### \*BEEF DA\*

### Notes

This is basically just another form of growth bad. So anytime they claim an econ advantage you have a link, like any other turn with this DA you need to win econ collapse doesn’t lead to war.

Also for scenarios I suggest either warming or Antibiotic resistance, the starvation one is ok, but doesn’t have as good of impacts.

I only included a few warming impacts in here, just go to the warming core for more!

### Consumption low now

#### Beef consumption is at an all-time low – lowest point in 50 years.

Zimmerman 2012(Jess Zimmerman is a staff wrter for Grist. Grist is an American non-profit online magazine that has been publishing environmental news and commentary. January 13, 2012. http://grist.org/list/2012-01-12-american-beef-consumption-is-at-a-50-year-low/)hs

According to this graph from the Daily Livestock Report, we are way past Peak Beef. U.S. beef consumption has been dropping for the last 40 years, and projections put it back down at 1950s levels this year, which would mean we're eating less meat than at any time in the last 50 years. Americans are eating a lot less meat overall, but beef and to a lesser extent pork have seen the biggest reductions — which is cool, because cattle and pigs are the most resource-intensive livestock.¶ Tom Laskawy speculates about the causes for the drop-off:¶ What really struck me was how this latest news mirrors the trend in consumer attitudes on meat-eating uncovered by the food industry's own market research. It turns out that since 2007, there has also been a 12 percent drop in the number of consumers who report that they have "no problem" eating meat or dairy (a bare majority of respondents currently feel that way).

#### US meat consumption is continually decreasing the SQ

Larsen 12 (Janet Larsen is the Director of Research and one of the incorporators of the Earth Policy Institute, an independent environmental research organization based in Washington, DC. March 7, 2012. <http://www.earth-policy.org/data_highlights/2012/highlights25>) hs

U.S. meat consumption has peaked. Data from the U.S. Department of Agriculture show that meat eating across the country fell from the 2004 high point of 184 pounds (83 kilograms) per person to 171 pounds in 2011. Early estimates for 2012 project a further reduction in American meat eating to 166 pounds, making for a 10 percent drop over the eight-year period. For a society that lives high on the food chain, this new trend could signal the end of meat’s mealtime dominance.¶ Total U.S. meat consumption peaked in 2007 at 55 billion pounds and has fallen each year since. In 2012, consumption is expected to drop to 52 billion pounds, the lowest level in more than a decade.¶ After years of increasing consumption, Americans began cutting back on beef in the 1970s as health and cost concerns about red meat pushed people toward poultry. Falling from the 1976 peak of 91 pounds, beef eating per person is projected to sink to 52 pounds in 2012, a –43-percent drop off the high. The national beef cattle herd is now smaller than it has been in any year since 1962. The record heat and drought that desiccated grazing lands and curtailed hay production in the Southern Plains in 2011 has led to further culling of herds as well as a mass movement of cattle from drought-ridden Texas to Nebraska.

#### Beef consumption low now

Davis 2011 (Meredith Davis is a staff writer for Reuters. December 2011. http://www.reuters.com/article/2011/12/22/us-usa-beef-consumption-idUSTRE7BL1MI20111222)hs

For the past decade, cattle ranchers and meat packers watched with despair as America's beef consumption steadily declined, ceding ground to leaner meats as well as vegetarian trends among the health-conscious.¶ Most recently, high unemployment in the world's wealthiest nation had cash-strapped Americans avoiding restaurants where beef is a common entree and had them switching to lower cost non-meat dishes at home.¶ USDA estimates 2011 U.S. per capita beef consumption at 57.4 lbs, down 13 percent from 10 years ago and down about 25 percent from 1980. In 2012, USDA predicts, Americans will eat 54.1 lbs of beef on average.¶ The beef industry is coping with these changes by developing new cuts that will satisfy appetites for steaks but at a lower cost. Also, it has benefited from a huge recovery in beef exports particularly to Asia and Russia, where consumers are upgrading their diets and concerns about mad cow disease fade.¶ Beef companies, like Tyson Foods, JBS, Cargill, and National Beef, are carving up beef carcasses in interesting new ways. Carcass portions that were once meant for ground meat or roasts, such as rounds and chucks, are now sliced into cheaper cuts of steaks for the American palate.

#### Americans are consuming less meat now

Grandoni 2012 (Dino Grandoni is a staff writer for the Atlantic Wire. January 11, 2012. http://www.theatlanticwire.com/national/2012/01/americans-are-eating-less-meat/47295/)hs

According to U.S. Department of Agriculture, meat consumption's predicted to go down 12.2 percent between 2007 and 2012, so we have something to ask our "red-blooded" compatriots: How has our once meat-loving nation become so un-American? The Daily Livestock Report recently pulled together five decades of USDA meat data to show that meat consumption is down for all types of delicious dead animal parts. "That should come as no surprise to industry observers but the cumulative reductions of the past few years are rather shocking in historical context." It is shocking to us meat-lovers at this end of the sausage-making machine. Though beef consumption per capita has been on a big overall decline since the mid-'70s (despite the National Livestock and Meat Board declaring that beef is for dinner in 1992), consumption in every meat category -- beef, broliers (chicken), pork, and turkey -- has decreased since 2007, marked off by the black vertical line.¶ So what gives? According to the Daily Livestock Report, which is prepared for commodity traders, a host of economic factors -- such as increased meat exports, higher feed costs due to ethanol production, and high oil prices -- have made meat too pricy for Americans to gorge themselves on like they used to. There's also been a "war on meat protein consumption for many years," we're told. But as much as we like meat, we don't think the federal government's nefariously trying to take the meat off of our dinner plates. Mark Bittman at The New York Times agrees. He counters that if anything, the government props up the meat industry by issuing subsidies for livestock feed, buying up unsold meat, and turning a blind eye to the ethics and environmental costs killing all those tasty animals.

#### The recession has tanked the global beef consumption, hitting the US beef industry the hardest, which is the largest global producer.

Bloomberg, 2009. (Aya Takada, “U.S. May Miss Beef Export Target on Global Recession (Update1)”, June 25 2008, Bloomberg, http://www.bloomberg.com/apps/news?pid=20601087&sid=aaJBmKr4Ywp8.)

Beef exports from the U.S., the world’s largest producer, may miss a 7 percent growth forecast made by an industry group for this year as the global recession spurs consumers to cut spending on expensive foods. ¶ “We saw record increases in market share last year for both pork and beef, but with recession in place now, it will be more difficult to get to that 7 percent growth,” Mark Jagels, executive committee member of the U.S. Meat Export Federation, said yesterday in an interview in Tokyo. ¶ Slower-than-forecast exports may curb cattle prices in Chicago and erode earnings of producers such as Tyson Foods Inc. as the recession saps export and domestic demand. The World Bank said this week the global economy will contract 2.9 percent this year compared with a previous forecast for a 1.7 percent decline. U.S. feedlot managers slashed purchases of young cattle by 12 percent last month, according to a Bloomberg News survey. ¶ “It’s not just a U.S. problem as all markets have experienced a reduction in demand for beef, particularly the prime cuts,” said Wendy Voss, a Melbourne-based senior analyst at food and agribusiness banking specialist Rabobank Groep NV. ¶ Cattle futures traded at 82.525 cents a pound on the Chicago Mercantile Exchange at 5:33 p.m. Tokyo time. Prices slumped to the lowest since June 2006 on March 30 and lost 21 percent in the past year. ¶ Taking Months ¶ “We haven’t seen any signs yet” of recovery in U.S. beef consumption, Terri Carstensen at the Iowa Beef Industry Council said yesterday in the same interview in Tokyo. “It will take more months.” ¶ The federation forecast on March 5 that U.S. beef exports, including offal, may climb to 1 million metric tons this year as consumers in Japan and South Korea seek cheaper alternatives to domestic meat and as the dollar’s drop could make U.S. supplies more affordable to foreign buyers. ¶ Mexico and Canada were the largest export markets for U.S. beef last year. Jagels declined to say which markets were performing below expectations so far this year. ¶ Tyson Foods, based in Springdale, Arkansas, said May 4 its net loss widened to $104 million in its fiscal second quarter as sales of beef declined 11 percent. ¶ U.S. Wheat Associates Inc. President Alan Tracy said June 15 that world wheat consumption may rise as some consumers shift from meat to cereals amid the economic slowdown.¶

### Link–Decreased Income

#### Economic problems stop people from buying more meat

The New York Times 2012 ( January 10, 2012. http://opinionator.blogs.nytimes.com/2012/01/10/were-eating-less-meat-why/)hs

But that’s changing, and considering the fairly steady climb in meat consumption over the last half-century, you might say the numbers are plummeting. The department of agriculture projects that our meat and poultry consumption will fall again this year, to about 12.2 percent less in 2012 than it was in 2007. Beef consumption has been in decline for about 20 years; the drop in chicken is even more dramatic, over the last five years or so; pork also has been steadily slipping for about five years.¶ Holy cow. What’s up?¶ It’s easy enough to round up the usual suspects, which is what a story in the Daily Livestock Report did last month. It blames the decline on growing exports, which make less meat available for Americans to buy. It blames it on ethanol, which has caused feed costs to rise, production to drop and prices to go up so producers can cover their increasing costs. It blames drought. It doesn’t blame recession, which is surprising, because that’s a factor also.¶ All of which makes some sense. The report then goes on to blame the federal government for “wag[ing] war on meat protein consumption” over the last 30-40 years.¶ Is this like the war on drugs? The war in Afghanistan? The war against cancer? Because what I see here is:¶ a history of subsidies for the corn and soy that’s fed to livestock¶ a nearly free pass on environmental degradation and animal abuse¶ an unwillingness to meaningfully limit the use of antibiotics in animal feed¶ a failure to curb the stifling power that corporate meatpackers wield over smaller ranchers¶ and what amounts to a refusal — despite the advice of real, disinterested experts, true scientists in fact — to unequivocally tell American consumers that they should be eating less meat¶ Or is the occasional environmental protection regulation and whisper that unlimited meat at every meal might not be ideal the equivalent of war? Is the U.S.D.A. buying $40 million worth of chicken products to reduce the surplus and raise retail prices the equivalent of war?¶ No. It’s not the non-existent federal War on Meat that’s making a difference. And even if availability is down, it’s not as if we’re going to the supermarket and finding empty meat cases and deli counters filled with coleslaw. The flaw in the report is that it treats American consumers as passive actors who are victims of diminishing supplies, rising costs and government bias against the meat industry. Nowhere does it mention that we’re eating less meat because we want to eat less meat.

#### Poor economy leads to cuts in beef consumption

Kaye 2012 (Leon Kaye is a freelance writer, sustainability consultant and the editor of GreenGoPost.com. He also contributes to Guardian Sustainable Business. March 14 2012. http://www.triplepundit.com/2012/03/meat-consumption-united-states/)hs

The majority of us are still loathe to replace meat and potatoes with lentils and quinoa, but the United States’ meat consumption has declined in recent years. According to the U.S. Department of Agriculture, the average meat intake for Americans peaked at 184 pounds (84.5 kilograms) a person in 2004. By 2011, that amount dropped to 171 pounds, and projections for 2012 indicate even more of a decrease to 166 pounds per person this year.¶ So what is going on? A convergence of forces are at work: a bad economy has forced families to cut back on their food expenditures; concurrent rising prices due to the increased costs of energy and commodities; and concerns over health, the environment, animal welfare and industrial meat production.

