

FAO/INFOODS Density Database version 1.0 (July 2011)

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INFOODS prepared this database to allow researchers and professionals to convert volume into weight and vis-versa.

$$\text{density} = \frac{\text{mass}}{\text{volume}}$$

If you have any additional measured data, we would appreciate if you could send them to ruth.charrondiere@fao.org to incorporate them into the FAO/INFOODS Density Database. Your contribution will be acknowledged with your name.

Selected densities of foods

Food name and description	Density in g/ml	Source
Beverages, non alcoholic (including soft drinks and juices)		
Fruit drinks, low calories, undiluted	1.01-1.03	UK 6th
Fruit drinks, undiluted	1.09-1.12	UK 6th
Fruit juice	1.06	FNDDS 4.1
Fruit juice drinks	1.04	UK 6th
Fruit juice drinks, ready to drink	1.03-1.04	UK 6th
Grape juice	1.054	S&W
Lime juice cordial, undiluted	1.102	UK 6th
Orange juice	1.038	S&W
Orange juice with calcium	1.038	S&W
Orange soda (sweetened with sugar)	1.029	S&W
Soft drinks, cola type	1.04	UK 6th
Soft drinks, diet soda	0.988	S&W
Soft drinks, lemonade type	1.02	UK 6th
Soft drinks, lucozade type	1.07	UK 6th
Soy drink	1.08	FNDDS 4.1
Water	0.988	S&W
Water, ice, 0 °C	0.916	TB
Water, ice, 4 °C	0.999	TB
Water, liquid, 20 °C	0.998	TB
Water, mineralwater	1.035-1.04	DK
Tea and Coffee and drinking powders		
Tea, liquid	1	FNDDS 4.1
Coffee, brewed	1	FNDDS 4.1
Coffee, espresso	1	FNDDS 4.1
Coffee, powder (nescafé)	0.25	RC
Powders	0.2-0.25	
Chocolate drinking powder	0.5-0.55	RC
Miso, broth, ready to drink	1.06	FNDDS 4.1

Food name and description	Density in g/ml	Source
Beverages, alcoholic		
Alcohol, ethyl	0.789	TB
Beer, type bitter or brown ale	1.008	UK 6th
Beer, type draught	1.004	UK 6th
Beer, type Keg	1.001	UK 6th
Beer, type mild, draught	1.009	UK 6th
Beer, lager	1.005	UK 6th
Beer, pale ale	1.003	UK 6th
Beer, stout, bottled	1.014	UK 6th
Beer, stout, extra	1.002	UK 6th
Beer, strong ale	1.018	UK 6th
Beer, pilsner, 4 °C	1.008	TB
Beer, pilsner	1.007	DK
Cider, dry	1.007	UK 6th
Cider, sweet	1.012	UK 6th
Cider, vintage	1.017	UK 6th
Wine, red	0.998	UK 6th
Wine, rose, medium	1.003	UK 6th
Wine, white, dry or sparkling	0.995	UK 6th
Wine, white, medium	1.005	UK 6th
Wine, white, sweet	1.016	UK 6th
Wine, white	1-1.04	DK
Port	1.026	UK 6th
Sherry, dry	0.988	UK 6th
Sherry, medium	0.998	UK 6th
Sherry, sweet	1.009	UK 6th
Vermouth, dry	1.005	UK 6th
Vermouth, sweet	1.046	UK 6th
Liqueur, type advocaat	1.093	UK 6th
Liqueur, type cherry brandy	1.093	UK 6th
Liqueur, type curacao	1.052	UK 6th
Liqueur	1.03-1.150	DK
Spirits, 38% alcohol	0.953	UK 6th
Spirits, 40% alcohol	0.948	UK 6th
Spirits, 45% alcohol (whiskey)	0.939	DK
Spirits, 70% alcohol	0.885	DK
Spirits, 75% alcohol	0.873	DK
Milk and dairy products		
Milk, liquid (whole, semi-skimmed, skimmed)	1.03	UK 6th
Milk, liquid, whole	1.03	TB
Milk, liquid, whole	1.031	DK
Milk, acidophilus cultured	1.01	DK
Milk, liquid, skimmed	1.033	TB
Milk, liquid, skimmed	1.036	DK
Milk, liquid, partially skimmed	1.034	DK
Milk shake, fruit and other	1	FNDDS 4.1

