)	72.3247305
grade	0.9909527
genderM	0.9359398
race_ethnicityWhite	1.0183262
race_ethnicityOther	0.9389663
race_ethnicityBlack or African American	0.9716990
paid_free_reducedPaid	1.0384621
lunch_dur	1.0046708

time_to_eat	0.9824571
-------------	-----------

5.2.2 OR

	[,1]
(Intercept)	0.007069318
grade	1.178747486
genderM	1.553195784
race_ethnicityWhite	2.013430668
race_ethnicityOther	1.079386140
race_ethnicityBlack or African American	2.456185119
paid_free_reducedPaid	0.508121676
lunch_dur	1.007668157
time_to_eat	1.036624197

5.3 Middle School

Histogram of Percent Fruits/Vegetables Was



-mean and sd for participants that wasted some F/V but not 100%

```
[1] 50.82084
```

```
[1] 31.95659
```

Call:

```
mixed_model(fixed = fv_prop_waste ~ grade + gender + race_ethnicity +  
  paid_free_reduced + lunch_dur + time_to_eat, random = ~1 |  
  school_name, data = salad_bar_dat_use[salad_bar_dat_use$school_type ==  
  "Middle School" & salad_bar_dat_use$fv_selected == "Y" &  
  salad_bar_dat_use$fv_prop_waste < 100, ], family = zi.negative.binomial(),  
  zi_fixed = ~grade + gender + race_ethnicity + paid_free_reduced +  
  lunch_dur + time_to_eat, zi_random = ~1 | school_name)
```

Data Descriptives:

Number of Observations: 548

Number of Groups: 12

Model:

```
family: zero-inflated negative binomial  
link: log
```

Fit statistics:

log.Lik	AIC	BIC
-2533.249	5110.497	5121.165

Random effects covariance matrix:

	StdDev	Corr
(Intercept)	0.2810	
zi_(Intercept)	1.5580	-0.6376

Fixed effects:

	Estimate	Std.Err	z-value	p-value
(Intercept)	4.4048	0.3681	11.9647	< 1e-04
grade	-0.0167	0.0420	-0.3973	0.691171
genderM	-0.1720	0.0661	-2.6031	0.009239
race_ethnicityWhite	0.0512	0.1058	0.4836	0.628654
race_ethnicityOther	-0.3404	0.1327	-2.5649	0.010321
race_ethnicityBlack or African American	-0.3341	0.1412	-2.3667	0.017948
paid_free_reducedPaid	-0.0373	0.1194	-0.3124	0.754744
lunch_dur	-0.0038	0.0078	-0.4908	0.623564
time_to_eat	-0.0207	0.0100	-2.0711	0.038350

Zero-part coefficients:

	Estimate	Std.Err	z-value	p-value
(Intercept)	-2.3658	2.2387	-1.0568	0.290617
grade	-0.3679	0.2511	-1.4651	0.142907
genderM	-0.0351	0.3812	-0.0920	0.926676
race_ethnicityWhite	-1.0193	0.7561	-1.3481	0.177627
race_ethnicityOther	1.6814	0.5688	2.9562	0.003115
race_ethnicityBlack or African American	-1.2629	1.3353	-0.9458	0.344264
paid_free_reducedPaid	0.5524	0.6756	0.8177	0.413550
lunch_dur	0.0872	0.0548	1.5910	0.111619
time_to_eat	-0.0826	0.0680	-1.2160	0.223998

log(dispersion) parameter:

Estimate	Std.Err
0.7319	0.066

Integration:

method: adaptive Gauss-Hermite quadrature rule

quadrature points: 11

Optimization:

