Supplementary table 1 Coffee type and caffeinated status for each coffee item identified by USDA food code in dietary recall, NHANES 1999-2010

DA food code	USDA food descriptions	Caffeinate status ^a
	Coffee, made from ground, regular	
	(Include coffee, made from ground, NS as to regular or decaffeinated; made from	
92101000	filter pack; and Coffee Singles)	U
	Coffee, made from powdered instant, regular	
	(Include coffee, made from powdered instant, NS as to regular or decaffeinated; and	
92103000	made from freeze-dried)	U
	Coffee, decaffeinated, made from ground	
92111010	(Include made from filter pack; and Coffee Singles)	D
	Coffee, decaffeinated, made from powdered instant	
92114000	(Include made from freeze-dried)	D
92100500	Coffee, regular, NS as to ground or instant	R
	Coffee, made from ground, equal parts regular and decaffeinated	
92101500	(Include Maxwell House Lite Reduced Caffeine Ground Coffee)	R
	Coffee, latte	
92101900	(Include NS as to regular or decaffeinated)	U
92161000	Cappuccino	U
92111000	Coffee, decaffeinated, NS as to ground or instant	D
	Coffee, made from powdered instant mix, with whitener and sugar, instant	
	(Include Cafe au Lait; Orange Cappuccino; Cafe Amaretto; Cafe Francais; General	
	Foods International Coffee flavors; Italian Cappuccino; Cafe Vienna; and French Vanilla	
92121000	Cafe)	R
	Coffee, mocha	
92101950	(Include Cafe mocha)	R
	Coffee, espresso	
92101610	(Include demi-tasse)	R
	Blended coffee beverage, made with regular coffee, milk, and ice, sweetened	
92101920	(Include NS as to regular or decaffeinated)	U
	Coffee, regular, presweetened with sugar, pre-lightened	
	(Include coffee, light, with sugar, from vending machine; iced coffee, NS as to regular	
92130000	or decaffeinated, NS as to type of sweetener; and McDonald's iced coffee)	U
00404400	Coffee, dry instant powder, regular	
92191100	(Include freeze-dried)	R
00404000	Coffee, dry instant powder, decaffeinated	-
92191200	(Include freeze-dried)	D
02104000	Coffee, Cuban	~
92101800	(Include sweetened espresso)	R
	Coffee, made from powdered instant mix, with whitener and low calorie sweetener	
	(Include Sugar Free Cafe au Lait; Sugar Free Cafe Amaretto; General Foods	
02121040	International Coffee flavors; Sugar Free Cafe Vienna; and Sugar Free French Vanilla	п
92121040	Cafe)	R U
92100000	Coffee, NS as to type Coffee and cocoa (mocha), made from powdered instant mix, with whitener,	U
	presweetened	
	•	
92121020	(Include NS as to sweetener; Suisse Mocha; General Foods International Coffee flavors; Viennese Chocolate Cafe; and Cafe Mocha Cappucino)	D
92121020	Coffee, latte, decaffeinated	R D
92101910	Coffee, made from powdered instant mix, presweetened, no whitener	R
92121010	Coffee, made from ground, regular, flavored	n
	(Include made from filter pack)	R
92101700		n
92101700	Cappuccino, decaffeinated	п
92101700 92162000	Cappuccino, decaffeinated	D
	Cappuccino, decaffeinated Coffee, made from powdered instant, 50% less caffeine (Include Maxwell House Lite Reduced Caffeine Instant Coffee)	D

