Journal of Agricultural and Environmental Ethics (2018) 31:467–481
https://doi.org/10.1007/s10806-018-9740-9

ARTICLES

Why Milk Consumption is the Bigger Problem: Ethical Implications and Deaths per Calorie Created of Milk Compared to Meat Production

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Accepted: 27 July 2018 / Published online: 2 August 2018

Abstract

Pictures of sides of beef, hanging from overhead rails in refrigerated warehouses and meat-processing plants, often leave a feeling of unease. These pictures provoke the notion that human beings have no right to inflict suffering and death on other sentient beings for the sole purpose of providing food. However, the ethical analysis conducted in this study shows that meat production, if animal welfare and deaths per calorie created are considered, is less of a pressing problem compared to the production of milk. While meat can be provided with minimal suffering to animals, the consumption of milk is always associated with considerable suffering during the dairy cow's life-span and the lives of their offspring. Moreover, more bovine deaths per unit of calorific value created are associated with milk production compared to meat production. The vegan movement, which is currently growing, wishes to minimise farm animal suffering as much as possible. However, if a vegan diet is not possible, consumers should make an informed decision about the products they consume. Replacement of the calories obtained from meat with those from milk and dairy products is not rational if animal welfare is considered.

Keywords Vegan · Vegetarian · Animal ethics · Meat · Milk

Introduction

Many consumers see the direct connection between the consumption of meat and the death of animals as problematic and therefore avoid the consumption of meat and meat products (Deckers 2009; Kenyon and Barker 1998; Mullee et al. 2017). They decide to live as vegetarians which means that they do not consume meat, although other animal derived products are consumed. I will show in this paper that

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the suffering of animals and deaths per calorie are higher in dairy farming than in meat production. Substituting meat for dairy products might therefore make matters ethically worse.

A vegetarian or vegan diet is common in many countries around the world. In contrast to vegetarians, vegans do not only reject meat consumption, but also avoid other animal-derived products. However, different specifications of vegan eating exist. It normally refers to people that only consume plant-based foods. Meat, fish, milk and eggs are rejected. Animal gelatin and honey are often—but not necessarily—rejected. Strict vegans also reject animal products for clothing such as leather, silk, fur and wool and cosmetics which contain animal derived ingredients. In some cases, products that were produced using animal derived substances, even if these are no longer found in the product itself, as well as products that were tested on animals are equally rejected. Overall, there is a multitude of vegan and vegetarian approaches towards consumption which are not in all cases easy to define (Dwyer 2013, p. 317). India, with around 30%, has the highest percentage of vegetarians and vegans (Office of the Registrar General and Census Commissioner 2014, p. 22). While there is no data available for Europe as a whole, at least in some European countries vegetarianism is very common. In Italy, around 10% of the population are vegetarians or vegans, in France 8%, in Spain, Germany and Poland 7% and in Switzerland as much as 14% (Dupré 2016; Swissveg 2017). A poll in the United States showed that over 3% of the population are vegetarians or vegans (The Vegetarian Resource Group 2016). A large percentage of vegetarians choose this option for ethical reasons (Fox and Ward 2008). They believe, that the killing of animals is unnecessary and morally unjustifiable.

Research also indicates that one major reason for adopting a vegan lifestyle is equally that of ethics e.g. to avoid the suffering and death of animals (Radnitz et al. 2015). In a survey conducted by Janssen et al. (2016) around 90% of respondents named the welfare of animals as a motive for their vegan diet. The rejection of all animal-derived products is the lifestyle that reduces animal suffering and deaths to the highest degree. However, only a small fraction of the population—around 1–2% in countries such as the United States or the United Kingdom—are vegans (The Vegan Society 2016; The Vegetarian Resource Group 2016). The percentage of the population who are vegetarians is much higher than the fraction that live vegan.

Receiving adequate nutrition from solely plant-based foods can be difficult. A lack of ion (Waldmann et al. 2004), calcium (Kohlenberg-Mueller and Raschka 2003), vitamin D (Craig 2009), vitamin B12 (Herrmann and Geisel 2002) or zinc (Hunt 2003) can occur as a result of an unbalanced vegan diet. Most of these deficits can be overcome by choosing a balance of foods such as different vegetables, fruit, nuts, soy products, seeds, grain and legumes. Only vitamin B12, which is primarily found in fish, shellfish, meat and dairy products needs to be supplemented in a vegan diet, either by choosing products which are fortified with the vitamin or by taking a supplement. From a health perspective, veganism is therefore not problematic. A range of studies even highlight the health benefits of a well-planned vegan diet (Glick-Bauer and Yeh 2014; Le and Sabaté 2014).

So-called "meaningful omnivores" claim that a meat-containing diet is more "meaningful" than a plant-based diet (Acton 2013, p. 81). In the view of meaningful omnivores, food can have a symbolic character, for instance because it was eaten by certain groups of the population or during particular times. Food can also represent a valuable aesthetic experience and it highlights the close relationship and interaction between life and death. However, Ciocchetti who analyses the arguments of meaningful omnivores, concludes, that the arguments against veganism on the grounds of "meaning" are not justified in his perspective. He concludes that "in the end […] the meaningful omnivore's arguments add little to the case for eating meat" (Ciocchetti 2012, p. 10).

In a survey among vegetarians, 90% of respondents claimed that they found environmental, health related and ethical reasons for becoming a vegan convincing. When asked why they were—despite this knowledge—"only" vegetarians, 35% of respondents stated that they feared problems when dining in restaurants. 34% considered that the vegan lifestyle is too difficult to live up to and 23% stated that a vegan diet would not fit in well with the eating habits of their peers (Gebauer 2015).

