

Does Maternal Bond Between a Lamb and its Dam Lead to an Increase in Weaning Weight?

J.S. Richards^A and K.D. Atkins^A

^A CRC for Sheep Industry Innovation, NSW Dept of Primary Industries, Orange N.S.W. 2800

A method of collecting maternal pedigree has been developed that records the RFID tag sequence of ewes and lambs over a period of time to calculate potential pedigree matches (Richards & Atkins 2007). In addition to pedigree, this walk-over system also collects dynamic information on the degree of association between the lambs and their dams. It has been suggested that lambs that have a higher association with their dams may perform better than lambs with lower association. A similar measurement, maternal bond score, has been used in previous research trials and in some studs to identify dams that stay closer to their offspring at tagging shortly after birth. Both these measurements have been examined to see whether the lambs that more closely associate with their dam result in a higher weight at weaning.

Two flocks of 100 and 200 Merino ewes and their lambs from Trangie, NSW were examined. Each ewe was given a maternal bond score according to how far they moved away from their lamb (1= close, 2= near and 3= far) when approached by a human shortly after birth. All ewes and lambs were also tagged with radio-frequency identification (RFID) tags so their association could be recorded as the number of times each lamb followed its dam past a reader on their way to water. This association was recorded for a period of 28 days after birth. A weaning weight was also recorded when the average age of the lambs was 9-10 weeks.

There was a large variation in the level of association between lambs and their dams. In the 28 day period some lambs only followed their dams past the reader twice, whereas some followed their dam through 44 times. On average, lambs followed their dam through 15 times over the 28 days irrespective of whether they were in the small or large flock. Single lambs only had a slightly higher number of associations than the twins, with on average 17 associations for the single lambs and the twins had on average 14 associations.

The significance of these measurements for association and maternal bond were examined using ASReml (Gilmour *et al.* 2002) with birth date, birth type, sex, bloodline and association/bond and their interactions fitted as fixed effects in the model for estimating weaning weight. Maternal association was fitted as a linear (no quadratic affect) covariate, while maternal bond was fitted as a (3-level) fixed affect. The results are shown in Table 1.

Table 1. Weaning weights for sheep over a range of (i) maternal association and (ii) maternal bond scores

		Weaning Weight – kg (standard error)
Maternal Association	5	18.00 (0.34)
	10	18.14 (0.28)
	20	18.42 (0.27)
	30	18.70 (0.41)
	40	18.98 (0.60)
Maternal Bond Score	1 (close)	18.92 (0.50)
	2 (near)	18.41 (0.27)
	3 (far)	18.74 (0.36)

A slight but not significant (P=0.27) increase in weaning weight can be observed with increasing pedigree association. Maternal bond had no significant effect on weaning weight (P=0.72). This shows that even though the lambs may be more closely associated with their dam it does not directly relate to an environment for improved growth such as more access to milk or less stress. The maternal bond score may be more of a measure of the dams' fear of humans than their mothering ability and the level of association may be more about the lambs' persistence in following their dam than the dam "mothering" its lamb. It is possible that these measures may have more of an impact on lamb survival. Further data on pedigree association is required to test this association.

Gilmour, A.R., Gogel, B.J., Cullis, B.R., Welham, S.J. and Thompson, R. (2002). 'ASReml User Guide Release 1.0.' (VSN International: Hemel Hempstead, UK).

Richards, J.S. and Atkins, K.D. (2007). *Proc. Assoc. Advt. Anim. Breed. and Genetics* **17**: 403.

Email: jessica.richards@dpi.nsw.gov.au