R&D INTO PROFIT PER HECTARE OF DIFFERENT MERINO TYPES

A new AWI-funded project with Murdoch University aims to better predict differences in stocking between sheep and thus estimations of differences in profitability per hectare.

Farm consultants and economists have long been saying that the key driver of production in a Merino enterprise is profit per hectare. Currently, the extrapolation of per head productivity to per hectare productivity is attempted using liveweight and the increase in energy requirements of heavier animals based on body weight alone. These assumptions mean lower stocking rates and lower profit per hectare for heavier genotypes. However, there are more factors than just bodyweight that determine the number of animals carried per hectare, but these liveweight-based estimates of profitability per hectare are the best available unless other information is collected and can be valued.

When animals have been run together and genotypes have different body composition or levels of fatness and productivity, this indicates variation between genotypes in their ability to utilise the feed resource. Animals that are fatter can either be fed less supplementary grain in subsequent feed shortages or more animals could have been carried on the same pasture. New profit equations could better quantify these differences using feed intake and differences in body energy stores. This approach, if successful and practical, will be superior to the current assumption that the number of stock carried is only inversely proportional to the metabolic liveweight which implies that all animals have the same grazing ability and all animals have the same energetic efficiency.

NEW AWI-FUNDED PROJECT

Murdoch University, with funding from AWI, are about to undertake a large-scale trial to more accurately estimate profit per hectare by measuring feed intake and whole-body energy reserves on progeny from 29 different Merino sires representing the many different sheep types.

The animals in this project are wether progeny born in 2016 and 2017 from the AWI-funded Merino Lifetime Productivity (MLP) project at the University of Western Australia's Ridgefield farm at Pingelly in Western Australia. The MLP project aims to compare the lifetime productivity of 5,000 ewe progeny from 135 sires over five sites across Australia. If successful, this project will improve the estimation of profitability of the MLP sire groups at Pingelly by demonstrating the importance of more accurately estimating profit per hectare assuming the missing data needed can be practically collected and interpreted with data already being collected. This could then lead to an improvement in the economic analysis of the other four MLP sites.

The wethers involved in the project were part of the Pingelly MLP project up until weaning age. Since weaning they have been assessed for a number of growth and productivity traits and visually classed for structural and performance traits. From 12 months of age the wethers have also been assessed for time of teeth eruption, scanned for fat and eye muscle depth and had weight and condition score recorded monthly until all animals were no longer classified lamb (according to current teeth eruption status). They have had wool measurements taken and AWEX-IDs given to value wool quality and quantity for individual animals.

PROJECT'S UPCOMING ACTIVITIES

From January 2019, the wethers will undergo intensive animal house studies to quantify key components of the feed intake and energy equations. Following shearing in December 2018, the wethers will be introduced to a pelleted feed at the Ridgefield research site before being transported to the Department of Primary Industry and Regional Development's Katanning research facility and housed in single pens. Following a seven-day acclimation period, the wethers will be managed through two 35-day feeding periods with liveweights collected three times weekly and condition score once weekly. During the first period, the wethers will be fed to maintain liveweight. During the second period, the wethers will be split into two groups and fed one of two diets to gain or lose weight. These groups will be balanced for sire, fasting liveweight and condition score.

During the trial, all wethers will be assessed using Dual Xray Absorptiometry (DXA) so that changes in fat and muscle components in relation to energy intake can be quantified for an understanding of the efficiency of energy use over the course of each feeding period. Wethers will also be measured by ultrasound for fat and muscle depth at the C site by an industry specialist. Mid-side sample wool patches will be collected for each wether and dyebands will be applied every month or so to assess wool growth rates.

On two occasions during each feeding period, the wethers will be held in portable accumulation chambers for 45 minutes to measure CO_2 production in order to investigate the value of this measurement as a proxy for feed intake.

Wethers will also be fitted with sensors for two periods. The first application will be during the final 14 to 17 days of the maintenance feeding period and the second application will be during the second feeding period. It is anticipated that the sensors measuring feeding and rumination behaviour will be correlated with their feed intake.

Following completion of the intensive measurements, wethers will be removed to a feedlot, and monitored for liveweight change and gross feed intake. Sensors will again be fitted to the wethers for five days during this period and using knowledge of individual and sire group intakes in relation to liveweight change, we will be able to assess the usefulness of sensors to predict feed intake in a less controlled environment. In addition, the geolocation and accelerometer functions of the sensors will be used to examine feedlot behaviours. This program will be repeated in 2020 using 2017 drop wethers.

The ultimate aim is that better measures of sire group differences in feed intake together with the current measures of live weight, fat and muscle and whole body reserves will provide better estimations of stocking rate and thus profitability per hectare of the different sire groups.

2017 drop Pingelly wethers.