Nevertheless, vegetarians hope to reduce animal pain and death to a large degree—even if not completely by rejecting meat and meat products. A range of philosophers and ethicists have similarly highlighted the need to become vegetarian in order to reduce suffering and premature death of animals (Fox 2006; Lomasky 2013; Matheny 2003; Oswald 2016). This seems logical since meat production is directly associated with the deaths of animals. However, meat consumption is not necessarily associated with suffering during the animals' lives, if meat products are chosen with care. In this paper I am going to argue that the replacement of meat and meat products with milk and dairy products is not useful if animal welfare is considered. Suffering of animals and death per calories created are higher in dairy farming than in meat production.

In the case of eggs, initiatives have been established that try to avoid the deaths of male chicks. For instance, the "bruderhahn" or "haehnlein" initiative in Germany raise male offspring of laying hens for meat production. The meat is inferior in quality compared to meat produced from races that were bred for meat production exclusively. However, it is used for convenience foods or soups. The eggs from producers that practice this approach are more expensive than conventional eggs. The additional price is used for the upbringing of male chicks.

Intensive Farming Practices

The suffering inflicted on animals for no good reason beyond price competition is ethically unacceptable. This is acknowledged by a wide range of philosophers from Regan (2004) to his opponent Jan Narveson (1987, p. 193).

However, current practices of intensive animal raising often inflict physical and/or psychological pain and suffering in farm animals. Rollin names explicitly the "lack of space, lack of companionship for social animals, inability to move freely, boredom [and] austerity of environments" (Rollin 1995, p. 11). In order to produce meat as cheaply as possible, conditions on many farms compromise animal welfare.

Next to little available space and the associated problems to lie down or move, most animal housings offer little to no distraction (Geers et al. 2003). Abnormal animal behaviour is not uncommon (Keeling and Jensen 2017). A range of studies have indicated that animals experience stress and/or pain during housing (Düpjan and Puppe 2016; Mandel et al. 2016), transportation (Caulfield et al. 2014; Santurtun and Phillips 2015; Warriss 1998; Werner et al. 2007) and sometimes before or during the slaughtering process (Hultgren et al. 2014; Terlouw et al. 2008). From an ethical point of view, this treatment of animals which leads to lifelong suffering and/or pain cannot be justified. While the EU and the USDA provides minimum standards for farm animals in the EU and North America, different countries, regions and farms have different approaches towards animal raising and upkeep (Stevenson et al. 2014). Within the EU, over 90% of the population perceive animal welfare as an important or even a very important issue and 82% believe that farm animal welfare should be better protected than it currently is European Commission (2015).

However, the raising and use of animals for human consumption is not in all cases associated with suffering of animals.

Alternatives to Intensive Animal Farming

While intensive animal farming is in most cases associated with animal suffering, the production of meat can also be achieved with excellent welfare. In extreme cases, animals are raised with almost no suffering and a minimum of stress: Kobe beef, the most expensive meat that is currently available, comes from beef cattle that are kept in an exceptionally luxurious environment. They are kept in well-managed stalls that allow sufficient movement. Regular oil massages help "to improve the distribution and softness of the sub-cutaneous fat" (Longworth 1983, p. 98). While this treatment is clearly advantageous for the cattle involved, it is also associated with extremely high costs. Prices of around 500 Euros per kilogram of Kobe beef are not uncommon. Most people are not able or willing to spend this amount of money on meat. If all farm animals were treated in this manner, meat would be a luxury product only available to a small minority.

However, the treatment of Kobe beef cattle is more than is needed for a farm animal to live a life appropriate to the species. In general, it is agreed that the "provision of appropriate conditions (those allowing normal behaviour) is […] an essential prerequisite for animal well-being" (Luescher and Hurnik 1987, p. 68). Hence, regarding the need of different farm animals for physical activity, their need to move freely in the stall, the option to have access to the outdoors, a place to lie down and the opportunity to live together in social associations of farm animals is beneficial.

Such animal-friendly raising is already practised on many, often but not necessarily small-to-medium-scale farming environments of which many abide by organic standards. Animal welfare is traditionally of particular importantance in organic production environments (Boehncke 1997; Niggli 1996). The International Federation of Organic Agricultural Movement (IFOAM) which is the worldwide

umbrella organisation for organic production states that it is one of the principle aims of organic animal management systems to ensure that "living conditions (including housing) provided to animals: afford them comfort and safety, allow them to exhibit natural behaviour, give them freedom of movement [and] allow access, whenever weather allows, to pasture, open air and/or exercise areas, including shade" (IFOAM 2012). Equally, farms which fulfil the standards of the EU regulations on organic production and labelling of organic products comply with the rule that "the livestock […] have permanent access to open air areas, preferably pasture, whenever weather conditions and the state of the ground allow this" (European Commission 2007). The standards of most organic associations go beyond the EU regulation and can help consumers to choose meat from animals which were not dehorned, lived in social groups in an appropriate environment and have large areas for resting (Demeter USA 2018; Naturland E.V. 2017). These living conditions lead to a high degree of animal welfare so that the upkeep of animals in such a way is not an ethical problem, as has been pointed out before (Fischer 2016). Research showed that mastitis is less frequent in cows that are raised in organic systems (Hamilton et al. 2002; Hardeng and Edge 2001) and the number of abscesses, arthritis, mastitis and liver disease is lower in organic cattle carcasses compared to cattle carcasses from conventional farms (Hansson et al. 2001).

However, specific aspects of organic farming also have their downsides. For instance: the ban of routine antibiotic use might in some cases reduce animal welfare (Andrews 1991; Vaarst et al. 2001). Different studies highlighted, however, that routine antibiotic use is not necessary in organic systems to guarantee a certain level of health (Hardeng and Edge 2001; Vaarst and Bennedsgaard 2002).

