*Proc. Assoc. Advmt. Anim. Breed. Genet. 26: 162-165*

# INDUSTRY PERSPECTIVES ON DAIRY CALF TRAITS

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## SUMMARY

Breeding tools are under development in Australia to improve dairy calf health. A survey revealed that dairy farmers value calf traits similarly to well-known traits such as survival, mastitis, and conformation. Results suggest that calf traits should be presented in genetic evaluations so that the favourable direction is a higher value and as individual traits rather than a general calf index. Findings from this study will assist industry to optimise the release of this new information.

## INTRODUCTION

Calf morbidity increases heifer rearing costs, directly through increased labour and health costs and indirectly through poorer lifetime performance. In addition, improving heifer rearing improves two sustainability metrics, outlined by the Australian Dairy Sustainability Framework (Dairy Australia 2023). Firstly, reducing disease, deaths and reliance on antimicrobials to treat disease, contributes to the goal of providing best care for animals. Secondly, rearing less animals to achieve the same level of production reduces the amount of methane emitted per kg milk solids produced.

Previous studies investigating the genetic variation in calf health traits suggest that it is feasible to breed for fewer stillbirths and lower pre-weaning mortality in Australian dairy herds (Axford *et al*. 2024) and further work is underway to measure genetic variation for additional calf traits. However, producing new Estimated Breeding Values (EBV) is only the first step to using genetic selection to influence calf performance. Herd managers need to be aware of and understand genetic tools and consider any barriers to using the tools in their herd before they can decide to implement (Monks *et al*. 2021). Using an industry survey, we aimed to analyse the perspectives of farmers and service providers on improving calf health traits. The purpose of the survey was to provide details on the language associated with potential traits and their perceived importance to improve the ease with which adoption can take place following implementation by DataGene, Australia's dairy genetic evaluation centre.

## MATERIALS AND METHODS

An on-line survey was conducted between 23 October 2023 to 10 June 2024 using SurveyMonkey (SurveyMonkey Inc. 2024). The survey was distributed through traditional and social media to dairy farmers, calf growers (those who raise calves but do not milk cows) and industry stakeholders. Farmers and calf rearers were separated from industry stakeholders as they have an economic interest in a farm business. Respondents were asked about their business activity, region, role, number of calves reared, breed, calving system, calf record keeping, trait preferences as well as how they would like to see calf traits presented for genetic evaluation. Trait preferences were gathered using two question types with the first being a scale from 'lowest emphasis' to 'highest emphasis' and the second asking respondents if they would trade off protein kg/cow/year for an improvement in calf traits, similar to the method applied by Axford *et al*. (2021).

## RESULTS AND DISCUSSION

A total of 109 responses were received of which 66% of respondents were dairy farmers and calf rearers located in all dairying regions of Australia, 14% provided technical support to farmers and

13% were from bull breeding companies and resellers. For simplicity, calf rearers responses were grouped with those from farmers for the remainder of this report. Most respondents were farm owners (66%). Of these respondents, 44% reared between 51-150 calves per year and 31% reared between 151-300 calves per year. Holstein-Friesian (58%) and Jersey (19%) were most frequently reported to be the 'main breed'. While a small number of farmers (3%) reared mainly beef cross calves, half of respondents reared some beef cross calves.

All farmers reported that calf records were kept but there were multiple methods for recording this data as illustrated in Figure 1. Calving ease and calf fate was the most common information to record and it was usually recorded electronically (73%). It was more common for calf illness records to be kept on paper rather than electronically (52% compared to 37%). From a survey of Canadian farmers, Edwards *et al*. (2024) reported that 56% reported illness was captured using computer software or an app. In the same study, the authors concluded that farmers were more likely to record calf illness and treatments if records were collected with a computer software system, recorded in closer proximity to the calves and collected by a nonfamily employee (Edwards *et al.* 2024). It seems that the recording of calf data lacks the same systematic approach that is currently applied to the milking herd with multiple sources of data required to attain a complete picture of the fate and health of calves. Future research and benchmarking activities would benefit from improvements in calf record keeping systems being made available to farmers.

