

“Isn't man an amazing animal? He kills wildlife - birds, kangaroos, deer, all kinds of cats, coyotes, beavers, groundhogs, mice, foxes and dingoes - by the million in order to protect his domestic animals and their feed. Then he kills domestic animals by the billion and eats them. This in turn kills man by the million, because eating all those animals leads to degenerative and fatal health conditions like heart disease, kidney disease, and cancer. So then man tortures and kills millions more animals to look for cures for these diseases. Elsewhere, millions of other human beings are being killed by hunger and malnutrition because food they could eat is being used to fatten domestic animals. Meanwhile, some people are dying of sad laughter at the absurdity of man, who kills so easily and so violently, and once a year, sends out cards praying for “Peace on Earth” - C. David Coats, from Old MacDonald's Factory Farm.

Why I Don't Eat Animals

Second Edition, 2020

“People often say that humans have always eaten animals, as if this is a justification for continuing the practice. According to this logic, we should not try to prevent people from murdering other people, since this has also been done since the earliest of times” - Isaac Bashevis Singer, Polish author, Nobel prize, 1978.

I grew up in a household where animals were as much a part of life as furniture. We always had dogs and cats, and I remember having to catch the Sunday chicken after my Grandfather had cut off its head for lunch. Some animals were friends and others were food. That's all there was to it, and the notion that this could be a subject for debate was about as far removed as Alpha Centauri. It just wasn't going to happen, certainly not in our world.

It was an issue I was not to consider with any seriousness for another thirty-five years, and the reason I did was partly due to a person I met who caused me to question some of my most fundamental assumptions, and partly due to a book I was writing which up until that point was about the human condition. The book was about to change, because I was about to change. The reasons I changed are detailed in this booklet. I have divided my own considerations into pragmatic aspects and ethical aspects.

1. Pragmatic Aspects

These are aspects of the issue that I see as having practical consequences.

1.1 Environmental Considerations

The first questions were raised in my mind concerning animals as food when I discovered the environmental consequences of the meat industry.¹ The meat industry contributes to land degradation, climate change, air pollution, water shortage and pollution, and loss of biodiversity.²



“Cattle raising has also been criticized for its role in the destruction of tropical forests. Hundreds of thousands of acres of tropical forests in Brazil, Guatemala, Costa Rica, and Honduras, to name just a few countries, have been levelled to create pasture for cattle. Since most of the forest is cleared by burning, the extension of cattle pasture also creates carbon dioxide, and, according to some environmentalists, contributes significantly to global warming” ~ Richard Robbins, Global Problems and the Culture of Capitalism, (Allyn and

¹<http://www.fao.org/newsroom/en/news/2006/1000448/index.html>

²http://www.alternet.org/environment/137737/13_breathtaking_effects_of_cutting_back_on_meat/?page=entire

Bacon, 1999), p.220.

The livestock sector is by far the single largest anthropogenic user of land. The total area occupied by grazing is equivalent to 26 percent of the ice-free terrestrial surface of the planet. In addition, the total area dedicated to feed crop production amounts to 33 percent of total arable land. In all, livestock production accounts for 70 percent of all agricultural land and 30 percent of the land surface of the planet.³

Not only is land used up to grow grain to feed cattle, but additional land is of course required for pastures and grazing. Furthermore, overgrazing leads to land degradation while top soil loss and water wastage and depletion are also extremely urgent issues. With industrial agriculture, more petrochemicals are used. More energy is required to create fertilizers, pesticides and herbicides, etc, to grow the grain that is used to feed cattle.⁴

Meat production produces more greenhouse gas emissions than transportation with direct emissions from meat production accounting for some 14% of world's total. (This includes emissions generated from clearing forests and land, making and transporting fertilizer, burning fossil fuels in farm vehicles, and the front and rear end emissions from cattle and sheep.) By contrast, transport accounts for 13% of total global greenhouse gas emissions.⁵

Many leading environmental organizations, including the National Audubon Society, the WorldWatch Institute, the Sierra Club, and the Union of Concerned Scientists, have recognized that raising animals for food damages the environment more than just about anything else that we do:

(1) Factory farms produce massive amounts of dust and other contamination that pollutes our air. A study in Texas found that animal feed-lots in the state produce more than 14 million pounds of particulate dust every year and that the dust contains biologically active organisms such as bacteria, mould, and fungi from the faeces and the feed.

(2) According to the non-profit group Greenpeace, all the wild animals and trees in more than 2.9 million acres of rainforest were destroyed in the 2004-2005 crop season in order to grow crops used to feed chickens and other animals in factory farms. Expansion of livestock production is a key factor in deforestation, especially in Latin America where the greatest amount of deforestation is occurring – 70 percent of previous forested land in the Amazon is occupied by pastures, and feed-crops cover a large part of the remainder. About 20 percent of the world's pastures and range-lands, with 73 percent of range-lands in dry areas, have been degraded to some extent, mostly through overgrazing, compaction and erosion created by livestock action.⁶

(3) Nitrous oxide is about 300 times more potent as a global warming gas than carbon dioxide. According to the U.N., the meat, egg, and dairy industries account for a staggering 65 percent of worldwide nitrous oxide emissions.

(4) Cows and other grazing animals get a lot of attention for their methane-producing belches and releases. Such grazers host microbes in their stomachs, gut-filling hitchhikers that help them break down and absorb the nutrients from tough grasses. Those microbes produce methane as their waste, which wafts out of both ends of cows. The manure that cattle and other grazers produce is also a site for microbes to do their business, producing even more methane. There are 1.4 billion cattle in the world, and that number is growing as demand for beef and dairy increases. 40% of methane emissions come from animal agriculture.⁷

(5) According to the Environmental Protection Agency, the run-off from factory farms pollutes our waterways more than all other industrial sources combined. The EPA reports that chicken, hog, and cattle excrement have polluted 35,000 miles of rivers in 22 states and contaminated groundwater in 17 states.

(6) The meat industry causes more water pollution in the US than all other industries combined because the animals raised for food produce 130 times more excrement than the entire human population - 86,000 lbs

³Livestock's Long Shadow, xxi, LEAD (Livestock, Environment and Development) Initiative

⁴<http://www.globalissues.org/article/240/beef#Divertingresourcestoenvironmentallydestructiveuses>

⁵<http://www.globalissues.org/article/240/beef#MeatProductionConsumptionandClimateChange>

⁶Livestock's Long Shadow, xxi, LEAD (Livestock, Environment and Development) Initiative

⁷ <https://letstalkscience.ca/educational-resources/stem-in-context/cows-methane-and-climate-change>

per second. A typical pig factory farm generates a quantity of raw waste equal to that of a city of 12,000 people.

(7) 75 percent of U.S. topsoil has been lost to date, 85 percent of that loss is due to livestock rearing. Meat is murder on the environment A kilogram of beef is responsible for more greenhouse gas emissions and other pollution than driving for 3 hours while leaving all the lights on back home...



Livestock now account for about 20 percent of the total terrestrial animal biomass, and the 30 percent of the earth's land surface that they now inhabit was once habitat for wildlife. Indeed, the livestock sector may well be the leading player in the reduction of biodiversity, since it is the major driver of deforestation, as well as one of the leading drivers of land degradation, pollution, climate change, overfishing, sedimentation of coastal areas and facilitation of invasions by alien species.⁸

When we lose rainforests, the following occurs:

- Loss of biodiversity
- Depletion of soil
- Disruption of water cycle
- Greenhouse gas emissions and climate change
- Loss of ability to produce oxygen
- Flooding and drought cycles increased
- Loss of medicinal plants
- Loss of indigenous tribes

These facts represent a pragmatic reason to reconsider the production and consumption of meat – it seems practical, given these effects, to re-evaluate the role of meat in our society. For me, the 'big picture' consequences were significant enough for me to ask more questions, although the environmental effects of the meat industry were not, on their own, sufficient to cause me to reconsider my dietary habits, due to the simple fact that if the variables around meat production could be better managed, the environmental impacts may be significantly reduced.

Some arguments have been presented suggesting that pasture-fed herbivores would be less environmentally destructive and constitute less harm to the animals, but these are patently flawed:

“In a 2003 article in the Journal of Agricultural and Environmental Ethics, Steven Davis advanced the argument that fewer animals would be harmed if we consumed a diet containing large herbivores (namely cattle) fed on pasture than if we consumed a vegan diet, based on his calculation that more wild animals would be killed in crop harvesting than in producing food from a ruminant-pasture-forage system. Gaverick Matheny identified a crucial error in Davis's calculation: it assumed that equal amounts of land will produce equal amounts of food from

• ⁸Livestock's Long Shadow, xxiii, LEAD (Livestock, Environment and Development) Initiative

crops or from animals on pasture. In fact, an amount of land will produce much more food when used to grow crops for direct human consumption than when used to raise cattle, provided it is suitable for growing crops. Once Matheny corrected the calculation, Davis's argument made the case for, rather than against, a vegan diet, given an objective to cause the least amount of animal death. Davis's argument was also criticized by Andy Lamey, who pointed out that the case that Davis makes for the numbers of animals being killed by harvesting activity is weak, as his numbers included animals who were killed by predators, and that the argument overlooks ways that humans can be harmed or killed by beef production but not vegetable production.” ~ Mark Middleton 9 ”

“...Davis then tries to calculate the numbers of animals killed by rearing beef cattle on pasture and argues that twice as many animals die per acre when growing crops as in pasture-reared beef production. He then concludes that if we are trying to kill as few animals as possible, we will do better to eat beef – as long as it is fed entirely on grass and not fattened on grain – than to follow a vegan diet. Davis has, however, made a gross error in his calculations: He assumes that an acre of land will feed the same number of people irrespective of whether it is used to raise grass-fed beef or to grow crops. In fact, an acre of land used for crops will feed about ten times as many people as an acre of land used for grass-fed beef. When that difference is fed into the calculations, Davis's argument is turned on its head, and proves that vegans are indirectly responsible for killing only about a fifth as many animals as those who eat grass-fed beef.” ~ The ethics of what we eat p.255, by Singer & Mason.

The idea that that pasture-fed herbivores would be less environmentally destructive and constitute less harm to the animals is also hopelessly inconsistent in two other respects: one, in animal production, there is a compound effect, since animals are killed in crop production and again when the animals to whom the crops have been fed are slaughtered. Secondly, this case, labelled as the 'Least Harm' argument and presented by meat-eaters, is ethically inconsistent with the idea of compassion for animals and is more of a justification for eating meat than a real ethical argument, which would be directed at less animal consumption, not more. The argument also ignores the severe cruelty of factory farms and their significant physical and emotional impact on the animals.

An equally poor argument has been raised by Allan Savory in a TED talk¹⁰, *How to fight desertification and reverse climate change*, in support of grass-fed beef. Overgrazing, he argues, is not the cause of desertification; grasslands have historically evolved with grazing animals. He believes that the problem is poorly-planned grazing, and he advocates for “holistic management and planned grazing” in order to address “all of nature's complexity and our social, environmental, economic complexity.” According to Savory, well-planned grazing promotes plant growth, and the action of animal hooves on the soil improves the soil's absorption of water. These ideas support the view that well-planned animal grazing can prevent and reverse desertification, thereby helping to combat climate change.¹¹ He thinks we should be eating more livestock, not less...

“Restoration in this sense is complex and insidious. It is true that mob/rotational grazing by livestock could help selected, previously desertified areas in certain developing countries. But it comes with a price undisclosed by Savory or other permaculturists—misdirected resource use. The same land used for grazing could be used for producing plant foods for humans to eat directly. Water is being used for livestock, rather than directly by humans. There is an increase in GHG emissions, disposition (slaughtering) at the end of the animals' tenure, and production of a food product that is much less healthy to eat than any of a number of plants that could have been grown. On its surface, Savory's process may look attractive, but it obscures the Savory Institute's objective of feeding a certain portion of the world with increased meat and dairy products by way of herd management of desertification.” ~ Dr Richard Oppenlander, author of

⁹<http://www.animalvisuals.org/projects/data/1mc/>

¹⁰https://www.ted.com/talks/allan_savory_how_to_green_the_world_s_deserts_and_reverse_climate_change

¹¹<http://www.inexactchange.org/blog/2013/03/11/cows-against-climate-change/>

There are other serious reservations from various scientists concerning Savory's plan.

“No grazing system has yet shown the capacity to overcome the long-term effects of overstocking and/or drought on vegetation productivity.

We could find no evidence that short-duration grazing with 8 or more paddocks has any advantage in terms of improved livestock productivity, increased carrying capacity or improved rangeland condition over more simplistic grazing systems with 4 paddocks. Experimental evidence that even simplistic 2-4 pasture rotation systems can be advantageous over continuous grazing is lacking.

...various rotational grazing system studies have shown no clear cut advantage for any particular form of management. More often than not the more intensive systems with large numbers of paddocks per herd lowered animal production, and there was no apparent improvement in botanical composition.