Pigs which are kept outdoors, which is the preferred option for organic pig raising, are more likely to suffer from piglet mortality (Baxter et al. 2009; Vaarst et al. 2000). Cannibalism and feather pecking are more likely to happen in free-range systems for poultry (Bestman and Wagenaar 2003; Blokhuis and Wiepkema 1998). Enhanced environments, for instance through foraging opportunities, can reduce these problems (Gilani et al. 2013; Pettersson et al. 2017; Wechsler and Huber-Eicher 1998; Zepp et al. 2018).

Despite this, Vaarst et al. (2001, p. 377) conclude, that organic farming systems with all likelihood add favourable qualities to the farm animals' lives through natural experiences. Hence, animals enjoy—at least on well-kept farms—a high degree of welfare and it can be reasonably assumed that they live a life worth living.

However, even in these environments, animals are ultimately raised to be slaughtered for meat production which lessens the animal's welfare considerably.

Killing for Meat Production

Even animals which are kept on perfect farms with excellent welfare will ultimately be killed to produce meat. To reduce the killing of animals, meat should be avoided. However, there are different opinions regarding the question as to whether the killing of animals is an ethical problem. Death is the end to life and thereby to potential wishes, hopes, pleasures and well-being. It can therefore be argued that

death is the biggest harm that can be imposed on any living being (Blatti 2012; Purves 2016; Robson 2014).

However, some philosophers also argue that death should not be considered as negative. Since every living being is bound to die, death is part of life and gives meaning to life (Trisel 2015; Yacobi 2014). Unlike humans, animals have no knowledge of their impending death. They have no concept of time and no long-term desires for the future. They are "no persons" as Belshaw (2016, p. 37) puts it.

While death can be seen as a harm to animals because it takes future happiness and well-being from them (Bradley 2016), their lack to be aware of themselves existing in time and dying in the end leads to the conclusion that death is not a welfare problem per se.

However, if we consider the slaughtering of very young animals, this outcome is not quite as clear. Young animals had no chance to experience happiness or pleasure. In the case of milk production, male calves are slaughtered days, weeks or in the "best-case scenario" months after birth. The length of life is a welfare issue because it is "a precondition for flourishing", as Kasperbauer and Sandøe (2016, p. 29) put it.

Ethical Implications of Milk Production

To guarantee a steady flow of milk, milk cows have to give birth to one calf per year. Male calves born to dairy breeds are quickly slaughtered after birth since there is no direct use for them—in the best cases they live for a few months. Even on organic farms, male calves are regularly sold to conventional feed lots while female calves are separated from their mothers to become milk cows themselves. This practice diminishes animal welfare in four ways:

Firstly, cows are social animals which would prefer to raise their offspring themselves like most other mammals.

Secondly, the calves suffer from maternal deprivation and experience health problems as a result of the separation process.

Thirdly, male calves are often sold to other farms where animal welfare standards are not necessarily practised to a high degree.

Fourthly, male calves are slaughtered quickly after birth. Their short lives are dominated by loss and suffering.

The first aspect is difficult to assess since it is not possible to directly analyse the degree to which this aspect is experienced by cattle. For humans, the loss of a child is one of the most traumatic incidents that can happen to parents. Long term, traumatic grief reactions are the result of such a loss (Prigerson et al. 1999) with complicated grief symptoms (Meert et al. 2011). Long term effects include more depressive symptoms, poorer well-being and more health problems compared to parents who have not experienced the loss of a child (Rogers et al. 2008). Although it is unlikely that cows experience such complex reactions, it seems likely that mammals share a similar emotional basis with humans (Panksepp 2011). As Rollin states "common sense suggests that such a separation is stressful to [mother cows and calves]" (Rollin 1995, p. 101).

A range of studies highlight the second aspect: after birth, calves are either directly separated from their mothers or within the first few days. This little time is sufficient to form a bond between mother cows and calves (Daniel 2011, p. 146). Separation leads to stress symptoms such as an increased heart rate. Calves actively search for their mothers (Stehulova et al. 2008). As a result of this stress, animals show reduced weight gain in the weeks after separation (Price et al. 2003) and abnormal oral behaviour (Roth et al. 2009). Moreover, long term negative effects for the calves have been reported (University of Veterinary Medicine Vienna 2015). Stehulova et al. (2008) found in their research positive influences on social behaviour if calves were separated later from their mother compared to calves which were separated on the first day after birth. Lupoli et al. (2001) measured the concentration of seven different hormones in milk cows and calves after suckling and compare the concentrations to cows and calves without suckling. The authors find significant differences which impacts the physiology of the animals. Fraser and Broom (1997, p. 352) highlight that the separation of calves from their mothers leads to stereotypic and abnormal behaviour such as urine-drinking or intersuckling. Reinhardt (2002) concludes that "artificial weaning seriously impairs the welfare of the calf and of the mother". Welfare of calves and cows could be increased. Calves could stay with their mother cows longer and even suckle from them, as was described by Johnsen et al. (2016). This increases welfare of calves and cows considerably (Johnsen et al. 2015).[1] While in theory possible, there are just very few farms which practice this concept. Next to practical problems, one major obstacle is that milk coming from such animal friendly farms cannot be sold for a higher price although the increase in welfare comes with a direct economic loss due to the milk that is consumed by the calves. While current EU labelling allows to trackback eggs and meat to the farm where they were produced, this is not possible in the case of milk. Milk is collected by the milk transporter from the farms and is than processed in the dairy. Milk is homogenized and heated to kill potential pathogens. Therefore, milk coming from farms where calves can stay with mother cows cannot be purchased at the current time. It is always mixed with the milk of other farms. The consumer does not have the option to find out where his milk came from.

