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Bringing a systems approach to food systems

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Another argument for adaptability

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I thought of some of the systems concepts I've been writing about here when I saw the paper by Marty Heller and Greg Keoleian in the *Journal of Industrial Ecology* last fall (2014). In it they reported that a shift from the present-day average American diet to a diet based on the current USDA dietary recommendations results in an 11% *increase* in greenhouse gas emissions (GHGE). On the other hand, a shift to a 2,000 calorie diet (Americans now "consume" an average of about 2500 calories according to the USDA's retail-level food availability data [Heller & Keoleian, 2014]) results in only a 2% overall *decrease* in GHGE. Most people would expect larger decreases in GHGE given the 20% decrease in calories and considerable decreases in recommended meat consumption. But the shifts to food patterns needed to move to a healthier diet include the substitution of dairy products for meat proteins, and solid fats and added sugars represent relatively low emissions per calorie. The authors state that this may be a surprising result—but it shouldn't be if one has been following the research on foodprints for a while. What I find of most interest, however, is how the new science in the article again calls forth a need to understand the complexity in dynamic food systems, including feedback and how it is heard and treated, and heterogeneity—many actors who have different goals and decision-making procedures. What follows from this reality is the need for adaptability, clear thinking, and overcoming innate biases.

One of the major goals of much of our collective work is to align the environmental and health

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objectives of the food system. Complexity, flexibility, adaptability, attention to feedback loops, and heterogeneity are hallmarks of a systems approach to problem-solving (Institute of Medicine & National Research Council, 2015). And they all come into play when new research demonstrates that previous information is no longer valid. It turns out that people are not very good at believing new scientific findings because they interpret information with an eye to reinforcing preexistent views (Keohane, 2010). For some time now, experts have researched and written about how pre-existing beliefs "can skew our thoughts and even color what we consider our most dispassionate and logical conclusions" (Mooney, 2011, p. 2). All the work on framing that many of us have looked at in the last 10 years tells us that we take new information and place it very quickly in the slots in our brains where it seems to fit. It turns out that we also push threatening information away, at least at first, until we have time to deliberate on it (Mooney, 2011). But often we don't get to the deliberation step. Instead, because reasoning is tied up with emotion we bring up thoughts that justify previous beliefs, whether they are factual or not (Keohane, 2010).

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We *are* motivated to see the world in an accurate, realistic way. And we also can change our minds, but other goals such as not wanting to admit that we are wrong make us resistant to change our beliefs (Mooney, 2011). And it gets worse. Following a phenomenon known as "backfire," not only do people not change their minds when looking at new science, but "they may hold their wrong views more tenaciously than ever" (Mooney, 2011, p. 6). This is called "motivated reasoning" and it kicks in with no concern about the accuracy of those beliefs (Keohane, 2010). Interestingly, some research suggests that the more self-esteem a person has, the better he or she listens and accepts new information (Keohane, 2010).

I can think of many instances when new research has not been accepted or has only been accepted quite slowly, by all sides on a food systems issue. One example is the debate about energy and food miles. In the late 1990s when the formulae for calculating the average distance food travels were developed, the information about long distances seemed to favor a preference for foods produced closer to the point of consumption (Carlsson-Kanyama, 1998; Leopold Center for Sustainable Agriculture, 2002), but other research on the energy utilized to transport food different distances told a different story. Local food required in many cases more energy and emitted more carbon dioxide than regionally or nationally transported food because the trucks supplying local food had smaller capacities and required more trips (Pirog, Van Pelt, Enshayan, & Cook, 2001). Since then there has been more and better research on transportation issues in specific situations, and adaptations such as more aggregation of small loads, but the generic claim is still being made too frequently.

Another example is the debates about the nutrient differences between organic and conventional food. Many organic advocates have insisted that there were significantly higher levels of nutrients in organically produced crops, despite the fact that many experts from Europe and the United States disagree. Unfortunately, many of the studies cited were hindered by the fact that they were conducted without any input from human nutritionists. It is only recently that an extensive study by a team that did include such experts reported that there are not nutrient differences, but there apparently are significant differences in phytochemical levels which are not, with a few exceptions, nutrients (Barański et al., 2014). The research on phytochemicals is not at the point where standards can be set, so the differences can't be compared on nutrition grounds.

