Table 1. Inputs and outputs per acre and energy ratios for mixed crop and livestock farms.

Farms	Per acre of cropland: Marketed crops (C)	All marketed outputs (O)[a]	All purchased inputs (I)[b]	Farm energy ratio (O/I)	Energy ratio of marketed crops to outputs (C/O)
	million Btu			unitless	
Sunshine Farm					
Without photovoltaic array	5.5	5.8	3.4	1.7	0.95
With photovoltaic array	5.5	5.8	3.3	1.8	0.95
Pennsylvania dairy farm[i]	2.4	3.5	2.0	1.8	0.69
Groups of Amish farms[c]					
2 groups (PA)[ii]	0.7-0.9	2.8-6.6	3.3-9.4	0.7-0.8	0.14-0.25
4 groups (PA, WI, IL)[iii]	—	2.1-5.1	1.3-5.2	1.0-1.6	—
Groups of conventional farms[c]					
3 groups (PA)[ii]	0.8-1.6	5.5-6.9	13.2-17.5	0.4[d]	0.14-0.29
3 groups (PA, WI)[iii]	—	2.7-4.9	8.3-9.8	0.3-0.6	—
Group with greatest marketed output (IL)[iii]	10.9	18.4	9.2	2.0	0.59

[a] Outputs from crops and animals.
[b] Inputs for crops, animals, and things used on the farm.
[c] The reported data are averages for individual groups, not unaveraged numbers for individual farms, and are given as ranges of averages. States are indicated in parentheses.
[d] The ratio was the same, by coincidence, for the three groups of farms defined by dairy herd size.

Notes for Tables 1-3.

[i] J. Zucchetto and G. Bickle. 1984. Energy and nutrient analyses of a dairy farm in central Pennsylvania. *Energy in Agriculture* 3:29-47.

[ii] P. Craumer. 1979. Farm productivity and energy efficiency in Amish and modern dairying. *Agriculture and Environment* 4:281-299.

[iii] W.A. Johnson, V. Stoltzfus and P. Craumer. 1977. Energy conservation in Amish agriculture. *Science* 198:373-378.

[iv] M. Green. 1978. *Eating Oil: Energy Use in Food Production*. Westview Press, Boulder, CO.

[v] R.M. Gifford. 1976. An overview of fuel used for crops and national agricultural systems. *Search* 7:412-417.

[vi] C.A.S. Hall, C.J. Cleveland and R. Kaufmann. 1986. *Energy and Resource Quality: The Ecology of the Economic Process*. John Wiley, New York.

[vii] C.E. Goering and M.J. Daughtery. 1982. Energy accounting for eleven vegetable oil fuels. *Transactions of the American Society of Agricultural Engineers* 25:1209-1215.

[viii] R. Herendeen and S. Brown. 1987. A comparative analysis of net energy from woody biomass. *Energy* 12:75-84.

[ix] A.F. Turhollow and R.D. Perlack. 1991. Emissions of CO_2 from energy crop production. *Biomass and Bioenergy* 1:129-135.

[x] W. Vergara and D. Pimentel. 1978. Fuels from biomass: Comparative study of the potential in five countries: The United States, Brazil, India, Sudan, and Sweden. *Advances in Energy Systems and Technology* 1:125-173.

[xi] M. Demuynck, E.J. Nyns and W. Palz. 1984. *Biogas Plants in Europe: A Practical Handbook*. D. Reidel Publishing Co., Dordrecht.

[xii] R.A. Herendeen. 1988. Net energy considerations. Pp. 255-273 in: R.E. West and F. Kreith (eds.). *Economic Analysis of Solar Thermal Energy Systems*. MIT Press, Cambridge, MA.

[xiii] C.J. Cleveland and R. Herendeen. 1989. Solar parabolic collectors: Successive generations are better net energy and exergy producers. *Energy Systems and Policy* 13:63-77.

[xiv] G. Tyner, Sr. and R.G. Fowler. 1992. Estimating the viability of alternative sources of energy. In: *Investing in Natural Capital – A Prerequisite for Sustainability*. Second Meeting of the International Society for Ecological Economics. Stockholm University, Stockholm, Sweden, 3-6 August 1992.

[xv] B. Sørensen. 1995. History of, and recent progress in, wind-energy utilization. *Annual Review of Energy and Environment* 20:387-424.

[xvi] M.W. Gilliland, J.M. Klopatek and S.G. Hildebrand. 1981. Net energy: Results for small-scale hydroelectric power and summary of existing analyses. *Energy* 6:1029-1040.

[xvii] D.M. Gates. 1985. *Energy and Ecology*. Sinauer Associates, Sunderland, MA.

[xviii] R.H. Williams and E.D. Larson. 1993. Advanced gasification-based biomass power generation. Pp. 729-785 in: T.B. Johansson, H. Kelly, A.K.N. Reddy and R.H. Williams (eds.). *Renewable Energy: Sources for Fuels and Electricity.* Island Press, Washington, DC.

[xix] B. Hannon. 1981. The energy cost of energy. Pp. 81-107 in: H.E. Daly and A.F. Umaña (eds.). *Energy, Economics, and the Environment: Conflicting Views of an Essential Interrelationship*. Westview Press, Boulder, CO.

———————