Food Ethics (2024) 9:4
https://doi.org/10.1007/s41055-023-00137-3

DISCUSSION PAPER

Evaluating Longevity as a Farm Animal Welfare Indicator

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Accepted: 1 December 2023 / Published online: 18 December 2023

Abstract
In assessing the welfare of dairy cows and laying hens, longevity has recently been introduced as an indicator. This paper presents recent attempts to transfer the normative power of longevity to non-human animals and evaluates this choice systematically. It first shows that the normative power of longevity can be justified by utilitarianism but not by rights-based approaches. The case of the ban to kill day-old chicks in Germany is then used to show that public opinion leans neither to the utilitarian approach nor to the rights-based one but draws a firm line between killing animals before and after reaching an adult age. This may be not so much a desire for longevity among farmed animals but a first sign of empathy that may transform our relationship with farmed animals.

Keywords Utilitarianism · Animal rights · Chicks · Dairy cows · Longevity

Introduction

Merriam-Webster defines longevity as the length of life, and it has become an important indicator for measuring quality of life and well-being among humans (Ogwang and Abdou 2003; McGillivray 2006; Frugoli et al. 2015). There are two main arguments supporting this consensus. The first is that 'longevity is, for most purposes, the single best measure of health' (Friedman and Kern 2014, p. 719), and the second is that happier, more optimistic people outlive their pessimistic counterparts (Dello Buono et al. 1998; Diener and Chan 2011; Sadler et al. 2012). These components give longevity considerable normative power so that increasing it by suitable political measures is often recommended as a political objective (Butler 2009; Putot et al. 2021). However, this tendency has provoked scholars to question (Lafontaine 2009; Rose 2011) or even criticize (Meidl 2008) the attempt to prolong life without strong respect for its quality.

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The rising societal interest in the ethical treatment of animals warrants a deeper theoretical understanding of the ethical significance of longevity for animals (Hecht 2021). This concern applies more forcefully to farmed animals than to wild ones. The end of life for farmed animals hardly depends on anything but the farm manager's commercial (or in special cases other personal) interests, who decides which animal is slaughtered and when. Therefore, if longevity for farmed animals has any normative connotation, it must be fundamentally different from how the concept is applied to humans.

This question is important, as it could add a second dimension to farm animal welfare debates. Currently, these debates focus on the dimension of qualitative aspects such as the animals' freedom to move, the possibility of social contact or their physical treatment (Childers et al. 2005; Bennett 2013). The concept of animal welfare, a crucial societal concept which takes the animals' well-being into account in terms of human decision-making (Stamp Dawkins 2012), has largely been reduced to envisioning ways to enable animals to live a good life. The dimension of longevity would add a quantitative component to the concept: how long is a farm animal allowed to live? Or how long do they have to live, if we assume that living for farmed animals is full of suffering? While today's agricultural researchers tend to define longevity as the duration of an animal's productive life (Le et al. 2016; Rahman et al. 2021), our definition does not presuppose that only an animal's life which produces benefits for humans is a real life.

It is this paper's objective to explore the possible normative connotation of longevity for farmed animals. This includes a literature view, a theoretical part of argumentation and an empirical part where public perceptions are shown and analyzed. This includes a concrete case study—what does longevity mean for chicks in Germany under a new law that aims to protect them—to examine the feasibility of longevity as an animal-welfare indicator.

State of the Debate

Most of the research on longevity has focussed on humans. There is a considerable literature about the explanatory factors for longevity (e.g., Skytthe et al. 2003; Chapman et al. 2011) and about appropriate instruments to prolong human life (e.g., Bischof 2021; Zhavoronkov et al. 2021). In recent years, scientists have begun to question when human issues are also applicable to non-human animals (Cooke 2017; Pintos-Penaranda 2021; Torpin and Röcklinsberg 2021). Regarding longevity, this applicability has often only been understood from a purely biological perspective, which would use animals only as a role model for humans (e.g., de Magalhaes and Costa 2009). The transition of the ethical view on longevity from humans to non-human animals is still to be made.

