

## **FELTBALL DIAMETER MEASUREMENT LACKS REPEATABILITY OVER THE LIFESPAN OF A MERINO EWE**

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### **SUMMARY**

Felting is the action of permanent shrinkage in fabrics and is a problem for the wool industry. Feltball diameter (FBD) is a measurement that offers the potential of selecting sheep on the basis of their felting shrinkage potential. This study examines repeatability of measuring feltball diameter throughout the lifespan of breeding Merino ewes. Feltball diameters were determined on wool of ewes at hogget age and then at the age of 2, 3 or 4 years. The correlation between adult FBD and hogget FBD is weak ( $r_p=0.14$ ) indicating that the measurement is probably not repeatable over the lifespan of a ewe. Fibre curvature and diameter are the two significant characteristics in explaining FBD at adult age. The best linear regression of these parameters explains only 20% of variation in FBD at adult age.

**Keywords:** wool, Merino, repeatability, feltball diameter

### **INTRODUCTION**

Felting is the action of permanent shrinkage in fabrics and is a major issue for the wool industry as wool is prone to felt when wet and agitated. The wool industry currently addresses this problem by using chemical treatments to 'shrink-proof' wool fabrics. As the wool industry is being pressured to reduce production and environmental costs to remain viable, alternative options to 'shrink-proof' wool are being explored. One option is to breed sheep that grow wool that is naturally resistant to felting shrinkage.

Feltball diameter (FBD) is a measurement performed on loose wool to determine the degree of felting (Kenyon and Wickham 1999). Past studies have examined the genetic variation within flocks for FBD and the heritability of the trait. Greeff and Schlink (2002) determined that FBD at hogget age was a heritable trait in Merino sheep, indicating that genetic differences exist between animals, hence it would be possible to select for reduced felting using FBD.

However, repeatability of the FBD measurement across ages has not been examined. Thus, it is not known if there is value in taking only one measurement at hogget age or if several measurements are required over the lifespan of a sheep. Hence, this study examines how repeatable the FBD measurement is throughout the lifespan of a breeding Merino ewe.

### **MATERIALS AND METHODS**

This study was carried out on the Merino Resource flocks of the Department of Agriculture of Western Australia at Katanning. Ewes born in the years 1999, 2000, and 2001 were used in the study. All ewes were reared under normal commercial conditions. The ewes were shorn soon after weaning and again at 15 months of age with 12 months wool growth, and then annually. Mid-side wool samples were collected at hogget age and from the 2003 shearing when ewes were either 2, 3 or 4 years of age. All standard fleece measurements including fibre diameter, coefficient of variation of fibre diameter (CV of