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**SEMEN:**

Semen, or seminal fluid, is a natural fluid produced by the male [reproductive system](https://www.wisegeek.com/what-is-the-reproductive-system.htm). It includes secretions from organs such as the testicles, the [prostate gland](https://www.wisegeek.com/what-is-the-prostate-gland.htm), and the seminal vesicles. Seminal fluid, which is heavily concentrated with protein and sugars, may be found in a jelly-like or liquefied state. The primary function of this fluid is to transport [sperm](https://www.wisegeek.com/what-is-sperm.htm) to the female reproductive system. It also contains nutrients that contribute to healthy sperm.

It is common for individuals to believe that sperm and semen are the same. Actually, semen is the fluid that passes through the [urethra](https://www.wisegeek.com/what-is-the-urethra.htm) and transports sperm, which are male reproductive cells. Seminal fluid's primary purpose is to help the male reproductive cells, or sperm, to successfully navigate their way through the female reproductive system to fertilize a woman's eggs.

The fluid is generally described as being white. It may also have a tinge of gray or yellow and still be considered normal. If it appears pink or red, that is usually an indication that the fluid is tainted with blood.

In addition to sperm, which develop in the testicles, there are other organs whose secretions contribute to the composition of semen. One example is the seminal vesicles, which are a pair of small structures that are located behind the bladder. These glands produce secretions that can account for more than half of semen's makeup. These secretions are heavily laden with the sugar fructose, which promotes healthy sperm cells. These secretions are also the component that is needed to give sperm its jelly-like consistency.

Another large portion of semen is composed of secretions from the prostate gland. These help to make the seminal fluid effective in protecting the sperm cells against the acidic conditions of the female reproductive system. One of the notable chemicals that the prostate gland contributes to seminal fluid is an enzyme known as prostate specific antigen ([PSA](https://www.wisegeek.com/what-is-psa.htm)).

After a man ejaculates, the semen converts to a jelly-like state. It is believed that this happens because such a consistency allows it to more effectively adhere to a woman's womb. The fluid does not remain in this state, however. It will eventually return to a liquefied state. PSA is credited for causing this melting action. The amount of time that will elapse before it occurs can vary from several minutes to well over half an hour.

The Cowper's gland is another contributor to the makeup of semen. Secretions from this gland are found in the form of a clear natural lubricant. Sometimes this lubricant may be released from the penis before ejaculation occurs.

The amount of seminal fluid that a man releases can be affected by the frequency of his ejaculations. If a man frequently ejaculates or has recently done so, he may produce a below average amount of seminal fluid. On the contrary, if he has gone for an extended period without ejaculation, he may produce an above average amount of fluid

**SPERMATOGENESIS:**

Spermatogenesis is the process of making [sperm](https://www.wisegeek.com/what-is-sperm.htm) cells, or developing immature [germ cells](https://www.wisegeek.com/what-are-germ-cells.htm) known as *spermatogonia* into mature sperm cells called *spermatozoa*. A sperm cell is the male reproductive cell that fertilizes the female egg in sexual reproduction. A male’s ability to reproduce depends on a high quality and quantity of sperm; therefore, spermatogenesis occurs continually from the time of puberty until death. The stages included in this process are spermatocytogenesis, spermatidogenesis, and spermiogenesis.

Spermatogenesis begins in the seminiferous tubules, which, depending on their type, look like small, straight or twisted noodles in the testicles. The inside of the seminiferous tubules are lined with Sertoli cells and spermatogonia. The Sertoli cells are often referred to as “nurse” cells because they aid in the development of sperm by eating the waste materials of spermatogenesis and directing the cells through the canals of the tubules.

During spermatocytogenesis, the spermatogonia divides through [mitosis](https://www.wisegeek.com/what-is-mitosis.htm) to form two diploid cells called *primary spermatocytes*. Mitosis is a type of cell division in which a parent cell grows and then splits in half to form two identical daughter cells. The primary spermatocytes, which have twice the amount of genetic material as a normal cell, must then undergo [meiosis](https://www.wisegeek.com/what-is-meiosis.htm) I.

In this type of division, the parent cell splits to form two diploid daughter cells, which have half the [chromosomes](https://www.wisegeek.com/what-are-chromosomes.htm), or genetic material, as the parent cell. The resulting secondary spermatocytes, which have the normal amount of chromosomes, must then go through meiosis II to form spermatids. This brief portion of spermatogenesis is called spermatidogenesis.

Spermatids have only half the total amount of chromosomes. This is because when the sperm joins with the egg, which also contains only half the amount of necessary chromosomes, they form a full set of chromosomes made from both the male and female genes. The random halving and pairing of chromosomes increases genetic variability, an important component in evolution.

During spermiogenesis, the final phase of spermatogenesis, the sperm cell grows a tail and reaches full maturation. In the first stage of this process, the Golgi phase, the [spermatid](https://www.wisegeek.com/what-is-a-spermatid.htm)’s genetic material becomes packed tightly together to form a [nucleus](https://www.wisegeek.com/what-is-a-nucleus.htm) and the spermatid undergoes structural change. While it was formerly circular, the mid-section begins to bulge and the cell extends at one end to form a Golgi apparatus, which creates chemicals called [enzymes](https://www.wisegeek.com/what-are-enzymes.htm). Next, the Golgi apparatus envelops the nucleus to form an acrosomal cap during the cap phase. The enzymes released by the acrosomal cap break down the wall of the female egg during fertilization, allowing the nucleus of the sperm to enter the egg and join the with the egg’s nucleus.

In the following acrosomal phase, the sperm cell grows a tail that helps it to move. The sperm cell rotates itself around in the wall of the seminiferous tubules so that its tail is facing toward the lumen, or inner space, of the tube. With the help of a [hormone](https://www.wisegeek.com/what-are-hormones.htm) called testosterone, the Sertoli cells consume the excess cellular materials in the maturation phase. In another process known as spermiation, the mature sperm cells are released into the lumen and propelled into the [epididymis](https://www.wisegeek.com/what-is-the-epididymis.htm), a small, coiled tube located between the back of the testicle and the vas deferens. Here, the sperm becomes motile, or capable of moving on its own, and ready to be ejaculated into the female during sex.