For wild animals, Bono and De Mori (2005) suggested moving from what they call a mere 'animal welfare approach', which considers wellbeing during the individuals' lifespan, to a quality of life concept for animals that would include longevity. And Overall (2017, xvii) suggested that 'longevity for companion animals, as for human beings, is important; barring great suffering, a longer life is a better life'.

For farmed animals, the situation is more complex. Hurnik and Lehman (1988) first identified the main problem: longevity would be as good a wellbeing indicator for farmed animals as for humans if farmed animals were not deliberately killed. This reality makes

applying longevity to farmed animals difficult, particularly when longevity is influenced by requirements for meat production, meat quality and growth rates.

It is therefore no coincidence that most of the literature examining longevity in the context of farm animal welfare focusses on dairy and egg production, where more leeway exists for farmers in two ways. The first is the choice of how long female animals are used for their productivity until being replaced by younger ones; the second is the choice of whether to fatten male animals or to kill them right after birth (Franco et al. 2014). In this context, Bruijnis et al. (2012) suggested that good living conditions would also enable dairy cows to be healthy and productive for a longer period. These authors consider longevity as a constituent of quality of life rather than a welfare indicator. This view, however, blurs the useful distinction between quality and quantity. Although the two do strongly correlate, it is also possible to live a wonderful but short life.

More recently, Scherer et al. (2018) applied two longevity indicators to an assessment of farm animal welfare: the slaughter age of an animal and the ratio between this age and their biological life expectancy. As a limitation to these indicators' validity, they concede that 'for animals living a life full of suffering, death might mean salvation from that suffering' (p. 1478). It seems, however, that the ethical foundations for this indicator have not been sufficiently explored to establish it in any normative framework.

Ethical Analysis

Today's systems of animal production are still shaped by a rationale of production economics, in which the organization of processes follows the maximization of profits (Debertin 2015). This principle defines the duration that animals are allowed to live. While *gallus gallus*, for example, would have a life expectancy of around ten years (Vier Pfoten 2017), maximum revenues can be obtained if broilers for meat production are allowed to live around 42 days (Baéza et al. 2012). In egg production, most male chicks are killed on their first day of life (Schäfer 2019), while their female counterparts are usually allowed to live lives between one and two years (Yalcin et al. 2020). In the ethical appraisal of animal husbandry, which evaluates these and other practices over the last 50 years, two schools of thought have dominated. One is utilitarianism, which bases its argument on the benefit that society (in this case, including animals) obtains from different scenarios, while the other is an animal-rights approach based on deontological traditions. This exploration of longevity as an indicator of animal welfare focuses on these two concepts.

Animal Longevity in Utilitarianism

With his book on animal liberation, Singer (1975) was the first to systematically evaluate the practice of animal husbandry from an ethical angle, concluding that our appetite for meat was very unlikely to justify the miserable life and eventual murder of farmed animals. Several utilitarians have extended Singer's framework, such as Visak (2013), who examined the killing of animals who had a good life, considering the improvements in animal welfare in many countries over the last few decades.

The distinction between Singer's assumption about the negative utility of a farm animal's life and Visak's assumption about a positive one is crucial when conclusions about the value of longevity for farmed animals are to be made. Traditionally, utilitarians have argued that maximising years in life is a worthwhile objective (Ferranna et al. 2021). Before examining this objective in the case of the life of farmed animals, however, a second important question has to be resolved—the case of substitute animals.

Usually, farmers actively control the number of animals they want to raise. The second core question focusses on the farm manager's behaviour in this respect. Imagine an egg producer who decides to let their hens lay eggs for three instead of two years. If they do not alter the production (or purchase) of chicks, they will have to fill more densely or even increase the barn's size. A longer life of the animals would, under these assumptions, not affect the birth of other lives. An alternative would be to keep the same number of animals by reducing the number of hens being fertilised or chicks being bought. Some of the animals in the 'reference scenario' would not be born. This choice has, of course, implications for utilitarian calculus.

The answer to this important question of animal substitution depends on why the longevity of animals increases on a farm. As long as animals are kept to produce a certain amount of milk or eggs, letting animals live longer will automatically make the farmer decrease the number of new-born lives on the farm. Only if animals were allowed to live a sanctuary after their productive phase, an absolute exception in today's systems, would the longevity of one animal not substitute for the life of another.

