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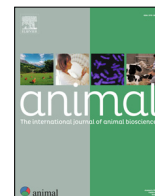
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## Opinion paper: Increasing the economic value of male calves from dairy herds to avoid poor animal welfare



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Male dairy calves are often considered as a by-product of the dairy sector. Young male dairy calves can be sent to veal farms, often after long journeys especially if the country of birth does not have a strong veal sector. Alternatively, they can be sent to beef production, with the problem of a low value of dairy calves for the beef sector. Some calves are slaughtered at an early age or even euthanised on the farm.

The mortality of male dairy calves is higher than that of female calves. For example, in Estonia, the mortality of male dairy calves under 3 months of age is twice that of the female dairy calves. In Ireland, the mortality of male dairy calves is also twice that of male beef calves. Biological factors can explain part of the higher mortality of male calves compared to that of females. Indeed, stillbirth resulting from dystocia is more common in male calves than in female calves due to the larger body size of males. This, however, cannot explain the large disproportion observed, nor the higher mortality of male dairy calves compared to beef calves.

Management factors play a decisive role in the mortality of dairy calves, with male calves often receiving less care than female calves, which are generally intended for herd restocking. Compared to female calves, male calves may receive less colostrum, be fed smaller amounts of milk thereafter, be housed in larger groups with a reduced lying surface and in a barn with poor environment (extreme temperatures, high humidity, poor ventilation), receive less care for their navels (which can lead to omphalitis and more generalised infections), and the caretakers may also be less involved in their care than in that of female calves (e.g., male calves are less often vaccinated). Female dairy calves not intended for restocking may also be poorly cared for. Therefore, the present opinion applies also to them.

The care of very young calves has implications for their continued welfare during transport and at a fattening unit. Morbidity and mortality during transport of calves under 3 months of age are increased by prolonged fasting, young age at transport, and poor colostrum immunity. Calves that receive less care on sourcing farms (e.g., no routine veterinary visits, no regular inspection of the calving pens) have a higher risk of dying on a veal unit. Calves in a high

state of stress on arrival at the veal unit are also more susceptible to pneumonia.

Poor management of male dairy calves is not due to a lack of knowledge. Indeed, good practices for the management of calves are well-known: good practices include providing good quality colostrum soon after birth, feeding at least 20% of calf birth weight in milk, providing solid feed from 2–3 weeks after birth, calm handling, transporting calves only when they are in good condition (dry navel, no fever...). The knowledge has largely been disseminated in good practice guidelines.

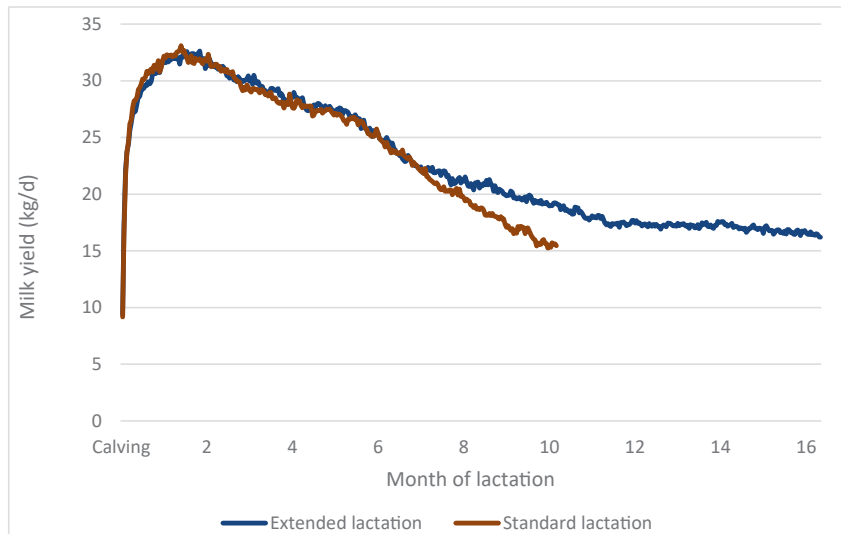
We believe that the lack of care for male dairy calves is due to their low and fluctuating commercial value. Young male dairy calves are generally sold at a low price, especially if they are from a highly specialised and small size dairy breed such as Jersey. The low and fluctuating value of male dairy calves does not encourage farmers to give them a lot of care, but rather to reduce costs and workload. In addition, the disorders may occur after the calves have left the dairy farm and therefore will not affect the dairy farm results. Increasing the value of male calves from dairy herds is needed to encourage a better care for them. We suggest below several options for achieving this. Each option requires a thorough examination of its advantages and disadvantages, which is beyond the scope of this paper.

