

COMMENTS ON MEAT & LIVESTOCK AUSTRALIA'S "MYTH BUSTERS" AND OTHER CLAIMS

Paul Mahony, 15th April, 2012 (Updated 25th April, 2012)

Introduction:

This article considers material produced by Meat & Livestock Australia (MLA) in the form of what it calls "myth busters" and "red meat green facts".

At the time of writing, the relevant material could be seen here:

<http://www.redmeatgreenfacts.com.au/Myth-Bust>

<http://www.redmeatgreenfacts.com.au/Reduce-Emission>

MLA introduces its material with the comments: *"Red Meat Green Facts has been created by the cattle and sheep industry in an ongoing effort to discuss the issues of sustainable farming practices. Here you'll find the facts about the impact of farming on our environment and the proactive initiatives undertaken by farmers and processors across Australia."*

MLA's so-called "myth busters", with my views on them, are outlined below.ⁱ

MLA'S "MYTH BUSTER" NO. 1 INCLUDING ITS CORRESPONDING "FACT" STATEMENT:

"Myth": *It takes 50,000 litres of water to produce a kilogram of beef.*

"Fact": *These figures arise from 'virtual water figures'. Virtual water figures attribute every drop of rain that falls on a farm to the production of red meat, ignoring that most of the water ends up in waterways such as dams and rivers, is used to grow trees and plants and is absorbed in pastures not grazed by cattle.*

Virtual water figures were never intended for environmental measurements.

A more appropriate figure is from a life cycle assessment that calculates the amount of water used to produce a kilogram of beef from grazing on farm to exiting the processing facility. A 2009 life cycle assessment carried out by The University of New South Wales for three beef production systems in southern Australia found that it takes between 27 to 540 litres of water to produce a kilogram of beef.

My Comments:

The figure of 50,000-100,000 litres has come from Prof. Wayne Meyer of the University of Adelaide and CSIRO.^{1,2} It is similar to the figures of Dr David Pimentel of Cornell University³. It is higher than figures from Prof. Arjen Hoekstra of the University of Twente and colleagues⁴ (whose figures are used by the Water Footprint Network)⁵, but Prof. Hoekstra's figures for meat are still many times higher than those for vegetables and grains.

The Water Footprint Network is a non-profit foundation under Dutch law. The founding partners are: University of Twente, World Wildlife Fund, UNESCO-IHE Institute for Water Education, the Water Neutral Foundation, the World Business Council for Sustainable Development, the International Finance Corporation (part of the World Bank Group) and the Netherlands Water Partnership.

In responding to queries regarding the differences between his figures and those of Prof. Meyer and Dr Pimentel, Prof Hoekstra has stated, *"All authors agree the water footprint of beef is larger than the water footprint of pork or chicken and much larger than the water footprint of grains."*⁶

ⁱ Please note that none of the information contained in this article is intended to represent dietary advice, and should not be construed as such.

Prof. Meyer has said (my underline), *“While the numbers . . . were originally derived for irrigated pastures and therefore for fairly intense production the conversion of vegetative dry matter into meat is an intensive energy process and hence also an intense water requiring process. I suspect that if you do the same exercise on rain fed, extensive meat production that there may even be more water involved since feed conversion is likely to be lower, energy expended in gathering dry matter would be greater and soil evaporation losses may even be higher in the more sparsely vegetated dry land grazing.”*⁷

Based on that comment, it appears that MLA’s claim that “virtual water” figures *“attribute all rain that falls on a farm to the production of red meat”* is incorrect. They attribute all rain on a beef cattle grazing pasture (for example) to beef production. This is due to the fact that all water has alternative uses, including environmental run-off such as replenishment of water tables. For a grazing pasture, it is used to grow grass to feed cattle. Far more nutrition would generally be derived from that land area if it were used to grow crops.

Even in remote grazing lands, the available water sustains native vegetation. Making that vegetation, and hence the water that was essential for its growth, available to livestock can severely degrade the soil and negatively impact other aspects of the natural environment. (See comments in relation to “myth buster” no. 5.)

Some comments from Professor Meyer, which are relevant to MLA’s final paragraph:

“Most commentators taking a meat production perspective identify only that water involved in the direct supply of water to the animal. However, the very large amount of water needed is associated with growing the feed (grass, grain and vegetative dry matter). To grow this vegetation dry matter for the animal to eat requires water; whether this comes from rain or irrigation is not immediately important.”

The Water Footprint Network’s approach is as follows:

“The water footprint of a product is an empirical indicator of how much water is consumed, when and where, measured over the whole supply chain of the product. The water footprint is a multidimensional indicator, showing volumes but also making explicit the type of water use (evaporation of rainwater, surface water or groundwater, or pollution of water) and the location and timing of water use. The water footprint of an individual, community or business, is defined as the total volume of freshwater that is used to produce the goods and services consumed by the individual or community or produced by the business. The water footprint shows human appropriation of the world’s limited freshwater resources and thus provides a basis for assessing the impacts of goods and services on freshwater systems and formulating strategies to reduce those impacts.”

The “water footprint” and “virtual water” approaches are similar in the context of food products themselves. The Water Footprint Network states, “in this context we can also speak about the ‘virtual water content’ of a product instead of its ‘water footprint’”.

The main differences are:

- The “water footprint” approach applies the methodology more widely by determining the “water footprint” of an individual, a business, a country and the like.
- While “virtual water” simply refers to water volume, the “water footprint” is a multidimensional indicator, in that it determines where the water footprint is located, what source of water is used, and when the water is used.

In the context of the similarities between “virtual water” and “water footprint”, MLA’s comment that *“virtual water figures were never intended for environmental measurements”* is curious. The Water Footprint Network states, *“The water-footprint concept is part of a larger family of concepts that have been developed in the environmental sciences over the past decade.”*

Based on the work of Prof. Meyer, Prof. Hoekstra, Dr Pimentel and their colleagues, the water efficiency of various plant products can be compared to beef, as referred to in Figure 1.

Figure 1: Per hectare nutritional value and water usage of different foods

Producing this much nutrition per hectare . . .

Figure 1: Protein per hectare (gm)

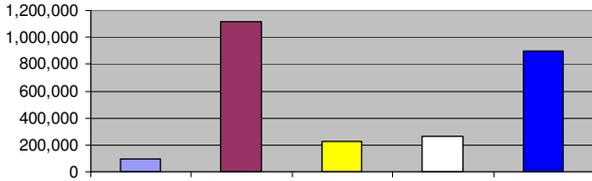


Figure 2: Energy per hectare (kcal)

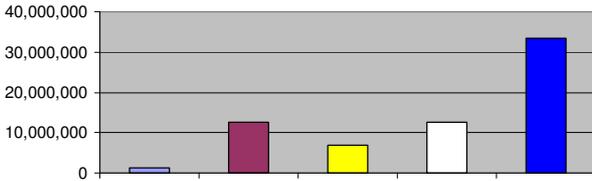


Figure 3: Iron per hectare (mg)

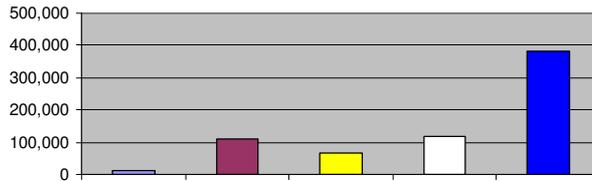


Figure 4: Zinc per hectare (mg)

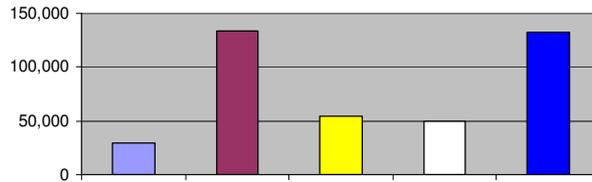


Figure 5: Omega 3 per hectare (mg)