North American studies have been quite consistent in showing that hoof action from having a large number of animals on a small area for short time periods reduced rather than increased filtration.”¹³

As Dr. Sylvia Fallon of the Natural Resources Defence Council has shown, symbiosis between grazing herds and grasses has historically worked best to sequester carbon when the animals lived the entirety of their lives within the ecosystem, their carcasses rotted and returned their accumulated nutrients into the soil, and human intervention was minimal to none. It is unclear, given that Savory has identified this type of arrangement as his ecological model, how marketing cattle for food would be consistent with these requirements. Cows live up to 20 years of age, but in most grass-fed systems, they are removed when they reach slaughter weight at 15 months. Cheating the nutrient cycle at the heart of land regeneration by removing the manure-makers and grass hedgers when only 10 percent of their ecological “value” has been exploited undermines the entire idea of efficiency that Savory spent his TED talk promoting.¹⁴

Savory, whose idea of a healthy ecosystem is one with plenty of grass to feed cattle, neglects the less obvious flora - such as, in addition to algae crust, blackbrush, agaves, and creosote—that cattle tend to trample, thereby reducing the desert's natural ability to sequester carbon on its own terms. “It is very important,” Ralph Maughan, director of the Western Watershed Project writes, “that this carbon storage not be squandered trying to produce livestock.”

In short, Savory's distorted view of desert ecology is “dead wrong.”

“Whether desert landscapes or the foundation's coffers become any greener remains to be seen. In the meantime, the evidence continues to suggest what we have long known: There's no such thing as a beef-eating environmentalist.” ~ James E. McWilliams¹⁵

None of the above, however, alters the facts regarding depletion of and utilisation of scarce resources by livestock and it is unavoidable, even in the case of altering the diets of cows:

“The numbers are always quite consistent, in that you cannot raise one grass fed cow on less than 2 to 20 acres. Even Polyface Farms and agriculture educational institutions with their “mob grazing” and “juvenile growth rotation” techniques cannot extract more than one cow per acre of land, which then produces not more than 480 pounds of an end product (“edible carcass weight”), that some consider food. During the 2 to 2 ½ or even 3 years required to raise that cow, you will need minimally 20,000 to 1,000,000 gallons of water (20,000 gallons for drinking and up to 1 to 2 million gallons for irrigating portions of your pasture which is necessary in many areas of the world), and you will have produced 3 to 4 tons of methane and carbon dioxide by way of enteric fermentation and respiration.” ~ Dr Richard Oppenlander, 'Comfortably Unaware'.

¹²<http://www.comfortablyunaware.com/blog/saving-the-world-with-livestockthe-savory-approach-examined/>

¹³Short Duration Grazing Research in Africa report.

¹⁴http://www.slate.com/articles/life/food/2013/04/allan_savory_s_ted_talk_is_wrong_and_the_benefits_of_holistic_grazing_have.2.html

¹⁵http://www.slate.com/articles/life/food/2013/04/allan_savory_s_ted_talk_is_wrong_and_the_benefits_of_holistic_grazing_have.html

All things having been taken into consideration, the meat industry is hopelessly inefficient. It represents a waste of water, land, energy, and life.

It is not just the consumption of land animals that bears further examination. We are overfishing our seas, and the effect on sea mammals is significant even if one discounts the notion that fish feel pain or have emotions.

“Across all our oceans, the Food and Agriculture Organization of the United Nations (FAO) estimates that 70 percent of the world’s fish species are either fully exploited or depleted, with many of them reaching more than a 90% decline. The World Conservation Union lists 1,081 types of fish worldwide as threatened or endangered.

The Inter-American Tropical Tuna Commission study recently revealed that it requires up to 60 million metric tons of “harvested wild fish” per year to feed the 3 million tons of the three major tropical tuna species that we are now harvesting annually raised in ‘farms’ (essentially concentrated floating pig farms). This is interesting logic—to catch, kill, and eat Blue Fin Tuna until they are critically endangered and then turn around and create near extinctions of other species of fish just to feed the tuna we are now raising on farms because we cannot get enough of what—sushi? For salmon the ratio is 3.3 tons of fishmeal to produce 1 ton of farmed fish, complete with pesticides, antibiotics, and sea lice.” ~ Dr. Richard Oppenlander, author of ‘Comfortably Unaware’

With reference to critically endangered species, it is worth mentioning that we are losing species of life as well as ecosystems on Earth at an unprecedented and alarming rate, estimated to be anywhere between 1,000 and 10,000 times the “background rate” - that which had been seen for the previous several thousands of years. Therefore, it is this massive *rate* of extinction rather than number of losses that becomes a more meaningful metric and cause for concern.

Habitat loss is by far the most pervasive threat to terrestrial animal species, impacting 86% of all mammals, 88% of amphibians, and 86% of all birds. One in every eight birds, one in every three amphibians and one in every four mammals is facing an extremely high risk of extinction in the near future.

What causes the habitat loss? With estimates of 45% of all the land mass on Earth used by animal agriculture and 1 to 2 trillion fish extracted from our oceans each year (by fishing methods such as trawling, purse seine, long lines, explosives and other techniques that are damaging ecosystems) - eating animals (fishing and livestock production) is the largest contributing factor in habitat loss. About 80% of all rainforest loss is due to raising cattle with another 10% lost due to growing crops to feed them.¹⁶ One cannot be a conservationist and a meat-eater; they are mutually exclusive processes.

Lastly, the effects on the environment are usually a human-centred consideration. In other words, it is something we contemplate primarily because of its effect on humans. Consideration for the animals themselves is not a component of the evaluation. Their well-being is not a necessary condition except in respect of the effect their suffering or pain may have on humans. However, even from this perspective, given the threat that meat represents to the entire living system, it seems practical to reduce or stop consuming meat.

1.2 Health Considerations

Is meat healthy? There have been major shifts in recent times as to the nutritional benefits of various food types, and controversy has raged over whether fats or carbohydrates are bigger contributors to human disease.

Heart Disease

During the 90's, the issue of cholesterol became a major talking point, especially in respect of the effect of animal fats on heart disease. According to the lipid hypothesis, abnormal cholesterol levels

• ¹⁶Dr Richard Oppenlander, 'Comfortably Unaware'

(hypercholesterolemia) - that is, higher concentrations of LDL and lower concentrations of functional HDL - are strongly associated with cardiovascular disease because these promote atheroma development in arteries (atherosclerosis). Atherosclerotic plaque in the arteries is our leading killer.

Research conducted at the Harvard Chan School of Public Health has found that eating even small amounts of red meat - especially processed red meat - on a regular basis is linked to an increased risk of heart disease and stroke, and the risk of dying from cardiovascular disease or any other cause.

One investigation followed 120,000 men and women in the Nurses' Health Study and Health Professionals Follow-Up Study for more than two decades. For every additional 3-ounce serving of unprocessed red meat the study participants consumed each day, their risk of dying from cardiovascular disease increased by 13%.¹⁷

Processed red meat was even more strongly linked to dying from cardiovascular disease—and in smaller amounts: every additional 1.5 ounce serving of processed red meat consumed each day (equivalent to one hot dog or two strips of bacon) was linked to a 20% increase in the risk of cardiovascular disease death.

In another study of 43,000 men that looked at both amount and sources of protein found that intake of total protein was minimally associated with heart disease risk, but intake of protein from red meat was associated with higher risk.¹⁸

Those who cut out all meat except for fish had a 38 percent lower risk of high blood pressure, and those who cut out all meat had a 55 percent lower rate. People who cut out all meat, eggs, and dairy did the best, with a 75 percent reduced risk of high blood pressure. Those eating completely plant-based diets appeared to have thrown three-quarters of their risk for developing this major killer out the window.¹⁹ When scientists looked at diabetes and body weight, they found the same apparent progressive improvements as consumption of animal products decreased and plant foods increased.

The saturated fat, trans fat, and cholesterol found in animal products and junk food are associated with impaired kidney function, and meat protein increases the acid load to the kidneys, boosting ammonia production and potentially damaging our sensitive kidney cells. This is why a restriction of protein intake is often recommended to chronic kidney disease patients.

The single most pro-inflammatory food component is saturated fat. The single, most anti-inflammatory food component? Fibre. Saturated fat is found mostly in meat, dairy, and junk food, whereas fibre is abundant in whole grains, beans, vegetables, and fruit. Dietary fibre is an essential component of a healthful diet, with research linking a high fibre diet with reduced risks of many health conditions, including cardiovascular disease, type 2 diabetes, and certain cancers. Fibre is also important for keeping the gut healthy. There is no fibre in meat or milk.²⁰

Higher Dietary Inflammatory Index scores are linked to a higher risk of cardiovascular disease and lower kidney, lung, and liver function. Those eating diets rated as more inflammatory also experienced faster cellular ageing. In the elderly, pro-inflammatory diets are associated with impaired memory and increased frailty. Inflammatory diets are also associated with worse mental health, including higher rates of depression, anxiety, and impaired well-being. Additionally, eating more pro-inflammatory foods has been tied to higher prostate cancer risk in men and higher risks of breast cancer, endometrial cancer, ovarian cancer, and miscarriages in women. Higher Dietary Inflammatory Index scores are also associated with more risk of oesophageal, stomach, liver, pancreatic, colorectal, kidney, and bladder cancers, as well as non-Hodgkin lymphoma. Overall, eating a more inflammatory diet are associated with 75 percent increased odds of having cancer and 67 percent increased risk of dying from cancer. Not surprisingly, those eating more anti-inflammatory diets appear

¹⁷ <https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/1134845>

¹⁸ <https://academic.oup.com/ajcn/article-abstract/92/5/1265/4597560>

¹⁹ Fraser GE. Vegetarian diets: what do we know of their effects on common chronic diseases? *Am J Clin Nutr.* 2009;89(5):1607S–1612S.

²⁰ <http://ajcn.nhri.org.tw/server/info/books-phds/books/foodfacts/html/data/data2c.html>

to live longer lives.²¹

For every additional 300 mg of dietary cholesterol eaten per day, the risk of CVD and all-cause mortality was higher by 17% and 18%, respectively. These associations became nonsignificant after adjustment for consumption of eggs and red meat. In the U.S. population, eggs and meats contribute 25% and 42% of total dietary cholesterol, respectively.

For each additional half of an egg consumed daily, the risk of CVD and all-cause mortality was higher by 6% and 8%, respectively. When the authors looked more closely, dietary cholesterol intake was more strongly associated with risk of stroke than heart disease, and it was associated with both CVD and non-CVD deaths.²² - Zhong et al, JAMA study over 31 years of US men and women

In a report called The China Study, T. Colin Campbell details the connection between nutrition and heart disease, diabetes and cancer. The report also examines the source of nutritional confusion produced by powerful lobbies, government entities, and opportunistic scientists. The New York Times has recognized the study (*China-Oxford-Cornell Diet and Health Project*) as the "Grand Prix of epidemiology" and the "most comprehensive large study ever undertaken of the relationship between diet and the risk of developing disease."²³ Campbell's conclusion was that "People who ate the most animal-based foods got the most chronic disease ... People who ate the most plant-based foods were the healthiest and tended to avoid chronic disease. These results could not be ignored," said Dr. Campbell.

Similarly, other studies confirm that meat-eating is not healthy, in particular red or processed meats. For example, Frank Hu MD PhD et al concluded that:

"...we found that a greater consumption of unprocessed and processed red meat is associated with a higher mortality risk. Compared with red meat, other dietary components, such as fish, poultry, nuts, legumes, low-fat dairy products and whole grains, were associated with a lower risk. These results indicate that replacement of red meat with alternative healthy dietary components may lower the mortality risk."²⁴

Furthermore, Sabine Rohrmann et al concur:

*"The results of our analysis support a moderate positive association between processed meat consumption and mortality, in particular due to cardiovascular diseases, but also to cancer."²⁵
~ Sabine Rohrmann et al, Division of Cancer Epidemiology and Prevention, Institute of Social and Preventive Medicine, University of Zurich²⁵*

Further evidence to support the above is presented by Doctor Michael Greger, in his book, 'How Not to Die: Discover the Foods Scientifically Proven to Prevent and Reverse Disease', in which he identifies animal consumption as a major threat to human health, and presents the following compelling evidence:

"A study of women in China found that smokers who stir-fried meat every day had nearly three times the odds of lung cancer compared to smokers who stir-fried foods other than meat on a daily basis. This is thought to be because of a group of carcinogens called heterocyclic amines that are formed when muscle tissue is subjected to high temperatures. The fumes produced by frying bacon contain a class of carcinogens called nitrosamines. Although all meat may release potentially carcinogenic fumes, processed meats like bacon may be the worst: A UC-Davis study found that bacon fumes cause about four times more mutations than the fumes from beef patties fried at similar temperatures.

... one hot dog has as many nitrosamines (and nitrosamides, which are similar tobacco

²¹ Michael Greger, How Not to Die – Discover the food scientifically proven to prevent and reverse disease.

²² <https://www.hsph.harvard.edu/nutritionsource/2019/03/18/eggs-and-cholesterol-back-in-the-spotlight-in-new-jama-study/>

²³ <http://www.thechinastudy.com/>

²⁴ <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3712342/>

²⁵ <http://www.biomedcentral.com/1741-7015/11/63/abstract>

carcinogens) as four cigarettes and these carcinogens are also found in fresh meat, including beef, chicken, and pork. This may help explain the rising rates of kidney cancer over the last few decades despite the falling rates of smoking.

What about people who eat chicken? The largest study to ever address that question is the European Prospective Investigation into Cancer and Nutrition (EPIC) study, which followed 477,000 people for about a decade. The researchers found a 72 percent increased risk of pancreatic cancer for every fifty grams of chicken consumed daily. And that's not much meat, under two ounces—just about a quarter of a chicken breast.” - Dr. Michael Greger, How Not to Die – Discover the food scientifically proven to prevent and reverse disease.

There are in addition many risks associated with the consumption of animals, and include toxins and infectious agents.