First, extending the calving-to-calving interval would reduce the number of calves, which in turn is likely to increase their value according to the law of supply and demand. For instance, extending the calving interval from 12 to 18 months would reduce the number of calves by 33%. At present, many high-yielding dairy cows are dried off at a time when they are still producing over 20 kg/d of milk. Thanks to good persistence, they can easily continue to produce large amounts of milk for several months (Fig. 1). Extending calving interval from 13 months to 15–17 months can lead to similar annual yields of energy-corrected milk per cow and reduces costs for feed, reproduction and medical care, and therefore seems economically viable for farmers (modelling by Lehmann et al., 2019).

Second, labelling dairy farms that follow a specification that ensures all calves are well cared for. Such initiatives already exist, such as 'Genuss mit Respekt' (<https://www.genussmitrespekt.ch/de/milchgenuss/>) and 'Vachement heurreux' (<https://demeter.ch/fr/rind/#1609782602582-965a7018-2033>) in Switzerland, or

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**Fig. 1.** Example of milk production under standard (10 month) and extended (16 month) lactation of Holstein cows ( $n = 61$  cows for each lactation duration, source: Barbet et al., 2013).

'Bruderwohl' (<https://www.zurueckzumursprung.at/blog/pionier-projekt-bruderwohl/>) in Austria, that group actors of food chains (farmers, manufacturers, suppliers). In these initiatives, a premium price for the calves or the milk covers extra costs for calves' care.

Third, combining the use of sexed semen to produce female calves for the dairy herd renewal with the use of semen from beef bulls for the rest of the herd to increase the value of the calves for the beef sector (Holden & Butler, 2018). Currently, the use of sexed semen is limited by lower conception rates, lower availability and higher cost (Balzani et al., 2021); these conditions may change in future as advances are made. Further, using sexed semen may be perceived by the public as an unnatural instrumentalisation of animals as suggested by controversies on genetically modified animals (Macnaghten, 2004); therefore, its use should be counterbalanced by better care for all calves. When using semen from beef bulls, attention should be paid to the size of the bull in relation to that of the cow to avoid excessive nutritional requirements during pregnancy and dystocia. At present, some cattle breeding companies offer semen from beef bulls specially adapted for dairy cows. The production of too many crossbred calves from the dairy sector may jeopardise the beef production from suckler herds by leading to overproduction of beef meat. The production of crossbred calves is thus limited by the number of calves that can be used by the beef sector (for veal or beef).

Fourth, slaughtering some calves to produce veal meat at a younger age than what is currently practised would require more calves to obtain same amounts of veal meat. By increasing the demand, it could increase the value of the calves according to the law of supply and demand. In North America, veal calves from dairy herds are slaughtered at 16–18 weeks of age and in Europe, the age of veal calves at slaughter increased from 13 weeks in the 1950s to 26–35 weeks today. Shortening the life of calves, e.g. slaughtering them at 13–16 weeks, however can be criticised because it reduces the opportunity for the animals to experience the good aspects of life (if any) and young animals are particularly stressed at slaughter. Such a practice should therefore be counterbalanced by higher welfare standards such as fattening and slaughtering male dairy calves on the dairy farm to avoid stress due to handling, transport, mixing, exposure to unknown environments, etc.

Fifth, using dual-purposes breeds for both milk and meat production. This would, of course, be a radical change from the current trend towards more and more specialised breeds. But it would certainly solve the problem of low-value dairy calves.

Sixth, reducing the consumption of animal products, as advocated to ensure a sustainable human food system (van Zanten et al., 2016). This could have two benefits: (1) a reduction in the number of farmed animals, thus reducing the number of animals potentially experiencing poor welfare, and (2) more disposable income for consumer to spend on fewer premium products, thus allowing higher production costs.

We believe that the dairy and the beef sectors should discuss the options listed above and work closely together and with society to find solutions to provide a good life for all male calves while stabilising the economic value of calves at an appropriate level. We believe that a combination of the solutions proposed above can be applied to promote good care to male dairy calves. In particular, prolonging lactations and inseminating dairy cows with (female) sexed dairy semen and beef semen seem to be widely applicable, with the decision lying essentially within and between the dairy and the beef sectors. Ensuring premium prices for products from farms with high standard of calf care or reducing the age at slaughter of veal calves while ensuring high welfare standards will depend on societal factors. These options correspond to specific markets and require decisions between food-chain actors (producers, manufacturers, suppliers, retailers, consumers). The use of dual-purpose breeds and the reduction in the consumption of animal products represent radical changes on a global scale that require decisions at the sectoral, societal and political levels.

### Supplementary material

Supplementary material to this article can be found online at <https://doi.org/10.1016/j.animal.2023.100885>.

### Ethical approval

Not applicable.

### Data and model availability statement

No data and no models are used for this article. The literature used to describe the actual situation in dairy herds is provided in the [supplementary material](#).

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### Author contributions

**Isabelle Veissier:** Conceptualisation, Writing – original draft, Writing – review and editing. **Josef Schenkenfelder:** Writing – review and editing. **Dominique Pomiès:** Writing – review and editing, Visualisation.

### Declaration of interest

None.

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