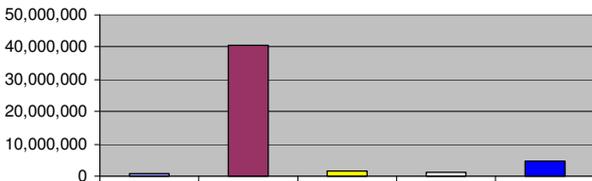
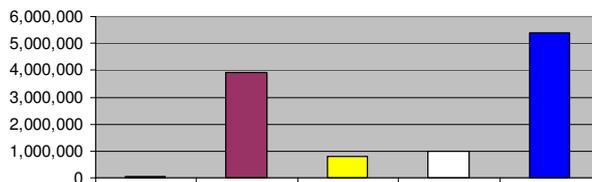


Figure 6: Calcium per hectare (mg)



. . . causes us to use this much water per hectare (litres):

Figure 7: Based on CSIRO figures for beef, soy, wheat and rice and Water Footprint Network figures for potato

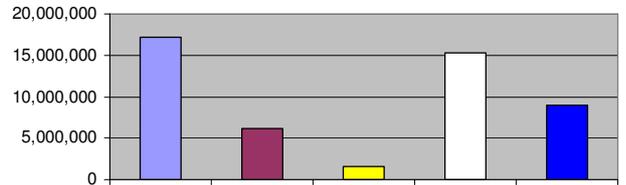


Figure 8: Based on Water Footprint Network figures

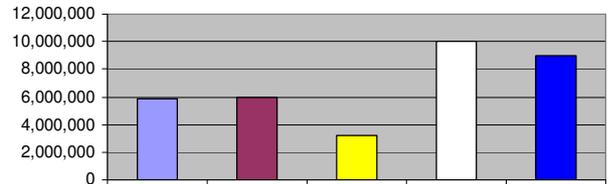
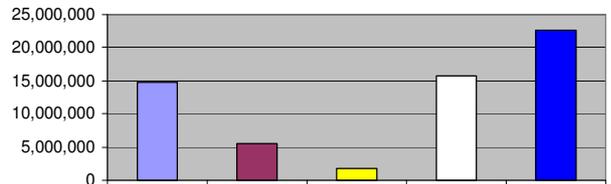


Figure 9: Based on figures from Dr David Pimentel, Cornell University and colleagues



Legend:

- Beef
- Soy
- Wheat
- Rice
- Potato

The calculations for determining the level of nutrition per hectare in the charts have utilised information from the United States Department of Agriculture's (USDA) National Nutrient Database for Standard Reference.⁸ The assumed per hectare yield of **beef** (343 kg) has been determined by utilising the gross energy output per hectare as reported by Spedding⁹ and the USDA energy value figures. The assumed per hectare **soybean** yield (2,804 kg) has been derived from the U.S. bushels per acre as reported by Nabors¹⁰, and the USDA's bushel weight for soybeans of 60 pounds.¹¹ The figures for **wheat, rice** and **potato** have been obtained from the Australian Bureau of Statistics Year Book 2008.¹² Please refer to further comments on product yields below.

Wide variations in product yield can apply, depending on the location and conditions in which products are grown, and some of the yields used for the above charts may be high for Australian conditions.

For example, while the yield figure for beef (refer above) may be achievable in the more intensive cattle farming regions of Australia, the enormously widespread range of cattle grazing (including grazing in marginal areas) causes our average yield to be a small fraction of the figure assumed in the charts.

In regard to soy beans, the Primary Industry Bank has reported an average yield for Australian production of 1,880 kg per hectare between 1993/94 and 1999/00.¹³ Accordingly, as for beef, the yields for soy may be at the upper end of the expected range.

If lower yields were assumed for any product, the water usage figures would be lower, but so would the nutritional value.

With the exception of vitamin B12, and subject to comments below regarding Omega-3 fatty acids, the comparisons include all the nutrients highlighted in Meat & Livestock Australia's "five essential nutrients one amazing food" advertising campaign featuring the actor Sam Neill and an orangutan.¹⁴ Vitamin B12 is perhaps the only nutrient that is significantly more difficult to obtain directly from plants than from animals. However, it is easily produced from bacteria and supplemented in other food products, which is a far more natural approach than: (a) destroying rainforests and other natural environs; and (b) operating industrial livestock production systems; purely for animal food products.

The charts do not distinguish between long chain (DHA and EPA) and short chain (ALA) Omega-3 fatty acids. However, the relative benefits of long chain over short chain varieties, and the benefits of Omega-3 fatty acids generally, have been questioned on the basis of statistical meta-analysis and other studies.¹⁵

MLA'S "MYTH BUSTER" NO. 2 INCLUDING ITS CORRESPONDING "FACT" STATEMENT:

***"Myth":** Livestock produce more emissions than the whole of the transport sector combined*

***"Fact":** This commonly quoted figure originated from the 2006 United Nations Food and Agricultural Organization (FAO) report, *Livestock's Long Shadow*. A subsequent 2010 review of this report by scientists from the University of California Davis found that the FAO paper used two different methodologies to calculate greenhouse gas emissions and resulted in an unfair comparison. Following this paper one of the initial authors of the FAO report, Livestock Policy Officer Pierre Gerber, told BBC News he accepted the criticism.*

"I must say honestly that he [Professor Mitloehner, UC Davis] has a point; we factored in everything for meat emissions, and we didn't do the same thing with transport".

In Australia, energy generation represents 37 per cent of Australia's emissions, compared to 10 per cent for livestock.

My Comments:

1. World Watch Institute:

While the UN FAO's "Livestock's Long Shadow" report may not have included all relevant factors in relation to transport, it also omitted many critical factors in relation to livestock's impact.

Another report, issued by the World Watch Institute in late 2009 and written by the former lead environmental adviser to the World Bank and another World Bank colleague, suggested that livestock are responsible for 51% of global greenhouse gas emissions.¹⁶

It highlighted the following issues in the context of the "Livestock's Long Shadow" report:

- 20 year "global warming potential" (GWP) on methaneⁱⁱ
- Land use, including foregone sequestration on land previously cleared
- Livestock respiration overwhelming photosynthesis in absorbing carbon
- Increased livestock production since 2002
- Corrections in documented under-counting
- More up to date emissions figures
- Corrections for use of Minnesota for source data
- Re-alignment of sectoral information
- Fluorocarbons for extended refrigeration
- Cooking at higher temperature and for longer periods
- Disposal of waste
- Production, distribution and disposal of by-products and packaging
- Carbon-intensive medical treatment of livestock-related illness

Even removing the respiration factor, based on this author's calculations and using the World Watch Institute's findings, livestock would be responsible for around 43% of emissions.

Some key issues in relation to the report are:

(a) Land use, including foregone sequestration on land previously cleared:

The World Watch Institute report highlighted the fact that Livestock's Long Shadow did not allow for foregone sequestration on land cleared in the years prior to the reporting period. Australia's National Greenhouse Inventory also does not allow for such foregone sequestration in any of its emissions figures. Furthermore, the Australian inventory reports livestock-related land clearing under the "land use, land use change and forestry" category (LULUCF), rather than agriculture or livestock, meaning that livestock's impact is understated.

The authors of the World Watch Institute report suggest the possibility of allowing land that has been cleared for livestock grazing or feed crop production to regenerate as forest, thereby mitigating "*as much as half (or even more) of anthropogenic GHGs [greenhouse gases]*". Alternatively, they suggest that the land could be used to grow crops for direct human consumption or crops that could be converted to biofuels, thereby reducing our reliance on coal. They have used the biofuel scenario in their calculations.

