We're Ruã Daros, João Costa, Marina von Keyserlingk, Maria Hötzel, Heather Neave and Daniel Weary. We recently published a study in PLOS ONE that found dairy calves experience emotional effects when undergoing routine procedures, such dehorning – AUA!

PLOSScienceWednesday [1] and r/Science AMAs[1]

[1]Affiliation not available

April 17, 2023

Abstract

Hi Reddit, Our names are Ruã Daros, João Costa, Marina von Keyserlingk, Maria Hötzel, Heather Neave and Daniel Weary. We are researchers from the University of British Columbia in Canada and the Universidade Federal de Santa Catarina in Brazil. Our research focuses on animal welfare, how to use changes in behaviour to make inferences about the quality of life that animal's experience. We recently published a study entitled "Separation from the Dam Causes Negative Judgement Bias in Dairy Calves" in PLOS ONE. Young farm animals, including dairy calves, are often separated from the dam far earlier than what occurs under natural conditions. Farms animals are also sometimes subjected to painful procedures like hot-iron dehorning. The aim of this study was to better understand the effects of these routine procedures on the emotions of animals. One way to investigate mood states is to look for evidence of judgement biases. We tested for cognitive biases in calves before and after separation from the cow and dehorning, and found diminished responding to intermediate, ambiguous stimuli (evidence of a pessimistic response) following both physical pain and social loss. This paper illustrates one approach to investigating emotional states in animals, and draws parallels in the emotional experience of physical and social pain. We will be online at 1pm EST (10am PST), and we look forward to hearing your questions about our work! Please also follow us in Twitter @ubcAWP.

the WINNOWER

REDDIT

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PLOSSCIENCEWEDNESDAY R/SCIENCE

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CORRESPONDENCE:

DATE RECEIVED:
January 28, 2016

DOI:
10.15200/winn.145389.97004

ARCHIVED:
January 27, 2016

CITATION:
PLOSScienceWednesday , r/Science , PLOS Science Wednesday: Hi Reddit, we're Ruã Daros, João Costa, Marina von Keyserlingk, Maria Hötzel, Heather Neave and Daniel Weary. We recently published a study in PLOS ONE that

Thank you for the AMA.
Haven't (yet) read your article, will do so now. Here goes my question beforehand:
On what level will your research influence the currently ongoing philosophical debate on animal phenomenology and what are your viewpoints on it?
Also: Are you living a vegan life and if so, on what point in your life did you decide to do so?

Baoum

Dan: The results really do address the issue of subjective lives of animals - in this case the mood of dairy calves. This type of research (on animal emotions) is becoming more common, especially in the field of animal welfare science (assessing the 'feelings' of animals is often at the heart of our concerns about animal welfare). We have also found that just seeing the calves learn (and how quickly they learn) makes people more interested in these animals, and more respectful of their abilities!

Are you able to tie these results back to a resulting decrease in dairy production? I fear that's likely the

found dairy calves e, *The Winnower* 3:e145389.97004 , 2016 , DOI: 10.15200/winn.145389.97004

only way to have any hope of something being done to improve the situation.

Alexandre_Dumbass

Maria: I am not aware of any study that suggests that. Which does not mean the effect does not exist. For example, the prevalence of diseases in young dairy calves is relatively high; it is reasonable to hypothesize that the mood state of the calves that have been separated from the dam or dehorned may influence the immune response.

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Alexandre_Dumbass

Dan: often this type of research is framed in terms of production benefits, but I'm not convinced that this is the best approach (at least in this case). The farmers I know and work with are motivated also by pride in their farm and their care for the animals. Also, providing pain relief is not very costly, so it is more a question of getting people interested in this issue and providing the right tools.

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Ruã Daros: Looking at FAO database you can see a trend of increasing in dairy production. Thus, we need to find ways of preventing animal suffering. Our paper contributes to the animal suffering literature showing that there is solid scientific evidence that animals experience negative emotional states. Some option addressing dehorning may be genetic selection or at least using the best techniques that prevent pain. Even though the later does not prevent animals of having negative emotions. You can see our other paper addressing dehorning and negative emotions in calves at: http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0080556. To address the calf-dam separation issue we need to thing in production systems that could accommodate calf-dam contact.