The third aspect regards the lives of the offspring of milk cows: after separation from their mothers, farmers are free to sell calves to other farms. There is no regulation that stipulates how long they have to be kept where they were born. Even relatively strict regulations of organic farming agriculture only regulate that calves should remain with their mothers for a short period of a few days and be separated within the first week (Tölle 2014). In the case of organic farming practises, the farms that the calves are sold to do not need to practice organic farming but could also practice factory farming. Hence, even in cases where the milk cows live in a species-appropriate way on small scale, organic farms, there is no guarantee that their offspring—a necessary by-product of milk production—equally live in species appropriate conditions.

[1] Milk cows are bred to produce as much milk as possible. They therefore produce more milk than calves drink.

Finally, the fourth aspect looks up the fact that the lives of male calves come to an end soon after birth. Thereby, they do not have sufficient time to flourish or gain from positive experiences.

A consumer who wants to increase animal welfare has the chance to buy animal-friendly meat and eggs. In the case of eggs, brands exist where male chicks are equally raised for meat production. It is not possible, however, to buy milk from farms were calves were raised together with their mothers or where male calves are brought up for meat production instead of killed directly.

Milk production and consumption are therefore associated with a range of dilemmas which cannot be solved at the current time. While a species appropriate production of meat is possible, milk cannot be produced without the infliction of suffering on cows and calves.

Hopefully, this will change in the future. For instance as a result of dairy products being created by biotechnological means (Milburn 2018). At the current time, however, ethically concerned consumers have no alternatives to these practices. There is currently no milk brand available which is not associated with the birth of calves and their early separation from the mother cows.

Deaths per Calories Created for Meat and Milk Production

While the vegetarian lifestyle is normally chosen to reduce deaths, milk leads to more deaths per calorie compared to meat production.

Cattle are bred to yield either a high milk or meat output. With a typical weight of over 1000 kg, cattle bred for meat production provide more calories than the milk that an average cow bred for milk production produces in 2 years. It is important to note that not the complete weight of the cattle is suitable for meat production. Around 40–50% is lost during the slaughtering process. Hence, only between 50 and 60% of the cow is transformed into meat and meat products. In extreme cases, the weight of cattle that are bred for meat production can be up to 1400 kg. Table 1 summarises the weight of different cattle species according to Bauer and Graber (2012). From this weight, the amount of meat that can be expected per animal is calculated. The more conservative estimate of 50% meat yield per animal is chosen. The calories that can be received per animal are calculated from this. It is assumed that 100 grams of beef provide on average 250 calories.

One litre of milk with 3.8% fat contains around 68 calories. In the European Union, the average yearly milk production per cow was 5917 litres in 2008. In 2011/12, the amount ranged from 3483 litres in Slovenia to a maximum of 8647 litres per average cow in Denmark. While milk is not directly associated with the death of animals, every cow has to give birth to one calve per year to allow a steady flow of milk. It can be reasonably assumed, that half of these calves are male and are hence slaughtered after birth, while the other half are female calves which will become milk-cows themselves.

Table 2 summarises the calorific intake coming from milk that can be expected per death of one male calve in the different European countries.

Table 1 Weight per animal, meat output per animal and calories gained per animal

Species	Weight female (kg)	Weight male (kg)	Meat female (kg)	Meat male (kg)	Calories created per death of female animal	Calories created per death of male animal
Angus	750	1200	375	600	937,500	1,500,000
Blonde d'Aquitaine	850	1300	425	650	1,062,500	1,625,000
Charolais	900	1400	450	700	1,125,000	1,750,000
Fleckvieh	800	1200	400	600	1,000,000	1,500,000
Galloway	600	900	300	450	750,000	1,125,000
Gelbvieh	800	1100	400	550	1,000,000	1,375,000
Hereford	750	1200	375	600	937,500	1,500,000
Highland Cattle	400	600	200	300	500,000	750,000
Limousin	750	1200	375	600	937,500	1,500,000
Luing	600	1000	300	500	750,000	1,250,000
Pinzgauer	800	1100	400	550	1,000,000	1,375,000
Tiroler Grauvieh	580	1100	290	550	725,000	1,375,000

It is estimated that in the UK, an average of 3.3 lactations are undergone per dairy cow before it is culled (Beever 2013, p. 60). In Denmark, it is estimated that only around 2.4 lactations are undergone before the dairy cow is culled (Wadsworth 2013). Therefore, the deaths of the dairy cows has to be added to the calculation of deaths per calorific intake. There is no data available on lactation before culling for all European countries. However, in the case of the UK, the yearly milk production of 7827 litres, which corresponds to 532,236 calories, is associated with 0.303 deaths from the dairy cow and 0.5 deaths from male calves. Hence 427,407 calories are gained per death if the death of the dairy cow is equally considered. In Denmark, where the average life of a cow is considerably shorter but the milk output considerably larger, it is 538,996 calories per death.

As can be seen, the deaths per calorific intake are in many cases higher for milk production compared to meat production. Therefore, consumption of a certain number of calories created from milk and milk derived products can lead to more deaths compared to the consumption of meat or meat derived products. Moreover, the problem is exacerbated since the deaths that are associated with milk production are ethically more problematic because relatively young animals are slaughtered. These animals had no time to experience a life full of pleasure or well-being. Rather these calves experienced suffering as a result of the separation from the mother cows, were often not able to act out their species-specific need to suckle and are slaughtered shortly after birth.

