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Beware of Bad Science

November 16, 2009 on 6:30 pm | By Andrew in Agricultural Policy, Environment, Factory Farms, Family Farms, Home Feature, The Big Picture 7 Comments

On November 5, a "news article" appeared word-for-word across countless livestock-related websites – including Drovers, Dairy Herd, Cattle Network, AgWired, DairyLine, Beef Magazine, and so on. No journalist is cited as the author on any of the sites where it is published, an indication that the piece was not a "news article" at all but a press release issued by an unidentified source.

Entitled "Environmentally Friendly Food Myths Debunked," the news article provided coverage of a presentation given by Dr. Jude Capper at the 71st Cornell Nutrition Conference in October 2009. Her presentation reportedly findings from a recent paper co-authored with R.A. Cady and D.E. Bauman, entitled, "Demystifying the Environmental Sustainability of Food Production."

The article quotes Dr. Capper – who is assistant professor of dairy sciences at Washington State University – as claiming that the "intuitively correct" food choice made by today's consumers is actually often the least environmentally friendly option. The article went on to justify the paper's position:

"Pasture- or grass-fed meat is growing in popularity, with the perception that it is more eco-friendly than conventionally produced beef. However, the time needed to grow an animal to slaughter weight is nearly double that of animals fed corn. This means that energy use and greenhouse gas emissions per pound of beef are increased three-fold in grass-fed beef cattle. Again, the intuitively environmentally friendly option has a far higher resource and environmental cost."

Dr. Capper went on to rally the delegates present (who were mostly animal nutritionists), calling for the food industry "to use a whole-system approach and assess environmental impact per gallon of milk, pound of beef or dozen eggs, not per farm or per acre."

Ties to Industrial Agriculture

Before discussing what I believe to be the inherent errors of this paper, it is worthwhile to note the credentials of the authors. There is an obvious tie to the industrial agriculture sector. R.A. Cady works for Elanco, a company that devotes itself to artificial productivity enhancers and feed additives for animals. Elanco is a division of Eli Lilly and Company, a global pharmaceutical corporation.

But it is Dr. Capper and her association with American Farmers for the Advancement and Conservation of Technology (AFACT) that causes me the most concern regarding whether this paper represents unbiased research. It has been well-publicized that the use of rBST was banned in Canada, Australia, New Zealand and most of Europe over concerns about the threat it posed to animal health. Indeed, researchers found that the use of rBST substantially increased health problems with cows—including foot problems, mastitis and injection site reactions—which impinged on the welfare of the animals and caused reproductive disorders. Thus it is appalling to note that AFACT is an industry-led pro-rBST advocacy group. It exists to "promote the truth about American agricultural products" – including, of course, the benefits of rBST, and is funded by the likes of Monsanto, Fort Dodge Animal Health, Intervet/Schering-Plough Animal Health, Merial, and Pfizer Animal Health.

An earlier paper of Dr. Capper's, "The Environmental Impact of Biotechnology: Application of recombinant Bovine Somatotropin (rBST) in Dairy Production," concluded that: "Overall, rBST appears to represent a valuable management tool for use in dairy production to improve productive efficiency and to have less negative effects on the environment than conventional dairying." Is this the way we want to ensure our future food security?

And is the paper, "Demystifying the Environmental Sustainability of Food Production," reflective of general scientific consensus on the issues it covers? In fact, there is much research that contradicts its positions.

Whole System Approach?

The paper claims that a "whole-system approach" proves that intensive livestock systems – where meat or milk production is maximized per animal, per acre – are less environmentally damaging than "inefficient" pasture- or grass-based systems. In the face of increasing global demand for meat and dairy products, Dr. Capper argues in her presentation that the answer lies in further improving the "efficiencies of livestock productivity" by increasing the quantity of meat and dairy products produced from each farm animal, while maintaining current levels of greenhouse gas (GHG) emissions.