#### Demand for beef grows when incomes improve

Mintert 2002 (James Mintert is a proessor and extension state leader for the department of agricultural economics at Kansas State University. 2002. http://ag.arizona.edu/arec/wemc/cattlemarket/Focusonbeefdemand.pdf)hs

Because there is considerable confusion¶ surrounding demand, it is useful to stipulate what¶ beef demand is not. Beef demand is not per capita¶ beef consumption. Per capita consumption is beef¶ production (net of changes in cold storage, imports,¶ and exports) divided by population. Observing per¶ capita consumption over time without consideration¶ of price provides little information regarding beef¶ demand. Beef demand is not beef’s relative share of¶ total meat consumption. This share concept simply¶ reflects production of beef relative to production of¶ competing meats and does not include information¶ regarding prices. Finally, beef demand is not the¶ share of consumer income spent on beef. Consumer¶ income level affects beef demand, but changes in the¶ share of consumer income spent on beef do not¶ provide a measure of whether beef demand is¶ increasing or decreasing since changes in income¶ alone can cause changes in the share of consumer¶ income spent on beef, even if beef demand remains¶ unchanged.¶ Since many beef demand determinants, as well¶ as beef production, change at the same time, it is¶ impossible to accurately assign relative demand shifts¶ to individual demand determinants through casual¶ observation of trends and beef demand shifts. As a¶ result, a meat demand system was estimated using¶ quarterly time series data over the 1982 to 1998¶ period. The system included factors accounting for¶ prices of competing meats and total consumer¶ expenditures, changing consumer demographics,¶ food safety problems, health information, and¶ seasonality. The impacts of individual demand¶ determinants on beef demand were calculated each¶ year from 1992 through 1998.¶ Model results indicate beef demand is inelastic¶ with respect to beef price and that pork and poultry¶ are weak substitutes for beef. Over 1982 to 1998, on¶ average, beef quantity demanded declined 0.61¶ percent given a 1 percent increase in beef price.¶ Responses to competing meat price changes were¶ much smaller as beef quantity demanded increased¶ 0.04 percent and 0.02 percent, given a 1 percent¶ increase in retail pork and poultry prices,¶ respectively. These elasticity estimates indicate¶ relative prices matter, however, per capita beef¶ consumption was not highly responsive to changes in¶ pork and poultry prices. Moreover, beef expenditures¶ represent a progressively smaller proportion of total¶ consumer expenditures. This implies beef demand¶ will become even more inelastic (i.e., quantity¶ demanded will be less responsive to price changes) in¶ the future. This result, taken together with findings¶ from other consumer research indicates many¶ consumers are willing to pay for a high quality¶ product (i.e., price is less of an issue if quality is¶ high). As a result, consideration should be given to¶ devoting resources to research focusing on quality¶ (especially tenderness) measurement. Making it¶ easier for consumers to select the quality product¶ they desire will encourage consumers to buy beef.¶ Beef demand was highly responsive to changes¶ in total per capita expenditures on all goods. Changes¶ in total per capita expenditures occur when personal¶ disposable income increases, consumer willingness to¶ spend income increases, or a combination of the two.¶ Consumer willingness to spend a larger proportion of¶ total income has been an important source of¶ economic growth for the U.S. economy in recent¶ years. For example, consumer expenditures rose from¶ less than 90 percent of disposable income in the early¶ 1980s to near 98 percent by 1999. Demand model¶ results indicate beef demand increases 0.90 percent¶ for a 1 percent increase in total per capita¶ expenditures. This means beef demand was a major¶ beneficiary of increasing consumer expenditures, but¶ if consumers choose to increase savings in the future¶ (in lieu of consumption), or if disposable income¶ declines, it will have a negative impact on beef¶ demand.

#### Improving the economy leads to an increase in beef demand

Mintert 2002 (James Mintert is a proessor and extension state leader for the department of agricultural economics at Kansas State University. 2002. http://ag.arizona.edu/arec/wemc/cattlemarket/Focusonbeefdemand.pdf)hs

Although it is not clear exactly what drove the¶ recent improvement in beef demand, some inferences¶ can be drawn. First, changes in competing meat¶ prices since 1998 do not explain the demand shift. If¶ all else is held constant, an increase in inflationadjusted¶ competing meat prices would lead to an¶ increase in beef demand as consumers would shift¶ their consumption away from relatively higher priced¶ competing meats towards relatively lower priced¶ beef. But from 1998 to 2001 inflation-adjusted¶ broiler prices declined 5.5 percent. Retail pork and¶ turkey prices increased just 2.2 and 1.5 percent,¶ respectively, so most of the beef demand increase¶ was not attributable to changes in competing meat¶ prices.¶ Second, growth in the U.S. economy¶ contributed to the improvement in beef demand.¶ Inflation-adjusted per capita disposable personal¶ income grew by about 3.7 percent from 1998 to 2001.¶ Demand model results indicate that consumer income¶ is an important determinant of beef demand. So, the¶ rise in income contributed to the beef demand¶ increase.

#### Income has a large effect of beef consumption

Gossard and York 2003 (Marcia Hill Gossard works at Department of Sociology at Washington State University and Richard York works at the Department of Sociology at University of Oregon. Human Ecology Review, Vol. 10, No. 1, 2003. <http://www.humanecologyreview.org/pastissues/her101/101gossardyork.pdf>)s

Social class appears to have a substantial influence on¶ meat consumption. Those in laborer occupations eat both¶ more beef and total meat than those in either service or professional¶ occupations.8 Furthermore, education is inversely¶ related to beef and total meat consumption (i.e., people with¶ more education eat less beef and total meat).9 Interestingly,¶ income does not influence total meat consumption.10 Beef¶ consumption, however, does appear to rise with income,¶ which may possibly be explained by the price of beef relative¶ to other types of food. Taken together, these findings support¶ the argument that eating habits reflect an individual’s class¶ position (see Bourdieu 1984).¶ The location of residence also appears to have a substantial¶ influence on the meat consumption habits of individuals.¶ Midwesterners eat considerably more beef and total¶ meat than people in other regions,11 and urbanites eat less¶ beef (but not total meat) than non-urban residents. These differences¶ in meat consumption could simply be explained by¶ the availability and price of meat in different locations, or¶ they could reflect regional cultural differences.

#### Growth in the US economy causes demand in the beef industry

Mintert et al 2009 (James Mintert, Professor Dept. of Agricultural Economics at Kansas State University, Glynn Tonsor¶ Assistant Professor Dept. of Ag., Food, and Resource Economics at Michigan State University and Ted Schroeder Professor in the Dept. of Agricultural Economics at Kansas State University. January 2009. http://www.beefboard.org/news/files/factsheets/Beef\_Demand\_Drivers\_January\_2009.pdf)hs

Large shifts in domestic beef demand have had substantial impacts on the beef industry. Before the late 1970s, growth in the U.S. economy and rising consumer incomes contributed to beef demand increasing for a sustained period. In response to growing product demand, the beef industry increased in size. However, starting about 1980, domestic retail beef demand weakened and subsequently declined every year through 1998. The long-run decline in retail beef demand contributed to a reduction in cattle industry size, particularly in relation to competing meat sectors such as poultry and pork. In 1999, following nearly 20 consecutive years of decline, domestic beef demand began to strengthen. From the late 1990s through 2004, the all fresh domestic retail beef demand index increased from a low of 76 to a peak of 92, before weakening again from 2005 through 2008.¶ Designing programs to increase domestic retail beef demand requires a comprehensive understanding of the many underlying factors that caused beef demand to decline precipitously during the 1980s and 1990s. Likewise, it is important to determine what caused recent beef demand increases from the late 1990s through the middle part of this decade. Increasing consumer demand for beef requires concerted effort by all vertical segments of the production, processing, and marketing chain as there are myriad opportunities to improve product quality, food safety, and diversity of product offerings. How the industry collectively responds to these challenges will ultimately determine the success or failure of demand enhancement initiatives.¶ The purpose of this study was to provide a comprehensive and updated assessment of factors influencing U.S. consumer demand for beef. To assess the relative impact various factors have on beef demand, a demand model was built to estimate the impacts of beef, competing meat, and other goods prices; consumer expenditures; published information on food safety, health and nutrition information related to meat consumption; female labor force participation; and expenditures on food consumed away from home. Quarterly data from 1982 through 2007 were used to estimate the model. Estimates obtained from the model provide measures of expected impacts from changes in each of the demand drivers. This fact sheet focuses on the impact of key demand drivers on U.S. consumer demand for beef and what these results mean for the U.S. beef industry.¶ Consumer income increased steadily from the early 1980s through 2007, averaging about 6 percent compound annual growth. Personal consumption expenditures grew even more rapidly than income during this time as consumers consistently reduced their personal savings rate (Figure 1). In the early 1980s, personal savings ranged from about 8 to 12 percent of disposable income, but the savings rate declined steadily and by 2007 averaged less than 1 percent. This is important because it reveals that consumers were allocating nearly all of their income to living expenses with little money left for savings by late 2007, just as the U.S. economy was entering a recession.¶ Demand model results reveal beef demand is very responsive to changes in consumer expenditures on goods and services. On average, a 1 percent increase in U.S. consumer total expenditures results in a 0.9 percent increase in the quantity of beef demanded. Results indicate that from 1982 through 2007, beef demand benefitted from increases in consumer incomes and from consumer willingness to increase consumption expenditures even more rapidly than income was increasing. In other words, the beef demand decline experienced from 1980 through 1998 would have been even more severe if incomes were not growing and consumers were not reducing personal savings rates during this time.¶ Looking ahead, weakness in the U.S. macroeconomic¶ outlook for 2009 suggests that a decline in per¶ capita consumer income can be expected. Moreover, the¶ impact of weaker consumer income is expected to be¶ compounded by consumers’ desire to increase savings in¶ response to uncertainty and risk present in the financial¶ and real estate markets. An increase in consumer savings¶ means consumption expenditures will decline even¶ more rapidly than income and, given the importance¶ of consumer expenditures, a decline in U.S. retail beef¶ demand is likely during 2009. Longer term, it is unlikely that domestic beef demand will rebound until the U.S. economy strengthens and consumers regain enough¶ confidence to spend more of their income. Since the beef¶ industry can do little to dampen the industry-wide effect¶ of this macroeconomic demand determinant, it will be¶ important to focus resources in areas where noticeable¶ impacts are possible.

