



HUMANE SOCIETY INTERNATIONAL

Submission to the Inquiry into the Food Standards Amendment (Truth in Labelling Laws) Bill 2009

16 October 2009

Humane Society International (HSI) welcomes the opportunity to make a submission to the Senate Economics Committee Inquiry into the Food Standards Amendment (Truth in Labelling Laws) Bill 2009. HSI proposes that the current proposed Bill should go further to enhance national truth in labelling laws. Specifically, we propose that the Bill be amended to include the mandatory labelling of:

1. Palm oil in the ingredients list of products; and
2. The method of production on all meat, eggs and dairy products.

Palm Oil

HSI proposes an amendment to the Food Standards Amendment (Truth in Labelling Laws) Bill 2009 such that FSANZ is required to develop a standard mandating the use of the words “palm oil” in the ingredients list of all packaged foods which contain any quantity of palm oil or palm oil derivatives.

The mandatory labelling of palm oil is essential to allow consumers to make informed purchasing decisions on the basis of health and environmental impacts.

Health impacts

Palm oil is used as an ingredient in processed foods worldwide. While the palm oil industry and some scientists contend that studies show palm oil is safe and good for human health,^{1,2} most health authorities, including the World Health Organisation, agree that palm oil promotes heart disease. This research dates back to 1970.³

Two meta-analyses (a statistical technique that combines the results of several similar studies) on palmitic acid, a saturated fatty acid that is the major component of palm oil, have both demonstrated that this acid raises blood cholesterol levels. The first meta-analysis, based on 134 experiments, was conducted in 1997 by prominent British researchers,⁴ while the second, conducted in 2003 by scientists in the Netherlands, was based on 35 medical studies.⁵ In terms of blood cholesterol, the latter study showed that palm oil is significantly more harmful than other liquid oils such as canola, olive and soy.

An increasingly large body of scientific evidence prompted the World Health Organisation to state that there is “*convincing evidence*” that palmitic acid increases the risk of cardiovascular disease. It advised that, “...*intake of foods rich in myristic*

*and palmitic acids should be replaced by fats with a lower content of these particular fatty acids”.*⁶

Moreover, several United States health authorities have warned against the consumption of saturated fat, a major constituent of palm oil. The US National Heart, Lung, and Blood Institute warned, *“Saturated fat raises blood cholesterol the most. Over time, this extra cholesterol can clog your arteries. You are then at risk for having a heart attack or stroke...A high content of saturated fat can be found in some foods that come from plants such as: palm kernel oil, palm oil, coconut oil, cocoa butter”.*⁷

More recently, the US National Institute of Diabetes and Digestive and Kidney Diseases promoted cutting back on, *“...foods high in saturated fat or cholesterol, such as meats, butter, dairy products with fat, eggs, shortening, lard, and foods with palm oil or coconut oil”.*⁸

Furthermore, high rates of heart disease in Mauritius in the 1980s have been found to be linked with palm oil consumption. In assessing whether this high incidence was linked with palm oil, the government switched their subsidy of the cost of oil from one made mostly of palm oil, to one made mostly of soy.⁹ This change resulted in a decrease in the consumption of palm oil among the population. Consequently, the World Health Organisation noted a 15% decrease in serum cholesterol in the population,¹⁰ a finding that was supported by the All India Institute of Medical Sciences in New Delhi.¹¹

The aforementioned research provides evidence of possible adverse health effects of palm oil consumption, and consumers should therefore be able to discern products containing palm oil when making purchasing decisions.

Environmental impacts

Palm oil production has boomed in south-east Asia since the 1970s. Areas planted with oil palm have expanded radically in Malaysia and Indonesia, the world's largest producers of palm oil, and its production increased from 151,000 metric tonnes in 1964 to 16.5 million metric tonnes in 2006.¹² It is widely recognised that the expansion of oil palm plantations occurs at the expense of biodiverse rainforests and carbon-rich peatlands that store billions of tonnes of greenhouse gases.