ⁱⁱ The emissions of different gases can be aggregated by converting them to carbon dioxide equivalents (CO₂-e). They are converted by multiplying the mass of emissions by the appropriate global warming potentials (GWPs). GWPs represent the relative warming effect of a unit mass of the gas when compared with the same mass of CO₂ over a specific period. For methane, the GWPs used by the UN's Intergovernmental Panel on Climate Change (IPCC) are 21 for 100 years and 72 for 20 years. The UN Food & Agriculture Organization used a GWP of 23 for the 100 year time horizon in its 2006 "Livestock's Long Shadow" report.

(b) 20-year global warming potential (GWP):

The World Watch Institute report used a 20-year GWP for methane (see footnote), which may be more valid than the 100-year figure used by the UN FAO and most other reporting bodies, including Australia's Department of Climate Change and Energy Efficiency. That is because methane, a critical factor in livestock's greenhouse effects, generally breaks down in the atmosphere in 9–12 years. Accordingly, a 100-year GWP (which shows the average impact over a period of 100 years) greatly understates its shorter-term impact.

Although methane may have a shorter life than carbon dioxide (which remains in the atmosphere for many hundreds of years), its impact can be long term if it contributes to us reaching tipping points that result in positive feedback loops with potentially irreversible and catastrophic consequences.

On the positive side, the relatively short term nature of methane's impact means that action on livestock production can be one of the most effective steps available to us in dealing with climate change.

2. Prof. Frank Mitloehner:

The following guest post from the website of Adelaide University's head of climate science, Prof. Barry Brook, is also of interest in relation to the work of Prof. Frank Mitloehner, who has been referred to in MLA's "myth buster" no. 2.

Extract from "Livestock and Climate Change - Status Update", 17/1/11, by Geoff Russell¹⁷:

"The livestock industry has countered LLS [the UN FAO's "Livestock's Long Shadow" report] with all manner of rubbish. For example the NSW Farmer's Association ran a line which confused US figures with global figures and left out nitrous oxide emissions altogether. Much of this confusion comes from one Frank Mitloehner who has been trumpeting a 3 percent figure at any journalist who will listen for some time now. While I'm sure Associate Professor Mitloehner knows what he's talking about, journalists and NSW Farmer's Association people tend to be easily confused.

Livestock methane emissions in the US are indeed about 3 percent of US emissions and are well below the 14 percent global average figure of LLS ... about half of which was nitrous oxide as we saw in the first table.

It is common for US authors to confuse the US with the entire planet, but US livestock methane emissions are below average for a number of unsurprising reasons:

- 1. US cattle are predominantly grain fed (producing less methane) than cattle on pasture.*
- 2. The US ratio of cattle to people is about 1 to 3 compared to 1 to 1 in Brazil and well above 1 to 1 in Australia.*
- 3. US methane emissions from garbage are huge. In Australia, by comparison, and we are not noted for frugality, our garbage methane emissions are 1/6th of our livestock emissions. In the US, methane from garbage exceeds livestock methane.*
- 4. The US imports about 10 percent (net) of its beef and almost all of its sheep meat ... not that they eat much. So the emissions from that beef don't appear in US figures.*
- 5. Lastly, US advertisers and fast food chains may portray their home country as a hamburger culture, but Americans actually eat twice as much chicken as beef and almost no sheep meat at all. Australian ruminant meat intake is double that of the US.*

It's not so much that US livestock emissions are small, but that they are swamped by other profligate consumption emissions."

3. Percentage of Emissions:

MLA's "Myth buster no. 2" also states, "*In Australia, energy generation represents **37 per cent** of Australia's emissions, compared to **10 per cent** for livestock.*"

The link used by MLA is no longer working, but it directed readers to Australia's National Greenhouse Inventory for 2008. The figures used for this item are based on that inventory, titled "*Australian National Greenhouse Accounts, National Greenhouse Inventory – Accounting for the Kyoto Target*".¹⁸ While it no longer appears to be available online, the figures appear to be consistent with the latest version of the 2008 inventory that is available online, titled "*Australian National Greenhouse Accounts, National Inventory Report 2008, Volumes 1, 2 & 3, The Australian Government Submission to the UN Framework Convention on Climate Change*".¹⁹

The inventory used for this item confirms that the figure of 37 per cent for 2008 referred to electricity production rather than all energy production (pp. 3 & 7). Stationary energy in total accounted for 53.9% (p. 7).

The report indicated that livestock's emissions were 59 mt, representing 10.7% of Australia's total emissions of 549 mt. The livestock figure was based solely on enteric fermentation (which causes methane to be released, primarily through belching) and manure management (which releases methane and nitrous oxide).

Adding emissions from livestock-related deforestation and savanna burning increases livestock's emissions to 106 mt or **18%** of the revised total.

Using that figure and applying a 20-year GWP, the final percentage increases to **30%**.

Assumptions:

- 85.1% of forest clearing was for livestock grazing²⁰; and
- 56.9% of savanna burning was for livestock²¹.

In respect of the first assumption, it is helpful to note that the National Greenhouse Inventory's land use change estimate for 2008 includes emissions and removals from all forest lands cleared that year as well as ongoing emissions from the loss of biomass and soil carbon on lands cleared over the previous twenty years (p. 19).

4. Comparison with Coal-fired Power:

Applying a 100-year GWP, Australia's 2008 National Greenhouse Inventory reported 55.6 tonnes of CO₂-equivalent (CO₂-e) methane emissions from enteric fermentation by livestock. That equates to 190 tonnes of CO₂-e emissions using a 20-year GWP, which is more than the emissions from coal-fired electricity generation (Figure 7, page 8). Such an approach was utilised in a late 2007 article in Australasian Science titled "*Meat's Carbon Hoofprint*".²²

The comparison only takes into account livestock's methane emissions, and not:

- (i) nitrous oxide emissions from manure management;
- (ii) deforestation for grazing and feed crop production; or
- (iii) savanna burning for livestock pasture and grazing; which is referred to in item 3 above.

5. Comments from the Climate Institute (with my underline for emphasis):²³

"It has been known for decades that methane is a powerful greenhouse gas. Up to one third of the warming during the twentieth century may be attributable to methane. Since the eighteenth century, methane concentrations have risen 2.5 fold even as natural sources such as wetlands and wildlife declined. According to ice core analyses, concentrations are the highest they have been for around

650,000 years. For reasons poorly understood, methane levels stabilised for several years during the late 1990's and early 2000's, possibly as a result of a decline in the rate of tropical deforestation. In recent years, however, methane concentrations have resumed their rapid rise." (p. 8)

"Of the global anthropogenic sources of methane, ruminant livestock is one of the biggest. Fugitive emissions from coal mining, vegetation burning and other industries, as well as landfill sites, are also significant sources. It is worth noting that, globally, numbers of ruminant livestock continue to climb as world population and incomes - and hence demand - rise." (p. 9)

"While it is true that atmospheric methane is short-lived, it is continually being 'topped up' and, even more significantly, is some seventy-two times more potent than carbon dioxide when measured in a twenty-year timeframe. Suggestions that methane from livestock is not a significant greenhouse gas, while comforting to vested interests, are not based in science." (p. 9)

MLA'S "MYTH BUSTER" NO. 3 INCLUDING ITS CORRESPONDING "FACT" STATEMENT:

"Myth": Cows are solely responsible for methane emissions

"Fact": While the livestock industry makes a significant contribution to methane emissions, livestock emissions are only one contributor to methane levels in the last decade. Other contributors are wetlands, termites, fossil fuel use, landfill and industrial processes.

Livestock farming also helps to absorb carbon emissions through sequestration - the ability of plants, shrubs, grass and soil to store carbon.

A worldwide analysis on the effects of land management on soil carbon showed that comparing forests and well-managed pastures there is, on average, about 8 per cent more soil carbon under well-managed pasture than under native forests.

It is also important to note that atmospheric methane concentrations have remained relatively stable since 2000, despite significant increases in livestock numbers globally.