### IL – Warming

#### Livestock is a main cause of warming – increases deforestation, CO2, methane, and nitrous oxide.

Walsh 2009 (Bryan Walsh is a staff writer for Time Magazine. 2009. http://www.time.com/time/health/article/0,8599,1839995,00.html)hs

By the numbers, Pachauri is absolutely right. In a 2006 report, the U.N. Food and Agriculture Organization (FAO) concluded that worldwide livestock farming generates 18% of the planet's greenhouse gas emissions — by comparison, all the world's cars, trains, planes and boats account for a combined 13% of greenhouse gas emissions. Much of livestock's contribution to global warming come from deforestation, as the growing demand for meat results in trees being cut down to make space for pasture or farmland to grow animal feed. Livestock takes up a lot of space — nearly one-third of the earth's entire landmass. In Latin America, the FAO estimates that some 70% of former forest cover has been converted for grazing. Lost forest cover heats the planet, because trees absorb CO2 while they're alive — and when they're burned or cut down, the greenhouse gas is released back into the atmosphere.¶ ¶ Then there's manure — all that animal waste generates nitrous oxide, a greenhouse gas that has 296 times the warming effect of CO2. And of course, there is cow flatulence: as cattle digest grass or grain, they produce methane gas, of which they expel up to 200 L a day. Given that there are 100 million cattle in the U.S. alone, and that methane has 23 times the warming impact of CO2, the gas adds up.¶

#### Meat consumption takes a serious toll on the environment – creates tons of greenhouse gas emissions

Sarasota 2011 (Jason K., Sarasota is a writer for Scientific American. December 28, 2011. <http://www.scientificamerican.com/article.cfm?id=meat-and-environment>. http://www.scientificamerican.com/article.cfm?id=meat-and-environment)hs

Our meat consumption habits take a serious toll on the environment. According to the Environmental Working Group (EWG), the production, processing and distribution of meat requires huge outlays of pesticides, fertilizer, fuel, feed and water while releasing greenhouse gases, manure and a range of toxic chemicals into our air and water. A lifecycle analysis conducted by EWG that took into account the production and distribution of 20 common agricultural products found that red meat such as beef and lamb is responsible for 10 to 40 times as many greenhouse gas emissions as common vegetables and grains.¶ Livestock are typically fed corn, soybean meal and other grains which have to first be grown using large amounts of fertilizer, fuel, pesticides, water and land. EWG estimates that growing livestock feed in the U.S. alone requires 167 million pounds of pesticides and 17 billion pounds of nitrogen fertilizer each year across some 149 million acres of cropland. The process generates copious amounts of nitrous oxide, a greenhouse gas 300 times more potent than carbon dioxide, while the output of methane—another potent greenhouse gas—from cattle is estimated to generate some 20 percent of overall U.S. methane emissions.

#### Meet production is one of the largest causes of CO2 emissions

Fiala 2009 (Nathan Fiala is a staff writer for the Scientific American. 2009. http://www.scientificamerican.com/article.cfm?id=the-greenhouse-hamburger) hs

Most of us are aware that our cars, our coal-generated electric power and even our cement factories adversely affect the environment. Until recently, however, the foods we eat had gotten a pass in the discussion. Yet according to a 2006 report by the United Nations Food and Agriculture Organization (FAO), our diets and, specifically, the meat in them cause more greenhouse gases carbon dioxide (CO2), methane, nitrous oxide, and the like to spew into the atmosphere than either transportation or industry. (Greenhouse gases trap solar energy, thereby warming the earth's surface. Because gases vary in greenhouse potency, every greenhouse gas is usually expressed as an amount of CO2 with the same global-warming potential.)¶ The FAO report found that current production levels of meat contribute between 14 and 22 percent of the 36 billion tons of "CO2-equivalent" greenhouse gases the world produces every year. It turns out that producing half a pound of hamburger for someone's lunch a patty of meat the size of two decks of cards releases as much greenhouse gas into the atmosphere as driving a 3,000-pound car nearly 10 miles.

#### Production of beef creates tons of emissions – creates more than cars

Sample 2007 (Ian Sample is a staff writer for the Guardian. 2007. http://www.guardian.co.uk/environment/2007/jul/19/climatechange.climatechange)hs

Producing 1kg of beef results in more CO2 emissions than going for a three-hour drive while leaving all the lights on at home, scientists said today.¶ A team led by Akifumi Ogino at the National Institute of Livestock and Grassland Science in Tsukuba, Japan, trawled through data on aspects of beef production including calf raising, animal management and the effects of producing and transporting feed.¶ They are calling for an overhaul of the beef industry, after their audit revealed producing the meat caused substantial amounts of greenhouse gases and other pollutants.¶ Most of the greenhouse gas emissions are emitted in the form of methane from belching cattle, but the meat production process also releases fertilising compounds that can wreak havoc in river and lake ecosystems.¶ The study, which is published in today's New Scientist magazine, shows that the production of 1kg of beef releases greenhouse gases with a warming potential equivalent to 36.4kg of carbon dioxide.¶ The production process also led to fertilising compounds equivalent to 340g of sulphur dioxide and 59g of phosphate, and consumed 169 megajoules of energy.¶ Over two-thirds of the energy is spent on producing and moving cattle feed.¶ The emissions are equivalent to the amount of CO2 released by an average car every 160 miles, and the energy consumption is equal to a 100W bulb being left on for 20 days, says New Scientist.¶ But the total environmental impact will be higher than the study suggests because the calculations do not include emissions from managing farm equipment and transporting the meat.¶

### IL – Deforestation

#### Beef production is one of the largest reasons for deforestation – that leads to global warming.

UCS 6/28 (Jun 28 2012. The Union of Concerned Scientists is the leading science-based nonprofit working for a healthy environment and a safer world. UCS combines independent scientific research and citizen action to develop innovative, practical solutions and to secure responsible changes in government policy, corporate practices, and consumer choices. http://www.energybulletin.net/stories/2012-06-30/report-links-beef-production-deforestation-threats-climate-and-health)hs

Cattle ranching requires large tracts of land. In Brazil—the biggest net exporter of meat in the world—and other Latin American countries, ranchers clear-cut tropical forests to provide pasture land for their herds. This contributes to global warming in two ways. First, when ranchers cut down trees, much of the carbon they store goes into the atmosphere. Second, grazing cattle produce methane—a powerful gas that has 23 times the warming effect of carbon—which is released from their stomachs and manure.¶ Tropical deforestation is responsible for about 15 percent of the world’s heat-trapping emissions—more carbon pollution than the emissions from every car, truck, plane, ship and train on Earth. As demand for beef goes up, so too does deforestation.¶ And conversely, because beef production is a global market, as the demand for beef is reduced in the United States or anywhere else, the price of beef will decline and the incentives to deforest for beef production will also be reduced.¶ “There are many tasty alternatives to the beef hamburger” said Boucher. “Why not try spare ribs, a pulled pork sandwich, a turkey burger, chicken kebabs, or a veggie burger? If you want fewer cancers, less heart disease, more forests, and less global warming, eat less beef.”¶ Note: “Grade A Choice?” is the second in series of reports highlighting the major causes of deforestation. The first report, “Recipes for Success,” analyzed the connection between vegetable oils and deforestation. The third report, about the wood products industry, is expected this fall.¶ Producing meat, especially beef, requires large amounts of land. Global meat consumption has increased in recent years—and much of the new land for meat production has come from clearing tropical forests. This trend is a leading driver of deforestation and a significant contributor to global warming emissions.¶ Beef in particular requires vastly more land than meats like chicken and pork, which use much less land to produce the same amount of protein. Thus a simple diet shift from beef toward chicken would greatly reduce the pressure on land and the resulting pressure for deforestation. Even without a dietary shift, a variety of other practical solutions can help significantly reduce the impacts of meat production.

#### Beef production is a main cause of deforestation

Kamel 7/6 (Yasmine Kamel is a staff writer for Intellectualyst. Intellectualyst is a new e-newspaper built on the ideas that the world needs change and progress to grow, and that thinking critically about who we are and what we do are the tools for that change July 6, 2012. http://intellectualyst.com/scientists-say-reducing-beef-consumption-can-help-save-the-planet-192/)hs

Since beef production requires massive amounts of land for pasture, it is a powerful driver of deforestation. Newly cleared forest land tends to have soil of poor quality which is not conducive to growing crops. That land becomes profitable when sold to meat producers as pasture, thus providing high incentive to ranchers in the Amazon to sell and allow deforestation while growing consumer demand for beef encourages expansion of the beef industry. In a press release about the report the UCS underscores effects of deforestation and its connection to the beef industry, “Tropical deforestation is responsible for about 15 percent of the world’s heat-trapping emissions—more carbon pollution than the emissions from every car, truck, plane, ship and train on Earth. As demand for beef goes up, so too does deforestation.”

#### Meat consumption leads to water pollution and deforestation

Sarasota 2011 (Jason K., Sarasota is a writer for Scientific American. December 28, 2011. <http://www.scientificamerican.com/article.cfm?id=meat-and-environment>. http://www.scientificamerican.com/article.cfm?id=meat-and-environment)hs

Our meat consumption habits also cause other environmental problems. A 2009 study found that four-fifths of the deforestation across the Amazon rainforest could be linked to cattle ranching. And the water pollution from factory farms (also called concentrated animal feeding operations or CAFOs)—whereby pigs and other livestock are contained in tight quarters—can produce as much sewage waste as a small city, according to the Natural Resources Defense Council (NRDC). Further, the widespread use of antibiotics to keep livestock healthy on those overcrowded CAFOs has led to the development of antibiotic-resistant strains of bacteria that threaten human health and the environment in their own right.

### IL – BioD

#### Beef consumption is directly tied to a massive loss of biodiversity.

Dauvergne 8 (Peter, Professor of Political Science and Canada Research Chair in Global Environmental Politics at the University of British Columbia, The Shadows of Consumption, p. 166, AD: 7-7-9)

Consuming so much meat is casting ecological shadows over rural ecosystems, global water and food supplies, tropical rainforests, and the earth’s climate. Billions of animals are multiplying their numbers on industrial farms. To produce more meat more efficiently, feedlots are flooding local ecosystems with antibiotics, hormones, and animal waste. Plantations for animal feed like corn and soybeans are relying on genetically modified seeds as well as on chemical pesticides and fertilizers to ensure cheap crop surpluses. With the technical and financial assistance of multinational corporations, plantations and ranches in places like the Brazilian Amazon are clearing rainforests—hotspots of biodiversity—to increase exports of cattle and soybeans for beef consumers worldwide, from Canada to Chile to Europe to Egypt to China.

#### Beef consumption destroys the environment and global biodiversity.

Dauvergne 8 (Peter, Professor of Political Science and Canada Research Chair in Global Environmental Politics at the University of British Columbia, The Shadows of Consumption, p. 166, AD: 7-7-9)

Producing so much beef involves many ecological costs. Farmers are tilling land with pesticides and fertilizers to grow enough grain to fatten cattle quickly. Waste from feedlots is polluting local waterways and air. Growth hormones are tainting food chains, and antibiotics are flowing through ecosystems. The nutritional value of beef is inconsistent and declining in some places. Ranches and feed crops like soybeans are deforesting biodiversity hotspots like the Amazon. And grazing, fattening, and slaughtering billions of cattle every few years is depleting water supplies and emitting vast quantities of greenhouse gases like methane, nitrous oxide, and carbon dioxide.

