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The Future Of Food
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THE FUTURE OF FOOD: The Environmental Impact of Dietary Choices

Despite an increased awareness about global warming and related environmental issues, the overwhelming effect of dietary choices is usually overlooked. There are numerous reasons for this. The fact that governments ignore the impact of food is predictable, partly because of powerful vested interests within farming and the food industry. Also, there is little public interest in a subject which many regard as further interference by "the nanny state". Top ten tips to reduce your carbon footprint rarely include any advice about changing diets to save the planet. The 2006 eco-documentary *An Inconvenient Truth* was an unexpected hit, but failed to make any connections between diet and climate change. Also, the meat-heavy diet of the film's narrator (Al Gore) typifies a fundamental problem: even the most dedicated eco-warrior can be very selective if a particular course of action doesn't appeal to him. Many people will either reduce their air miles or refuse to fly at all, some drastically reduce how much they use their cars. But we all have to eat; for those in the First World there is a staggering range of choice, and those choices are crucial for the future of the planet.

Food miles (the distance food travels to reach the consumer) are usually highlighted as the major environmental food problem, but this is just one of many factors. A third of all the food bought in Britain today ends up being thrown away. This extraordinary waste is appalling, especially as most of it is perfectly good – it has simply exceeded a largely arbitrary "best by" date. This is a far cry from the situation in World War Two when wasting food was actually illegal, punishable by imprisonment. Since the end of rationing in 1954 food in Britain has gradually lost its value, both financially and symbolically. 35 years ago over 30% of income was spent on food; today it is only about 10%. Supermarkets offer a ridiculous choice of over 26,000 food items, but many of these are endless variations of the same basic product. (E.g., Asda currently stock 88 types of crisps.)

In 2007 the global cattle population exceeded 1.6 billion, taking up an astonishing 25% of the Earth's landmass. Their combined weight exceeds that of the human (6.5 billion) population. Cattle consume vast amounts of grain in a ratio of 10:1 or higher (i.e. ten pounds of grain to produce just one pound of meat). This is the most expensive, inefficient, wasteful and totally unsustainable method of food production ever devised. Crucially, the environmental damage that goes with it is devastating. 40% of the world's total grain harvest is fed to cattle and other livestock. 90% of the total soya harvest and 75% of all EU agricultural land is used for animal feed. While up to a billion humans suffers from chronic hunger and malnutrition, millions in the West are dying from the "diseases of affluence". Rates of heart disease, cancer and obesity are rocketing in the USA and across Europe as consumption of saturated animal fats hit record levels.

Millions of acres of ancient rain forest in Central and South America are being felled and cleared for grazing cattle. It's a tragic irony that this land is poorly suited for this purpose. Within 3 to 5 years the soil is depleted and the cattle ranchers greedily gobble up more virgin forest. Only 2,000 years ago the tropical rain forest belt covered 5 billion acres of the Earth – 12% of the total landmass. Since then humans have destroyed over half of this. "The aesthetic, environmental and commercial impact of razing and burning millions of acres of ancient rain forests to make room for cattle ranching is beyond human calculation." (Jeremy Rifkind: *Beyond Beef*.)

Livestock are responsible for most of the spreading desertification in sub-Saharan Africa and the western rangelands of the US and Australia. There are four main causes.

1. Overgrazing of livestock (35%).
2. Deforestation (30%).
3. Overcultivation of the land (27%).
4. Improper irrigation techniques and other factors (8%).<1>

Meat and dairy production is a primary factor in all of these. The global cattle population are overgrazing and trampling native and non-indigenous grasses. Without flora to anchor the soil, absorb water and recycle nutrients, the land becomes highly vulnerable to wind and water erosion. The loss of topsoil had diminished the productivity of the world's croplands by 29% in the final decade of the 20th Century. 85% of topsoil loss is directly attributable to cattle and feed crop production. These factors are never included in the equation for calculating the real cost of meat. The Worldwatch Institute estimates that each pound of US feedlot (intensively reared) steak costs 35 lbs of eroded topsoil. The replacement of this priceless material is an incredibly slow process – each inch of topsoil takes between

200 and 1,000 years to form under natural conditions. The World Resources Institute (WRI) states that almost 40% of the world's agricultural land is seriously degraded and continuing to intensify production on these areas is unsustainable. Unfortunately, increasing food productivity (at any cost) has been the major goal of the global food industry.

