



TABLE 1

pH of Waters and Sports Drinks

Water and Sports Drinks	pH (stand. dev.)
Activ Water Focus Dragonfruit	2.82 (0.04)
Activ Water Vigor Triple Berry	2.67 (0.01)
Gatorade Frost Riptide Rush	2.99 (0.01)
Gatorade Lemon-Lime	2.97 (0.01)
Gatorade Orange	2.99 (0.00)
Powerade Fruit Punch	2.77 (0.01)
Powerade Grape	2.77 (0.01)
Powerade Lemon Lime	2.75 (0.01)
Powerade Mountain Berry Blast	2.82 (0.01)
Powerade Orange	2.75 (0.02)
Powerade Sour Melon	2.73 (0.00)
Powerade Strawberry Lemonade	2.78 (0.01)
Powerade White Cherry	2.81 (0.01)
Powerade Zero Grape	2.97 (0.01)
Powerade Zero Lemon Lime	2.92 (0.00)
Powerade Zero Mixed Berry	2.93 (0.01)
Powerade Zero Orange	2.93 (0.01)
Activ Water Power Strawberry Kiwi	3.38 (0.03)
Clear American Kiwi Strawberry	3.70 (0.01)
Clear American Pomegranate Blueberry Acai	3.24 (0.01)
Clear American Tropical Fruit	3.07 (0.01)
Clear American White Grape	3.43 (0.01)
Dasani Grape	3.05 (0.01)
Dasani Lemon or Strawberry	3.03 (0.01)
Gatorade Blueberry Pomegranate Low Calorie	3.21 (0.01)
Gatorade Fierce Grape or Melon	3.05 (0.00)
Gatorade Fruit Punch	3.01 (0.01)
Gatorade Rain Berry	3.17 (0.01)
Gatorade Rain Lime	3.19 (0.01)
Gatorade Rain Strawberry Kiwi	3.17 (0.01)
Propel Berry	3.01 (0.00)
Propel Grape	3.10 (0.01)
Propel Kiwi Strawberry	3.17 (0.00)
Propel Lemon	3.03 (0.00)
S. Pellegrino Sparkling Natural Mineral Water	4.96 (0.09)
Skinny Water Acai Grape Blueberry	3.81 (0.02)
Skinny Water Goji Fruit Punch	3.67 (0.01)
Skinny Water Raspberry Pomegranate	3.68 (0.01)
Sobe Life Water Acai Fruit Punch	3.22 (0.01)
Sobe Life Water Blackberry Grape	3.15 (0.01)
Sobe Life Water Cherimoya Punch	3.28 (0.00)
Sobe Life Water Fuji Apple Pear	3.53 (0.01)
Sobe Life Water Mango Melon	3.29 (0.01)
Sobe Life Water Strawberry Dragonfruit	3.32 (0.01)
Vidration Vitamin Enhanced Water Defense Pomegranate-Acai-Blueberry	2.92 (0.01)
Vidration Vitamin Enhanced Water Energy Tropical Citrus	2.91 (0.01)
Vidration Vitamin Enhanced Water Multi-V Lemon Lime	3.59 (0.01)
Vidration Vitamin Enhanced Water Recover Fruit Punch	3.61 (0.01)
Vitamin Water Connect Black Cherry-Lime	2.96 (0.01)
Vitamin Water Dwnld Berry-Cherry	3.04 (0.01)
Vitamin Water Energy Tropical Citrus	3.15 (0.01)
Vitamin Water Essential Orange-Orange	3.23 (0.00)
Vitamin Water Focus Kiwi-Strawberry	3.04 (0.01)
Vitamin Water Multi-V Lemonade	3.19 (0.01)
Vitamin Water Power C Dragonfruit	3.05 (0.00)
Vitamin Water Revive Fruit Punch	3.65 (0.01)
Vitamin Water Spark Grape-Blueberry	3.19 (0.01)
Vitamin Water XXX Acai-Blueberry-Pomegranate	2.98 (0.01)
Vitamin Water Zero Go-Go Mixed Berry	3.08 (0.01)
Vitamin Water Zero Mega C Grape-Raspberry	3.05 (0.00)
Vitamin Water Zero Recoup Peach-Mandarin	3.01 (0.01)
Vitamin Water Zero Rise Orange	3.46 (0.00)
Vitamin Water Zero Squeezed Lemonade	3.19 (0.00)
Vitamin Water Zero XXX Acai-Blueberry-Pomegranate	3.05 (0.01)
Minimally Erosive	
Aquafina regular	6.11 (0.23)
Birmingham, Alabama, municipal water	7.20 (0.05)
Dasani regular	5.03 (0.04)
Perrier carbonated mineral water	5.25 (0.10)