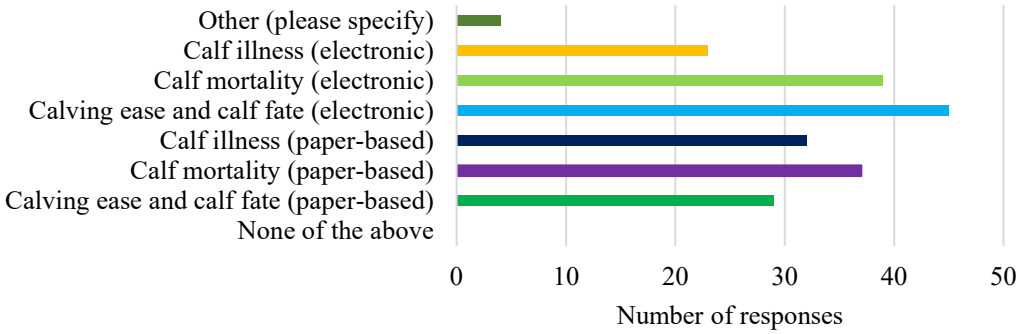


**Figure 1. Record keeping practices of Australian dairy farmers and calf growers**

Calving ease is known to have a significant effect on the rate of stillborn calves. To understand the extent of calving difficulties, farmers were asked to estimate the proportion of first-time heifers that require assistance. The responses ranged from 0-33 % with a mean of 6.5% (SD 6.2) which is consistent with the percent of calvings with dystocia (5.8%) reported from Australia's centralised data repository by Axford *et al*. (2024). Amongst farmers with Holstein as the main breed, the mean percent of calvings with dystocia was 6.4% (SD 5.7).

The most popular trait names were Stillbirth ABV (55%), Calf Survival ABV (43%) and Calf Health ABV (36%). There was close alignment between farmers and service providers in their choice of breeding value name. As expected, respondents preferred that calf traits were presented so that higher ABV values reflect healthier calves (88%). Interestingly, respondents preferred that traits were presented separately, rather than as components of an index which may be related to a desire for transparency, especially when traits are new.

National genetic evaluation services routinely report calving ease, gestation length and stillbirth breeding values. However, calf health traits are less common in genetic evaluations and their economic value is harder to define compared to production traits. The survey asked questions to help understand industry perspectives on the value of various calf traits and the results are shown in

Figure 2. On a preference scale of 1-5 where 5 was most important, the mean score for all respondents ranged between 3.5 (SD 1.1) for heifer survival from weaning to first calving and 3.8 (SD 1.1) for calf health. These results were significantly lower than scores for some existing breeding values such as protein yield, but higher than scores for gestation length, feed saved and heat tolerance. Between calf traits, there was no significant difference in the mean score for calf health, calf survival at birth (stillbirth), calf survival to weaning (pre-weaning mortality), calving ease and heifer survival from weaning to first calving. Calf trait scores were similar to those for survival, mastitis and type traits that are included in Australia's national breeding indices.

A similar survey with a larger number of respondents (n=254) and many overlapping traits was conducted in Australia in 2019. That survey included calving ease but did not include the recently conceived calf traits. Interestingly, the order of trait preferences in 2019 was similar to that observed in the current study with fertility, protein and fat ranking highly whereas feed saved, gestation length and heat tolerance had lower median scores. The similarity in the ranking of traits across the two studies suggests that the current study is broadly reflective of farmer views.

Farmers with Jersey cattle (n=10) put significantly less emphasis on calving ease (2.7, SD 1.2) compared to farmers with Holstein cattle (4.07, SD 0.8). The mean score for calf health and calf survival at birth for farmers with Jersey cattle was ranked second and third, next to protein, and these traits were scored significantly higher than calving ease. This is understandable considering the prevalence of dystocia in Jerseys (3.6%) is lower than Holsteins (10.8%) in calvings with first parity dams (Axford *et al.* 2024).

Farmers generally placed a higher emphasis on calf traits compared to advisers. While not statistically significant, advisers ranked survival, somatic cell count and mastitis higher than calf traits and this observation could be helpful to better understand contextual differences when developing extension material.