The cultivation of such large tracts of palm oil plantations is made possible by the clearing of massive expanses of native forest. This conversion reduces biodiversity, increases the vulnerability of the habitat to catastrophic fires and affects the local communities that depend on the services and products provided by the forest ecosystems. In Malaysia, the area covered by oil palm plantations increased from fewer than 2,849 km² in 1973 to almost 39,965 km² in 2005, while during the same period in Indonesia the area increased from fewer than 1,036 km² to almost 31,080 km².¹³

The conversion of land for oil palm plantations by the clearing of tropical forests and peat swamps has massive ecological consequences, on both a global and local scale. In terms of carbon storage, deforestation releases large amounts of carbon that is stored in the vegetation. Oil palm plantations are estimated to hold even less carbon than a logged forest, made worse by the fact that these plantations are only viable for 25 years.¹⁴

Furthermore, more and more plantations are being cultivated on vulnerable peat soils, one of the largest naturally-occurring carbon depots worldwide. To prepare the soil for cultivation, these swamps are drained and logged, exposing the soil, and releasing the carbon into the atmosphere by the process of oxidation. Drained peat soils are also particularly susceptible to fires, which are often deliberately lit as a means of land clearing, and which result in the release of large amounts of carbon dioxide to the atmosphere. These fires are most common in Indonesia, but are also known to occur in Malaysia.¹⁵ It is estimated that peat swamps throughout south-east Asia contain around 50 billion tonnes of carbon,^{16,17} and its release into the atmosphere from habitat conversion in Malaysia alone has resulted in a 64.7% increase in carbon dioxide emissions between 1990 and 2003.¹⁸ This has far-reaching implications for global climate change.

The process of palm oil production is also very damaging to the local environment. In 2001, Malaysia alone produced 7 million tonnes of crude palm oil, which generated 9.9 million tonnes of solid oil wastes, palm fibre, and shells, and 10 million tonnes of palm oil effluent, a polluted mix of crushed shells, water, and fat residues that has been shown to have a negative impact on aquatic ecosystems.¹⁹ Furthermore, the liberal use of petroleum-based pesticides, herbicides and fertilisers involved in palm oil cultivation contributes to the exacerbation of pollution in local ecosystems.²⁰

Oil palm plantations are essentially monocultures that have replaced forests with an immense diversity of shrubs, trees, vines, mosses and other plants, and which lack the food resources most animals require to survive. Most of Indonesia and Malaysia's terrestrial species can only survive in rainforest habitat, not in plantations. In 2004, 47 of Malaysia's nearly 300 land mammal species (16%) were listed as threatened on the IUCN Red List of Threatened Species, and 6 were listed as critically endangered. This is in addition to 41 threatened terrestrial bird species.²¹ The list of threatened animal species in Malaysia continues to grow with expanding oil palm plantations, and currently includes species such as the Asian elephant, orangutan, gibbon and clouded leopard. It is estimated that the plantations provide habitat for only 20% or less of the previously resident mammals, reptile and birds.²²

In addition, increasing forest fragmentation has increased the incidence of wildlife-human interactions. Shrinking habitats are forcing orangutans closer to human settlements, where they raid fruit orchids and oil palm plantations,²³ and it is not uncommon for orangutans to be killed in such confrontations.²⁴ The Sumatran orangutan is classified as critically endangered on the IUCN Red List of Threatened Species, while the Bornean orangutan is considered endangered.²⁵ Populations of both species are decreasing rapidly and given the current rates of decline, it is likely that they could become extinct in the wild within as little as 10 years.

The tremendous impact of palm oil production on deforestation and global climate change prompted the Dutch Government to ban the use of palm oil as a green form of energy from December 2006. The Netherlands was previously the largest importer of palm oil in Europe, and the fourth largest in the world²⁶, however, a realisation of the environmental impacts of its production led to this national policy change.

Current labelling terms for palm oil and palm oil derivatives

As there are no regulations governing the labelling of palm oil or its derivatives on product labels, there are a staggering number of guises under which it is labelled on ingredient lists.

In addition to the generic “vegetable oil” label that commonly conceals the presence of palm oil as an ingredient in packaged products, palm oil and palm oil derivatives can currently be labelled as:

- arachamide mea
- caprylic triglyceride
- capric triglyceride
- caprylyl glycol
- cetyl palmitate
- elaeis guineensis
- ethylene glycol monostearate
- ethylhexyl palmitate
- hydrated palm glycerides
- isopropyl palmitate
- myristoyl
- octyl palmitate
- oleyl betaine
- palm oil
- palm kernel oil
- palm olein
- palmolein
- palmitoyl oxostearamide
- peg-100 stearate
- peptide complex
- palmitoyl tetrapeptide-3
- saponified elaeis guineensis
- sodium dodecyl sulfate (or sulphate) (SDS or NaDS)
- sodium isostearoyl lactylate (derived from vegetable stearic acid)
- sodium lauroyl lactylate
- sodium lauryl sulfate
- sodium lauryl sulphate
- sodium lauryl sulfoacetate
- sodium laureth sulphate
- sodium laureth sulfate
- sodium palm kernelate
- sls
- stearamidopropyl dimethylamine
- steareth-2
- steareth-20
- steareth-21

With this many possible labelling terms for palm oil on product labels, it is extremely difficult for consumers to confidently identify products containing this ingredient. A FSANZ standard mandating the use of the words “palm oil” in the ingredients list of all packaged foods which contain palm oil or palm oil derivatives would alleviate this problem.