#### Beef production massively contributes to climate change and destroys global biodiversity.

Dauvergne 8 (Peter, Professor of Political Science and Canada Research Chair in Global Environmental Politics at the University of British Columbia, The Shadows of Consumption, p. 166, AD: 7-7-9)

Industrial ranching has other consequences for the global environment. The artificial feed leaves the cattle bloated and, without antimicrobial drugs, often sick. Belching and flatulent livestock now account for one-quarter to one-third of worldwide methane emissions from human-related activities. Meanwhile, decomposing manure emits nitrous oxide, which, like methane, is a primary greenhouse gas driving climate change. Most of the energy to raise cattle (growing grain for feed), to process the carcasses (running the slaughterhouses), and to distribute beef (trucking and refrigerating) is generated by burning fossil fuels, which adds still more to global emissions of carbon dioxide. Livestock and livestock waste as a whole contribute to somewhere between 5 and 10 percent of global greenhouse gas emissions. Fattening cattle in feedlots in particular tends to produce large amounts of carbon dioxide—by one analysis, more than twice as much as grazing them on open range-or pastureland. Burning down forests to create pastures in places like the Amazon is also an increasingly large source of carbon dioxide emissions—and an increasingly serious threat to biodiversity.

### IL – Methane

#### Beef production leads to an increase of methane

Kamel 7/6 (Yasmine Kamel is a staff writer for Intellectualyst. Intellectualyst is a new e-newspaper built on the ideas that the world needs change and progress to grow, and that thinking critically about who we are and what we do are the tools for that change July 6, 2012. http://intellectualyst.com/scientists-say-reducing-beef-consumption-can-help-save-the-planet-192/)hs

Beef production doesn’t only require more land to produce, it also yields more waste. During their digestive process cattle produce methane, which the report defines as “a potent heat trapping gas that exits the cow from both ends and causes about 23 times as much global warming per molecule as carbon dioxide.” The report adds that cattle also produce large amounts of manure which is an additional source of methane and a leading cause of water pollution. The US Department of Agriculture estimates that US livestock and poultry generate 63.8 tons of manure every year.¶ Since the 1800s meat production has increase by 25 times, and since the 1960s meat consumption has tripled, with the US today consuming more than 120 KG (264.5 lbs) of meat per capita. The USDA valued the American cattle and beef industry at $74 billion in 2010. The UCS report concludes with suggested solutions to the climate effects of meat production. Among them, that meat producers exhaustively use land already deforested and acquired, and that policy makers eliminate subsidies or any tax incentives that encourage beef production on new lands. The report emphasizes the influence of increasing global demand for beef and urges consumers to shift from beef as a staple in their diet.

### IL – Environment Laundry List

#### Beef production creates a laundry list of problems – soil erosion, water pollution, loss of BioD, and warming.

Gossard and York 2003 (Marcia Hill Gossard works at Department of Sociology at Washington State University and Richard York works at the Department of Sociology at University of Oregon. Human Ecology Review, Vol. 10, No. 1, 2003. <http://www.humanecologyreview.org/pastissues/her101/101gossardyork.pdf>)s

The environmental literature identifies industrial meat¶ production as a leading cause of many ecological problems¶ (Durning and Brough 1991; Ehrlich, Ehrlich and Daily 1995;¶ Goodland 1997; Pimentel and Pimentel 1996; Rifkin 1992;¶ Subak 1999). Modern, intensive meat production places a¶ burden on ecosystems since it requires the use of large quantities¶ of natural resources — particularly land, energy, and¶ water used to produce feed grain (Durning and Brough 1991;¶ Dutilh and Kramer 2000; Fiddes 1991). Relative to the production¶ of grain and other vegetable matter for human consumption,¶ meat production is extremely resource inefficient¶ — several times more people can subsist on a vegetarian diet¶ than can on a meat centered diet (Durning and Brough 1991;¶ Dutilh and Kramer 2000; Ehrlich, Ehrlich and Daily 1995;¶ Lappé 1991; Rifkin 1992).¶ Beef production is particularly resource intensive, having¶ an even greater impact on the environment than is suggested¶ by the amount of grain — and the resources that go¶ into producing grain — that it requires (Subak 1999).¶ Livestock grazing contributes to many environmental problems¶ including soil erosion, desertification, water pollution,¶ and loss of biological diversity (Durning and Brough 1991;¶ Ehrlich, Ehrlich and Daily 1995; Pimentel and Pimentel¶ 1996; Rifkin 1992). For example, millions of acres of tropical¶ forest in Latin America have been cleared for cattle grazing¶ (Durning and Brough 1991; Harrison and Pearce 2000;¶ Myers 1981). Additionally, due to their digestive physiology,¶ cattle also emit a large quantity of methane, a greenhouse¶ gas, and their manure expels gaseous ammonia into the air,¶ contributing to acid rain (Durning and Brough 1991;¶ Harrison and Pearce 2000; Subak 1999).

### IL – Starvation

#### The amount of grain needed to feed a cow could feed many more people than the one cow does.

UCS 6/28 (Jun 28 2012. The Union of Concerned Scientists is the leading science-based nonprofit working for a healthy environment and a safer world. UCS combines independent scientific research and citizen action to develop innovative, practical solutions and to secure responsible changes in government policy, corporate practices, and consumer choices. http://www.energybulletin.net/stories/2012-06-30/report-links-beef-production-deforestation-threats-climate-and-health)hs

There are fundamental biological reasons why meat production requires more land and resources than plant production, related to the fact that meat consumption occurs at a higher level on the food chain than plant consumption. When we eat a certain number of calories’ worth of steak, we are consuming not only those calories but also, in effect, all the calories consumed by the cow that produced the steak (i.e., the calories in all the food it processed during its lifetime). Producing all the food the cow ate — pasture grasses, feed grains, soy supplements, and forages like alfalfa — requires a great deal of land. For a given amount of energy, it would take far fewer calories and less total land if you were to eat the grain and soy directly rather than feed it to the cow to make the steak. A diet primarily based on meat consumption requires far more land than a vegetarian diet.

#### Beef is one of the most inefficient sources of food production

UCS 6/28 (Jun 28 2012. The Union of Concerned Scientists is the leading science-based nonprofit working for a healthy environment and a safer world. UCS combines independent scientific research and citizen action to develop innovative, practical solutions and to secure responsible changes in government policy, corporate practices, and consumer choices. http://www.energybulletin.net/stories/2012-06-30/report-links-beef-production-deforestation-threats-climate-and-health)hs

Grade A Choice? Solutions for Deforestation-Free Meat looks at how smart choices by consumers, businesses, and policy makers can help reduce the impacts of meat production on deforestation and reviews the global history, economics, and environmental impacts of the meat industry.¶ Beef production uses more agricultural land than all other food sources combined¶ Nearly 60 percent of the world's agricultural land is used for beef production, yet beef accounts for less than two percent of the world's calories.¶ Beef makes up about 24 percent of the world's meat consumption, yet requires 30 million square kilometers of land to produce. Poultry (34 percent of global meat consumption) and pork (40 percent) each use less than two million square kilometers of land.¶ Beef production is an inefficient use of food resources. Chickens need to consume two kilograms of grain to produce one kilogram of meat. Pigs need four kilograms. For beef cattle the ratio is 10 to 1.

#### Not only is beef production bad for the environment it is extremely ineffective as feeding populations

UCS 6/28 (Jun 28 2012. The Union of Concerned Scientists is the leading science-based nonprofit working for a healthy environment and a safer world. UCS combines independent scientific research and citizen action to develop innovative, practical solutions and to secure responsible changes in government policy, corporate practices, and consumer choices. http://www.energybulletin.net/stories/2012-06-30/report-links-beef-production-deforestation-threats-climate-and-health)hs

With the Fourth of July just around the corner, millions of Americans are planning to fire up the backyard grill for one of the top family events of the summer. Few of them realize, however, that the beef they’re going to barbeque threatens not only their health, but the future of the planet.¶ A report released today by the Union of Concerned Scientists (UCS), “Grade A Choice? Solutions for Deforestation-Free Meat,” found that if Americans shifted their diets toward less beef and more poultry or pork, they would protect their health, protect forests, and protect the planet by reducing carbon emissions.¶ “We have a big beef with beef,” said Doug Boucher, director of UCS’s Tropical Forest and Climate Initiative and a co-author of the report. “Because of the way it is produced, the more beef we eat, the worse global warming gets.”¶ Beef is what scientists would call an ‘inefficient’ protein,” Boucher explained. It requires substantial resources to produce compared with what it contributes to the human diet. For example, the report found that beef production uses about 60 percent of the world’s agricultural land but produces less than 5 percent of the protein and less than 2 percent of the calories that feed the global population.

#### Beef consumption ensures global food shortages.

Nash and Horowitx 92 (JM and JM, Both Writers for Time Magazine, “The beef against…” Time, 139(16), AD: 7-8-9)

Grain fed to cattle could feed the hungry. "Hunger isn't about actual scarcity," declares Stephanie Rosenfeld, a researcher for San Francisco-based Food First. "It's about the maldistribution of resources. People are hungry for different reasons at different times, but quite often the reasons have to do with beef." The link is often very subtle: in countries like Egypt and Mexico, for instance, farmland that formerly grew staples for human consumption is being switched to grow grain for beef that only the wealthy can afford. Indirectly, then, a growing cattle population threatens humans on the low end of the economic scale with hunger. D. Gale Johnson, an agricultural economist at the University of Chicago, questions this assumption. He notes that in China, beef consumption has risen in tandem with overall improvements in diet.

#### Beef production is a major contributor to food insecurity.

Shaul 94 (D’Vora, Biologist with a PhD from the University of Texas, “Here’s the Beef,” The Jerusalem Post, March 2, 1994, Lexis, AD: 7-8-9) BL

"If we were to take the land that is today devoted to producing food for fattening beef we could grow enough legumes and grains on it to feed an additional 400 million people. In a world where people are starving to death it is iniquitous to devote so much of our resources to the production of a food that is unnecessary and isn't even healthy." This is Rifkin's message; his executive director at Beyond Beef, Howard Lymon, a former cattle rancher, adds, "The growing of beef for food is one of the most wasteful of all uses to which we devote our resources."

