

Biting Into Our Future: Is Meat Sustainable?

Environmental vegetarianism: Does it help?

Although humans have been raising animals for agricultural purposes for centuries, our methods of doing so have changed greatly over time. With the relatively recent development of **industrial agriculture**, we are now able to cost-effectively produce many times more food than ever before. As in any industry, the aim is to increase yield and decrease production costs; and as with other industries, this system brings benefits such as convenience and lowered prices for consumers, cheaper supplies for further production, and substantial exports to foreign markets. However, there is now overwhelming evidence that **industrial agriculture has serious environmental consequences that raise concerns about the sustainability of such farming practices**. One of the main contributors to this problem is the tending of animals, which produce tons of dangerous waste and consume valuable resources. Many are now arguing for the **cessation of animal agriculture** in favor of growing only plant crops so as to reduce the negative environmental effects of farming. Consumers who ascribe to this theory often boycott some or all animal products by shifting to a plant-based diet, called vegetarianism or veganism. The information presented here seeks to **clarify the extent to which such lifestyle changes are effective by examining the degree to which certain agricultural systems that do include animals, such as organic farms, might be sustainable**.

Industrial agriculture: Nature's nightmare

Industrial agriculture **transforms the farm into a factory**. As such, it is considered a machine that requires "inputs," or resources such as feed and fuel, in order to produce "outputs," or commodities such as corn and chickens. Industrial farmers have developed certain practices that have become typical of their businesses:

- ◆ **monoculture** (the cultivation of a single crop)
- ◆ **limited crop varieties**
- ◆ **reliance on certain chemical and organic inputs** (pesticides and fertilizers)
- ◆ **separation of animal and plant agriculture**¹¹

Though these practices keep the system running efficiently for the most part, they can have dangerous consequences. The decline in genetic diversity in agriculture, due to the pressure put on farmers to grow uniform crop varieties, **makes crops especially vulnerable to disease**. Plants that farmers no longer grow sometimes disappear altogether, taking with them genes for pest resistance and stress resistance.

Therefore, industrial farmers rely more and more heavily upon chemical and organic inputs such as **pesticides and fertilizers, which in excess lead to air and water pollution**.

The separation of animal and plant agriculture, meanwhile, means that agricultural products and byproducts like manure are **not naturally recycled, but rather become hazardous waste**. Additionally, industrial farms' consumption of large amounts of fossil fuels releases harmful gases and therefore spurs on **global climate change**.

Such extreme repercussions are typical of factory farming systems in which animals are confined to tiny spaces and used like pieces of a machine. **Yet environmental damage also results from more pastoral or traditional methods of farming**, which require a great deal of land, among other things. To obtain this land, **farmers often clear many acres of forest**, thereby removing the trees that process the hazardous CO₂ emitted with the burning of fossil fuels.

With use, the land itself becomes less and less healthy as **livestock overgraze and degrade the soil**.¹³ Livestock often encroach upon tropical rainforests and compete with wildlife. Considering that **about 60 percent of the world's pasture land—just less than half the world's usable surface—is covered by grazing systems**,⁴ this is a serious ecological concern. Proponents of environmental vegetarianism or veganism would argue that the fastest way to counteract these threats is to halt all consumption of animal products, thereby putting these farms out of business.



Leigh Courtney

court_n_l@denison.edu

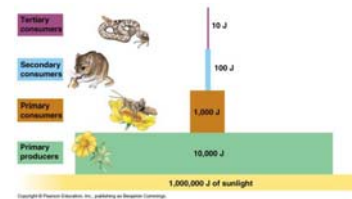
Denison University

"The good life for a human being entails good health, good health in turn rests on a carefully chosen diet, and our diet in part reflects as well as determines our species' impact on the biosphere."—Michael Allen Fox⁶

→ The chart to the right presents the ratio of fossil fuel energy used to produce certain types of food versus the energy provided by the food (both measured in Kilocalories). The numbers demonstrate that a great deal more fossil fuel is used when producing meat rather than producing plant crops.⁹

Data courtesy of Dr. David Pimentel, Cornell University

↓ The diagram below displays differences in the amount of energy consumed by animals at various levels of the trophic pyramid. It demonstrates that the higher up the trophic pyramid an animal is, the less efficient its energy consumption. In short, **diets become increasingly efficient as they move down the trophic pyramid and toward a plant-based diet**, because plants derive their energy directly from the sun.⁵



