Appendix

The statistical model used in this analysis uses information from both consuming and nonconsuming households. The censored normal regression model, commonly referred to as the Tobit model, is used to obtain expenditure estimates when some households purchase and others do not purchase in a given time period.

The Tobit model can be expressed, for a typical household, as:

$$Y_i = X_iB + \varepsilon_i \text{ if } X_iB + \varepsilon_i > 0;$$

$$Y_i = 0 \text{ if } X_iB + \varepsilon_i \leq 0.$$

Where i = 1, 2. …, n; n is the number of households; Y_i is item expenditure; X is a vector of explanatory variables; B is a vector of coefficients; and ε_i is an independently and normally distributed random disturbance term with a mean of zero and constant variance, σ^2. The level of expenditures for the i^{th} household is determined by the combination of a nonstochastic component, $X_i\beta$, and a stochastic component, ε_i. The determinate or nonstochastic portion of the model is a linear function of household characteristics and their respective response parameters. Expenditures differ among households due to both the determinate portion of the model and to the stochastic element, which embodies the unobserved factors and idiosyncrasies of individual households. For a more detailed discussion of the Tobit technique, see Blisard and Blaylock.

Appendix table 1—Tobit model for food expenditures, 1997-98: parameter estimates and statistics

Independent variables	Total food	Food at home	Cereals and bakery	Meat, poultry, fish, and eggs	Beef	Pork	Poultry	Fish	Dairy
Constant	11.30	14.13	1.81	10.86	5.44	5.68	0.83	-4.48	0.54
	(4.59)	(3.22)	(0.70)	(1.35)	(0.80)	(0.65)	(0.56)	(0.95)	(0.63)
Diet knowledge	0.98	0.80	0.16	-0.08	-0.16	-0.20	0.05	0.25	0.15
	(0.26)	(0.18)	(0.04)	(0.08)	(0.05)	(0.04)	(0.03)	(0.05)	(0.04)
North Central	-4.03	-2.13	-0.56	-0.80	-0.17	0.32	-0.55	-1.31	-0.43
	(1.02)	(0.72)	(0.16)	(0.30)	(0.18)	(0.15)	(0.13)	(0.21)	(0.14)
South	-3.52	-1.51	-0.73	-0.40	-0.08	0.35	-0.42	-0.47	-0.26
	(0.96)	(0.67)	(0.15)	(0.28)	(0.17)	(0.14)	(0.12)	(0.20)	(0.13)
West	-0.68	0.55	-0.41	-0.35	-0.22	-0.17	-0.35	0.19	-0.04
	(1.00)	(0.70)	(0.15)	(0.30)	(0.18)	(0.14)	(0.12)	(0.20)	(0.14)
Race	-4.16	-0.55	-0.40	1.25	-0.26	0.37	0.88	1.44	-0.89
