

Reference



Facts and information that may prove useful from gestation tables, conversion charts, to calculating the weight of silage in a clamp.

Weight of Silage in a Clamp

Kg/cubic metre (lb per cubic foot)

Silage DM %	Silage Depth in metres (ft.)		
	2.5 (8'2")	3.0 (9'9")	3.5 (11'4")
20	865 (52)	881 (55)	920 (58)
25	735 (46)	772 (48)	803 (50)
30	658 (41)	689 (43)	715 (45)
35	597 (37)	624 (39)	646 (40)

(SOURCE - CEDAR)

Clamp silage calculated in cubic metres:

Weight of fresh silage = $\frac{\text{Volume of silage (m}^3\text{)} \times \text{Density (kg/m}^3\text{)}}{1000}$
(tonnes)

Clamp silage calculated in cubic feet:

Weight of fresh silage = $\frac{\text{Volume of silage (cu/ft)} \times \text{Density (lbs/cu/ft)}}{2200}$
(tonnes)

Converting Fresh Weight Silage to DM silage:

DM silage (tonnes) = $\frac{\text{Fresh weight (tonnes)} \times \text{silage DM}}{100}$

e.g. DM Silage = $\frac{750 \text{ tonnes} \times 25\text{DM}}{100}$

187.5 tonnes DM Silage = 750 tonnes fresh weight silage.

Big bale silage:

relationship between fresh weight and DM content

	Dry matter content (%)						
	20	25	30	35	40	45	50
Fresh weight per bale (kg)	585	550	515	480	445	410	375
Weight of DM per bale (kg)	117	137	155	168	178	185	188

Density and weight of hay and straw:

Standard rectangular bales

Material	Density (kg/m ³)	Average weight (kg)
Field-cured hay	145	25
Barn-dried hay	130	23
Barley straw	87	16
Wheat straw	77	14

Big round bales (straw)

Diameter (m)	Length (m)	Typical weight (kg)
1.2	1.2	135
1.5	1.5	265
1.5	1.8	320
1.8	1.8	460

N.B. Guidelines only – Consult baler manufacturer for specifics.

Approximate weights of various materials

Material	Weight lb/ft ³	Weight Kg/m ³
Barley	39	620
Beet Pulp (pressed)	57	906
Beet Pulp (nuts)	38	604
Brewsters Grains	70	1110
Brick Aggregate	115	1828
Carrots	40	636
Chalk	50	795
Clay (dense)	111	1764
Coal (anthracite)	55	874
Earth (dry loose)	70	1113
Earth (wet packed)	100	1590
Fertiliser	64	1017
Hay (norm, density bale)	12	190
Manure (farmyard)	58	922
Oats	26	413
Onions	35	556
Potatoes	44	699
Refuse (town)	20	318
Rubble	66	1047
Salt	64	1017
Sand (dry)	83	1319
Sand (wet)	104	1653
Silage (green)	22	349
Silage (green ensiled)	47	747
Slurry	112	1780
Straw (norm, density bale)	10	159
Straw (high density bale)	16	254
Sugar Beet	35	556
Turnips	34	540
Wheat	48	763

Approximate cubic capacity of Compound Feed

	Weight Kg/m ³	Weight lbs/ft ³
Crumbs/meal	577	36
Pellets/Nuts	640	40
Rolls	693	43

Recommended standard for building allowances

(i.e. space/floor area requirements/beef cattle) - Source ADAS

Liveweight (kg)	Floor Area (m ² /head)		Air Space (m ³ /head)
	Bedded	Slats	
100	1.5	1.0	7
200	3.0	2.0	1.5
300	3.4	2.3	20
400	3.8	2.5	25
500	4.2	2.8	25
600	4.6	3.0	25

Replacement Rate of vegetables and Roots for Barley

The values shown reflect energy intake only. No account is taken of protein balance, but it should be noted that most root crops have a lower protein content than barley and hence additional protein supplementation may be warranted, especially for growing stock (e.g. less than 400kg for cattle).