TABLE 2

pH of Energy Drinks

Energy Drinks	pH (stand. dev.)
24:7 Energy Cherry Berry	2.61 (0.01)
180 Blue Orange Citrus Blast	2.82 (0.00)
180 Blue With Acai	2.82 (0.01)
5-Hour Energy Berry	2.81 (0.03)
5-Hour Energy Extra Strength	2.82 (0.00)
5-Hour Energy Lemon-Lime	2.81 (0.00)
Amp Energy Elevate	2.79 (0.01)
Amp Energy Overdrive	2.78 (0.01)
Amp Energy regular	2.81 (0.01)
Amp Energy Sugar Free	2.86 (0.01)
Jolt Blue Bolt	2.96 (0.00)
Jolt Passion Fruit	2.82 (0.01)
Jolt Power Cola	2.47 (0.01)
Meltdown Energy Peach Mango	2.77 (0.00)
No Fear regular	2.97 (0.02)
Orange County Choppers	2.78 (0.02)
Purple Stuff Lean	2.87 (0.01)
Redline Peach Mango	2.74 (0.02)
Redline Princess Exotic Fruit	2.85 (0.01)
Redline Triple Berry	2.77 (0.01)
Rockstar Energy Drink	2.74 (0.01)
Rockstar Punched (Energy + Punch)	2.83 (0.01)
Rockstar Recovery	2.84 (0.01)
Crunk Citrus	3.20 (0.01)
Crunk Energy Drink	3.31 (0.01)
Crunk Grape Acai Energy Drink	3.30 (0.01)
Crunk Low Carb Sugar Free	3.34 (0.00)
Drank	3.09 (0.01)
Fuel Energy Shots Lemon Lime	3.97 (0.01)
Fuel Energy Shots Orange	3.44 (0.01)
Full Throttle Blue Agave	3.10 (0.01)
Full Throttle Citrus	3.09 (0.01)
Full Throttle Red Berry	3.08 (0.01)
Hydrive Blue Raspberry	3.45 (0.01)
Hydrive Citrus Burst	3.03 (0.01)
Hydrive Lemon Lime	3.42 (0.01)
Hydrive Triple Berry	3.15 (0.01)
Jolt Ultra Sugar Free	3.14 (0.00)
Killer Buzz	3.23 (0.01)
Killer Buzz Sugar Free	3.36 (0.00)
Monster Assault	3.58 (0.01)
Monster Energy	3.48 (0.01)
Monster Hitman Energy Shot	3.44 (0.01)
Monster Khaos	3.47 (0.01)
Monster Low Carb	3.60 (0.01)
Monster M-80	3.29 (0.00)
Monster MIXXD	3.35 (0.00)
Nitrous Monster Anti-Gravity	3.64 (0.01)
Nitrous Monster Killer B	3.31 (0.00)
Nitrous Monster Super Dry	3.46 (0.00)
No Fear Sugar Free	3.06 (0.01)
NOS Fruit Punch	3.32 (0.00)
NOS Grape	3.27 (0.01)
NOS High Performance Energy Drink	3.31 (0.01)
NOS Power Shot	3.03 (0.02)
Redbull regular	3.43 (0.01)
Redbull Shot	3.25 (0.03)
Redbull Sugar Free	3.39 (0.00)
Redbull Sugar Free Shot	3.28 (0.02)
Redline Xtreme Grape	3.23 (0.01)
Redline Xtreme Triple Berry	3.24 (0.01)
Redline Xtreme Watermelon	3.41 (0.00)
Rhinos Energy Drink	3.51 (0.01)
Rhinos Sugar Free Energy Drink	3.32 (0.01)
Rockstar Energy Cola	3.14 (0.01)
Rockstar Juiced Energy + Guava	3.16 (0.01)
Rockstar Juiced Energy + Juice Mango Orange Passion	3.05 (0.01)
Rockstar Sugar Free	3.15 (0.03)