Method of production of meat, eggs and dairy products

Consumer awareness of the ethical, environmental and health considerations involved with factory farming production methods is growing, and consumers are increasingly wanting to make informed choices on the animal-derived food products they purchase. Within Australia, this has been demonstrated by the doubling of the free-range egg market in the last six years alone, with the result that it now

comprises over 30% of the total retail egg market value,²⁷ representing an increase of more than 200% since 2000. Similar growth has occurred in the free-range chicken market, with one of Australia's major chicken-producers, Inglewood Farms, reporting a tripling in sales over a 6 month period in 2005.²⁸

The growth of these industries is supported by shifting consumer attitudes to the purchasing of animal-derived products. Recent surveys have revealed that 63% of participants would be more inclined to buy free-range pig products after becoming aware of factory farming conditions. In the ACT, a 2005 survey revealed that 84% of participants felt that keeping chickens in battery cages was cruel, and 73% supported a prohibition on these cages. Moreover, a survey in Queensland in 2001 showed that many consumers rank the humane treatment of animals ahead of price.²⁹

Despite this growth in awareness and demand, animal-derived food products are still labelled with a confusing and incoherent abundance of poorly defined and unregulated labelling terms. These include: caged / battery eggs; barn laid eggs; free-range, open-range or range eggs; grain fed; bred free-range; organic and bio-dynamic. None of these terms have a nationally consistent legal definition, or enforceable standards. Currently, only product labels in the ACT and Tasmania expressly require the identification of production systems, and this only extends to egg production.

Instead, a suite of voluntary standards and third party certification schemes of varying regulation have resulted in the big producers redefining the terms to suit themselves, and consumers left with a spectrum of products produced under a range of conditions.

As such, we propose an amendment to the Food Standards Amendment (Truth in Labelling Laws) Bill 2009 such that meat, eggs and dairy products are labelled with a limited number of nationally consistent and legally defined terms that refer to their method of production. These terms would relate to criteria on the source of the product, the type of housing provided and the specific standards of husbandry, transport and slaughter. These labelling terms would also be linked to consistent national standards that include those for animal welfare.

A standard of this nature would enable consumers to make informed purchasing decisions on the basis of health, environmental and ethical considerations.

Health considerations

Clear and mandatory labelling of the method of production of meat, eggs and dairy products is necessary to allow consumers to make informed decisions based on health considerations.

Food safety is inextricably linked to animal health and therefore animal welfare in food production systems. The European Commission has related poor animal welfare and reduced animal health to lower food safety, and for this reason has maintained animal welfare standards within the EU's food safety policy.³⁰ Improved animal welfare conditions in farming operations reduce the risks to food safety through reduced stress-induced immuno-suppression, reduced incidence of infectious disease on farms, reduced shedding of human pathogens by farm animals, and reduced antibiotic use and antibiotic resistance.³¹ Specifically, chronic stress in farm animals has been found to inhibit their immune response to infection,^{32,33} and can

affect food safety through an increased risk of bacterial contamination of food, and a greater risk of antibiotic residues in food.

Antibiotic resistance and use in food-producing animals

A suite of drugs and medicines are used during animal production in intensive farming practices. Australia imports around 700 tonnes of antibiotics each year, two-thirds of which are for veterinary use, and the majority used in the meat and livestock industry for therapy, disease prevention (prophylaxis), growth promotion (to increase feed conversion, growth rate and / or yield), and protozoal disease control.³⁴ When used for therapy and individual animal prophylaxis, antibiotics are administered by injection or orally. For disease prevention of groups, and as growth promoters, they are given in the animals' feed. In Australia, the pig industry alone utilises over 200 different varieties.³⁵

A number of these antibiotics belong to the same classes and select for cross-resistance to human antibiotics. These include avoparcin (a glycopeptide used in pig, cattle and meat poultry farming operations in Australia), and virginiamycin (a streptogramin used in pig and meat poultry farms in Australia).³⁶ The EU has suspended the use of Virginiamycin as an in-feed antibiotic following concern that it selects for resistance to drugs that are reserved for infections caused by bacteria resistant to multiple other antibiotics (so called "last-line" drugs).³⁷