My Comments:

1. Cows and methane:

I cannot recall anyone claiming that cows are solely responsible for methane emissions. However, they and other ruminants are significant methane emitters. For example, Australia's National Greenhouse Inventory for 2009 (released in May, 2011) stated as follows²⁴:

"The agriculture sector is the dominant national source of both methane and nitrous oxide - accounting for 57.9% and 75.9% respectively of the net national emissions (excluding LULUCF) for these two gases." (p. 203).

In regard to methane, the corresponding table (6.1) shows that the combined contribution of enteric fermentation (within ruminant animals) (54,736 Gg) and manure management (1,752 Gg) is **56,488 Gg**, or **87%** of total methane emissions from agriculture. Savanna burning contributes another 8,530 Gg, and it has previously been estimated that livestock are responsible for around 57% of that, i.e. around **4,900 Gg**, giving a total for livestock of around **61,388**, or **94%** of Australian agriculture's methane emissions.

That is equivalent to **54%** of net national methane emissions (excluding land use, land use change and forestry). (Including LULUCF methane emissions, the figure is 53%. Refer to Table 2.1, p. 28.)

While not as high on a global scale, livestock's contribution to methane emissions is significant. The U.S. Environmental Protection Agency has reported, "Globally, ruminant livestock produce about 80

million metric tons of methane annually, accounting for about 28% of global methane emissions from human-related activities.”²⁵

2. Soil carbon:

Another issue addressed in this “myth buster” is soil carbon.

A concern with the referenced article (i.e. the “*worldwide analysis on the effects of land management on soil carbon*”) is the following comment within the abstract²⁶:

“As the quantity of available data is not large and the methodologies used are diverse, the conclusions drawn must be regarded as working hypotheses from which to design future targeted investigations that broaden the database.”

As the paper was released in 2002, it would seem reasonable to assume that more favourable findings from those potential “future targeted investigations” would have been used, if they were available.

Researcher, author and mathematician Geoff Russell has commented as follows in relation to this matter (referring to a different paper to that utilised by MLA) under the heading “**Carbon Neutral Cattle Stations**”²⁷:

“A long term study in South East Spain illustrates the kinds of gains in carbon sequestration that can be made in suitable areas when pastures are converted to woodland.”

The abstract from the article referred to by Mr Russell says (with my underlines)²⁸:

“The area has always acted as a carbon sink with sequestration rates ranging from 28,961 t CO(2) year(-1) in 1921 to 60,635 t CO(2) year(-1) in 1995, mirroring changes in land use. Conversion from pastures to woodland, for example, accounted for an increase in carbon sequestration above 30,000 t CO(2) year(-1) by the end of the century. However, intensive deforestation would imply a decrease of approximately 66% of the bulk CO(2) fixed. In our study area, woodland conservation is essential to maintain the ecosystem services that underlie carbon sequestration. Our essay could inspire policymakers to better achieve goals of increasing carbon sequestration rates and sustainability within protected areas.”

Also, Queensland pastures have seen a long term drawdown in soil carbon, due to grazing pressure, and the only way to stop this is through cell grazing or resting pastures, which is not possible on most of the rangelands²⁹. Some key points are as follows:

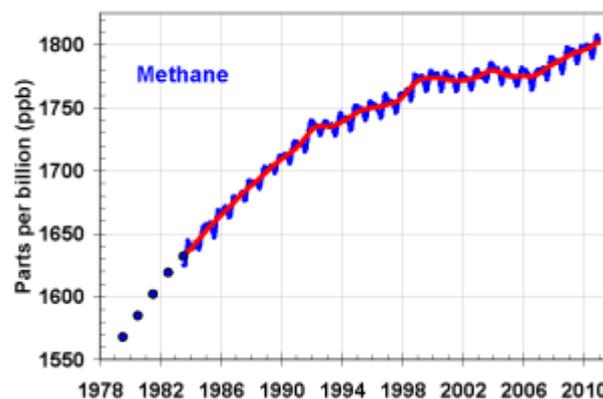
- Since 1956 Australia’s rangelands have carried 8–14 million cattle and 18–40 million sheep (National Land and Water Resources Audit 2001).
- Over 3.2 million sq km of rangelands (more than 43% of Australia) are used for livestock grazing and much of this area has been affected by degradation
- The manifestations of land and pasture degradation, are the loss of ‘desirable’ (in terms of providing feed for livestock) perennial grasses and shrubs, the resulting increase in soil erosion (both wind and water-driven), soil structural decline and infestation of woody weeds. Perennial species (usually grasses but also palatable shrubs in some areas) are the key to economic and resource sustainability.
- Excessive grazing pressure and climatic variability interact to cause the loss of ‘desirable’ perennial grasses and shrubs.
- The loss of perennial cover leads to increased soil erosion, and reduced fuel to support pasture burning, with resultant woody weed infestation and further pressure on the grazed resource.

- Recovery of vegetation generally requires sequences of above-average rainfall years and low grazing pressure to allow plant populations and perennial root systems to build up.
- Recovery sometimes occurred decades after the degradation episode.
- In episodes where there has been considerable loss of soil and/or woody weed increase, irreversible change may well have occurred.
- The main feature of degradation in the documented episodes was the carrying of too many animals, for too long, on areas especially under stress from drought. This highlights that the major management issue in natural grazing systems is managing stock numbers. The challenge is to optimise economic performance, yet at the same time matching stock numbers to available feed and reducing resource degradation risk.
- The evidence for degradation is unequivocal. The accounts from the time are graphic in their descriptions of the physical 'horror' of bare landscapes, erosion scalds, gullies and dust storms. Subsequent observations documented the environmental and economic damage caused by woody weeds, loss of palatable perennial species and soil loss, and highlighted the animal suffering through deaths or forced sales.
- Some common factors between major degradation episodes included the following: (i) Stock numbers and other herbivores (e.g. rabbits, kangaroos and goats), and in some cases woody weed seedlings, increased in response to a period of mainly above-average rainfall that preceded the drought/degradation episode. (ii) Intermittent dry seasons or years resulted in heavy utilisation, damage to the 'desirable' perennial species, and ultimately the grazing land resource. This led to the rapid collapse in the capability of the land to carry animals at the onset of drought. (iii) Extreme utilisation in the first years of drought by retaining stock caused the further loss of perennial species, exacerbating the effects of drought in subsequent years. (iv) Rapid decline in, or generally low, commodity prices resulted in some managers retaining stock in the hope of better prices or the fear of high cost of restocking. (v) Continued retention of stock through a long drought period compounded damage to the resource and delayed recovery.

3. Growth in methane emissions:

"Myth buster" 3 suggests that atmospheric methane concentrations have remained relatively stable since 2000. However, the USA's National Oceanic and Atmospheric Administration's findings indicate that methane concentrations are rising again after slowing down in the early 2000s³⁰, as shown in the following chart.

Figure 2: NOAA Annual Greenhouse Gas Index (AGGI), Updated Fall 2011 (Methane)



MLA'S "MYTH BUSTER" NO. 4 INCLUDING ITS CORRESPONDING "FACT" STATEMENT:

"Myth": *Replacing red meat would be beneficial for people's health*

"Fact": *Red meat delivers nutrients essential for health and wellbeing including: protein, iron, zinc, B vitamins and long chain omega-3s.*

Australian's [sic] should eat a balanced diet with meat, vegetables and grains. To do this in a country with only 7% arable land, great care needs to be taken to use the land and water appropriately. Cattle and sheep are able to sustainably convert roughage on land that is otherwise unsuited to crop production. Without animal agriculture, this land would not be effectively used to produce food, as it is unsuitable for arable farming.

Cattle and sheep grazing are not exclusive and many cropping programs integrate sheep and cattle grazing into their rotation, improving soil health and productivity.

