

## BIOCHEMISTRY OF SEMEN

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### Composition of Semen

Semen is a substance produced by the male reproductive organs. It is composed of spermatozoa in a semi-viscous fluid. Structures within the male reproductive tract that are involved in the production of semen include:

- Testes and epididymis
- Prostate
- Seminal vesicles
  
- Bulbourethral gland

Semen is produced as a combination of secretions from the different regions of the male reproductive tract. Each fraction differs in chemical composition and function. The combination of these fractions during ejaculation results in the optimal environment for transporting sperm to the endocervical mucus in the female.

- Spermatozoa are produced in the testes. They mature in the epididymis. The testes also produce testosterone and inhibin.
- Fluid from the seminal vesicles accounts for approximately 70% of semen volume. The seminal vesicles are the source of fructose in semen. Fructose is used by the spermatozoa as an energy source.
- The prostate gland supplies about 20% of the volume of semen. Its fluids include acid phosphatase and proteolytic enzymes that lead to coagulation and subsequent semen.

The components and contributions of semen are as follows:

Gland(s)	Approximate fraction	Description
<a href="#">testes</a>	2–5%	Approximately 200 million – 500 million spermatozoa (also called <i>sperm</i> or <i>spermatozoans</i> ), produced in the <a href="#">testes</a> , are released per ejaculation. If a man has undergone a <a href="#">vasectomy</a> , he will have no sperm in the ejaculation.
<a href="#">seminal vesicles</a>	65–75%	<a href="#">Amino acids</a> , <a href="#">citrate</a> , <a href="#">enzymes</a> , <a href="#">flavins</a> , <a href="#">fructose</a> (2–5 mg per mL semen, <sup>[5]</sup> the main energy source of sperm cells, which rely entirely on sugars from the seminal plasma for energy), <a href="#">phosphorylcholine</a> , <a href="#">prostaglandins</a> (involved in suppressing an immune response by the female against the foreign semen), <a href="#">proteins</a> , <a href="#">vitamin C</a> .
<a href="#">prostate</a>	25–30%	<a href="#">Acid phosphatase</a> , <a href="#">citric acid</a> , <a href="#">fibrinolysin</a> , <a href="#">prostate specific antigen</a> , <a href="#">proteolytic enzymes</a> , <a href="#">zinc</a> . (The zinc level is about 135±40/mL for healthy men. <sup>[6]</sup> Zinc serves to help to stabilize the DNA-containing <a href="#">chromatin</a> in the sperm cells. A zinc deficiency may result in lowered fertility because of increased sperm fragility. Zinc deficiency can also adversely affect <a href="#">spermatogenesis</a> .)
<a href="#">bulbourethral glands</a>	< 1%	<a href="#">Galactose</a> , <a href="#">mucus</a> (serve to increase the mobility of sperm cells in the vagina and cervix by creating a less viscous channel for the sperm cells to swim through, and preventing their diffusion out of the semen. Contributes to the cohesive jelly-like texture of semen), <a href="#">pre-ejaculate</a> , <a href="#">sialic acid</a> .