Therefore, it is more relevant to take a closer look at systems using animal substitutions. In this case, much depends on the consideration of a potential animal's life. This is a core point in Visak's book about the justification for killing happy animals. Visak (2013), for this question, refers to Jamieson's (1984, p. 215) position that 'average utilitarianism does not seek to maximise average utility per potential life'. This conscious negligence of potential lives in utilitarian calculus makes the positive effect of longevity in the case of positive animal utility somewhat likely, even though arguments for including the utility of unborn animals could also be made.

Longevity is no benefit if animals plainly suffer over their life course. However, it has positive effects on husbandry systems that allow animals to live a life with positive utility, something that governments increasingly try to secure. The question of potential lives affects the question of animal substitution. In the more relevant cases, where longevity in dairy and egg production is achieved by bringing fewer animals to birth, much depends on the evaluation of such potential lives. As long as one can agree on dismissing potential lives, the same diagnosis applies to systems without animal substitution: longevity increases the utility of an animal's life if this life can be lived under animal-friendly conditions. One, however, could also argue that the substitution effect weakens the importance of longevity.

Animal Longevity in a Rights-Based Framework

While utilitarians often reflect on the objective and the impact of longevity (Arrow 1992; Lerou and Ponthiere 2013; Pestieau and Ponthiere 2016), these issues are not really at the top of the agenda for rights-based scholars. The fact of longevity is occasionally considered to argue why older people may need special protection (Love and Lynch 2018). However, when Stambler (2014, p. 25) claims, in a deontological context, that 'the value of extended

longevity is derived from the value of life preservation, regardless of its term', this is a minority position at best. Deontologists focus on the rights and duties we have while we live. Extending other lives (or their own) is rarely regarded as a component of our duties. Therefore, it is very difficult to find a lot of literature on longevity by rights-based ethicists.

In animal ethics, the key criticism of deontological scholars, in the tradition of Regan (1983), is that we regard the right to live as one of the most fundamental human rights and that there is no factual justification to distinguish between humans and other animals in this respect (Svoboda 2012; Korsgaard 2018; MacCormack 2020). It is the act of killing that is immoral. Whether this act is performed on the first or last day of an animal's life, it is always an unjustified interruption of the course of being; therefore, longevity is usually not among deontologists' concerns. The same applies to the call for respect for animals in the tradition of Taylor (1986). Referencing such a respect-oriented framework, Bradley (2009, p. 153) reminds us that 'there is no good reason to discount the badness of death for animal'. Even minority positions in the animal rights debate—such as Carruthers' (1992), who argues that non-human animals do not have moral rights, but that there are good reasons to avoid unnecessary suffering—do not deal with the issue of longevity. This reality confirms the core point that right-based scholars would probably make when it comes to the question of longevity: it is unjustfied to kill an animal, be it on its first or thousandth day of life. The timing of the wrong act does not make it better or worse. It is difficult, however, to support this claim with references: while animal-rights scholars write a lot about what McPherson (2015) calls the 'wrongness of killing an animal', statements from these scholars concerning longevity are scarce.

On most political questions of commercial husbandry, utilitarians and deontologists stand united against today's practices (Mann 2020). On the question of whether farmed animals should live a longer percentage of their biological lives, however, this consensus ends. Unless the animals are allowed to live 100 per cent of their potential life length, deontologists would find the question of longevity irrelevant, while utilitarians would likely defend every extra day that an animal has to live under appropriate conditions. It is therefore worthwhile looking at which side popular opinion leans to.

The Killing of Day-Old Male Chicks in Germany

The issue of longevity of farmed animals is usually not the focus of either the public or the farming sector. The following case study depicts one of the few situations in which a legal change mobilised both policymakers and agricultural stakeholders. The subsequent case study includes both interviews with core actors in the sector and written and video sources. In industrialised chicken production systems, there is a clear genetic distinction between laying hens and meat chickens (broilers). Dual-purpose chickens, animals that are used for egg and also for meat production, are mainly prevalent in developing countries (Badi et al. 2019); in the rest of the world, they are the absolute exception (Wahl 2015). Therefore, the male offspring of laying hens are commercially worthless and are usually killed immediately after birth; they are then fed to zoo animals (Arbuckle 2010), used for biogas production or simply disposed of (Oliver and Turnbull 2021).