My Comments:

The following authors and organisations have highlighted serious health concerns involving meat products:

1. Geoff Russell, "CSIRO Perfidy"³¹:

The author has summarised "the plot":

- Researchers in the 1990s discovered the similarities between damage to lung DNA from cigarettes and damage to bowel DNA caused by red meat: ". . . *red meat induced . . . [a reaction in the bowel] similar to . . . cigarette smoke.*" UK medical researchers, 1996
- CSIRO researchers are on the ball ... "*Earlier reports suggested that high intake of red or processed meats could be a risk factor [for bowel cancer]. Three large population studies have recently confirmed those earlier reports.*" CSIRO research scientists, early 2006
- Documents obtained under Freedom of Information legislation show that CSIRO researchers informed the CSIRO Board "*Recent findings from [CSIRO] scientists have established that diets high in red meat, processed meats and the dairy protein casein can significantly increase the risk of bowel cancer.*" CSIRO scientists inform the CSIRO Board, April 2006
- What did CSIRO tell the public? . . . "*Studies have shown that fresh red meat (beef and lamb) is not a significant risk factor for colorectal cancer.*" CSIRO Total Wellbeing Diet, Book 2, October 2006

2. Dr T. Colin Campbell and Thomas M. Campbell II, "The China Study"³²:

- Dr. Campbell is the Jacob Gould Schurman Professor Emeritus of Nutritional Biochemistry at Cornell University.
- The China Study website says, "*The research project culminated in a 20-year partnership of Cornell University, Oxford University, and the Chinese Academy of Preventive Medicine, a survey of diseases and lifestyle factors in rural China and Taiwan. More commonly known as the China Study, this project eventually produced more than 8,000 statistically significant associations between various dietary factors and disease.*"
- Dr Campbell says, "*People who ate the most animal-based foods got the most chronic disease ... People who ate the most plant-based foods were the healthiest and tended to avoid chronic disease. These results could not be ignored.*"

3. Physicians Committee for Responsible Medicine³³

- *“Scientific research shows that health benefits increase as the amount of food from animal sources in the diet decreases, so vegan diets are the healthiest overall.”*
- *“The 9 essential amino acids, which cannot be produced by the body, must be obtained from the diet. A variety of grains, legumes, and vegetables can also provide all of the essential amino acids our bodies require. It was once thought that various plant foods had to be eaten together to get their full protein value, otherwise known as protein combining or protein complementing. We now know that intentional combining is not necessary to obtain all of the essential amino acids. As long as the diet contains a variety of grains, legumes, and vegetables, protein needs are easily met.”*
- *“With the traditional Western diet, the average American consumes about double the protein her or his body needs. Additionally, the main sources of protein consumed tend to be animal products, which are also high in fat and saturated fat.”*

4. World Cancer Research Fund³⁴

- *“There is strong evidence that red and processed meats are causes of bowel cancer, and that there is no amount of processed meat that can be confidently shown not to increase risk.”*
- *“Aim to limit intake of red meat to less than 500g cooked weight (about 700-750g raw weight) a week. Try to avoid processed meats such as bacon, ham, salami, corned beef and some sausages.”*

5. Harvard University³⁵

- *“Eating red meat is associated with a sharply increased risk of death from cancer and heart disease, according to a new study, and the more of it you eat, the greater the risk. The analysis, published online Monday in Archives of Internal Medicine, used data from two studies that involved 121,342 men and women who filled out questionnaires about health and diet from 1980 through 2006.”*
- *“Previous studies have linked red meat consumption and mortality, but the new results suggest a surprisingly strong link.”*
- *“‘When you have these numbers in front of you, it’s pretty staggering,’ said the study’s lead author, Dr. Frank B. Hu, a professor of medicine at Harvard.”*

6. American Dietetic Association³⁶

- *“It is the position of the American Dietetic Association that appropriately planned vegetarian diets, including total vegetarian or vegan diets, are healthful, nutritionally adequate, and may provide health benefits in the prevention and treatment of certain diseases. Well-planned vegetarian diets are appropriate for individuals during all stages of the life cycle, including pregnancy, lactation, infancy, childhood, and adolescence, and for athletes. A vegetarian diet is defined as one that does not include meat (including fowl) or seafood, or products containing those foods.”*

MLA'S "MYTH BUSTER" NO. 5, INCLUDING ITS CORRESPONDING "FACT" STATEMENT:

"Myth": It is better for the environment to eat less red meat

"Fact": All food production has an environmental impact, which is important to understand when looking at how Australia can continue to feed a growing population in an environmentally sustainable way. By just looking at one environmental factor, such as emissions, it is impossible to get a complete view of sustainability.

It has been estimated that to substitute the level of protein provided by red meat production in Australia with a vegetarian diet, it would mean finding an area the size of Victoria and Tasmania combined to add to the land currently used for plant-based food production.

Australian soils are frequently unable to sustain cropping on a continuous basis and rotation with livestock provides an essential environmental break to renew soil productivity as well as an income for farmers throughout the year.

Additionally, by grazing arid and semi-arid lands, the livestock industry is able to produce food on land that is unusable for providing any other food source.

My Comments:

1. United Nations Food and Agriculture Organization:

The UN's Food & Agriculture Organization (FAO)³⁷ says livestock production is one of the major causes of the world's most pressing environmental problems, including (in addition to global warming and air pollution):

- loss of biodiversity;
- land degradation; and
- water pollution

Some key points from the FAO on biodiversity are:

- According to the Millennium Ecosystem Assessment (MEA) Report (2005b), the most important direct drivers of biodiversity loss are habitat change; climate change; invasive alien species; overexploitation; and pollution.
- Livestock play an important role in the current biodiversity crisis, as they contribute directly to all these drivers of biodiversity loss, at the local and global level.
- Livestock-related land use and land-use change modify or destroy ecosystems that are the habitats for given species.
- Terrestrial and aquatic ecosystems are affected by emissions into the environment (nutrient and pathogen discharge in marine and freshwater ecosystems, ammonia emissions and acid rain).
- The sector also directly affects biodiversity through invasive alien species (the livestock themselves and diseases for which they may be vectors) and overexploitation, for example through overgrazing and pasture plants.

2. United Nations Environment Programme:

A report released by the UNEP stated:³⁸

"Impacts from agriculture are expected to increase substantially due to population growth increasing consumption of animal products. Unlike fossil fuels, it is difficult to look for alternatives: people have to eat. A substantial reduction of impacts would only be possible with a substantial worldwide diet change, away from animal products."

"Animal products cause more damage than [producing] construction minerals such as sand or cement, plastics or metals. Biomass and crops for animals are as damaging as [burning] fossil fuels." (Professor Edgar Hertwich, lead author)

3. Peter Singer and Jim Mason:

Australian ethicist and Princeton University Professor, Peter Singer, and co-author Jim Mason, have commented as follows on land degradation³⁹:

- The desire to create grazing land for cattle and sheep has been a major factor in clearing forest and bushland all over the world.
- In Australia, since European settlement, 13 per cent of the land has been completely cleared of native vegetation, mostly for grazing animals, and a much larger area has been severely damaged by grazing.
- According to the World Resources Institute⁴⁰, overgrazing is the largest single cause of land degradation, world-wide. Much of this degradation occurs in the semi-arid areas used for cattle and sheep grazing in countries like Australia and the United States. Cattle are heavy animals with hard hooves, big appetites, and a digestive system that produces a lot of manure. Turned loose on fragile, semi-arid environments, they can soon devastate a landscape that has not evolved to cope with them.
- Professor Michael Archer (cited by Singer and Mason), Professor of Biological Sciences and Dean of the Faculty of Science at the University of New South Wales, and a former director of the Australian Museum, has pointed out that Australian agriculture contributes about 3 per cent of the country's gross domestic product, but degrades over 61% of Australia's lands.