### IL – Health

#### Any amount of beef consumption is bad for health and increases the risk of death greatly.

Brown 2012 (March 13, 2012 Eryn Brown is a staff writer for LA Times. http://articles.latimes.com/2012/mar/13/health/la-he-red-meat-20120313)hs

Even worse, adding an extra daily serving of processed red meat, such as a hot dog or two slices of bacon, was linked to a 20% higher risk of death during the study.¶ "Any red meat you eat contributes to the risk," said An Pan, a postdoctoral fellow at the Harvard School of Public Health in Boston and lead author of the study, published online Monday in the Archives of Internal Medicine.¶ Crunching data from thousands of questionnaires that asked people how frequently they ate a variety of foods, the researchers also discovered that replacing red meat with other foods seemed to reduce mortality risk for study participants.¶ Eating a serving of nuts instead of beef or pork was associated with a 19% lower risk of dying during the study. The team said choosing poultry or whole grains as a substitute was linked with a 14% reduction in mortality risk; low-fat dairy or legumes, 10%; and fish, 7%.¶ Previous studies had associated red meat consumption with diabetes, heart disease and cancer, all of which can be fatal. Scientists aren't sure exactly what makes red meat so dangerous, but the suspects include the iron and saturated fat in beef, pork and lamb, the nitrates used to preserve them, and the chemicals created by high-temperature cooking.¶ The Harvard researchers hypothesized that eating red meat would also be linked to an overall risk of death from any cause, Pan said. And the results suggest they were right: Among the 37,698 men and 83,644 women who were tracked, as meat consumption increased, so did mortality risk.¶ In separate analyses of processed and unprocessed meats, the group found that both types appear to hasten death. Pan said that at the outset, he and his colleagues had thought it likely that only processed meat posed a health danger.¶ Carol Koprowski, a professor of preventive medicine at USC's Keck School of Medicine who wasn't involved in the research, cautioned that it can be hard to draw specific conclusions from a study like this because there can be a lot of error in the way diet information is recorded in food frequency questionnaires, which ask subjects to remember past meals in sometimes grueling detail.¶ But Pan said the bottom line was that there was no amount of red meat that's good for you.

### IL – Antibiotic Resistance/Superbugs

#### Antibiotics are used in beef production that leads to antibiotic resistance and the development of superbugs

Starmer 9 (1-12-09 – Agriculture policy/communications consultant, working mostly on how concentration in food and agricultural markets affects the food system. Elanor, “Dope shit: Who to thank, and why, for antibiotics in your veggies,” The Ethicurean, 1-12, http://www.ethicurean.com/2009/01/12/antibiotics-in-manure/)

Last week, an article in Environmental Health News covered two studies by a team of researchers at the University of Minnesota and set the sustainable food & ag world abuzz with horror. The studies aren't new - one was written in 2005 and the other in 2007 — but the shock of their findings stings just as bad as it did the first time. In a nutshell: As many Ethicurean readers know, in industrial livestock operations, it's common practice to feed animals subtherapeutic doses of antibiotics (literally, doses that are smaller than what you'd give an animal to cure it of illness — low doses that act as growth promoters, or keep the animals from getting sick). As much as 90% of the antibiotics that animals consume are not absorbed, but are instead excreted in their waste. That waste may hang out in lagoons and leach into water sources, but much of it gets applied to cropland as a fertilizer.¶ What the Minnesota researchers discovered is that when certain vegetables are planted in soil that's been mixed with said manure, the plants take up the antibiotics, and traces of antibiotic residue are detectable in the part of the plant that you eat.¶ In other words, there may be antibiotics in your veggies. Even, just maybe, your organic ones. And that's why all the emails and blog posts are flying. Pissed? Read on.¶ Attack of the superbugs¶ That concentrated animal feeding operations (CAFOs) overuse antibiotics is not news. According to the Union of Concerned Scientists, as much as 70% of all antibiotics used in the United States are fed to animals that aren't sick. Many of the drugs they're fed are the same ones that doctors rely on to cure human illnesses; penicillin, for example, is one of the more widely used antibiotics in the livestock industry. Over 95% of the antibiotics fed to hogs in the United States are human-use drugs. Damn.¶ Recent attention to the antibiotic issue has focused on the role CAFOs play in breeding antibiotic-resistant bacteria that can spread to the human population. When bacteria are exposed repeatedly and over long periods of time to the antibiotics that are fed to animals, they evolve to be resistant to them. Then they breed rapidly. Finally, they hitch a ride to Planet Human on workers, farm families, or the wind. The result? A growing number of illnesses that didn't used to kill humans, back in the day when antibiotics worked, now do. (For background, see my previous post from the American Public Health Association conference here or check out the Pew Commission report here.)¶ The research coming out of UMN adds a new twist to the already depressing story. Both the 2005 study and the 2007 study found that vegetables — corn, cabbage, green onions, potatoes and lettuce — planted in a mix of soil and antibiotic-laced manure take up small amounts of the antibiotics. The more recent study found that only about 0.1% of the antibiotics in the manure are absorbed by the plants, but researchers worry that if humans eat those low doses repeatedly over long periods of time, they could serve as another breeding ground for antibiotic-resistant bacteria. That means faster evolution of superbugs.

#### Beef consumption accelerates antibiotic resistance

Davies 2008 (Julian Davies is in the Department of Microbiology and Immunology at the University of British Columbia in Vancouver. June 2008. http://www.nature.com/embor/journal/v9/n1s/full/embor200869.html)

The increased production and decreasing prices of antibiotics encouraged additional applications outside the medical setting. Low concentrations of antibiotics added to animal feeds were found to promote the growth of cattle, pigs and chickens, thereby resulting in increased economic turnover and profits for the meat industry—although this practice also accelerates antibiotic resistance. At present, approximately 50% of all antibiotics produced worldwide are used for non-human purposes, notably in agriculture and aquaculture. It is not surprising that the development of resistance to antibiotics shows a direct correlation with the extent of antibiotic use. Awareness of this problem has increased over the years and many countries have mounted efforts to educate the public about the threat posed by resistant bacteria, and have instituted measures to control antibiotic use. As long ago as 1969, the Swann report, which was published in the UK, recommended restricting the use of antibiotics in animal feeds (Swann, 1969). Recent progress is most evident in The Netherlands and the Scandinavian countries, where the use of antibiotics to promote growth in animals has been effectively curtailed. Reduced levels of antibiotic resistance in animals and farm workers indicate the success of these measures; however, despite such controls, resistance has not been eliminated and outbreaks of resistant pathogens still occur frequently. Cases of pig-related community-acquired multi-resistant Staphylococcus aureus (CA-MRSA) in The Netherlands confirm the inevitability of antibiotic resistance—bacteria are omnipotent.

### Impact – Deforestation

#### DEFORESTATION CAUSES MASSIVE EXTINCTION

GENESIS OF EDEN DIVERSITY ENCYCLOPEDIA, 2002, p. http://www.dhushara.com/book/diversit/saceve.htm (WFU73)

By some estimates, a million species will have died out during the last century, but even this is possibly a vast under-estimate because the number of uncharacterized species in many small species, from insects to bacteria, may exceed the known ones by an order of magnitude. "It is hard to be accurate about extinctions, since most are unrecorded; the vast majority of the world's species have neither been named nor classified" (Lean 136). These difficulties are sometimes exploited by opponents of biodiversity conservation, but the arguments do not hold. The sheer scale of the devastation caused as whole forests are systematically burned and cleared of their natural diversity and large habitats fragmented into small islands is qualitatively devastation, which will have a very significant impact on diversity. The more species there are on Earth the worse the scale of the loss becomes.

### Impact – Food Shortages

#### Food shortages break down the international system, culminating in extinction.

Brown 9 (Lester, President and Founder of the Earth Policy Institute, Masters in Public Administration from Harvard, “Could Food Shortages Bring Down Civilization?” Scientific American, May, http://www.scientificamerican.com/article.cfm?id=civilization-food-shortages, AD: 7-8-9)

As demand for food rises faster than supplies are growing, the resulting food-price inflation puts severe stress on the governments of countries already teetering on the edge of chaos. Unable to buy grain or grow their own, hungry people take to the streets. Indeed, even before the steep climb in grain prices in 2008, the number of failing states was expanding [Purchase the digital edition to see related sidebar]. Many of their problems stem from a failure to slow the growth of their populations. But if the food situation continues to deteriorate, entire nations will break down at an ever increasing rate. We have entered a new era in geopolitics. In the 20th century the main threat to international security was superpower conflict; today it is failing states. It is not the concentration of power but its absence that puts us at risk. States fail when national governments can no longer provide personal security, food security and basic social services such as education and health care. They often lose control of part or all of their territory. When governments lose their monopoly on power, law and order begin to disintegrate. After a point, countries can become so dangerous that food relief workers are no longer safe and their programs are halted; in Somalia and Afghanistan, deteriorating conditions have already put such programs in jeopardy. Failing states are of international concern because they are a source of terrorists, drugs, weapons and refugees, threatening political stability everywhere. Somalia, number one on the 2008 list of failing states, has become a base for piracy. Iraq, number five, is a hotbed for terrorist training. Afghanistan, number seven, is the world’s leading supplier of heroin. Following the massive genocide of 1994 in Rwanda, refugees from that troubled state, thousands of armed soldiers among them, helped to destabilize neighboring Democratic Republic of the Congo (number six). Our global civilization depends on a functioning network of politically healthy nation-states to control the spread of infectious disease, to manage the international monetary system, to control international terrorism and to reach scores of other common goals. If the system for controlling infectious diseases—such as polio, SARS or avian flu—breaks down, humanity will be in trouble. Once states fail, no one assumes responsibility for their debt to outside lenders. If enough states disintegrate, their fall will threaten the stability of global civilization itself.

### Impact - Methane

#### Methane Emissions cause extinction

The Sun News, 2008 (“Scientist uncovers methane menace” Wesley Hughes, 06/07/08)

He calls it the Doomsday Scenario. Imagine alligators swimming at the North Pole. It happened once and it could happen again if Martin Kennedy's hypothesis comes true. And if Al Gore's "An Inconvenient Truth" made you nervous, imagine something 50 times worse. If we as a society can't stop it, it could mean the end of civilization. Kennedy says, "I don't know how a nuclear power could survive if most of its population is dying." Kennedy is no nut case. He's a highly respected professor of geology at UC Riverside; and his scenario was published recently in the journal Nature. It involves something no one had paid much attention to before: methane. We in the Inland Empire are familiar with it as a byproduct of cow poop. But Kennedy's methane is no BS, cowboy. It's trapped in the permafrost under the ice cap in high latitudes at the top of the world. If the ice cap melts - as the Greenland ice sheet rapidly is - the methane will be released and methane is 50 times more active than carbon as a greenhouse gas, the scientist said. The Earth has 5,000 gigatons of carbon dioxide in its deposits of oil and natural gas. Big numbers. But there are 10,000 gigatons of methane under the ice sheets and in the ocean floor near the coasts. That's twice the amount of the carbon dioxide and 100 times more powerful. Methane lingers in the atmosphere for five or 10 years before oxidation converts it to carbon dioxide. The more methane released as the ice melts, the warmer it becomes, melting more ice releasing increasingly more methane. As the ice melts, the planet loses its reflectability - the albedo effect - absorbing more of the heat from the sun and increasing the warmth. It's like putting your hand on a white car in the hot summer sun and then putting it on a black one. "Ouch." Total meltdown of the Greenland ice sheet would deepen the oceans by 20 feet, flooding places like New York City and turning Florida into a reef. Kennedy began working on his hypothesis five years ago and his research took him back to his native Australia. There he found ancient methane seeps that could be tied to earlier global ice melts and the "Snowball Earth" of 635 million years ago. That occurred just before animal life appeared on Earth, Kennedy said, "suggesting some kind of environmental link." The life possibly kick-started by the first methane age could be wiped out by a second. The tipping point for that phenomenon is unknown, Kennedy said. It occurred the first time when methane was loosed in a runaway feedback. The tipping point for a new methane age could occur in a decade, Kennedy said. But we are primed for it and when it occurs the world could warm at a rate of tens of degrees. "It's an abrupt mechanism," Kennedy said. "It's an entirely different climate- warming scenario. In the first global warming from carbon dioxide, the Earth didn't go through catastrophic change. "We think we are increasing the probability of abrupt climate change," the scientist said. "When we understand the tipping point," Kennedy said, we'll be able to better predict the climate's future in the next century." He said the Greenland ice sheet is not stable and is melting rapidly. Fourteen of the past 20 years have been the hottest in world history, Kennedy said. A methane age would wreak havoc with the climate, plant and animal life and humanity, Kennedy said. The results are unpredictable and could be catastrophic with more Hurricane Katrinas, dust bowls, monsoons, floods and famine. The scientist is director of the Global Climate and Environmental Change Program, a two-year master's degree program at UCR.

