

NEW ZEALAND NATIONAL DAIRY BREEDING OBJECTIVE REVIEW STAKEHOLDER SURVEY

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SUMMARY

The National Breeding Objective (NBO) for the New Zealand dairy industry is currently under review. As part of this process a stakeholder survey was carried out to help guide the direction of the review. The survey included questions on key issues related to the NBO, such as the direction of breeding worth (BW – the national breeding index which includes economically important traits), the role of important traits (particularly fertility, TOP traits - Traits Other than Production, liveweight and environmental traits, among others), and views on the dairy cow of the future. There were good levels of engagement with the survey and overall, the results show there is stakeholder support for prioritising the inclusion of a new and more accurate fertility breeding value in BW, applying a non-linear weighting to liveweight, and including key TOP traits (such as udder traits, capacity, feet and legs, and lameness) in BW.

INTRODUCTION

The NBO for the New Zealand dairy industry had its last major review in 2012 (Amer *et al.* 2013). Since that time, it has been updated annually. Following discussions with breeding industry representatives along with the New Zealand Animal Evaluation Ltd (NZAEL) management and board, it was agreed that a major review of the NBO should take place. To guide this process a stakeholder survey was carried out to garner views from key stakeholders on the direction the NZ dairy herd is heading in and what the dairy cow of the future looks like for NZ. A farmer survey will also follow. In this paper, we will discuss key findings of the stakeholder survey and how this is shaping a plan for the future direction of the National Breeding Objective.

MATERIALS AND METHODS

To gather stakeholder opinions on the NBO a survey was constructed in Alchemer (formerly Survey Gizmo). Questions in the survey covered the following points:

1. Fertility - After recognising the antagonistic effect that continued selection for milk production was having on NZ dairy herd fertility levels (Grosshans *et al.* 1997), fertility was added to the NBO in 2001. However, recent summaries show only a very small positive genetic trend in fertility (DairyNZ 2021). This is coupled with the opinion, expressed by many farmers, that fertility does not have a high enough weighting in Breeding Worth (BW). There is also some interest in changing the definition of the fertility trait breeding value (EBV) from CR42 (calving rate in the first 42 days after planned start of calving) to 6-week-in-calf rate (from planned start of mating). Questions in the survey asked whether respondents believed the fertility EBV was accurate enough, had high enough weighting in BW and whether a 6 week in-calf rate trait was more desirable definition for the fertility breeding value.
2. Environmental traits – environmental traits have become a major issue for NZ dairy farmers over the past decade. There is scope to increase focus on environmental traits in BW to achieve gains genetically as a low-cost approach to reaching on farm environmental goals. However, this would result in reductions in the rate of genetic progress in the existing BW traits. How much would farmers be willing to give up in profitability to make advances in environmental

traits?

3. Traits affecting survival - fertility and production traits play a large part in cow culling, however, there are a number of other traits that affect survival – these traits are currently encompassed in the residual survival breeding value. Functional survival is computed on the phenotypic level and is independent from fertility and production also. Functional survival is a newer alternative trait to residual survival and is a more accurate way of removing fertility and production related survival from the survival EBV. TOP traits, such as udder overall, can influence a cows functional survival. Is stakeholder opinion that it is sufficient to include udder overall indirectly in BW by including it as a predictor trait for survival or do stakeholders believe udder overall should be considered as a standalone trait in BW?
4. Liveweight – do stakeholders believe that the current liveweight penalty is appropriate?

There were also questions covering further TOP traits, optimal sire selection and decision support tools, gestation length, calf survival and calving difficulty, OAD (once a day) milking, high output systems, health traits, producing milk for specific markets based on genotype, milk price prediction, frequency of updates, as well as questions on traits that do not currently have breeding values (e.g. lameness). The survey was circulated among key stakeholders from DairyNZ, breeding companies (LIC, CRV), NZAEL Farmer Advisory Board, Massey University, and breed societies.