TABLE 3
pH of Fruit Drinks and Fruit Juices

Fruit Drinks	pH (stand. dev.)
Barber's Lemonade	2.69 (0.00)
Barber's Orange Drink	2.96 (0.00)
Bug Juice Berry Raspberry	2.99 (0.01)
Bug Juice Grape Grape	2.83 (0.00)
Country Time Lemonade	2.72 (0.01)
Crystal Light Fruit Punch	2.96 (0.02)
Crystal Light Raspberry Ice	2.77 (0.01)
Hi-C Tropical	2.81 (0.03)
Kool-Aid Mix Cherry	2.71 (0.00)
Kool-Aid Mix Grape	2.83 (0.01)
Kool-Aid Mix Lemon-Lime	2.73 (0.01)
Kool-Aid Mix Orange	2.77 (0.01)
Kool-Aid Mix Pink Lemonade	2.66 (0.01)
Kool-Aid Mix Tropical Punch	2.69 (0.00)
Minute Maid Fruit Punch	2.86 (0.00)
Minute Maid Lemonade	2.57 (0.01)
Minute Maid Orangeade	2.85 (0.00)
Minute Maid Pink Lemonade	2.59 (0.00)
Simply Lemonade	2.61 (0.01)
Snapple Kiwi Strawberry	2.77 (0.01)
Snapple Mango Madness	2.89 (0.01)
Sobe Black and Blueberry Brew	2.69 (0.00)
Sobe Citrus Energy	2.63 (0.00)
Sobe Power Fruit Punch	2.43 (0.02)
Sobe Strawberry Banana	2.62 (0.01)
Sun Fresh Lemonade	2.68 (0.01)
Sunny D Smooth	2.92 (0.01)
Sunny D Tangy Original	2.86 (0.01)
Tropicana Cranberry Cocktail	2.70 (0.01)
Tropicana Juice Beverage Cranberry	2.59 (0.00)
Tropicana Juice Beverage Grape	2.58 (0.00)
Tropicana Lemonade	2.70 (0.01)
Tropicana Twister Blue Raspberry Rush	2.62 (0.00)
Tropicana Twister Cherry Berry Blast	2.63 (0.00)
Tropicana Twister Orange Strawberry Banana Burst	2.89 (0.01)
Tropicana Twister Strawberry Kiwi Cyclone	2.59 (0.01)
Welch's Blueberry Kiwi Blast	2.57 (0.01)
Welch's Cranberry	2.59 (0.02)
Welch's Grape Juice Cocktail	2.92 (0.01)
Welch's Ruby Red Grapefruit Juice	2.97 (0.01)
Barber's Fruit Punch	2.96 (0.00)
Bug Juice Fruity Punch	3.09 (0.00)
Bug Juice Leapin Lemonade	3.06 (0.00)
Bug Juice Whistlin Watermelon	3.40 (0.01)
CapriSun Surfer Cooler	3.08 (0.00)
Crystal Light Green Tea Raspberry Mix	3.11 (0.02)
Fuze Banana Colada	3.45 (0.03)
Fuze Blueberry Raspberry	3.20 (0.01)
Fuze Green Tea Honey and Ginseng	3.28 (0.02)
Fuze Orange Mango	3.34 (0.02)
Fuze Peach Mango	3.53 (0.01)
Fuze Strawberry Banana	3.54 (0.01)
Fuze Strawberry Guava	3.55 (0.02)
Fuze Strawberry Melon	3.18 (0.01)
Fuze Tropical Punch	3.17 (0.01)
Jumex Guava	3.38 (0.02)
Jumex Mango	3.41 (0.01)
Jumex Peach	3.33 (0.02)
Jumex Strawberry Banana	3.68 (0.01)
Kool-Aid Burst (Tropical)	3.07 (0.01)
Little Hug Grape	3.09 (0.01)
Little Hug Orange	3.00 (0.01)
Mondo (Legendary Berry)	3.07 (0.01)
Mondo (Primo Punch)	3.10 (0.01)
Sesame Street Elmo's Punch	3.87 (0.01)
Sobe Fuji Apple Cranberry (low calorie)	3.16 (0.01)
Sobe Orange Carrot	3.34 (0.00)
Sobe Pina Colada	3.25 (0.01)
TumE Yummies Fruitabulous Punch	3.35 (0.00)
TumE Yummies Orangearific	3.34 (0.01)
TumE Yummies Soursational Raspberry	3.18 (0.00)
TumE Yummies Very Berry Blue	3.33 (0.00)
Vitamin Stix Dragonfruit Acai	3.11 (0.01)
Vitamin Stix Passionfruit Citrus	3.19 (0.01)
Vitamin Stix Strawberry Kiwi	3.06 (0.01)
Welch's Orange Pineapple	3.20 (0.01)
Welch's Strawberry Kiwi	3.03 (0.01)