The term 'longevity' may seem a strange word to apply to chicks who may either experience less than one or around ten per cent of their biological life expectancy. However, the chicks of laying breeds in principle are a case in point for the debate outlined above. This is

acknowledged both by Bruijnis et al. (2015), who find that killing day-old chicks violates animals' interests, and by Gremmen et al. (2018), who have asked Dutch consumers about their opinion on the fate of the chicks.

In 2021, with its record of 13 billions of eggs produced per year (Statistisches Bundesamt 2022), Germany was the first country in the world to ban the killing of day-old chicks, which came into effect in 2022 (Verbraucherzentrale 2022). In addition, it will ban, from 2024 onwards, the destruction of eggs after the seventh breeding day, which make any application of current technologies that identify sex within the egg illegal, as they only work at a later stage of the breeding process. Other governments have already announced that they will follow Germany's example (e.g., France; Nakagawa 2022), while in other countries, the profession itself has committed to end the killing of chicks (e.g., Switzerland; GalloSuisse 2022). Therefore, the German case, with its legal provisions, has importance far beyond its borders.

It is important to note why this legal step is such a convenient example for discussions over longevity. The new law does not ban the killing of any animal; it only bans killing it before a certain age (which is the 70th day, if the chick has obtained a minimum weight of 1300 g, as defined in the law's ordonnance). If no new technology allows the identification of the gender in the embryo before the seventh breeding day, the new law will not prevent a single case of killing but will still have a major impact on the longevity of the male animals. To explore public sentiment on longevity as an animal welfare indicator, it may therefore be helpful to explore both the causes and the impacts of this legal decision.

Causes of the Chicklet Killing Ban

Whenever researchers have asked consumers about their perceptions on the practice of killing male chicks on their first day of life, they have usually stated they were uninformed about practice and shocked about its existence. Leenstra et al. (2011), Gremmen et al. (2018) and de Haas et al. (2021) all find that many consumers are not aware of the practice and that killing chicks directly after hatching in unacceptable to a large majority of them.

The first organisation that brought the mass killing of chicks to the attention of the German public was the German Animal Protection Party. In 2013, the first federal election campaign of this splinter party put the maceration practice (in which chicks are placed into a large, high-speed grinder) on billboards and TV spots. Although the campaign did not result in the party achieving anywhere close to the five per cent needed to enter the national parliament, the pictures of chicks being killed still strengthened the party's position (van Heesch 2019). In subsequent years, the subject remained on the party's agenda and may have contributed to an increase of election results that averaged between one and two% and brought the party into the European Parliament and some local German parliaments.

Whether or not this campaign had any impact on the political parties in power, the contract of Germany's coalition of Christian and Social Democrats in 2018 was the first time a sitting government mentioned the chicks, as the group proclaimed that 'the killing of one-day chicks will be terminated until the middle of the legislative period." When defending the law, which would not take effect for another two years, Germany's serving minister of agriculture usually referred to the killing of chicks as an 'unethical practice', without being more explicit about the reasons for this position.

The parliamentary debate in which the law was discussed was more revealing (Deutscher Bundestrag 2021). In addition to the governing parties, the Greens also voted for the law. The Liberals and of the Populists ('Alternative for Germany') voted against it, but not, as they emphasised, because they found the killing of chicks acceptable but because they claimed that it needed a European solution so that the problem would not merely be exported. Gero Hocker, the speaker of the Liberal Party who voted against the ban, opened his speech in parliament by stating:

> *'If life emerges, it always has a value as such. And to let life emerge in order to terminate it a few moments afterwards, because it ostensibly does not have a sufficient function, has no use; that touches the fundament of our society, touches our convictions, and even our culture'.*

It should be emphasised that a parliamentarian who voted against the German ban on killing chicks made this statement. In the following part of his speech, Hocker even expressed his joy about the consensus between all parties that the killing of chicks should be terminated. In the quote itself, the first sentence leans toward a more deontological perspective. For utilitarians, only feeling life would have to be considered, whereas the reference to a 'value as such' leaves a lot open. Schwartz (1992) defined 'values' as universal guiding principles in a person's life, whereas a more economic interpretation understands 'value' as having a positive utility. The first sentence points toward some norm that life should be protected without being explicit about this question. The second sentence, however, reveals a lot about the issue of longevity. A lifespan of only "a few moments" is something that, if humans are responsible for it, touches on many issues that the politician enumerates. Nothing less than German culture is at stake when young chicks are killed.

