

Online Supporting Material

**Supplemental Table 1. Food items' distribution (PIN Study, NC. 2000-2005)**

<b>Food item</b>	<b>No consumption %</b>	<b>≤ Median %</b>	<b>&gt; Median %</b>
<b>Vitamin C fruits</b>			
Oranges or tangerines	27.2	44.4	28.5
Grapefruit <sup>1</sup>	73.5		
<b>Other fruits</b>			
Apples or pears	12.8	44.2	43.0
Bananas	13.2	55.6	31.2
Peaches or apricots	42.9	36.6	20.5
Cantaloupe	35.9	32.1	32.0
Watermelon	53.4	26.5	20.2
Canned fruit	28.4	46.4	25.2
Strawberries	20.5	46.0	33.5
Other fruits	11.1	48.1	40.8
<b>Vegetables</b>			
Green beans or peas	8.9	56.5	34.6
Corn	9.2	47.3	43.5
Coleslaw or cabbage	41.2	33.0	25.8
Green salad <sup>2</sup>		57.7	42.3
White potatoes baked or mashed <sup>2</sup>		61.6	38.4
Other vegetables	26.4	45.1	28.5
<b>High-carotenoid vegetables</b>			
Raw tomatoes	20.9	40.6	38.5
Broccoli	14.2	43.9	41.9
Spinach	41.6	33.2	25.2
Greens (e.g. collards)	65.9	17.5	16.6
Carrots	14.6	43.3	42.0
Sweet potatoes	57.7	21.9	20.4
<b>Dairy</b>			
Cheese and cheese spreads <sup>2</sup>		54.2	45.8
Yogurt	29.6	42.6	27.8
Frozen yogurt	65.8	19.0	15.3
Low fat milk	26.5	36.8	36.7
Soy milk <sup>3</sup>	0.98		
Rice milk <sup>3</sup>	1.00		
<b>Nuts and beans</b>			
Peanut butter	22.4	43.7	33.9
Peanuts, other nuts and seeds	27.2	40.5	32.3
Baked beans	29.1	46.5	24.4
Chili with beans	53.5	29.3	17.2
Refried beans or bean burritos	43.0	29.2	27.8
<b>Mixed dish with meat</b>			
Vegetable stew	63.5	19.8	16.7
Spaghetti with tomato sauce and meat <sup>2</sup>		63.8	36.2
Vegetable soup	31.0	36.1	32.9
Other soups (e.g. chicken noodles)	30.3	36.1	33.6
Mixed dishes with beef or pork	51.5	24.4	24.0

Online Supporting Material

<b>Food item</b>	<b>No consumption %</b>	<b>≤ Median %</b>	<b>&gt;Median %</b>
Pasta salad or other pasta dish	6.8	47.0	46.1
Chicken stew or pot pie	19.6	40.9	39.5
<b>Eggs and meat</b>			
Eggs or egg biscuits <sup>2</sup>		64.4	35.6
Beef (e.g. roast, steak, sandwiches)	24.9	41.2	33.9
Liver or liverwurst <sup>3</sup>	0.92		
Pork (e.g. chops, roasts, dinner ham)	28.6	47.9	23.5
Ribs or spareribs	67.7	18.8	13.5
Gizzard, neckbones or chitlins <sup>3</sup>	0.94		
Fried chicken	40.9	30.3	28.9
Chicken not fried	10.5	45.4	44.0
Fried fish	61.6	19.4	19.0
Fish not fried	56.3	26.1	17.5
Tuna casserole or tuna sandwich	47.9	26.5	25.5
Shellfish (e.g. shrimp, crab)	32.1	38.4	29.4
Oysters <sup>3</sup>	0.92		
<b>Processed meat</b>			
Hot dogs or dinner sausage	30.7	38.7	30.6
Ham (e.g. boloney, lunch meats)	18.8	49.6	31.5
Bacon	24.4	40.4	35.2
Breakfast sausage	46.4	27.2	26.5
Rice or dishes with rice	8.0	50.0	41.9
<b>Refined grains</b>			
White bread (e.g. French, Italian)	14.8	43.2	42.0
Cornbread or hush puppies	58.0	23.8	18.2
Cereal excluding fiber or fortified	21.7	46.2	32.1
Cooked cereal or grits	36.7	38.4	25.0
Bagels, English muffins or buns <sup>2</sup>		54.2	45.8
Biscuits or muffins	11.7	53.9	34.4
Pancakes or waffles	16.7	47.7	35.6
Tortillas (corn or flour)	31.7	34.8	33.5
<b>Whole grains</b>			
Whole wheat bread (e.g. dark, rye)	29.8	40.2	30.0
High fiber cereals	51.8	24.2	24.0
Highly fortified cereals (e.g. Total) <sup>1</sup>	85.9		
<b>Salty snacks and sweets</b>			
Salty snacks (chips or popcorn) <sup>2</sup>		58.3	41.7
Crackers	14.2	45.0	40.8
Ice cream <sup>2</sup>		59.6	40.4
Doughnuts or pastry	30.5	37.6	31.9
Pumpkin pie or sweet potato pie <sup>1</sup>	81.9		
Pie or cobbler	53.5	33.2	13.4
Chocolate candy or candy bars	13.5	50.1	36.3
Candy (not chocolate)	31.8	35.9	32.4
Pudding	62.4	20.2	17.4
Cookies	10.5	51.2	38.3

## Online Supporting Material

Food item	No consumption %	≤ Median %	>Median %
Cake	22.5	40.9	36.7
Jelly, jam or syrup	16.4	42.0	41.6
<b>Beverages</b>			
Orange juice or grapefruit juice	8.3	46.8	44.8
Tomato juice or V-8 juice <sup>1</sup>	81.1		
Real fruit juice excluding orange and grapefruit	18.8	40.8	40.4
Coffee	49.9	25.8	24.3
Alcohol <sup>1</sup>	90.5		
Light beer <sup>3</sup>	0.99		
Non-alcoholic beer <sup>3</sup>	0.93		
Drinks with some juice (e.g. Sunny D) <sup>1</sup>	73.5		
Vitamin C rich drinks (e.g. Hi-C)	56.2	23.6	20.2
Not diet soft drinks or Snapple	24.4	40.2	35.4
Tea or iced tea (not herb tea)	33.3	34.9	31.8
Cranberry juice cocktail	54.6	23.0	22.3
Diet soft drinks <sup>1</sup>	69.1		
Breakfast or diet shakes <sup>3</sup>	0.91		
Water <sup>2</sup>		57.4	42.6
<b>Fast food</b>			
French fries or fried potatoes <sup>2</sup>		58.3	41.7
Hamburger or cheeseburger	10.4	45.2	44.4
Pizza <sup>2</sup>		62.4	37.6
Cheese dish like macaroni and cheese	15.9	43.7	40.5
Chinese dishes	22.6	38.8	38.5
Tacos or burritos	21.1	44.3	34.6
<b>Condiments and other food items</b>			
Butter	34.6	39.5	25.9
Margarine	39.5	33.3	27.2
Gravy	53.9	25.4	20.8
Mayonnaise or sandwich spreads	24.2	48.1	27.7
Salad dressing	7.9	56.2	36.0
Salsa, ketchup or taco sauce	15.2	47.2	37.6
Mustard, BBQ sauce or other sauce	13.7	44.0	42.3
Cream or half and half <sup>1</sup>	80.3		
Non dairy creamer <sup>3</sup>	0.94		
Sugar or honey in coffee or tea	43.2	28.7	28.1
Breakfast bars or Power bars	46.3	28.5	25.2
Meat substitutes (not just soy) <sup>1</sup>	76.7		

<sup>1</sup> Food-items were dichotomized as consumed or not because there were too few consumers; only percent of non consumers shown.