Yet it is Dr. Capper and her co-authors who are not actually looking at the whole system – or indeed the "bigger picture" we all face. The vast majority of scientists who are working on climate related issues contend that it is intensive agriculture – with its heavy reliance on fossil fuels and other damaging environmental practices – which is the real climate culprit. And in the face of the reality of climate change and ever-decreasing oil reserves, "business as usual" agriculture is just no longer an option.

The Intergovernmental Panel on Climate Change (IPCC) – the world's leading body for the assessment of climate change – recognizes that modern agriculture contributes more than 20% of global anthropogenic GHG emissions in the form of carbon dioxide, nitrous oxide, and methane (IPCC, 2001). And intensive livestock production is responsible for the vast majority of agriculture's GHG emissions.

In the US and other industrialized nations, the burning of fossil fuels is the main cause of carbon dioxide emissions. In developing nations, a significant source of global CO2 emissions comes from the clearance of vast areas of tropical forests and other land to grow livestock feed for the global commodities market. Clearing forests and the often concurrent result of soil compaction results in 2,400 million tonnes of CO2 being released into the atmosphere annually (FAO, 2006).

Creating the fertilizers and growing the feedcrops to supply intensive livestock operations adds an entirely new dimension. A 2006 United Nations report by the Food and Agriculture Organization (FAO) clearly states that for intensive livestock farming, the carbon dioxide emitted globally from producing nitrogen fertilizer and growing feedcrops such as maize is equal to 131 million tonnes a year (FAO, 2006).

Of those emissions, 90 million tonnes of carbon dioxide are released from the production of feedcrops alone. Notice that we're talking about *intensive* livestock production only? Grass-based systems do not depend on feedcrops and fertilizer for growing them. The FAO states, "On-farm fossil fuel use induced emissions in extensive [grass-based] systems sourcing their feed mainly from natural grasslands or crop residues can be expected to be low or even negligible in comparison to the [intensive livestock] estimate" (FAO, 2006).

And despite the fact that the intensive livestock industry in the US and other developed nations continues to rely on vast quantities of imported livestock feed – particularly soya – from developing nations, the related GHG emissions are not attributed to US agricultural activity, as they occurred outside of the US. A convenient omission of emissions.

Carbon dioxide emissions are not the only risk from the profligate use of fertilizers, though. According to the Energy Information Administration (a section of the US Department of Energy), more than three-quarters of farming's nitrous oxide emissions – a greenhouse gas some 310 times more powerful than carbon dioxide – come from the production of artificial fertilizer, used to grow the vast quantities of soya and corn required by the intensive livestock industry to satisfy our ever-increasing demand for cheap meat and livestock products.

Finally, US farmers are only too aware of the fact that livestock production has come under increasing fire for its associated methane gas emissions. But while all livestock systems inevitably produce methane, most of the criticism can be laid firmly at the doors of intensive livestock systems, typified by indoor pig units or vast cattle feedlots, where literally thousands of cattle spend their entire lives confined to concrete or barren pens, where they are fed an unnatural diet of soya and corn, and where their manure gathers in vast liquid manure lagoons – releasing huge quantities of methane gas. In contrast to these systems, extensive livestock production again is the exception. The same FAO report states, "Manure deposited on fields and pastures, or otherwise handled in dry form, does not produce significant amounts of methane" (FAO, 2006).

Modern livestock production is dominated by industrialized facilities that maximize profits by treating animals not as sentient creatures, but as production units. We know only too well of the animal welfare issues associated with the unchecked pursuit of "improved productivity and efficiency" in modern livestock farming.

But our cheap meat habit is not without its human health and welfare costs. As our diets have changed over recent decades to incorporate the ever-increasing availability of cheaper meat and dairy products, devastating diet-related diseases – like obesity, heart disease, Type 2 diabetes and diet-related cancers – have developed to near epidemic levels in the US and many other countries. Recent research published in the Journal of the American Medical Association estimates that one in three people born in 2000 in the US will develop Type 2 diabetes by 2050. And, according to the World Health Organization, the same thing is now happening in countries across the world like China and the rest of Asia as the Western fast-food diet, with its high meat, sugar and fat intake, is taking hold.