RESULTS AND DISCUSSION

In total, there were 459 responses - 280 complete and 179 partial responses. Of the total, approximately 50% of respondents were commercial farmers (211) and a further 25% breeders (109, produce milk and sell heifers, embryos, and occasionally semen or bulls). The remaining respondents (109) consisted of stakeholders from industry support and research groups, technical farmer support roles, bull breeding companies and milk processors. There were some differences in results between farmer and non-farmer survey respondents.

When respondents were asked which of the NZ indexes were most useful for genetic selection – 60% thought Breeding Worth (BW) was the most useful (Figure 1). The Australian Balanced Performance Index (BPI) was most commonly listed index under the ‘Other’ category.

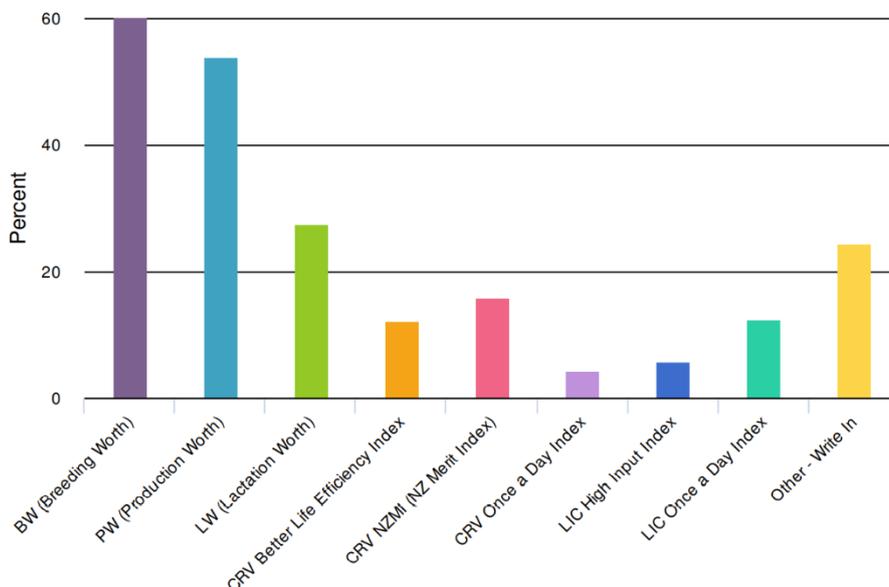


Figure 1. Which of the NZ indexes are the most useful for genetic selection?

Results from the survey show that overall stakeholders believe indexes are a useful tool for selection, however, support for BW was lower than expected because stakeholders believe there are some important traits missing in the national index. Some of the specific traits that stakeholders would like to see included in BW are udder traits, capacity, feet and legs, and lameness – along with further health traits (e.g. clinical mastitis and facial eczema). There was very strong support for the inclusion of lactation persistency in BW – with 71% of respondents either agreeing or strongly agreeing with this statement (Figure 2).

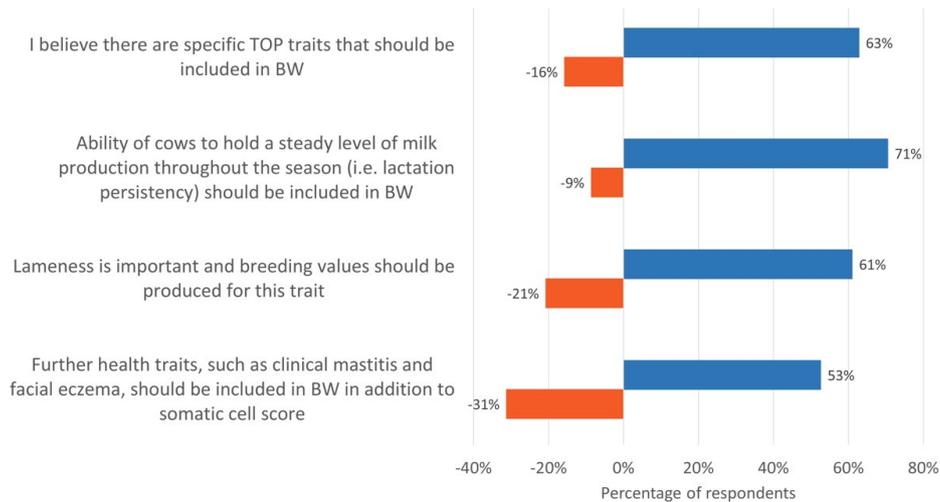


Figure 2. Traits stakeholders would like to see included in BW (blue – strongly agree/agree, orange – strongly disagree/disagree)