method: hybrid EM and quasi-Newton

converged: TRUE

5.3.1 IRR

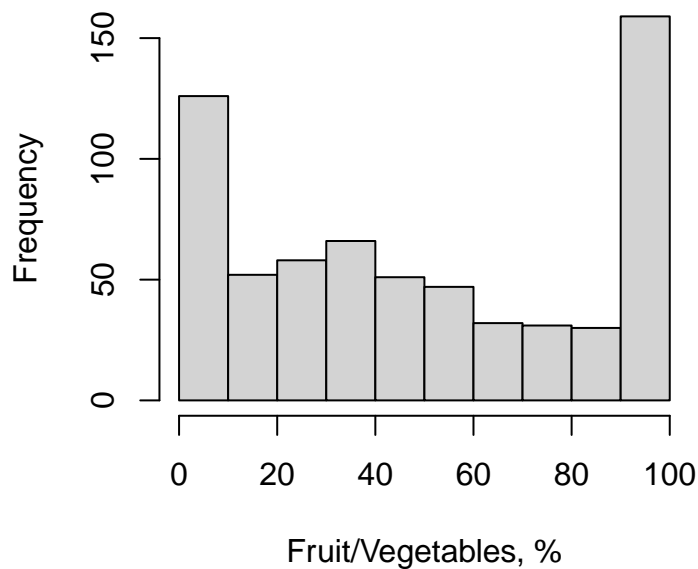
	[,1]
(Intercept)	81.8421086
grade	0.9834450
genderM	0.8419593
race_ethnicityWhite	1.0524826
race_ethnicityOther	0.7114942
race_ethnicityBlack or African American	0.7159560
paid_free_reducedPaid	0.9633808
lunch_dur	0.9961726
time_to_eat	0.9794887

5.3.2 OR

	[,1]
(Intercept)	0.09387426
grade	0.69219926
genderM	0.96552591
race_ethnicityWhite	0.36085048
race_ethnicityOther	5.37290070
race_ethnicityBlack or African American	0.28284544
paid_free_reducedPaid	1.73740541
lunch_dur	1.09109321
time_to_eat	0.92068424

5.4 High School

Histogram of Percent Fruits/Vegetables Was



-mean and sd for participants that wasted some F/V but not 100%

```
[1] 47.67042
```

```
[1] 28.94252
```

Call:

```
mixed_model(fixed = fv_prop_waste ~ grade + gender + race_ethnicity +  
  paid_free_reduced + lunch_dur + time_to_eat, random = ~1 |  
  school_name, data = salad_bar_dat_use[salad_bar_dat_use$school_type ==  
  "High School" & salad_bar_dat_use$fv_selected == "Y" & salad_bar_dat_use$fv_prop_waste <  
  100, ], family = zi.negative.binomial(), zi_fixed = ~grade +  
  gender + race_ethnicity + paid_free_reduced + lunch_dur +  
  time_to_eat, zi_random = ~1 | school_name)
```

Data Descriptives:

Number of Observations: 555

Number of Groups: 12

Model:

```
family: zero-inflated negative binomial  
link: log
```

Fit statistics:

log.Lik	AIC	BIC
-2416.392	4876.784	4887.452

Random effects covariance matrix:

	StdDev	Corr
(Intercept)	0.1969	
zi_(Intercept)	0.8980	-0.9408

Fixed effects:

	Estimate	Std.Err	z-value	p-value
(Intercept)	4.5344	0.3349	13.5406	< 1e-04
grade	-0.0180	0.0286	-0.6309	0.528097
genderM	-0.0926	0.0611	-1.5141	0.129997
race_ethnicityWhite	0.0500	0.1023	0.4886	0.625146
race_ethnicityOther	-0.2279	0.1725	-1.3215	0.186324
race_ethnicityBlack or African American	0.0321	0.2097	0.1530	0.878388
paid_free_reducedPaid	0.0664	0.1558	0.4258	0.670251
lunch_dur	-0.0110	0.0061	-1.8078	0.070634
time_to_eat	-0.0128	0.0069	-1.8542	0.063716

Zero-part coefficients:

	Estimate	Std.Err	z-value	p-value
(Intercept)	-4.8839	1.7871	-2.7328	0.0062799
grade	0.0231	0.1330	0.1740	0.8618398
genderM	0.7229	0.2823	2.5602	0.0104613
race_ethnicityWhite	-0.3184	0.4899	-0.6500	0.5157007
race_ethnicityOther	1.1813	0.5216	2.2649	0.0235165
race_ethnicityBlack or African American	1.3117	0.7653	1.7140	0.0865292
paid_free_reducedPaid	0.8390	0.5047	1.6622	0.0964800
lunch_dur	0.0399	0.0340	1.1744	0.2402523
time_to_eat	0.0504	0.0259	1.9449	0.0517820

log(dispersion) parameter:

