

### 1 Bushel Equals

Wheat and Soybeans = 60 lbs  
Corn, Sorghum and Rye = 56 lbs  
Barley Grain = 48 lbs  
Barley Malt = 34 lbs  
Oats = 32 lbs

### Bushels To Tonnes

Wheat & Soybeans = bushels x 0.027216  
Corn, Sorghum & Rye = bushels x 0.025401  
Barley Grain = bushels x 0.21772  
Oats = bushels x 0.014515

### Yields

Wheat: bushels/acre x 0.06725=tonnes/hectare  
Corn: bushels/acre x 0.06277=tonnes/ hectare  
Barley: bushels/acre x 0.05380=tonnes/hectare  
Oats: bushels/acre x 0.03587=tonnes/hectare

### 1 Tonne (metric ton) Equals

1 cubic meter of water  
2204.622 lbs.  
22.046 hundredweight  
1,000 kilograms  
10 quintals  
36.7437 bushels of Wheat or Soybeans  
39.3683 bushels of Corn, Sorghum or Rye  
45.9296 bushels of Barley Grain  
68.8944 bushels of Oats  
4.5930 US bales of Cotton

### Area Measurements

1 acre = 43,560 square feet = 0.040694  
1 hectare = 2.4710 acres = 10,000 sq. meters  
640 acres = 1 square mile = 259 hectares

### Soybean Crush

1 Bushel of Soybeans yields  
11 pounds of soybean oil  
44 pounds of 48% protein soybean meal  
4 pounds of hulls  
1 pound of waste

Synthetic Soybean Crush (\$/bu) =  
Soybean Meal price (\$/short ton) x .022  
+ Soybean Oil price (cents/lb) x 11  
- Soybean price (\$/bu)

### Extraction Rates

100 Grain = 72 Bread Flour  
100 Raw Sugar = 92 Refined Sugar  
100 Paddy Rice = 65 Milled Rice  
100 Milk = 4 Butter  
1 ton Barley = 105 Proof Gallon of Whiskey

### Cotton Bales

US = 480 lb  
(statistical net bale used by the USDA & ICAC)  
Brazil = 397 lb (metric bale = 180 kg)

### Weights and Conversions

1,000 grams = 1 kilogram  
100 kilograms = 1 quintal  
1 tonne = 1,000 kilograms = 10 quintals  
1 kilogram = 2.204622 lbs  
1 quintal = 220.4622 lbs  
1 tonne = 2204.622 lbs  
1 tonne = 1.1023 short tons  
1 tonne = 0.9842 long tons  
1 long ton = 2240 pounds  
1 short ton = 2000 pounds  
20 pennyweights = 1 ounce  
16 ounces = 1 lb  
1 troy ounce = 31.03 grams  
1 troy ounce = 0.0311033 kilogram  
1 troy (fine) ounce = 480 grains  
1 troy ounce = 155.52 metric carats  
1 troy pound = 0.37224 kilogram  
1 kilogram = 32.1507 troy ounces  
1 tonne = 32,151 troy ounces  
1 stone = 14 pounds

### Liquid Volumes and Conversions

1 ounce = 1.8047 cubic inches = 29.6 milliliters  
1 cup = 8 ounces = 0.237 liter = 237 milliliters  
1 pint = 16 ounces = 0.473 liter = 473 milliliters  
1 quart = 2 pints = 0.946 liter = 946 milliliters  
1 gallon=4 quarts=231 cubic inches=3.785 liters  
1 liter = 1.0567 quarts = 1,000 milliliters  
1 milliliter = 0.033814 fluid ounce  
1 liter = 33.814 fluid ounce  
1 imperial gallon = 277.42 cubic inches  
= 1.2 US Gallons = 4.546 liters

### Water

1 liter weighs 1 kilogram  
1 cubic meter weighs 1 tonne  
1 UK gallon weighs 10.022 lbs  
1 US gallon weighs 8.345 lbs

### Temperature

C=Degrees Celsius  
F=Degrees Fahrenheit

C=5/9 (F -32)

F=9/5 C + 32

-40 C = -40 F

-18 C = 0 F

0 C = 32 F

5 C = 41 F

10 C = 50 F

15 C = 59 F

20 C = 68 F

25 C = 77 F

30 C = 86 F

35 C = 95 F

40 C = 104 F

100 C = 212 F

### Ethanol

1 bushel corn produces about 2.75 gallons ethanol and 18 lbs dried distillers grain  
1 tonne corn produces about 101.0 gallons ethanol and 661 lbs dried distillers grain  
1 tonne sugar produces about 149.3 gallons ethanol

