

Sufficient food vital for functioning ram sperm

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Towards the end of the trial she collected semen from each ram and analysed it for volume, sperm concentration, sperm motility, sperm viability and morphology. Credit: April Westervelt

An animal biologist says poor nutrition results in genetic damage to sperm cells and lower sperm motility for rams.

She is yet to determine whether this translates to reduced fertility.

UWA PhD candidate Yongjuan Guan says several fellow researchers have studied the effect of inadequate pastures on breeding sheep.

"In Australia the breeding season of the merino sheep always falls in the autumn," she says.

"During the autumn they don't have enough pasture for the sheep, so it's easy for the sheep to lose body weight and testes size."

"On the farm it's a real problem because the farmers cannot afford to provide enough food for all the sheep if there is no pasture."

Ms Guan says while earlier studies showed reduced [sperm](#) production under such conditions, she has demonstrated underfed rams' sperm became less motile (capable of motion) and subject to [genetic damage](#).

However she says this is unlikely to lead to any birth deformities as damaged chromatids render the sperm unviable for conceiving lambs.

She wrote her current paper after studying a set of rams taken from a research flock, which she divided into three groups.

For 65 days she underfed one group, so as to cause a 10 per cent weight loss, maintenance-fed a second group, and "high-fed" a third group which gained 10 per cent body weight.

Meal size affects testis size

The amount she fed the rams also seems to have influenced individuals' scrotal circumference and testis size.

Towards the end of the trial she collected semen from each ram and analysed it for volume, [sperm concentration](#), [sperm motility](#), sperm

viability and morphology.

Her results confirmed observations from the earlier study.

"In my project I only focus on the [sperm quality](#) rather than the sperm production because in the previous study people already found that when the testes shrink the sperm production will decrease," she says.

"Indicators of sperm velocity...were lower for sperm from rams fed the low diet than for sperm from rams fed the high and maintenance diets.

"In addition, change in scrotal circumference was positively correlated with progressive motile sperm percentage."

She says the next stage in her work is to continue to find out the cellular and molecular causes of reduced [sperm production](#) and [sperm cell](#) quality in underfed rams.

In attempting to find a solution her focus will be on the changes of testis function, particularly the function of Sertoli cells which provide developing sperm cells with nutrition.

More information: "Under-nutrition reduces spermatogenic efficiency and sperm velocity, and increases sperm DNA damage in sexually mature male sheep." Yongjuan Guan, Irek A. Malecki, Penelope A.R. Hawken, Matthew D. Linden, Graeme B. Martin. *Animal Reproduction Science* Received: April 26, 2014; Received in revised form: June 21, 2014; Accepted: July 11, 2014; Published Online: July 22, 2014. DOI: [dx.doi.org/10.1016/j.anireprosci.2014.07.014](https://doi.org/10.1016/j.anireprosci.2014.07.014)

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