Table 2 Milk yield per cow and year in the different countries of the European Union in 2012, calories that are obtained there from and calories created per death of one male calve

Country	Milk yield per cow	Calories created per cow and year	Calories created per death of one male calve
EU	5917**	402,356	804,712
Austria	6462	439,416	878,832
Belgium	6189	420,852	841,704
Bulgaria	3711	252,348	504,696
Cyprus	6438*	437,784	875,568
Czech Republic	6616	449,888	899,776
Denmark	8647	587,996	1,175,992
Estonia	7198*	489,464	978,928
Finland	8205	557,940	1,115,880
Germany	7232*	491,776	983,552
Greece	5823*	395,964	791,928
Hungary	7165	487,220	974,440
Ireland	5092	346,256	692,512
Italy	6779	460,972	921,944
Latvia	6474*	440,232	880,464
Lithuania	5361	364,548	729,096
Luxembourg	6431	437,308	874,616
Netherlands	7710	524,280	1,048,560
Poland	5400	367,200	734,400
Romania	7372	501,296	1,002,592
Sweden	8281	563,108	1,126,216
Slovakia	6226	423,368	846,736
Slovenia	3483*	236,844	473,688
Spain	7861	534,548	1,069,096
United Kingdom	7827*	532,236	1,064,472

*Data from 2011; **data from 2008

Discussion

Comparing the ethical implications of meat and milk production is difficult because the suffering from pain, the suffering from the separation of cows and calves and the suffering/pain of death are difficult to quantify. However, if meat from animals which lived on well-kept farms that allowed species-appropriate lives is chosen, it is ethically acceptable. Animals have no sense of their forthcoming death and are not aware that the humans who take care of them will ultimately slaughter them for meat production. It can therefore be reasonably assumed that for the most part of their lives, farm animals benefit from the fact that they are alive. The harm inflicted

by death can be tolerated in the light of the pleasure that life provided for these animals. However, the killing of very young animals, such as is often done with the male calves of dairy cows, is an ethical problem because the lengths of their lives is in many cases not long enough to flourish. On the contrary: the separation of calves and mother cows leads to stress and abnormal behaviour, as research demonstrated. Cows and calves suffer when they are separated. There is no way that consumes can know on what kind of farms the male offspring of the milk-cows were raised. If deaths per calories created are considered, it becomes clear that a substitution of meat with milk or dairy products—for instance choosing cheese instead of sausage as a topping for bread—makes the problem ethically worse. More deaths per calorie are associated with milk compared to meat: next to male calves, of which one is slaughtered approximately every 2 years, the life expectancy of dairy cattle is currently very low. Once milk production decreases after a few years, they are normally culled and replaced with other dairy cows which are more productive.

Milk production is therefore associated with five ethical dilemmas even if milk of organic associations is bought:

1. Cows are social animals. They suffer from the loss of their offspring.
2. Calves suffer from maternal deprivation which leads to psychological and physical problems.
3. Male calves are regularly sold to other farms where welfare standards are not necessarily as high as on the original farms.
4. Male calves are regularly killed shortly after birth. Their lives are too short to experience pleasure or well being.
5. More death per calories are associated with milk production compared to meat production.

It is therefore not advisable for ethical reasons to replace the calories obtained from meat with calories from milk or other dairy products. Ethically concerned consumers should be knowledgeable about the ethical problems associated with milk and the influence that their product choice has on the welfare of animals and the number of deaths per calorific intake.

Overall, it is hoped that interest in milk production increases and that animal friendly raising techniques, for instance the raising of mother cows and calves together, are more often taken up. Such milk should be marketed separately so that customers have the choice to buy and thereby support such animal friendly milk production options.

Conclusion

Farming environments with high animal welfare standards offer farm animals the chance to live lives in a species-appropriate way. Although their lives are ended artificially through human hand, this does not lessen the happiness which they experienced during their lives. The consumption of meat that was sourced on farms with high animal welfare standards is not an ethical problem.

Milk, on the other hand, is normally always associated with suffering and pain. Calves are almost always separated from their mothers relatively early in their lives which leads to stress and suffering of cows and calves. Male calves are often slaughtered before they had the chance to experience pleasure or well-being. Even organic farms can sell male calves to other conventional farms on which the calves cannot live in a species-appropriate way. Next to this, milk is in many cases associated with more deaths per calories compared to meat. Replacing meat with dairy products is therefore not useful for reducing animal suffering and deaths. Instead, consumers should make an informed decision based on the suffering and pain which is associated with the upkeep of animals and their offspring for meat and for dairy production.

Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

References

Acton, A. (2013). *Issues in ethical research and application Atlanta*. Atlanta: ScholarlyEditions.
Andrews, T. (1991). Suffering animals in a greens landscape? *Dairy Farmer, 38*(5), 26–28.
Bauer, K., & Graber, R. (2012). *Mutterkuhhaltung Graz*. New York: Leopold Stocker Verlag.
Baxter, E. M., Jarvis, S., Sherwood, L., Robson, S. K., Ormandy, E., Farish, M., et al. (2009). Indicators of piglet survival in an outdoor farrowing system. *Livestock Science, 124*(1), 266–276.
Beever, D. (2013). Management issues with dry cows and a new feeding system for improved health, welfare and performance. In H. P. S. Makkar (Ed.), *Enhancing animal welfare and farmer income through strategic animal feeding—Some CASE STUDIES* (pp. 59–68). Rome: FAO.
Belshaw, C. (2016). Death, pain, and animal life. In T. Višak & R. Garner (Eds.), *The ethics of killing animals* (pp. 32–50). New York: Oxford University Press.
Bestman, M. W. P., & Wagenaar, J. P. (2003). Farm level factors associated with feather pecking in organic laying hens. *Livestock Production Science, 80*(1), 133–140.
Blatti, S. (2012). Death's distinctive harm. *American Philosophical Quarterly, 49*(4), 317–330.
Blokhuis, H. J., & Wiepkema, P. R. (1998). Studies of feather pecking in poultry. *Veterinary Quarterly, 20*(1), 6–9.
Boehncke, E. (1997). Preventive strategies as a health resource for organic farming. In I. Isart & J. J. Llerena (Eds.), *Resource use in organic farming—Proceedings of the 3rd ENOF workshop* (pp. 25–35). Acona.
Bradley, B. (2016). Is death bad for a cow? In T. Višak & R. Garner (Eds.), *The ethics of killing animals* (pp. 51–64). New York: Oxford University Press.
Caulfield, M. P., Cambridge, H., Foster, S. F., & McGreevy, P. D. (2014). Heat stress: A major contributor to poor animal welfare associated with long-haul live export voyages. *The Veterinary Journal, 199*(2), 223–228.
Ciocchetti, C. (2012). Veganism and living well. *Journal of Agricultural and Environmental Ethics, 25*(3), 405–417.
Craig, W. J. (2009). Health effects of vegan diets. *The American Journal of Clinical Nutrition, 89*(5), 1627S–1633S.
Daniel, U. (2011). *Kühe halten*. Stuttgart: Eugen Ulmer KG.
Deckers, J. (2009). Vegetarianism, sentimental or ethical? *Journal of Agricultural and Environmental Ethics, 22*(6), 573.
Demeter USA. 2018. Animal welfare. http://www.demeter-usa.org/learn-more/animal-welfare.asp. Accessed 27 June 2018.
Düpjan, S., & Puppe, B. (2016). Abnormal behaviour with a focus on stereotypies—Indicators of suffering and impaired welfare? *Berliner und Münchener tierärztliche Wochenschrift, 129*(3–4), 93–102.

Dupré, M. (2016). *The impact of connectivity on nutritional purchases*. Mintel Group (8-11-2017).
Dwyer, J. (2013). Vegetarian Diets. In B. Caballero (Ed.), *Encyclopedia of human nutrition, third* (edition ed., pp. 316–322). Amsterdam: Elsevier.
European Commission. (2007). Council regulation (EC) No 834/2007 of 28 June 2007 on organic production and labelling of organic products and repealing regulation (EEC) No 2092/91. Brussels. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:189:0001:0023:EN:PDF. Accessed 17 May 2017.
European Commission. (2015). Special Eurobarometer 442—attitude of Europeans towards animal welfare. http://ec.europa.eu/COMMFrontOffice/publicopinion/index.cfm/Survey/getSurveyDetail/instruments/SPECIAL/surveyKy/2096. Accessed 10 June 2018.
Fischer, B. (2016). You can't buy your way out of veganism. *Between the Species, 19*(1), 8.
Fox, M. A. (2006). Why we should be vegetarians. *International Journal of Applied Philosophy, 20*(2), 295–310.
Fox, N., & Ward, K. (2008). Health, ethics and environment: A qualitative study of vegetarian motivations. *Appetite, 50*(2–3), 422–429.
Fraser, A. F., & Broom, D. M. (1997). *Farm animal behaviour and welfare*. Oxon: Cab International.
Gebauer, G. F. 31-1-2015. Umfrage: Vegetarier möchten viel lieber vegan leben. https://www.vegan.eu/vegetarier_lieber_vegan/#comments. Accessed 1 June 2018.
Geers, R., Petersen, B., Huysmans, K., Knura-Deszczka, S., De Becker, M., Gymnich, S., et al. (2003). On-farm monitoring of pig welfare by assessment of housing, management, health records and plasma haptoglobin. *Animal Welfare, 12*(4), 643–647.
Gilani, A. M., Knowles, T. G., & Nicol, C. J. (2013). The effect of rearing environment on feather pecking in young and adult laying hens. *Applied Animal Behaviour Science, 148*(1), 54–63.
Glick-Bauer, M., & Yeh, M. C. (2014). The health advantage of a vegan diet: Exploring the gut microbiota connection. *Nutrients, 6*(11), 4822–4838.
Hamilton, C., Hansson, I., Ekman, T., Emanuelson, U., & Forslund, K. (2002). Health of cows, calves and young stock on 26 organic dairy herds in Sweden. *The Veterinary Record, 150,* 503–508.
Hansson, I., Hamilton, C., Ekman, T., & Forslund, K. (2001). Carcass quality in certified organic production compared with conventional livestock production. *Journal of Veterinary Medicine Series B, 47*(2), 111–120.
Hardeng, F., & Edge, V. L. (2001). Mastitis, ketosis, and milk fever in 31 organic and 93 conventional Norwegian dairy herds. *Journal of Dairy Science, 84,* 2673–2679.
Herrmann, W., & Geisel, J. (2002). Vegetarian lifestyle and monitoring of vitamin B-12 status. *Clinica Chimica Acta, 326*(1), 47–59.
Hultgren, J., Wiberg, S., Berg, C., Cvek, K., & Lunner Kolstrup, C. (2014). Cattle behaviours and stockperson actions related to impaired animal welfare at Swedish slaughter plants. *Applied Animal Behaviour Science, 152,* 23–37.
Hunt, J. R. (2003). Bioavailability of iron, zinc, and other trace minerals from vegetarian diets. *The American Journal of Clinical Nutrition, 78*(3), 633S–639S.
IFOAM 2012. The IFOAM norms for organic production and processing. https://www.ifoam.bio/sites/default/files/page/files/ifoam_norms_version_august_2012_with_cover.pdf. Accessed 20 June 2018.
Janssen, M., Busch, C., Rüdiger, M., & Hamm, U. (2016). Motives of consumers following a vegan diet and their attitudes towards animal agriculture. *Appetite, 105,* 643–651.
Johnsen, J. F., de Passille, A. M., Mejdell, C. M., Bøe, K. E., Grøndahl, A. M., Beaver, A., et al. (2015). The effect of nursing on the cow-calf bond. *Applied Animal Behaviour Science, 163,* 50–57.
Johnsen, J. F., Zipp, K. A., Kälber, T., Passillé, A. M. D., Knierim, U., Barth, K., et al. (2016). Is rearing calves with the dam a feasible option for dairy farms? Current and future research. *Applied Animal Behaviour Science, 181,* 1–11.
Kasperbauer, T. J., & Sandøe, P. (2016). Killing as a welfare issue. In T. Višak & R. Garner (Eds.), *The ethics of killing animals* (pp. 17–31). New York: Oxford University Press.
Keeling, L., & Jensen, P. (2017). Abnormal behaviour, stress and welfare. In P. Jensen (Ed.), *The ethology of domestic animals* (pp. 119–134). Oxfordshire: CABI.
Kenyon, P. M., & Barker, M. E. (1998). Attitudes towards meat-eating in vegetarian and non-vegetarian teenage girls in England—An ethnographic approach. *Appetite, 30*(2), 185–198.
Kohlenberg-Mueller, K., & Raschka, L. (2003). Calcium balance in young adults on a vegan and lactovegetarian diet. *Journal of Bone and Mineral Metabolism, 21*(1), 28–33.
Le, T. L., & Sabaté, J. (2014). Beyond meatless, the health effects of vegan diets: Findings from the adventist cohorts. *Nutrients, 6*(6), 2131–2147.