	Coffee and cocoa (mocha), made from powdered instant mix, with whitener and low calorie sweetener, decaffeinated	
	(Include Naturally Decaffeinated Sugar Free Suisse Mocha; and General Foods	
92121050	International Coffee flavors)	D
92105010	Coffee, made from liquid concentrate	R
92101930	Blended coffee beverage, made with decaffeinated coffee, milk, and ice, sweetened	D
	Coffee and cocoa (mocha), made from powdered instant mix, with whitener and low	_
	calorie sweetener	
	(Include Sugar Free Irish Mocha Mint; Sugar Free Suisse Mocha; and General Foods	
92121030	International Coffee flavors)	R
52121000	Coffee, decaffeinated, presweetened with sugar, pre-lightened	
	(Include coffee, decaffeinated, light, with sugar, from vending machine; and iced	
92130001	coffee, decaffeinated, with sugar)	D
52150001	Coffee, pre-lightened, no sugar	5
92130010	(Include from vending machine)	R
52150010	Coffee, presweetened with sugar	i v
92130020	(Include from vending machine)	R
52150020	Coffee, dry instant powder, NS as to regular or decaffeinated	i v
92191000	(Include freeze-dried)	U
52151000	Coffee, dry instant powder, with whitener and sugar	Ŭ
	(Include Cafe au Lait; Orange Cappuccino; Cafe Amaretto; Cafe Francais; General	
92193000	Foods International Coffee flavors; Cafe Vienna; and French Vanilla Cafe)	R
92101600	Coffee, Turkish	R
92101000	Coffee, acid neutralized, from powdered instant	IN IN
92106000	(Include Kava)	R
92100000	Coffee, mocha, made with soy milk	R
92101900	Coffee, regular, with low-calorie sweetener, pre-lightened	IN IN
	(Include coffee, light, low calorie sweetener, from vending machine; and iced coffee,	
92130005	with low calorie sweetener)	R
92130003	Coffee, decaffeinated, with low-calorie sweetener, pre-lightened	IN IN
	(Include coffee, decaffeinated, light, with low calorie sweetener, from vending	
92130006	machine; and iced coffee, decaffeinated, with low calorie sweetener, non-vending	D
92130000	Coffee, dry, acid neutralized	D
92191250	(Include Kava)	R
92191230	Coffee, liquid concentrate	R
92103000		R
92152000	Coffee and chicory, made from ground	n
	Coffee and cocoa (mocha) mix, dry instant powder with whitener, presweetened	
02102000	(Include Irish Mocha Mint; Suisse Mocha; and General Foods International Coffee	в
92192000	flavors) Coffee and cocoa (mocha) mix, dry instant powder, with whitener and low calorie	R
	sweetener, decaffeinated //include Naturally Decaffeinated Surger Free Suisse Maskey and Caparal Frede	
02102040	(Include Naturally Decaffeinated Sugar Free Suisse Mocha; and General Foods	~
92192040	International Coffee flavors)	D
	Coffee, dry instant powder, with whitener and low calorie sweetener	
	(Include Sugar Free Cafe au Lait; Sugar Free Orange Cappuccino; Sugar Free Cafe	
02102020	Amaretto; General Foods International Coffee flavors; Sugar Free Cafe Vienna; and	~
 92193020	Sugar Free French Vanilla	R
° Catt	feinated status: D=decaf. R=regular. U=unspecified	

^a Caffeinated status: D=decaf, R=regular, U=unspecified

Supplementary table 2 Multivariate ^a adjusted serum levels of ALT, AST, ALP and GGT, by categories of coffee reported in FFQ, NHANES (2003-2006)

			coffee, cup/day			
	0	<1	1-<2	2-<3	3+	p trend
		Total coffee				
ALT	22.5 (22.0, 23.1)	22.1 (22.1, 23.9)	22.4 (22.2, 24.4)	22.5 (22.3, 24.5)	21.4 (20.9, 23.7)	0.76
AST	23.7 (23.3, 24.1)	23.4 (23.1, 24.9)	23.5 (23.3, 25.0)	23.2 (23.0, 24.6)	22.3 (21.9, 23.8)	0.09
ALP	65.8 (64.6, 67.0)	63.7 (63.7, 67.2)	62.1 (61.6, 66.0)	61.5 (60.8, 65.6)	60.1 (59.2 <i>,</i> 64.3)	0.0002
GGT	20.3 (19.4, 21.2)	19.7 (18.8, 20.7)	19.7 (18.7, 20.7)	19.8 (18.8, 20.9)	18.2 (17.1, 19.4)	0.04
		Decaf coffee ^b				
ALT	22.5 (22.0, 23.1)	22.5 (21.4, 23.6)	23.3 (21.8, 24.8)	23.6 (22.0, 25.3)	17.1 (15.5, 18.9)	0.84
AST	23.7 (23.3, 24.1)	23.5 (22.4, 24.6)	24.2 (23.0, 25.4)	24 (22.6, 25.4)	19.8 (18.6, 21.1)	0.76
ALP	65.8 (64.6, 67.0)	62.9 (60.6, 69.0)	59.9 (57.0, 66.5)	61.2 (59.3, 66.6)	52.5 (47.0, 61.9)	0.0003
GGT	20.3 (19.4, 21.2)	18.3 (16.6, 20.1)	19.1 (17.1, 21.4)	19.4 (17.6, 21.4)	15.4 (13.1, 18.0)	0.04