Dioxins

Dioxins are environmental pollutants found throughout the world and are of concern because of their highly toxic potential. They belong to the so-called “dirty dozen” - a group of dangerous chemicals known as persistent organic pollutants (POPs). Dioxins are mainly by-products of industrial processes but can also result from natural processes, such as volcanic eruptions and forest fires. They are unwanted by-products of a wide range of manufacturing processes including smelting, chlorine bleaching of paper pulp and the manufacturing of some herbicides and pesticides. Uncontrolled waste incinerators (solid waste and hospital waste) are often the worst culprits of dioxin release into the environment, due to incomplete burning.

More than 90% of human exposure to dioxins is through food, mainly meat and dairy products, fish and shellfish. Once dioxins enter the body, they last a long time because of their chemical stability and their ability to be absorbed by fat tissue, where they are then stored in the body. Their half-life in the body is estimated to be 7 to 11 years. Dioxins are highly toxic and can cause reproductive and developmental problems, damage the immune system, interfere with hormones and also cause cancer. 26

Salmonella

The majority of Salmonella infections are caused by eating foods that have been contaminated by faeces.

How does it get there? In slaughter facilities, birds are typically gutted by a metal hook, which too often punctures their intestines and can expel faeces onto the flesh itself. According to the latest national FDA retail-meat survey, about 90 percent of retail chicken showed evidence of contamination with faecal matter.

The egg industry itself funded research on Salmonella and the various ways to cook eggs. What did they find? Salmonella in eggs can survive scrambled, over-easy, and sunny-side-up cooking methods. Sunny side up was found to be the riskiest. The industry-funded researchers bluntly concluded: “The sunny-side-up method should be considered unsafe.” In other words, even the egg industry itself knows that its product, prepared in a manner that millions of people eat on any given day, is unsafe. Actually, we’ve known this for some time. Twenty years ago, Purdue University researchers determined that Salmonella can survive in cooked omelettes and French toast. Salmonella may even survive in eggs boiled up to eight minutes. 27

Eggs have been a fundamental component of human diets for such a long time that they have been assumed to be a reliable source of nutrients and carry few risks. The benefits of eating eggs are not the only myth in the traditional diet.

The Mythology of Milk

Ask any parent, and they will tell you that milk is good for kids and it has many nutritional benefits. This is a myth that has persisted due to very effective marketing by the milk industry and very little reading by the general public of scientific research.

Approximately 65 percent of the human population has a reduced ability to digest lactose after infancy. Lactose intolerance in adulthood is most prevalent in people of East Asian descent, with 70 to 100 percent of

²⁶ <https://www.who.int/news-room/fact-sheets/detail/dioxins-and-their-effects-on-human-health>

²⁷ Michael Greger, How Not to Die – Discover the food scientifically proven to prevent and reverse disease

people affected in these communities. Lactose intolerance is also very common in people of West African, Arab, Jewish, Greek, and Italian descent.

Surprisingly, milk-drinking does not even appear to prevent osteoporosis, its major selling point. Research shows that calcium losses are increased by the use of animal protein, salt, caffeine, and tobacco, and by physical inactivity. Animal protein leaches calcium from the bones, leading to its excretion in the urine. Moreover, calcium is readily available in sources other than dairy products. Green leafy vegetables such as broccoli, kale, and collards, are rich in a form of calcium whose absorption is as good or better than that of cow's milk. Linda Folden Palmer elaborates on this by refuting the idea that consumption of dairy strengthens bones:

“Decades of effort to demonstrate that high calcium diets chiefly derived from dairy products build strong bones have failed to prove any such correlation. In fact, the opposite seems to be true. It appears that high calcium intake before puberty, and especially in young childhood, may have some slight positive effect on bones, but this diet is not the answer. A balanced intake of all the bone minerals, along with adequate vitamin A, C, D, and K, is what is truly needed. A balanced intake of minerals cannot occur when the diet emphasizes dairy. Dairy's high calcium causes relative deficiencies in magnesium and other bone-building minerals, and its high phosphorus and animal protein reduces calcium availability.” - Linda Folden Palmer

In fact, ironically:

“The countries with the highest rates of osteoporosis are the ones where people drink the most milk and have the most calcium in their diets. The connection between calcium consumption and bone health is actually very weak, and the connection between dairy consumption and bone health is almost non-existent.” - Amy Lanou Ph.D., nutrition director for the Physicians Committee for Responsible Medicine in Washington, D.C.

A recent analysis of studies examining a relationship between dairy product consumption and ovarian cancer risk found that for every 10 grams of lactose consumed (the amount in one glass of milk), ovarian cancer risk increased by 13 percent.

Milk consumption increases serum concentrations of insulin-like growth factor 1, an anabolic hormone linked to prostate and other cancers. Multiple studies have shown that high consumption of dairy protein was associated with an increase in the risk of prostate and other cancers.

The incidence and mortality rates of testicular and prostatic cancers in 42 countries were correlated with the dietary practices in these countries... Among the food items examined, cheese was most closely correlated with the incidence of testicular cancer at ages 20-39, followed by animal fats and milk.²⁸

“Milk, cheese, and ice cream once enjoyed a healthful reputation that few people questioned, but that has changed. It has become clear that these foods contribute not only fat but also cholesterol, animal protein, and, in the case of fat-free varieties, a big load of lactose sugar.” – Dr Neal Barnard

Milk makes things grow fast. Good for baby cows, but bad for adult people who may have tiny microscopic breast or prostate tumours, growth of which we don't want. In a study of 140,000 men, 35 grams of dairy protein increased the risk of developing high-grade prostate cancer by 76%, a 2% increased risk for every gram of milk protein. So a cup of cottage cheese a day could increase one's risk by about 50%...

Prostate cancer has become the most common cancer among men in the United States... A meta-analysis was conducted to estimate the combined odds ratio (OR) between milk consumption and prostate cancer from case-control studies published between 1984 and 2003... In conclusion, they found a positive association [meaning higher rates of disease] between milk consumption and prostate cancer.²⁹

²⁸ International Journal of Cancer 2002

²⁹ <https://www.ncbi.nlm.nih.gov/pubmed/15203374>

No other animal drinks milk beyond childhood. No other animal suffers from osteoporosis, except the occasional pet raised on human meals. The myth that humans need milk is debunked in the American Journal of Clinical Nutrition, where it is unequivocally stated:

*“Bones are better served by attending to calcium balance and focusing efforts on increasing fruit and vegetable intakes, limiting animal protein, exercising regularly, getting adequate sunshine or supplemental vitamin D, and getting ≈500 mg Ca/d from plant sources. Therefore, dairy products should not be recommended in a healthy vegetarian diet.”*³⁰

One of the most common questions carnists ask vegetarians or vegans is, “Where do you get your protein?”. It turns out to be a question loaded with ignorance and prejudice concerning sources of nutrition.

Protein

All protein is initially made by plants. Animal protein in the human diet is unnecessary. Plant protein supplies enough of the essential and non-essential amino acids as long as sources of protein are varied and caloric intake is sufficient to satisfy energy needs.³¹

Only organisms that can fix nitrogen (take it from the air and convert it into usable chemical compounds) can create amino acids, the building blocks of proteins. All other organisms are dependent on them to get the amino groups needed to make amino acids, and thus to make proteins. Thus, the total amount of protein in the biosphere ultimately comes from, and depends on, nitrogen-fixing micro-organisms that live symbiotically in plant roots and in the earth, and this process of converting nitrogen into a form that can be utilised by living organisms only takes place in plants.

This means that all animal protein is recycled plant protein. We grow, using scarce resources, food that we could eat, and we feed it to animals. This seems impractical, given that we don't need to – we can get all our nutritional needs from plants, including protein.

Sources of concentrated plant protein include legumes, nuts and seeds, grains/seitan, tofu/tempeh, while less concentrated sources include broccoli/brussel sprouts, potatoes/root vegetables, asparagus/artichokes, green leafy vegetables, fresh and dried fruits.

Too much protein is counterproductive and unhealthy. The adverse effects associated with long term high protein/high meat intake include a) disorders of bone and calcium homeostasis, b) disorders of renal function, c) increased cancer risk, d) disorders of liver function, and e) precipitated progression of coronary artery disease.

Animal Protein in the diet (all sources – including milk/egg or meat) is linked to:

1. Higher Cholesterol levels
2. Increased heart disease
3. Increased Type 1 Diabetes
4. Increased cell division – faster growth of cancer tumours, Alzheimer's and other diseases.
5. Increased osteoporosis

Plant proteins have the opposite effect:

1. Lower cholesterol levels
2. Reversal of heart disease

³⁰ <https://academic.oup.com/ajcn/article/89/5/1638S/4596954>

³¹ Plant proteins in relation to human protein and amino acid nutrition – Vernon Young and Peter Pellett

3. Lower rates of both types of Diabetes
4. Lower cancer growth (even reversal of cancer)
5. Lower risk of osteoporosis

Plant proteins in human nutrition: myths and realities

Myth	Reality
Plant proteins are ‘ ‘incomplete’ ‘ (i.e. lack specific amino acids)	Usual dietary combinations of proteins are complete: specific food proteins may be low in specific amino acids
Plant proteins are not as ‘ ‘good’ ‘ as animal proteins	Quality depends on the source and dietary mixture of plant proteins: can be equivalent to high-quality animal proteins
Proteins from different plant foods must be consumed together in the same meal to achieve high nutritional value	Proteins do not need to be consumed at the same time, the balance over a day is of greater importance
Animal bioassay procedures are satisfactory indexes of the human nutritional value of food proteins	Animal bioassay procedures can be useful but they may underestimate plant protein nutritional quality for humans
Plant proteins are not well digested	Digestibility can vary according to source and food preparation: digestibility can be high
Plant proteins alone are not sufficient to achieve an adequate diet (protein intake)	The intakes and balance of intakes of indispensable amino acids and nitrogen are crucial and can be adequately met from plant or plant and animal sources
Plant proteins are ‘ ‘imbalanced’ ‘ and this limits their nutritional value	There is no evidence that amino acid imbalances per se are important: possible imbalances can be created by inappropriate amino acid supplementation, but this is not a practical problem

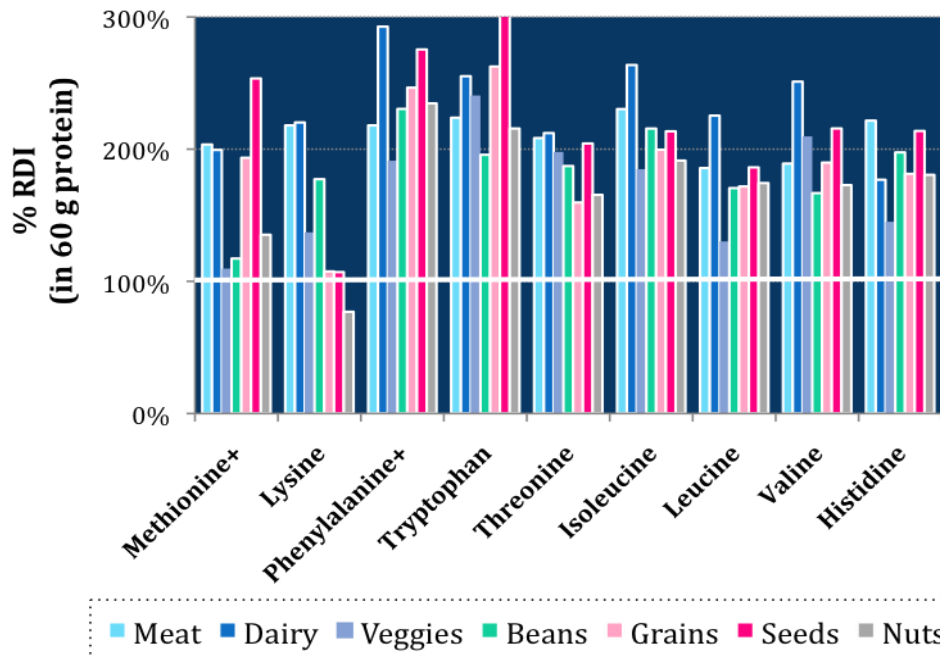
Table from ‘Plant proteins in relation to human protein and amino acid nutrition’ ~ Vernon R Young and Peter L Pellett

Essential amino acids

“With three important exceptions, there is little danger of protein deficiency in a plant food diet. The exceptions are diets very heavily dependent on fruit, or on some tubers, such as sweet potatoes or cassava, or on junk food (refined flours, sugars, and fat). Fortunately, relatively few people in the world try to survive on diets in which these foods are virtually the sole source of calories. In all other diets, if people are getting enough calories, they are virtually certain of getting enough protein.” Diet for a Small Planet by Frances Moore Lappé

In healthy adults, nine of the 20 amino acids are considered essential (also called indispensable). Your body cannot make them, so they must come from your diet. The other 11 key amino acids are considered “non-

essential,” as your body can make them. Some amino acids are “conditionally” essential — needed only in certain stages of life or for certain diseases. As long as you’re eating enough total plant-based protein, and incorporating some diversity in your sources, you should be covering your essential amino acids. To fail, you’d need to either not eat enough protein, or eat a severely limited diet (such as only rice), neither of which is advised for many reasons. (Chana Davis, PhD)



Each bar shows how much of a specific amino acid is found in a group of foods. A bar height of 100% means daily needs are met. 32

Industry influence

A report entitled Dietary Goals for the United States was released advising Americans to cut down on animal-based foods and increase their consumption of plant-based foods. As a founding member of Harvard University’s nutrition department recalls, “The meat, milk and egg producers were very upset.” That’s an understatement. Under industry pressure, not only was the goal to “decrease meat consumption” removed from the report but the entire Senate nutrition committee was disbanded. The meat and dairy industries clearly have huge influence.

