CONVERSION TABLES & FORMULAS

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

Yields
Wheat: bushels per acre x 0.06725 = tonnes per hectare
Rye, Corn: bushels per acre x 0.06277 = tonnes per hectare
Barley: bushels per acre x 0.05380 = tonnes per hectare
Oats: bushels per acre x 0.03587 = tonnes per 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 square 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 (¢/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 (the statistical net bale used by the USDA and ICAC)
Brazil = 397 lb (metric bale = 180 kg)
India = 392 lb (metric bale = 170 kg)

Orange Juice
1 metric ton of 65 degree brix =
344.8 gallons at 42 degree brix
1 metric ton of 65 degree brix =
1,405.88 gallons at Single Strength Equivalent (SSE)
1 metric ton = 2204.622 lbs
Florida Box = 90 lbs
Texas Box = 85 lbs
California & Arizona Boxes = 75 lbs
Brazil 40.8 kg Box = 91.4 lb

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 = 31.103 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 ounces
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

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

Precious Metals
24 carat implies pure gold
1 metric carat = 200 milligrams

Ethanol
1 bushel corn produces abut 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 Dollars per Barrel / 5.826 = Dollars 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 Therms = 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 anhydrous ammonia
1 million BTU's = 1.054615 gigajoule

Crack Spreads
2:1:1 Crack: 2 Barrels Crude Oil vs. 1 Barrel Gasoline 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 Gasoline 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 Gasoline 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)

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