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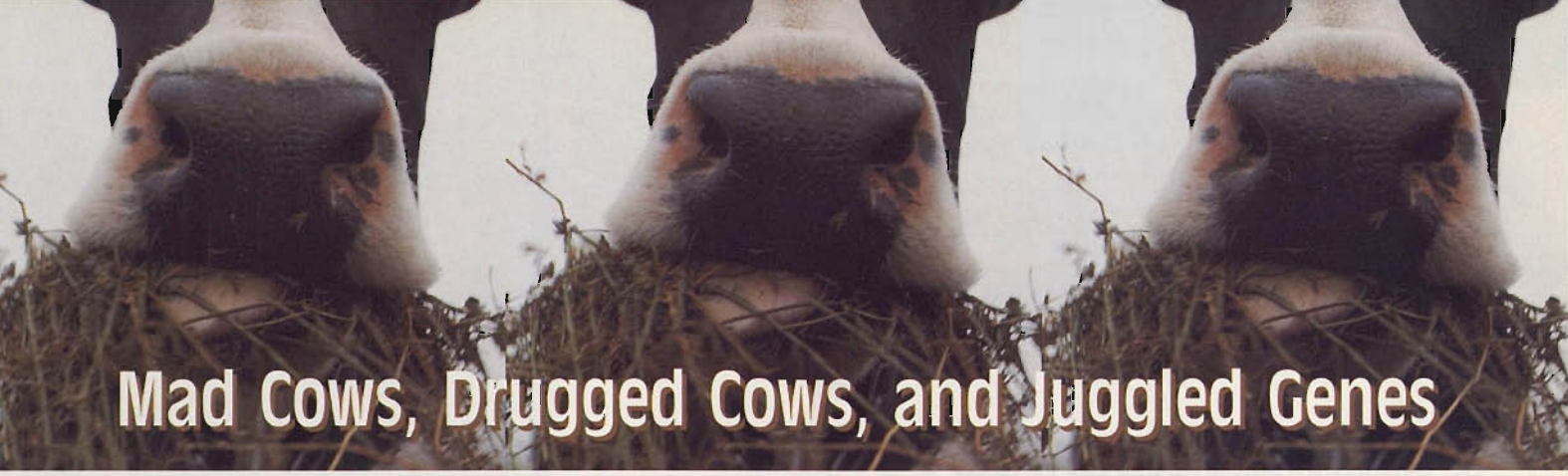


Mad Cows, Drugged Cows, and Juggled Genes

Purpose and Necessity in Science Policy and Public Opinion

What's the purpose of innovations such as BST and biotech crops? Are they necessary? Uncertainty regarding purpose and necessity drives food-related public health scares.

BY DANIEL W. BROMLEY

While much attention has been devoted to the controversy over GMOs (genetically modified organisms) making their way into the food system– witness the ongoing StarLink™ controversy–the pressing issue at the moment seems to be associated with the rather old-fashioned matter of contamination. Mad cow disease has now left the relative confines of the British Isles and has spread to Europe. The French, who are practically defined in terms of their food, are now faced with a horror of unimaginable proportions — *mon Dieu,* unsafe beef!

Purpose and Necessity — The Neglected Elements?

Perhaps the most interesting element here concerns what may seem to be an extreme reaction in the face of very small odds of actual contamination. One infected animal in Spain and another in Germany was sufficient to spark the most intense display of individual and official outrage. Beef sales in Germany dropped by 50 percent when the news first spread, and are said to remain low three months after the initial news. There is something about food.

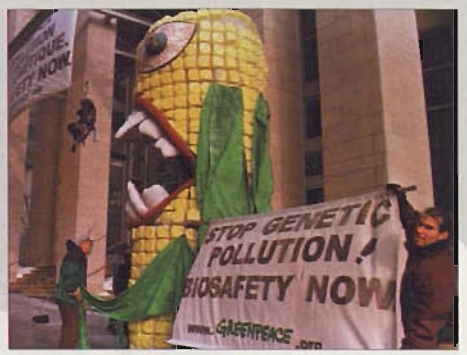
If this matter were approached in a rather traditional way, it might be easy to conclude that these reactions are overblown. What, after all, are the chances that someone will actually acquire new-variant Creutzfeldt-Jakob disease by eating meat from a cow with bovine spongiform encephalopathy (BSE)? What seems "rational" on the basis of simple statistics about the chances of infection is quite insufficient to explain human behavior here. We need something more.