While conducting my research for this book, I came across the Prospective Urban Rural Epidemiology (“PURE”) study that made headlines: “*Study Challenges Conventional Wisdom on Fats, Fruits, and Vegetables*,” “*PURE Shakes Up Nutritional Field*,” “*Huge New Study Casts Doubt on Conventional Wisdom About Fat and Carbs*.” Following over 135,000 participants spanning five continents, the study is a large one.

PURE researchers collected self-reported dietary data from 135,335 people in 18 countries, and grouped them according to the amount of carbohydrate, fat, and protein they consumed. After tracking participants’ health over a seven year period, researchers found that those with the highest intake of dietary fat (35% of daily calories) were 23% less likely to have died than those with the lowest intake of fat (10% of daily calories). Oppositely, for carbohydrates, those with the highest intake (77% of daily calories) were 28% more likely to have died than those with the lowest intake (46% of daily calories). From these findings the authors’ main conclusion is that “*high carbohydrate intake was associated with higher risk of total mortality, whereas total fat and individual types of fat were related to lower total mortality.*”

Their conclusions were sensational. What they were suggesting is that all the research from the last decade

³² <https://medium.com/tenderlymag/busting-the-myth-of-incomplete-plant-based-proteins-960428e7e91e>

was wrong, and that fats were good (and implicitly animal foods) and carbs were bad. There were, however, key methodological problems:

1. Total carbohydrates” is over-simplified. Since carbohydrate foods range from fruits, vegetables, legumes and whole grains to refined grains and added sugars, it is important to consider both quality and quantity of carbohydrates—rather than grouping them all together. Different types of carbohydrates have different effects on health.
2. Such high carbohydrate intake may indicate a ‘poverty diet’. Most study participants located in low-income countries subsisted almost entirely on carbohydrates, “especially from refined sources.” In this situation, it is extremely challenging if not impossible to separate the effects of diet from poverty and undernutrition.
3. Incomplete assessment and analysis of types of fat. Unlike carbohydrates, the study does break down total fat intake into saturated, monounsaturated, and polyunsaturated fats. Interestingly, the study did not examine the effects of substituting polyunsaturated fat for saturated fat. Randomized clinical trials have found that while replacing saturated fat with carbohydrates had no effect, swapping saturated fat with polyunsaturated fat significantly reduced the risk of cardiovascular disease.
4. Reliability of dietary intake data. In Chinese participants (which constituted almost one third of the total study population), average total fat intake is noted as 17.7% of total daily calories, yet other surveys have found an average intake of around 30% of daily calories from fat in China. Such a large discrepancy is puzzling because similar dietary questionnaires were used in the PURE study and other Chinese studies.

In summary, Dr. Frank Hu, Chair of the Department of Nutrition at the Harvard Chan School of Public Health had this to say:

“The main messages for nutritional advice have not changed: follow a healthy dietary pattern that includes abundant amounts of vegetables, fruits, whole grains, legumes, and nuts; moderate amounts of reduced-fat dairy products and seafood; and lower amounts of processed and red meat, sugar-sweetened foods and beverages, and refined grains. Such a dietary pattern does not need to limit total fat intake but the main types of fat should be unsaturated fats from plant sources rather than animal fat.”³³

I found it very strange that researchers could make such basic mistakes. I examined the PURE study more carefully and found the following:

“...funded through unrestricted grants from several pharmaceutical companies (with major contributions from AstraZeneca [Canada], Sanofi-Aventis [France and Canada], Boehringer Ingelheim [Germany and Canada], Servier, and GlaxoSmithKline), and additional contributions from Novartis and King Pharma.”

Big Pharma companies manufacture products like statins to manage cholesterol and other products to treat people who suffer from chronic disease caused by consumption of animals, so they have an incentive to support studies that reinforce people's dietary habits dominated by animal-derived foods. I am not saying they would pay people to make sure the findings support the pharmaceutical industry, but this study is deeply suspicious. *80% of pharmaceutical sales are made to animal agriculture.* That is a significant factor in motivating them to mislead the public. It seems more practical, from a logical standpoint, to stop consuming something if it causes harm, rather than take pharmaceuticals to reduce its effects.

Summary

“The truth is that adhering to just four simple healthy lifestyle factors can have a strong impact on the prevention of chronic diseases: not smoking, not being obese, getting a half hour of exercise a day, and eating healthier - defined as consuming more fruits, veggies, and whole grains and less meat. Those four factors alone were found to account for 78 percent of chronic disease risk.

The best available science suggests that the more whole plant foods we eat, the better. The pandemic of

³³ <https://www.hsph.harvard.edu/nutritionsource/2017/09/08/pure-study-makes-headlines-but-the-conclusions-are-misleading/>

chronic disease has been ascribed in part to the near-universal shift toward a diet dominated by animal-sourced and processed foods - in other words, more meat, dairy, eggs, oils, soda, sugar, and refined grains. The one diet found to best prevent and treat many of these chronic diseases is a whole-food, plant-based diet, defined as an eating regimen that encourages the consumption of unrefined plant foods and discourages meats, dairy products, eggs, and processed foods.” - Dr. Michael Greger, How Not to Die – Discover the food scientifically proven to prevent and reverse disease.

To drastically reduce LDL cholesterol levels, we need to drastically reduce our intake of three things: trans fat, which comes from processed foods and naturally from meat and dairy; saturated fat, found mainly in animal products and junk foods; and to a lesser extent dietary cholesterol, found exclusively in animal-derived foods, especially eggs.

Although consumption of non-human animals is certainly unhealthy, it is still not a determining factor in my decision whether to do so or not. There are always ways in which undesirable effects of a diet can be negated – statins in the case of cholesterol are one such example, although pharmaceuticals have their own consequences – and plant-based foods have their own associated risks. Sugar as contained in simple carbohydrates is a major cause of obesity and its associated risks for heart disease and it is a plant-based food. Dr Ross Walker calls sugar a 'poison'...

It is also worth mentioning here that consumption of meat is unnecessary. Vegan athletes, including body builders, marathon runners and many others, have shown for some time that a degree of functionality far exceeding that of the average person, is possible with food that employs no animal products. Other primates, like Gorillas and Chimps, thrive on plant diets, and their strength and mobility is remarkable.

“It is the position of the American Dietetic Association that appropriately planned vegetarian diets, including total vegetarian or vegan diets, are healthful, nutritionally adequate, and may provide health benefits in the prevention and treatment of certain diseases. Vegetarian diets are often associated with a number of health advantages, including lower blood cholesterol levels, lower risk of heart disease, lower blood pressure levels, and lower risk of hypertension and type 2 diabetes. Vegetarians tend to have a lower body mass index (BMI) and lower overall cancer rates. Vegetarian diets tend to be lower in saturated fat and cholesterol, and have higher levels of dietary fibre, magnesium and potassium, vitamins C and E, folate, carotenoids, flavonoids, and other phytochemicals. These nutritional differences may explain some of the health advantages of those following a varied, balanced vegetarian diet. Well-planned vegetarian diets are appropriate for individuals during all stages of the life cycle, including pregnancy, lactation, infancy, childhood, and adolescence, and for athletes. A vegetarian diet is one that does not include meat (including fowl) or seafood, or products containing those foods.” ~ American Dietetic Association 2009

“There is no physiologic ‘need’ for us to kill and consume sea life. The omega 3 fatty acids, protein, and beef alternatives you seek can easily be found in plant foods—and, without the cholesterol, saturated fat, potential for mercury and heavy metals, and accompanying environmental loss you find in our quest for more fish. Additionally, there is no fibre to be found in fish and not one phytonutrient—so, if you wish to eat foods that have numerous types and powerful amounts of these highly beneficial substances, you will have to consume plants—thus also reducing your risk of developing cancer, heart disease, inflammation, and oxidation/aging all at the same time.” ~ Dr. Richard Oppenlander, author of 'Comfortably Unaware'

My own decision not to consume animals was not based on whether I would be healthier or not. It was only when I looked at health with a broader, historical scope that I understood the degree to which human health had been and still is impacted by animal agriculture.

Zoonotic Disease

A **zoonosis** (plural zoonoses, or zoonotic diseases) is an infectious disease caused by a pathogen (an infectious agent, including bacteria, viruses, parasites, prions, etc) that has jumped from non-human animals

(usually vertebrates) to humans.³⁴

“There is a major threat to humanity and it comes from the very food we eat – a terrible consequence of our modern farming systems. Some diseases that infect animals can also be passed on to humans. These are known as zoonotic diseases.

As farming methods have become more intensive, there are an increasing number of animals reared in confined spaces. This is combined with breeding and feeding approaches designed to increase production. It is often at the expense of the animals’ welfare but it’s also putting human health at risk. It increases the risk of certain diseases, which can lead to serious illness in humans and may be fatal. As we consume more animal products, particularly chicken and pig meat, there is greater risk of exposure to these illnesses.”³⁵

About 60 percent of all human diseases and 75 percent of all emerging infectious diseases are zoonotic. Most human infections with zoonoses come from livestock, including pigs, chickens, cattle, goats, sheep and camels.

The 13 that were most important in terms of their impact on human deaths, the livestock sector and the severity of disease in people, along with their amenability to agriculture-based control are, in descending order: zoonotic gastrointestinal disease; leptospirosis; cysticercosis; zoonotic tuberculosis (TB); rabies; leishmaniasis (caused by a bite from certain sandflies); brucellosis (a bacterial disease that mainly infects livestock); echinococcosis; toxoplasmosis; Q fever; zoonotic trypanosomiasis (sleeping sickness), hepatitis E; and anthrax.

Contact with farm animals can lead to disease in farmers or others that come into contact with infected farm animals. Glanders primarily affects those who work closely with horses and donkeys. Close contact with cattle can lead to cutaneous anthrax infection, whereas inhalation anthrax infection is more common for workers in slaughterhouses, tanneries and wool mills. Close contact with sheep who have recently given birth can lead to clamydiosis, or enzootic abortion, in pregnant women, as well as an increased risk of Q fever, toxoplasmosis, and listeriosis in pregnant or the otherwise immunocompromised.

Echinococcosis is caused by a tapeworm which can be spread from infected sheep by food or water contaminated with faeces or wool. Bird flu is common in chickens. While rare in humans, the main public health worry is that a strain of bird flu will recombine with a human flu virus and cause a pandemic like the 1918 Spanish flu. In 2017, free range chickens in the UK were temporarily ordered to remain inside due to the threat of bird flu. Cattle are an important reservoir of cryptosporidiosis and mainly affects the immunocompromised. Recent reports have shown Minks can also get infected.³⁶

As I write this, I am in lockdown due to the COVID-19 pandemic.

Coronaviruses are a group of viruses with exceptionally high mutation rates that are known to exist in bats, rodents, camels and cats, making them prime for jumping from animal hosts to humans. The viruses that caused the outbreaks of Middle East Respiratory Syndrome (MERS) in 2012 and Severe Acute Respiratory Syndrome (SARS) from 2002-2004 are categorized as coronaviruses.

The virus that causes COVID-19 is just the latest pathogen to jump from animals to people. HIV, Ebola, Marburg virus, SARS, MERS, Zika also originated in animals and are part of the same perilous trend of novel diseases that have surfaced with increasing frequency as population growth, industrial agriculture, deforestation, wildlife exploitation, urban sprawl and other human activities bring our species into continuous contact with animal-borne pathogens.

Humanity’s effect on the natural world and on wildlife especially, is causing novel pathogens to infect, harm and kill us. When we mine, drill, bulldoze and overdevelop, when we traffic in wild animals and invade intact habitat, when we make intimate contact with birds, bats, primates, rodents and more, we run an intensifying risk of contracting one of the estimated 1.6 million unknown viruses that reside in the bodies of other species.

Increases in deforestation spur new outbreaks; loss of tree cover has been rising steadily over the past 17

³⁴ <https://en.wikipedia.org/wiki/Zoonosis>

³⁵ Zoonotic diseases, human health and farm animal welfare – WPSA and Compassion in World Farming

³⁶ <https://en.wikipedia.org/wiki/Zoonosis>

years, and 31% of outbreaks of new and emerging diseases, such as the Nipah virus, Zika and Ebola, are linked to deforestation. The link between deforestation and the spread of disease is both clear and scientifically proven. Deforestation is most often for agricultural purposes, more specifically livestock.

So wildlife trading and meat markets, where multiple live species are kept together and butchered on the same surfaces, prove a perfect breeding ground for novel pathogens. If enough species are put together and allowed to share viruses and then a lot of people placed in contact with the animals and their parts, then a virus that can enter a human cell and replicate and, in rarer occasions, transmit from human to human, becomes a higher probability.

While SARS and H5N1 (or bird flu) focused international attention on “wet markets” and backyard farms, Factory Farms may ultimately represent a greater animal and public health risk. For example, the odds of H5N1 infections and outbreaks among poultry in Thailand during the 2004 outbreak were significantly higher in large-scale commercial poultry operations as compared with backyard flocks. Industrial factory farm food production builds in biological risks by reducing genetic diversity in animals, creating more uniform susceptibility to disease. Antibiotic regimens that promote livestock growth increase the danger that animal diseases that cross into humans may resist treatment. Animal stress due to crowding and transport can suppress animals’ immune systems, facilitating animal-human and animal-animal disease transmission:

“A systematic review was conducted by a multidisciplinary team to analyse qualitatively best available scientific evidence on the effect of agricultural intensification and environmental changes on the risk of zoonoses for which there are epidemiological interactions between wildlife and livestock. The study found several examples in which agricultural intensification and/or environmental change were associated with an increased risk of zoonotic disease emergence, driven by the impact of an expanding human population and changing human behaviour on the environment. We conclude that the rate of future zoonotic disease emergence or re-emergence will be closely linked to the evolution of the agriculture–environment nexus.