Nonetheless, there have been recent reports that the heavy use of such antibiotics on factory farms is creating a range of antimicrobial-resistant superbugs, including resistant versions of salmonella, campylobacter and *E. coli*, that may be transferred to humans through meat consumption.³⁸ This issue has been recognised by the World Health Organisation and there have been calls for a reduction in the use of antibiotics on farms as a result.³⁹

In 1998, the Commonwealth Department of Health and Aged Care, and the Commonwealth Department of Agriculture, Fisheries and Forestry established the Joint Expert Technical Advisory Committee on Antibiotic Resistance (JETACAR). Following an examination of the scientific literature and consultation with key stakeholders, the JETACAR released a report of recommendations.⁴⁰ They found there was evidence for:

- The emergence of resistant bacteria in humans and animals following antibiotic use
- The spread of resistant animal bacteria to humans
- The transfer of antibiotic-resistance genes from animal bacteria to human pathogens
- Resistant strains of animal bacteria causing human disease

Although not conclusive, evidence is building that antibiotic-resistant infections may be linked with the use of antibiotics in food-producing animals. Examples include:

- MRSA (methicillin-resistant *Staphylococcus aureus*). Although mostly found in hospitals, MRSA is a strain that has shown up in people working in pig farms. It has spread rapidly in the Netherlands, especially in swine-producing areas, and a Dutch study found pig farmers were 760 times more likely to carry MRSA than the general population.⁴¹ In June 2008, the Daily Mail (UK) revealed the strain had been transmitted to

humans in the UK, and in August 2008 reported that limited surveys in Europe and UK had found the bug in raw pork and chicken.⁴²

- Antibiotic-resistant strains of salmonella, campylobacter and *E. coli*. This has been recognised by the World Health Organisation who has called for a reduction in the use of antibiotics on farms and in human medicine. The UK Food Commission has estimated that 30,000 people every year in the UK are affected by *E. coli* infections that are resistant to almost all antibiotics.⁴³

The European Food Safety Authority has called for a Europe-wide review of safety regimes to tackle the increasing numbers of bacteria-resistant superbugs and has stated, “*Antimicrobial resistance of bacteria is a growing concern as antimicrobials become less effective in fighting human infections.*”⁴⁴

Ractopamine (Paylean)

Ractopamine hydrochloride (Paylean) is a drug that is commonly used as a feed additive in Australian intensive piggeries. Ractopamine is a beta-adrenoceptor agonist, a phenethanolamine salt, and promotes leanness in pigs, resulting in dramatic muscle growth. Paylean works by directing nutrients away from the production of fat deposits towards the production of lean meat. It increases the rate of weight gain in hogs by 10%, feed efficiency by 13%, and carcass leanness by 25% – 37%. It also reduces the average daily feed intake by 6%. The end result is that, with the use of ractopamine, the average producer can earn an extra \$5 to \$10 per hog.⁴⁵

The use of ractopamine has been banned in food-producing animals in China, Taiwan and Malaysia. The use of beta agonists has been banned in the European Union since 1996.

Bans on the use of ractopamine have been implemented because of concerns of exacerbation of cardiovascular disease and poisoning in humans eating pork from pigs given the drug prior to slaughter. The manufacturer’s product description for paylean carries the following warning:⁴⁶

WARNING: Individuals with cardiovascular disease should exercise special caution to avoid exposure.

Furthermore, people mixing and handling paylean are advised to use protective clothing, impervious gloves, protective eyewear, and approved dust masks, as well as wash themselves immediately after handling.

The International Programme on Chemical Safety (IPCS) has produced an internationally peer reviewed chemical analysis of ractopamine⁴⁷ which includes an assessment of observations in humans. This document notes a range of cardiovascular effects resulting from the use of ractopamine in humans. These include tachycardia, vasodilation, skeletal muscle tremor, nervousness, and metabolic disturbances, in addition to airway hyper-responsiveness and increased airway inflammation. The analysis notes that people with underlying coronary artery disease or pre-existing arrhythmias are at an increased risk of tachycardia, decreased blood pressure and cardiac palpitations. These results were later corroborated by a FEEDAP clinical trial.⁴⁸ Furthermore, clinical trials on human subjects revealed behavioural side-effects including restlessness, apprehension and anxiety.

