What can sheep teach us about shelter use?

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Over many years there has been limited success in encouraging sheep to use shelter and a poor understanding of why they choose to use shelter the way they do. Have we misunderstood sheep use of shelter and if so are sheep sensible in their use of existing shelter based on climate and topography? The information gathered in this research should address this question and more. Over three lambing seasons a random sample of five ewes from each of the two flocks of 200 - 300 ewes were fitted with GPS collars. The GPS collars provided continuous (51 days) observation of the ewes' movements and use of shelter in two paddocks with varying shelter designs on a commercial property on the Northern Tablelands, NSW. Weather stations and temperature loggers were strategically located throughout the paddock to provide localized measures of temperature, wind speed and precipitation that will be correlated to paddock and shelter use by the flocks. These data will give insight into sheep choice of shade and shelter use within a paddock relative to climatic conditions post shearing and during lambing. If sheep are reluctant to use perimeter shelter currently provided by producers, can they be encouraged or attracted to shelter during inclement weather?

To determine if sheep could be trained to a visual and/or auditory stimulus that would attract them to shelter, forty-four fine wool Merino ewes were obtained at eight months of age, gentled, introduced to lupin grain and randomly dividing them into four groups (n=11): auditory, visual, visual+auditory and control (not trained). The ewes were trained in a 23.9 x 21.5 m outdoor arena to approach either the auditory, visual or visual+auditory stimulus for a food reward. After eight days of individual training the ewes were tested in a 'T' shaped maze without a food reward. The proportion of correct T-maze choices for each group was: auditory 36% (± SEM 0.08), visual 41% (± SEM 0.04) and visual+auditory 58% (± SEM 0.04). The ewes learned to approach the stimulus within 5-6 trials and demonstrated long-term memory retention for over 110 days without reinforcement. Training significantly improved the animal's ability to choose the stimulus. The controls received no training and made no choice during the 60 second T-maze test. The time taken by the trained animals to make a choice decreased as their proportion of correct choices increased ($p<0.01$, $R^2=0.75$) suggesting memory assurance in making the choice. This study indicates sheep can be trained to approach a visual/auditory stimulus that could potentially be used to attract them to shelter.

The next phase of our research will examine whether Merino synchronized following behaviour can improve the trained sheep's ability to lead a group of naive sheep to the stimulus. No published study has examined a means of attracting sheep to shelter as an alternative to forced shelter provision; or studied shelter use with GPS to understand their shelter selection criteria.