Fruit Juices	pH (stand. dev.)
Lemon juice	2.25 (0.01)
Minute Maid Cranberry Apple Raspberry	2.79 (0.01)
Minute Maid Cranberry Grape	2.71 (0.01)
Ocean Spray Cranberry	2.56 (0.00)
Ocean Spray Cran-Grape	2.79 (0.01)
Ocean Spray Cran-Pomegranate	2.72 (0.01)
Ocean Spray Strawberry Kiwi Juice Cocktail	2.90 (0.01)
V8 Splash Berry Blend	2.94 (0.01)
V8 Splash Strawberry Kiwi	2.99 (0.01)
V8 Splash Tropical Blend	2.93 (0.00)
Amp Energy Juice Mixed Berry	3.62 (0.01)
Amp Energy Juice Orange	3.60 (0.01)
Barber's Orange Juice	3.81 (0.01)
Dole Pineapple Juice	3.40 (0.01)
Juicy Juice Apple	3.64 (0.01)
Juicy Juice Berry	3.78 (0.01)
Juicy Juice Sparkling Apple	3.47 (0.01)
Juicy Juice Sparkling Berry	3.50 (0.01)
Juicy Juice Sparkling Orange	3.49 (0.01)
Minute Maid Apple Juice	3.66 (0.01)
Minute Maid Natural Energy Mango Tropical	3.34 (0.02)
Minute Maid Natural Energy Pomegranate Berry	3.33 (0.01)
Minute Maid Natural Energy Strawberry Kiwi	3.40 (0.01)
Minute Maid Orange Juice	3.82 (0.01)
Minute Maid Pineapple Orange	3.71 (0.01)
Minute Maid Ruby Red Grapefruit Juice	3.07 (0.03)
Naked Blue Machine	3.81 (0.01)
Naked Orange Mango	3.75 (0.01)
Ocean Spray Orange Juice	3.83 (0.01)
Ocean Spray Pineapple Peach Mango Juice Blend	3.64 (0.01)
Ocean Spray Ruby Red	3.07 (0.01)
Simply Apple	3.67 (0.01)
Simply Orange Orange Juice	3.78 (0.00)
Tango Energy Juice	3.47 (0.00)
Tropicana 100% Juice Apple Juice	3.50 (0.02)
Tropicana 100% Juice Orange Juice	3.80 (0.01)
Tropicana Apple Orchard Style Juice	3.57 (0.00)
Tropicana Grape Juice	3.29 (0.01)
V8 Fusion Cranberry Blackberry	3.56 (0.01)
V8 Fusion Pomegranate Blueberry	3.66 (0.00)
V8 Fusion Strawberry Banana	3.66 (0.00)
Very Fine Grapefruit Juice	3.22 (0.03)
Welch's 100% Grape Juice	3.38 (0.00)
Welch's Apple Juice	3.57 (0.01)
Welch's Orange Juice	3.73 (0.00)
Minimally Erosive	
Campbell's Tomato Juice	4.01 (0.01)
Naked Protein Zone	4.69 (0.01)
Tropicana Orange Juice (With Calcium)	4.09 (0.01)
V8 Vegetable Juice	4.23 (0.01)
V8 Vegetable Juice Low Sodium	4.17 (0.01)
V8 Vegetable Juice Spicy Hot	4.19 (0.00)