Importantly, no long term studies have determined the safety of ractopamine in humans, and there is no data on the effects of long-term exposure of humans to the chemical.

While most other drugs used by producers require a clearance time of two weeks before an animal can be slaughtered for food, there is no such clearance period required for ractopamine. Pigs can continue to be administered the drug in their feed right up until the time of slaughter. This is despite industry research showing that it takes a full seven days for 97% of ractopamine to be excreted following a one-time typical dose.⁴⁹

Smithfield Foods in the US have reportedly agreed to sell 60-million pounds of paylean-free pork to China. In order to do so, they stop feeding their pigs paylean for *three weeks* prior to slaughter. Evidently it takes three full weeks for paylean to clear from the body of pigs so that it cannot be detected during inspections. It follows that pigs fed paylean right up until the time of slaughter have significant amounts of paylean within their bodies.

In China, pork containing paylean is considered toxic and harmful. There is a “categorical” ban on pork produced with ractopamine and cases where it has been detected in pork have resulted in multiple arrests.⁵⁰ In 2007, China blocked pork shipments from the US because traces of ractopamine were found. A Chinese representative has stated, “*China does not share the US view that the substance is a safe product.*”⁵¹ In Malaysia, where the use of paylean has been banned since 2002, the government monitors the food given to pigs, and farms found to use paylean are fined and / or sentenced to two years in prison.⁵² Ractopamine is also banned in Taiwan, where pork products are often screened.⁵³

Environmental considerations

Consumers increasingly want to make environmentally conscious purchasing decisions, and clear and adequate method of production labelling will allow them to do so.

It is now commonly acknowledged that rural industries and meat farming contribute greatly to atmospheric carbon dioxide concentrations, and are subsequently one of the leading causes of global warming. However, it has recently been purported that a shift to free range production methods would not only reduce emissions associated with livestock industries, but would concurrently reduce the effects of global warming by sequestering carbon out of the atmosphere. As there is more carbon stored in soil in comparison with the atmosphere, free range farming methods can contribute to the better management of that bank of carbon. By moving animals frequently, it allows the grass to accumulate the carbon. The animals then trample the soil, enabling it to absorb the carbon. When the animals are moved, the grass is allowed to re-sprout and the process is repeated.⁵⁴ Such free range farming effectively mitigates the methane emissions associated with raising cattle.⁵⁵ Studies are also showing that cattle grazing on healthier grass that is allowed to regenerate produce up to 20% less methane during digestion,⁵⁶ thereby directly contributing to a reduction in greenhouse gas emissions.

Furthermore, water usage on intensive farms is far greater than that used with free range production methods. For example, a free range pork producer would use

seven times less water than an intensive farm with the same number of breeding sows.⁵⁷

Both the United Kingdom⁵⁸ and Sweden⁵⁹ are considering food labelling schemes that will provide information on greenhouse gases involved in food production, that will be linked to environmental standards relating to, among other things, energy inputs, fertiliser use, soil management, waste management and water pollution.

Ethical considerations

Consumers must have the right to make informed purchasing decisions that align with their ethics and belief systems.

The conditions in which the 500 million animals currently in factory farming environments are housed and treated are widely documented. As education campaigns inform consumers of the common practices in these environments, including cramped and often inhumane living conditions and cruel husbandry practices,⁶⁰ there is an increased need for a nationally consistent labelling scheme to assist consumers to identify those products that are produced according to humane production methods and standards.

Deceptive and misleading conduct

The Senate Standing Committee on Rural and Regional Affairs and Transport recently concluded their inquiry into meat marketing, and in the final report⁶¹ stated,

“...it is currently too easy for food producers to make dubious claims about their animal welfare practices on the labels seen at retail level. This is because it is too difficult for the ACCC to prosecute misleading and deceptive conduct in this area when the meaning of these descriptors are broadly understood but not clearly defined. Any misuse of animal welfare descriptors such as ‘free range’ threatens the competitiveness of genuine producers bearing the increased costs associated with meeting high animal welfare standards. Animal welfare-related labelling should be subject to tighter controls to protect both consumers and genuine producers” (p. 33).

Accordingly, HSI is aware of cases of misleading and false labelling resulting from the current lack of regulation, specifically involving the mislabelling of “bred free-range” pork products as “free-range”.

