



Is our production system a hummer?

- Our industrialized and centralized agricultural production system while efficient in reducing labor performs less competitively in terms of energy production requirements.



Energy Use Varies on Organic and Conventional Farms

Organic agriculture reduces energy needed for production by One Third

Pimentel, D., P. Hepperly, J. Hanson, D. Douds, and R. Seidel. 2005. Environment, energy, and economic comparisons of organic and conventional farming systems. *Bioscience* 55(7):573-582.

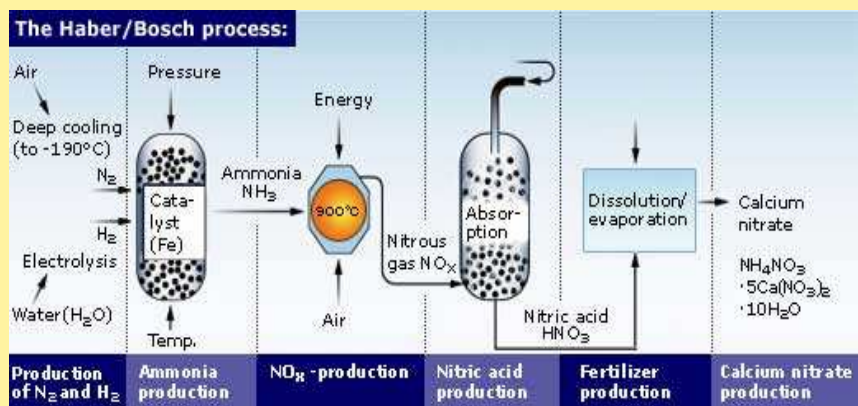
Pimentel, David. 2006. Impacts of organic farming on efficiency and energy use in agriculture. www.organicvalley.coop/fileadmin/pdf/ENERGY_SSR.pdf. 40 pages.

- This is due to more efficiency in biological nitrogen fixation compared to the chemical Bosch Haber process

Chemical Agriculture is Energy Intensive

- Over 40% of fossil fuel requirement is devoted to the chemically based process for the production for ammoniated fertilizer, the Bosch Haber process.
- Over 20% of agricultural production energy is devoted to mechanization
- For every Two Kilocalorie of Fossil Fuel used in the agriculture production system only 1 kilocalorie of food energy is produced

Energy Intensive Bosch Haber N Production Process



www.hydro.com/upload/4518haberboschen.jpg



- How Sustainable is our Current Food System if it takes more energy for its production than the food energy it generates?



Fossil Fuel Dependency Becomes More Important

- As we reach peak oil production
- As cost for fossil fuels escalate
- As we use fossil fuels exorbitantly



Grain Used for Animal Production

Kilograms of Grain
Per Kilogram of Animal Produced

- Beef 13.0
- Pork 6.0
- Broiler Chicken 2.2
- Milk 0.8

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Kilocalorie Input for every Kilocalorie Protein Output

- Lamb 57
- Beef 40
- Grass fed 20
- Pork 14
- Turkey 10
- Chicken 4

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Energy ration Kilocalorie Input per Output and Yield of Agricultural Production Systems

Agricultural System	Yield (t/a)	Production	
		Mcalories	Cal Output/input
Organic Corn	7.7	3.6	7.7
Conventional Corn	7.7	5.2	5.1
Conv. Soybean	2.5	2.1	4.6
Organic Soybean	2.5	2.3	3.8