We know that people react differently to risks that they assume voluntarily (driving a car, rock climbing, downhill skiing, crossing a busy street) as opposed to risks to which they are involuntarily exposed (second-hand cigarette smoke, pesticide residues, air and/or water pollution). When smoking became a public policy issue, most smokers knew that their habit was not necessarily safe, but they weighed the pleasures of their addiction against the risks that lung disease might materialize in the future. But when it was discovered that the tobacco industry had lied about its product, and had apparently taken action to make cigarettes more addictive, outrage — and legal claims — soon followed.

We see here the profound role of human agency at work. The tobacco industry emerged and evolved, as with any consumer-goods industry, with the purpose of selling tobacco products to those who wanted them. But we now know that along the way the pressure for

Oh, the corn has pretty teeth, dear: Many environmental activitsts and some consumers ascribe sinister characteristics to genetically engineered crops and the corporations who make and market these crops. The industry, some believe, has not conclusively demonstrated the purpose of — or necessity for — these and other innovations.

Photo courtesy of Greenpeace.



yet more sales led to a series of nefarious practices intended to lock smokers into their habit. We see that the purpose of the tobacco industry was transformed from one of providing a product to one of making sure that consumers lost their ability to control their consumption of the product.

Along with the new purpose of the industry — selling addiction rather than a product — came the obvious question of whether or not this evolved purpose was really necessary. Was it really necessary for tobacco companies to tinker with their product to make it more addictive? With purpose and necessity in hand, we can begin to understand the recent success of smokers' claims against the tobacco industry.

Mad Cows, Madder Consumers

Can the twin concepts of purpose and necessity help us to understand the alarm over mad cow disease? It is now common knowledge that cows developed BSE after being fed infected sheep tissue. And why, one might plausibly ask, are cows — which are serious herbivores — eating body parts? The answer, apparently, has something to do with saving money. A dubious notion of necessity—feeding sheep tissue to cows—introduces a critical element into the story of mad cow "policy."

Was it really necessary to feed sheep to cows? What is the purpose of the food system, anyway? Is it to recycle otherwise superfluous sheep parts? The reactions to mad cow disease are thus seen to be a mixture of horror at the prospects of unsafe food, and outrage at the feeding of body parts to cows. On this new knowledge, the presence of mad cow disease moves from the realm of accident to the realm of scandal. Are carnivorous cows accidental?

This Is Your Dairy Cow — This Is Your Dairy Cow on Drugs

Readers may well recall the controversy surrounding bovine somatotropin (BST) injected into cows to augment the production of milk. Many people outside of agriculture imagined that America's cows were doing quite a fine job of producing more milk than we could possibly consume, and yet somehow there was a felt need to produce even more. In response to this apparent "technical imperative" there was a predictable reaction. Is it necessary to shoot steroids into cows so that they might be able to do what years of selective breeding had already managed to induce them to do — produce too much milk? Many dairy scientists responded in bewilderment to these concerns. The scientists were quick to point out that cows already had natural BST in them(what could possibly be wrong with shooting them up with a bit more of it?).

Consumers drew a quite different conclusion — one that focused on the necessity of injecting steroids into cows. Aren't Olympic athletes stripped of their medals when discovered to have taken performance-enhancing drugs? Scientists, surprised at the initial resistance, rushed out to reassure us that we should not worry — after all, cows were already full of antibiotics and other ingested hormones, and BST was just another inevitable aspect of "modern" agriculture. Ironically, rather than calming the waters, this admission made matters worse. Many people, previously innocent of the chemical content of those sweet-looking dairy cows, were not amused. Is this drug necessary?

Juggling Genes For Fun and Profit

The ideas of purpose and necessity may offer some purchase on the current controversy over GMOs. As with BST, we see technical possibilities and social wariness. The scientific community responsible for creating and advocating genetically modified products is convinced of the benefits of such technology, and we see the predictable confident assurances that there are no known risks in such technologies. Others will dismiss these assurances as yet another instance of technological optimism. Those opposed to GMOs will assert that the very novelty of the technology, and the long time span over which adverse effects can materialize, imply that there are no reliable means whereby the plausible risks can be measured and assessed.

Moreover, those wary of GMOs reject *a priori* risk assessments of such technologies. For this they are criticized because they are refusing to accept the logic and the evidence of the scientific community. Those in favor of such technologies will claim to be dealing with the facts, while they will accuse the opponents of appealing to emotion. Indeed, it

Milk, milk everywhere: The introduction of bovine somatotropin (BST) into an already glutted milk market contributed to the backlash against it.

Clear Window photo

is not uncommon to hear that public policy about GMOs should be guided by "the science" and not by political posturing. Notice in these appeals to rely on science that the absence of proof of risk is subtly transformed into proof of the absence of risk.

