Ms Megan Chadwick

Profile
Megan grew up on a wheat and sheep farm near Narrogin. Her interest in sheep started when she grew taller than them and realised that they wouldn’t bowl her over anymore. So after leaving Narrogin Senior High School, Megan enrolled at UWA to study Animal Science. Her honours project looked at increasing colostrum production in maiden ewes. Following a trip around Europe and America for 4 months Megan came back to UWA to take up her PhD.

Megan was interested in salinity because from an early age she was forced into service every winter planting over 300,000 trees to try to curb the spread of salinity on her family’s farm. The only way she could get out of planting more trees was if to promise her father that she would research ways to make use of saline land. Therefore, Megan’s PhD project works towards increasing sheep production from saline land. Even though she is 2 years into her research, she still hasn’t managed to get out of planting trees every year.

Summary
Salt tolerant sheep for salt tolerant plants
One of the few ways that farmers in southern Australia can make use of the growing amount of land turning saline on their farms is to grow saltbush (Atriplex spp.), which is a halophyte shrub that contains about 20% salt. Sheep lose weight or, at best, maintain weight when grazing saltbush mainly because they cannot cope with the high salt content. In rats, high dietary salt during pregnancy can lower the plasma renin activity (PRA) of the offspring which may allow them to have an increased tolerance to salt. If similar responses occur in lambs from ewes grazing saltbush, we may be able to develop sheep that are more salt-tolerant and better suited to grazing saltbush. To test this, we had two treatment groups of lambs whose mothers were fed different diets in the last three months of pregnancy and three weeks after birth: 1) Pasture lambs - their mothers grazed a clover-based pasture supplemented with lupins 2) Saltbush lambs – their mothers grazed saltbush supplemented with barley. Grazing ewes on saltbush lowered their renin activity and that of their lambs at 3 weeks old, compared to pasture ewes and lambs (P<0.001). When the lambs were 8 months old, their physiological responses to a salt load were tested by drenching with 25
grams and 50 grams of salt. When given 25 g of salt, saltbush lambs had a lower water intake and urine output, as well as a higher urine concentration than pasture lambs (P<0.05). When given 50g of salt, saltbush lambs were able to excrete the salt quicker than pasture lambs (P<0.05). When the lambs grazed saltbush at 8 months of age, the saltbush lambs gained weight, whereas the pasture lambs lost weight on average (P<0.05). It is likely that the kidney function and salt balance of the saltbush lambs has been altered by the diet of their mother which enables them to cope better with the high salt content of saltbush. By grazing pregnant ewes on saltbush farmers can set the next generation of sheep up for increased production on saltbush, but more importantly, they can better utilize the ever increasing amount of land turning to salt on their farms.