<sup>2</sup> Food-items were dichotomized as below or above the median because there were too few non consumers.

<sup>3</sup> Food-items were rarely consumed (<10% consumption) and were not included in EFA, CFA and LCA because they did not add any useful information.

## Online Supporting Material

**Supplemental Table 2. Selected Software for Latent Class Analysis**

	<b>macro PROC LCA<sup>1</sup></b>	<b>GLLAMM<sup>1</sup></b>	<b>Mplus</b>
<b>Acronym</b>	Latent class analysis	Generalized Linear Latent And Mixed Models	-
<b>Version</b>	1.2.5 beta	-	6.0
<b>Date of release</b>	Jan-2010	Nov-06	Apr-2010
<b>Authors</b>	Lanza ST, Lemmon DR, Schafer JL, Collins LM	Rabe-Hesketh S, Skrondal A	Muthen LK, Muthen BO
<b>Institution</b>	The Methodology Center, Penn State University	Biostatistics, University of California at Berkeley	Muthen and Muthen
<b>Free<sup>2</sup></b>	Y	Y	N
<b>Software</b>	SAS	STATA	Stand-alone
<b>Outcomes</b>			
<b>Nominal</b>	Y	Y	Y
<b>Ordinal</b>	N	Y	Y
<b>Count</b>	N	Y	Y
<b>Continuous</b>	N	Y	Y
<b>Different scales jointly</b>	N	N	Y
<b>Covariates</b>	Y	Y	Y
<b>Allows factors and latent classes simultaneously</b>	N	N	Y
<b>Tests to determine number of classes</b>	N	N	Lo-Mendell-Rubin LRT, Bootstrap LRT
<b>Ease of use</b>	Medium	Difficult	Difficult

<sup>1</sup> These procedures are macros developed, documented and maintained by users and are not part of the software.

<sup>2</sup> However SAS and STATA software is not free.

Online Supporting Material

**Supplemental Table 3. Exploratory and Confirmatory Factor Loadings for 4-Factor Model (PIN Study, NC. 2000-2005)**<sup>1,2,3,4</sup>

Food item	FA-Prudent		FA-Southern		FA-Western		FA-Prudent coffee and alcohol		<i>R</i> <sup>2</sup>
	EFA	CFA	EFA	CFA	EFA	CFA	EFA	CFA	
Oranges or tangerines	0.47	0.49							0.23
Grapefruit	0.42	0.52							0.25
Apples or pears	0.45	0.51							0.24
Bananas	0.29	0.36							0.13
Peaches or apricots							0.29	0.47	0.20
Cantaloupe							0.32	0.44	0.19
Watermelon							0.26	0.29	0.08
Canned fruit	0.43	0.39							0.15
Strawberries							0.34	0.41	0.16
Other fruits	0.33	0.24					0.32	0.33	0.23
Green beans or peas	0.27	0.28	0.27	0.24					0.12
Corn			0.35	0.38					0.14
Coleslaw or cabbage			0.50	0.46					0.20
Green salad							0.66	0.70	0.42
White potatoes			0.32	0.27	0.31	0.23			0.16
Other vegetables	0.34	0.27					0.41	0.33	0.25
Raw tomatoes							0.54	0.65	0.37
Broccoli	0.35	0.30					0.40	0.35	0.29
Spinach	0.36	0.25					0.50	0.47	0.35
Greens like collards			0.51	0.41	-0.31	-0.19			0.14
Carrots	0.41	0.40					0.37	0.26	0.30
Sweet potatoes	0.51	0.57							0.30
Cheese and cheese spreads <sup>3</sup>	0.13		-0.10		0.19		0.11		
Yogurt	0.36	0.36	-0.31	-0.25			0.38	0.29	0.36
Frozen yogurt	0.25	0.39							0.15
Low fat milk			-0.41	-0.27					0.07
Peanut butter					0.32	0.27			0.07
Peanuts, other nuts or seeds	0.36	0.50							0.24
Baked beans	0.40	0.43							0.18
Chili with beans	0.41	0.46							0.20
Refried beans or bean burritos	0.31	0.46							0.20
Vegetable stew	0.50	0.51							0.24
Spaghetti with tomato sauce and meat					0.30	0.23			0.05
Vegetable soup	0.49	0.54							0.27
Other soups (e.g. chicken noodle)	0.41	0.43							0.18
Mixed dishes with beef or pork			0.35	0.52					0.24
Pasta salad or other pasta dish					0.45	0.39			0.14
Chicken stew (e.g. pot pie)					0.38	0.49			0.22
Eggs or egg biscuits <sup>3</sup>	0.09		0.22		-0.03		0.12		
Beef (e.g. roast, steak, sandwiches)			0.46	0.61					0.33
Pork (e.g. chops, roasts, dinner ham)			0.50	0.63					0.34
Ribs or spareribs			0.58	0.62					0.33
Fried chicken			0.63	0.73					0.44

Online Supporting Material

Food item	FA-Prudent		FA-Southern		FA-Western		FA-Prudent coffee and alcohol		$R^2$
	EFA	CFA	EFA	CFA	EFA	CFA	EFA	CFA	
Fried fish			0.48	0.46					0.20
Chicken not fried							0.36	0.29	0.08
Tuna casserole or tuna sandwich							0.33	0.44	0.18
Shellfish (e.g. shrimp, crab)							0.39	0.39	0.14
Fish not fried							0.56	0.67	0.39
Hot dogs or dinner sausage			0.55	0.66					0.37
Ham (e.g. boloney, lunch meats)			0.28	0.36					0.12
Bacon			0.53	0.69					0.40
Breakfast sausage			0.56	0.65					0.36
Rice or dishes with rice							0.27	0.34	0.11
White bread (e.g. French or Italian)			0.40	0.48					0.21
Cornbread or hush puppies	0.37	0.32	0.32	0.45					0.26
Cereal excluding fiber or fortified <sup>3</sup>	0.06		0.05		0.23		-0.10		
Cooked cereal or grits	0.36	0.37							0.13
Bagels (e.g. English muffins and buns)					0.44	0.35			0.12
Biscuits or muffins					0.36	0.49			0.21
Pancakes or waffles					0.31	0.41			0.16
Tortillas (corn or flour)					0.41	0.35			0.11
Whole wheat bread (e.g. dark, rye)	0.33	0.35	-0.42	-0.36			0.43	0.29	0.40
High fiber cereals	0.30	0.40							0.15
Highly fortified cereals (e.g. Total)	0.30	0.40							0.15
Salty snacks (e.g. chips or popcorn)					0.44	0.35			0.12
Crackers					0.38	0.34			0.11
Ice cream					0.41	0.37			0.13
Doughnuts or pastry					0.43	0.60			0.31
Pumpkin pie or sweet potato pie	0.42	0.33							0.11
Pie or cobbler					0.29	0.55			0.27
Chocolate candy or candy bars					0.48	0.45			0.19
Candy (not chocolate)					0.40	0.40			0.15
Pudding <sup>3</sup>	0.23		0.16		0.24		-0.11		
Cookies					0.45	0.39			0.14
Cake					0.39	0.54			0.26
Jelly, jam or syrup					0.33	0.37			0.13
Orange juice or grapefruit juice <sup>3</sup>	0.13		0.05		0.00		0.01		
Tomato juice or V-8 juice							0.25	0.38	0.14
Real fruit juice excluding orange and grapefruit			0.25	0.11					0.01
Coffee							0.36	0.30	0.09
Alcohol							0.32	0.20	0.04
Drinks with some juice (e.g. Sunny D)			0.47	0.46					0.20
Vitamin C rich drinks (e.g. Hi-C)			0.53	0.40			-0.38	-0.19	0.19
Not diet soft drinks			0.26	0.25					0.06
Tea or iced tea (not herb tea)			0.38	0.23					0.05
Cranberry juice cocktail	0.26	0.27							0.07
Diet soft drinks <sup>3</sup>	-0.08		-0.11		0.11		0.20		
French fries or fried potatoes			0.40	0.40	0.34	0.12			0.20