TABLE 4
pH of Teas and Coffee

Teas and Coffee	pH (stand. dev.)
Admiral Iced Tea Raspberry	2.94 (0.00)
Arizona Iced Tea	2.85 (0.03)
Lipton Green Tea With Citrus	2.93 (0.00)
Lipton Green Tea With Citrus Diet	2.92 (0.00)
Nestea Iced Tea With Natural Lemon Flavor	2.94 (0.01)
Nestea Red Tea Pomegranate and Passion Fruit	2.87 (0.01)
Snapple Peach Tea	2.94 (0.01)
Snapple Raspberry Tea	2.92 (0.00)
Admiral Iced Tea Green Tea	3.72 (0.01)
Admiral Iced Tea Mango	3.41 (0.00)
Admiral Iced Tea Sweet Tea	3.76 (0.01)
Arizona Diet Green Tea + Ginseng	3.29 (0.01)
Snapple Diet Raspberry Tea	3.39 (0.02)
Snapple Diet Peach Tea	3.32 (0.01)
Minimally Erosive	
Milo's Famous Sweet Tea	4.66 (0.02)
Milo's No Calorie Famous Sweet Tea	5.18 (0.03)
Red Diamond Tea Fresh Brewed Sweet Tea	5.04 (0.02)
Starbucks Medium Roast	5.11 (0.05)



TABLE 5

pH of Sodas

Soda	pH (stand. dev.)
7UP Cherry	2.98 (0.01)
Boylan's Black Cherry	2.76 (0.02)
Boylan's Grape	2.91 (0.01)
Boylan's Sugar Cane Cola	2.54 (0.01)
Canada Dry Ginger Ale	2.82 (0.01)
Coca-Cola Caffeine Free	2.34 (0.03)
Coca-Cola Cherry	2.38 (0.03)
Coca-Cola Cherry Zero	2.93 (0.01)
Coca-Cola Classic	2.37 (0.03)
Coca-Cola Lime Diet	2.96 (0.03)
Coca-Cola Zero	2.96 (0.03)
Crush Grape	2.76 (0.01)
Crush Orange	2.87 (0.01)
Dr. Pepper	2.88 (0.04)
Fanta Grape (2 liter)	2.67 (0.02)
Fanta Orange	2.82 (0.02)
Fanta Pineapple (2 liter)	2.79 (0.02)
Fanta Strawberry	2.84 (0.01)
Grapico	2.77 (0.03)
Hansen's Cane Soda Cherry Vanilla Crème	2.91 (0.01)
Hansen's Cane Soda Kiwi Strawberry	2.59 (0.01)
Hansen's Cane Soda Mandarin Lime	2.57 (0.01)
Hansen's Cane Soda Pomegranate	2.55 (0.00)
Hawaiian Punch (Fruit Juicy Red)	2.87 (0.01)
Jolly Rancher Grape	2.60 (0.01)
Jolly Rancher Orange	2.88 (0.01)
Jones Blue Bubblegum	2.99 (0.01)
Jones Green Apple Soda	2.65 (0.01)
Jones Mandarin Orange	2.93 (0.00)
Jones M.F. Grape	2.89 (0.02)
Jones Orange & Cream Soda	2.79 (0.01)
Jones Strawberry Lime	2.81 (0.02)
Mr. Pibb Xtra	2.80 (0.01)
Natural Brew Draft Root Beer	2.90 (0.00)
Pepsi	2.39 (0.03)
Pepsi Max	2.74 (0.01)
Pepsi Max Ceasefire	2.70 (0.01)
Pepsi Wild Cherry	2.41 (0.03)
RC Cola	2.32 (0.02)
Schweppes Tonic Water	2.54 (0.03)
Sunkist Orange	2.98 (0.01)
Sunkist Peach	2.89 (0.01)
Sunkist Strawberry	2.99 (0.01)
Tab	2.72 (0.01)
Vault	2.77 (0.02)
Vault Red Blitz	2.80 (0.01)
Vault x	2.89 (0.03)
7UP	3.24 (0.02)