4. CSIRO and University of Sydney – Balancing Act Report:

The Balancing Act Report by the CSIRO and the University of Sydney shows that 92% of the total land degradation in Australia is due to the beef, sheep and dairy industries. The other 132 economic sectors were responsible for the remaining 8%.⁴¹

5. ABARE:

According to the Australian Bureau of Agricultural and Resource Economics (ABARE), *"Beef production is widespread across Australia. In northern Australia, production is based mainly on native pastures on large properties; in the southern states, smaller properties with a high degree of pasture improvement predominate. Extensive grazing by sheep and cattle occupies approximately 60 per cent of the rangelands, which in turn represent about 80 per cent of Australia's land area"*.⁴² Accordingly, grazing, with all its destructive qualities (and after allowing for grazing which occurs outside the rangelands), almost certainly occurs across more than 50% of the continent.ⁱⁱⁱ

ⁱⁱⁱ For a map based on ABARE's definition of the rangelands, please see http://affashop.gov.au/PdfFiles/g_Ch_2_Rangelands_Maps_5aug04.pdf, which shows that grazing in all of Victoria, most of New South Wales, around one third of Queensland and portions of Western Australia and South Australia is additional to the figures referred to above.

6. Desertification:

Livestock's ability to create desert from once-fertile land is outlined as follows⁴³:

- *"Internationally, severe problems of soil compaction, erosion and decreased soil fertility are being experienced in many cattle-farming areas. These include the American West, Central and South America, Australia and Sub-Saharan Africa. The United Nations Environmental Programme (UNEP) estimates that 20 per cent of the world's grazing lands have been significantly degraded since 1945, with the pace of destruction increasing."*
- *"Desertification, where land is no longer capable of sustaining food production, affects roughly 50 million acres of the world's available agricultural land every year, with overgrazing (particularly of beef cattle) a leading cause."*
- *"In many parts of the famed American West, overgrazing from the Great Plains to the Pacific Ocean has ground down native grasses and trampled streams. (Much of the destruction is subsidised by more than \$100 million of public money.) 3.2 million cattle are grazed on public lands covering 254 million acres in 17 western states. A 1999 investigation by a local newspaper, The San Jose Mercury News, summarises the environmental impact: 'The lifeblood of the arid West, streams, make up only 1 per cent of the acreage in the 11 Western-most states. Yet scientists say at least 70 per cent of wildlife there depends on them for survival... Largely because of cattle, only 36 per cent of streams surveyed by the Bureau of Land Management on its public lands in the Lower 48 states are classified as "proper functioning" or healthy... Severely overgrazed streams have trampled banks and little vegetation. Murky, warm water is choked with sediment, algae and manure.'"*
- *"Comparable desertification is also occurring in many poverty stricken areas of the world, where effects on the rural poor are most critical. Larger livestock populations, partly created by subsidised feed concentrates from wealthier nations, are degrading land in many areas, including the semi arid Sahel, West Asia and North Africa, and the Southern Cone of the Americas."*

7. Water Pollution:

Some points to note in relation to water pollution are:

- The FAO's summary comments in relation to water indicated that the sector *"is probably the largest sectoral source of water pollution, contributing to eutrophication, 'dead zones' in coastal areas, degradation of coral reefs, human health problems, emergence of antibiotic resistance and many others."*³⁶
- American journalist Jim Motavelli has provided a stark example of the disastrous effects on waterways of intensive farming practices. He has stated:
*"The much-publicized 1989 Exxon Valdez oil spill in Alaska dumped 12 million gallons of oil into Prince William Sound, but the relatively unknown 1995 New River hog waste spill in North Carolina poured 25 million gallons of excrement and urine into the water, killing an estimated 10 to 14 million fish and closing 364,000 acres of coastal shell fishing beds. Hog waste spills have caused the rapid spread of a virulent microbe called Pfiesteria piscicida, which has killed a billion fish in North Carolina alone"*⁴⁴.
- In December 1997, the U.S. Senate Agricultural Committee released a report stating that livestock raised for food, produce 130 times as much excrement as the entire human population of the country, roughly equivalent to five tons per annum for every US citizen.⁴⁵ In that year, cattle, pigs, chicken and turkeys produced an estimated 1.36 billion tons of solid waste, 90% of which was from cattle⁴⁶. On that basis, it's little wonder that spills such as the New River incident occur.
- Agriculture in the United States, much of which now serves the demand for meat, contributes to nearly three-quarters of all water-quality problems in U.S. rivers and streams, according to the Environmental Protection Agency⁴⁷.

- With the inherent inefficiency of meat as a food source (refer to item 8 below) and the resultant massive increase in crop production beyond what would otherwise be required, our oceans are also suffering. For example, the MSNBC news service in the United States reported as follows in December, 2007:

“The nation’s corn crop is fertilized with millions of pounds of nitrogen-based fertilizer. And when that nitrogen runs off fields in Corn Belt states, it makes its way to the Mississippi River and eventually pours into the Gulf, where it contributes to a growing ‘dead zone’ — a 7,900-square-mile patch so depleted of oxygen that fish, crabs and shrimp suffocate. . . . Fertilizer causes explosive growth of algae, which then dies and sinks to the bottom, where it sucks up oxygen as it decays. This creates a deep layer of oxygen-depleted ocean where creatures either escape or die.”⁴⁸

The problem has been exacerbated by competing demands for crops to be used for the production of biofuels, due to the rapid increase in oil prices.

- Australia is not immune to such problems, and has already experienced (for example) widespread outbreaks of toxic algae in our waterways.
- The journal *Water Science and Technology* has reported on the impact of run-off from areas used for cattle grazing to the Great Barrier Reef Marine Park (GBRMP):

“Grazing of cattle for beef production is the largest single land use on the catchment with cropping, mainly of sugarcane, and urban/residential development considerably less in areal extent. Beef cattle numbers are approximately 4,500,000, with the highest stock numbers in the Fitzroy catchment.”

“Beef grazing on the large, dry catchments adjacent to the GBRMP (in particular the Burdekin and Fitzroy catchments) has involved extensive tree clearance and over-grazing during drought conditions. As a result, widespread soil erosion and the export of the eroded material into the GBR has occurred, and is continuing.”⁴⁹

- Australia’s Sunday Age newspaper has commented on a study produced for Victoria’s Department of Health by Water Futures, a company specialising in water quality. The study indicates that faeces from livestock is contaminating rivers and threatening Victoria’s drinking water supplies.⁵⁰

The Sunday Age report, from 15th April 2012, states, *“Only weeks after the government renewed hundreds of cattle grazing licences around the Murray River, a damning report has reignited concerns about the public health risks of livestock grazing near waterways.”*

“The report argues that manure contamination is often poorly controlled, and without adequate water treatment, the risk to public health would be ‘several orders of magnitude’ beyond tolerable levels.”

It also states that the Victorian government has *“has no plans to tackle the problem”*.

Little may have changed since Daryl Holland of Monash University Water Studies Centre prepared a study for the Victorian National Parks Association (VNPA) in September 2009, titled *“Human health risk from Crown water frontage licences”*.⁵¹ The study was a literature review on the health impacts of cattle in riparian zones and rivers. The VNPA summarised the findings:⁵²

- Cattle faeces contain pathogens that can be transmitted to humans.
- These pathogens can survive for long periods in water.
- Transmission to humans can occur through ingestion of contaminated water, or indirectly through using contaminated water to grow fruit and vegetables.
- Uncontrolled cattle access to water has direct effects through defecation directly on the bank or in the water, and also an increase in inputs from faeces away from the stream due to loss of the riparian buffer.

- Nutrient inputs from cattle increase the potential for toxic algal blooms.
- Uncontrolled cattle access to water leads to increased costs of water treatment for human consumption, due to higher risk of pathogen contamination and increased suspended solids.

The VNPA also commented on a report by the Environment Defenders Office, *"Crown Frontage Grazing Licences, Water Quality and Human Health - an analysis of legal obligations and risks"*.⁵³ The VNPA stated that the report, *"shows how the policy of allowing farmers to graze their cattle along riverbanks and streams contributes to poor water quality and can affect human health, as well as damaging native vegetation"*.