Online Supporting Material

Food item	FA-Prudent		FA-Southern		FA-Western		FA-Prudent coffee and alcohol		<i>R</i> <sup>2</sup>
	EFA	CFA	EFA	CFA	EFA	CFA	EFA	CFA	
Hamburger or cheeseburger			0.50	0.67	0.34	0.03			0.39
Pizza					0.48	0.38			0.14
Cheese dish like macaroni and cheese					0.41	0.44			0.18
Chinese dishes							0.27	0.33	0.10
Tacos or burritos					0.49	0.52			0.25
Butter <sup>3</sup>	0.10		0.11		0.08		0.13		
Margarine			0.26	0.26	0.26	0.16			0.12
Gravy			0.54	0.68					0.39
Mayonnaise or sandwich spreads			0.34	0.28					0.08
Salad dressing							0.53	0.52	0.25
Water							0.27	0.36	0.13
Salsa, ketchup or taco sauce					0.42	0.52			0.24
Mustard, BBQ sauce or other sauce					0.38	0.47			0.20
Cream or half and half							0.32	0.20	0.04
Sugar or honey in coffee or tea			0.38	0.20					0.04
Breakfast bars or Power bars	0.27	0.33							0.11
Meat substitutes (not just soy)	0.40	0.56	-0.52	-0.54					0.53

<sup>1</sup> The confirmatory 4-factor model was adjusted for energy intake, nulliparous, smoker, white, education and age. It included correlated errors between coffee and half & half, and iced tea and sugar or honey. Some factors were correlated;  $r=0.49$  between 'FA-Southern' and 'FA-Western',  $0.38$  between 'FA-Prudent' and 'FA-Prudent with coffee and alcohol' and  $r=0.17$  between 'FA-Prudent' and 'FA-Western'.

<sup>2</sup> Sample size was 1,285 women for EFA and 1,219 women for CFA due to missing values in some covariates.

<sup>3</sup> Food-items with EFA loadings  $< 0.25$  for all factors were excluded from CFA and LCA.

<sup>4</sup> For EFA only factor loadings  $\geq 0.25$  are presented.

Online Supporting Material

**Supplemental Table 4. Regression Coefficients for 4-Factor Model (PIN Study, NC. 2000-2005)**

Covariate	FA-Prudent		FA-Southern		FA-Western		FA-Prudent with coffee and alcohol	
	Estimate	P-value	Estimate	P-value	Estimate	P-value	Estimate	P-value
Nulliparous	0.13	< 0.0001	-0.12	< 0.0001	-0.07	0.011	0.03	0.311
Smoker	-0.17	0.004	0.19	< 0.0001	-0.13	0.007	-0.07	0.135
White	0.15	< 0.0001	-0.23	< 0.0001	0.37	< 0.0001	0.00	0.890
Age, y								
25-29	0.14	0.006	0.01	0.806	0.06	0.158	0.24	< 0.0001
30-34	0.21	< 0.0001	-0.06	0.116	0.04	0.356	0.37	< 0.0001
35-47	0.18	0.002	-0.03	0.492	-0.06	0.255	0.41	< 0.0001
Education								
Grades 13-16	0.12	0.020	-0.13	0.001	0.21	< 0.0001	0.20	< 0.0001
≥ Grade 17	0.22	< 0.0001	-0.25	< 0.0001	0.16	0.002	0.36	< 0.0001
Pregravid BMI								
Underweight	0.07	0.105	-0.09	0.013	-0.07	0.067	-0.06	0.139
Overweight	-0.13	0.011	0.11	0.015	0.02	0.649	-0.01	0.795
Obese	-0.06	0.143	0.14	< 0.0001	-0.02	0.645	-0.13	< 0.0001
Energy intake								
2nd quartile	0.18	< 0.0001	0.13	< 0.0001	0.30	< 0.0001	0.15	< 0.0001
3rd quartile	0.31	< 0.0001	0.28	< 0.0001	0.51	< 0.0001	0.25	< 0.0001
4th quartile	0.42	< 0.0001	0.44	< 0.0001	0.79	< 0.0001	0.33	< 0.0001



