

The effect of the breeding value status of pedigree Suffolk and Charollais sires on lamb growth under commercial farm conditions

J P Hanrahan

Teagasc, Galway, Ireland

Email: seamus.hanrahan@teagasc.ie

Introduction The objective of the Pedigree Sheep Breed Improvement Programme (PSBIP), operated by the Department of Agriculture Fisheries and Food, is to increase lean tissue growth rate in breeds used as terminal sires (Murphy *et al.* 1999). Genetic evaluation (an index called LMI; base = 100, s.d. = 30) is based on live weight and ultrasonic muscle and fat depths recorded at ~120 days of age. The genetic correlation between the index and 120 day weight is ~0.7. Participation in the PSBIP by pedigree breeders has declined over recent years reflecting the absence of any clear market signal favouring rams with LMI data. The latter is assumed to reflect a perception that such rams do not enhance progeny performance compared with rams without LMI information. This study was designed to evaluate the growth benefits from rams with a positive LMI index under commercial farm conditions.

Materials and methods Pedigree Suffolk and Charollais rams were purchased at the principal breed society sales (and thus can be taken as good representatives of the breeds in question). The rams purchased either had high LMI values (at least 110) or had no breeding value information (non-LMI rams). The latter rams had to be from flocks that had not been in the PSBIP and the ram's sire could not be from a flock that had participated in the PSBIP. The mean LMI values were 145 (n = 27) for Charollais and 161 (n = 21) for Suffolk. The number of non-LMI rams was 28 and 24 for Charollais and Suffolk, respectively. Rams were used on one of 6 commercial flocks and both LMI and non-LMI rams from the same breed were represented in each flock each year (2005 to 2008). The breed(s) used on any particular flock was constrained by flock-owner preference. Single-sire mating groups were formed by random assignment of ewes within age (2-tooth or older) categories and joining was usually limited to 17 days. Ewe identities were provided by the National Sheep Identification System. All live lambs were tagged within 24 h of birth when dam identity, sex, birth date and live weight were recorded. These details were also recorded for dead lambs. Lambs were weighed at around 5 weeks of age and at weaning (about 14 weeks of age), when ultrasonic muscle and fat depths were recorded. Available lambs were weighed and scanned again at about 1 month post weaning. Lambs were drafted for sale as per the individual farm practice. Lamb growth data were analysed (Proc MIXED of SAS) using a model with fixed effects for year, farm, dam age, sex, birth and rearing type, sire breed and index category (LMI or non-LMI). Individual ram effects were fitted as random within breed by index sub groups.

Results The mean LMI for the Charollais and Suffolk rams used were 1.5 and 2.0 s.d. above the base for the respective breeds and, thus, represented the best 15% and 6% of the populations, respectively. Total progeny from LMI and non-LMI rams were 1657 and 2363 for Charollais, and 1648 and 1562 for Suffolk, respectively. The growth data for lambs are summarised in Table 1 together with estimates of the difference between LMI and non-LMI progeny. The only significant difference detected between progeny of LMI and non-LMI sires was for weight at 5 weeks for the Charollais breed (LMI significantly lighter than non-LMI). The variance components for sires yielded h^2 estimates (s.e. ~0.02 in all cases), pooled across breeds, of 0.07, 0.09, 0.08 and 0.08 for birth weight, growth rate to weaning, weaning weight and live weight at 120 days, respectively. The heritability estimate for weaning weight is close to the estimate of 0.1 ± 0.05 reported by Hanrahan (1999) using data obtained under research flock conditions.

Table 1 Effect of sire lean meat index (LMI) status on progeny growth

Factor	Growth trait				
	Birth weight (kg)	Live weight (kg) at			Growth rate (g/day)
		5 weeks	14 weeks	120 days	
Birth Type					
Single	5.7	17.2	34.9	39.1	301
Twin	4.8	14.3	30.7	34.9	264
LMI versus non-LMI					
Charollais	-0.0 ± 0.04	-0.3* ± 0.11	-0.3 ± 0.25	-0.4 ± 0.27	-3 ± 2.4
Suffolk	+0.1 ± 0.05	-0.0 ± 0.18	+0.3 ± 0.27	+0.3 ± 0.30	+3 ± 2.7
Farm effect					
Range for twins (kg)	4.3-5.1	13-16	28-35	33-39	235-306

Conclusions The absence of evidence for a significant benefit to lamb growth from using above average LMI rams is consistent with the lack of positive market signals for LMI rams from commercial producers. The results highlight the importance of the current redevelopment of the genetic evaluation system for Irish sheep, and the need to avoid unrealistic projection of expected genetic gain.

References

- Hanrahan, J.P. 1999. Genetic and non-genetic factors affecting lamb growth and carcass quality. Sheep Series No. 8, Teagasc, 35 pages.
- Murphy O.J., Wall, E., Crosby, E.J., Kelleher, D.L. and Olori, V. 1999. Genetic evaluation of sheep to improve carcass quality in Ireland. Proceedings of 50th European Association for Animal Production (Zurich), 9 pages.