



Temporal patterns of caffeine intake in the United States



Danika Martyn^{a,*}, Annette Lau^b, Philip Richardson^c, Ashley Roberts^b

^a Intertek Scientific & Regulatory Consultancy, Farnborough, United Kingdom

^b Intertek Scientific & Regulatory Consultancy, Mississauga, ON, Canada

^c Kantar WorldPanel, Westgate, London W5 1UA, United Kingdom

ARTICLE INFO

Keywords:

Caffeine
Temporal pattern
Coffee
Energy drinks
Tea
Carbonated soft drinks

ABSTRACT

To investigate whether caffeine intake among adolescents and adults in the U.S. varies across the week or throughout the day, data from a 7-day online beverage consumption survey (2010–2011) were analyzed. Mean (206.8–213.0 mg/day) and 90th percentile (437.4–452.6 mg/day) daily caffeine intakes among consumers 13 years and older were relatively constant across the week with no marked difference among weekdays *versus* weekend days. Percent consumers of caffeinated beverages likewise remained stable across the week. Mean daily caffeine intake for coffee and energy drink consumers 13 years and older was higher than contributions for tea and carbonated soft drink consumers. Caffeinated beverage consumers (13 + yrs) consumed most of their caffeine in the morning (61% *versus* 21% and 18% in the afternoon and evening) which was driven by coffee. Caffeinated beverage consumption patterns among adolescents (13–17 yrs) - who typically consume less daily caffeine - were more evenly distributed throughout the day. These findings provide insight into U.S. temporal caffeine consumption patterns among specific caffeinated beverage consumers and different age brackets. These data suggest that while caffeine intakes do not vary from day-to-day, mornings generally drive the daily caffeine intake of adults and is predominantly attributed to coffee.

1. Introduction

Caffeine has a long history of consumption as a constituent of the human diet. It is a natural component of many foods and beverages, including coffee, tea, cocoa, and some nuts and berries. It is also added to beverages such as soft drinks, energy drinks, and related products, as well as to dietary supplements. Given the introduction of several additional caffeinated beverage products (e.g., energy drinks) into the marketplace over the past two decades, there is interest in exploring typical consumption patterns among various age groups, with a focus on specific life stages (e.g., adolescence and young adulthood).

While many investigators have examined caffeine intakes and trends among Americans (Barone and Roberts, 1996; Knight et al., 2004; Frary et al., 2005; Somogyi, 2010; Ahluwalia et al., 2014; Branum et al., 2014; Mitchell et al., 2014, 2015; Fulgoni et al., 2015; Tran et al., 2016; Drewnowski and Rehm, 2016), research into variations in caffeine intake across the week or throughout the day is limited (Tran et al., 2016). A caffeine dietary exposure assessment for each day of the week affords the opportunity to evaluate whether caffeine intake (from a population-perspective) may occur on distinct days associated with well-established behavioral patterns, such as school-/work-week *versus* weekend activities (Lau-Barraco et al., 2016). Additionally,

temporal caffeine consumption patterns throughout the day would shed some insight into the time of day that contributes most to the daily caffeine intake, which is not possible when only reporting average daily caffeine intakes.

The current study aims to investigate U.S. caffeinated beverage consumption patterns across the week and throughout the day by leveraging the Kantar WorldPanel (KWP) Beverage Consumption Panel 7-day online survey. Only caffeinated beverage consumers on each respective day of the week and during each time of day (i.e., morning, afternoon, evening) were the focus of this study, thus establishing the upper range of caffeine estimates across the week and throughout the day for caffeinated beverage consumers.

2. Materials and methods

2.1. Survey description

The KWP Beverage Consumption Panel and corresponding 7-day online beverage survey have been described elsewhere in detail (Mitchell et al., 2014). Briefly, 42,851 participants within the KWP Beverage Consumption Panel - a nationally representative sample of the U.S. population (1 yr and older) between October 2010 and September

* Corresponding author. Intertek Scientific & Regulatory Consultancy, Room 1036, Building A8, Cody Technology Park, Ively Road, Farnborough GU14 0LX, United Kingdom.
E-mail address: danika.martyn@intertek.com (D. Martyn).