### Impact – Warming

**Warming causes extinction - a preponderance of evidence proves it's real, anthropogenic, and outweighs other threats**

**Deibel 7** — International Relations @ Naval War College (Terry, "Foreign Affairs Strategy: Logic of American Statecraft," Conclusion: American Foreign Affairs Strategy Today)

Finally, there is one major existential threat to American security (as well as prosperity) of a nonviolent nature, which, though far in the future, demands urgent action. It is the threat of global warming to the stability of the climate upon which all earthly life depends. Scientists worldwide have been observing the gathering of this threat for three decades now, and what was once a mere possibility has passed through probability to near certainty. Indeed not one of more than 900 articles on climate change published in refereed scientific journals from 1993 to 2003 doubted that anthropogenic warming is occurring. “In legitimate scientific circles,” writes Elizabeth Kolbert, “it is virtually impossible to find evidence of disagreement over the fundamentals of global warming.” Evidence from a vast international scientific monitoring effort accumulates almost weekly, as this sample of newspaper reports shows: an international panel predicts “brutal droughts, floods and violent storms across the planet over the next century”; climate change could “literally alter ocean currents, wipe away huge portions of Alpine Snowcaps and aid the spread of cholera and malaria”; “glaciers in the Antarctic and in Greenland are melting much faster than expected, and…worldwide, plants are blooming several days earlier than a decade ago”; “rising sea temperatures have been accompanied by a significant global increase in the most destructive hurricanes”; “NASA scientists have concluded from direct temperature measurements that 2005 was the hottest year on record, with 1998 a close second”; “Earth’s warming climate is estimated to contribute to more than 150,000 deaths and 5 million illnesses each year” as disease spreads; “widespread bleaching from Texas to Trinidad…killed broad swaths of corals” due to a 2-degree rise in sea temperatures. “The world is slowly disintegrating,” concluded Inuit hunter Noah Metuq, who lives 30 miles from the Arctic Circle. “They call it climate change…but we just call it breaking up.” From the founding of the first cities some 6,000 years ago until the beginning of the industrial revolution, carbon dioxide levels in the atmosphere remained relatively constant at about 280 parts per million (ppm). At present they are accelerating toward 400 ppm, and by 2050 they will reach 500 ppm, about double pre-industrial levels. Unfortunately, atmospheric CO2 lasts about a century, so there is no way immediately to reduce levels, only to slow their increase, we are thus in for significant global warming; the only debate is how much and how serous the effects will be. As the newspaper stories quoted above show, we are already experiencing the effects of 1-2 degree warming in more violent storms, spread of disease, mass die offs of plants and animals, species extinction, and threatened inundation of low-lying countries like the Pacific nation of Kiribati and the Netherlands at a warming of 5 degrees or less the Greenland and West Antarctic ice sheets could disintegrate, leading to a sea level of rise of 20 feet that would cover North Carolina’s outer banks, swamp the southern third of Florida, and inundate Manhattan up to the middle of Greenwich Village. Another catastrophic effect would be the collapse of the Atlantic thermohaline circulation that keeps the winter weather in Europe far warmer than its latitude would otherwise allow. Economist William Cline once estimated the damage to the United States alone from moderate levels of warming at 1-6 percent of GDP annually; severe warming could cost 13-26 percent of GDP. But the most frightening scenario is runaway greenhouse warming, based on positive feedback from the buildup of water vapor in the atmosphere that is both caused by and causes hotter surface temperatures. Past ice age transitions, associated with only 5-10 degree changes in average global temperatures, took place in just decades, even though no one was then pouring ever-increasing amounts of carbon into the atmosphere. Faced with this specter, the best one can conclude is that “humankind’s continuing enhancement of the natural greenhouse effect is akin to playing Russian roulette with the earth’s climate and humanity’s life support system. At worst, says physics professor Marty Hoffert of New York University, “we’re just going to burn everything up; we’re going to het the atmosphere to the temperature it was in the Cretaceous when there were crocodiles at the poles, and then everything will collapse.” During the Cold War, astronomer Carl Sagan popularized a theory of nuclear winter to describe how a thermonuclear war between the Untied States and the Soviet Union would not only destroy both countries but possible end life on this planet. Global warming is the post-Cold War era’s equivalent of nuclear winter at least as serious and considerably better supported scientifically. Over the long run it puts dangers form terrorism and traditional military challenges to shame. It is a threat not only to the security and prosperity to the United States, but potentially to the continued existence of life on this planet.

### Impact – Soil Erosion

#### Soil erosion threatens all life.

Horne and McDermott 2001 (James E., PhD and Maura, The next green revolution, p 69)

Conserving healthy soil by guarding it against erosion or other forces that would degrade it is the most basic step. This step has as its corollary actively building soil health, because soil used for agricultural purposes today is not as healthy as it could be. It is both less diverse and less active biologically. Without healthy topsoil, the world cannot begin to feed its billions. Although American popular culture discourse in recent years has speculated the fate of line on earth in case of alien invasion, asteroid bombardment, or rampaging killer viruses, the slow loss of quality soil is more of a threat to life on the planet than any of these scenarios.

### Impact – BioD

#### Loss of biodiversity leads to human extinction.

Diner 94 (David N. J.D. Recipient. College of Law. Ohio State University. “The Army and the Endangered Species Act: Who’s Endangering Whom?” Military Law Review. 143 Mil. L. Rev. 161. Winter, 1994, gender edited)

No species has ever dominated its fellow species as man has. In most cases, people have assumed the God-like power of life and death -- extinction or survival -- over the plants and animals of the world. For most of history, mankind pursued this domination with a single-minded determination to master the world, tame the wilderness, and exploit nature for the maximum benefit of the human race. n67 In past mass extinction episodes, as many as ninety percent of the existing species perished, and yet the world moved forward, and new species replaced the old. So why should the world be concerned now? The prime reason is the world's survival. Like all animal life, humans live off of other species. At some point, the number of species could decline to the point at which the ecosystem fails, and then humans also would become extinct. No one knows how many [\*171] species the world needs to support human life, and to find out -- by allowing certain species to become extinct -- would not be sound policy. In addition to food, species offer many direct and indirect benefits to mankind. n68 2. Ecological Value. -- Ecological value is the value that species have in maintaining the environment. Pest, n69 erosion, and flood control are prime benefits certain species provide to man. Plants and animals also provide additional ecological services -- pollution control, n70 oxygen production, sewage treatment, and biodegradation. n71 3. Scientific and Utilitarian Value. -- Scientific value is the use of species for research into the physical processes of the world. n72 Without plants and animals, a large portion of basic scientific research would be impossible. Utilitarian value is the direct utility humans draw from plants and animals. n73 Only a fraction of the [\*172] earth's species have been examined, and [human]kind may someday desperately need the species that it is exterminating today. To accept that the snail darter, harelip sucker, or Dismal Swamp southeastern shrew n74 could save mankind may be difficult for some. Many, if not most, species are useless to man in a direct utilitarian sense. Nonetheless, they may be critical in an indirect role, because their extirpations could affect a directly useful species negatively. In a closely interconnected ecosystem, the loss of a species affects other species dependent on it. n75 Moreover, as the number of species decline, the effect of each new extinction on the remaining species increases dramatically. n76 4. Biological Diversity. -- The main premise of species preservation is that diversity is better than simplicity. n77 As the current mass extinction has progressed, the world's biological diversity generally has decreased. This trend occurs within ecosystems by reducing the number of species, and within species by reducing the number of individuals. Both trends carry serious future implications. Biologically diverse ecosystems are characterized by a large number of specialist species, filling narrow ecological niches. These ecosystems inherently are more stable than less diverse systems. "The more complex the ecosystem, the more successfully it can resist a stress. . . .[l]ike a net, in which each knot is connected to others by several strands, such a fabric can resist collapse better than a simple, unbranched circle of threads -- which if cut anywhere breaks down as a whole." n79 By causing widespread extinctions, humans have artificially simplified many ecosystems. As biologic simplicity increases, so does the risk of ecosystem failure. The spreading Sahara Desert in Africa, and the dustbowl conditions of the 1930s in the United States are relatively mild examples of what might be expected if this trend continues. Theoretically, each new animal or plant extinction, with all its dimly perceived and intertwined affects, could cause total ecosystem collapse and human extinction. Each new extinction increases the risk of disaster. Like mechanic removing, one by one, the rivets from an aircraft's wings, [hu]mankind may be edging closer to the abyss.

#### Climate change causes mass-species extinction and threatens to wipe out civilizations

The Courier Mail 2008 (Australia-based international newspaper, published daily. “species wipeout-humans included” http://www.lexisnexis.com.turing.library.northwestern.edu/us/lnacademic/results/docview/docview.do?docLinkInd=true&risb=21\_T4162653354&format=GNBFI&sort=BOOLEAN&startDocNo=101&resultsUrlKey=29\_T4162653349&cisb=22\_T4162710017&treeMax=true&treeWidth=0&csi=244788&docNo=119) 3/31/2008

A NEW geological age is dawning thanks to human-caused mass extinctions and unprecedented climate change says a leading environmental scientist.¶ The planet is already amid a ``human-induced mass extinction event'' which is defining a new geological age known as the Anthropocene, says Professor Will Steffen, director of the Centre for Resource and Environmental Studies at Canberra's Australian National University. Professor Steffen will speak at the Second International Salinity Forum in Adelaide today.``In 2005, the Millennium Ecosystem Assessment published a report on the changes in species diversity and found the current rate of species loss is higher than the background rate inferred in the fossil record. ``This rapid rate in the loss of species diversity is similar in intensity to the event around 65 million years ago which wiped out the dinosaurs and other species.''Damming nearly all of the world's major rivers had left 75 per cent of the world's fisheries exploited or depleted, he said.¶ The human impact had been pronounced in Australia, due to the highly variable climate, unique wildlife and poor soils, he said.``Human history is littered with examples of civilisations that have collapsed because of their inability to adjust to environmental change -- such as the Mayans in Meso-America the Norse colonies in southern Greenland and the Akkadian civilisation, which was located in what is now Syria.''¶ With no one sure what the tipping point was, the best course of action was to mitigate climate change and reduce greenhouse gas emissions as soon as possible, he said.