^a Adjusted for age (20-34, 35-49, 50-64, 65-85 yr), gender (male, female), race and ethnicity (Mexican American, other Hispanic, non-Hispanic White, non-Hispanic Black, other), education (less than 9th grade, 9-11th grade, high school/GED, some college or AA degree, college and higher), smoking status (Never, former, current smoker with <1 pck/d, current smoker with 1+ pck/d, missing), alcohol consumption (non-drinker, <1, 1- <3, 3-<7 drink/week, 1-<2, 2+ drink/day, missing), day of recall (Monday, Tuesday, Wednesday, Thursday, Friday, Saturday and Sunday), hepatitis B (positive serum hepatitis B surface antigen and core antibody, negative) and hepatitis C (positive serum hepatitis C antibody, negative). ^b This analysis included people who reported that they did not drink coffee (the "0" group) and those who reported "almost always or always" to the question "how often was the coffee you drank decaffeinated?"

	coffee, cup ^b /day						р
	0	<1	1-<2	2-<3	3+	_ p trend	interaction
			BMI, kg/m2				
ALT							0.07
<25	19.6 (19.3, 20.0)	19.0 (18.4, 19.6)	19.1 (18.5, 19.7)	20.0 (19.3, 20.8)	19.1 (18.5, 19.8)	0.44	
25-<30	23.7 (23.3, 24.2)	22.2 (21.2, 23.2)	22.9 (22.1, 23.8)	24.1 (22.9, 25.4)	21.6 (20.6, 22.7)	0.99	
30+	25.4 (24.9, 25.8)	26.0 (25.1, 26.8)	25.3 (24.6, 26.1)	25.0 (24.1, 25.8)	25.0 (24.2, 25.7)	0.19	
A <i>ST</i>							0.11
<25	22.8 (22.5, 23.2)	22.4 (22.0, 22.9)	22.1 (21.6, 22.6)	22.9 (22.3, 23.5)	22.1 (21.5, 22.7)	0.04	
25-<30	24.1 (23.8, 24.4)	24.8 (24.3, 25.4)	24.0 (23.5, 24.5)	24.0 (23.3, 24.6)	23.5 (22.9, 24.1)	0.05	
30+	23.9 (23.6, 24.2)	24.3 (23.7, 24.9)	23.6 (23.1, 24.2)	23.3 (22.8, 23.9)	23.3 (22.8, 23.9)	<.0001	
ALP							0.70
<25	63.1 (62.0, 64.2)	60.4 (58.8, 62.1)	59.7 (58.3, 61.1)	60.5 (58.4 <i>,</i> 62.8)	58.5 (56.6, 60.4)	<.0001	
25-<30	67.2 (66.3, 68.1)	64.7 (63.1, 66.2)	66.0 (64.5, 67.6)	65.1 (63.2 <i>,</i> 67.1)	65.7 (63.7, 67.7)	0.06	
30+	71.8 (70.8, 72.8)	69.4 (67.5, 71.3)	69.2 (67.8, 70.6)	67.6 (65.9 <i>,</i> 69.3)	67.7 (65.8, 69.7)	<.0001	
GGT							0.01
<25	17.6 (17.2, 18.1)	16.5 (15.8, 17.2)	17.0 (16.4, 17.7)	17.9 (17.0, 18.9)	16.1 (15.3, 16.9)	0.01	
25-<30	22.3 (21.7, 22.9)	22.7 (21.8, 23.7)	22.5 (21.5, 23.4)	22.5 (21.5, 23.5)	22.0 (21.0, 23.0)	0.63	
30+	25.9 (25.3 <i>,</i> 26.5)	25.0 (23.9, 26.3)	25.1 (24.0, 26.2)	24.4 (23.2, 25.7)	24.1 (23.1, 25.3)	0.001	
			Alcohol intake				
A <i>LT</i>							0.57
Nondrinker	21.4 (21.0, 21.9)	21.8 (21.1, 22.6)	21.8 (21.0, 22.7)	22.0 (21.1, 22.9)	21.9 (21.0, 22.8)	0.18	
<2 drinks/day	23.1 (22.8, 23.4)	22.7 (22.2, 23.3)	22.7 (22.3, 23.2)	23.2 (22.6, 23.8)	22.4 (21.8, 23.0)	0.06	
2+ drinks/day	29.1 (27.7, 30.6)	30.4 (26.8, 34.4)	28.1 (25.6, 30.8)	27.9 (25.1, 31.1)	26.5 (24.0, 29.3)	0.08	
AST							0.15