Table 1
Mean daily caffeine intake for ‘any caffeinated beverage’^a consumer^b for each day of the week by age.

Age group (years) [Total sample of caffeinated beverage consumers for entire week, n]	Total caffeine intake, mean ± SE ^c						
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
<i>Caffeine Intakes (mg/day)</i>							
All ages (13+) [35,102]	206.8 ± 1.2	209.6 ± 1.2	213.0 ± 1.2	213.0 ± 1.2	211.8 ± 1.2	211.2 ± 1.2	209.3 ± 1.2
13-17 [1772]	122.2 ± 3.8	110.6 ± 3.2	115.7 ± 3.5	112.8 ± 3.4	116.9 ± 3.6	113.6 ± 3.5	120.2 ± 3.4
18-24 [1178]	152.4 ± 5.2	157.5 ± 5.8	165.3 ± 6.0	161.1 ± 6.0	152.4 ± 5.4	167.1 ± 6.3	163.1 ± 5.5
25-34 [4155]	170.1 ± 3.7	169.3 ± 2.8	175.6 ± 2.9	174.6 ± 2.8	173.9 ± 3.3	169.9 ± 2.7	172.3 ± 2.9
35-49 [9128]	221.1 ± 2.5	230.5 ± 2.5	213.2 ± 2.5	231.8 ± 2.6	230.5 ± 2.7	228.4 ± 2.5	223.9 ± 2.6
50-64 [12,691]	241.8 ± 2.0	244.8 ± 2.1	247.6 ± 2.1	248.8 ± 2.1	248.5 ± 2.1	247.7 ± 2.1	244.2 ± 2.0
65+ [6178]	221.9 ± 2.5	219.1 ± 2.6	222.6 ± 2.6	222.9 ± 2.6	222.4 ± 2.6	224.8 ± 2.6	222.4 ± 2.6
<i>Caffeine Intakes per Body Weight (mg/kg bw/day)</i>							
All ages (13+) [35,102]	2.7 ± 0.0	2.7 ± 0.0	2.8 ± 0.0	2.8 ± 0.0	2.8 ± 0.0	2.8 ± 0.0	2.7 ± 0.0
13-17 [1772]	2.0 ± 0.1	1.8 ± 0.1	1.9 ± 0.1	1.8 ± 0.1	1.9 ± 0.1	1.8 ± 0.1	1.9 ± 0.1
18-24 [1178]	2.1 ± 0.1	2.2 ± 0.1	2.3 ± 0.1	2.2 ± 0.1	2.1 ± 0.1	2.3 ± 0.1	2.3 ± 0.1
25-34 [4155]	2.3 ± 0.1	2.3 ± 0.0	2.4 ± 0.0	2.4 ± 0.1	2.4 ± 0.1	2.3 ± 0.1	2.4 ± 0.1
35-49 [9128]	2.8 ± 0.0	2.9 ± 0.0	2.9 ± 0.0	2.9 ± 0.0	2.9 ± 0.0	2.9 ± 0.0	2.8 ± 0.0
50-64 [12,691]	3.1 ± 0.0	3.1 ± 0.0	3.1 ± 0.0	3.2 ± 0.0	3.2 ± 0.0	3.1 ± 0.0	3.1 ± 0.0
65+ [6178]	2.8 ± 0.0	2.8 ± 0.0	2.8 ± 0.0	2.8 ± 0.0	2.8 ± 0.0	2.9 ± 0.0	2.8 ± 0.0

Abbreviations: bw = body weight; ns = not significantly different; SE = standard error of the mean.