Online Supporting Material

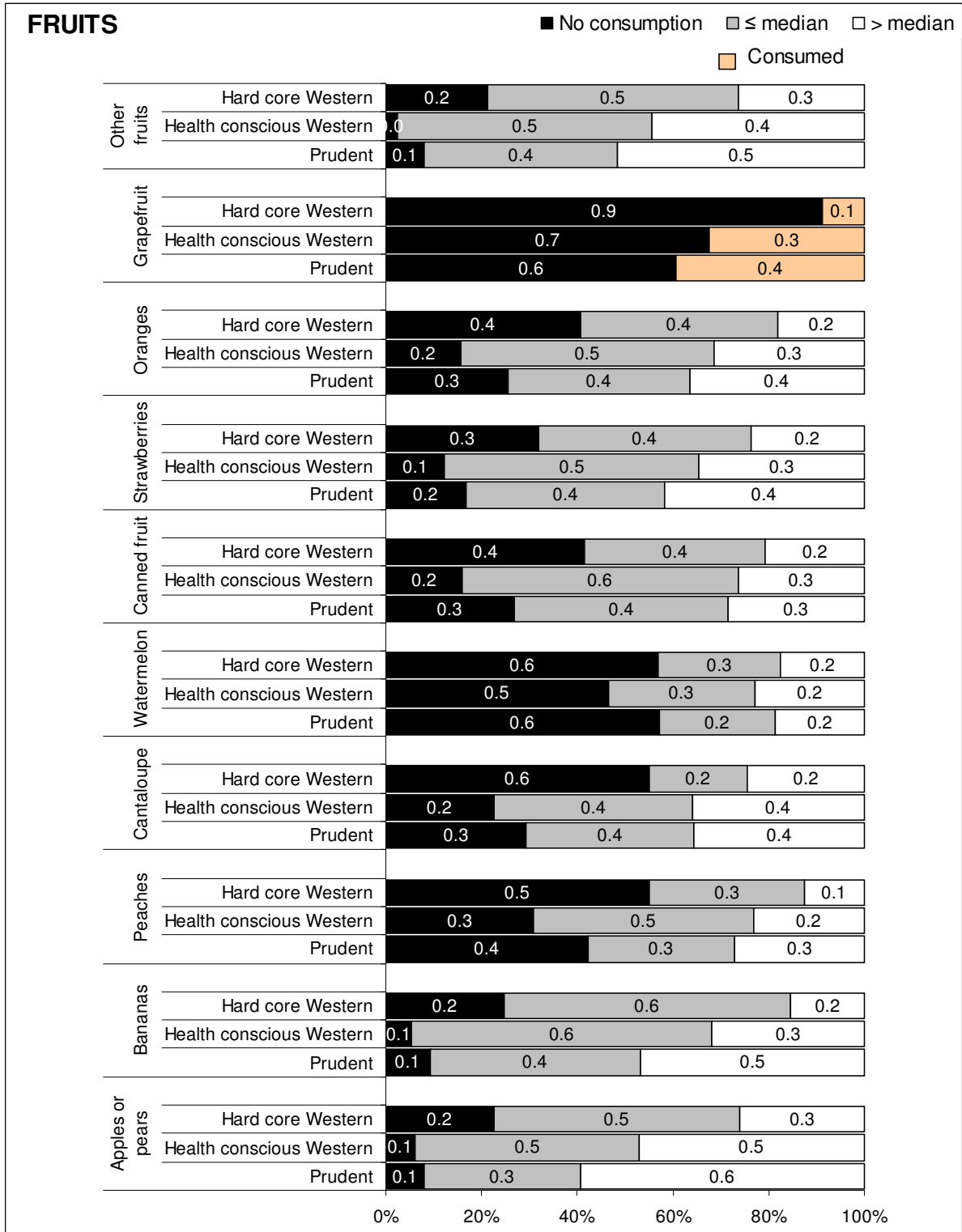
**Supplemental Table 5. Partial Spearman correlations between factors and daily dietary nutrient intake, adjusted by energy intake (PIN Study, NC. 2000-2005)**

Nutrient	FA-Prudent with			
	FA-Prudent	FA-Southern	coffee and alcohol	FA-Western
Fat, <i>g</i>	-0.11	0.17	0.04	0.21
Saturated fat, <i>g</i>	-0.21	0.21	-0.09	0.11
Cholesterol, <i>mg</i>	-0.12	0.29	0.03	-0.04
(n-3) fatty acids, <i>g</i>	0.02	0.03	0.21	0.14
Fiber, <i>g</i>	0.64	-0.46	0.52	0.01
Iron, <i>mg</i>	0.27	-0.25	0.23	0.06
Folate, $\mu\text{g}$	0.47	-0.40	0.41	-0.01
Calcium, <i>mg</i>	0.26	-0.39	0.21	-0.08
Vitamin D <sup>1</sup> , <i>IU</i>	0.09	-0.15	0.08	-0.12
Vitamin A, <i>retinol equivalents</i>	0.57	-0.30	0.54	-0.02
Vitamin E, <i>mg</i>	0.39	-0.31	0.47	0.14
Zinc, <i>mg</i>	0.35	-0.23	0.35	0.04
$\alpha$ -carotene, $\mu\text{g}$	0.53	-0.23	0.40	0.03
$\beta$ -carotene, $\mu\text{g}$	0.55	-0.21	0.53	-0.03
Fat, % energy	-0.13	0.18	0.03	0.20
Protein, % energy	0.26	-0.22	0.38	0.03
Carbohydrates, % energy	0.09	-0.12	-0.11	-0.17
Sweets, % energy	-0.17	0.15	-0.20	0.20
Alcohol, % energy	0.04	-0.06	0.17	0.06
Foods consumed, <i>n</i>	0.61	0.31	0.45	0.54

<sup>1</sup> Vitamin D: 40 IU = 1  $\mu\text{g}$

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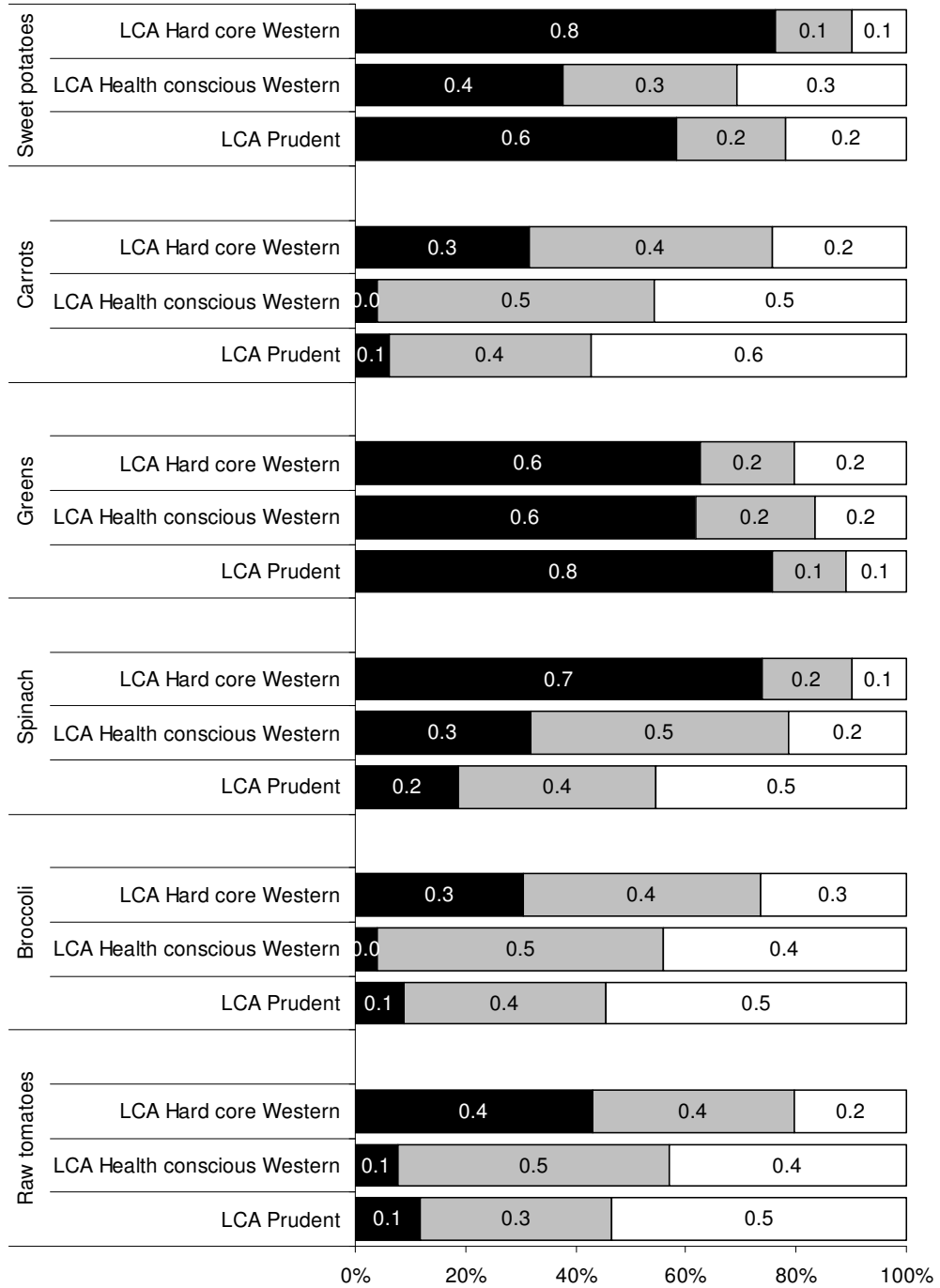
**Supplemental Figure 1. Probabilities of consumption for ALL food-items by dietary patterns derived using latent class analysis (PIN Study, NC. 2000-2005). Values are estimated probabilities.**