...livestock may become intermediate or amplifier hosts in which pathogens can evolve and spill over into humans, or humans can be infected directly from wildlife or vectors. Human behavioural changes, driven by increasing population, economic and technological development, and the associated spatial expansion of agriculture, are creating novel as well as more intensive interactions between humans, livestock, and wildlife. These changes have been implicated as drivers of some recent emerging disease events that had important impacts on human livelihoods and health.”³⁷

Large scale animal husbandry is rising to compensate for consumer demand. Industrial Food Animal Production (IFAP) builds in biological risks by reducing genetic diversity in animals, creating more uniform susceptibility to disease. Antibiotics used in livestock farming to improve growth and treat infection apply selective pressure leading to the emergence of antimicrobial resistant strains in livestock and poultry. Animal stress due to crowding and transport can suppress animals’ immune systems, facilitating animal-human and animal-animal disease transmission.

“Attention has often focused on wild animal reservoirs, but most zoonotic pathogens of recent concern to human health either originate in, or are transferred to, human populations from domesticated animals raised for human consumption. Thus, the ecological context of emerging infectious disease comprises two overlapping ecosystems: the natural habitats and populations of wild animals, and the anthropogenically controlled habitats and populations of domesticated species ... Although not typically recognized as such, industrial food animal production generates unique ecosystems -- environments that may facilitate the evolution of zoonotic pathogens and their transmission to human populations. It is often assumed that confined food animal production reduces risks of emerging zoonotic diseases.” 38

Farming animals allows new pathogens to increase their numbers exponentially. This ‘high intensity’ farming allows pathogens that may occur in small numbers to spread rapidly.

Domestic animals themselves are reservoirs of zoonotic diseases. Voss et al described one of the first cases

³⁷ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3666729/>

³⁸ <https://pubmed.ncbi.nlm.nih.gov/19437076/>

of pig-farming related methicillin-resistant *Staphylococcus aureus* (MRSA) in the Netherlands.

Animal wastes often contaminate the outside environment. Integrated livestock management systems may cross borders, exposing people and other animals. Rapid transport of live poultry contributed to the spread of simultaneous H5N1 outbreaks across eight Southeast Asian countries in 2004. Interactions between animals like pigs and poultry at various points throughout IFAP can also facilitate the re-assortment of influenza viruses, as animals may act as “mixing vessels” in which novel pathogens can be created and then transmitted to people. Although bird flu has been overshadowed by an H1N1 pandemic that proved less severe than worst case scenarios, H5N1 could still recombine or change in one of these animal “vessels” to become more transmissible among humans while remaining just as deadly.

The industrialisation of livestock farming has led to a dramatic increase in the number of animals, especially poultry and pigs, reared for food. This has been accompanied by an equally dramatic rise in our consumption of meat, particularly chicken meat. This increased consumption leads to more opportunities for exposure to food borne pathogens and is consistent with the increased number of cases reported. Chicken meat, and products like hamburgers made from minced or ground meat, pose a greater risk because pathogens are not restricted to the surface of the food and may be better able to survive cooking.

The crowding together of large numbers of animals at high stocking densities can facilitate the spread of disease. In addition, animals reared intensively may be more susceptible to infection due to immunosuppression. This is the result of chronic stress induced by the production conditions and/or the use of animals highly selected for rapid growth rates. In many cases, these factors appear to lead to a greater risk of infection in intensive systems, despite the potentially greater risk of exposure to bacteria and viruses from the natural environment in animals reared outdoors.

It appears that the risk of *Salmonella* and *E.coli* infection is often greater in intensive production conditions. *Campylobacter* levels in chicken are a serious concern for human health and the application of biosecurity measures in higher welfare indoor systems, with lower stocking densities and slower-growing birds may be successful in reducing the risk. Further research is urgently needed to clarify the implications of animal breeds for the risks associated with *Campylobacter*, and to avoid solutions being put forward that have negative consequences for human health as well as animal welfare.

The explosion in farm animal numbers, along with the geographical concentration of large-scale poultry and pig production and the transport of animals over long distances, facilitates the emergence of new strains of influenza viruses that can give rise to human pandemics, with potentially devastating consequences.³⁹

Impact of climate change on zoonotic diseases:

The distribution and incidence of zoonotic diseases relate, in part, to their degree of climate sensitivity. The contributing factors leading to the emergence and spread of zoonotic diseases are due to pathogen, host and vector or ecological determinants and in many scenarios a combination of the above factors.

Vector distribution and therefore disease risk is expected to increase for vector-borne zoonotic diseases. Arthropod vectors are the most sensitive to climatic temperature variability. Mosquitoes, ticks and sandflies are ectothermic and have life cycles that are dependent on ambient temperatures. Disease transmission is likely to occur if there are changes at the extremes of temperature (14-18°C at the lower end and 35-40°C at the upper end). Vector densities are expected to be their greatest at 30-32°C.

1. Temperature has a direct effect on mosquitoes. It leads to increased activity, increased reproduction and therefore increased frequency of blood meals and faster digestion of blood
2. Warmer climates allow ticks to survive at higher latitudes and altitudes. Brownstein et al used a climate suitability model, and found potential expansion of tick populations causing Lyme disease. Higher temperatures increase the developmental rate of ticks and the over-winter survival rate is also increased.
3. Sandflies are more active at higher temperatures and take more frequent bloodmeals, which in turn increases transmission. Increased temperatures also increase the development of leishmania parasites.
4. With warmer climates and decreasing snowfall, the protective environment provided by snow is removed and rodents seek shelter within human habitats, increasing transmission of hantavirus, as seen in Scandinavia.

³⁹ Zoonotic Diseases, Human Health and Farm Animal Welfare, May 2013, Compassion in World Farming, WSPA

5. Rising sea levels will lead to coastal flooding and risks for water- borne zoonoses.⁴⁰

The argument to stop eating meat because it is unhealthy, is environmentally destructive, and economically inefficient is instrumentalist⁴¹ in nature; the issue is only considered by most people because these are negative impacts of meat production and consumption on humans. In other words, non-human animals are regarded as means to human ends, having no intrinsic value.

2. Ethical Aspects

2.1 Socio-Economic Considerations

More than one third of the world's grain harvest is used to feed livestock. While corn is a staple food in many Latin American and Sub-Saharan countries, worldwide it is used largely as feed. Wheat is more evenly divided between food and feed and is a staple food in many regions such as the West, China and India. The total cattle population for the world is approximately 1.3 billion occupying some 24% of the land of the planet. Some 70 to 80% of grain produced in the United States is fed to livestock. Half the water consumed in the U.S. is used to grow grain for cattle feed. A gallon of gasoline is required to produce a pound of grain-fed beef. ⁴²

“Beef is terribly inefficient as a source of food. By the time a feedlot steer in the United States is ready for slaughter, it has consumed 2,700 pounds of grain and weighs approximately 1,050 pounds; 157 million metric tons of cereal and vegetable protein is used to produce 28 metric tons of animal protein” — Richard Robbins, Global Problems and the Culture of Capitalism, (Allyn and Bacon, 1999) p.221

“The powerful myth that industrial food is cheap and affordable only survives because all of these environmental, health, and social costs are not added to the price of industrial food. When we calculate the real price, it is clear that far from being cheap, our current food production system is imposing staggering monetary burdens on us and future generations.” — The Editors, AlterNet.org, September 5, 2002

It takes more than eleven times as much fossil fuel to make one calorie of animal protein than it does to make one calorie of plant protein. It takes 16 pounds of grain and 2,500 gallons of water to produce one pound of meat. One average meat eater could consume that pound of meat during a meal, while 16 people could have been fed on the grain it takes to produce that pound of meat.

The livestock population of the US consumes enough grain and soy beans to feed more than 5 times its human population. 90% of all corn and 80% of all grains and beans grown in the US are used to feed livestock animals.

Every two seconds, a child starves to death somewhere in the world. Countries such as Ethiopia and some Central American countries use their farmland to supply the United States with cheap burgers instead of growing healthful grain foods for their own starving people.

Water problems affect half of humanity:

- Some 1.1 billion people in developing countries have inadequate access to water, and 2.6 billion lack basic sanitation.
- 1.8 billion people who have access to a water source within one kilometre, but not in their house or yard, consume around 20 litres per day. In the United Kingdom the average person uses more than 50 litres of water a day flushing toilets (where average daily water usage is about 150 litres a day. The highest average water use in the world is in the US, at 600 litres day.)
- Some 1.8 million child deaths each year result from diarrhoea.

⁴⁰ <https://www.acmicrob.com/microbiology/the-impact-of-climate-change-and-other-factors-on-zoonotic-diseases.php?aid=220>

• ⁴¹ The assumption that animals are means to human ends, so whether we should consume animals is only a consideration if there is a human downside.

• ⁴² <http://www.globalissues.org/article/240/beef>

- Close to half of all people in developing countries suffering at any given time from a health problem caused by water and sanitation deficits.
- To these human costs can be added the massive economic waste associated with the water and sanitation deficit. The costs associated with health spending, productivity losses and labour diversions are greatest in some of the poorest countries. Sub-Saharan Africa loses about 5% of GDP, or some \$28.4 billion annually, a figure that exceeds total aid flows and debt relief to the region in 2003.⁴³

...and yet we are willing to spend 2500 gallons of water to produce ONE pound of meat...

“Quite simply, eating animals IN ANY FASHION uses too much land, energy, and water, creates unnecessary greenhouse gas emissions, is responsible for a massive loss of biodiversity, plays a significant role in world hunger, and justifies the inhumane slaughtering of billions of animals annually - all while increasing the risk of contracting many disease states after consumption.”
 ~ Dr Richard Oppenlander, author of 'Comfortably Unaware'

It should be obvious to anyone that from a “big picture” perspective, this is impractical. It is pragmatic from a resource utilisation (and hence economic and ecological) perspective to engage in the process that delivers the most output from a given set of inputs. This is just common sense. If one decides to employ another process, one is no longer guided by pragmatic considerations and certainly not by those who consider optimisation of the whole as an important outcome. *The mindset driving meat, given the inefficiency of the industry and its destructive effects on the environment, can only be ascribed to self-indulgence, tradition, exploitation, and short-term thinking.*

That it is unethical to consume meat in the light of this knowledge should also be patent, given that those who consume meat utilise scarce resources (land, water, fuel) that could be used to feed more people.

“Realize that 82% of the world’s starving children live in countries where food is fed to animals that are then killed and eaten by more well off individuals in developed countries like the US, UK, and in Europe. One fourth of all grain produced by third world countries is now given to livestock, in their own country and out.”

“Typically, these areas (the Greater Horn of Africa) are drought - ridden and the people plagued by poverty, hunger, and illiteracy. It would make more sense to optimize sustainability by producing a type of food that is the most efficient to grow—least water usage, no GHG emissions, least land needed, and healthiest for humans to consume. When compared to plants, raising livestock seems illogical. Wherever pasture can grow or be restored to feed livestock, other plants could be grown as well—to be eaten directly by humans. It’s interesting to note that livestock already occupy 44 percent of the total land surface of the eight GHA countries and are directly responsible for use of the sparse natural resources available for their human population.” ~ Dr Richard Oppenlander, author of 'Comfortably Unaware'

• ⁴³<http://www.globalissues.org/issue/2/causes-of-poverty>



“Globally, even with climate change issues and weather extremes, we are producing enough grain to feed two times as many people as there are in the world. In 2011, there was a record harvest of grain globally, with over 2.5 billion tons, but half of that was fed to animals in the meat and dairy industries. Seventy seven percent of all coarse grains (corn, oats, sorghum, barley, etc.) and over 90% of all soy grown in the world was fed to livestock. So clearly the difficulty is not how can we produce enough food to feed the hungry, but where all the food we produce globally is going, in addition to the other factors of pricing, policy making, and education. This will certainly become more of an issue as our planet’s human population extends beyond 9 billion before the year 2050.” ~ Dr Richard Oppenlander, author of 'Comfortably Unaware'

In her book *Diet for a Small Planet*, written 37 years ago, Frances Moore Lappe argued that world hunger is not a problem of production - it's a problem of distribution. *“If ungulates were simply let to graze on land too marginal for most agriculture (including much of the American west, aka cattle country), while productive croplands fed people instead of animals, the world would have enough to eat.”*

Here was a compelling consideration. The meat industry is extraordinarily wasteful, using scarce resources to feed an elite minority at the cost of the feeding of many others.

“More than 66% of the world’s poorest people (those living on \$2 or less per day) live in rural areas and rely on natural resources for their existence. Global demand and production of fish and livestock has reduced traditional fishing stocks and decimated coral reef systems for indigenous people living on coasts and islands, shrivelled and segmented million year old forests. This will only exacerbate world poverty and hunger because while remote from those who consume animal products, it is the world of the indigenous and the very natural resources they have relied on for centuries.” ~ Dr Richard Oppenlander, author of 'Comfortably Unaware'

Whether this is important to one depends largely on one's value system. Those who live in a Benign Universe in which there is a Universal Moral Code must surely question whether one's consumption of animals can be justified when it has such significant moral consequences. The Naturalist, of course, sees the Universe as indifferent to the effects of one group on another, so “that's just the way it is” and nothing more needs to be said; the only imperative is survival and since this competition is apparently “good for the breed”, those who suffer are merely collateral damage for the greater good of the ruling species. Others think existence to be an Illusion, which may be a conveniently safe way of avoiding ethical dilemmas and a great escape hatch for avoiding personal responsibility for anything.

