# Adaptability of Damara, Dorper and Traditional Meat Sheep Breeds in Semi-Arid Queensland

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Reproductive rate is a major contributing factor to the profitability of a sheep meat enterprise. Low reproduction rate is a feature of sheep husbandry in semi-arid Queensland. High ambient temperatures are implicated in poor fertility (Moule 1970) where variation in response can be due to breed and to animals within a breed  (Hopkins and Stephenson 1978). Breeds recently imported  from South Africa were selected in arid environments and may be better adapted to pastoral conditions of northern Australia than traditional breeds.  This study will investigate  (a) the thermoregulatory ability of Damara, Dorper, Poll Dorset, Rambouillet, South African Meat Merino and Queensland medium wool Merino rams prior to joinings in the autumn and spring of 1999, 2000 and 2001 and (b) the association between thermoregulatory parameters (rectal temperature and respiration rate) and ewe fertility. Results for the initial autumn joining are reported in this paper.

Rectal temperature and respiration rate were measured on three rams from each of the breeds. Recordings were taken at 8:00h and 16:00h over four consecutive days where expected daily maximum temperature was greater than $35^{o}C$, approximately one week prior to joining.  Rams were single-sire mated to groups of 28 medium wool Merino ewes for six weeks. Sire-sine harnesses and crayons were fitted to rams. Incidence of oestrus and return to service were recorded at two-week intervals.  Ewes were scanned during mid pregnancy and the number of fetuses recorded.  Procedures of CATMOD and repeat measures GLM in SAS (1996) were used to analyse discrete and continuous data, respectively.

**Table 1.** Effect of  sheep meat breed of ram on rectal temperature, respiration rate and pregnancy rate

| Breeds | Mean daily rectal temperature ($^{o}C$) | Difference in am and pm rectal temperature ($^{o}C$) | Mean daily respiration rate (breaths / minute) | Difference in am and pm respiration rate (breaths / minute) | Pregnancy rate (number of ewes pregnant of ewes joined) |
|---|---|---|---|---|---|
| Queensland Merino | 39.7 | 0.16 a | 123 a | 27 | 85.2 |
| Damara | 39.7 | -0.20 b | 85 b | 40 | 86.9 |
| Dorper | 39.6 | 0.47 a | 122 a | 36 | 85.7 |
| Poll Dorset | 39.5 | 0.09 a | 130 a | 29 | 91.9 |
| Rambouillet | 39.3 | 0.09 a | 135 a | 29 | 91.8 |
| SA Meat Merino | 39.8 | 0.41 a | 139 a | 25 | 82.4 |

Least squares means with different letters vary significantly  (P<0.05).

Mean daily rectal temperature did not vary with breed (P>0.05) but the difference in morning and afternoon rectal temperature indicated that all breeds except the Damara increased temperature as ambient temperatures increased (P<0.05). This breed maintained a constant rectal temperature. Absolute respiration rate was lower (P<0.05) for the Damara compared with all other breeds.  All breeds increased respiration rate during the day;  the larger increase indicated for the Damara was not statistically significant (P>0.05).  Neither incidence of  oestrus, returns to service, pregnancy rate (Table 1) nor the number of fetuses per pregnancy were associated with rectal temperature and respiration rate.

Preliminary results indicate that breed variation exists for thermoregulatory parameters. The importance of these observations on ewe and ram fertility, in an environment where maximum temperatures are greater than $35^{o}C$ for 4-6 months of the year, warrants further investigation.

Moule G. R. 1970. Anim Breeding Abst. 38:185-202.
Hopkins P. and Stephenson R. 1978. Proc Aust Soc Anim Prod. 12:198 Abst.
SAS. 1996.  SAS User's Guide, Statistics.  SAS Institute Incorporated, Cary, North Carolina

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