I don't want to sound rude, but it seems patently obvious that something like 'hot iron dehorning' would have an emotional impact on a calf. Is there denial within the dairy industry that these processes could have a negative emotional impact on calves? What was the motivation for conducting this study?

Demon_Slut

Dan: It is obvious that this process causes pain, but it was not obvious (at least to us) that the pain would be sufficient to alter mood states in the hours after the procedure. We all experience pain and other unpleasant stimuli in our day-to-day lives. For example, my knee is bothering me, from an old injury. Even though I feel the pain, it is not affecting my mood - otherwise my life is good, the pain is relatively minor, I understand why it is there, I could control it if I wanted to, etc. -- all in all, not enough to affect my mood (maybe also because I'm also engaged in answering these questions!). Some pains are sufficiently important (or out of our control, or fear inducing, etc.) that they do cause changes in mood in human patients. Our data suggests that dehorning pain does this. I think that's interesting (and novel) and that it helps inform the correct action (as it is now most farmers do not provide medication for treating the post-operative pain from this procedure).

Thank you for doing this AMA! I have linked some older papers by Dr. Weary on here before, when I tried to get people to understand the harmful emotional effects of cow-calf-separation. What I particularly love about those papers is how they show how harm to animals is *inevitable* in animal use – *both* early and late separation cause considerable harm, and *not* separating cow and calf would defeat the purpose. Which again goes to show that one can not at once support these industries *and* care sincerely about animal welfare.

My question: One problem in getting people to understand the harm done to animals in animal industries is that they keep thinking all harm is *avoidable* and merely *optional*. How do you see the role of animal science in correcting this misunderstanding?

IceRollMenu2

Dan: Great point. All animal care (maybe like child care) requires making difficult decisions. But I actually think that farming enjoys quite a bit of good will from the public, and for the most part we trust farmers to 'do the right thing.' But farmers do need to stay in tune with changing public values to make sure that their practices do not fall out of step, and thus risk a loss in public trust. I think public values around pain (and pain treatment) have changed, and that farming practices need to take this into account. Cow-calf separation is a more difficult issue, but it is possible that the public may become more demanding about the need for cow and calf to spend time together and engage in more natural interactions. We can do this in dairy farming (we do this sometimes on our own farm), but it is not the standard practice.

Thank you for doing this AMA! I have linked some older papers by Dr. Weary on here before, when I tried to get people to understand the harmful emotional effects of cow-calf-separation. What I particularly love about those papers is how they show how harm to animals is *inevitable* in animal use – *both* early and late separation cause considerable harm, and *not* separating cow and calf would defeat the purpose. Which again goes to show that one can not at once support these industries *and* care sincerely about animal welfare.

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Maria: What can be considered acceptable, avoidable, economically viable, etc, changes with time, as society changes and the production sector internalizes these changes. One way we can help increase the speed and reduce the pain of the change for those within the animal industries is by increasing the ethical background of animal science and veterinary students. As professionals they will be more prepared to ask themselves the question you are posing and help others answer it.

Can you explain a little more how you measure and study judgement bias in the calves?

firedrops

Ruã Daros: Just starting with the basics in a very simple way. Judgment bias is based on the theory that your decision making process is affected by your emotional state. So, if you under a negative emotional state you would interpret neutral (or ambiguous) stimuli more negatively than you would if you were under a positive emotional state and vice-versa. That said, we train animals (this type of study has been done in many species, i.e. sheep, starlings, dogs, pigs etc) in a manner that we know if they're responding positively or negatively to a neutral/ambiguous stimuli (in our study go respond was the positive and no-go a negative response). Once learned we give them some neutral/ambiguous

stimuli and see how they behave, if it's more positively or negatively towards this stimuli. With this result we can make inferences about animals' emotional state. To measure it you can calculate the ratio of positive/negative behaviour towards the neutral stimuli and then compare it to the behaviour towards the positive and negative stimuli. The see if your treatment has an effect you can have a between subject (i.e. comparison between groups) approach or a within subject approach, where the same animal it is its own control. We used the later as we know emotions are subjective experiences and individuals may have different responses. Hope this can help.