In 2007, the Free Range Pork Farmers Association complained to the ACCC about “Gooralie Free Range Pork” and “Bundawarra Free Range Pork” marketing their pork as free-range when it is bred free-range. In 2008, HSI made a complaint about David Jones marketing “Bangalow Sweet Pork” as free-range when it is actually bred free-range. More recently, we made a complaint to the ACCC earlier this year when Woolworths told one of our supporters that they stock free range-pork in 50 stores in Victoria and 20 in NSW – the pork they were referring to was KR Castlemaine and again it is bred free-range, not free-range.

In all instances the ACCC did not take any further action, claiming that there are no fixed standards against which to define the terms, and that they cannot be certain of the average consumer’s understanding of the labelling terms.

Most recently, an analysis of egg industry data from 2006 – 2007 confirmed that producers are substituting cage eggs for eggs labelled as free-range.⁶² In order to produce the quantity of eggs sold as free-range according to Australian Egg Corporation data, the overall flock of laying hens would have needed to increase by over 200,000. In actual fact, they decreased by 6% during that time period, indicating that 36.8 million eggs, or just over 16% of eggs produced, were incorrectly labelled. Largely to blame is the voluntary accreditation scheme of the Australian Egg Corporation, who have a vastly different definition of free-range than the definition endorsed by the Free Range Egg and Poultry Association of Australia.

According to the Australian Egg Corporation, free-range indicates:

- Hens are housed in sheds with access to an outdoor range
- Stocking capacity within sheds can't exceed 14 birds / m²
- Maximum of 1500 birds / hectare
- Beak trimming is permitted

The Free Range Egg and Poultry Association of Australia definition indicates:

- Unrestricted access to free-range during daylight hours
- Stocking capacity within sheds can't exceed 7 birds / m²
- Maximum of 750 birds / hectare
- Beak trimming is not permitted

It is therefore clear that the use of the term free-range is being used to describe vastly different welfare standards for egg-laying poultry.

International precedents

Australia is lagging behind the European Union when it comes to the labelling of animal-derived food products. The EU has required the mandatory labelling of egg production systems since 2004,⁶³ and has simplified labelling on egg cartons by only allowing the use of the terms “free range eggs”, “barn laid” and “eggs from caged hens”.⁶⁴ These are stipulated in Commission Regulation (EC) No 2295/2003 and amended in Commission Regulation (EC) No 1515/2004, which also defines these terms according to legislated criteria according to animal welfare conditions.

The European Union has also proposed a mandatory labelling scheme for chicken meat and meat products based on compliance with animal welfare standards.⁶⁵

FSANZ Act

While we understand that the primary objective of the FSANZ Act is the protection of public health and safety, the provision of adequate information relating to food to enable consumers to make informed choices, and the prevention of misleading or deceptive conduct are also objectives of the Act. Country of Origin labelling has demonstrated the application of a national mandatory labelling scheme, facilitated by the FSANZ Act and incorporated into state and territory legislation, for the express purpose of “providing adequate information relating to food to enable consumers to make informed choices”.

Given this precedent, and the health aspects described above involved with the consumption of palm oil and intensively produced meat products, we feel our suggested amendments are not limited by the FSANZ Act. Furthermore, the introduction of mandatory labelling of palm oil and the production method of meat,

eggs and dairy products would be complimentary to existing mandatory labelling schemes.

We thank you for the opportunity to provide a submission to this Committee and look forward to hearing of your recommendations.

