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Published in:

Proceedings of the British Society of Animal Science in association with AVTRW, CFER and EBLEX

Print publication: 01/04/2015

Document Version

Publisher's PDF, also known as Version of record

[Link to publication](#)

Citation for published version (APA):

Moore, KL., Pearston, F., Pritchard, TC., Wall, E., & Coffey, MP. (2015). Producing the UK's first carcass trait Estimated Breeding Values (EBVs) using national abattoir data. In *Proceedings of the British Society of Animal Science in association with AVTRW, CFER and EBLEX* (2 ed., Vol. 6). [55] Cambridge University Press. https://www.cambridge.org/core/services/aop-cambridge-core/content/view/4F9BEDFE94534153335B19513B2F8A7B/S2040470015000035a.pdf/summary_list.pdf

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Producing the UK's first carcass trait Estimated Breeding Values (EBVs) using national abattoir data

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Implications Carcass trait EBVs produced from national abattoir data, for traits of direct economic importance to commercial breeders, will enable the beef industry to increase the rates of genetic improvement for carcass traits. Furthermore it will help to link the different sectors of the beef industry as they will all be using the same trait definitions from breeder to finisher to abattoir.

Introduction Farmers are paid for carcasses using the EUROP system; however, pedigree animals are selected based on ultrasound muscle and fat depth. This reduces genetic progress as the traits are different reducing the efficiency of selection. In addition, the lack of clear signals between pedigree and commercial farmers often make it difficult for farmers to select the most appropriate sires. The aim of this study was to produce EBVs for the abattoir carcass traits providing tools to enable the industry to make genetic improvement for carcass traits of importance.

Material and methods Using the software MiX99, EBVs were produced for carcass weight and visually assessed EUROP fat and conformation class (converted to a numeric scale where higher values for both traits indicate more muscular and fatter carcasses) using statistical models and genetic parameters previously developed (unpublished results; Pritchard *et al*, 2013). The animal models were adjusted for age and genetic parameters were moderately heritable with moderate positive genetic correlations between weight and conformation and moderate negative genetic correlations between fat and the other traits. Nearly 4 million abattoir records were available and matched to the BCMS database to obtain further information about the fixed effects and movement information. These data were reduced to just over half a million records from nearly 40,000 sires from 31 different breeds after data edits. The data edits applied removed records of non-prime slaughter animals (this accounted for the greatest loss of records), were incomplete (i.e. recent records not yet included in the BCMS data snapshot) or in error. A three generation pedigree was built and EBVs produced for approximately 1.4 million animals.

Results The first ever UK EBVs for abattoir carcass traits are shown in Table 1. As these EBVs have not been re-based the average EBVs are near 0, with some differences due to differences in breed. Within different breed subsets, the EBVs were shown to be normally distributed (results not shown) with a trend for those animals with the higher EBVs also being those with higher phenotypic values for the traits of interest. Figure 1 shows the average EBVs for high accuracy sires for individual breeds within breed types. It can be seen that for carcass weight, the continental breeds had the higher EBVs and the dairy breeds the lowest.

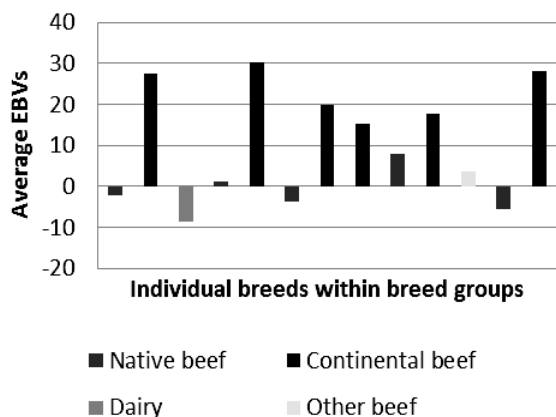


Figure 1 Average carcass weight EBVs of high accuracy sires within breed and breed type

Acknowledgements We would like to acknowledge the abattoirs (ABP, Stoddarts, Dovecote Park, MacIntosh, Morrisons and Dunbia), the Rural payments Agency's British Cattle Movement Service (BCMS), and EGENES for supplying the data. Funding was received from AHDB (EBLEX and DairyCo divisions) and Hybu Cig Cymru (HCC).

References

Pritchard, T., Wall E., Moore, K and Coffey, M. 2013. *Advances in Animal Biosciences* 4(1), 163.

Table 1 Summary of across-breed EBVs (reliability in brackets) for abattoir carcass traits (n=1,423,070)

Trait	Average	Std	Range
Dead weight (kg)	0.96 (0.26)	13.9	-56.6 to 76.8
Conformation (score ¹)	0.02 (0.18)	4.4	-9.7 to 11.9
Fat (score ¹)	0.08 (0.25)	1.63	-10.9 to 10.1

¹ numerical score from 3 to 45 where higher values indicate carcasses with more muscle and/or more fat

Conclusion These EBVs are the first of their kind in the UK and can be used to assist both pedigree and commercial farmers to produce animals that better meet market specification contributing to a more profitable and efficient beef industry.