Soda	pH (stand. dev.)
7UP Diet	3.48 (0.00)
A&W Cream Soda	3.86 (0.01)
Ale 8-One	3.13 (0.01)
Boylan's Orange Cream	3.59 (0.01)
Boylan's Orange Soda	3.22 (0.00)
Boylan's Original Birch Beer	3.80 (0.00)
Buffalo Rock Ginger Ale	3.23 (0.01)
Coca-Cola Caffeine Free Diet	3.04 (0.01)
Coca-Cola Diet	3.10 (0.05)
Dr Pepper Cherry	3.06 (0.02)
Dr Pepper Diet	3.20 (0.00)
Dr Pepper Diet Cherry	3.32 (0.01)
Fresca (1 liter)	3.08 (0.01)
Grapico Diet	3.04 (0.01)
Hansen's Cane Soda Black Cherry Diet	3.47 (0.02)
Hansen's Cane Soda Creamy Root Beer Diet	3.73 (0.01)
Izze Sparkling Blackberry	3.28 (0.01)
Izze Sparkling Clementine	3.27 (0.01)
Izze Sparkling Pomegranate	3.01 (0.01)
Jones Cream Soda	3.04 (0.01)
Jones Red Apple	3.40 (0.02)
Jones Root Beer	3.42 (0.02)
Mellow Yellow	3.03 (0.00)
Mountain Dew (regular)	3.22 (0.07)
Mountain Dew Code Red	3.27 (0.01)
Mountain Dew Diet	3.18 (0.01)
Mountain Dew Voltage	3.05 (0.01)
Mug Root Beer	3.88 (0.02)
Pepsi Diet	3.02 (0.01)
Sierra Mist	3.09 (0.02)
Sierra Mist Diet	3.31 (0.01)
Sprite	3.24 (0.05)
Sprite Zero	3.14 (0.01)
Sunkist Diet	3.49 (0.01)
Sunkist Solar Fusion Tropical Mandarin	3.02 (0.01)
Welch's Grape Soda	3.11 (0.02)
Minimally Erosive	
A&W Root Beer	4.27 (0.02)
A&W Root Beer Diet	4.57 (0.00)
Barq's Root Beer	4.11 (0.02)
Boylan's Creme Soda	4.17 (0.02)
Boylan's Diet Black Cherry	4.00 (0.01)
Boylan's Diet Root Beer	4.05 (0.02)
Boylan's Root Beer	4.01 (0.01)
Canada Dry Club Soda	5.24 (0.03)
IBC Root Beer	4.10 (0.02)
Maine Root Root Beer	4.36 (0.02)

Reference:

Reddy A, Norris DF, Momeni SS, Waldo B, Ruby JD. The pH of beverages in the United States. J Am Dent Assoc. 2016 Apr;147(4):255-63.



TABLE 6

Acidity of Common Foods and Beverages

Beverages	pH Range
Cider	2.9-3.3
Beers	4.0-5.0
Wines	2.3-3.8
Fruits	pH Range
Apples	2.9-.35
Apricots	3.5-4.0
Grapes	3.3-4.5
Peaches	3.1-4.2
Pears	3.4-4.7
Plums	2.8-4.6
Grapefruit	3.0-.3.5
Lemons, Limes/Juice	1.8-2.4
Oranges/Juice	2.8-4.0
Pineapples/Juice	3.2-4.1
Blueberries	3.2-3.6
Cherries	3.2-4.7
Strawberries	3.0-4.2
Raspberries	2.9-3.7
Tomatoes	3.7-4.7
Condiments	pH Range
Mayonnaise	3.8-4.0
Vinegar	2.4-3.4
A-1® Sauce	3.4
Mustard	3.6
Italian salad dressing	3.3
Cranberry sauce	2.3
Sauerkraut	3.1-3.7
Relish	3.0
Ketchup	3.7
Sour cream	4.4
Other	pH Range
Yogurt	3.8-4.2
Pickles	2.5-3.0
Rhubarb	2.9-3.3
Vegetables/fermented	3.9-5.1
Fruit jam/jellies	3.0-4.0

Reference: Clark DC, Woo G, Silver JG, Sweet D, Grisdale JC. The influence of frequent ingestion of acids in the diet on treatment for dentin sensitivity. *J Can Dent Assoc.* 1990 Dec;56(12):1101-3.