Estimate	Std.Err
0.9194	0.0685

Integration:

method: adaptive Gauss-Hermite quadrature rule
quadrature points: 11

Optimization:

method: hybrid EM and quasi-Newton
converged: TRUE

5.4.1 IRR

	[,1]
(Intercept)	93.1635446
grade	0.9821149
genderM	0.9115709
race_ethnicityWhite	1.0512607
race_ethnicityOther	0.7961759
race_ethnicityBlack or African American	1.0326016
paid_free_reducedPaid	1.0686079
lunch_dur	0.9891016

time_to_eat	0.9872801
-------------	-----------

5.4.2 OR

	[,1]
(Intercept)	0.007567665
grade	1.023412967
genderM	2.060312163
race_ethnicityWhite	0.727289858
race_ethnicityOther	3.258672997
race_ethnicityBlack or African American	3.712643671
paid_free_reducedPaid	2.313965968
lunch_dur	1.040724550
time_to_eat	1.051642513

6 Supplemental Information – Complete vs Missing Time to Eat

6.1 Demographic Characteristics

Table 2: Demographic Characteristics and Variables of Interest

Group	Characteristic	Full Sample		Time to Eat Data			p-value
		N	N = 2,832	N	Complete	Missing	
	Gender	2,832		2,832			0.268
	F		1,328 (47%)		1,100 (46%)	228 (49%)	
	M		1,504 (53%)		1,269 (54%)	235 (51%)	
	Grade	2,832	6.9 (3.3)	2,832	7.1 (3.1)	5.6 (3.5)	0.000
	Age, yr	2,732	12.0 (3.3)	2,732	12.2 (3.2)	10.8 (3.5)	0.000
	Unknown		100		95	5	
	Race/Ethnicity	2,832		2,832			0.000
	Hispanic or Latino		1,751 (62%)		1,498 (63%)	253 (55%)	
	White		713 (25%)		557 (24%)	156 (34%)	
	Other		208 (7.3%)		180 (7.6%)	28 (6.0%)	
	Black or African American		160 (5.6%)		134 (5.7%)	26 (5.6%)	
	Free-Reduced Lunch	2,832		2,832			0.001
	Free/Reduced		2,273 (80%)		1,875 (79%)	398 (86%)	
	Paid		559 (20%)		494 (21%)	65 (14%)	
	F/V Selected	2,832		2,832			0.008
	N		399 (14%)		352 (15%)	47 (10%)	
	Y		2,433 (86%)		2,017 (85%)	416 (90%)	
	Lunch duration	2,832	27.8 (9.5)	2,832	27.8 (9.6)	27.8 (8.9)	0.514
	F/V Consumed Any	2,433		2,433			0.033
	N		309 (13%)		243 (12%)	66 (16%)	
	Y		2,124 (87%)		1,774 (88%)	350 (84%)	
	F/V Self-Served, g	2,433	135.8 (68.9)	2,433	136.9 (70.6)	130.3 (59.7)	0.312
	Lunch Period	2,433	26.9 (9.6)	2,433	26.9 (9.7)	26.9 (8.8)	0.382
	Time in Line	2,350	5.4 (4.4)	2,350	5.3 (3.2)	6.0 (8.6)	0.920
	Unknown		83		0	83	
	Eating Duration	2,018	10.6 (4.1)	2,018	10.6 (4.1)	-0.4 (NA)	0.084
	Unknown		415		0	415	
	F/V Consumed, g	2,433	58.1 (54.9)	2,433	57.5 (55.3)	60.9 (53.3)	0.182
	F/V Waste, g	2,433	77.7 (65.7)	2,433	79.5 (66.7)	69.4 (60.0)	0.012
	F/V Percent Waste (post/pre), %	2,433	55.8 (35.3)	2,433	56.3 (35.1)	53.8 (36.7)	0.427

¹ n (%); Mean (SD)

² Pearson's Chi-squared test; Wilcoxon rank sum test