The role of seminal plasma in the function, transport and fertility of ram spermatozoa

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Abstract. To date, there have been no studies investigating the role seminal plasma plays in cervical transit of epididymal ram spermatozoa. As such, epididymal spermatozoa were assessed in the presence and absence of seminal plasma both in vitro and in vivo. Experiment 1 examined the effect of seminal plasma on fresh epididymal spermatozoa with and without subsequent cryopreservation, measuring motility variables and the ability to penetrate cervical mucus. Motility parameters of fresh epididymal spermatozoa did not improve with exposure to seminal plasma. Only the total motility of cryopreserved epididymal spermatozoa significantly ($p<0.001$) improved with pre-freeze exposure to seminal plasma (average exposed 31.9% ± 4.9% vs unexposed 20.4% ± 4%). However, adding seminal plasma significantly improved mucus penetration by fresh and cryopreserved epididymal ram spermatozoa ($p<0.05$). Experiment 2 investigated the fertility of epididymal spermatozoa with and without exposure to seminal plasma after cervical and intrauterine insemination. While epididymal spermatozoa performed poorly when inseminated cervically without seminal plasma (7.3%), exposure to seminal plasma yielded significantly ($p=0.05$) higher pregnancy rates (37.0%). Treatment had no significant effect on pregnancy rates following intrauterine insemination. These results suggest that exposure to seminal plasma during ejaculation is necessary for normal survival and transit of spermatozoa through the cervix.