Thank you for doing this AMA. How do you think your research will affect the beef industry? Do you think it will have an effect on how we consume beef/dairy?

kittylifter

Maria: Very interesting question! I do not think consumers need this type of information to decide to consume more or less meat or milk. Generally lay people do not need to be convinced by scientists that animals are capable of feeling emotions and that this important for their welfare (see for example http://dx.doi.org/ 10.3168/jds.2012-6040 and http://dx.doi.org/10.3168/jds.2015-9925). But I believe our research may influence (some) beef cattle farmers to change the way they manage weaning. Young of farmed mammals need to be separated from their mothers at some point in their life. In the case of beef cattle they are weaned between 90 to 180 days of age, because it is very difficult to care for them without milk before that, as they are reared on pasture. According to our results, calves of this age will have an emotional response when they are separated from the mother. Many farmers still wean beef calves abruptly – i.e. separating calf from cow at a given day totally and irreversibly – which causes them the strongest behavioural and physiological response. Luckily, we know from other work that weaning may be managed as to reduce this response. For example, they may also be weaned "in steps" (for details see Haley et al. J Anim Sci 83: 2205-2214, 2005). That involves preventing them from suckling but allowing them to be with mother, so they get used and adapt to the solid diet (pasture normally), and after a few days separating them from the dam. This still causes some stress to the calves, but less than the abrupt system (if you want more details, see http://www.actavetscand.com/content/53/1/28).

Thanks for the AMA, My two questions are: how long after the dehorning process was a change in mood noticed? and two, I've hot-iron dehorned goats before and it seemed to me that they sort of shook it off and went back to being kids hopping around and even head-butting eachother right after. The farmer I was working for said this was because of the thicker skulls of goats but I was curious what your thoughts on the matter are?

Thanks

mycoborg

Marina: We tested the animal 6 and 22 hours after the hot ironing dehorning procedure and found no difference between the two sessions: both showed the same reduced mood state. Unfortunately we did not test them after that so we are not able to comment on how long they were affected by the procedure. In terms of goats we have not done any work on this species but in terms of skull thickness it is much thinner skull than calves.

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mycoborg

We have measured responses over 24 h. Other work shows evidence of post operative pain in dairy calves for 48 h or more. Less work has been done in goats, but we need to be careful in how we interpret some of these responses. After 'processing' lambs and calves will often return immediately to the mom and begin to nurse. Some have taken this as a sign that all is well, but other see it as 'comfort' behavior indicative of pain and distress. This underscores the need for validated methods of pain assessment. That said, the head butting is curious! Calves will shake their heads and rub the wounds after dehorning, but I have not seeing them head butt!

How do you objectively measure emotional distress in animals?

paulinsky

Heather: This is a great question, as I answered above, this was exactly the topic of my thesis (http://awp.landfood.ubc.ca/2013/10/16/msc-thesis-hw-neave/). Most commonly, studies have used physiological or behavioural measures as indicators of emotional state. For example elevated heart rate or cortisol levels, or approach/avoidance behaviors, conditioned place preference or aversion facial expressions or vocalizations. However in many cases, these measures do not reliably indicate the valence (ie. if it is is positive or negative - in the case of cortisol, a sexual experience or a predator will both result in increased cortisol levels) or the intensity of the emotion (ie. if it is depression vs anxiety - low vs high intensity of a negative emotion). More recently the cognitive approach to assessing emotions has shown promise, with the premise that emotions affect cognitive processes. The judgement bias method is just one type of technique utilizing the cognitive approach, which is based on responses to ambiguity. The animal's responses to ambiguity reflect both the valence and intensity of the emotional response. In other words we can pinpoint with this method what type of pessimism or optimism the animal is experiencing - in our experiment we showed that the calves were more expectant of the negative stimulus (ie. were more expectant to receive no milk rather than less expectant to receive the milk), which we and other researchers in cognitive bias have suggested to indicate as a high intensity, negative emotion such as anxiety. This is how judgement bias, and other cognitive approach methods is advantageous in the study of animal emotions.