Almost half of the water consumption of the US goes to grow feed for cattle and other livestock. To produce just one pound of grain-fed steak requires hundreds of gallons to irrigate the feed crops. (Statistics vary, but it takes over 5 times the amount of water to feed a meat eater, compared with that used to feed a vegan.<2>) Cattle excrete almost 1 billion tons of organic waste globally each year. Much of this runs off and pollutes essential water supplies. The manure generated by a 10,000-head US feedlot (a massive highly automated system of factory farming) is equal to the human waste generated in a city of 110,000 people. (Cow excrement is highly toxic owing to the appalling cocktail of hormones, antibiotics and mineral supplements in the animal feed.)

‘‘Every pound of grain-fed flesh is secured at the expense of a burned forest, an eroded rangeland, a barren field, a dried up river or stream and the release of millions of tons of carbon dioxide, nitrous oxide and methane." (Jeremy Rifkind: Beyond Beef.) Cow farts are now responsible for a massive amount of methane, a highly potent greenhouse gas many times more damaging than carbon dioxide. Greenhouse gases from the planet's livestock (total 18%) are now more damaging than those produced by all of the world's transport systems (total 13.5%) including cars, trains, planes and ships. (Note – these figures are clearly documented in the UN's 2006 *Livestock's Long Shadow* report.)

The burning of millions of acres of rain forest spews countless tons of CO2 into the heavens. With 70% of all US grain production devoted to livestock feed, the energy burned simply to produce the feed represents another hefty addition to global warming. Furthermore, the use of petro-chemical fertilisers has increased dramatically and this emits nitrous oxide, which now accounts for 6% of greenhouse gases. These whopping emissions are another problem for which the meat industry accepts, as with all the environmental damage it creates, no responsibility whatsoever. In a letter published in *The Independent* (4/1/07) the NFU (National Farmer's Union) actually claimed that: "Extensive livestock production makes a major contribution to the environment & landscape, benefits that actually outweigh its relatively minor contribution to total greenhouse gas emissions."

During the course of the 20th century a shift of monumental proportions – from food grains to feed grains – occurred in world agriculture. (As previously stated: 40% of the world's grain production is wasted as animal feed.) This is a totally new agricultural phenomenon and it has had a more significant effect on the politics of land use and food distribution than any other single factor in modern times. Two thirds of all grain exported from the US goes to feed livestock, not people. The overwhelming problem of "food vs. feed" will create greater divisions in the politics of the relationship between the northern and southern hemispheres. Two thirds of humans (mainly in the south) consume a primarily vegetarian diet. As the human population continues to increase and with so much grain and soya wasted as animal feed, a global food crisis is looming. Crucially, this will also start to affect the rich nations who arrogantly assume that they are immune to any sort of food shortage. Moreover, global meat and dairy production and consumption is increasing. The huge populations of China and India are developing a widespread taste for westernised meat and dairy produce. The traditional Chinese diet has excluded dairy foods, but the increasing consumption of milk, butter and cheese in China will only produce more environmental damage. And the negative health effects of the western diet are already being felt in the big cities of China.

The use of resources to feed the average meat eater is stupefying. A middle-class American in effect consumes over a ton (2000 lbs) of grain each year – 80% of this for feeding livestock. The average Asian adult consumes between 300 and 400 lbs of grain per year; the daily intake of protein is 56 grams of which only 8 grams is animal protein. This contrasts with the American who consumes 96 grams of protein of which 66 is of animal origin. Anyone who follows a vegetarian diet (no meat or fish) will require only 50% of the resources needed to feed the average meat eater. The vegan diet (which excludes all animal produce) means that there is only 25% to 30% usage of resources. A varied vegan diet uses just one fifth of the land needed for a typical European omnivorous diet.<3>