There were mixed opinions on the inclusion of environmental traits (low nitrogen and low methane production) in BW – however, a reasonable number of respondents (>60%) said they would sacrifice some profitability to achieve genetic gain in a Low Nitrogen (Low N) or Greenhouse Gas (GHG) trait. Currently, there are no direct environmental traits that have reached a level of proven integrity to justify inclusion in the NBO. Work on appropriate future weights for environmental traits is encompassed in research programs investigating the development and application of these traits.

Forty percent of respondents believed fertility is underweighted in BW. Of those that believe fertility is underweighted, a majority (strongly) agreed with the following: there is lost opportunity around sales of high value calves and heifers when fertility isn't high; the cost of artificial insemination is too high; the fertility EBV is not currently accurate enough; having to rear more replacement heifers (i.e. low fertility herd) is inconvenient; the economic impact of reduced fertility is very high for a dairy operation; and more weighting on fertility would result in faster improvements in herd fertility levels. The percentage of respondents who thought fertility was underweighted in BW was less than expected, which may be driven by a belief that the current fertility trait isn't accurate enough – in which case, increasing weighting on fertility still wouldn't achieve the desired gains. Respondents were in support of having a new fertility breeding value indicating likely change in 6-week-in-calf rate, rather than the current definition of 6-week-recalving rate (CR42). The rationale here is that 6-week-in-calf rate is the primary metric of fertility performance used by farmers at a phenotypic level, providing farmers with a more tangible means of understanding how changes in the fertility genetic merit of their herd is contributing to their fertility performance targets.

Most respondents either disagreed or strongly disagreed (43% vs 28% who agreed/strongly

agreed) that the penalty for liveweight is appropriate for comparing across breeds. Holstein-Friesian farmers/breeders believed that liveweight (LW) is penalised too much within the Holstein-Friesian breed, these breeders also tended to think that LW is penalised too much within the Jersey breed (but not to the same magnitude). On the other hand, while Jersey farmers/breeders believed LW is penalised too heavily in Jerseys, they tended to disagree more than agree with the statement that LW is penalised too much within the Holstein-Friesian breed. Traits like BCS and LW have intermediate optimum levels in the minds of farmers and while Jerseys benefit as a breed from the current liveweight penalty, few farmers purchasing Jersey bulls wish them to produce very small sized cows in their herd. The current linear weighting applied to every breed equally creates a rigidity in deployment that causes mismatches between BW and farmer perception. Therefore, these survey responses support the thinking that a non-linear weighting on liveweight is more appropriate than the current weighting. Other key findings were that there is: strong support for custom selection tools along with mating allocation and inbreeding management tools; support for a NZAEL produced OAD index and high production index; and finally, there were mixed views on timelines of NBO reviews – annual updates versus every 3-5 years.

Full results from the stakeholder survey can be found via the DairyNZ website at the following address <https://www.dairynz.co.nz/animal/animal-evaluation/national-breeding-objective-review/>.

Following on from this stakeholder survey, a farmer survey is planned for later this year. Farmer trait prioritisation surveys provide insights into farmer preferences and traits that have an important influence over the cows they farm – over and above those traits which are associated with profitability by inclusion in selection indexes (Amer and Byrne 2019). Trait prioritisation surveys are an important way to engage farmers in the process of creating a selection index, influencing acceptance and adoption of the index (Axford 2018), and ensuring the industry is working together to create the NZ dairy cow of the future.

CONCLUSIONS

Overall, results from the stakeholder survey suggest the following changes should be considered as priorities for the NBO: higher weighting on a new and improved fertility value; application of a non-linear weighting on liveweight; and direct weighting on udder, feet and legs. Following on from this stakeholder survey, a farmer survey including trait prioritisation is planned for 2021.

ACKNOWLEDGEMENTS

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