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Role of Uric Acid in Semen

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Abstract: Since 1963, various research studies and reports have demonstrated the role of uric acid (2,6,8-trihydroxypurine), an end product of adenosine and guanosine catabolism, on semen quality and sperm function. However, this effect has not yet been collectively discussed, even though uric acid has been a well-recognized constituent in semen. Here, we systematically and comprehensively discuss and summarize the role/effect of uric acid in semen quality by searching the main databases for English language articles considering this topic. Additionally, certain significant and relevant papers were considered to support discussions and perceptions. In conclusion, uric acid contributes to maintaining and enhancing sperm motility, viability, and morphology; therefore, protecting sperm function and fertilizing ability. This contribution is performed mainly by neutralizing the damaging effect of oxidizing (e.g., endogenous free radicals and exogenous toxins) and nitrating agents and enhancing certain bioactive enzymes in spermatozoa. In contrast, high levels of uric acid may induce adverse effects to sperm function, at least in part, by reducing the activity of vital enzymes in spermatozoa. However, further research, mainly clinical, is still required to fully explore the role/ effect of uric acid in semen.