Crop	Dry Matter (%)	Energy (mj/kg DM)	Approx. weight to replace 1kg barley (kg fresh)
Swede (winter hardy)	11	13.9	7.5
Turnip (not winter hardy)	10	12.7	9.0
Mangel	11	12.4	9.0
Fodder Beet	18	11.9	5.5
Sugar Beet	20	13.7	4.5
Carrot	10	12.8	9.0
Parsnip	15	13.0	6.0
Potato	20	13.3	4.5
Beetroot	13	12.1	7.5
Brussel Sprouts	16	13.0	5.5
Stubble Turnips	8	11.6	12.0

Potential yields of forage crops (t/ha):

Crop	Tops (t/ha)	Roots (t/ha)
Stubble Turnip	30-40	45-50
White Turnips	up to 30	up to 60
Swede Turnips	25-30	up to 75
Fodder Beet	up to 30	75-100
Mangels	*	75-100
Sugar Beet	up to 20	*
Cabbage	up to 95	
Kale	up to 50	
Forage Rape	up to 35	
Forage Maize	up to 40	

* Not normally fed

Loss of Weight in Drying

To calculate the loss in weight of a crop which has been dried, multiply the original weight of crop by the factor at the intersection of the two columns, i.e. initial moisture content and final moisture content as shown in the table below.

Weight of grain (tonne) after drying

Initial moisture content % (M1)	Final Moisture content % (M2)									
	19	18	17	16	15	14	13	12	11	10
30	.864	.854	.843	.833	.824	.814	.805	.795	.787	.778
29	.875	.866	.855	.845	.835	.826	.816	.807	.798	.789
28	.889	.878	.867	.857	.847	.837	.828	.818	.809	.800
27	.901	.890	.880	.869	.859	.849	.839	.830	.820	.811
26	.914	.902	.892	.881	.871	.860	.851	.841	.831	.822
25	.926	.915	.904	.893	.882	.872	.862	.852	.843	.833
24	.938	.927	.916	.905	.894	.884	.874	.864	.854	.844
23	.951	.939	.928	.917	.906	.895	.885	.875	.865	.855
22	.963	.951	.940	.926	.918	.907	.897	.886	.876	.867
21	.975	.963	.952	.940	.929	.919	.908	.898	.888	.878
20	.998	.976	.964	.952	.941	.930	.920	.909	.899	.889
19		.988	.976	.964	.953	.942	.931	.920	.910	.900
18			.988	.976	.965	.953	.943	.932	.921	.911
17				.988	.976	.965	.954	.943	.933	.922
16					.988	.977	.965	.955	.944	.933
15						.988	.977	.966	.955	.944

e.g. 28 tonnes of grain at 24% moisture content are dried to 14% moisture content. What is the weight of dried grain? - 28 x 0.884 = 24.752 tonnes.

Approximate P&K Levels available to crop

	DM%	Phosphate	Potash
Fresh F.Y.M.		Units/Tonne	
Cattle	25	4	10
Pig	25	8	6
Poultry Manures		Units/Tonne	
Layer	30	16	14
Broiler	60	30	28
Slurries		Units/1000 Gals.	
Dairy	6	5	28
Beef	6	5	21
Pig	6	13	24

Nitrogen levels will vary depending on type of manure and timing of application.

Calculation of Phosphate and Potash removal by crop

		Imperial Units/t fresh material	
		P205	K20
Cereals	Grain only	15	11
	Grain & straw		
	Winter wheat/barley	17*	23*
	Spring wheat/barley	17*	27*
	Winter/spring oats	17*	34*
Oilseed Rape	Seed only	27	22
	Seed & straw	34*	34*
Peas	Dried	17	20
Field Beans		22	24
Potatoes		2.0	11.4
Sugar Beet	Roots only	1.6	3.3
	Roots & Tops	3.8	15.5
Grass	Fresh grass@ 15-20% DM	2.7	9.4
	Silage@ 25% DM	3.4	11.8
	Silage@ 30% DM	4.1	14.1
	Hay@ 86% DM	12	35
Kale		2.4	10
Maize	Silage@ 30% DM	2.7	8.6
Swedes	Roots only	1.4	4.7

* Offtake is per tonne of grain or seed but includes nutrients in straw. Source – The Potash Development Association.