TABLE 8

Mean pH of Oral Moisturizers

Oral Moisturizer	Mean pH (SD)
Oasis	6.33 (0.28)
Biotène MS	6.11 (0.03)
CTx2 Spray	9.09 (0.05)
Mouth Kote	3.03 (0.03)
Thayer's	6.30 (0.47)
Biotène OB	6.61 (0.12)
Rain	7.10 (0.02)
Tap water	6.99 (0.13)
Citric acid	1.33 (0.09)

Reference: Delgado AJ, Olafsson VG, Donovan TE. pH and Erosive Potential of Commonly Used Oral Moisturizers. *J Prosthodont.* 2016 Jan;25(1):39-43.

TABLE 7

pH of Mouthrinses

Mouthrinse	pH
CTx4 Treatment Rinse	10.4
CTx3 Maintenance Rinse	8.33
TheraBreath Oral Rinse	8.20
ACT Anticavity Fluoride Mouthwash	7.95
Cepacol Mouthwash	7.79
PerioSciences AO ProRinse	7.75
OraCare	7.55
BreathRx Anti-Bacterial Tongue Spray	7.30
CB12 Mouthwash	7.20
Oxyfresh Mouthrinse	7.17
SmartMouth	7.11
CloSYS Rinse	7.10
Biotène Dry Mouth Oral Rinse	7.09
Colgate Optic White Mouthwash	6.95
CloSYS Alcohol-Free Oral Rinse	6.85
Oasis Moisturizing Mouthwash for Dry Mouth	6.49
Colgate Total Advanced Health Mouthwash	6.31
BreathRx Anti-Bacterial Mouth Rinse	6.21
BreathRx Anti-Bacterial Breath Spray	6.20
Colgate FluoriGard Daily Mouth Rinse	6.10
Listerine Zero Alcohol Mouthwash	6.02
ProFresh Chlorine Dioxide Oral Rinse	5.90
ACT Restoring Anticavity Fluoride Mouthwash	5.56
Scope Classic	5.55
Peridex	5.48
Listerine Total Care Mouthwash	5.44
Crest 3D White Multi-Care Whitening Rinse	5.40
Crest Pro-Health Clinical Rinse	5.18
Chlorhexidine Alcohol-Free	5.10
Fluoridex Daily Renewal Oral Rinse	5.10
Listerine Antiseptic Mouthwash	4.88
BreathRx Anti-Bacterial Rinse	4.74
Biotène Mouthwash	4.64
BreathRx Anti-Bacterial Mouth Spray	4.53
Healthy White Bleach Agent	4.50
Crest Pro-Health Multi-Protection Mouthwash	4.27
Peroxyl Antiseptic Oral Cleanser	3.90
Tom's of Maine Wicked Fresh! Mouthwash	3.89
The Natural Dentist Healthy Gums Mouth Rinse	3.30

Neutral = 7



- pH alone may be misleading because it is also related to the type of acid, see table below:

TABLE 9

Main Dietary Acids and Their Sources

Type of acid	Dietary Source
Acetic	Vinegar-containing foods, pickles, and some sauces
Ascorbic	Chewable Vitamin C tablets, some drinks
Carbonic	Carbonated drinks
Citric	Citrus juices and fruits
Malic	Apple and apple juice
Oxalic	Rhubarb
Phosphoric	Soft Drinks (eg, cola drinks)
Tartaric	Grapes and Grape Juice, Wine

Reference: Auad S, Moynihan P. Diet and dental erosion. *Quintessence Int.* 2007 Feb;38(2):130-3.

- Certain acids chelate calcium, making the enamel surface more vulnerable to erosion, see tables below:

TABLE 10

Enamel Dissolution in Various Beverages

Beverage	Container	pH	14-day weight loss (%)	14-day weight loss (mg/cm)
Coca-Cola	Bottle	2.48	1.39 ± 0.34	2.78 ± 0.71
Diet Coca-Cola	Bottle	3.22	1.49 ± 0.29	3.07 ± 0.06
Pepsi-Cola	Can	2.46	1.40 ± 0.22	3.31 ± 0.43
Diet Pepsi-Cola	Can	2.94	1.46 ± 0.23	3.22 ± 0.26
Dr. Pepper	Bottle	2.90	1.72 ± 0.36	3.21 ± 0.24
Diet Dr. Pepper	Bottle	2.99	1.52 ± 1.00	2.99 ± 1.24
Mountain Dew	Bottle	3.14	6.17 ± 1.13	14.31 ± 0.94
Diet Mountain Dew	Bottle	3.27	8.01 ± 1.46	14.82 ± 2.23
Sprite	Can	3.27	3.93 ± 1.30	8.60 ± 1.94
Diet Sprite	Can	3.34	3.65 ± 1.27	6.43 ± 0.37
Canada Dry Ginger Ale	Can	2.94	3.48 ± 0.71	6.31 ± 0.65
A&W Root Beer	Can	4.80	-0.01 ± 0.12	-0.03 ± 0.28
Arizona Iced Tea	Can	2.94	4.86 ± 0.59	9.03 ± 1.21
Brewed Black Tea	N/A	5.36	0.22 ± 0.07	0.35 ± 0.12
Brewed Black Coffee	N/A	6.25	0.19 ± 0.03	0.34 ± 0.03
Tap Water (Control)	N/A	6.70	-0.02 ± 0.08	-0.05 ± 0.13

Reference: von Fraunhofer JA, Rogers MM. Dissolution of dental enamel in soft drinks. *Gen Dent.* 2004 Jul-Aug;52(4):308-12.

TABLE 11

Means and Standard Deviations of the Physiochemical Properties of Sports and Energy Drinks

Sports Drinks	Mean ± Standard Deviation		
	Fluoride (ppm)	pH	Titrateable Acidity* (mL of 1.0 M NaOH)
Propel Grape	0.20 ± 0.01	2.98 ± 0.09	3.11 ± 0.02
Powerade Option	0.06 ± 0.00	2.78 ± 0.07	3.03 ± 0.03
Gatorade Rain	0.36 ± 0.03	3.08 ± 0.02	3.32 ± 0.01
Powerade White	0.12 ± 0.02	2.76 ± 0.02	3.63 ± 0.15
Powerade Blue	0.12 ± 0.01	2.86 ± 0.03	3.60 ± 0.10
Powerade Red	0.08 ± 0.01	2.77 ± 0.01	3.50 ± 0.10
Powerade Advance	0.11 ± 0.02	2.77 ± 0.02	3.83 ± 0.25
Propel Mango	0.78 ± 0.07	3.23 ± 0.03	2.93 ± 0.06
Fuze	0.57 ± 0.08	3.09 ± 0.02	3.37 ± 0.21
Thirst Quencher	0.05 ± 0.01	2.85 ± 0.02	3.77 ± 0.06
Speedo	0.79 ± 0.09	3.06 ± 0.37	3.27 ± 0.06
Gatorade Blue	0.05 ± 0.01	2.92 ± 0.03	4.83 ± 0.06
Hydr8	0.35 ± 0.05	2.69 ± 0.01	4.40 ± 0.10
Energy Drinks			
Red Bull	0.42 ± 0.02	3.37 ± 0.06	10.79 ± 0.66
5-Hour Energy	0.14 ± 0.00	2.81 ± 0.01	13.73 ± 0.36
MDX	0.03 ± 0.00	2.70 ± 0.06	5.93 ± 0.38
Full Throttle Fury	0.16 ± 0.10	2.94 ± 0.01	9.83 ± 0.32
Rip It	0.39 ± 0.13	3.25 ± 0.01	10.13 ± 0.61
Red Bull Sugar Free	0.28 ± 0.09	3.27 ± 0.01	13.43 ± 0.86
Monster Assault	0.02 ± 0.01	3.49 ± 0.01	13.63 ± 1.38
Von Dutch	0.03 ± 0.01	3.10 ± 0.01	14.03 ± 0.50
Rockstar	0.005 ± 0.00	2.53 ± 0.01	14.53 ± 0.45

*A higher number means that the drink is more corrosive.

Reference: Jain P, Hall-May E, Golabek K, Agustin MZ. A comparison of sports and energy drinks--Physiochemical properties and enamel dissolution. *Gen Dent.* 2012 May-Jun;60(3):190-7.