Having lived in all these Universes, and having moved out of all of them and into the Mysterious Universe, where all is not known and everything is debatable, I was soon to realise that there was something I had not included in my reality model, and it would change everything. It also changed the very essence of a book I was writing about the human condition, because it changed my frame of reference...

2.2 Moral Considerations

“Now, you may try to argue that eating animals is a matter of personal opinion or choice, but again I’d have to disagree - this is not about your opinion versus my opinion, this is about animal suffering. You can’t discuss your “personal choice” of eating animals while leaving animals completely out of the conversation.” - Ari Solomon, Director of Communications, Mercy For Animals 44

That there is human suffering from lack of food is deplorable in the light of the use of resources to feed livestock that could be used to feed humans. That it is avoidable through the adoption of a simple change in diet is an indictment of those who somehow do not see the necessity for the change, probably motivated by a need for self-indulgence rather than any legitimate survival imperative.

That this is a humanist approach to the problem should be self-evident; it regards humans as the “measure of all things”, “top of the food chain”, the centre of existence and the reason why it exists, all notably arrogant and self-serving, particularly since there is not one shred of evidence for these assumptions.

The problem with placing human suffering as the point of focus is that it then makes everything else subject to the eradication of human suffering, and a means to the end of human optimisation. We think we are somehow 'separate from', rather than 'part of', this living system we call Earth. Once again, we struggle to find any evidence of this. In fact, all the available evidence from several disciplines points the other way, most notably zoology, biology, ecology and palaeontology.

The book I had been writing was an attempt at identifying where humanity had gone wrong, what the failings were in human thinking that had resulted in life being such a desperate struggle for the majority. At the time that I started, the effects we see today of global warming, the environmental impacts of fossil fuels, the chronic conflicts all over the planet, the growing disparity between rich and poor, and the collapse of the global economic systems, were in their infancy, and I saw them as being symptomatic of a single idea embraced by humans: separatism, the notion that we were independent entities in an interdependent environment. I saw it as problematic because our model of reality was incompatible with the way the real world worked, and I thought I had arrived at the root cause of our problems. I was soon to understand that I was only partially right, and that it went deeper and wider than I was initially ready to accept.

“The assumption that animals are without rights and the illusion that our treatment of them has no moral significance is a positively outrageous example of Western crudity and barbarity. Universal compassion is the only guarantee of morality.” ~ Arthur Schopenhauer, German philosopher, from On the Basis of Morality

The flaw in my problem statement was that I had not included the animals as part of the interdependent set. They had been reduced to bit part players, of no more significance than a 'walk-on' who could be replaced. This was partly due to my lack of understanding of ecological frameworks and my ignorance of the mechanics of large-scale systems over time. But it was also due to an almost blank component of my knowledge set: I had little understanding of the mind of an animal.

It is difficult to conduct such an analysis without giving due attention to the issue of consciousness and this was my first port of call. What do we mean by consciousness, and once we know that, can we say that all animals are conscious? If they are, are there degrees of consciousness? If so, at what point does “level of consciousness” demand moral consideration?

It was my new friend Jane who first introduced me to thinking about the inner lives of animals - Jane had grown

• ⁴⁴http://www.huffingtonpost.com/ari-solomon/who-you-callin-vegangelic_b_290582.html

up on a farm; the animals were her friends, there was no “separation”, and so for her the notion that she could eat them was simply absurd. My initial response to this was incredulity, and I attributed her value for animals to her conditioning as a child and her emotional vulnerability. I could not, however, stop my mind from asking, as it has my entire life, the dangerous questions: “What if they do have consciousness - what if they are like us, even to some extent?” An answer in the affirmative would require a revision of my own ethical standpoint.

I began to observe my own animals, and animals in general, a little more closely. I also invested a lot of time in reading about them, in books and from University textbooks to online publications on the subject, and before long I had a clearer understanding. My reading and thinking led me to an important question:

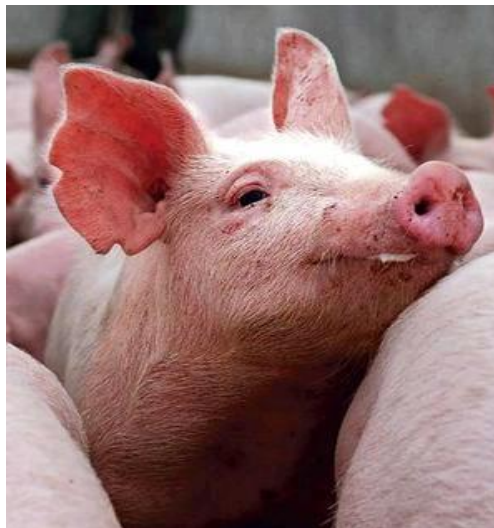
Are they like us?

"Humans - who enslave, castrate, experiment on, and fillet other animals - have had an understandable penchant for pretending animals do not feel pain. A sharp distinction between humans and "animals" is essential if we are to bend them to our will, wear them, eat them - without any disquieting tinges of guilt or regret. It is unseemly of us, who often behave so unfeelingly toward other animals, to contend that only humans can suffer. The behaviour of other animals renders such pretensions specious. They are just too much like us." - Carl Sagan

The essence of the argument: Are they like us, and if so, how?

My first port of call was an important concept.

Sentience



"Because one species is more clever than another, does it give it the right to imprison or torture the less clever species? Does one exceptionally clever individual have a right to exploit the less clever individuals of his own species? To say that he does is to say with the Fascists that the strong have a right to abuse and exploit the weak - might is right, and the strong and ruthless shall inherit the earth." - Richard D. Ryder, English scientist, Author

The term “Sentience” refers to the capacity that an organism has to “feel” – whether pain or emotion. It is a relatively new concept to most people and the meaning of the term is still the subject of debate.⁴⁵

Here is a useful hierarchy of states of intelligence:

0. *No Intelligence* - Cannot react to stimuli and hence cannot contribute to its surroundings in anyway. Creatures of this manner are probably not organisms at all. They could be simple non-computerized mechanical devices. Most matter and energy in the universe falls into this category.

1. *Contingency Based Intelligence* - Reacts to stimuli, but in a confined manner that is limited in productivity or

• ⁴⁵<http://en.wikipedia.org/wiki/Talk:Sentience>

'creativity'. Such might include plants and modern computers. Also known as "robotic intelligence".

2. *Sentience* - Reacts to stimuli in a very dynamic manner, beyond that which current software technology can render. Many perceive this state as debatable and as such, this state of intelligence is the subject of much of philosophy, perhaps even before the existence of writing. Anything of this state could be considered capable of "feeling", of which may or may not include basic emotions such as "happiness", "depression", and "anger/aggressiveness"; but none of the more complex emotions such as "frustration" or "embarrassment". As such, many non-human animals could be relegated to this state of intelligence.

3. *Sapience* - Primarily associated only with humans (*homo sapiens*). On a less rigid manner, sapience relates to the ability to form ideas and express them in a detailed language that allows their distribution among those that can interpret the language - usually other sapient organisms; note however that sentient organisms can participate through interpreting simpler concepts; ie. a dog being ordered to 'fetch'. Contingency based creatures (non-organisms) can also be produced by humans in the form of computers and electronics.

Sapience might be considered to allow more "free will" since a more intelligent organism has the power to simply choose from a greater variety of memories and knowledge in order to assist it in making decisions. Better deciding power lends to greater creativity which lends to a natural tendency to think about things in general - hence the influence of philosophy in human civilization.⁴⁶

"To argue that we humans are capable of complex multifarious thought and feeling, whereas the sheep's perception is probably limited by lowly sheepish perceptions, is no more to the point than if I were to slaughter and eat you on the grounds that I am a sophisticated personality able to enjoy Mozart, formal logic and cannibalism, whereas your imaginative world seems confined to True Romances and tinned spaghetti." ~ Brigid Brophy, English novelist, Essayist

On July 7 2012, a prominent international group of cognitive neuroscientists, neuropharmacologists, neurophysiologists, neuroanatomists and computational neuroscientists gathered at The University of Cambridge to reassess the neurobiological substrates of conscious experience and related behaviors in human and non-human animals.

The Cambridge Declaration on Consciousness was written by Philip Low and edited by Jaak Panksepp, Diana Reiss, David Edelman, Bruno Van Swinderen, Philip Low and Christof Koch. The Declaration was publicly proclaimed in Cambridge, UK, on July 7, 2012, at the Francis Crick Memorial Conference on Consciousness in Human and non-Human Animals, at Churchill College, University of Cambridge, by Low, Edelman and Koch. The Declaration was signed by the conference participants that very evening, in the presence of Stephen Hawking. Here is an excerpt:

"The neural substrates of emotions do not appear to be confined to cortical structures. In fact, subcortical neural networks aroused during affective states in humans are also critically important for generating emotional behaviours in animals. Artificial arousal of the same brain regions generates corresponding behaviour and feeling states in both humans and non-human animals. Wherever in the brain one evokes instinctual emotional behaviors in non-human animals, many of the ensuing behaviours are consistent with experienced feeling states, including those internal states that are rewarding and punishing. Deep brain stimulation of these systems in humans can also generate similar affective states. Systems associated with affect are concentrated in subcortical regions where neural homologies abound. Young human and nonhuman animals without neocortices retain these brain-mind functions. Furthermore, neural circuits supporting behavioral/electrophysiological states of attentiveness, sleep and decision making appear to have arisen in evolution as early as the invertebrate radiation, being evident in insects and cephalopod mollusks (e.g., octopus).

The absence of a neocortex does not appear to preclude an organism from experiencing affective states. Convergent evidence indicates that non-human animals have the neuroanatomical, neurochemical, and neurophysiological substrates of conscious states along with the capacity to exhibit intentional behaviors. Consequently, the weight of evidence indicates that humans are not unique in possessing the neurological substrates that generate

• ⁴⁶<http://en.wikipedia.org/wiki/Talk:Sentience>

consciousness. Nonhuman animals, including all mammals and birds, and many other creatures, including octopuses, also possess these neurological substrates.”



With regard to fish sentience, in 2009, in the Scientific Opinion of the Panel on Animal Health and Welfare titled *General approach to fish welfare and to the concept of sentience in fish*, the panel arrived at the following conclusions:

1. Different species of fish have evolved highly sophisticated sensory organs to survive in changing and varied environmental conditions. Some of these sensory organs are absent in mammals, for example electroreceptors and the lateral line system.
2. There is scientific evidence to support the assumption that some fish species have brain structures potentially capable of experiencing pain and fear.
3. The balance of evidence indicates that some fish species have the capacity to experience pain
4. Defence and escape behaviours are dependent on cognitive and learning abilities related to fear. Responses of fish - of some species and under certain situations - suggest that they are able to experience fear.
5. Fish possess a suite of adaptive behavioural and physiological responses that have evolved to cope with stressors. Many of these are homologous with those of other vertebrates.
6. Fish show short term adaptive responses which may be important to the maintenance of homeostasis but these do not necessarily imply any harmful consequences. Prolonged exposure to stressors generally leads to maladaptive effects or chronic stress. Chronic stress responses indicative of poor welfare include reduction in immune function, disease resistance, growth and reproduction, eventually death.
7. From studies of sensory systems, brain structure and functionality, pain, fear and distress there is some evidence for the neural components of sentience in some species of fish.

Some may see an escape hatch in the terms “indicates” and “some”, and such a motivation leads me to suspect the moral fibre of anyone wishing to find reasons to justify violence and killing, but the application of the “precautionary principle”, which suggests that if we cannot be sure we should err on the side of least harm, makes it less of a justification than a caveat.

It should be obvious that the above presents a compelling case for the idea that non-human animals are like us, to a large extent . We have no good reason to suppose that they feel no pain, are devoid of emotions and are not conscious in ways that *are material to their moral consideration*.

Pain and Morals

We are creatures that don't like pain. We avoid it whenever we can, taking great lengths to ensure that we

exist in relative comfort, building around us obstacles designed to ward off pain, preserve our comfort, and prevent us from being deprived of our pleasure. We believe we have a right to them, and anyone attempting to cause us physical pain or reduce our comfort or remove our pleasure is really doing the same thing, since they are all types of pain to some degree or another. We demand that others not cause us pain since we would regard this as morally wrong. Of course, we could not regard ourselves as moral agents if we did not agree to have the same consideration for others – we would have a double standard, and a society that did not uphold this *quid pro quo* could not deem itself a moral society.

In human history, whenever we have approached the issue of rights, we have done so because someone was in pain, whether the pain of exclusion from voting and the resulting deprivations in the case of women and blacks, the pain of inhumane treatment and impoverishment in the case of slaves, or the discrimination against gays and lesbians or indeed any group that has not conformed to ruling class criteria for social acceptance. Where there is pain, there will be a feedback loop in any system; it will manifest itself in different forms in different systems. In biological systems, it may be a bruise or a lesion or a tumour; in ecological systems, migrations or extinctions; in economic systems, downturns or a meltdowns. In social systems, it may be a protest, demonstration or even a revolution. Whatever the observable phenomenon, it started with pain.