Lomasky, L. (2013). Is it wrong to eat animals? *Social Philosophy and Policy, 30*(1–2), 177–200.
Longworth, J. W. (1983). *Beef in Japan. Politics, production, marketing & trade*. St Lucia: University of Queensland Press.
Luescher, U. A., & Hurnik, J. F. (1987). Contribution to a concept of behavioral abnormalities in farm animals under confinement. In M. W. Fox & L. D. Mickley (Eds.), *Advances in animal welfare sciences 1986/87* (pp. 67–76). Boston: Martinus Nijhoff Publishers.
Lupoli, B. E. R. I., Johansson, B. I. R. G., Uvnäs-Moberg, K. E. R. S., & Svennersten-Sjaunja, K. E. R. S. (2001). Effect of suckling on the release of oxytocin, prolactin, cortisol, gastrin, cholecystokinin, somatostatin and insulin in dairy cows and their calves. *Journal of Dairy Research, 2001*(2), 175–187.
Mandel, R., Whay, H. R., Klement, E., & Nicol, C. J. (2016). Invited review: Environmental enrichment of dairy cows and calves in indoor housing. *Journal of Dairy Science, 99*(3), 1695–1715.
Matheny, G. (2003). Least harm: A defense of vegetarianism from Steven Davis's omnivorous proposal. *Journal of Agricultural and Environmental Ethics, 16*(5), 505–511.
Meert, K. L., Shear, K., Newth, C. J., Harrison, R., Berger, J., Zimmerman, J., et al. (2011). Follow-up study of complicated grief among parents eighteen months after a child's death in the pediatric intensive care unit. *Journal of Palliative Medicine, 14*(2), 207–214.
Milburn, J. (2018). Death-free dairy? The ethics of clean milk. *Journal of Agricultural and Environmental Ethics, 31,* 1–19.
Mullee, A., Vermeire, L., Vanaelst, B., Mullie, P., Deriemaeker, P., Leenaert, T., et al. (2017). Vegetarianism and meat consumption: A comparison of attitudes and beliefs between vegetarian, semi-vegetarian, and omnivorous subjects in Belgium. *Appetite, 114,* 299–305.
Narveson, J. (1987). Case against Animal Rights. In M. W. Fox & L. D. Mickley (Eds.), *Advances in animal welfare sciences 1986/87* (pp. 191–204). Boston: Martinus Nijhoff Publishers.
Naturland E.V. (2017). A one-to-one comparison of the EU organic regulation with the Naturland. https://www.naturland.de/images/UK/Naturland/Naturland_Standards/Comparison_Naturland-EC-organic-regulation.pdf. Accessed 27 June 2018.
Niggli, U. L. W. (1996). Development of research in organic agriculture. In T. V. Østergaard (Ed.), *Fundamentals of organic agriculture*. Copenhagen: 11th IFOAM International Scientific Conference.
Office of the Registrar General & Census Commissioner. (2014). Sample registration system baseline survey 2014. India. http://www.censusindia.gov.in/vital_statistics/BASELINE%20TABLES07062016.pdf. Accessed 2 February 2018.
Oswald, C. J. (2016). Moral vegetarianism and the philosophy of mind. *Stance, 9,* 39–48.
Panksepp, J. (2011). The basic emotional circuits of mammalian brains: Do animals have affective lives? *Neuroscience and Biobehavioral Reviews, 35*(9), 1791–1804.
Pettersson, I. C., Weeks, C. A., & Nicol, C. J. (2017). Provision of a resource package reduces feather pecking and improves ranging distribution on free-range layer farms. *Applied Animal Behaviour Science, 195,* 60–66.
Price, E. O., Harris, J. E., Borgwardt, R. E., Sween, M. L., & Connor, J. M. (2003). Fenceline contact of beef calves with their dams at weaning reduces the negative effects of separation on behavior and growth rate. *Journal of Animal Sciences, 81*(1), 116–121.
Prigerson, H. G., Shear, M. K., Jacobs, S. C., Reynolds, C. F., Maciejewski, P. K., Davidson, J. R., et al. (1999). Consensus criteria for traumatic grief. A preliminary empirical test. *British Journal of Psychiatry, 174,* 67–73.
Purves, D. (2016). Accounting for the harm of death. *Pacific Philosophical Quarterly, 97*(1), 89–112.
Radnitz, C., Beezhold, B., & DiMatteo, J. (2015). Investigation of lifestyle choices of individuals following a vegan diet for health and ethical reasons. *Appetite, 90,* 31–36.
Regan, T. (2004). *The case for animal rights*. Berkeley: University of California Press.
Reinhardt, V. (2002). Artificial weaning of calves: Benefits and costs. *Journal of Applied Animal Welfare Science, 5*(3), 247–251.
Robson, J. (2014). A-time to die: A growing block account of the evil of death. *Philosophia, 42*(4), 911–925.
Rogers, C. H., Floyd, F. J., Seltzer, M. M., Greenberg, J., & Hong, J. (2008). Long-term effects of the death of a child on parents' adjustment in midlife. *Journal of Family Psychology, 22*(2), 203–211.
Rollin, B. E. (1995). *Farm animal welfare. Social, bioethical, and research issues*. Ames: Iowa State University Press.