#### Climate change threatens global biodiversity which is critical to survival

Brown 2008 (World-renowned environmental analyst and head of the non-profit research organization the Earth Policy Institute based in Washington DC. Chapter 5: Disappearing Plants and Animals. http://www.earth-policy.org/Books/PB3/PB3ch5\_ss7.htm) 2008

As various life forms disappear, they diminish the services provided by nature, such as pollination, seed dispersal, insect control, and nutrient cycling. This loss of species is weakening the web of life, and if it continues it could tear huge gaps in its fabric, leading to irreversible changes in the earth’s ecosystem.¶ Species of all kinds are threatened by habitat destruction. One of the leading threats to the earth’s biodiversity is the loss of tropical rainforests. As we burn off the Amazon rainforest, we are in effect burning one of the great repositories of genetic information. Our descendants may one day view the wholesale burning of this genetic library much as we view the burning of the library in Alexandria in 48 bc.¶ Habitat alteration from rising temperatures, chemical pollution, or the introduction of exotic species can also decimate both plant and animal species. As the human population grows, the number of species with which we share the planet shrinks. Yet we cannot separate our fate from that of all life on the earth. If the rich diversity of life that we inherited is continually impoverished, eventually we will be impoverished as well.¶ The share of birds, mammals, and fish that are vulnerable or in immediate danger of extinction is now measured in double digits: 12 percent of the world’s nearly 10,000 bird species; 20 percent of the world’s 5,416 mammal species; and 39 percent of the fish species analyzed. 77

### Impact – Antibiotic Resistance

#### Resistance to antibiotics will lead to extinction

Davies 8 (Julian, the Department of Microbiology and Immunology at the University of British Columbia, Infectious Diseases and the Future of Mankind, June 2008, http://www.nature.com/embor/journal/v9/n1s/full/embor200869.html)

For many years, antibiotic-resistant pathogens have been recognized as one of the main threats to human survival, as some experts predict a return to the pre-antibiotic era. So far, national efforts to exert strict control over the use of antibiotics have had limited success and it is not yet possible to achieve worldwide concerted action to reduce the growing threat of multi-resistant pathogens: there are too many parties involved. Furthermore, the problem has not yet really arrived on the radar screen of many physicians and clinicians, as antimicrobials still work most of the time—apart from the occasional news headline that yet another nasty superbug has emerged in the local hospital. Legislating the use of antibiotics for non-therapeutic applications and curtailing general public access to them is conceivable, but legislating the medical profession is an entirely different matter. In order to meet the growing problem of antibiotic resistance among pathogens, the discovery and development of new antibiotics and alternative treatments for infectious diseases, together with tools for rapid diagnosis that will ensure effective and appropriate use of existing antibiotics, are imperative. How the health services, pharmaceutical industry and academia respond in the coming years will determine the future of treating infectious diseases. This challenge is not to be underestimated: microbes are formidable adversaries and, despite our best efforts, continue to exact a toll on the human race.

#### Untreatable viruses lead to human extinction

Daswani 96 (Kavita, Health Analyst, “Leading the way to a cure for AIDS”, 1-4, South China Morning Post, A.D.: 7/1/09)

Despite the importance of the discovery of the "facilitating" cell, it is not what Dr Ben-Abraham wants to talk about. There is a much more pressing medical crisis at hand - one he believes the world must be alerted to: the possibility of a virus deadlier than HIV. If this makes Dr Ben-Abraham sound like a prophet of doom, then he makes no apology for it. AIDS, the Ebola outbreak which killed more than 100 people in Africa last year, the flu epidemic that has now affected 200,000 in the former Soviet Union - they are all, according to Dr Ben-Abraham, the "tip of the iceberg". Two decades of intensive study and research in the field of virology have convinced him of one thing: in place of natural and man-made disasters or nuclear warfare, humanity could face extinction because of a single virus, deadlier than HIV. "An airborne virus is a lively, complex and dangerous organism," he said. "It can come from a rare animal or from anywhere and can mutate constantly. If there is no cure, it affects one person and then there is a chain reaction and it is unstoppable. It is a tragedy waiting to happen." That may sound like a far-fetched plot for a Hollywood film, but Dr Ben -Abraham said history has already proven his theory. Fifteen years ago, few could have predicted the impact of AIDS on the world. Ebola has had sporadic outbreaks over the past 20 years and the only way the deadly virus - which turns internal organs into liquid - could be contained was because it was killed before it had a chance to spread. Imagine, he says, if it was closer to home: an outbreak of that scale in London, New York or Hong Kong. It could happen anytime in the next 20 years - theoretically, it could happen tomorrow. The shock of the AIDS epidemic has prompted virus experts to admit "that something new is indeed happening and that the threat of a deadly viral outbreak is imminent", said Joshua Lederberg of the Rockefeller University in New York, at a recent conference. He added that the problem was "very serious and is getting worse". Dr Ben-Abraham said: "Nature isn't benign. The survival of the human species is not a preordained evolutionary programme. Abundant sources of genetic variation exist for viruses to learn how to mutate and evade the immune system." He cites the 1968 Hong Kong flu outbreak as an example of how viruses have outsmarted human intelligence. And as new "mega-cities" are being developed in the Third World and rainforests are destroyed, disease-carrying animals and insects are forced into areas of human habitation. "This raises the very real possibility that lethal, mysterious viruses would, for the first time, infect humanity at a large scale and imperil the survival of the human race," he said.

### Cards to process

http://www.motherearthnews.com/Natural-Health/Meat-Poultry-Health-Risk.aspx?page=8

You may be familiar with many of the problems associated with concentrated animal feeding operations, or CAFOs. These “factory farm” operations are often criticized for the smell and water pollution caused by all that concentrated manure; the unnatural, grain-heavy diets the animals consume; and the stressful, unhealthy conditions in which the animals live. You may not be aware, however, of the threat such facilities hold for you and your family’s health — even if you never buy any of the meat produced in this manner.

Factory farms are breeding grounds for virulent disease, which can then spread to the wider community via many routes — not just in food, but also in water, the air, and the bodies of farmers, farm workers and their families. Once those microbes become widespread in the environment, it’s very difficult to get rid of them.

A 2008 report from the Pew Commission on Industrial Farm Animal Production, a joint project of the Pew Charitable Trusts and the Johns Hopkins Bloomberg School of Public Health, underscores those risks. The 111-page report, two years in the making, outlines the public health, environmental, animal welfare and rural livelihood consequences of what they call “industrial farm animal production.” Its conclusions couldn’t be clearer. Factory farm production is intensifying worldwide, and rates of new infectious diseases are rising. Of particular concern is the rapid rise of antibiotic-resistant microbes, an inevitable consequence of the widespread use of antibiotics as feed additives in industrial livestock operations.

Scientists, medical personnel and public health officials have been sounding the alarm on these issues for some time. The World Health Organization and the Food and Agriculture Organization (FAO) have recommended restrictions on agricultural uses of antibiotics; the American Public Health Association (APHA) proposed a moratorium on CAFOs back in 2003. All told, more than 350 professional organizations — including the APHA, American Medical Association, the Infectious Diseases Society of America, and the American Academy of Pediatrics — have called for greater regulation of antibiotic use in livestock. The Infectious Diseases Society of America has declared antibiotic-resistant infections an epidemic in the United States. The FAO recently warned that global industrial meat production poses a serious threat to human health.

The situation is akin to that surrounding global climate change four or five years ago: near-universal scientific consensus matched by government inaction and media inattention. Although the specter of pandemic flu — in which a virulent strain of the influenza virus recombines with a highly contagious strain to create a bug rivaling that responsible for the 1918 flu pandemic, thought to have killed as many as 50 million people — is the most dire scenario, antibiotic resistance is a clear and present danger, already killing thousands of people in the United States each year.

From one perspective, picking up bugs from our domesticated animals is nothing new. Approximately two-thirds of the 1,400 known human pathogens are thought to have originated in animals: Scientists think tuberculosis and the common cold probably came to us from cattle; pertussis from pigs or sheep; leprosy from water buffalo; influenza from ducks.

Most of these ailments probably appeared relatively early in the 10,000-year-old history of animal domestication. Over time, some human populations developed immunity to these diseases; others were eventually controlled with vaccines.

Some continued to kill humans until the mid-20th century discovery of penicillin, a miracle drug that rendered formerly life-threatening infections relatively harmless. Other antibiotics followed, until by the 1960s leading researchers and public health officials were declaring that the war on infectious diseases had been won.

Beginning in the mid 1970s, however, the numbers of deaths from infectious diseases in the United States started to go back up. Some were from old nemeses, such as tuberculosis, newly resistant to standard antibiotic treatments; others were wholly novel.

“In recent decades,” writes Dr. Michael Greger, director of public health and animal agriculture for the Humane Society of the United States and author of Bird Flu: A Virus of Our Own Hatching, “previously unknown diseases have surfaced at a pace unheard of in the recorded annals of medicine: more than 30 newly identified human pathogens in 30 years, most of them newly discovered zoonotic viruses.” (Zoonotic viruses are those that can be passed from animals to humans.)

Why is this happening? There are many reasons, including the increased pace of international travel and human incursions into wild animals’ habitats. But one factor stands out: the rise of industrial farm animal production. “Factory farms represent the most significant change in the lives of animals in 10,000 years,” Greger writes. “This is not how animals were supposed to live.”

Chicken and pig production are particularly bad. In 1965, the total U.S. hog population numbered 53 million, spread over more than 1 million pig farms in the United States — most of them small family operations. Today, we have 65 million hogs on just 65,640 farms nationwide. Many of these “farms” — 2,538, to be exact — have upwards of 5,000 hogs on the premises at any given time. Broiler chicken production rose from 366 million in 1945 to 8,400 million in 2001, most of them in facilities housing tens of thousands of birds.

On a global scale, the situation is even worse. Fifty-five billion chickens are now reared each year worldwide. The global pig inventory is approaching 1 billion, an estimated half of which are raised in confinement. In China and Malaysia, it’s not unheard of for hog facilities to house 20,000 or even 50,000 animals.

“Concentrated animal feeding operations are comparable to poorly run hospitals, where everyone is given antibiotics, patients lie in unchanged beds, hygiene is nonexistent, infections and re-infections are rife, waste is thrown out the window, and visitors enter and leave at will,” write Johns Hopkins researchers Ellen Silbergeld, Jay Graham and Lance Price in the 2008 Annual Review of Public Health. By concentrating large numbers of animals together, factory farms are terrific incubators for disease. The stress of factory farm conditions weakens animals’ immune systems; ammonia from accumulated waste burns lungs and makes them more susceptible to infection; the lack of sunlight and fresh air — as well as the genetic uniformity of industrial farm animal populations — facilitates the spread of pathogens.