Supplementary table 3 Multivariate ^a adjusted serum levels of ALT, AST, ALP and GGT and 95% CI according to categories of coffee, by BMI, alcohol intake, smoking status, history of diabetes, and HBV and HCV infection, NHANES (1999-2010).

Nondrink	er 22.8 (22.5, 23.1)	23.4 (22.8, 23.9)	22.9 (22.3, 23.5)	23.1 (22.4, 23.8)	22.9 (22.3, 23.5)	0.63	
<2 drinks/d	ay 23.5 (23.3, 23.8)	23.8 (23.4, 24.2)	23.1 (22.8, 23.5)	23.3 (22.9, 23.7)	22.8 (22.4, 23.3)	0.0004	
2+ drinks/d	ay 29.0 (27.7, 30.4)	27.0 (24.8, 29.3)	26.8 (24.6, 29.1)	26.5 (24.5, 28.7)	26.3 (24.1, 28.8)	0.02	
ALP							0.70
Nondrink	er 70.8 (69.8, 71.9)	68.1 (66.3, 70.0)	68.4 (66.8, 70)	67.3 (65.4, 69.3)	68.5 (66.2, 70.8)	0.0004	
<2 drinks/d	ay 65.4 (64.5, 66.3)	62.1 (60.8, 63.5)	63.1 (62.0, 64.3)	63.0 (61.4, 64.7)	61.5 (60.1, 63.1)	<.0001	
2+ drinks/d	ay 69.9 (68.2, 71.7)	69.9 (64.5, 75.8)	67.9 (64.5, 71.6)	65.5 (60.7 <i>,</i> 70.6)	65.1 (61.9, 68.4)	0.003	
GGT							0.24
Nondrink	er 20.5 (19.9, 21.2)	20.0 (19.1, 21.0)	20.5 (19.4, 21.5)	20.4 (19.1, 21.7)	20.7 (19.2, 22.2)	0.93	
<2 drinks/d	ay 21.4 (20.9, 21.8)	20.4 (19.8, 21.1)	20.5 (19.9, 21.2)	21.1 (20.3, 21.9)	19.6 (18.9, 20.4)	0.0002	
2+ drinks/d	ay 36.6 (33.8, 39.5)	32.9 (28.3, 38.2)	35.6 (30.7, 41.1)	33.2 (28.2, 39.1)	30.4 (25.5, 36.1)	0.05	
			Smoking				
ALT							0.19
Nev	er 22.4 (22.0, 22.8)	22.5 (21.9, 23.1)	22.5 (21.9, 23.1)	22.6 (21.8, 23.3)	22.2 (21.5, 23.0)	0.92	
Form	er 23.6 (23.4, 24.1)	23.6 (22.7, 24.6)	23.2 (22.4, 24.1)	23.3 (22.3, 24.2)	23.4 (22.5, 24.3)	0.54	
Curre	nt 23.2 (22.6, 23.8)	22.5 (21.5, 23.5)	22.4 (21.5, 23.3)	23.4 (22.2, 24.7)	22.3 (21.2, 23.3)	0.17	
AST							0.05
Nev	er 23.3 (23.1, 23.6)	23.6 (23.2, 24.0)	23.2 (22.8, 23.7)	23.2 (22.7, 23.8)	23.0 (22.4, 23.5)	0.22	
Form	er 24.0 (23.6, 24.3)	24.5 (23.7, 25.3)	23.7 (23.1, 24.2)	23.5 (22.9, 24.2)	23.5 (22.8, 24.3)	0.07	
Curre	nt 23.8 (23.3, 24.2)	23.3 (22.7, 24.0)	22.6 (22.0, 23.3)	23.4 (22.6, 24.2)	22.6 (21.9, 23.3)	0.003	
ALP							0.41
Nev	er 66.5 (65.6, 67.5)	63.6 (62.4, 64.9)	64.1 (62.8, 65.5)	63.6 (61.9, 65.4)	63.2 (61.4, 65.0)	<.0001	
Form	er 67.9 (23.6, 24.3)	65.9 (63.7, 68.1)	65.5 (63.6, 67.5)	65.3 (62.8 <i>,</i> 67.9)	65.1 (63.2, 67.1)	0.001	
Curre	nt 69.8 (68.5, 71.0)	65.8 (63.4, 68.3)	67.2 (65.3, 69.2)	65.5 (62.7, 68.4)	65.9 (63.7, 68.1)	0.0006	
							0.03
GGT							
<i>GGT</i> Nev	er 20.5 (20.1, 20.9)	19.5 (18.8, 20.3)	20.4 (19.6, 21.1)	20.3 (19.4, 21.3)	20.2 (19.3, 21.2)	0.65	
			20.4 (19.6, 21.1) 21.7 (20.5, 22.9)	20.3 (19.4, 21.3) 22.4 (20.9, 23.9)	20.2 (19.3, 21.2) 21.3 (20.2, 22.5)	0.65 0.04	