8. Inherent and gross inefficiency of meat as a food source for humans:

MLA provides no sources for its claim that *"to substitute the level of protein provided by red meat production in Australia with a vegetarian diet, it would mean finding an area the size of Victoria and Tasmania combined to add to the land currently used for plant-based food production."*

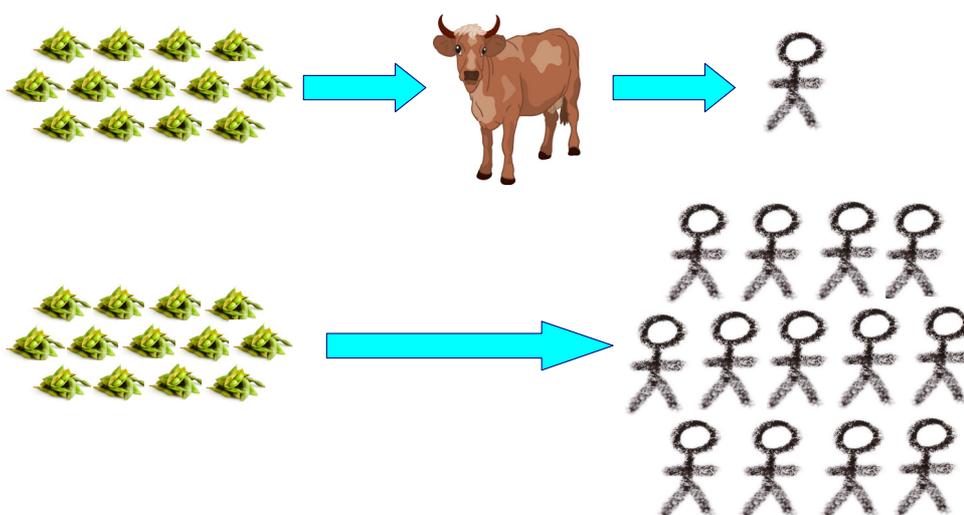
The very high relative efficiency of plant-based food production in supplying protein is highlighted in the charts contained within the discussion on "Myth Buster" no. 1 above, indicating the opposite to what MLA is claiming.

It takes many kilograms of plant-based food to produce one kilogram of animal-based food of comparable nutritional value, with significant impacts on energy inputs, emissions, water usage and land usage.

The figures vary depending on the animal involved, the source of its food, climatic conditions and the like. However, whether it requires two or twenty kilograms of plant-based food to produce one kilogram of animal-based food, the inefficiencies are startling. That is particularly so when an almost uniform economic creed around the world for decades has been the need for increased efficiency in production, using the mantra of productivity growth. An example is the Australian Bureau of Statistics 2010 publication *"Productivity and Progress"*.⁵⁴

The following diagram is based on figures outlined in a paper presented at the 2002 Beef Improvement Federation Annual Meeting in Omaha, USA. That paper indicated that it required around 13 pounds of grain, fed to cattle, to produce one pound of meat.⁵⁵

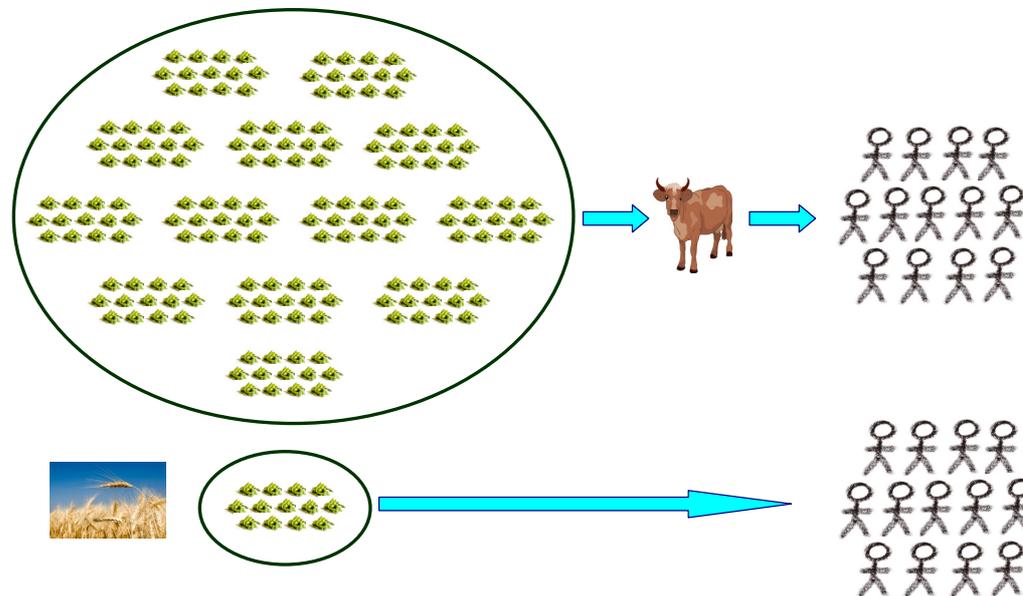
Figure 3: Comparative Efficiency of Different Food Sources (1)



The diagram demonstrates the fact that, for any given quantity of plant-based food, far more people can be fed if that food goes directly to them, rather than via the digestive system of an animal.

Looking at it another way, if we want to feed the same number of people using either production system, the plant based approach will require far fewer resources than the livestock alternative.

Figure 4: Comparative Efficiency of Different Food Sources (2)



Those resources can be in the form of:

- land, with clearing for grazing or feed crop production releasing carbon dioxide and creating an ongoing loss of carbon sequestration;
- nitrogen based fertilizer producing nitrous oxide (around 300 times more potent as a greenhouse gas than carbon dioxide);
- fugitive methane emissions from fertilizer production;
- emissions from farming and transportation;
- pesticides, herbicides and antibiotics;
- water used and polluted, including oceanic dead zones from nitrogen run-off.

Two further measures of livestock's inherent inefficiency are:

(a) **Information reported by Dr David Pimentel, Cornell University, USA in 2003:**⁵⁶

- The US livestock population consumes more than 7 times as much grain as is consumed directly by the entire American population. (*US Department of Agriculture, 2001. Agricultural statistics, Washington, DC*)
- The amount of grains fed to US livestock is sufficient to feed about 840 million people who follow a plant-based diet. (*Dr David Pimentel, Cornell University, "Livestock production and energy use", Cleveland CJ, ed. Encyclopedia of energy (in press). (Cited 2003)*)

We now have more than one billion under-nourished people in the world.⁵⁷ Quite apart from the horrendous environmental impacts of livestock production, the willingness of the wealthy to allow others to starve while plant production is channelled through livestock is morally repugnant.