Yours sincerely,



Michael Kennedy
Director

-
- ¹ Malaysian Palm Oil Promotion Council. Health, Nutrition, and Palm Oil: A Compilation.
- ² Hayes KC, Pronczuk A, Khosla P (1995). A rationale for plasma cholesterol modulation by dietary fatty acids: modeling the human response in animals. *Journal of Nutritional Biochemistry* 6:188–94.
- ³ Grande F, Anderson JT, Keys A (1970). Comparison of effects of palmitic and stearic acids in the diet on serum cholesterol in man. *American Journal of Clinical Nutrition* 23:1184–93.
- ⁴ Clarke R, Frost C, Collins R et al. (1997) Dietary lipids and blood cholesterol: quantitative meta-analysis of metabolic ward studies. *British Medical Journal* 314:112–7.
- ⁵ Mensink RP, Zock PL, Kester ADM et al. (2003). Effects of dietary fatty acids and carbohydrates on the ratio of serum total to HDL cholesterol and on serum lipids and apolipoproteins: a meta-analysis of 60 controlled studies. *American Journal of Clinical Nutrition* 77:1146–55.
- ⁶ World Health Organization (2003). Diet, Nutrition and the Prevention of Chronic Diseases. WHO Technical Report Series 916. Geneva.
- ⁷ National Heart, Lung, and Blood Institute, National Institutes of Health (NHLBI) (1997). Be Heart Smart! Eat Foods Lower in Saturated Fats and Cholesterol. NIH Publication No. 97- 4064.
- ⁸ National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health (2003). Prevent Diabetes Problems: Keep Your Heart and Blood Vessels Healthy. NIH Publication No. 03–4283.
- ⁹ Dowse GK, Garebo H, Alberti KG (1995). Changes in population cholesterol concentrations and other cardiovascular risk factor levels after five years of the non-communicable disease intervention programme in Mauritius. *British Medical Journal* 311:1255–9.
- ¹⁰ Keller I (2002). Towards a Global Strategy on Diet, Physical Activity and Health. Presentation made at 55th World Health Assembly, May 13, 2002. Geneva: World Health Organization. www.uni-giessen.de/~gk1728/downloads/EUB%20A%20Keller.pdf.
- ¹¹ Reddy KS (2004) Cardiovascular disease in non-western countries. *New England Journal of Medicine* 350: 2438–40.
- ¹² Environmental concerns mount as palm oil production surges. Key points on the environmental impact of palm oil. 15 May 2007.
- ¹³ Brown E & Jacobson MF (2005). Cruel oil: how palm oil harms health, rainforest and wildlife. Report commissioned by the Centre for Science in the Public Interest. Washington, DC.
- ¹⁴ Biofuel Watch (2006). Factsheet 1: South-east Asia's peat fires and global warming.
- ¹⁵ Delft Hydraulics (2006). Peat-CO₂: assessment of CO₂ emissions from drained peatlands in SE Asia.
- ¹⁶ Pearce F (2002) Indonesian fires spark global warming fears. *New Scientist*, November 2002. www.newscientist.com/article.ns?id=dn3024
- ¹⁷ Hooijer A, Silviu M, Wösten H & Page S (2006) Assessment of CO₂ emissions from drained peatlands in South-east Asia. 7 December 2006.
- ¹⁸ The World Bank (2007). The Little Green Data Book.
- ¹⁹ Butler RA (2006). Why is palm oil replacing tropical rainforests? Why are biofuels fueling deforestation? 25 April 2006.
- ²⁰ Ibid.
- ²¹ World Conservation Union (IUCN). 2004 IUCN Red List of Threatened Species.
- ²² Brown E & Jacobson MF (2005), op cit.
- ²³ Wakker E & de Bruin I (2004) Human-wildlife conflicts in and around oil palm plantations. Report commissioned by the Centre for Science in the Public Interest. Washington, DC.
- ²⁴ Brown E & Jacobson MF (2005) op cit.
- ²⁵ IUCN (2009) op cit.