### Biodiesel

1 metric ton = approximately 300 gallons  
1 gallon biodiesel requires 7.5-7.6 lbs oil or fat  
1 bushel soybeans produces about 1.5 gallons of biodiesel

### Crude Oil

1 barrel = 42 US gallons = 34.97 UK (imperial) gallons = 0.136 tonne (approx)  
1 barrel per day (b/d) = 50 tonnes per year (approx)  
Crude Oil \$ per Barrel / 5.826 = \$ per MMBtu

### Natural Gas

1 Cubic Feet (cf) = 1,031 Btu  
1 Cubic Meter = 35.315 Cubic Feet  
1 Therm = 100,000 Btu  
1 Decatherm = 10 Terms = 1 Million Btu (MMBtu)  
1 NYMEX Natural Gas contract = 10,000 MMBtu = approximately 9.7 million cubic feet

### Energy Content of Fuels (in Btu)

1 barrel Crude Oil = 5.826 Million Btu  
1 gallon Gasoline = 125,000 Btu  
1 gallon Heating Oil = 139,000 Btu  
1 gallon Diesel Fuel = 139,000 Btu  
1 gallon Propane = 91,000 Btu  
1 gallon Ethanol = 84,400 Btu  
1 gallon Gasohol (10% Ethanol, 90% Gasoline) = 120,900 Btu  
1 gallon E-85 (85% Ethanol, 15% Gasoline) = 90,500 Btu  
1 barrel Residual Fuel Oil = 6.287 Million Btu  
1 pound Coal = 8,100 to 13,000 Btu  
1 kilowatt hour Electricity = 3,412 Btu  
1 cubic foot Natural Gas = 1,008 to 1,034 Btu

### Fertilizer

34 gigajoules natural gas makes 1 tonne anhydrous ammonia  
1 Nat Gas NYMEX contract makes 298.53 tons anhydrous ammonia  
33,500 cubic ft nat gas makes 1 ton NH3  
1 million BTU's = 1.054615 gigajoule

### Crack Spreads

2:1:1 Crack: 2 Barrels Crude Oil vs. 1 Barrel Gas vs. 1 Barrel Heating Oil  
2:1:1 Crack (\$/bbl) = Gasoline price (\$/gal) x 21 + Heating Oil price (\$/gal) x 21 - Crude Oil price (\$/bbl)  
3:2:1 Crack: 3 Barrels Crude Oil vs. 2 Barrels Gas

India = 392 lb (metric bale = 170 kg)

### Precious Metals

24 carat implies pure gold

1 metric carat = 200 milligrams

### Measure of Surface (Area)

144 square inches = 1 square foot

9 square feet = 1 square yard

30 1/4 square yards = 1 square rod

160 square rods = 1 acre

43,560 square feet = 1 acre

640 square acres = 1 square mile

36 square miles = 1 township

### Numerical Prefixes

tera = trillion

giga = billion

mega = million

kilo = thousand

hecto = hundred

deca = ten

deci = 1 tenth

centi = 1 hundredth

milli = 1 thousandth

micro = 1 millionth

nano = 1 billionth

pico = 1 trillionth

### Measure of Length (Linear Measure)

12 inches = 1 foot

3 feet = 1 yard

16 1/2 feet = 1 rod

5,280 feet = 1 mile

1,760 yards = 1 mile

320 rods = 1 miles

vs. 1 Barrel Heating Oil

3:2:1 Crack (\$/bbl) = Gasoline price (\$/gal) x 28  
+ Heating Oil price (\$/gal) x 14  
- Crude Oil price (\$/bbl)

5:3:2 Crack: 5 Barrels Crude Oil vs. 3 Barrels Gas  
vs. 2 Barrels Heating Oil

5:3:2 Crack (\$/bbl) - Gasoline price (\$/gal) x 25.2  
+ Heating Oil price (\$/gal) x 16.8  
- Crude Oil price (\$/bbl)

### Cubic Measure (Volume)

1,728 cubic inches = 1 cubic foot

27 cubic feet = 1 cubic yard

2,150.42 cubic inches = 1 standard bushel

1 cubic foot = 4/5 of a bushel

128 cubic feet = 1 cord (wood)

1 bushel = 1.25 cubic feet

### Liquid Measure

2 cups = 1 pint

16 fluid ounces = 1 pint

2 pints = 1 quart

4 quarts = 1 gallon

1 gallon = 231 cubic inches

1 cubic foot = 7.48 gallons

1 teaspoon = .17 fluid ounces (1/6 oz.)

3 teaspoons (level) = 1 tablespoon (1/2 oz.)

2 tablespoons = 1 fluid ounce

1 cup (liquid) = 16 tablespoons (8 oz.)