Wet Cake or DDGS: Drying Cost against Sale Value

Water evaporated, dryer heat and fuel cost to dry distillers' wet cake to DDGS, compared with the price difference between dried and wet grains.

Method: Solids balance and dryer heat (definitions); Jacques; ...

Input parameters

Unit system: SI

Parameter	Value	Unit
Wet cake (with syrup) to the dryer	30.000	t/h
Solids in the wet cake	35.000	%
Solids in DDGS	90.000	%
Dryer heat per kg water evaporated	3.5000	MJ/kg
Fuel cost per GJ (currency)	600.00	
DDGS price per tonne	18,000	
Wet cake price per tonne (as is)	5,000.0	

Calculated results

Parameter	Value	Unit
DDGS produced	11.667	t/h
Water evaporated	18.333	t/h
Dryer heat	17.824	MW
Fuel cost per tonne of DDGS	3,300.0	
Gain per hour from drying (currency)	21,500	

Notes for this case

- Wet cake spoils in 5–7 days and costs more to haul per tonne of solids; drying makes sense only when feedlots are far away.

Formula and method

$$\dot{m}_d = \dot{m}_c \frac{x_c}{x_d}, \quad E = \dot{m}_c - \dot{m}_d, \quad Q = E q_e, \quad G = \dot{m}_d P_d - \dot{m}_c P_w - Q c_f \ \ (\text{per hour: flows in t/h, } Q \text{ in GJ/h}), \quad C_d = \frac{Q c_f}{\dot{m}_d}$$

Variables

$\dot{m}_c$	Wet cake (with syrup) to the dryer	kg/s
x_c	Solids in the wet cake	-
x_d	Solids in DDGS	-
q_e	Dryer heat per kg water evaporated	J/kg
c_f	Fuel cost per GJ (currency)	-
P_d	DDGS price per tonne	-
P_w	Wet cake price per tonne (as is)	-
$\dot{m}_d$	DDGS produced	kg/s
E	Water evaporated	kg/s
Q	Dryer heat	W
C_d	Fuel cost per tonne of DDGS	-
G	Gain per hour from drying (currency)	-

Method and standards

Solids balance and simple margin.

Assumptions and limits

- Fuel cost only; no electricity or labour.
- Money figures are per hour of operation, with flows in t/h and heat in GJ/h.

References

- Solids balance and dryer heat (definitions)
- Jacques
- Lyons and Kelsall (eds.)
- The Alcohol Textbook
- 4th ed. (2003)
- ch. 26–27: wet cake 30–35 % solids
- DDGS about 90 %

Report details

Report reference	FCC-SV84-DTAZ (the same inputs always give the same reference)
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Calculator	Wet Cake or DDGS: Drying Cost against Sale Value
Method last reviewed	13 November 2026
Software release	FireCAD Calc, release of 17 November 2026
Release checks	2 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/sugar-ethanol/ethanol/wet-cake-vs-ddgs-drying

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.