	(1.17)	(0.82)	(0.18)	(0.34)	(0.20	(0.16)	(0.14)	(0.24)	(0.16)
Income	3.41	0.95	0.14	0.10	0.03	0.04	0.04	0.01	0.12
	(0.19)	(0.14)	(0.03)	(0.06)	(0.03)	(0.03)	(0.02)	(0.04)	(0.03)
Income squared	-0.05	-0.01	-3.39-e3	5.63-e3	3.50-e3	-3.29-e4	3.61-e4	3.00-e3	-2.73-e3
	(0.01)	(4.75-e3)	(1.03-e3)	(1.20-e3)	(1.15-e3)	(9.96-e4)	(8.15-e4)	(1.28-e3)	(9.47-e4)
Winter	-0.33	-1.12	0.11	-0.03	0.24	-0.21	-0.15	0.59	-0.37
	(0.89)	(0.62)	(0.14)	(0.26)	(0.16)	(0.13)	(0.11)	(0.18)	(0.12)
Spring	0.22	-0.73	0.02	-0.04	0.48	-0.24	-0.19)	0.13	-0.24
	(0.89)	(0.62)	(0.14)	(0.26)	(0.16)	(0.13)	(0.11)	(0.18)	(0.12)
Summer	-0.02	-1.75	-9.99-e3	-0.38	0.18	-0.26	-0.20	-0.02	-0.37
	(0.89)	(0.63)	(0.13)	(0.26)	(0.16)	(0.13)	(0.11)	(0.19)	(0.12)
Year	1.84	-0.43	-0.20	-0.10	-0.03	-0.06	-0.11	0.18	-0.10
	(0.64)	(0.45)	(0.10)	(0.19)	(0.11)	(0.09)	(0.08)	(0.13)	(0.09)
Household size (inverse)	10.50	0.97	-0.37	-2.65	-2.65	-2.34	-1.69	-2.56	-0.06
	(1.38)	(0.97)	(0.21)	(0.41)	(0.25)	(0.21)	(0.18)	(0.30)	(0.19)
Proportion age 0-4	-19.76	-15.54	-2.74	-6.28	-2.00	-2.20	-1.48	-2.07	-0.63
	(3.35)	(2.35)	(0.51)	(0.99)	(0.58)	(0.47)	(0.41)	(0.69)	(0.46)
Proportion age 5-9	-14.85	-12.24	-1.07	-5.39	-1.72	-2.30	-1.09	-1.15	-0.76
	(2.97)	(2.08)	(0.45)	(0.87)	(0.51)	(0.42)	(0.36)	(0.60)	(0.41)
Proportion age 10-14	-10.41	-11.89	-1.35	-5.59	-1.68	-2.52	-0.98	-2.40	-0.84
	(3.01)	(2.11)	(0.46)	(0.88)	(0.52)	(0.42)	(0.36)	(0.61)	(0.41)
Proportion age 15-19	-15.35	-18.45	-2.87	-7.85	-3.05	-2.84	-1.81	-2.51	-2.13
	(2.29)	(1.63)	(0.36)	(0.71)	(0.43)	(0.36)	(0.30)	(0.52)	(0.32)
Proportion age 20-29	-6.13	-12.45	-1.42	-5.14	-1.98	-2.59	-1.13	-2.08	-1.34
	(1.31)	(0.92)	(0.20)	(0.39)	(0.24)	(0.20)	(0.17)	(0.29)	(0.18)
Proportion age 30-44	-0.87	-6.09	-0.85	-2.23	-1.19	-1.20	-0.21	-0.58	-0.49
	(1.20)	(0.84)	(0.18)	(0.36)	(0.21)	(0.18)	(0.15)	(0.25)	(0.17)
Proportion age 65-74	1.22	0.08	0.47	-0.47	-0.51	-0.29	-0.16	0.28	0.16
	(1.38)	(0.96)	(0.21)	(0.40)	(0.24)	(0.20)	(0.17)	(0.28)	(0.19)
Proportion age 75 and older	-3.56	-0.37	0.57	-1.36	-1.01	-0.62	-0.14	0.14	0.37
	(1.52)	(1.06)	(0.23)	(0.45)	(0.27)	(0.22)	(0.19)	(0.32)	(0.21)
Sigma	28.21	19.72	4.29	8.19	4.57	3.67	3.15	4.86	3.82
Direct income elasticity	0.27	0.12	0.09	0.07	0.07	0.06	0.08	0.05	0.10
Probability of purchase	0.92	0.89	0.80	0.75	0.52	0.48	0.49	0.32	0.75