Food name and description	Density in g/ml	Source
Milk, buttermilk	1.022	DK
Milk, Chocolate milk, skimmed	1.056	DK
Milk, evaporated	1.07	UK 6th
Milk, goat, whole	1.08	FNDDS 4.1
Cream, heavy	0.994	TB
Cream, light	1.012	TB
Cream, single (about 20% fat)	1	UK 6th
Cream, whipping (about 40% fat)	0.96	UK 6th
Cream, double (about 40-50% fat)	0.94	UK 6th
Cream, 9% fat	1.017	DK
Cream, 13% fat	1.013	DK
Cream, 38% fat	0.984	DK
Cream, sour (crème fraiche about 18% fat)	1.005	DK
Cream, sour (crème fraiche about 38% fat)	0.978	DK
Cream, whipped	0.496	S&W
Yoghurt, low fat, fruit	1.08	UK 6th
Yoghurt, fruits	1.045-1.06	DK
Yoghurt, berry, low fat, artificially sweetened	1.06	FNDDS 4.1
Yoghurt, plain, unsweetened	1.06	FNDDS 4.1
Yoghurt, plain, unsweetened	1.031	DK
Yoghurt, strawberry, low fat	1.08	FNDDS 4.1
Ice cream, dairy	0.61	UK 6th
Ice cream, non dairy	0.51	UK 6th
Ice cream, light (formerly ice milk)	0.56	FNDDS 4.1
Ice cream, light, no sugar added	0.58	FNDDS 4.1
Ice cream, no sugar added	0.54	FNDDS 4.1
Ice cream, regular	0.56	FNDDS 4.1
Ice cream, rich	0.62	FNDDS 4.1
Ice cream	0.554	S&W
Cheese, Emmentaler, grated	0.34	RC
Butter, margarine	0.96	RC
Butter	0.911	TB
Oils and fats		
Oil, vegetable, coconut	0.924	TB
Oil, vegetable, corn	0.922	TB
Oil, vegetable, olive	0.918	TB
Oil, vegetable, palm	0.915	TB
Oil, vegetable, peanut	0.914	TB
Oil, vegetable, soya	0.927	TB
Oil, sunflower	0.96	RC
Oil, palmoil	0.89	DK
Oil, other than palmoil	0.92	DK
Mayonnaise, traditional	0.91	TB
Mayonnaise, light	1	TB
Lard	0.919	TB

Food name and description	Density in g/ml	Source
Cereal and cereal products		
Barley	0.62	TB
Corn, shelled	0.72	TB
Corn, ear	0.9	TB
Millet	0.64	TB
Oats	0.41	TB
Rice, rough	0.58	TB
Rice, hulled	0.75	TB
Rye	0.72	TB
Wheat	0.77	TB
Biscuits	0.41-0.53	FNDDS 4.1
Bread	0.29	FNDDS 4.1
Bread, white, sliced, prepacked	0.29	FNDDS 4.1
Bread, Cornbread	0.433	S&W
Bread, roll, soft	0.18	FNDDS 4.1
Breadcrumbs	0.45	RC
Breakfast cereal, raisin bran	0.26	FNDDS 4.1
Breakfast cereal, Cornflakes (dry cereal)	0.117	S&W
Breakfast cereal, type Corn flakes	0.1	RC
Breakfast cereal, Muesli w/ fruits&nuts	0.37	FNDDS 4.1
Breakfast cereal, type frosted flakes	0.18	FNDDS 4.1
Breakfast cereal, type Just Right	0.24	FNDDS 4.1
Breakfast cereal, type rice krispies	0.12	FNDDS 4.1
Breakfast cereal, type Crispix	0.13	FNDDS 4.1
Breakfast cereal, type Cheerios	0.13	FNDDS 4.1
Cake	0.415	S&W
Corn starch, loosely packed	0.54	TB
Corn starch, tightly packed	0.63	TB
Flour, Wheat flour	0.521	S&W
Flour, wheat, white	0.67	RC
Flour, wheat, wholemeal	0.55	RC
Pasta, short macaroni style, boiled	0.55	RC
Pasta, short macaroni style, raw	0.39	RC
Rice, white, boiled	0.73	RC
Rice, white, raw	0.82	RC
Semolina, raw	0.78	RC
Egg and egg products		
Egg, chicken, boiled/poached	0.6	FNDDS 4.1
Nuts and seeds		
Nuts	0.63	FNDDS 4.1
Pistachio, raw, without shell	0.646	RC
Pistachio, raw, with shell	0.6	RC
Vegetables		
Cauliflower, boiled	0.45	RC