Period of gestation to production from date of service

Date of service.	MARES 340 days	COWS 283 days	EWES 150 days	SOWS 112 days
Jan 2	Dec 6	Oct 10	May 30	Apr 22
Jan 9	Dec 13	Oct 17	Jun 6	Apr 29
Jan 16	Dec 20	Oct 24	Jun 13	May 6
Jan 23	Dec 27	Oct 31	Jun 20	May 13
Jan 30	Jan 3	Nov 7	Jun 27	May 20
Feb 6	Jan 10	Nov 14	Jul 4	May 27
Feb 13	Jan 17	Nov 21	Jul 11	Jun 3
Feb 20	Jan 24	Nov 28	Jul 18	Jun 10
Feb 27	Jan 31	Dec 5	Jul 25	Jun 17
Mar 5	Feb 7	Dec 12	Aug 1	Jun 24
Mar 12	Feb 14	Dec 19	Aug 8	Jul 1
Mar 19	Feb 21	Dec 26	Aug 15	Jul 8
Mar 26	Feb 28	Jan 2	Aug 22	Jul 15
Apr 2	Mar 7	Jan 9	Aug 29	Jul 22
Apr 9	Mar 14	Jan 16	Sep 5	Jul 29
Apr 16	Mar 21	Jan 23	Sep 12	Aug 5
Apr 23	Mar 28	Jan 30	Sep 19	Aug 12
Apr 30	Apr 4	Feb 6	Sep 26	Aug 19
May 7	Apr 11	Feb 13	Oct 3	Aug 26
May 14	Apr 18	Feb 20	Oct 10	Sep 02
May 21	Apr 25	Feb 27	Oct 17	Sep 09
May 28	May 2	Mar 6	Oct 24	Sep 16
Jun 4	May 9	Mar 13	Oct 31	Sep 23
Jun 11	May 16	Mar 20	Nov 7	Sep 30
Jun 18	May 23	Mar 27	Nov 14	Oct 7
Jun 25	May 30	Apr 3	Nov 21	Oct 14
Jul 2	Jun 6	Apr 10	Nov 28	Oct 21
Jul 9	Jun 13	Apr 17	Dec 5	Oct 28
Jul 16	Jun 20	Apr 24	Dec 12	Nov 4
Jul 23	Jun 27	May 1	Dec 19	Nov 11
Jul 30	Jul 4	May 8	Dec 26	Nov 18
Aug 6	Jul 11	May 15	Jan 2	Nov 25
Aug 13	Jul 18	May 22	Jan 9	Dec 2
Aug 20	Jul 25	May 29	Jan 16	Dec 9
Aug 27	Aug 1	Jun 5	Jan 23	Dec 16
Sep 3	Aug 8	Jun 12	Jan 30	Dec 23
Sep 10	Aug 15	Jun 19	Feb 6	Dec 30
Sep 17	Aug 22	Jun 26	Feb 13	Jan 6
Sep 24	Aug 29	Jul 3	Feb 20	Jan 13
Oct 1	Sep 5	Jul 10	Feb 27	Jan 20
Oct 8	Sep 12	Jul 17	Mar 6	Jan 27
Oct 15	Sep 19	Jul 24	Mar 13	Feb 3
Oct 22	Sep 26	Jul 31	Mar 20	Feb 10
Oct 29	Oct 3	Aug 7	Mar 27	Feb 17
Nov 5	Oct 10	Aug 14	Apr 3	Feb 24
Nov 12	Oct 17	Aug 21	Apr 10	Mar 3
Nov 19	Oct 24	Aug 28	Apr 17	Mar 10
Nov 26	Oct 31	Sep 4	Apr 24	Mar 17
Dec 3	Nov 7	Sep 11	May 1	Mar 24
Dec 10	Nov 14	Sep 18	May 8	Mar 31
Dec 17	Nov 21	Sep 25	May 15	Apr 7
Dec 24	Nov 28	Oct 2	May 22	Apr 14