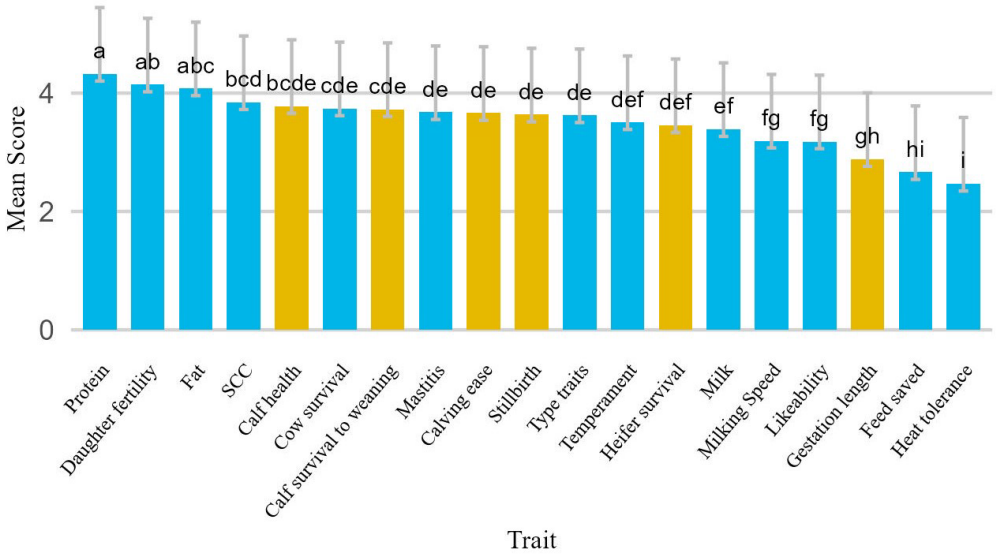


**Figure 2. Weighted mean scores (bars) and standard error (whiskers) for trait preferences for all respondents (5 is most important, 1 is least important). Letters identify traits with mean scores that are significantly different (P<0.05). Yellow bars denote calf traits and blue bars are cow traits included in the survey**

An alternative approach to valuing calf traits is by comparing that trait to a trait with a known value, such as protein kg. In this survey, farmers were asked how much protein they would trade to achieve an improvement in a calf trait. This question was asked specifically of farmers as they are most closely associated with dairy farm businesses. There was a wide margin of responses with a median trade-off of 6.5-10 kg protein to achieve a reduction in calf health issue from 10% to 5%. For example, in the case of Stillbirth, farmers were willing to trade 10 kg protein to lower the number of stillbirths from a hypothetical 10% to 5%.

Surveys are a cost effective and accessible mechanism for gathering feedback from farmers and their advisers. Over time, the insights gathered from similar surveys have provided reliable feedback to guide decision making related to the delivery of breeding values and indexes (Martin-Collado *et al.* 2015; Byrne *et al*. 2016). Surveys raise awareness and can act as an engagement tool in the lead up to delivery of new EBV. Surveys have limitations, such as the potential bias towards internet users as discussed by Martin-Collado *et al*. (2017) or enthusiasm for the subject matter. It is difficult to tell the impact of this bias without having purposeful discussions with farmers that do not participate in surveys because they are worried about scams, are not interested, do not have time and other reasons. The authors agree with findings by Martin-Collado *et al*. (2017) that industry co-ordination to avoid overwhelming farmers with too many surveys is likely a useful strategy to maintain and improve response rates.

## CONCLUSIONS

Based on this research, we recommend that industry apply Stillbirth, Calf Survival and Calf Health as the names of potential EBV and that traits should be presented in such a way that higher values are more favourable. Further, EBV should be presented as separate traits rather than as indexes that group traits together, where possible.

Calf traits were highly valued by survey respondents and were scored similarly for importance to traits such as survival and mastitis traits that are already included in Australia's breeding indexes.

## ACKNOWLEDGEMENTS

The authors thank survey respondents. We also thank DataGene, Dairy Australia, GippsDairy, Holstein Australia, Jersey Australia, Genetics Australia and MaxCare for distributing the survey.

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