History of Diabetes

ALT								0.01
	No	22.8 (22.5, 23.0)	22.6 (22.2, 23.0)	22.4 (22.0, 22.8)	22.9 (22.4, 23.4)	22.4 (21.9, 22.9)	0.29	
	Yes	23.4 (22.6, 24.3)	24.7 (23.3, 26.1)	24.0 (22.6, 25.5)	23.4 (21.8, 25.2)	21.5 (19.9, 23.1)	0.11	
AST								0.11
	No	23.6 (23.4, 23.8)	23.7 (23.3, 24.0)	23.2 (22.9, 23.5)	23.4 (23.0, 23.8)	23.0 (22.6, 23.3)	0.0006	
	Yes	23.5 (22.9, 24.1)	25.0 (23.9, 26.1)	23.5 (22.4, 24.8)	22.9 (21.8, 24.1)	22.3 (20.9, 23.7)	0.06	
ALP								0.04
	No	66.8 (66.0, 67.5)	64.0 (63.0, 65.0)	64.4 (63.5, 65.4)	63.9 (62.5 <i>,</i> 65.3)	63.4 (62.2, 64.6)	<.0001	
	Yes	75.8 (73.7, 78.0)	69.7 (65.9, 73.7)	68.8 (65.5, 72.3)	70.3 (66.1, 74.8)	68.7 (64.4, 73.3)	0.0002	
GGT								<.0001
	No	21.3 (20.9, 21.7)	20.4 (19.8, 21.0)	20.8 (20.2, 21.4)	21.1 (20.4, 21.8)	20.2 (19.5, 20.8)	0.008	
	Yes	29.2 (27.7, 30.9)	27.6 (25.3, 30.1)	25.9 (24.0, 27.9)	27.3 (24.0, 31.0)	23.2 (21.0, 25.8)	<.0001	
				HBV infection				
ALT								0.66
	No	22.7 (22.5, 23.0)	22.6 (22.2, 23.0)	22.4 (22.1, 22.8)	22.9 (22.4, 23.5)	22.3 (21.7, 22.8)	0.26	
	Yes	25.0 (23.8, 26.1)	24.7 (22.9, 26.8)	24.5 (22.6, 26.6)	23.0 (20.1, 26.3)	23.7 (21.0, 26.8)	0.22	
AST								0.12
	No	23.4 (23.3, 23.6)	23.7 (23.4, 24.0)	23.1 (22.8, 23.4)	23.3 (23.0, 23.7)	22.9 (22.5, 23.2)	0.002	
	Yes	26.8 (25.8, 27.8)	25.9 (24.2, 27.8)	25.1 (23.6, 26.8)	24.1 (21.9, 26.5)	24.6 (22.4, 27.1)	0.02	
ALP								0.84
	No	67.2 (66.5, 68.1)	64.2 (63.1, 65.2)	64.8 (63.9, 65.7)	64.3 (62.9 <i>,</i> 65.7)	63.7 (62.5, 64.9)	<.0001	
	Yes	70.5 (68.6, 72.5)	67.2 (63.3, 71.4)	66 (62.9 <i>,</i> 69.3)	64.1 (59.2 <i>,</i> 69.6)	65.2 (60.9, 69.9)	0.002	
GGT								0.12
	No	21.5 (21.1, 21.9)	20.4 (19.9, 21.0)	20.9 (20.4, 21.5)	21.3 (20.6, 22.0)	20.2 (19.6, 20.9)	0.004	
	Yes	27.6 (25.9, 29.4)	28.4 (25.4, 31.7)	25.7 (23.2, 28.4)	22.8 (19.4, 26.9)	24.1 (20.7, 28.2)	0.01	
			HCV	' infection				