Metric Conversion Factors

To Convert	To	Multiply approx. by	Multiply exactly by
Length			
Miles	Kilometres	1.61	1.609344
Yards	Metres	0.9	0.9144
Feet	Metres	0.30	0.3048
Inches	Millimetres	25.4	25.4
Inches	Centimetres	2.54	2.54

Area			
Square miles	Square kilometres	2.6	2.589988
Square miles	Hectares	259.0	258.999
Acres	Square metres	4047	4046.86
Acres	Hectares	0.4	0.4047
Square yards	Square metres	0.84	0.8361
Square feet	Square metres	0.1	0.0929
Square inches	Square millimetres	645	645.16
Square inches	Square centimetres	6.4	6.4516

Volume			
Cubic yards	Cubic metres	0.8	0.7646
Cubic feet	Cubic metres	0.03	0.0283
Cubic inches	Cubic centimetres	16	16.3871

Capacity			
UK Gallons	Litres	4.5	4.54596
Quarts	Litres	1.1	1.137
Pints	Litres	0.6	0.568
Gills	Litres	0.14	0.142

Velocity			
Miles per hour	Kilometres per hour	1.6	1.609344
Feet per second	Metres per second	0.3	0.3048
Feet per minute	Metres per second	0.005	0.0051
Inches per minute	Millimetres/second	0.4	0.4233

Mass			
Tons	Kilograms	1016	1016.05
Tons	Tonnes	1	1.016
Hundredweights	Kilograms	50	50.8023
Quarters	Kilograms	13	12.7006
Stones	Kilograms	6	6.3503
Pounds	Kilograms	0.5	0.4536
Ounces	Grams	28	28.3495

Fuel Consumption			
Gallons per mile	Litres per kilometre	3	2.825
Miles per gallon	Kilometres per litre	0.4	0.354
MPG (UK) to Litres / 100km = 280 / MPG (approx) = 28.3 / MPG (exactly)			

Temperature
 $^{\circ}\text{F} = \% ^{\circ}\text{C} + 32$

To Convert	To	Multiply approx. by	Multiply exactly by
Length			
Kilometres	Miles	0.6	0.621371
Metres	Yards	1.1	1.0936
Metres	Feet	3.3	3.28084
Millimetres	Inches	0.04	0.03937
Centimetres	Inches	0.4	0.3937

Area			
Square kilometres	Square miles	0.4	0.3861
Hectares	Square miles	0.004	0.003861
Square metres	Acres	0.00025	0.000247
Hectares	Acres	2.5	2.470966
Square metres	Square yards	1.2	1.1960
Square metres	Square feet	10	10.7643
Square millimetres	Square inches	0.0015	0.00155
Square centimetres	Square inches	0.15	0.155

Volume			
Cubic metres	Cubic yards	1.3	1.30787
Cubic metres	Cubic feet	35	35.3357
Cubic centimetres	Cubic inches	0.06	0.061

Capacity			
Litres	UK Gallons	0.2	0.21997
Litres	Quarts	0.9	0.8795
Litres	Pints	1.75 (1 $\frac{3}{4}$)	1.7606
Litres	Gills	7	7.0422

Velocity			
Kilometres per hour	Miles per hour	0.6	0.621371
Metres per second	Feet per second	3	3.2808
Metres per second	Feet per minute	200	196.0784
Millimetres/second	Inches per minute	2.4	2.36239

Mass			
Kilograms	Tons	0.001	0.0009842
Tonnes	Tons	1	0.98425
Kilograms	Hundredweights	0.02	0.019684
Kilograms	Quarters	0.08	0.078736
Kilograms	Stones	0.15	0.15747
Kilograms	Pounds	2.2	2.2045855
Grams	Ounces	0.035	0.0352739

Fuel Consumption			
Litres per kilometre	Gallons per mile	0.35	0.354
Kilometres per litre	Miles per gallon	2.8	2.8249

Temperature
 $^{\circ}\text{C} = \% (^{\circ}\text{F} - 32)$