It stands to reason, then, that it is in the interests of any collective to reduce, as much as possible, the pain in the system. Like every other variable phenomenon, pain exists on a continuum, stretching from mild to extreme, and we are all willing to tolerate pain to some extent if there is a benefit of doing so. What we should not expect is for others to experience pain in order to benefit ourselves; it is a fundamental principle underlying ethics in law and political systems and arguably should be part of our economic ethic too,

Pain, then, is the very basis of morality. So it becomes necessary to talk about the pain of the sentient beings that we eat, since it is impossible to do so without causing them pain, whether that pain is defined as physical, mental, or emotional.

“All the arguments to prove man’s superiority cannot shatter this hard fact: In suffering, the animals are our equals.” ~ Peter Singer, Australian professor, Author “Animal Liberation”

That animals are capable of feeling pain is not debatable, although when I use the term 'animals' I should perhaps qualify what I mean, since we cannot be sure that this is true of all non-human creatures. While there is some anecdotal evidence that fish feel pain, for example, it is inferred from the activity of endorphins, and there is little evidence that reptiles or insects do. If they do not feel pain then the chances that they experience emotion seem to fall somewhere between slim and impossible. If there are some that do and some that don't, then the title of this booklet is a generalisation, and should perhaps have been: “Why I don't eat *some* or *most* animals”. Problem is, where does one draw the line? By what criteria do we determine that there is a moral obligation to respect the life of another organism?

It is important to recognise, as I did when thinking about these issues, that to live is to kill. The mere act of survival necessarily requires the use and consumption of resources, and many of these are scarce, with the result that if we consume those resources, something or someone goes without, and such going without will have as its consequence that they will expire. This is true whether you think about it in its economic consequence to other humans or in its ecological ramifications in respect of other creatures. Someone – whether human or non-human - will die as a result of my survival. When we build buildings, consume paper, drive vehicles and use furniture and appliances, the resourcing and manufacturing processes we implement in order to produce products from which we gain utility in its various forms, all have effects on our living system. Whether from destruction of habitat, waste and emissions from the use of fossil fuels, or the loss of potential prey to predators, our effect is significant - we do not live in a vacuum.

If there were moral imperatives in relation to human animals – if my actions had consequences to other humans and that I should take responsibility for them – then it became important to determine the degree to which non-human animals were similar to ourselves. The inherent danger in this assumption is that it still makes humans the benchmark – man as the 'measure of all things' – but it is logically impossible for us to step outside our subjectivity in this area. There is no objective measure of 'consciousness'. There are many viewpoints, even

with regard to what the term 'consciousness' means⁴⁷. We barely understand consciousness in ourselves, yet we seek to use this non-understanding as a benchmark for others? Were the consequences not so sad, this would be hysterically funny...

“Every particle of factual evidence supports the factual contention that the higher mammalian vertebrates experience pain sensations at least as acute as our own. To say that they feel pain less because they are lower animals is an absurdity; it can easily be shown that many of their senses are far more acute than ours; visual acuity in certain birds, hearing in most wild animals, and touch in others; these animals depend more than we do today on a the sharpest possible awareness of a hostile environment. Apart from the complexity of the cerebral cortex (which does not directly perceive pain) their nervous systems are almost identical to ours and their reaction to pain remarkably similar, though lacking (so far as we know) the philosophical and moral overtones. The emotional element is all too evident, mainly in the form of fear and anger.” - Richard Serjeant, “The Spectrum of Pain”, 1969

We can safely conclude that non-human animals feel pain. Whether they experience it in the same manner as we do is not clear, but given the observation of a reaction in which the animal exhibits much the same behaviour as we would in a given painful situation or in response to a given painful stimulus, we can pretty much discern that they find the experience undesirable. That this also implies a moral consideration should be obvious, but the extent of that moral consideration is perhaps debatable.

I considered the following 'pains' in my assessment of the degree of moral consideration owed to non-human animals:

Catalogue of Cruelty

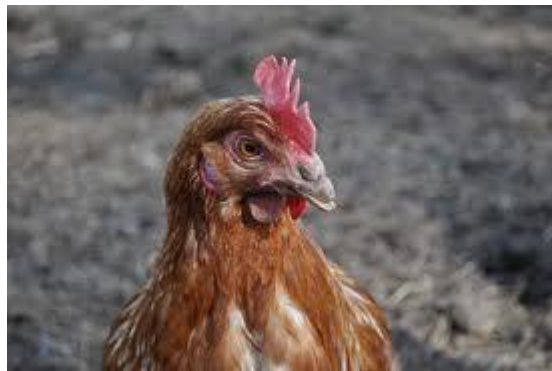
1. Cattle raised for beef are subjected to numerous painful procedures during their lives. These include the repeated infliction of third degree burns (branding), having their testicles ripped out (castration), and the removal of their horns. To minimize costs, all of these practices are routinely conducted without any painkillers. The majority of cattle spend their lives on overcrowded feedlots, "standing ankle deep in their own waste eating a diet that makes them sick", Typical cattle feed includes corn which the animals cannot properly digest, and "fillers" such as sawdust or chicken manure. This unnatural diet can lead to an array of health problems, such as bloat, acidosis (bovine heart burn), diarrhea, ulcers, liver disease, and general weakening of the immune system. During transport to feedlots, auctions, and slaughterhouses, cattle also endure extreme cruelty. Food is not given to the animals during transport or the day before since it will not be converted into profitable flesh. Some cattle succumb to pneumonia, dehydration, or heat exhaustion, and may even freeze to the sides of transport vehicles during long trips. Young calves are separated from their mothers, causing distress to both mother and calf. One would think their cries and bellows would have been a cue for those involved in this practice on a daily basis, but it seems people can become enured when it's not their own pain. Due to the skills level of the people employed in abattoirs, and their disregard for the animals, the stunning process is often not performed properly, resulting in the animal still being conscious as their throats are slit and they are hung up to bleed out, often trembling and shaking as they die slowly and painfully.

2. Veal is a by-product of the dairy industry. In order for dairy cows to produce milk, they must be impregnated and give birth. Half of the calves born are female, and they are used to replace older cows in the milking herd. The other half are male, and because they are of no use to the dairy industry, most are used for beef or veal. They are chained by the neck to restrict all movement, making it is impossible for them to turn around, stretch, or even lie down comfortably. This severe confinement makes the calves' meat "tender" since the animals muscles cannot develop. Published scientific research indicates that calves confined in crates experience "chronic stress" and require approximately five times more medication than calves living in more spacious conditions. Researchers have also reported that calves confined in crates exhibit abnormal coping behaviours associated with frustration. These include head tossing, head shaking, kicking, scratching, and stereotypical chewing behaviour. Confined calves also experience leg and joint disorders and an impaired ability to walk. In addition to restricting the animals' movement, veal producers severely limit what their animals can eat. The calves are fed an all liquid milk-substitute which is purposely deficient in iron and fibre. It is intended to produce

• ⁴⁷<http://plato.stanford.edu/entries/consciousness/>

borderline anaemia and the pale coloured flesh fancied by 'gourmets'. At approximately sixteen weeks of age, these weak animals are slaughtered and marketed as "white" veal (also known as "fancy", "milk-fed", "special fed", and "formula fed" veal). Besides the expensive veal which comes from calves who are kept in small wooden crates, "bob" veal is the flesh of calves who may be slaughtered at just a few hours or days old. While these calves are spared intensive confinement, they are still subjected to inhumane transport, handling, and slaughter, and many die before reaching the slaughterhouse.

3. Pigs are scientifically determined to be more intelligent than dogs. Mother pigs (sows), spend most of their lives in individual "gestation" crates that are approximately seven-feet-long and two-feet-wide — too small for them to even turn around. Just before giving birth, they are moved to "farrowing" crates, which are not large enough for them to even turn around or build nests for their young. The deprived environment produces neurotic coping behaviors such as repetitive bar biting, sham chewing (chewing nothing), and obsessively pressing on water bottles. After visiting several pig factory farms, investigator Lauren Ornelas wrote, "what will remain with me forever is the sound of desperate pigs banging their heads against immovable doors and their constant and repeated biting at the prison bars that held them captive. This, I now know, is a sign of mental collapse." Piglets are taken from their mothers when they are as young as 10 days old and packed into pens until they are separated to be raised for breeding or meat. They too are overcrowded and prone to stress-related behaviours, such as cannibalism and tail-biting. Rather than give the animals more space and a better environment to prevent these problems, factory farmers chop off the piglets' tails and often use pliers to break off the ends of their teeth. Factory farmers also rip chunks out of the young animals' ears for identification purposes and rip out the males' testicles to prevent them from producing sexual pheromones. All of these excruciating procedures are done without any use of painkillers.



4. Overcrowded by the thousands into ammonia-laden sheds where disease runs rampant, Chickens often cannot even flap their wings. Most will never see sunlight or breathe fresh air, except on their way to the slaughterhouse. The birds are forced to breathe air from oxygen-deficient sheds, full of pathogenic microbes, carbon dioxide, methane, hydrogen sulphide, excretory ammonia fumes, and lung-destroying dust and dander. The high ammonia levels cause painful skin and respiratory problems for the birds. Chickens have been genetically manipulated to grow much larger and more quickly than their ancestors. According to a May 26, 1997 article in Feedstuffs, an agribusiness journal, "...broilers now grow so rapidly that the heart and lungs are not developed well enough to support the remainder of the body, resulting in congestive heart failure and tremendous death losses." Modern broiler chickens also experience crippling leg disorders and lameness because their legs are not capable of supporting their abnormally heavy bodies. Researchers have found that this lameness is so chronically painful that lame chickens will repeatedly choose food that has painkillers added to it over regular feed. Another study found that 26% of broiler chickens are severely crippled and that 90% cannot walk normally.

5. Fish suffer greatly when caught, farmed and killed for their flesh. While fisheries would like you to believe otherwise, numerous studies, including a recent study by the Roslin Institute and the University of Edinburgh, have found conclusive evidence that fish do feel pain. Fish, as well as unintended victims including dolphins, birds, and turtles, are captured in huge fishing trawls and squeezed for hours along with any netted rocks and other debris. Dragged from the ocean depths, fish undergo excruciating decompression. The intense internal pressure ruptures their swim bladders, pops out their eyes, and pushes their stomachs through their mouths. They are then tossed onboard where many slowly suffocate or are crushed to death. Others are still alive when

their throats and bellies are cut open.

“Why are the central nervous systems of mammals so much alike, and wouldn't it stand to reason that they serve precisely the same evolutionary purpose, motivating each creature to flee bodily harm and thereby perpetuate the species? If the purpose of pain is the same for us as for other animals, if the internal mechanisms of pain are the same, if the outward expressions of pain are the same, and if the medical treatments for pain are the same, why wouldn't the physical experience of pain be the same—and for that matter, the psychological experience of it as well?” ~ Matthew Scully, Dominion

Having taken account of the many ways in which we inflict pain on non-human animals, I realised firstly that I could do none of these things myself, nor would I. If there was a way to avoid causing them pain, some said, by ensuring that they had natural lives in which their welfare was protected, still consuming them after a “humane” death, the “free range” philosophy, surely that should be acceptable?

Was it enough to take away the pain, always supposing this was possible? In order to assess whether it was, I had to consider another component of animal dynamics.

Emotions

What do we mean when we say that a creature experiences emotion? In humans, an emotion is a behavioural construct – we infer the emotion from the behaviour we observe. It's convenient that we can verbalise the way we feel, a benefit not available to the animals since they cannot do so, but why is it okay to infer an emotion from a human behaviour but not in the case of an animal? I will concede that in the case of complex emotions such as guilt or embarrassment that non-human animals may not have the requisite cognitive ability to experience such, but to deny that many non-human animals experience sadness, for example, is to deny that humans do, since the fact that humans can label a given state as 'sad' only means they have a useful label for a state that we can observe. The fact that non-humans cannot verbalise this state is not evidence that they cannot experience it.

“The discomfort of unpleasant emotional states has been regarded as a form of pain in standard and medical dictionaries. Pain has been defined as physical or mental suffering caused by injury, disease, grief, anxiety, and an awareness of acute or chronic discomfort occurring in varying degrees of severity and resulting from injury, disease, or emotional distress, as evidenced by biological or behavioral changes or both. The various physical and emotional pains have the capacity to induce suffering in animals.” ~ Franklin D. McMillan, DVM, DACVIM

We can, however, observe animals in such a state. We call the principle by which we infer that an animal is having a similar experience to our own, the Anthropomorphic principle, and while some argue that this is unreliable as a measure of the process taking place, and I can see why this may be so with regard to many human states, I cannot see why it should be problematic in the most basic cases, and for good reason:

1. What else could be taking place? When an animal exhibits what is patently a state we could call “low satisfaction”, like for example a dog in a shelter cage, or a starving horse, or a cow just separated from her calf, why would we want to infer that the most obvious inference – they are experiencing emotion – is not admissible, especially when the behaviours displayed are so easily identifiable with our own, as observed by Darwin in the 18th century?
2. Given that we share evolutionary paths with other species, it seems a stretch of logic to assume that somehow the experience of emotions came from nowhere or was isolated to humans by some mutation, especially given the role the “old brain” or limbic system, including the hypothalamus and the amygdala, plays in emotions.
3. The brain components we find in the human brain are found in other species and when they do they are found to perform the same functions. Science does not differentiate between a neuron in a rabbit and a neuron in a person playing the Rabbit in Alice in Wonderland. In fact, they can be transplanted with no loss in functionality.

4. The physiological states from which we infer that the creature is experiencing emotion are correlated so closely to human behaviours that it seems a little absurd to argue otherwise – it's difficult to interpret facial expressions and non-verbal behaviours any other way. In law, there is a principle called *prima facie* – 'on the face of it' – and it seems irrational to seek evidence that another creature is not experiencing something similar to us when they exhibit behaviour that has such close correlation to our own. It's a little desperate, as if there is another agenda...