Appendix table 2—Tobit model for food expenditures, 1997-98: parameter estimates and statistics

Independent variables	Fruits	Vegetables	Sugars and sweeteners	Nonalcoholic beverages	Fats and oils	Miscellaneous prepared food	Food away from home
Constant	-2.54	-0.12	-0.62	1.87	0.44	-1.32	-12.58
	(0.57)	(0.43)	(0.49)	(0.51)	(0.29)	(0.83)	(3.48)
Diet-health knowledge	0.28	0.17	0.11	0.01	0.03	0.24	0.61
	(0.03)	(0.02)	(0.03)	(0.03)	(0.02)	(0.05)	(0.20)
North Central	-0.53	-0.53	4.17-e3	0.21	-0.04	0.51	-1.91
	(0.13)	(0.10)	(0.11)	(0.11)	(0.06)	(0.19)	(0.77)
South	-0.42	-0.20)	-0.01	0.22	0.06	0.44	-2.19
	(0.12)	(0.09)	(0.10)	(0.11)	(0.06)	(0.17)	(0.72)
West	0.20	0.12	0.03	0.18	0.08	1.12	-1.05
	(0.12)	(0.09)	(0.11)	(0.11)	(0.06)	(0.18)	(0.75)
Race	0.53	0.09	-0.13	-0.43	0.04	-0.82	-4.68
	(0.15)	(0.11)	(0.13)	(0.13)	(0.07)	(0.21)	(0.90)
Income	0.16	0.07	0.07	0.10	0.02	0.24	2.77
	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.04)	(0.15)
Income squared	-3.70-e3	-1.55-e3	-1.81-e3	-2.46-e3	-6.30-e4	-5.57-e3	-0.04
	(0.8.57-e4)	(6.44-e4)	(7.24-e4)	(7.67-e4)	(4.38-e4)	(1.22-e3)	(0.01)
Winter	-0.02	0.02	-0.42	-0.13	-8.49-e3	-0.18	0.72
	(0.11)	(0.08)	(0.10)	(0.10)	(0.06)	(0.16)	(0.67)
Spring	0.27	0.06	-0.61	0.18	0.02	-0.24	1.07
	(0.11)	(0.08)	(0.10)	(0.10)	(0.06)	(0.16)	(0.67)
Summer	0.23	-0.05	-0.72	0.02	-0.10	-0.63	1.79
	(0.11)	(0.08)	(0.10)	(0.10)	(0.06)	(0.16)	(0.67)
Year	-0.03	0.05	9.97-e3	-0.12	-0.07	-0.05	2.76
	(0.08)	(0.06)	(0.07)	(0.07)	(0.04)	(0.12)	(0.49)
Household size (inverse)	-0.33	-0.86	-0.98	-0.25	-0.82	-0.05	7.16
	(0.17)	(0.13)	(0.15)	(0.15)	(0.09)	(0.25)	(1.04)
Proportion age 0-4	-0.74	-1.84	-0.73	-1.82	-1.14	-1.77	-4.56
	(0.41)	(0.31)	(0.36)	(0.37)	(0.21)	(0.60)	(2.53)
Proportion age 5-9	-0.76	-1.81	-0.13	-1.81	-0.73	-1.66	-3.03
	(0.37)	(0.28)	(0.31)	(0.33)	(0.18)	(0.54)	(2.25)
Proportion age 10-14	-1.46	-1.89	-0.19	-1.04	-0.78	-1.24	1.78
	(0.37)	(0.28)	(0.32)	(0.33)	(0.19)	(0.54)	(2.27)
Proportion age 15-19	-2.53	-2.74	-0.87	-1.46	-1.23	-2.78	2.71
	(0.30)	(0.23)	(0.26)	(0.26)	(0.15)	(0.43)	(1.72)
Proportion age 20-29	-1.55	-1.77	-0.87	-0.99	-0.98	-1.73	7.45
	(0.16)	(0.12)	(0.14)	(0.15)	(0.09)	(0.24)	(0.98)
Proportion age 30-44	-1.17	-0.92	-0.42	-0.17	-0.49	-0.56	6.12
	(0.15)	(0.11)	(0.13)	(0.13)	(0.08)	(0.22)	(0.90)
Proportion age 65-74	0.42	0.29	0.46	-0.47	-0.06	-0.42	1.07
	(0.17)	(0.13)	(0.15)	(0.15)	(0.09)	(0.25)	(1.04)
Proportion age 75 and older	1.44	0.23	0.23	-0.98	0.07	-0.01	-3.89
	(0.19)	(0.14)	(0.16)	(0.17)	(0.09)	(0.28)	(1.16)
Sigma	3.42	2.58	2.85	3.04	1.63	5.01	20.84
Direct income elasticity	0.15	0.10	0.11	0.11	0.05	0.15	0.44
Probability of purchase	0.72	0.75	0.55	0.72	0.54	0.73	0.74

Appendix table 3—Diet-health knowledge equation

Independent variables	Diet-health knowledge
Constant	16.19
	(0.27)
North Central	0.78
	(0.18)
South	0.07
	(0.27)
West	-0.21
	(0.24)
Nonmetro	0.01
	(0.17)
Income	0.18
	(0.03)
Male	-1.57
	(0.17)
Black	-1.44
	(0.36)
Male head	-0.64
	(0.22)
Female head	-0.80
	(0.17)
Employed	0.24
	(0.19)
High school education	1.46
	(0.21)
Some college	2.51
	(0.19)
College	3.12
	(0.22)
Proportion age 0-4	-0.25
	(0.54)
Proportion age 5-9	-0.46
	(0.60)
Proportion age 10-14	-0.19
	(0.70)
Proportion age 15-19	0.25
	(0.65)
Proportion age 20-29	-0.52
	(0.31)
Proportion age 30-44	-0.50
	(0.31)
Proportion age 65-74	0.10
	(0.21)
Proportion age 75 and older	-2.00
	(0.35)

R-squared = 0.20

F(21,23) = 48.4

N = 5,232