	No	22.6 (22.3, 22.8)	22.5 (22.1, 22.9)	22.4 (22.0, 22.7)	22.8 (22.3, 23.2)	22.2 (21.6, 22.7)	0.31	
	Yes	43.1 (38.1, 48.7)	38.6 (31.7, 47.1)	41.9 (35.0, 50.1)	49.5 (38.3, 64.0)	39.1 (32.0, 47.8)	0.66	
AST								0.17
	No	23.4 (23.2, 23.5)	23.6 (23.3, 23.9)	23.0 (22.7, 23.3)	23.2 (22.9, 23.5)	22.8 (22.4, 23.1)	0.007	
	Yes	41.7 (37.4, 46.6)	38.3 (31.9, 45.9)	38.2 (32.7, 44.6)	45.7 (36.1 <i>,</i> 57.8)	38.5 (32.7, 45.4)	0.52	
ALP								0.91
	No	67.3 (66.5, 68.1)	64.2 (63.2, 65.2)	64.7 (63.8, 65.6)	64.3 (62.9, 65.6)	63.7 (62.6, 64.9)	<.0001	
	Yes	75.4 (70.8, 80.3)	70.7 (62.5, 80.1)	71.7 (62.7, 82.1)	66.3 (55.7, 78.8)	71.4 (63.9, 79.7)	0.18	
GGT								0.004
	No	21.4 (21.0, 21.8)	20.5 (19.9, 21.0)	20.9 (20.4, 21.4)	21.2 (20.6, 21.9)	20.2 (19.6, 20.9)	0.005	
	Yes	53.4 (46.4, 61.4)	49.3 (38.6, 62.9)	52.5 (38.1, 72.5)	41.0 (31.9, 52.9)	43.0 (33.7, 54.8)	0.06	

^a Adjusted for age (20-34, 35-49, 50-64, 65-85 yr), gender (male, female), race and ethnicity (Mexican American, other Hispanic, non-Hispanic White, non-Hispanic Black, other), education (less than 9th grade, 9-11th grade, high school/GED, some college or AA degree, college and higher), smoking status (Never, former, current smoker with <1 pck/d, current smoker with 1+ pck/d, missing), alcohol consumption (non-drinker, <1, 1- <3, 3-<7 drink/week, 1-<2, 2+ drink/day, missing), day of recall (Monday, Tuesday, Wednesday, Thursday, Friday, Saturday and Sunday), hepatitis B (positive serum hepatitis B surface antigen and core antibody, negative) and hepatitis C (positive serum hepatitis C antibody, negative).

Abbreviations: ALT, alanine aminotransferase; AST, aspartate aminotransferase; ALP, alkaline phosphatase; GGT, gamma glutamyl transaminase; BMI, body-mass index; CI, confidence interval