In your opinion, will the use of the word "emotions" rather than (for example) "effective states" affect the impact of your study at all? Are policy makers and those in the industry more likely to be influenced with this more relatable language?

I completely agree with your use of the word; however, I know that not everyone in the scientific community is comfortable with the concept yet. Surprisingly, even many in animal welfare science still seem to shy away from it! Thank you for doing this AMA.

baleofturtles

Marina: thanks! In terms of what word to use - effective states vs emotion - for us it depends in part which audience we are working with at the time of the discussion! Regardless we have tried hard not to shy away from undertaking this type of work and to convey our findings to all stakeholders. What is interesting is that just a few short years ago bringing up the words 'animal emotion' to a farmer audience resulted in many thinking we were from another planet, however, even within this community this topic is now being discussed!

What is dehorning?

newsboywhotookmyign

Joao: Dehorning is the removal of horn buds from dairy calves (i.e. disbudding, also termed dehorning), which is a very common surgerie performed on commercial dairy farms.

Even though I'm not a animal psychologist expert, in your study there is this statement:

"One explanation for reduced responding after the procedure is that calves simply learned to stop responding to the non-reinforced ambiguous cues. For example, Doyle et al. [31] reported that sheep responded less to the ambiguous cues as sessions progressed, likely as a result of learning. To prevent calves from learning we used a 50% of reinforcement rate to the positive stimuli. From our results, three lines of evidence suggest that calves did not learn to avoid the non-reinforced ambiguous cues."

I'm highly skeptical of this measure, animal cognitives capacities won't be repressed just using an Pavlov scheme reinforcement, in my opinion, so if it is possible could you explain with more statistical data the evidences that the study stated? Also was there any other measure taken to ensure that the calf wasn't just learning then feeling anxiety from separation?

Great work, I became a vegetarian because I do feel that animals have real emotions and a sense of Self, a primordial one, and studies like these one day will prove that.

thenoisemanthenoise

Joao: This question has been address in other publications and I include here the passage from the Neave at al., 2013 (http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0080556) : "Decreased feeding motivation after disbudding cannot explain the reduced response to the probes as there was no difference in the number of responses to the reinforced training screen after disbudding showing that calves continued to be motivated to drink milk. It is possible that the reduced responding to the probe screens after disbudding was due to calves learning to not respond to the unreinforced probes, but we used a low rate of probes and partial reinforcement specifically to prevent this type of learning and we found no evidence of reduced responding to the probes over multiple test sessions before or after disbudding. However, future studies should include test sessions in the days following disbudding to ensure that calves return to baseline. "

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Ruã Daros: Complementing Joao's answer. Following Neave's study our study shows that a week after dehorning calves were tested again and showed the same levels of response as before dehorning. It's important to state that calves didn't forget the task as in between dehorning and separation calves were trained and didn't decrease their response levels towards positive and negative stimuli.

These results provide the first evidence of a pessimistic judgement bias in animals following maternal separation and are indicative of low mood.

Honest question: why is this important? I don't want to sound cheeky or offensive at all. Just would like to know what are the next steps here. Does low mood change the dairy products quality or anything like that?

overreactor

Dan: We don't normally eat these young dairy heifers, and if we did we would not need to dehorn them (the horns only develop when they are older). So the research is not about improving the meat characteristics or anything like that. I see it as addressing a more basic issue of mood states in cattle, and how these are affected by common procedures. The findings do have ethical implications for farmers (for example: if doing this causes low mood, do I need to change my practice?). In this larger sense the work does address issues around food 'quality', as many consumers are interested in how the animals they consume (or whose products they consume) were treated.

bout an inch or so long. (I can't recall the specific details of the timeline or the length, don't judge me). Our calves interacted daily with their mothers for months, as they would come in to get milked.

