

EQUIVALENCE OF DAIRY AND BEEF IN TERMS OF NO. OF COWS KILLED

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In terms of the number of cows killed, around 3 litres of milk or 350g of cheese is estimated to be the equivalent of eating a quarter pound of steak in the UK and around 2litres of milk or 200g of cheese in India.

Calculation methodology

For litres of milk equivalence to quarter pounds of steak:

$$\frac{\text{Average milk produced by cow per lactation (l)} / \text{Number of deaths per lactation}}{\text{Carcass weight of beef cattle at slaughter (kg)} * ^1 / \text{Weight of quarter pound of steak}}$$

Where number of deaths per lactation is estimated to be: $\frac{1}{\text{Average number of lactations per cow}} + \frac{\% \text{ of male calves killed at birth}}{2}$

For kg of cheese equivalence to quarter pounds of steak

$$\frac{\text{Number of deaths per litre of milk} / \text{Number of deaths per quarter pound of steak}}{\text{Number of litres of milk required for 1kg of cheese}}$$

For questions or comments on the methodology, please contact [sagar \[at\] jainvegans.org](mailto:sagar@jainvegans.org)

¹ Dressed carcass weights used in calculation. Dressed carcass weights typically exclude inedible parts of body, such as head, tail, legs and many organs. Proportion of dressed carcass that can be used for producing steak is likely to be lower than weight of dressed carcass.

Key data inputs and sources

Ref	#	Description	Source / notes
A ^{UK}	7557	Average amount of milk produced per year by mature dairy cows in the UK in 2016/17 (litres)	Agriculture and Horticulture Development Board UK https://dairy.ahdb.org.uk/market-information/farming-data/milk-yield/average-milk-yield/#.WY1jpem1uHt Downloaded on 11 August 2017
A ^{IND}	2500	Typical milk yield per lactation of cows/buffaloes in India	National Dairy Research Institute http://www.ndri.res.in/ndri/Design/livestock_farm.html Downloaded on 11 August
B _L ^{UK}	3.03	Average lactation age of dairy cows in the UK (lower bound)	Milk Development Council (1999) 'improving the longevity of cows in the UK dairy herd Final Report' https://dairy.ahdb.org.uk/non_umbraco/download.aspx?media=6779 Downloaded on 11 August 2017
B _U ^{UK}	3.7	Average lactation age of dairy cows in the UK (upper bound)	Hanks & Kossaibati (2014) 'Key performance indicators for the UK national dairy herd' https://www.nmr.co.uk/uploads/files/files/HolsteinFriesian-500NMRherds-2014.pdf Downloaded 11 August 2017 Consistent with 'Cow Facts' on Holstein UK website http://ukcows.com/holsteinUK/publicweb/Education/HUK_Edu_DairyCows.aspx?cmh=66 Downloaded 11 August 2017
B _L ^{IND}	4	Average lactation age of dairy cows in the India (lower bound)	Assumption
B _U ^{IND}	8	Average lactation age of dairy cows in the India (upper bound)	Assumption
C ^{UK}	100%	Proportion of male calves culled at birth in UK	Assumption
C ^{IND}	60%	Proportion of male calves culled at birth in India	Currently 216 female cows and buffaloes in India, but only 84 males. This implies that 60% (216-84)/216 of males calves born to dairy cows are being killed. Press Information Bureau Government of India Ministry of Agriculture 'Salient Features of 19th Livestock Census' Published 03-September-2014 15:19 IST http://pib.nic.in/newsite/PrintRelease.aspx?relid=109280 Downloaded 2 July 2017
D ₁	10	Litres of milk required to make 1kg of cheese (hard cheese)	http://www.cheeseboard.co.uk/facts/did_you_know_that-1 Downloaded on 11 August 2017
D ₂	7	Litres of milk required to make 1kg of cheese (soft cheese)	http://www.cheeseboard.co.uk/facts/did_you_know_that-1 Downloaded on 11 August 2017
E ^{UK}	350.9	Average dressed carcass weight of prime cattle in the UK in kilograms	Slaughterhouse surveys, Defra, The Scottish Government, DAERA (NI), Food Standards Agency (FSA) https://www.gov.uk/government/statistics/cattle-sheep-and-pig-slaughter https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/627870/slaughter-dataset-13jul17.ods Downloaded on 11 August 2017
F	0.1134	Weight of quarter pound of steak	