Grassfed Pasture-Based Solution

The solution is not to further intensify our livestock production systems or to seek ways of further exploiting our livestock to feed our insatiable habit for unsustainable meat. The solution lies in changing how we farm and feed ourselves: the solution lies in grassfed livestock production.

We already know that grassfed livestock are reared on pasture and finished on pasture – no need for carbon-costly soya and corn feed and the vast quantities of nitrous oxide-producing artificial fertilizers necessary to grow it. We also know that grassfed meat is better for us. Grassfed meat contains higher levels of healthy omega-3 fatty acids, conjugated linoleic acids (CLAs), and vitamins A, E and D – and lower levels of the omega-6 fats that are linked to obesity and heart disease (see www.EatWild.org).

But leading scientists are now acknowledging that pasture land – and here we're talking about traditional pastures that aren't totally reliant on brought in fertilizers and pesticides – could have a vital role to play in cutting GHG emissions through capturing and storing atmospheric carbon. Indeed, the IPCC now suggests that soil carbon sequestration is the mechanism responsible for most of the mitigation potential, with an estimated 89% contribution to the technical potential (IPCC, 2007).

Carbon sequestration (as it is widely known) is the natural process of transferring carbon dioxide from the atmosphere into the soil through crop residues and other organic solids, and into a form that is not immediately re-emitted. Indeed, there is more carbon locked up in the soil than there is in the atmosphere and, according to the US Department of Energy, enhancing the natural processes that remove CO2 from the atmosphere is increasingly considered to be the most cost-effective means of potentially reducing atmospheric levels of CO2. The FAO also agrees that rebuilding soil integrity is an integral part of reducing the livestock industry's carbon footprint. It states, "Compared to the amounts of carbon released from changes in land use and land-degradation, emissions from the food chain are small. So for CO2 the environmental focus needs to be on addressing issues of land-use change and land degradation. Here the livestock sector offers a significant potential for carbon sequestration, particularly in the form of improved pastures" (FAO, 2006, 115).

Pasture is the answer. Before the arrival of the European settlers, the prairies of the American West supported millions of bison, elk and deer. Since the 1800s, we have "improved" thousands upon thousands of acres, much of it to now grow soya and corn for livestock feed and bioethanol. But looking at the production supported since the supposed improvement – the dust bowls of the 1930s, ever decreasing soil carbon levels, ever greater reliance on fertilizers and pesticides, and so on – perhaps we should look back at the sustainable production systems that were once supported in the past.

For those who might be thinking that I am suggesting a mass conversion to vegetarianism, let me stress again that some meat production systems are more benign than others. Remember the millions of bison that roamed the Great Plains? Livestock are a vital part of this system and necessary to manage pastures as carbon sinks. Regular grazing by livestock encourages grass root growth, which in turn sequesters more carbon in the soil. Livestock also utilize the forage, providing meat as an output while helping to increase the organic matter content of the soil.

The world's soils are the largest terrestrial reservoir of carbon, containing three times as much carbon as the atmosphere and five times as much as forests. By leaving behind intensive livestock systems and, instead, adopting sustainable management techniques, the soils have the power to literally take CO2 out of the atmosphere and to significantly help to mitigate the threat of global warming.

Building organic matter in the soil through grassfed livestock systems is the key to reducing the emissions of gases that contribute to global warming. OK, so it may not be the catchiest headline, but it will have a far more positive effect on reducing climate change than mass vegetarianism – and far less devastating impacts than the business as usual approach espoused by the authors of "Demystifying the Environmental Sustainability of Food Production" and those who support industrial agriculture.