(b) **Net Primary Productivity.**⁵⁸

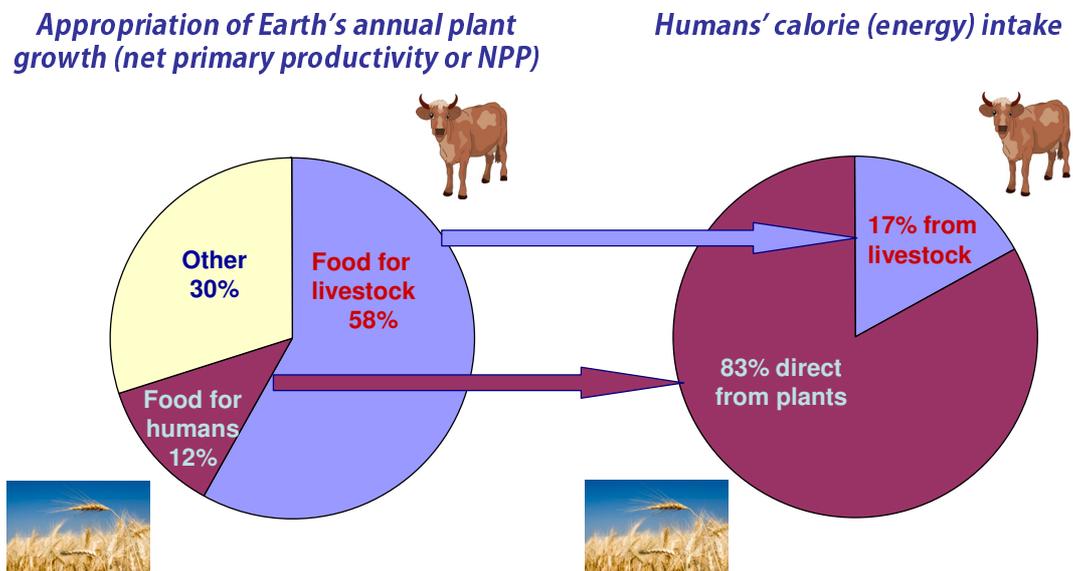
Two teams of Austrian researchers have shown that humans in 2000 appropriated 23.8 percent of the planet's net primary productivity or annual plant growth. Of that amount, around 30 percent was used for paper production, construction and the like. 58 percent was fed to livestock and supplied 17 percent of human-kind's global food calories. Only 12 percent was consumed directly by humans, providing 83 percent of calories.

If an individual business was operating with the level of efficiency demonstrated by the Austrian teams' work, it would almost certainly be closed or its methods radically overhauled.

How is it that we allow these levels of inefficiency in such a massive and critically important operation?

Here's how the comparison looks diagrammatically:

Figure 5: Comparative Efficiency of Different Food Sources (3)



CLAIM NO. 1:

Well managed grazing lands can store more carbon than forests:

Australia's livestock farmers manage not only their cattle and sheep, but all other living organisms on their property. The health of the soil, trees, micro-organisms, native animals and vegetation are essential to our farmers' livelihoods and is why farmers spend considerable time and effort ensuring they are well managed. This is also important for Australia's overall emissions profile. A worldwide analysis of the effects of land management on soil carbon showed there is on average about 8% more soil carbon under well-managed pasture than under native forests.

My comments:

This matter has been referred to in relation to "myth buster" no. 3 above.

CLAIM NO. 2:

The first Life Cycle Assessment undertaken on Australian red meat production systems showed that we have one of the lowest carbon emission profiles of any major meat producing country. The Life Cycle Assessment study was undertaken by the University of New South Wales in 2009.

My comments:

The relevant paper notes that it was funded by MLA.⁶⁰

A key omission seems to be any reference to land clearing.

Also, although they report on "primary energy use" and "solid waste", those figures do not seem to be included in what they call the "carbon footprint" or "CF" (representing kg of CO₂-e emissions), which was based solely on enteric fermentation. They also exclude emissions "associated with transport after the meat processing plant and other processing, retailing, or consumption activities". The system boundary "encompasses all on-site and upstream processes at the farm, feedlot, and whole processing plant, including transport between these sites".

The researchers reported emissions intensity figures (CF per kg of carcass) of **9.9** for grain-finished beef and **12.0** for grass-finished. If it is assumed that 55% of the carcass is usable (as shown in the external calculations referred to below), then the figures would become:

Grain-finished beef: **18.0**

Grass-finished beef: **21.8**

These results are still very poor compared to grains, vegetables and other products (refer below), and similar to **aluminium (20)**⁶¹, which consumes **16% of Australia's (mainly black and brown coal-fired) electricity** in the production process.⁶²

Recent independent calculations for beef and veal's emissions intensity are available from Carbon Neutral, a Perth-based not for profit company whose aim is to measure, reduce and offset greenhouse gas emissions and implement revegetation projects⁶³. Here is an extract:

Emissions from Beef and Veal

The Department of Climate Change (2003, 93) reports that the total emissions intensity of a Beef carcass is 51.0 kg CO₂e / kg. GHD (2008), among other sources report that on average, 55% of a beef carcass is used towards saleable products. The CSIRO (2005), reports that two thirds of the emissions associated with beef production in 1999 were associated with land clearing in Northern Australia. Because broad scale land clearing has been phased out in many states, particularly Queensland, the emissions factor has been divided by 3.

In 2008, beef prices range from \$8 - \$30 kg depending on the quality of the beef and other market factors. It is assumed that the average 2010 price for beef is \$18. The factor for beef and veal is therefore calculated as follows:

$Ghg (kg) / \$ = \text{emissions per kilo of carcass} / \text{fraction of carcass saleable} \times (1 - \text{portion attributable to land clearing}) / \text{price per kilo of meat}$
 $Ghg (kg) / \$ = 51 / 0.55 \times 0.33333 / 18$
 $Ghg (kg) / \$ = 1.71715$
 $Ghg (kg) / kg = 30.909066$

End of Carbon Neutral's Calculations for Beef and Veal

The people at Carbon Neutral may not be aware that a significant portion of the ongoing land clearing in Queensland (nearly 100,000 ha in total during 2008/09) is livestock related.⁶⁴ If so, their estimate may have been higher.

Emissions intensity figures for some alternative products have been reported as follows:

- Wheat and other grains⁶⁵: 0.4
- Fruit and vegetables⁵⁹: 0.48855
- Potatoes⁶⁶: 0.45 (Domestic, cooked)
- Rice⁶²: 1.3 (Cooked)
- Soy beans⁶²: 0.92 (Transported by boat and cooked)

CLAIM NO. 3:

The National Greenhouse Gas Inventory is based on the current international Kyoto Protocol carbon accounting system that doesn't fully account for the capacity of trees, grass and soil to store carbon as part of the carbon cycle. A recent report funded by the Queensland Government found that if all carbon sinks were taken into consideration, the Queensland beef industry (47% of Australia's cattle) would be close to carbon neutral, following the ban on tree clearing in 2009.

My comments:

The supposed ban on tree clearing took effect from late 2006, not 2009.

In their paper, "Deforestation and land degradation in Queensland - The culprit"⁶⁷, Gerard Bisshop and Lefki Pavlidis stated:

"New vegetation laws that came into effect in late 2006 have substantially reduced this clearing, however in 2007-2008, under the full protection of these laws, the clearing rate was still 123,000

ha/year, or an area of 35km x 35km each year (DERM, 2009⁶⁸).” (Please also refer to a subsequent figure shown above.)

Bisshop and Pavlidis also stated, “Clearing of endangered ecosystems and broadscale clearing of remnant (pre-European) vegetation is now unlawful under new laws, with certain exceptions, most notably clearing for livestock fodder”.

Gerard Bisshop resigned in protest from his Queensland Government principal scientist role over the report⁶⁹ referred to by MLA.

Some points from an article by Geoff Russell in relation to this matter are as follows:⁷⁰

- *Compare the Queensland study with the United Nations Framework Convention on Climate Change Clean Development Mechanism (CDM) rules.*
- *These are the rules which developing countries need to follow in order to get tradeable carbon offset credits for reforestation work on agricultural or pastoral land.*
- *The rules are clear. An ongoing cattle (or wheat) property can't get credits for woody regrowth because it happened to decide not to bulldoze one or more paddocks.*
- *The Queensland DPI paper claims credit for precisely that kind of non-activity.*
- *It would not qualify for actual tradeable credits for a developing country under CDM and it should not appear in “dodgy pro-industry advocacy papers by Queensland Government scientists”.*

CONCLUSION

It is essential that we objectively consider the impact of livestock industries on our planet. The objectivity of an industry group such as Meat & Livestock Australia may be open to question.

Efficient markets require all relevant parties to be well informed, and I trust this article has assisted the reader in achieving that aim.

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Please note:

- Unless indicated otherwise, all websites referred to above were accessible as at 7th or 15th April, 2012.
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