Roth, B. A., Barth, K., Gygax, L., & Hillmann, E. (2009). Influence of artificial vs. mother-bonded rearing on sucking behaviour, health and weight gain in calves. *Applied Animal Behaviour Science, 119*(3–4), 143–150.

Santurtun, E., & Phillips, C. J. C. (2015). The impact of vehicle motion during transport on animal welfare. *Research in Veterinary Science, 100*(Supplement C), 303–308.

Stehulova, I., Lidfors, L., & Spinka, M. (2008). Response of dairy cows and calves to early separation: Effect of calf age and visual and auditory contact after separation. *Applied Animal Behaviour Science, 110*(1–2), 144–165.

Stevenson, P., Battaglia, D., Bullon, C., & Carita, A. (2014). *Review of animal welfare legislation in the beef, pork, and poultry industries*. Rome, Food and Agricultural Organization of the United Nations. http://www.fao.org/3/a-i4002e.pdf. Accessed 27 June 2018.

Swissveg. (2017). *Veggie survey 2017*. Winterthur, Switzerland. https://www.swissveg.ch/veggie_survey?language=en. Accessed 8 November 2017.

Terlouw, E. M., Arnould, C., Auperin, B., Berri, C., Le Bihan-Duval, E., Deiss, V., et al. (2008). Pre-slaughter conditions, animal stress and welfare: Current status and possible future research. *Animal, 2*(10), 1501–1517.

The Vegan Society 17-5-2016. *There are three and half times as many vegans as there were in 2006, making it the fastest growing lifestyle movement*. Birmingham. https://www.vegansociety.com/whats-new/news/find-out-how-many-vegans-are-great-britain. Accessed 8 November 2017.

The Vegetarian Resource Group. (2016). *How many adults in the US are vegetarian or vegan?* Baltimore, USA. http://www.vrg.org/nutshell/Polls/2016_adults_veg.htm. Accessed 8 November 2017.

Tölle, K. (2014). *Milchratgeber*. Berlin, Welttierschutzgesellschaft. http://www.kuhplusdu.de/wp-content/uploads/Milchratgeber_Welttierschutzgesellschaft-eV.pdf. Accessed 20 December 2017.

Trisel, A. (2015). Does death give meaning to life? *Journal of Philosophy of Life, 5*(2), 62–81.

University of Veterinary Medicine Vienna. (2015). Early separation of cow and calf has long-term effects on social behavior. www.sciencedaily.com/releases/2015/04/150428081801.htm. Accessed 27 March 2017.

Vaarst, M., Alban, L., Mogensen, L., Milan, S., Thamsborg, S. M., & Kristensen, E. S. (2001). Health and welfare in danish dairy cattle in the transition to organic production: Problems, priorities and perspectives. *Journal of Agricultural and Environmental Ethics, 14*(4), 367–390.

Vaarst, M., & Bennedsgaard, T. W. (2002). Reduced medication in organic farming with emphasis on organic dairy production. *Acta Veterinaria Scandinavica, 43*(1), S51.

Vaarst, M., Roepstorff, A., Feenestra, A., Høgedal, P., Larsen, V. A., Lauritsen, H. B., & Hermansen, J. E. (2000). Animal health and welfare aspects in organic pig production. In J. E. Hermansen, V. Lund, & E. Thuen (Eds.), *Ecological animal husbandry in the Nordic countries* (pp. 177–178). Proceedings, NJF-seminar 303.

Wadsworth, M. (26-8-2013). *The productive lifetime of the dairy cow*. The Cow Longevity Conference 2013. http://www.milkproduction.com/Library/Editorial-articles/The-productive-lifetime-of-the-cow/. Accessed 5 June 2017.

Waldmann, A., Koschizke, J. W., Leitzmann, C., & Hahn, A. (2004). Dietary iron intake and iron status of German female vegans: Results of the German vegan study. *Annals of Nutrition and Metabolism, 48*(2), 103–108.

Warriss, P. D. (1998). The welfare of slaughter pigs during transport. *Animal Welfare, 7*(4), 365–381.

Wechsler, B., & Huber-Eicher, B. (1998). The effect of foraging material and perch height on feather pecking and feather damage in laying hens. *Applied Animal Behaviour Science, 58*(1), 131–141.

Werner, C., Reiners, K., & Wicke, M. (2007). Short as well as long transport duration can affect the welfare of slaughter pigs. *Animal Welfare, 16*(3), 385–389.

Yacobi, B. G. (2014). What little remains of life. *Journal of Philosophy of Life, 4*(1), 38–47.

Zepp, M., Louton, H., Erhard, M., Schmidt, P., Helmer, F., & Schwarzer, A. (2018). The influence of stocking density and enrichment on the occurrence of feather pecking and aggressive pecking behavior in laying hen chicks. *Journal of Veterinary Behavior, 24,* 9–18.