After about a week of mom coming in and going to her calf to comfort it, she would basically ignore them and head straight for the grain to get milked. I definitely noticed diminishing emotional stress over time. Almost as if their maternal instincts just fade. The babies still get their own mother's colostrum for the first week but after that, they care more about the milk they receive than seeing their mother in the barn.

I am wondering if you saw any differences when the baby had limited exposure everyday with their mothers. And though seemingly cruel, the calves would recover from their horn surgery almost immediately with no lasting negative emotional effects toward me or the other farmers. I assumed they wouldn't trust us ever again, but they seem to appreciate the fact that we pet and snuggle them every day. I guess my question can be summarized to this:

Does separation anxiety occur to calves who receive supplemental love from people, dispite daily dam interaction,or do they still react negatively to the separation?

lookaname

Ruã Daros: Social support or social buffering does exist, unfortunately we couldn't make a fair comparison between calves housed with their dams to those housed individually. Supposedly training schedule and milk reward may have an enrichment effect on individual housed calves that would overcome any effect of social support. Another methodological problem is comparing the same response in different individuals (i.e. comparing single housed with dam-reared calves), as we known emotions are subjetive. As you can see in our study we took an within subject approach, which

minimizes problems with individual response variation.

I remember a Mike Roe interview/"Dirty Job" with asheep farmer(video). It would seem one could infer from the video "environmentalist"/"Animal lovers" have attempted to proscribe a method that seems way more agonizing to the emotional well being of the animal compared to a 'band-aid removal'(ripping the band-aid off quickly as possible as to minimize prolonged suffering) . In your course of study, had there been procedures you've witnessed that would at first glance seem to be more 'brutal', but, alternative methods yielding more stress; pain for the animal--or more simply, how many of your findings were counter-intuitive results?

FourFingeredMartian

Dan: Excellent point. For the dehorning the issue is pretty simple - we need to avoid a way of causing the pain, or at least a way of treating the pain that we do cause. But for the separation it has been the dominant view that it is better to separate cow and calf early (maybe equivalent to your 'ripping the band-aid'), rather than wait and have the cow and calf develop a strong bond that becomes a bigger issues when separation does occur. Our results showing the effect on mood come from cows and calves separated at a late age, so you could say these results agree with the 'band-aid' theory. But I'm not convinced, as we have not assessed how cow and calf may also benefit from an extended period of contact, and how we could develop better practices for avoiding this separation distress.

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FourFingeredMartian

Heather: I'm not sure I quite understand your question. But in our particular study we didn't have any results that were counter-intuitive. We hypothesized that calves would show a negative response to dehorning and separation from the mother, which is exactly what we found. We didn't know, however, what type of pessimism we would find. We found the bias toward the negative stimulus, rather than the positive, indicative of a high-intensity emotion like anxiety.

What other approaches have been considered to evaluate emotional state in animals, and how does your judgement bias method compare?

ZippityD

Heather: Great question, and this was exactly the topic of my thesis (http://awp.landfood.ubc.ca/2013/10/16/msc-thesis-hw-neave/). Most commonly, studies have used physiological or behavioural measures as indicators of emotional state. For example elevated heart rate or cortisol levels, or approach/avoidance behaviors, conditioned place preference or aversion facial expressions or vocalizations. However in many cases, these measures do not reliably indicate the valence (ie. if it is is positive or negative - in the case of cortisol, a sexual experience or a predator will both result in increased cortisol levels) or the intensity of the emotion (ie. if it is depression vs anxiety - low vs high intensity of a negative emotion). More recently the cognitive approach to assessing emotions has shown promise, with the premise that emotions affect cognitive processes.

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Thanks for the AMA! I have a bit of a bigger picture question. In terms of animals experiencing physical and social pain is it known at what point in our evolution that these traits started to be developed or am I thinking of this wrong? I appreciate your time contributed to doing this. More agricultural science-related studies would be great to see here!

yobroyobro

Dan: Difficult question! There is still some discussion in the fish literature, for example, about whether fish feel pain, but hardly anyone working on mammals seriously doubts that they experience pain. For my money I put the line at tomatoes (ok, any non-animal) as not being able to feel pain, but some smart colleagues raise questions about this issue when it comes to very simple animals (e.g. Nematodes).