The radicalness of this statement underlines the enormous consensus of all parties in the German parliament that killing young chicks contradicts ethical principles. However, the practice of killing farmed animals in general would not be questioned by any party in parliament and probably by none or very few individual delegates. Hocker's speech is a good example of this tacit consensus. While the "value as such" of life seems to forbid the killing of chicks, it does not seem to affect the killing of hens and cocks.

Impacts of the Chicks Killing Ban

Since the ban on killing chicks in Germany, the market for eggs has bifurcated. Large retailers have agreed to list eggs only from systems that do not kill chicks. These systems of animals, usually bred domestically, originate from two sources:

- In around two-third of cases, male animals of the laying strains are raised until they reach the minimum legal weight. Little of the meat produced from the laying strains goes into the mainstream food market, but many new labels for such animals have been created, and many live or slaughtered animals are exported.
- The market leader in the breeding business, Lohmann Germany, is working with technologies that identify the gender of the egg in the breeding process (Rauffmann 2021). Eggs with a male embryo are destroyed before the chick hatches. These technologies, however, will be banned from 2024 onwards, as they only allow the diagnosis (and

therefore also the killing) at a stage when it is likely that the embryos already feel pain.

Examining this debate is helpful to evaluate the sensitive points of society. Foodwatch, for example, has publicly criticised the system of fattening male chicks from egg breeding, not because the male animals are killed but because they are part of a system of egg production that would unsustainably mistreat animals in a far too intensive system (Foodwatch 2021).

In addition to this market, which has terminated the killing of chicks, another segment actively circumvents the ban through trade. As the new systems increase production costs per egg by around two euro cents, independent retailers and the food industry still use eggs from chickens whose male counterparts have been killed right after birth. This system works mostly by importing the female animals but also partly by buying from (mainly small) breeders who export the male animals for slaughter. The fact that this chain has not gained attention is probably rooted in information deficiencies. To date, the share of eggs that circumvents the new legislation through international chick transports is also unclear, but half may be affected. In any case, whereas Germany had been a strong exporter of chicks before the ban, multinational companies have shifted their capacities and have made the country a net importer of chicks.

Discussing Public Sentiments

It has become obvious that there are two major and almost unquestioned public consensuses in German society that have shaped the public debate: it is unethical to kill animals immediately after their birth, and it is ethically not problematic to kill them once they have reached a certain age. This combination of opinions may remind some readers of Carruthers' (1992, p. 156) suggestion that killing animals is only immoral if it is unnecessary, 'where "unnecessary" means either "for no reason", "for trivial reasons" or "for its own sake"'. Carruthers may speak for many consumers who are unable to resolve the inherent cognitive dissonance connected with the consumption of animal products (Rothgerber 2020). The fact that the newly fattened male chicks offer some amenities (in the form of meat), which the younger animals do not offer, may appear as a better justification for killing from an anthropocentric perspective. When day-old chicks are killed, there is no cognitive dissonance anymore, as no visible amenities relate to this death. Consumers are unanimously condemning it.

However, it is crucial to note for our purposes that chicken meat production with these animals is much less effective than with breeding designed for meat production. Therefore, the rationale of killing male chicks on their first day of life—that it costs much more to feed them than they could ever generate in terms of revenue—is no more trivial than the reason to kill them on their, say, 70th day of life, which then is essentially the same as on the first day. And the same logic applies for in-ovo sexing today, which is only technologically possible when embryos are already likely to feel pain. Therefore, Carruthers would probably morally accept the fact that young chicks are killed, whereas the public apparently does not accept it.

