

Reducing Suffering

Saturday, September 12, 2009

Pain-free Animals?

The [current Vegan Outreach newsletter](#) contains a [link](#) to a *New Scientist* piece (as well as an unfortunate editorial) based on a fascinating article: "[Knocking Out Pain in Livestock: Can Technology Succeed Where Morality has Stalled?](#)" by Adam Shriver. The moral urgency of such a proposal seems to me obvious, so I was most interested in the discussion of its scientific plausibility.

Shriver presents two example proposals for what might be done. First, we might

create knockouts of other mammals (cows and pigs for starters) lacking the AC1 and AC8 enzymes. Interfering with the cAMP cycle in the brain reduces the affective dimension of chronic or persistent pain, rather than pain full stop, but this would still be an improvement over current circumstances. If we could eliminate the sensitization that occurs as a result of painful or traumatic experiences, the animals would still be better off than they are now.

Secondly,

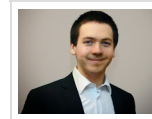
Zhou-Feng Chen and colleagues searched the Allen Brain Atlas to find genes that were highly expressed in the ACC but not other areas of the brain [29]. One strong candidate was the peptide P311. The researchers created knockout mice lacking the expression of P311 and found that heat and mechanical sensitivity were normal in the animals. However, they then performed a conditioned place aversion test on the animals and found that the knockouts no longer demonstrated the conditioned place aversion caused by formalin injections, in stark contrast to control rats. Thus, at first glance, it appears that knocking out P311 in mice strongly diminishes the affective dimension of pain while keeping acute responses intact.

Furthermore, P311 is likely to play a similar role in all mammals (Chen, personal communication), so one presumably could engineer other mammals that have a reduced affective dimension of pain while maintaining the sensory dimension of pain.

Since I'm even more interested in [wild-animal suffering](#) than farm-animal suffering, in view of the [vast difference in numbers of animals involved](#), my immediate question was whether similar techniques might one day be applicable there. Doing so is a lot trickier, because evolution produced the *badness* of pain for a reason. Shriver mentions this concern:

Since it seems likely that the affective dimension of pain played some role in determining the evolutionary fitness of organisms, we might question whether knockout livestock could really survive up through the point where they are normally slaughtered. However, it appears that the experimental rats were able to survive without complication at least in their cages (Chen, personal communication). This would be a good model for sows or veal calves

About Me



[Brian Tomasik](#)

I'm interested in ways to prevent large amounts of expected suffering in our multiverse. This blog contains small notes or random ideas, but the pieces on my main web page (<http://utilitarian-essays.com/>) are generally more substantive.

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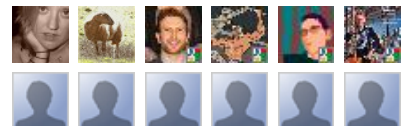
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who spend most of their lives confined in small pens where they can't do much of anything that would injure or otherwise harm themselves.

Producing genetically fit wildlife without pain might require not just knocking out pain but replacing the "pain" - "pleasure" axis with a "[less pleasure](#)" - "[more pleasure](#)" axis, which could be much more difficult.

I mentioned that Shriver's proposal seems obviously valuable from my perspective, but unfortunately this isn't necessarily the case among the general public. As the *New Scientist* article notes:

[Alan] Goldberg also contends that public attitudes may make pain-free livestock a non-starter. He and colleague Renee Gardner conducted an online survey on the use of pain-free animals in research and found little public support, even among researchers who experiment on animals (*Alternatives to Animal Testing and Experimentation*, vol 14, p 145).

This underscores the importance of [public outreach to change hearts and minds](#) about wild-animal suffering and how it could be prevented.

Posted by [Brian Tomasik](#) at 16:58  

Labels: [neuropsychology](#), [pain](#), [suffering](#), [wild animals](#)



5 comments:



Carl [Saturday, September 12, 2009 at 6:53:00 PM PDT](#)

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Adam Shriver [Monday, September 14, 2009 at 6:14:00 AM PDT](#)

Thanks, this is a very interesting post. Just want to mention one optimistic note from the Johns Hopkins study you mentioned (which you can see here: http://wwwsoc.nii.ac.jp/jsaae/zasshi/WC6_PC/paper145.pdf). If you look at figures 2 and 3, you'll see that while people disagree with the idea that we should genetically engineer animals that don't feel pain, if we already have animals that are genetically engineered to not feel pain, more people agree that we have a moral obligation to use them instead of other animals than disagree. In other words, I think how people feel about this depends a lot on how you ask the question, and if it can really be boiled down to a choice of causing animals to suffer or not, people are receptive to the idea.

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Alan Dawrst [Monday, September 14, 2009 at 9:50:00 PM PDT](#)

Thanks for the link to the study, Adam!

The near uniform negative response to the question, "If animals that could not feel pain were to be created, should scientists be free to conduct any experiment with those animals?" is nearly as puzzling to me as some of the other sentiments. I suppose animal happiness matters too, but if I imagine myself as a pain-free animal, I certainly wouldn't object to

being used in pretty much any way the experimenter decided, especially if the experiment could ultimately lead to less suffering by other organisms in the future.

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Matt Brown [Wednesday, April 20, 2011 at 11:17:00 AM PDT](#)

I've been wondering about this for awhile since as has been mentioned pain is a very useful adaptation. Getting rid of it would entail replacing it with something that serves the same purpose just as well but without the unpleasant sensation. Perhaps a feeling of heat or pressure could let the animal know its been injured but whether that would drive it to avoid the danger in the same way I'm not so sure. I think any discussion of pain-free wildlife needs to be under the assumption that we have already eliminated from the wild the major threats to animal well being inherent in the ecosystem (predation, parasitism, etc.) Without those the need for pain lessens somewhat.

As far as engineering farm animals in this way I suppose its feasible, though you'd still have to deal with the problem of them injuring themselves without knowing it. In the end though I can't see this kind of technology competing with things like in-vitro meat production which solves the pain problem in a much more novel way.

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Alan Dawrst [Saturday, April 23, 2011 at 3:13:00 AM PDT](#)

Thanks for the comments, Matt! I agree that pain-free farm animals may not be worth the trouble in view of the alternatives. What's more interesting about the paper is the idea of knocking out pain in general, as a proof of concept.

Yeah, it is unclear whether pain-free alternatives could motivate wild animals to action in the same way that pain does. It seems possible in principle (e.g., consider non-sentient robots navigating their environments), but whether it can be accomplished through simple gene manipulation is unclear.

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