MSU FOOD & HEALTH LAB

Plant-based versus Animal Protein Sources

Table 1: Greenhouse gas emissions, land use, and water use required for production of plant-based versus animal protein sources [1, 2]

Protein Source	Beef (20% protein)	Pork (20% protein)	Poultry (20% protein)	Eggs (13% protein)	Pulses (20-36% protein)
GHG (CO2eqs / kg protein)	45 - 640	20 - 55	10 - 30	15 - 42	4 - 10
Land use (m2/yr/kg of protein)	37 - 2,100	40 - 75	23 - 40	29 - 52	10 - 43
Water use liter/g protein	112	57	34	29	19

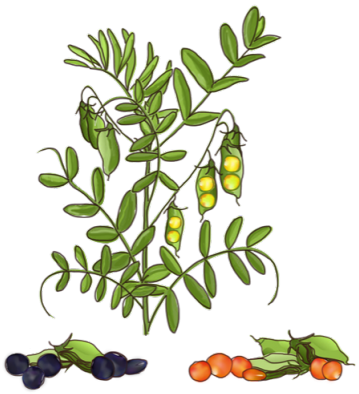

Table 2: US average price per 100 g of plant-based versus animal protein sources [3]

Protein Source	Beef (lean and extra lean)	Pork (boneless chops)	Poultry (boneless chicken breast)	Egg (~2 whole)	Lentils (1/2 cup dry)
Price / 100 g	$ 1.16	$ 0.83	$ 0.69	$ 0.27	$ 0.12

Table 3: Nutrient comparisons per 100 g of plant-based versus animal protein sources [4]

Per 100g	Ground Beef 80/20 (~4 oz)	Pork (~4 oz)	Poultry (~4 oz)	Egg (~2 whole)	Lentils (1/2 cup cooked)
Calories	254	263	243	143	116
Carb (g)	0	0	0	1	20
Dietary Fiber (g)	0	0	0	0	8
Protein (g)	17	17	15	13	9
Fat (g)	20	21	20	10	<1
Cholesterol (mg)	1	72	143	372	0
Iron (mg)	1.9	0.9	1.2	1.8	3.3
Potassium (mg)	269	287	104	138	369
Sodium (mg)	66	56	40	142	2
Zinc (mg)	4.2	2.2	1.9	1.3	1.3
Thiamin (mg)	0.04	0.73	0.10	0.04	0.17
Calcium (mg)	18	14	187	56	19
Magnesium(mg)	17	19	12	12	36
Folate (µg)	7	5	5	47	181

References: [1] Mekonnen, M. M. & Hoekstra, A. Y. A Global Assessment of the Water Footprint of Farm Animal Products. *Ecosystems* **15**, 401–415 (2012), [2] Nijdam, D., Rood, T. & Westhoek, H. The price of protein: Review of land use and carbon footprints from life cycle assessments of animal food products and their substitutes. *Food Policy* **37**, 760–770 (2012), [3] United States Dept of Labor: Bureau of Labor and Statistics, Average Retail Food and Energy Prices, U.S. December 2018, accessed 2/6/2019, [4] USDA Food Composition Database, accessed 2/6/2019

For more information contact Teresa Warne at teresa.warne@montana.edu

Artwork by: Angie Mangels

MONTANA STATE UNIVERSITY
Mountains and Minds

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Water Agriculture Food Energy Research Nexus
http://waferx.montana.edu/

This project is part of the Water Agriculture Food Energy Research Nexus (WAFERx). WAFERx is supported by the National Science Foundation under the EPSCoR Track II Cooperative Agreement No. OIA-1632810. Any opinions, findings, conclusions, or recommendations are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.