Milk Powder Yield from Milk or Concentrate

Powder produced and water removed when milk or concentrate of known total solids is dried to a powder moisture, with powder per 1000 L of milk.

Method: Mass and energy balances (definitions): total solids balance

Input parameters

Unit system: SI

Parameter	Value	Unit
Milk or concentrate	100,000	kg
Total solids	12.500	%
Powder moisture	3.5000	%
Solids losses	1.0000	%
Feed density (milk or concentrate)	1,032.0	kg/m³

Calculated results

Parameter	Value	Unit
Powder	12.824	t
Water removed	87.051	t
Powder per 1000 L of feed (milk or concentrate)	132.34	g/L

Notes for this case

- Evaporate to 45–50 % solids before the spray dryer: water costs far less to remove there.

Formula and method

$$M_p = \frac{MTS(1-L)}{1-w_p}$$

Variables

M	Milk or concentrate	kg
TS	Total solids	-
w_p	Powder moisture	-
L	Solids losses	-
ρ	Milk density	kg/m³
M_p	Powder	kg
M_w	Water removed	kg
M_p/V	Powder per 1000 L of milk	kg/m³

Method and standards

Total solids balance.

Assumptions and limits

- Solids conserved except the loss share.
- The powder per 1000 L refers to the feed entered: for a concentrate it is per 1000 L of concentrate, not of the original milk.

References

- Mass and energy balances (definitions): total solids balance

Report details

Report reference	FCC-BPVP-YTPM (the same inputs always give the same reference)
Generated	17 November 2026, 19:50 UTC
Calculator	Milk Powder Yield from Milk or Concentrate
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/chemical/food-dairy/milk-powder-yield

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.