Oil Used : Food Produced

Range beef	---- 10 : 1
Chicken	---- 16 : 1
Range lamb	---- 16 : 1
Milk	---- 19 : 1
Eggs	---- 28 : 1
Beef	---- 35 : 1
Pork	---- 68 : 1
Lamb	---- 188 : 1
Soy	---- 0.24 : 1
Corn	---- 0.4 : 1
Wheat	---- 0.46 : 1
Potato	---- 0.72 : 1
Apple	---- 0.9 : 1
Tomato	---- 1.6 : 1
Spinach	---- 5.0 : 1

Conclusions

The research presented here indicates that **although the predominant animal-inclusive agroindustrial system is indeed dangerous and unsustainable, there are ways of including animals in agriculture that are environmentally sound and even preferable to plant-only systems**. It seems that the issue is not at heart a matter of meat consumption, but rather of food consumption in general, and of finding ways to make our consumption of all agricultural goods sustainable. The fact that animal production is often badly managed is not necessarily reason enough to demand its abolition, but rather to adopt more sustainable systems.¹³

Still, **until the day arrives when all our agriculture is sustainable, abstaining from meat consumption is probably the most effective way of individually protesting today's agricultural practices that destroy the natural world**. For the sake of our environment, it is imperative to think about the impact of our dietary choices. For now, plant-based or at least organic diets are a key element of ensuring a healthy, peaceful future for our planet.

Organic farming: An ecological dream come true

Partly in response to the dire situation of our current agroindustrial system, a new breed of farming has developed that may be able to counteract arguments against the agricultural use of animals. Called organic farming, this technique **approaches agriculture with the aim of creating an integrated, humane, environmentally and economically sustainable production system**. It relies mostly on locally or farm-derived renewable resources and reduces reliance on external inputs, whether chemical or otherwise, as much as possible. The very term "organic" encompasses the basic principle behind this method: that **the farm should be treated as an organism in which all the parts—the soil minerals, organic matter, micro-organisms, insects, plants, animals, and humans—interact to create a coherent and stable whole**.⁷

Organic farming systems:

- ◆ **protect the long-term fertility of soils** by maintaining organic matter levels, encouraging soil biological activity, and using careful mechanical intervention.
- ◆ **control weeds, pests, and disease** primarily through crop rotation, natural predation, diversity, organic manuring, and resistant varieties, rather than excessive biological and chemical intervention.
- ◆ **manage livestock extensively**, respecting their evolutionary adaptations, behavioral needs, and welfare issues with respect to nutrition, housing, health, breeding, and rearing.
- ◆ **pay careful attention to their impact on the wider environment and the conservation of wildlife and natural habitats**.¹⁹

Indeed, the central environmental concern of organic farmers is the preservation of a diverse and healthy ecosystem. Organic farmers believe that they can conduct their business in a minimally invasive way and **can even benefit the environment** somewhat. Arguably, farming can be seen as a **natural co-evolution** over thousands of years.¹³ It has even been suggested that the farming relationship between human and animal is a form of **symbiosis**. After all, the organic farming system takes good care of animals during their lifetimes—and in return, we humans reap benefits such as **animals' ability to transform materials unsuitable for human consumption** and to graze areas that would be difficult to harvest otherwise. And we are not the only ones who benefit: Grazing is important for recycling plant material, increasing plant biomass, diversifying plant communities, and maintaining large-scale open habitats for flora and fauna. Additionally, the manure produced by livestock is colonized by huge numbers of invertebrates that provide feed for birds and mammals and improve soil fertility.

According to such an approach, **the agricultural ecosystem can be modeled after natural ecosystems**, meaning that the surplus of the system should be harvested each year. For the purpose of system balance, **the human takes the role of the predator of its livestock**.¹³ From the ecological point of view, for human beings to stop consuming meat and to universally become vegetarians is tantamount to a shift downward in the trophic pyramid, which in effect shortens the food chains that end with humans. This represents an increase in the efficiency of the conversion of solar energy, which increases available food resources for human beings. (See the trophic pyramid chart to the left.) In short, it is much more efficient to consume a plant-based diet. But although this may seem like a positive effect, **the result could be a human population boom beyond control, which—under certain conditions—could cause an ecological catastrophe**.¹⁸

An organic farming system **producing both plants and animals**, on the other hand, seems capable of generating plenty of food without overwhelming the population. New research from the University of Michigan reveals that **organic farming can yield up to three times as much food** in developing countries as conventional methods.³ Such findings refute the assertion that organic farming cannot produce enough food to feed a global population.

Helpful websites:

<http://goveg.com/environment.asp> | www.sierraclub.org | epa.gov



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