-
- ²⁶ Wetlands International Press Release: Palm oil banned from bio-fuels in the Netherlands. 15 December 2006.
- ²⁷ Australian Egg Corporation 2006. Egg industry overview.
- ²⁸ Demand soars for organic chicken meat. ABC Rural News, 30 November 2005. <http://www.abc.net.au/rural/content/2005/s1519954.htm>
- ²⁹ Voiceless (2007). From label to liable: lifting the veil on animal-derived food product labelling in Australia.
- ³⁰ Commission of the European Communities (2002). Communication from the Commission to the Council and the European Parliament on animal welfare legislation on farmed animals in Third World Countries and the implications for the EU.
- ³¹ De Passille AM & Rushen J (2005), Food safety and environmental issues in animal welfare. *Animal welfare: global issues, trends and challenges*. Scientific and Technical Review 24(2): 757-766.
- ³² Kanitz E, Tuchscherer M, Tuchscherer A, Stabenow B & Manteuffel G (2002). Neuroendocrine and immune responses to acute endotoxemia in suckling and weaned piglets. *Biology of the Neonate* 81(3): 203-209.
- ³³ Minton J (1994). Function of the hypothalamic-pituitary-adrenal axis and the sympathetic nervous system in models of acute stress in domestic farm animals. *Journal of Animal Science* 72(7): 1891-1898.
- ³⁴ Joint Expert Advisory Committee on Antibiotic Resistance (JETACAR) (1999). The use of antibiotics in food-producing animals: antibiotic resistant bacteria in animals and humans.
- ³⁵ Chris Richards and Associates Swine Veterinary Consultants. <http://chrisrichards.com.au/index.php?page=msds's>
- ³⁶ Turnidge J (2001). Antibiotics in animals – much ado about something. *Australian Prescriber* 24(2): 26-27.
- ³⁷ Ibid.
- ³⁸ Putting Meat on the Table: Industrial Farm Animal Production in America. A Report of the Pew Commission on Industrial Farm Animal Production (2008).
- ³⁹ Poulter S (2008). Factory farms “to blame for new superbugs”. *Daily Mail*, 11 August 2008.
- ⁴⁰ Joint Expert Advisory Committee on Antibiotic Resistance (JETACAR) (1999), op cit.
- ⁴¹ Kristof ND (2009). Our pigs, our food, our health. *The New York Times*, 12 March 2009.
- ⁴² Poulter S (2008). Factory farms “to blame for new superbugs”. *Daily Mail*, 11 August 2008.
- ⁴³ Ibid.
- ⁴⁴ Ibid.
- ⁴⁵ Minton B (2009). Paylean: Drug in conventionally raised meat linked to cancer and heart disease. www.naturalnews.com
- ⁴⁶ Paylean 20: Ractopamine hydrochloride. Elanco Animal Health.
- ⁴⁷ Ractopamine (addendum). Joint Expert Committee on Food Additives (JECFA) 53, 2004.
- ⁴⁸ Scientific Opinion of the Panel on Additives and Products or Substances used in the Animal Feed (FEEDAP) on a request from the European Commission on the safety evaluation of ractopamine. *The EFSA Journal* (2009) 1041: 1-52.
- ⁴⁹ Minton B (2009), op cit.
- ⁵⁰ Nine arrested for selling pigs fed with banned chemical. 31 March 2009. www.xinhuanet.com
- ⁵¹ China says ban on hog growth enhancer improves food safety. *ThePigSite*, 25 September 2007.
- ⁵² Ten pig farms quarantined. *New Straits Times*, 31 December 2008. <http://www.highbeam.com/doc/1P1-159544936.html>
- ⁵³ Pigs under scrutiny for ractopamine. *ThePigSite*, 10 August 2007.
- ⁵⁴ Walljasper J (2008). Can cattle save us from global warming? 30 June 2008. *Eatwild: Grassfarming benefits the environment*. <http://www.eatwild.com/environment.html>
- ⁵⁵ Finishing cattle on pasture may reduce greenhouse gases. *Eatwild: Grassfarming benefits the environment*. <http://www.eatwild.com/environment.html>
- ⁵⁶ DeRamus HA, Clement TC, Giampola DD & Dickison PC (2003). Methane emissions of beef cattle on forages: efficiency of grazing management systems. *Journal of Environmental Quality* 32(1): 269-277.
- ⁵⁷ Humane Society International. The environmental benefits of free range farming over intensive farming.
- ⁵⁸ Clover C (2008). Eco-label will create green standard for food, says Miliband. *The Telegraph UK*, 19 April 2008. <http://www.telegraph.co.uk/news/uknews/1543832/Eco-label-will-create-green-standard-for-food.-says-Miliband.html>
- ⁵⁹ Climate labelling of food in Sweden. KRAV. <http://www.krav.se/upload/Broschyr%20EN.pdf>
- ⁶⁰ RSPCA Australia. Fair go for farm animals.
- ⁶¹ The Senate Standing Committee on Rural and Regional Affairs and Transport (2009). *Meat Marketing. Final Report*. Commonwealth of Australia. http://www.aph.gov.au/Senate/committee/rrat_ctte/meat_marketing/report/report.pdf
- ⁶² Burke K (2009). Free-range egg claims don't add up. *Sydney Morning Herald*, 6 September 2009.
- ⁶³ Council Regulation 2001/05/EC of 19 December 2000 amending Regulation 1907/90/EEC on certain marketing standards on eggs [1999] OJ L 2/1; cited by Voiceless (2007), above n 14.

⁶⁴ Commission Regulation (EC) No 2295/2003 of 23 December 2003 introducing detailed rules for implementing Council Regulation (EEC) No 1907/90 on certain marketing standards for eggs <http://faolex.fao.org/docs/pdf/eur45596.pdf> as amended by Commission Regulation (EC) No 1515/2004 <http://faolex.fao.org/docs/pdf/eur45599.pdf>

⁶⁵ Commission of the European Communities. Communication from the Commission to the European Parliament and the Council on a Community Action Plan on the Protection and Welfare of Animals 2006-2010. Brussels, 23 January 2006. http://ec.europa.eu/food/animal/welfare/com_action_plan230106_en.pdf