The addition of steady doses of antibiotics to this picture tips the balance from appalling to catastrophic. Poultry producers discovered by accident in the 1940s that feeding tetracycline fermentation byproducts accelerated chickens’ growth. Since then, the use of antibiotics as feed additives has become standard practice across much of the industry. The Union of Concerned Scientists estimates that non-therapeutic animal agriculture use (drugs given to animals even when they are not sick) accounts for 70 percent of total antibiotic consumption in the United States.

The medical community has been cautioning for years against irresponsible antibiotic use among people, but in terms of sheer numbers, livestock use is far more significant. It’s a simple scientific fact that the more antibiotics are used — especially prolonged use at low doses as in factory farms — the more antibiotic-resistant microbes will become. Bacteria and viruses are also notoriously promiscuous, swapping genes across species and even across genera, creating what the Johns Hopkins researchers call “reservoirs of resistance.” “In some pathogens, selection for resistance also results in increased virulence,” they note. In other cases, otherwise harmless microbes can transfer resistance genes to pathogenic species.

There also are indications that factory farm conditions make animals more likely to excrete pathogenic microbes — suggesting another mechanism by which conversion to more humane farming methods would offer greater protection for human health.

Most so-called bio-containment procedures for confinement livestock operations are more concerned with protecting the crowded animals from disease outbreaks than from preventing human pathogens from escaping into the wider environment. As the report from the Pew Commission points out, every step in the industrial farm animal production system holds the potential for disease transmission, from transportation and manure handling, to meat processing and animal rendering.

The increasingly globalized nature of the farm animal production system means that live animals, as well as fresh and frozen meat, are constantly crossing international borders, ensuring that diseases present in one location will soon spread elsewhere. But the biggest transmission route is waste: Confined livestock operations in the United States produce three times as much waste each year as our country’s entire human population — and yet all that manure is much more loosely regulated and handled than human waste. Antibiotic-resistant microbes, as well as the antibiotics themselves, are now widely present as environmental contaminants, with unknown consequences for everything from soil microorganisms to people. Canada’s largest waterborne disease outbreak, which infected 1,346 people and killed six, was traced to runoff from livestock farms into a town’s water supply. The U.S. Geological Survey found antimicrobial residues in 48 percent of 139 streams tested nationwide from 1999 to 2000. Other studies have detected resistant bacteria in the air up to 30 meters upwind and 150 meters downwind of industrial hog facilities.

A wealth of evidence links industrial meat and poultry directly with foodborne illness. When dioxin-contaminated chicken feed led to the removal from the market of all chicken and eggs in Belgium for several weeks in June of 1999, doctors there noted a 40 percent decline in the number of human Campylobacter infections. Repeated studies have concluded that as much as 80 percent of retail supermarket chicken in the United States is contaminated with Campylobacter. Similarly, the Centers for Disease Control and Prevention estimates that Salmonella-contaminated eggs caused 180,000 cases of sickness in the United States in 2000. E. coli O157:H7 is blamed for 73,000 illnesses in this country each year, including about 2,000 hospitalizations and 60 deaths.

Although thorough cooking and careful handling can minimize your risks, antibiotic resistance raises the stakes when someone gets ill: “One in two human cases of Campylobacter, and one in five cases of Salmonella are now antibiotic-resistant,” says Steve Roach, public health program director for the Food Animal Concerns Trust and a member of the executive committee for the Keep Antibiotics Working coalition. “And when you have antibiotic resistance, you have more complications, more blood infections, more mortality.”

In fact, public health experts are beginning to suspect that a whole host of infections not previously thought of as food-related may ultimately be linked to the overuse of antibiotics in animal agriculture. Researchers at the University of California-Berkeley, for example, traced a multi-state outbreak of urinary tract infections among women in 1999 and 2000 to contamination with a single strain of drug-resistant E. coli found in cows. Dr. Lee Riley, lead author of a paper on the findings published in Clinical Infectious Diseases, cautioned that the findings indicated that “the problem of foodborne disease is much greater in scope than we had ever previously thought.”

And then there’s methicillin-resistant Staphylococcus aureus, or MRSA. Previously confined largely to hospitals, MRSA is now killing more people in the United States each year than HIV/AIDS. A series of recent studies in Europe have demonstrated a strong causal link between MRSA and intensive pig farming in the Netherlands, Germany and France. Little or no data are available on MRSA in animals in the United States, but the bacterium is widely present on pig farms in Canada, which sells millions of live pigs to the United States annually, so it seems pretty likely it’s in U.S. pig factories, too.

All in all, the CDC reports that 2 million people in the United States now contract an infection each year while in the hospital. Of those, a staggering 90,000 die — a toll higher than that from diabetes. Numbers such as that are prompting some medical investigators to suggest that we may be entering a “post-antibiotic era,” one in which (as a paper published in Environmental Health Perspectives in 2007 put it) “there would be no effective antibiotics available for treating many life-threatening infections in humans.”

Connections such as these aren’t always easy to prove, however, especially for drugs that have already been in widespread use for decades, which is one reason why regulations to reign in the non-therapeutic use of antimicrobials have so far been largely lacking in the United States. The pending approval of an antibiotic called cefquinome to treat respiratory diseases in cattle offered a recent test case. Cefquinome is similar to cefepime, a last-resort antibiotic used to treat serious infections in people. (Both are fourth-generation cephalosporins, one of the small number of new antibiotics developed in recent years.) The FDA’s Veterinary Medicine Advisory Committee, along with the Centers for Disease Control and Prevention and the American Medical Association, recommended against approval, warning that using cefquinome for animals would almost certainly render cefepime less effective for humans. But the FDA has apparently caved to industry pressure, claiming it lacks the authority to deny the drug companies’ request.

Fortunately, there is a better way. No one wants high-quality food to be unaffordable, but increasingly it appears that as a human species we need to strike a better balance between cheap food and safe food. Sweden and Denmark have led the way over the past two decades in the development of commercial farming methods that minimize antibiotic use. Alternative management strategies include improving animals’ diets, changing weaning practices for pigs, cleaning facilities thoroughly in between groups and being more careful about mixing animals coming from different locations.

Scandinavian producers weren’t necessarily happy when their countries’ ban on non-therapeutic uses of antibiotics was put in place, but they’ve come to realize that they can still run profitable operations without them. Researchers in this country have shown that the same is true here: In 2006, a team at Johns Hopkins used data from poultry giant Perdue to show that the small advantage in weight gain associated with non-therapeutic antibiotic use was canceled out by the cost of the drugs. Organic farmers in many parts of the world have also shown that livestock can be raised profitably and humanely without the use of antibiotics.

“This is not a necessary problem,” says Lance Price, scientific advisor for Johns Hopkins’ Center for a Livable Future. “If you look at all the stakeholders in this equation — you and me, the doctors and hospitals, the producers — everyone but the drug companies can entertain alternatives. The only group that stands to lose from a more responsible use of antibiotics is the drug companies.”

A bill introduced in Congress in 2007, the Preservation of Antibiotics for Medical Treatment Act, was one attempt to address these issues. Sponsored by Rep. Louise Slaughter, D-N.Y., the only microbiologist in Congress, and Senate Health Committee Chairman Edward Kennedy, D-Mass., the bill would have withdrawn approvals for feed-additive use of seven classes of antibiotics of value to human medicine and required producers of agricultural antibiotics to provide data to public health officials on the usage of the drugs they sell.

The costs associated with continuing industrial farm animal production are enormous. If it’s allowed to continue, industrial production as currently practiced could eventually eliminate a lot of other farming options (in addition to making a lot of us sick). As one Midwestern organic farmer explained to me, it’s simply not possible to raise pigs organically if you live too close to a confinement facility: The pathogen pressure is too intense. “Iowa has become a sink for pig diseases,” he said. They’re just in the air, and you can’t avoid them.

Campylobacter: This is the most common cause of foodborne diarrheal illness in the United States, causing an estimated 2 million cases each year. Most don’t require medical treatment, but a small number (approximately 50 per year) end in death. Chicken and turkey are the usual sources: Studies have shown that most conventional chicken is contaminated when it leaves the processing plant. Rising numbers of Campylobacter infections resistant to a class of antibiotics called fluoroquinolones led the FDA, in 2000, to seek to ban fluoroquinolone use in U.S. poultry production. The ban was held up in court by drug maker Bayer, but was finally put in place in 2005.

MRSA: Staphylococcus aureus is a bacteria widely present in our environment and usually harmless, but in susceptible individuals it can cause life-threatening infections. Methicillin-resistant Staphylococcus aureus, or MRSA (pronounced “mir-sah”), used to be primarily a problem in hospitals, but these days, cases of MRSA are increasingly likely to be “community-acquired,” and evidence suggests that factory farms are a source. MRSA can be spread by human or animal carriers with no signs of illness; a recent study found that nearly half of Dutch pig farmers, and 39 percent of pigs in Dutch slaughterhouses, were carriers of MRSA.

Salmonella: This is another bacteria causing frequent and sometimes serious foodborne illness, with an estimated 1.4 million U.S. cases each year, including 18,000 hospitalizations and 600 deaths. Salmonella can contaminate beef, poultry, eggs and even vegetables. Antibiotic-resistant Salmonella is on the rise: One strain, known as DT104, is resistant to five major antibiotics used in humans.

E. coli O157:H7: Most Escherichia coli bacteria are harmless, but a few strains, including the notorious O157:H7, can be deadly. Ground beef is the most common contaminated food source for people, but as the spinach scare of 2006 showed, other foods can also be affected. The toxic strains are linked to conditions in beef feedlots.

Enterococcus: Enterococci are a widespread group of intestinal bacteria that can cause serious infections in other parts of the body. Antibiotic resistance is a major concern with Enterococcus faecium, the strain most commonly associated with illness in people. In Europe, vancomycin-resistant Enterococcus (VRE) is a widespread environmental contaminant, where its emergence has been linked to agricultural use of avoparcin, an antibiotic closely related to vancomycin. In the United States, VRE is more often found in hospitals, and doctors are running out of treatment options: About 4 percent of VRE patients no longer respond to the antibiotic Synercid, a last-defense drug which is unfortunately related to virginiamycin, widely used in U.S. animal agriculture.

Reduce the amount of meat in your diet. Industrial farm animal production is driven by rising global demand for meat. Healthy protein alternatives include whole grains, beans, nuts and dairy products. Think of meat more as a seasoning (as in soups and stews), not an essential, three-meals-a-day main course.

When you do eat meat, buy from local farmers practicing humane, sustainable methods. Seek out meat and dairy products labeled as “raised without antibiotics,” and tell your local market manager you’d like to see more such products on store shelves.

Contact your Congressional delegation and ask them to support legislation to limit antibiotics in livestock feed, such as the Preservation of Antibiotics for Medical Treatment Act, introduced to Congress in 2007.