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Mating rams clearly prefer heavy ewes

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It is generally accepted that nutritional status of the ewe affects its fertility. It has however never been shown that ram's decision to mate a ewe may also contribute to this fertility. Such a ram's decision remains mostly unknown although even if many factors may influence its choice. Inversely, ewes' behaviour may also take part. Its behaviour has been characterised by using three criteria resulting from different pen-tests to be held during limited time. Attractiveness (A)[1] of an estrus ewe is defined as its relative ranking within a group of ewes considering the time spent by the ram when courting and mounting each of them. Considering time spent seeking for rams gives the criterion of Proceptivity of the ewe (P)[2] i.e. % of time spent close to rams in a situation of choice between rams and ewes. Finally, ewe Receptivity (R)[2] is the number of agonistic activities toward a unique ram placed with the ewe. Thirty-six Merinos d'Arles ewes with similar age, body weight (BW; 46.5 ± 3.7 kg) and sexual behaviour (A, R, P) were randomly assigned to long-term (3 months) contrasting diets in order to change their nutritional status and body condition score (BCS). All diets were made by mixing straw cap, beet pulp, alfalfa and long hay so that three different feeding regimes were obtained: High (H: 175% of Maintenance Energy Requirements), Medium (M: 105% MER) and Low (L: 72% MER). The average final attractiveness rank was compared by analysis of variance or compared to initial individual values using Spearman's rank correlation coefficient with R package. Mean final BW were significantly ($P < 0.002$) different i.e. H: 55.0 ± 2.7 kg, M: 46.9 ± 4.1 kg and L: 36.3 ± 3.1 kg. Attractiveness of ewes was simultaneously evaluated on 2 oestrus induced ewes per diet which were joined, successively, to 6 active rams. The R and P tests were performed alternating ewes from each diet. Diets did not change ($P > 0.1$) R and P behaviours of ewes, but induced a change in the average A scores i.e. H: 4.47 ± 0.4 (a), M: 3.63 ± 0.6 (b) and L: 2.42 ± 0.7 (c) (a, b, c; $P < 0.01$). Furthermore, we found that rams can finely tune their choice according to the ewe' BW regardless of the diet: Attractiveness score (1-6) = $+0.1002$ BW(kg) - 2.1 ; $r = +0.82$; $n = 36$; $P < 0.001$). Even if cues for these mating preferences were not identified, our results clearly prove that nutritional status of the ewe is of great influence on the rams' mating decision.

[1] Tilbrook AJ, Lindsay DR. Differences in the Sexual "Attractiveness" of Oestrous Ewes to Rams. *Applied Animal Behaviour Science* 1987; 17: 129-8.

[2] Fabre-Nys C, Venier G. Development and use of a method for quantifying female sexual behaviour in ewes. *Applied Animal Behaviour Science* 1987; 17: 289-4.