This sentiment highlights the role longevity has an animal welfare indicator, while it is not in accordance with utilitarian thinking and even less so with an animal-rights approach. An attempt to understand it is therefore difficult but essential, particularly when exploring an appropriate role for animal longevity as an indicator of social sustainability.

However, nobody in the debate described above has stressed the merits of longevity. The issue that most Germans seem to have with killing chicks seems to relate more to the fact that animals are killed in their infancy. Since this sentiment exists, a discussion on the sociological literature on infant animals seems necessary. However, it is not very fruitful, except for the empirical result that visitors to a zoo stay longer if infant animals are present (Clark Ridgway et al., 2005). Little has been written about the social role of infant animals.

The discourse about the so-called Kindchenschema, a human reflex based on youth attributes, provides an exception to this rule. It links human reactions to attributes applicable to both humans and animals. As hypothesised by Lorenz (1943) and empirically confirmed by Alley (1983), it increases our willingness to protect others if they display the physical attributes of children, such as having large heads and eyes. A study by Fletcher (2013) confirms the Kindchenschema's empirical relevance for the discourse around animals when referring to the frequent use of images and videos of infant animals by PETA. While Fletcher suggests that the organisation uses the human desire to protect infants and tries to extend it to non-human ones, the Kindchenschema, as modelled by Dydynski (2020), appears to be the most appropriate theoretical explanation of PETA's strategy and success. If babyfacedness, to state it bluntly, is 'a trigger for instinctive behavior', as Golle et al. (2013) put it, it is likely to influence the case of killing chicks. This link between the Kindchenschema and the ban on killing chicks is also something the German farming press highlighted when the ban was in parliamentary debate (Leopold 2021).

Therefore, the key to understanding the public despise of killing male chicks is not the life of the animals as such but the early stage of their life when being killed. While some surveys find a clear majority for the position that the killing of animals in agriculture can be defended generally (Mann 2020), other surveys show that 85% of consumers find it unethical to kill day-old chicks (Verbraucherzentrale 2022). Going back to the use of longevity as an indicator of farm animal welfare, longevity seems to only matter to the public if infancy is cut off early. However, if a majority feels moral responsibility for infant individuals only, this points to a potential importance of relational ethics (Metz and Clark Miller 2016).

Conclusion

The case of male chicks may show that the societal consensus that animals may be killed for human consumption is increasingly under scrutiny. If consumers and lawmakers start to find it unacceptable that male chicks are culled after their birth, this is not because of their agreement with longevity as an animal welfare indicator but because of the empathy they feel with infant animals. It is difficult to imagine that this is where empathy will stop in terms of farm animal welfare; it is likely this empathy will move to other stages of farmed animals' lives. Day-old chicks have shown to be an easy entry point for people to become sufficiently empathetic with these animals that they eventually disprove of killing them altogether. Although public engagement has led to longer lives for many male chicks in Germany, it should be considered part of a larger transformative process in humans' interaction with animals than as an argument to focus on longevity as an indicator for the quality of a production system.

This conclusion, however, does not justify longevity as an indicator for animal welfare. For many issues in everyday life, utilitarianism, rights-based approaches, and public opin-

ion come to similar conclusions or even identical answers. On the question of longevity as an indicator of farm animal welfare, however, it could be shown that this is not the case. Under certain circumstances, utilitarianism may see some merit in the indicator, particularly in systems that provide at least some minimum welfare standards for farmed animals in terms of housing, outdoor access, and other quality attributes. In contrast, rights-based approaches would not see any reason why the longevity of farmed animals matters at all. In this view, killing farmed animals at a later stage would not provide any of the rights that animals should have. Public opinion would lean neither to the utilitarian nor to the rights-based approach. There are cultural, probably instinct-based sentiments that would object to killing infant animals, which are only loosely connected with longevity as such.

What should be done with longevity as a farm animal welfare indicator under these controversial circumstances? While there is no easy answer to this question, the minimum to be achieved in every appraisal should be consistency. Few sustainability frameworks make explicit reference to the normative framework under which their assumptions have been coined, but for the case of longevity, such a clear reference would be essential.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s41055-023-00137-3.

Funding Open access funding provided by Agroscope

Declarations

Conflict of Interest There is no conflict of interest.

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