^a Any caffeinated beverage includes coffee, tea, carbonated soft drinks (CSDs), energy drinks, and/or a small percentage (< 1–4% depending on age group) from other sources (cocoa and chocolate-containing beverages, energy shots).

^b Consumer is defined as an individual reporting at least one caffeinated beverage consumption event on a particular day. Each day is treated independently from the other.

^c Mean daily caffeine intake estimates for consumers represent the amount of caffeine consumed on average on a particular day by age bracket. Using Monday as an example, 13–17 yrs consumed a mean of 122.2 mg caffeine/day (2.0 mg/kg bw/day) from all caffeinated beverages. Each mean value for a given day is independent from all other days.

2011 - recorded their beverage consumption in the 7-day online beverage survey. Individuals 13 years and older (13 + yr) were the focus of this study due to (i) the relatively limited daily caffeine intake observed amongst survey respondents 12 years and under, and (ii) the extremely small sample size of energy drink consumers in the younger age bracket (Mitchell et al., 2014; Tran et al., 2016).

2.2. Data collection

Respondents recorded beverage consumption occasions using the KWP online system for 7 consecutive days. The information recorded for each beverage occasion included the type of beverage (from a pre-defined list of 18 beverage types), brand details, time and location of consumption, details of preparation, and amount of the beverage consumed.

Table 2

90th percentile daily caffeine intake for ‘any caffeinated beverage’^a consumer^b for each day of the week by age.

Age group (years) [Total sample of caffeinated beverage consumers for entire week, n]	Total caffeine intake, 90th percentile ^c						
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
<i>Caffeine Intakes (mg/day)</i>							
All ages (13+) [35,102]	437.4	448.4	452.6	452.0	450.6	450.9	448.0
13-17 [1772]	262.4	229.6	244.4	251.4	277.2	252.0	256.5
18-24 [1178]	339.6	355.2	357.8	357.0	329.6	353.6	343.2
25-34 [4155]	369.8	355.2	380.8	368.0	362.6	353.4	373.2
35-49 [9128]	462.4	477.7	482.0	476.0	486.5	480.0	475.2
50-64 [12,691]	496.8	502.8	509.0	520.0	511.7	510.6	504.8
65+ [6178]	457.6	453.2	453.2	452.2	450.6	459.4	453.8
<i>Caffeine Intakes per Body Weight (mg/kg bw/day)</i>							
All ages (13+) [35,102]	5.7	5.8	5.8	5.8	5.8	5.8	5.8
13-17 [1772]	4.0	3.6	3.8	3.8	4.0	3.8	4.1
18-24 [1178]	4.6	4.7	5.0	4.8	4.6	5.1	4.8
25-34 [4155]	5.0	5.0	5.1	5.1	5.1	5.0	5.0
35-49 [9128]	6.0	6.2	6.1	6.1	6.0	6.2	6.0
50-64 [12,691]	6.4	6.4	6.4	6.6	6.5	6.4	6.4
65+ [6178]	5.9	5.9	5.9	5.8	5.9	6.0	5.9

Abbreviations: bw = body weight.

^a Any caffeinated beverage includes coffee, tea, carbonated soft drinks (CSDs), energy drinks, and/or a small percentage (< 1–4% depending on age group) from other sources (cocoa and chocolate-containing beverages, energy shots).

^b Consumer is defined as an individual reporting any caffeinated beverage consumption event on a particular day. Each day is treated independently from the other.

^c 90th percentile daily caffeine intake estimates for consumers represent the amount of caffeine consumed at the 90th percentile on a particular day by age bracket. Using Monday as an example, 13–17 yrs consumed 262.4 mg caffeine/day (4.0 mg/kg bw/day) from all caffeinated beverages at the 90th percentile. Each intake value is independent from all other days.

Download English Version:

<https://daneshyari.com/en/article/8548431>

Download Persian Version:

<https://daneshyari.com/article/8548431>

[Daneshyari.com](https://daneshyari.com)