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Experiences with grazing the new annual pasture legume *Biserrula pelecinus* L. in southern Australia production benefits and risk of photosensitisation

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Key words: *Biserrula pelecinus*, pasture legume, photosensitivity, grazing preference

Introduction *Biserrula pelecinus* (L.) is a species of annual legume located in the Galegeae tribe of the Leguminosae family. It is endemic to the Mediterranean basin and was first commercialised as a pasture plant in Australia in 1997. It is often used in a ley farming system where it self-regenerates from persistent seed banks after one or more cereal crops. Its key features are high seed production, high hard seed content, small seeds, deep root system and acid soil tolerance (Loi et al. 2005). *Biserrula* has a high protein content, particularly as a dry feed and is tolerant of heavy grazing by sheep and cattle. Sheep will preferentially avoid grazing *biserrula* in some circumstances (Revell and Thomas 2004) and it has been associated with cases of photosensitivity when it dominates the sward. We tested the hypothesis that the aversion response is a function of elevated rumen ammonia resulting from the high protein content of *biserrula* herbage.

Materials and methods The hypothesis was tested by measuring the performance of sheep that grazed green *biserrula* only or given access to *biserrula* plus either additional nitrogen as lupin grain (450 g/hd/day) or additional energy as oat grain (580 g/hd/day). The field experiment was conducted near Narrogin, Western Australia (lat 32°56'S, long 117°49'E) a region with winter dominant rainfall. Fifty-four weaner sheep (three grazing treatments, six sheep per treatment, three replicates) with prior experience of *biserrula* were allowed to graze *biserrula* for six weeks from mid-August and measured for growth, plasma urea nitrogen (converted to rumen ammonia according to McMeniman 1990) and clinical signs of photosensitisation. Each grazing pot was 0.25 ha and initial sheep liveweight was approximately 40kg.

Results and discussion The crude protein (CP) content of *biserrula* pasture was 23% and digestibility was 76.5% (falling to 68.1% after six weeks). The lupin supplement was 35% CP, 93.7% digestibility and the oat supplement was 9.7% CP and 71.8% digestibility. Animals took up to a week to become accustomed to supplements (longer with oats). Plasma urea nitrogen stabilised after two weeks. Signs of photosensitization on the face, ears and tail appeared after two weeks. Sheep grew faster when offered supplements, regardless of the effect on rumen ammonia (Table 1). The lower growth rate of sheep grazing only *biserrula* (more pronounced towards the end of the grazing period) indicates an aversion response. Photosensitisation appears to result from ingestion of particular secondary compounds (i.e. Type I condition).

Table 1 Effect of protein and energy supplements on productivity and health of sheep grazing *biserrula* pasture.

Treatment	Rumen ammonia (mg/100ml)	Liveweight change (g/hd/day)	Sheep with signs of photosensitisation	Sheep with severe photosensitisation
Biserrula control	77	81	15	9
Biserrula+lupins	98	154	4	1
Biserrula+oats	68	130	6	3
lsd ($P=0.05$)		42		

Conclusions The hypothesis that the high protein content of *biserrula* elevates rumen ammonia in sheep leading to an aversion response was not supported. Provision of a supplement helped overcome the aversion to grazing *biserrula* and reduced the incidence of photosensitisation. Analysis and identification of secondary compounds in *biserrula* is on-going.

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