5. The very fact that some people have a need to explain animal behaviour in ways that make it qualitatively different so as to avoid the idea that they could be similar to us in their responses to given stimuli, seems strange in the sense that they avoid Ockham's Razor in a disingenuous manner; it seems the most obvious, intuitive and logical explanation that animals pretty much all have the same basic emotions.

“The way human beings describe and explain the behaviour of other animals is limited by the language they use to talk about things in general. By engaging in anthropomorphism — using human terms to explain animals’ emotions or feelings—humans make other animals’ worlds accessible to themselves (Allen and Bekoff 1997, Bekoff and Allen 1997, Crist 1999). But this is not to say that other animals are happy or sad in the same ways in which humans (or even other conspecifics) are happy or sad. Of course, I cannot be absolutely certain that Jethro, my companion dog, is happy, sad, angry, upset, or in love, but these words serve to explain what he might be feeling. However, merely referring acontextually to the firing of different neurons or to the activity of different muscles in the absence of behavioural information and context is insufficiently informative. Using anthropomorphic language does not have to discount the animal’s point of view. Anthropomorphism allows other animals’ behaviour and emotions to be accessible to us. Thus, I maintain that we can be biocentrically anthropomorphic and do rigorous science.” Marc Bekoff, Ph.D., Professor Emeritus of Ecology and Evolutionary Biology at the University of Colorado, Boulder.

Evolutionary Roots

Given that we share so many faculties with animals and given that the fundamental building blocks are common, there is no doubt that we got here as a result of the existence of our animal forbears, our common ancestors.

“There is no fundamental difference between man and the higher mammals in their mental faculties... The difference in mind between man and the higher animals, great as it is, certainly is one of degree and not of kind. We have seen that the senses and intuitions, the various emotions and faculties, such as love, memory, attention and curiosity, imitation, reason, etc., of which man boasts, may be found in an incipient, or even sometimes a well-developed condition, in the lower animals.” - Charles Darwin, English scientist

“The difference is one of degree and not of kind.”

Were we to devise an intelligence scale from one to ten and place, say, Einstein or da Vinci at the top at level 10, we might place intelligent people at 8, average people at 5, the majority at 3 and non-human animals at 1. Some humans may well be at the bottom level - feral children and humans with psychological problems or cognitive deficiencies might not even make level 1. But the scale itself could safely place all the creatures using the same criteria. If non-human animals devised the scales, humans would perform very badly indeed. In fact humans would not qualify in certain respects, since many non-human animals have perceptual capabilities – arguably forms of “intelligence” - that humans do not. The navigational abilities of birds, the use of echolocation by bats, the sensitivity to sound from many creatures, the use of infrared to see in the dark, the capacity to see ultraviolet, sense magnetism, and many other abilities make a mockery of the notion of human supremacy. Other animals are differently-abled, not inferior.

It is said that the most definitive differences between humans and non-human animals are our cognitive abilities and our use of language, and these are often cited as evidence of human superiority. It seems strange, then, that human behaviour is so emotionally driven and that so few seem capable of rational thought. It also seems

contradictory that even though humans have language, much research suggests that non-verbal cues play a significant role in human communication, arguably to the extent that they are dominant over verbal ones. Rational content is lost in the unconscious perception of superficial stimuli like colours, dress, appearance, attractiveness and personal identification. Most humans' behaviour is instinctual, more akin to 'monkey-see monkey-do' than anything we could call rational. Rational Man may be a myth.

We have mistaken our hegemony for superiority, effectively legitimising tyranny.

The fact is, in claiming that humans have abilities that non-human animals do not, we ignore the fact that humans developed these abilities along an evolutionary stream that necessarily took its path through non-human animals. They are part of the heritage and foundation of human intelligence and the potential for it must have existed and continues to exist in them now.

“The animal shall not be measured by man. In a world older and more complete than ours, they move finished and complete, gifted with extension of the senses we have lost or never attained, living by voices we shall never hear. They are not brethren; they are not underlings; they are other nations, caught with ourselves in the net of life and time, fellow prisoners of the splendour and travail of the earth.” - Henry Beston, American novelist, Naturalist, The Outermost House, 1928

So in answer to the question above, “Are they like us”, the answer is a resounding “yes”. Are they different in some respects? Certainly. We are undoubtedly different but it is difficult to see how the differences can be used to justify exploitation and cruelty, since they inevitably equate to the argument that “we can, so we should”. We cannot argue that we should be allowed to exploit or abuse other humans on the basis of intelligence, education, or appearance, so why would these criteria be relaxed when thinking about a creature that is only marginally different from the human animal?

But if I took the attitude that only animals that are similar to us are worthy of moral consideration, did this give me a licence to abuse and exploit others I perceived as dissimilar? The “precautionary principle” becomes pertinent again. We are only now beginning to understand the inner lives of non-human animals, and our ignorance should give us caution. We respect foreign human cultures and expect that they do the same for us - why do we think this should change across the species divide?

If we came across an alien species from another planet, would our first thoughts be how we'd prefer to slaughter and prepare them for consumption, or would we find out more about how their civilisation and culture worked? Are non-human animals not aliens among us? By what divine fiat do we claim the right to disregard their place in this world, to regard them as means to our ends?

The more I thought about the “free range” concept, the more I realised that firstly all the socio-economic and environmental downsides still applied, even if it was possible to give animals a pain-free life in captivity and develop a means of slaughter that could be regarded as “humane”, itself a strange word to use, given its meaning: “characterized by tenderness, compassion, and sympathy for people and animals, especially for the suffering or distressed: humane treatment of prisoners. acting in a manner that causes the least harm to people or animals”. When you are killing an animal there is inevitably violence, and it's difficult to see how killing a healthy creature can ever be tender or compassionate. It's an insane contradiction, one you would expect from an idiot, not from a supposedly intelligent species.

Impact on the human condition.

We do not escape unharmed when we abuse other species. In justifying brutality, we expose our own; in seeking protection from the law and police from experiencing it ourselves, we betray a hopeless double standard, since it seems brutality is okay as long as we are not the ones suffering it. We do not elevate ourselves through this behaviour; we diminish our moral stature firstly in the brutality and secondly in the hypocrisy. There is also the cowardice in looking the other way while others do the dirty work of confinement and slaughter.

“The indifference, callousness and contempt that so many people exhibit toward animals is evil first because it results in great suffering in animals, and second because it results in an incalculably great impoverishment of the human spirit.” - Dr. Ashley Montague, Chair of Anthropology, Rutgers Univ.

There is a strange inconsistency in the consideration given to the defenceless of our own species and the degree to which we will support them and compensate for their inadequacy, while exploiting those who are at least as sentient, but happen to be defined as 'not us'.

“We recognize, I hope, our special responsibilities to the aged and infirm, towards the sick, the mentally subnormal and the physically handicapped. We say that such sentient creatures that are less able to care for themselves deserve our special care and support. The same argument applies to children - and we as adults claim we recognize special duties towards them. If this is so, then why do we not recognize our special duties towards individuals from less clever species? - Richard D. Ryder, English scientist, Author

We forestall our own moral development in not including non-human animals in our moral framework:

“The emancipation of men from cruelty and injustice will bring with it in due course the emancipation of animals also. The two reforms are inseparably connected, and neither can be fully realized alone” - Henry S. Salt, wrote Animals' Rights in 1892.

“In an earlier stage of our development most human groups held to a tribal ethic. Members of the tribe were protected, but people of other tribes could be robbed or killed as one pleased. Gradually the circle of protection expanded, but as recently as 150 years ago we did not include blacks. So African human beings could be captured, shipped to America and sold. In Australia, white settlers regarded Aborigines as a pest and hunted them down, much as kangaroos are hunted down today. Just as we have progressed beyond the blatantly racist ethic of the era of slavery and colonialism, so we must now progress beyond the speciesist ethic of the era of factory farming, of the use of animals as mere research tools, of whaling, seal hunting, kangaroo slaughter and the destruction of wilderness. We must take the final step in expanding the circle of ethics.” ~ Peter Singer, Australian professor, Author of 'Animal Liberation'

Making the Decision

“I know that vegetarianism runs against mankind's most casual assumptions about the world and our place within it. And I know that factory farming is an economic inevitability, not likely to end anytime soon. But I don't answer to inevitabilities, and neither do you. I don't answer to the economy. I don't answer to tradition and I don't answer to Everyone. For me, it comes down to a question of whether I am a man or just a consumer. Whether to reason or just to rationalize. Whether to heed my conscience or my every craving, to assert my free will or just my will. Whether to side with the powerful and comfortable or with the weak, afflicted, and forgotten.” ~ Matthew Scully, Dominion

Having considered all the facts, assessing the issue from multiple perspectives rather than any single factor in isolation, I was confronted with three ethical dilemmas:

1. Environmental effects of my diet.

There could be no avoiding my implied responsibility, now that I understood the effects of my own contribution to global warming, environmental degradation, and their significant impacts on the future. Climate change affects human health in multiple ways. Increased extreme weather causes flooding and droughts, which influences food production, water and sanitation. Pathogens that plague humans, livestock and crops spread more widely. WHO⁴⁸ notes that diseases such as cholera, malaria and dengue are especially sensitive to weather and climate changes.

• ⁴⁸World Health Organisation

According to WHO, "Climate change is already causing tens of thousands of deaths every year from shifting patterns of disease, from extreme weather events, such as heat-waves and floods, and from the degradation of water supplies, sanitation, and impacts on agriculture" - and it will get worse if we fail to address the problem. The poor, elderly and children are most vulnerable.

Was it so important that I consume the flesh of non-human animals, knowing that the meat industry was so destructive? Were my gustatory pleasures a worthy trade-off against the resulting natural imbalance and the risk that all life would be compromised? When Chief Seattle said, "We do not inherit the earth from our ancestors; we borrow it from our children", he could not have foreseen how prophetic it would be. For me, it was a sobering thought: what was my personal legacy to the future? Was I part of the problem, or part of the solution? Which are you?

2. Socio-economic effects of my diet on other people.

*"The fact is that there is enough food in the world for everyone. But tragically, much of the world's food and land resources are tied up in producing beef and other livestock - food for the well off - while millions of children and adults suffer from malnutrition and starvation."
- Dr. Walden Bello*

The enormous waste in the meat industry and the fact that scarce resources such as land and water are deployed in order to convert food that could be consumed by many humans (i.e. grains, beans and other plant-based food) into food (meat) that is consumed by a minority but in much smaller quantities because the conversion rate is so poor, coupled to the fact that often poor countries export food for livestock while their own people are starving, gives rise to the second ethical dilemma: Could I live with the fact that by eating meat I was consigning those living on or below the breadline to death? Was I content to continue to support an industry that was not only extraordinarily wasteful, but also contributed to poverty and starvation?

Was I willing to trade my own pleasure for the suffering of others? The simple answer was rhetorical.

3. Effects of meat and dairy on my health

To me, it seems more practical to avoid the causes of disease than use pharmaceuticals or employ medical expertise to reduce the impact of the consumption of meat and dairy, especially given that many of the consequences can only be partially mitigated. Why spend additional money fixing something when one can avoid it entirely by stopping meat and dairy consumption? And why put one's own health at risk for the sake of a socially-conditioned, unnecessary self-indulgence?

4. The increased risk of pandemics via zoonosis

Given the multiple compounding factors – climate change, increased crowding and stress of animals in factory environments, accelerated reduced diversity in industrial facilities – the likelihood of more pandemics, already seen in recent times, makes reduction of or the abolishing of meat consumption in everyone's interests. When the choices of an elitist few have consequences that threaten the lives of others, it becomes an issue of global significance both economically and morally.

5. The effects of my diet on the animals

Whether or not the animal food factory conditions can be improved, there exists a status quo: current practices are cruel on a level that makes slavery look charitable. It means that, in the foreseeable future, nothing much will change. Yes, there have been small changes over time but incremental change implies that the process of exploiting animals for food is justifiable and the more we think like that the more the idea becomes entrenched.

Knowing that the cruelty exists and knowing that most animals, even those in supposed 'free range' conditions, live short, unnatural and brutal lives, meant that I could no longer support the process of exploitation. But even if their conditions could be changed, there was still the fact that

these alien beings, these strange and different creatures, were not mine to subject to my own ends; they had lives that were no less important in their own context, whatever that may be, and I committed an act of significant arrogance in assuming otherwise.

All things considered, it was the right thing to do, whether for the environment, the community, for my own psychological and spiritual well-being, or for the animals themselves, I had to stop consuming animals.

The fact is, if you regard yourself to be a moral agent, and you understand your own complicity in climate change and environmental degradation, your effect on poverty and starvation, and your collusion in cruelty to sentient beings, as well as the associated risks of global pandemics, you must give due consideration to these three ethical dilemmas or abandon the notion of morality. To not contemplate these dilemmas would be cowardly; to do so and still maintain your current behaviours would be immoral, given that the consequences in every case demand action.

"As far as eating is concerned, humans are the most stupid animals on the planet. We kill billions of wild animals to protect the animals that we eat. We are destroying our environment to feed the animals we eat. We spend more time, money and resources fattening up the animals that we eat, than we do feeding humans who are dying of hunger. The greatest irony is that after all the expenses of raising these animals, we eat them; and they kill us slowly. And rather than recognize this madness, we torture and murder millions of other animals trying to find cures to diseases caused by eating animals in the first place." ~ Mike Anderson

Derek du Toit

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