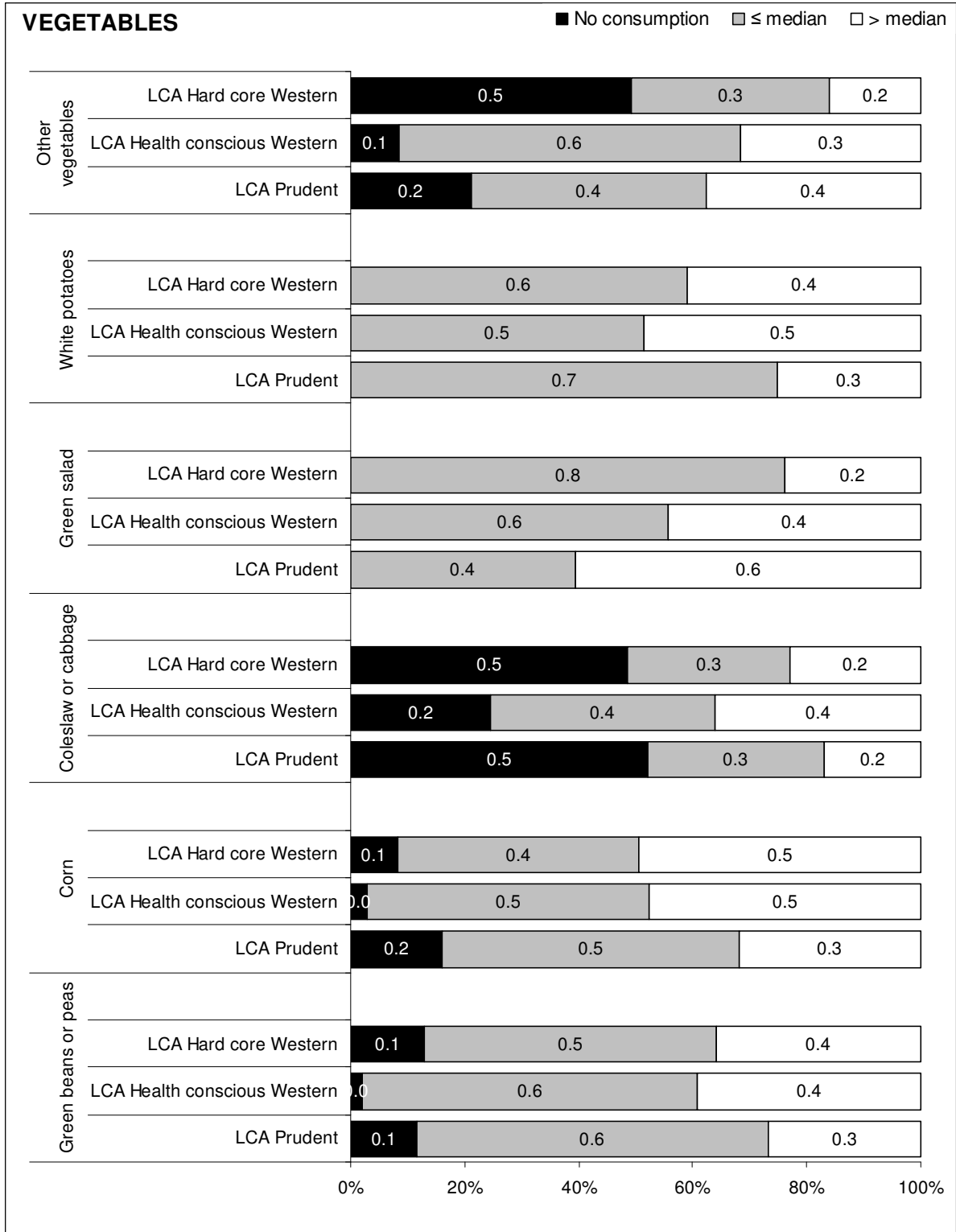
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## HIGH-CARATENOID VEGETABLES

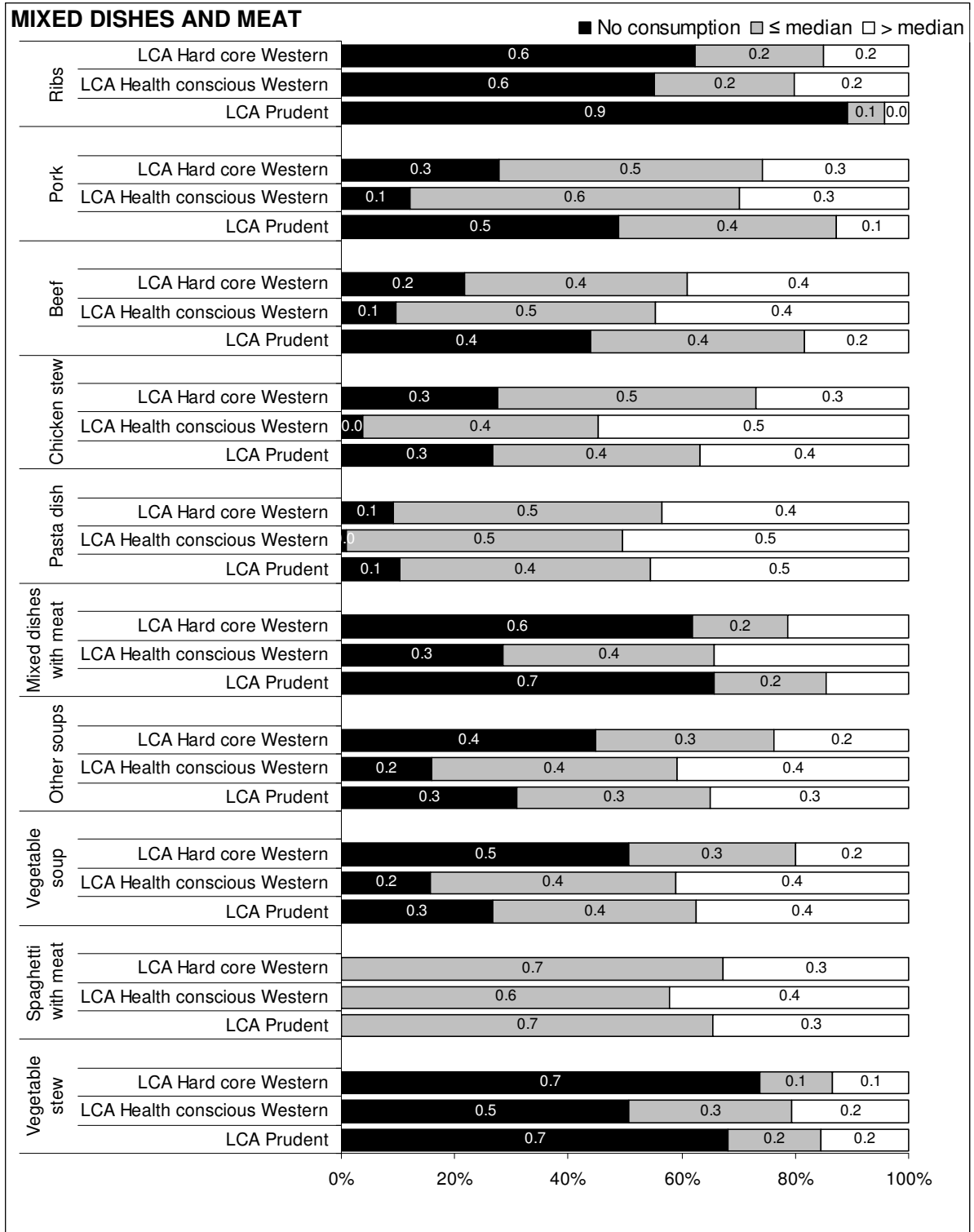
■ No consumption    ■ ≤ median    □ > median



