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Evidence for Cows' Minds and Hearts: Why Cows Are Far More than Biological Machines

Commentary on Marino and Allen (2017) The Psychology of Cows

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"A cow is a biological machine invented by humans to turn grass into steak." Astrophysicist Neil deGrasse Tyson (2017a) tweeted this statement to 8 million followers on August 17, 2017, causing an uproar. Among others, the musician Moby objected strenuously, citing the "unspeakable suffering" of animals killed for food and the environmental and health costs of animal agriculture.

Replying in a lengthy statement on August 18, Tyson (2017b) doubled down. The objective truth and the blunt reality, he wrote, is that a cow is "a biological machine with one purpose (actually, of course, two purposes if you include it as a source of milk), and that is to eat grass (or, of course other food stocks), grow big, and be slaughtered for food."

Tyson lamented that differences of opinions today lead to fights (Moby referred to Tyson as "an ignorant sociopath," then subsequently apologized) instead of conversations. Marino and Allen's (2017) review paper, chock full of scientific evidence about cow cognition and emotion, offers precisely what Tyson seeks: an invitation to dialogue about cows.

It is a much-needed invitation. Headlines shouted the news in summer 2017 that 16 million American adults believe that chocolate milk comes from brown cows. A more relevant statistic—and one I haven't found reported anywhere—would be how many people don't know that dairy cows routinely are artificially impregnated each year in order to keep their milk production at maximum levels. As part of this cycle, they are separated from their calves within days or sometimes even hours after birth. As Velten (2007, p.179) puts it, then, the first hurdle to overcome in order to redress the long "deterioration of the human/cow relationship" is "getting people to even think about the cow." We tend to be fascinated with exploring the cognitive and emotional lives of chimpanzees, elephants, and whales, but we don't much think in that way about cows, chickens, fish, and the other animals we eat (King, 2017).

After two 10-minute tests for five days' running, cows retain the memory of a feeder's location for six weeks. This is an impressive result. Marino and Allen (2017) report other data that pack a "wow" punch. Two examples: When heifers without previous experience with photographs are taken to a testing arena and trained to discriminate between photographs of familiar and unfamiliar cows, they immediately approach the familiar ones (Coulon, Baudoin, Heyman, & Deputte, 2011). The likely explanation, Marino and Allen (p. 479) say, is that the cows "used previously stored mental images from actual social

interactions." In other words, they matched up images they held in their minds from three-dimensional, multi-sensorial, real-world encounters with what they could assess from two-dimensional images, imported from the human world, using their vision alone. In cows' learning, emotion is involved as well as intelligence. Heifers taught a maze task, with rewards dispensed in a certain way that they could learn to control, became excited (Hagen & Broom, 2004). The timing of that emotional arousal is consistent with the interpretation that they began to understand their own improvement as they learned what to do. As I said, wow! These abilities point to a facility with memory and mental representation, and a fascinating degree of self-awareness, and thus showcase the poverty of a view of cows as unreflective grazing animals. The point is not to measure cows' cognition and emotional expression against that of chimpanzees, elephants, and whales, but instead to see cows as expressing capacities that reflect their lives rich with species-specific thoughts and feelings.

Marino and Allen's inclusion of data at many points along the spectrum of stronger to weaker evidence in support of cows' inner lives is crucial both for a full scientific picture and for credibility. It would have strengthened the paper for the authors to explicitly acknowledge points along this spectrum, distinguishing stronger versus weaker study results of cows' cognitive and emotional capacities. Cows, for instance, may feel socially buffered (socially secure) when they see their own image in a mirror, apparently feeling they are with another cow (Piller, Stookey, & Watts, 1999). This finding might suggest a limited kind of self-awareness in cows. To cite another example, surely it is an indicator of *something* going on that calves, after separation from their mothers, respond only 62% of the time positively to ambiguous stimuli compared to 72% before separation (Daros, Costa, von Keyserlingk, Hötzel, & Weary, 2014), but that degree of difference is not a robust pointer to calves' emotional distress at separation.

Could the finding that a mirror "companion" (the cow's own self) is experienced as a social comfort by some cows be used by the dairy industry to support practices of housing cows in isolation, with only mirrors available to them instead of other cows? Could another finding, that cow-calf separation leads to greater emotional distress when it happens later rather than earlier, be used by the dairy industry to push the separation to a very early point in a calf's life?

Two at-odds forces can be recognized in thinking about these questions. It is extremely important, as I have noted, to present fairly the range of data available on cow cognition and emotion, rather than cherry-picking certain results. Marino and Allen do this masterfully. It is equally important to look at the results in aggregate, because when we do that, it is abundantly clear that cows thrive with real social companionship and that mothers and calves suffer when they are separated from each other, full stop.

We are only beginning to discover the social repertoire of cows. If in the future scientists look seriously for the expression of grief and mourning in cows as a response to death of offspring or other close social partners, I believe it is likely that we will see it as we have seen such evidence in many other animals (King, 2013). As it is, a series of facts offered by Marino and Allen (2017) reflect what we already know about how important cows' social interactions are to them: Cows experience reduced stress when they are in proximity or partnership with other cows; conversely, social isolation may be highly stressing for them. It is not that just any nearby cow will do: individuals choose with whom they associate and who to avoid. At least, they do this when they are allowed choice. The matrilineal bovine social structure means that mothers and calves bond tightly with each other, and that sociability is very natural to them too. Mother cows' distress upon separation is visible to members of our species who care to see it, through the nature of their vocalizing and their restlessness, and the calf too may call in profound yearning.

What is "the objective truth" and "blunt reality" of cows' lives? Several studies described by Marino and Allen (2017) show that cows respond positively to cross-species care and compassion, including gentle petting and stroking by humans. Yet Marino and Allen (p. 487) note that "positive handling experiences and interactions" are "unfortunately non-normative" for cows because of human actions like branding, disbudding, and rough handling of infant and adult cows. If you read reports such as those of Foer (2009) and Lymbery (2014) on systemic abuse to farm animals then you will know just how understated that "non-normative" phrasing is.

The blunt reality of cows' lives in the dairy industry and the veal industry to which it is intimately connected (because male calves of dairy cows are routinely sent to veal farms) is not a pretty one. It is built up around anthropocentric expectations that a cow's purpose is to turn itself into meat and milk for us. Yet certainly the answer to a cow's purpose is not contained in any claim that the purpose of domesticated animals across the board is to feed us: dog brisket and cat fricassee are notably absent from (almost all of) our tables and our menus.

Any forward-thinking, scientifically informed answer to the question of what is a cow's purpose must move away from an anthropocentric view or a speciesist view and grapple with Marino and Allen's (2017) exploration of ways in which cows are "…far more sophisticated and sensitive than the simple grazers they are perceived to be…" (p. 490). As Gruen (2015, p. 71) stated, just like humans, other sentient animals "are beings for whom life can go better or worse." Cows have good days and bad. The data summarized by Marino and Allen indicate that they seek social interaction with certain individuals, they feel emotional as well as physical pain and pleasure, they come to realizations about what happens in their own lives, and they remember things that happen to them.

As we converse together about the lives of cows, the science of cows' inner lives should play a central role.

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