The establishment of a human-made artificial food chain with animal protein at the top has dire consequences for the whole of human and animal kind. The global meat industry continues to expand and devour essential resources with absolutely no regard for the consequences. This is the biggest overall threat to the survivability of the planet owing to the whole range of damage to water supplies, topsoil loss and desertification, rainforest destruction and emission of greenhouse gases. The apparently insatiable appetite for animal produce is disastrous for the planet. Professor of Food Policy

Tim Lang has stated (when he was recently interviewed on R4's *The Food Programme*) that if the demand for animal protein continues at the current rate, we will need six planets to feed an estimated human population of 9 billion in 2050.

Industrial fishing has devastated the world's oceans; numerous species have been depleted to the point of total collapse. Vast nets drag along the seabed and cause incalculable damage. Most of the fish caught are unwanted: either quotas have been exceeded or people won't eat strange fish with unpalatable names. The excess (all dead or moribund) are dumped back into the sea. Only one pound in every 15 actually kept. To counteract this extraordinary destruction, fish farms have been developed. With these systems fish (e.g. salmon) are kept in tanks and fed a diet of pellets and chemicals. Scottish fish farms produce 150,000 tons of farmed salmon per year, but this requires 600,000 tons of wild fish converted into feed pellets. Having devastated the world's fish stocks, the fishing industry has now established another totally unsustainable method of producing fish which requires even further destruction of wild stocks.<4> Also, the environmental damage caused by fish farming is nothing less than disastrous.

The prawn and shrimp industry has rapidly expanded with depressingly predictable consequences for the environment. Prawn trawling echoes the abysmal waste ratio of industrial fishing, 10 pounds of unwanted fish are caught and destroyed for every single pound of high value prawns. Shrimp farms are devastating eco-systems, irrelevant to the 'get rich quick' mentality of an industry which has a very low business start-up cost. The divisions between the northern and southern hemispheres is emphasised by the fact that 99% of all shrimp and prawn comes from the developing world, but virtually all of it is eaten in the US, Europe and Japan.<5>

In conclusion, the future of food is very bleak. We (as a species) cannot continue with such breathtakingly wasteful systems of food production. Fundamental attitudes, from individuals through all social classes to entire nations, must change. And governments must take tough unpopular decisions before it's too late. Realistically, this is highly unlikely. The latest environmental conference (Bali, Dec 2007) was typical of all the recent 'eco-junkets' where delegates stuffed themselves with everything from fillet steak to wild salmon, either ignorant of or oblivious to the fact that every greedy mouthful was simply pushing the planet closer to catastrophe.

<1>United Nations Environment Programme (UNEP), GEO Global Environment Outlook 3 Press Release. www.grida.no/geo/press.htm
<2>Marc Reisner Cadillac Desert: The American West and its Disappearing Water. Penguin (1986). Also D. Pimental et al, Bioscience 42, (1997) pp 97-106.
<3>United Nations Food and Agricultural Organisation (FAO), The State of Food Security in the World (2005).
<4>Naylor, Goldburg, Primavera, Kautsky, Beveridge, Clay, Folkes, Lubchenco, Mooney and Troell. Effect of Aquaculture on World Fish Supplies (2000). Nature 405, pp 1017-1024.
<5>"Prawn Sources". You & Yours Radio 4 (11/1/08).

Other sources, references and books.

- Rifkind, Jeremy. Beyond Beef. Plume (1993).
- Lang, Tim. The Atlas of Food: Who Eats What, Where and Why. Earthscan (2002).
- The Food Programme, Radio 4 (broadcast on Sunday at 12.30pm, repeated on Monday at 4pm).
- UN Food and Agricultural Organisation (FAO). Livestock's Long Shadow (2006).

Note – this article is based on Paul Freestone's talk The Future of Food, first delivered (29/11/07) as part of VERO's regular series of seminars at Mansfield College. This talk will be repeated at a meeting of Oxford Vegetarians at the Friends' Meeting House, St Giles on Friday 7th March 2008 at 7pm. Relevant websites www.vero.org.uk and www.ivu.org/oxveg