Food name and description	Density in g/ml	Source
Olives, green, with stone	0.65	RC
Onions, fried, cubed	0.75	RC
Onions, raw, cubed	0.55	RC
Salad, green, leaves, raw	0.06	RC
Spinach, frozen, cooked	1.046	RC
Spinach, leaves, raw	0.08	RC
Sweet pepper, raw, cubes	0.51	RC
Sweet pepper, raw, half rings	0.39	RC
Legumes		
Lentils, green, small, raw	0.89	RC
Lentils, green, small, boiled	0.85	RC
Fish and fish products		
Prawns, whole, boiled, without shell	0.77	RC
Prawns, whole, boiled, with shell	0.58	RC
Soups		
Chicken noodle soup	1	S&W
Egg drop soup	1.017	S&W
Mushroom soup	1.017	S&W
Tomato soup	1.017	S&W
Cheddar cheese soup	1.046	S&W
Bean soup	1.054	S&W
Soup, thick (squash, potato)	1.09	RC
Snacks		
Potato chips	0.09	RC
Potato chips, pringles	0.12	FNDDS 4.1
Snacks, puffed, lowfat	0.11	FNDDS 4.1
Sweets		
Sugar, white	0.9	RC
Sugar, sucrose	1.55	TB
Sugar, white	0.88	FNDDS 4.1
Honey	1.42	TB
Jam, sweetened	1.43	RC
Nutella	1.26	RC
Syrup, fruit (blackberry)	1.34	RC
Syrup, blackcurrant, undiluted	1.28	UK 6th
Corn syrup	1.38	TB
Jelly	1.245	S&W
Pancake syrup	1.312	S&W
Jam	1.333	S&W
Mixed dishes		
Tuna noodle casserole	0.933	S&W

Food name and description	Density in g/ml	Source
Broccoli casserole	0.95	S&W
Green bean casserole	0.95	S&W
Zesty Italian “hamburger helper”	1.038	S&W
Beef and noodles in gravy (mixture)	1.038	S&W
Chicken and dumplings (mixture)	1.038	S&W
Mexican casserole w/beef, beans, cheese, chips	0.6	S&W
Eggplant parmesan	0.825	S&W
Moussaka	0.846	S&W
Wieners and sauerkraut (mixture)	0.612	S&W
Beef and noodles (no sauce)	0.65	S&W
Beef, noodles and vegetables (no sauce)	0.675	S&W
Mini ravioli, canned	1.046	S&W
Spaghetti and meat balls, canned	1.038	S&W
Beef stew, canned	1.05	S&W
Macaroni and cheese, canned	0.996	S&W
Cheese tortellini	1.029	S&W
Lasagna	1.042	S&W
Miscellaneous		
Salt (sodium chloride)	2.165	TB
Salt, table	1.217	S&W
Salad dressing	1.1	FNDDS 4.1
Monosodium glutamate	1.62	TB
Sodium bicarbonate	2.2	TB
Sauce, soy	1.12	FNDDS 4.1

Sources:

- UK 6th = Food Standards Agency. 2002a. McCance and Widdowson’s The Composition of Foods. Sixth summary edition. Cambridge, UK, Royal Society of Chemistry.
- DK = The composition of foods 4th edition (1996) of Denmark
- RC = own measurements of Ruth Charrondiere
- TB = <http://hypertextbook.com/physics/matter/density/>
- S&W = Stumbo, P.J. and Weiss, R. 2011. Using database values to determine food density. Journal of Food Composition and Analysis. <http://dx.doi.org/10.1016/j.jfca.2011.04.008>
- FNDDS 4.1 = Agricultural Research Service, Food Surveys Research Group. 2010. USDA Food and Nutrient Database for Dietary Studies, 4.1. Web site: <http://www.ars.usda.gov/Services/docs.htm?docid=12089> (Accessed 28 July 2011)