I'm out of the farm biz myself now but I've always wondered what is the least stress inducing way to de-horn a calf?

We've tried burning, the acid paste, and snipping them off methods and all cause a considerable amount of 'stress'(kind of like when the Doctor tells you you might feel a little 'pinch')

So what's works best?

smilingonion

Heather: We recommend for any method of dehorning that calves receive a sedative, local anaesthetic such as lidocaine, and a post-operative NSAID analgesic such as meloxicam. Our research suggests caustic paste causes the least amount of pain, but this method must be done within one week of age. If hot-iron is used, this should be used as early as possible (between one week and three weeks). The sedative reduces handling stress, the local anaesthetic will treat short-term pain for approx. 2 hours and the analgesic will be up to 24 hours. As we show in this study, the calves experience an emotional response up to 24 hours so this reinforces the necessity to use the NSAID for longer-term pain relief.

Has doing this research/being in this field affected your desire to consume animal products at all?

magicmanfk

Maria: Others have asked similar questions, it seems quite popular! In my case yes, but only partially. I am not a vegetarian or a vegan. I avoid eggs from conventional farms and I reduced my (and my family's) consumption of animal products. But also think the opposite way: maybe our moral standing towards animals also affected our choice of field of study?

What other experiments are on the horizon? I haven't spent time around cattle but I imagine colors on

a screen isn't something they naturally encounter. Thanks for the AMA.

guard-duty

Dan: Yes, it would be great to devise more naturalistic tests. One dream is to use calves' natural behavioural interactions with automated feeding equipment (now common on farms) - this way we could have a real-time automated measure of mood!

Do you think it would be feasible to raise cows and pigs as vegetables - by destroying their cerebral cortex and feeding them through a tube? While that sounds horrific, it seems like there would be less suffering than their present condition.

dopadelic

Dan: Intersting suggestion! Others have talked about modifying animals so that they could no longer suffer, but the down side is that maybe that they would also no longer experience joy, etc - whatever it takes to have 'a good life.' We could also go the 'meat in a petri dish' route, but I actually think our world would be a poorer place if we did not have cows. As an analogy, some dogs have bad welfare, but the solution (I think) is not to have a world without dogs - it is to correct the issues so that we provide these animals with a good life.

Separated from the dam?

They are separated from their mother.

thetimeisnow

Maria: "the female parent of an animal, esp. a domestic mammal." You don't like the term? In this particular case I see no problem. And I have no problem saying, "calves are separated from their mothers".
Animal production scientists tend to adopt terms that remove the animal from the story (like "layer" instead of "hen"). I always try to make my students remember we are talking about animals, not instruments.

When thinking about dairy cows, in regards to painful stimuli, what are the results of post dehorning comforting, and do you have any advice for the average farmer.

NY_kind_of_guy

Joao: Even when pain control methods are use during the dehorning, the post-operative pain associated with hot-iron disbudding is known to persist at least for 24 h. The use of a post-operative analgesic (such as ketoprofen or meloxicam) following hot-iron disbudding is recommended. Many studies have found that calves have a marked reduction in ear flicks and head shakes (sings of pain and discomfort) and lower plasma cortisol and heart rate when post-operative analgesic were applied after dehorning.

When thinking about dairy cows, in regards to painful stimuli, what are the results of post dehorning comforting, and do you have any advice for the average farmer.

NY_kind_of_guy

Dan: Of course the best approach is to avoid the pain, by using 'polled' (genetically hornless) sires if possible, or by using appropriate methods of pain control. Animals may also benefit from social contact. For example, in other work we have found that calves are much less responsive to weaning if they are with another calf - this effect is called 'social buffering'.

