

Ovulation-inducing factor in seminal plasma: A review

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Recent findings about the systemic effects in female alpacas and llamas suggest a new role of seminal plasma – as an inducer of ovulation. The first direct evidence of an ovulation-inducing factor (OIF) in semen came from workers in China who concluded that some factor in the semen was responsible for eliciting ovulation in Bactrian camels, rather than the mechanical stimulation of copulation. In early studies of alpacas and llamas, New World relatives of camels, ovulation occurred in >95% of the females subsequent to mounting and penile intromission compared to <14% of the females in which intromission was not allowed, and led to the concept that physical stimulation of the genitalia during copulation is the primary trigger for inducing ovulation in alpacas and llamas. However, recent studies, designed to more carefully control other potential factors (i.e., physical stimulation of the vagina, cervix and uterus), have provided convincing evidence that ovulation in alpacas and llamas is elicited by a specific protein in seminal plasma.

In response to a recent surge in interest in OIF and a recent flurry of publications on the subject, review is offered about what is known about OIF in seminal plasma, with particular emphasis on recent studies from the author's laboratory. The review includes information about the discovery of OIF, its effects and route of action, biochemical isolation and purification, mechanism of action, and its existence among species.

Recent studies document the presence of OIF in the seminal plasma of several mammalian species suggesting implications that extend beyond camelid species. Further characterization of OIF is needed to determine the relative prevalence and functional role of OIF among species, and for developing tools to examine the tissue source within the male and the tissue targets within the female. These tools will permit test of the hypothesis that some as yet unexplained causes of infertility are based on alterations in the sensitivity to, or abundance of, this molecule.