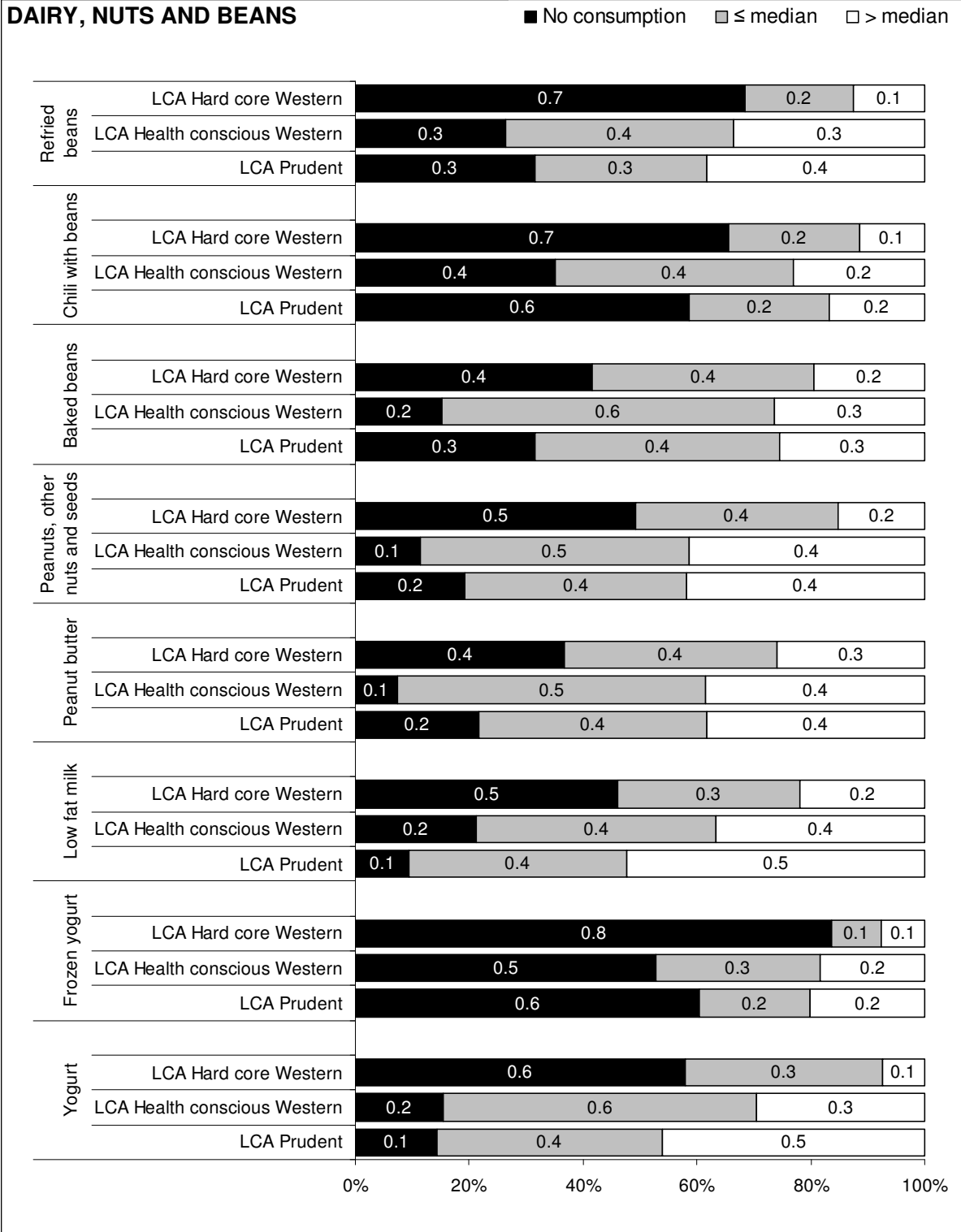
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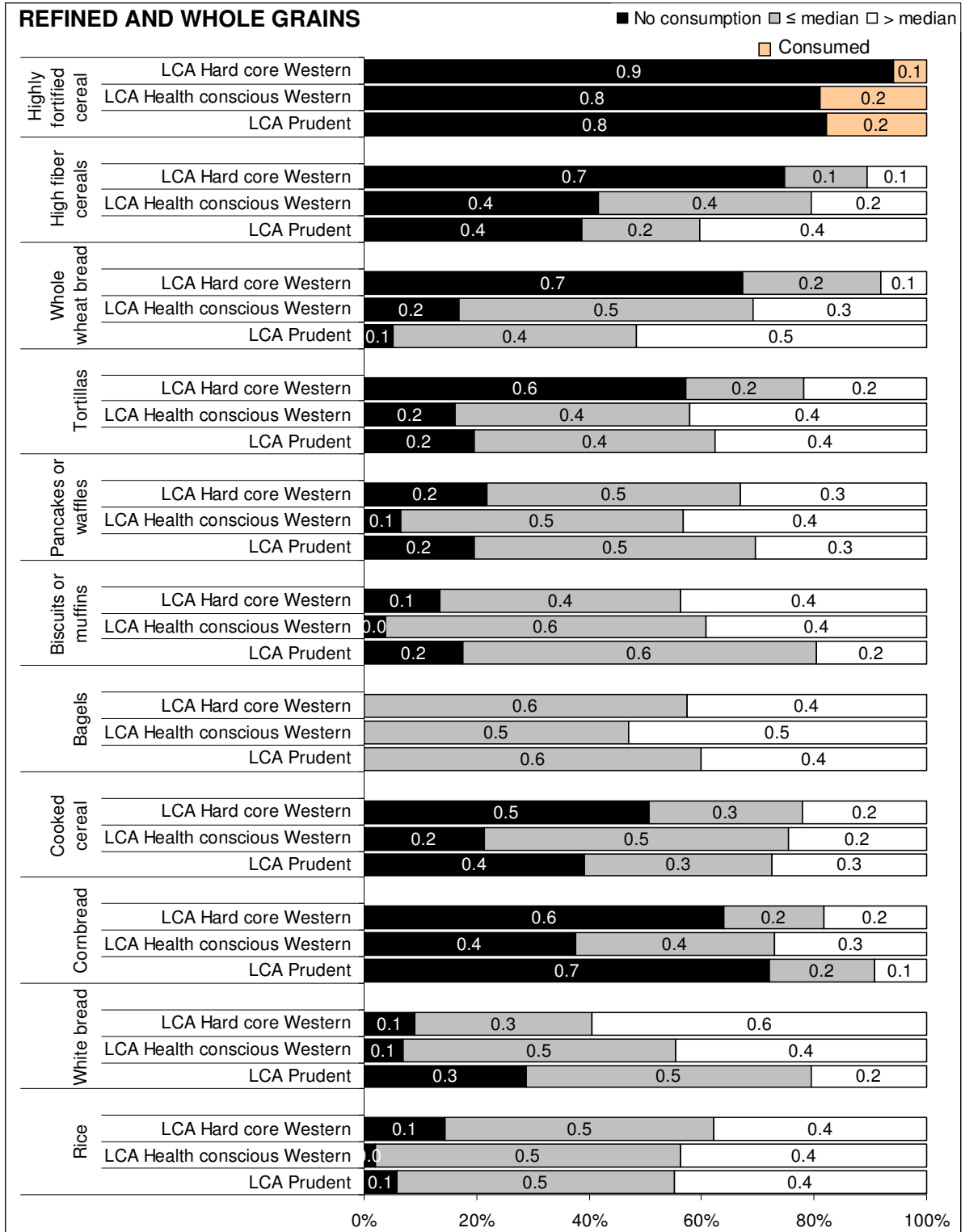
# Online Supporting Material