The public policy issue here is not as straightforward as the technological advocates would wish. Most profoundly, skepticism about the manifold wonders of GMOs will not be resolved by the display of data about the lack of proof of risks. This arises, I suggest, because the matter of GMOs has not yet been correctly framed. Those who tell us of the wonders of GMOs stress the many marvelous results that will almost inevitably attend the introduction of such new technology. Moreover, those who have the temerity to stand in their way are often painted in a most unpleasant light. In essence, it would seem that if the opponents of genetically modified food crops get their way, the starvation and immiserization of millions of the world's most fragile individuals will be on their hands — and their consciences. This is quite interesting. Aren't the opponents of technology the ones who supposedly appeal to emotion?

Notice, as well, that those who advocate new technology fail to articulate both the purpose and the necessity of those technologies. Is this because all new technology is presumptively beneficent? Are we socially predisposed to assume that all technological change is good for us, and for others? If so, a balanced assessment of new technologies is impossible and perhaps even unnecessary. Are we so taken by "modernism" that those who challenge the presumptive goodness of new technology are automatically considered the enemies of what passes for progress?

Notice that the mere possibility of these new technical options is taken as sufficient and compelling evidence of their inevitable beneficial effects. In other words, advocates of GMOs wish to leave the impression that in their absence the sorry state of agriculture and human nutrition in the developing world will not — and cannot — be changed. But is it plausible to suppose that the introduction of GMOs will induce long-overdue institutional transformations in agricultural policies that discriminate against farmers for the benefit of urban consumers in the lower latitudes? Can one suppose that GMOs will indeed be the initial impetus — the essential *deus ex machina* — to loosen the relentless grip of landlords? Can we be so sure that GMOs will provide the essential stimulus to sweeping land reform that would, throughout the tropics, give small farmers access to their own means of production?

It would appear that the advocates of GMOs wish to suggest that the spread of such crops throughout the world would alone be sufficient to bring about these desirable social and institutional trans-

formations. But the question remains: Will the spread of such crops alone be sufficient to overcome the above impediments in institutional circumstances? That is, can one be so sure that genetically modified crops could overcome all of the other incentive problems that characterize agricultural policy in the developing world? Or might they simply relax the pressure for much-needed institutional reform?

Green revolution crops in India brought food self-sufficiency to that country and by doing so made it possible to avoid confronting the vexing problems of medieval (feudal) agricultural relations that still exist throughout much of northern India. Is this an obvious social improvement? Are we sure that the winners can compensate the losers? Have they done so?

We do not have answers to these questions, but asking them reminds us that there is more at work in agricultural transformations around the world than the mere presence of a new technical fix. More fundamentally, asking these questions in a context of serious and careful deliberation — rather than in one of fear-mongering — will help all of those who care about the life prospects of rural people everywhere.

We know that people react differently to risks that they assume voluntarily as opposed to risks to which they are involuntarily exposed.

The fundamental issues here remain those of purpose and necessity. Those unconvinced about the wonders of GMOs will — and do — speculate about the purpose behind their introduction. The controversy over the terminator gene — in which farmers would be unable to save and use seed in subsequent years — shows us just how central the idea of purpose can be in economic policy. Is the purpose of the seed companies to "hook" farmers, just as tobacco companies had done to smokers?

Moreover, are GM crops really necessary? My previous comments about the role of such crops in transforming traditional agriculture alert us to what agricultural experts in the developing world know all too well. The depressed state of agriculture in many of these countries can be laid at the feet of landlordism, perverse production and marketing incentives, pernicious policies, and a host of other institutional factors that have nothing at all to do with genes and chromosomes. To suggest that embodied chemical properties can solve systemic institutional problems is to commit a serious category mistake.

Needed: Honest Conversations

The making of public policy about the food system requires honest conversations and informed contemplation. Such conversations are not well served by reference to "scientific truths" that trump "the flawed rhetoric of emotion." Neither is coherence helped by commitment to the fiction that all technical change is wonderful. Perhaps most profoundly, in the consternation over mad cow disease in Europe we see something much more fundamental at work. We see a commitment to absolute assurance on the part of the citizenry that what they put in their mouth must not, even in minute probabilities, be flawed or fouled at the hands of another human being. If we are poisoned as an "act of God" that is one thing. If we are poisoned at the hand of human agents then that is quite another matter indeed.

Purity of essence: Perceptions of "purity" and the fact that much milk is consumed by children may have been instrumental in driving public opposition to antibiotics in dairy cattle.

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