By all means, let's reduce our intake of unsustainable, low-welfare, intensively reared meat – indeed, there's a good chance that we'd all feel a lot better for doing so. But remember that buying high quality pasture-raised meat, such as that certified by Animal Welfare Approved, will mean that you're not only eating a healthier product and supporting family farms who raise their animals using the highest welfare standards in the US – you are also helping to protect the planet for future generations.

Andrew Gunther
Program Director
Animal Welfare Approved
www.AnimalWelfareApproved.org

The Animal Welfare Approved program audits and certifies family farms that utilize high-welfare methods of farming. Farmers benefit from having a third-party affirmation of their practices and consumers benefit by knowing that the label means what it says. Animals are raised outdoors on pasture or range on true family farms with the "most stringent" welfare standards according to the World Society for the Protection of Animals in both 2008 and 2009 reports. The standards have been developed in collaboration with scientists, veterinarians, researchers and farmers and incorporate best practice and recent research. Annual audits by experts in the field cover birth to slaughter. Animal Welfare Approved audits and certifies family farms for both the AWA program and the American Grassfed Association (AGA).

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The news release "Environmentally Friendly Food Myths Debunked" appears *ad verbatim* on numerous agricultural websites, including:

- Drovers – http://www.drovers.com/news_editorial.asp?pgID=675&ed_id=6401
- Dairy Herd – http://www.dairyherd.com/news_editorial.asp?pgID=675&ed_id=9814
- Cattle Network – <http://www.cattlenetwork.com/Environmentally-Friendly-Food-Myths-Debunked/2009-11-05/Article.aspx?oid=932439>
- AgWired – <http://agwired.com/2009/11/09/environmentally-friendly-food-myths-debunked/>
- DairyLine – <http://www.dairyline.com/releases/11062009capper.htm>
- Beef Magazine – <http://blog.beefmagazine.com/briefingroom/2009/11/10/environmentally-friendly-food-myths-debunked/>

American Farmers for the Advancement and Conservation of Technology (AFACT) – <http://itisafact.org/2009/04/dr-cappers-response-to-activists-claims-that-cows-are-bad-for-the-environment/>

EatWild website (references to scientific studies on the health benefits of grass-fed products) – <http://www.eatwild.com/healthbenefits.htm> (accessed November 10, 2009)

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7 Comments, add yours.

7 Comments

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1. Spectacular! You hit every nail squarely on the head. Thank you.

Comment by Fred Griffen — November 17, 2009 #

2. Thank you. This issue does come up in discussions and has been hard to refute. Now you've given us the talking points.

Karen

Comment by Karen Christensen — November 17, 2009 #

3. Wonderfully articulated argument. I love AWA and hope your pieces will be read on a mass scale.

Comment by Mike Calahan — November 17, 2009 #

4. Thank you so much for setting the record straight – in this information age it can be so hard to know what to believe. So much information is tainted by special interest groups – thank you AWA for your integrity.

Comment by Sarah M. — November 17, 2009 #

5. We have long advocated toward pastoral redevelopment on broad acre farm plots and need more of these type written cross examinations. Pasture as a technical medium is capable of much more than main line agriculture gives it credit for. Thank you for a job well done!

Comment by Royal A. Purdy — November 17, 2009 #

6. Capper's 'research' does not stand up to careful reading. She misquotes some of the references she cites, cherry picks her data, and ignores facts that don't support her agenda. What amazes me is how such blatant junk science gets past the reviewers who are supposed to be checking her work. What is even worse, is that once it is published, this garbage gets cited in other papers and continues to go unchallenged.

Comment by Klaas Martens — November 17, 2009 #

7. Good article. Is something still considered science if it's not true? Seems a legitimate question.

Also their numbers concerning the length of time required to finish grassfed vs corn fed seems a bit off unless they are feedlot finishing cattle at 10 to 12 months. Maybe some super genetically engineered version of cattle, don't know?

Comment by Don Davis — November 18, 2009 #

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