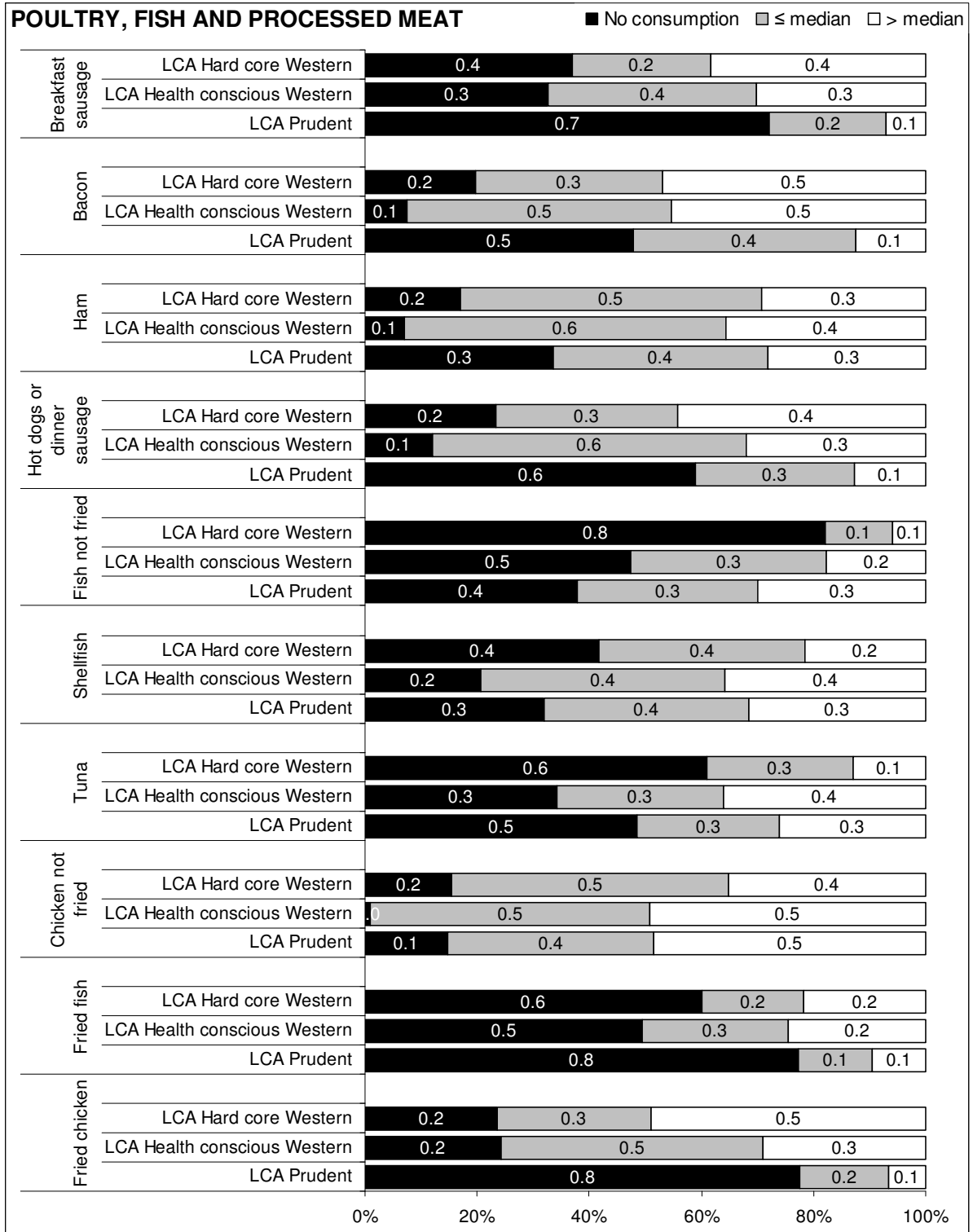
# Online Supporting Material



# Online Supporting Material

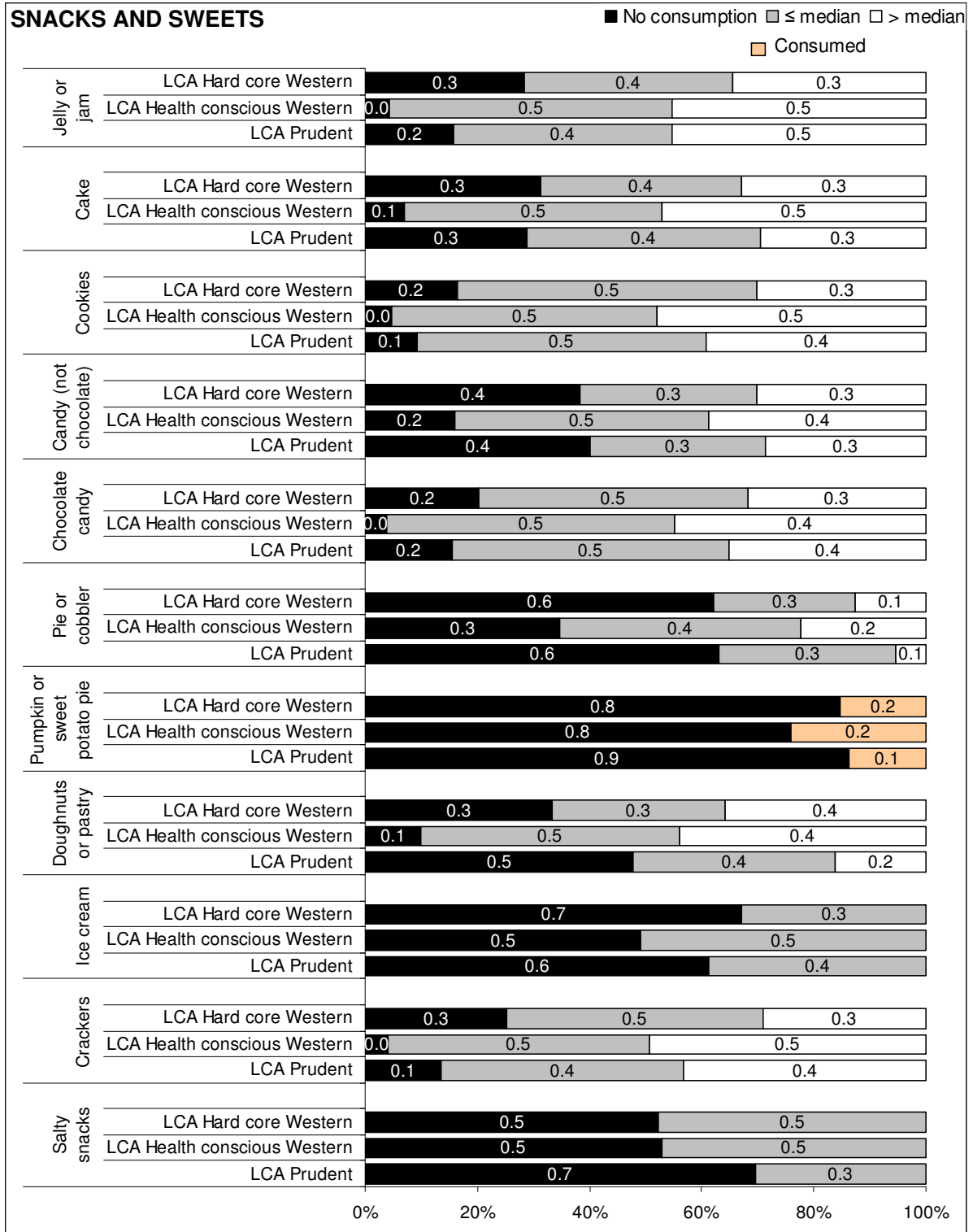


# Online Supporting Material

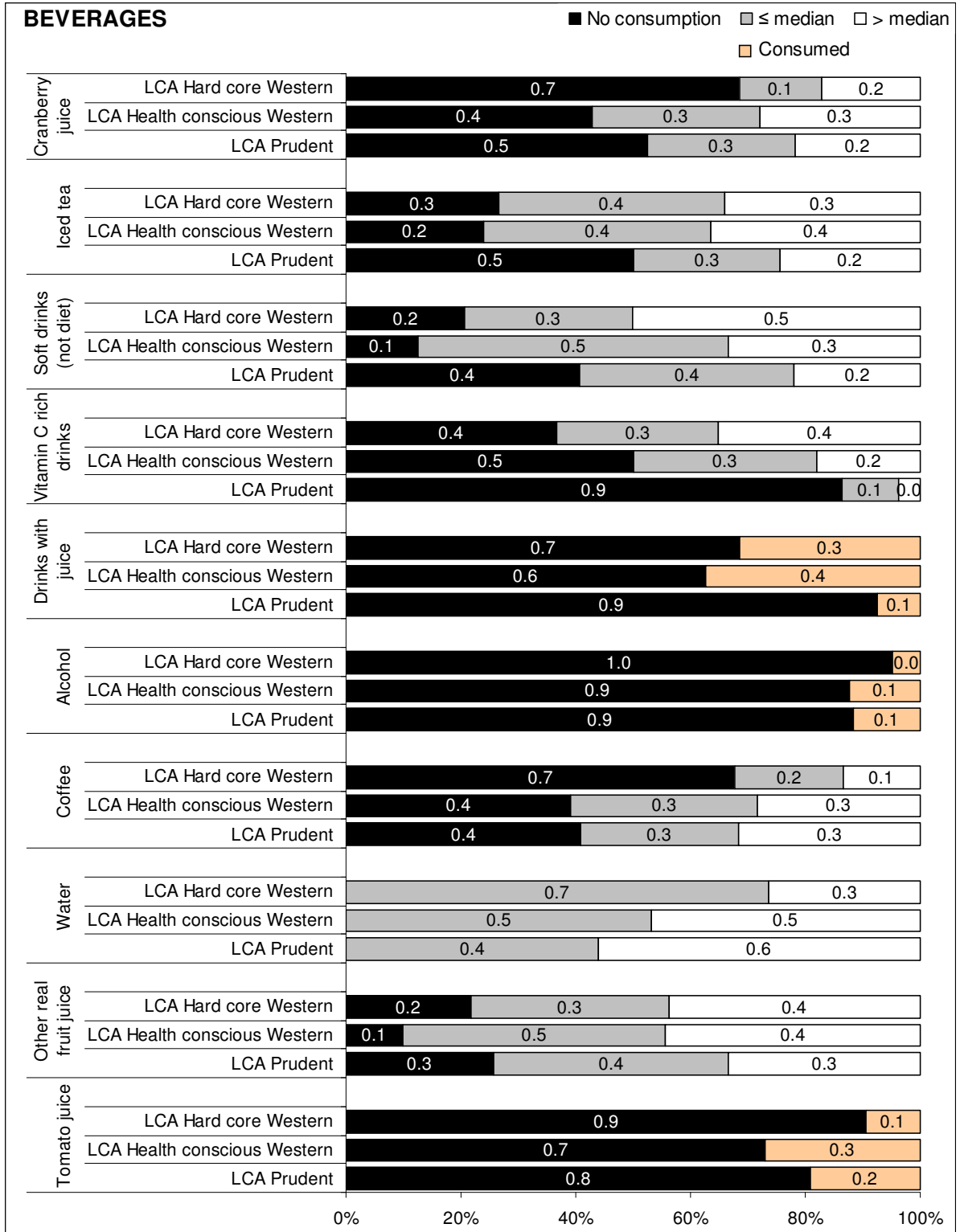




# Online Supporting Material



# Online Supporting Material



# Online Supporting Material

## FAST FOODS AND CONDIMENTS

■ No consumption    ■ ≤ median    □ > median