I understand it's all about the emotional state, but is there an alterative? A cow is a very hierarchical animal, and they'd do some serious damage to each other when they're fighting (not to mention a farmer). And also calfs are born in winter (where I'm from) when the animals are in the sheds, unfeasible to have calfs in there too with the dam, they'd be trampled to death!

dikkers4

Ruã Daros: That shouldn't prevent us on trying to create a better farming systems for our dairy cows and calves. Perhaps some of the issues are easy to address, but thinking in a barn where you could house calves with their dam would be ideal. Today it seems unfeasible but increasing understanding on the effects of rearing them together may shift public(consumer) perceptions towards what they buy, thus changing management practices. Another way of thinking it is to check other direct benefits to the farmers of having such a system. For example our research group has done research on group housing calves and showing that they grow at higher rates etc, thus increasing profits.

The Journal of Animal Science and researchers at the University of Milan's Faculty of Veterinary Medicine has confirmed that fear experienced during slaughter significantly elevates meat's levels of stress hormones—adrenaline, cortisol, and other steroids.

Are you familiar with this information and what information do you have in regards to how this is affecting the level of fear and stress within those that consume them.

also, are these hormones in the milk also , eggs ?

Thus, It seems that factory farming should be abolished in favor of only allowing the most humane practices.

thetimeisnow

Ruã Daros: I'm aware that some slaughter practices may influence meat quality, or some other practices and conditions (or breed for instance) may influence meat, milk and egg composition. Although I think is a long shot trying to associate this quality changes to fear and stress response among those that consume this meat. Is hard to address this kind of concern because is hard to clear out many cofounding factors that exists out there. Long term epidemiological studies are needed to confirm such hypothesis.

From an animal welfare scientist perspective the gold standard is to have a slaughter method that cause no pain and no fear, as there isn't one yet we keep seeking this goal.

The same way "factory farming" are not free from problems and do affect negatively some of animal welfare aspects, we should be skeptical and also have I look on the welfare of animal in small-scale/organic family farms.

The Journal of Animal Science and researchers at the University of Milan's Faculty of Veterinary Medicine has confirmed that fear experienced during slaughter significantly elevates meat's levels of stress hormones—adrenaline, cortisol, and other steroids.

Are you familiar with this information and what information do you have in regards to how this is affecting the level of fear and stress within those that consume them.

also, are these hormones in the milk also , eggs ?

Thus, It seems that factory farming should be abolished in favor of only allowing the most humane practices.

thetimeisnow

Dan: Thanks for pointing this out. This result fits with other data showing the effects of pre-slaughter handling etc. on meat characteristics. This was not part of our study (the dairy heifers grow into dairy cows and are not typically slaughtered). We were interested on how separation from mom and separation distress affects cow mood. Low mood is not necessarily associated with a physiological stress response (indeed, low mood animals may show low signs of stress).

My question is simple. Why does this matter?

gloveshack

Joao: Animal welfare and consequently the understanding of animal emotions are an important field of research because societal concern with the billions of animals under human care is increasing exponentially in the last decades. Also, in my opinion one of the mandates of scientists is to have evidence based answers to society. Plus, more specifically I agree with Prof. Maria has commented above: " Very interesting question! I do not think consumers need this type of information to decide to consume more or less meat or milk. Generally lay people do not need to be convinced by scientists that animals are capable of feeling emotions and that this important for their welfare (see for example http://dx.doi.org/ 10.3168/jds.2012-6040 and http://dx.doi.org/10.3168/jds.2015-9925). But I believe our research may influence (some) beef cattle farmers to change the way they manage weaning. Young of farmed mammals need to be separated from their mothers at some point in their life. In the case of beef cattle they are weaned between 90 to 180 days of age, because it is very difficult to care for them without milk before that, as they are reared on pasture. According to our results, calves of this age will have an emotional response when they are separated from the mother. Many farmers still wean beef calves abruptly – i.e. separating calf from cow at a given day totally and irreversibly – which causes them the strongest behavioural and physiological response. Luckily, we know from other work that weaning may be managed as to reduce this response. For example, they may also be weaned “in steps” (for details see Haley et al. J Anim Sci 83: 2205-2214, 2005). That involves preventing them from suckling but allowing them to be with mother, so they get used and adapt to the solid diet (pasture normally), and after a few days separating them from the dam. This still causes some stress to the calves, but less than the abrupt system (if you want more details, see http://www.actavetscand.com/content/53/1/28)."