One more instance is the argument about whether grain subsidies cause obesity. Claims were made for many years that they did (see, for example, Schoonover & Muller, 2006)—despite credible research by both progressive and conservative researchers that showed that they do not and that eliminating subsidies would not help small farmers or decrease prices (Beitel, 2005).

While it is true that one of the reasons debates occur is because science progresses slowly, the examples above reflect something else: the refusal to admit error and to accept a consensus among experts that a particular set of scientific findings is valid.

To avoid falling into these errors we could consider the following suggestions:

(1) Recognize and accept the complexities inherent in food systems issues;
(2) Apply a basic science philosophy to recognize that research is constantly evolving;
(3) Adapt programs to new credible knowledge;
(4) Keep an open mind, be conscious of the biases that we have, and work to recognize and put them aside when new information arrives from a credible source; and
(5) Present issues in a way that resonates with and is accessible to non–science-literate audiences (Scheufele, 2014).

I would argue that continuing to not accept credible results makes policy change and problem-solving much more difficult, and certainly extends for many years the work that must be done. Not adapting and adopting the best new science unnecessarily impedes progress, and progress is hard even with the best evidence and science available to us.

References

Barański, M., Srednicka-Tober, D., Volakakis, N., Seal, C., Sanderson, R., Stewart, G. B….Leifert, C. (2014). Higher antioxidant and lower cadmium concentrations and lower incidence of pesticide residues in organically grown crops: A systematic literature review and meta-analysis. *British Journal of Nutrition, 112*(5), 794-811. http://dx.doi.org/10.1017/S0007114514001366

Beitel, K. (2005, Summer). U.S. farm subsidies and the farm economy: Myths, realities, alternatives. *Food First/Institute for Food and Development Policy Backgrounder, 1*(3), 1–4. Retrieved from http://www.academia.edu/3139078/BACKGROUNDER_U.S._Farm_Subsidies_and_the_Farm_Economy

Carlsson-Kanyama, A. (1998). Climate change and dietary choices—How can emissions of greenhouse gases from food consumption be reduced? *Food Policy, 23*(3–4), 277–293. http://dx.doi.org/10.1016/S0306-9192(98)00037-2

Heller, M. C., & Keoleian, G. A. (2014). Greenhouse gas emission estimates of U.S. dietary choices and food loss. Journal of Industrial Ecology. Advance online publication. http://dx.doi.org/10.1111/jiec.12174

Institute of Medicine (IOM) & National Research Council (NRC). (2015). *A framework for assessing effects of the food system.* Washington, D.C.: The National Academies Press. Retrieved from http://www.nap.edu/catalog/18846/a-framework-for-assessing-effects-of-the-food-system

Keohane, J. (2010, July 11). How facts backfire. *Boston Globe.* Retrieved from http://www.bostonglobe/ideas/articles/2010/07/11/how_facts_backfire

Leopold Center for Sustainable Agriculture. (2002). *How far do your fruits and vegetables travel?* Ames, Iowa: Leopold Center for Sustainable Agriculture. Retrieved from http://www.leopold.iastate.edu/sites/default/files/pubs-and-papers/2002-04-how-far-do-your-fruit-and-vegetables-travel.pdf

Mooney, C. (2011). The science of why we don't believe science. *Mother Jones.* Retrieved from http://www.motherjones.com/print/106166

Pirog, R., Van Pelt, T., Enshayan, K., & Cook, E. (2001). Food, fuel and freeways: An Iowa perspective on how far food travels, fuel usage, and greenhouse gas emissions. Ames, Iowa: Leopold Center for Sustainable Agriculture. Retrieved from http://www.leopold.iastate.edu/sites/default/files/pubs-and-papers/2011-06-food-fuel-and-freeways-iowa-perspective-how-far-food-travels-fuel-usage-and-greenhouse-gas-emissions.pdf

Scheufele, D. A. (2014). Science communication as political communication. *Proceedings of the National Academy of Sciences of the United States of America, 111*(Supp. 4), 13585–13592. http://dx.doi.org/10.1073/pnas.1317516111

Schoonover, H., & Muller, M. (2006). *Food without thought: How U.S. farm policy contributes to obesity*. Minneapolis, Minnesota: Institute for Agriculture and Trade Policy [IATP]. Retrieved from http://www.iatp.org/files/421_2_80627.pdf